



**PROCEEDINGS
OF
INTERNATIONAL
AGRICULTURAL,
BIOLOGICAL & LIFE
SCIENCE CONFERENCE**

SEPTEMBER 2-5, 2018

EDIRNE, TURKEY



**PROCEEDINGS OF
INTERNATIONAL AGRICULTURAL,
BIOLOGICAL & LIFE SCIENCE
CONFERENCE**

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WELCOME NOTES

You are welcome to our AGBIOL Conference that is organized by Trakya University. The aim of our conference is to present scientific subjects of a broad interest to the scientific community, by providing an opportunity to present their work as oral or poster presentations that can be of great value for global science arena. Our goal is to bring three communities, namely science, research and private investment together in a friendly environment of Edirne, Turkey in order to share their interests and ideas and to benefit from the interaction with each other.

In September 2018, it will be held the first edition of the AGBIOL Conference, with ambition of the organizers to make it a periodical event. We are proud to announce that in the AGBIOL 2018 will take part more than 700 scientists and researchers from all over the world. There were submitted 823 scientific papers, of which 363 will be presented as oral talks and 460 as poster presentations. The full author list of all submitted papers comprises 2091.

Our conference is a premier international science, technology and business forum focusing on Agriculture, Biology and Life Science. The technical sessions highlight invited and volunteer speakers. Three student posters will be selected to receive 1st, 2nd and 3rd place monetary awards and a certificate during the conference.

We love our nature and care about the environment. We wanted to make our conference as much greener as possible, using less paper. The participants' posters were submitted via conference web page and will be presented on electronic poster screens, developed particularly for this purpose. Abstract book is published in electronic version, and copy of it on flash memory stick, will be provided on each participant.

Conference Topics:

Agriculture, Forestry, Life Sciences, Agricultural Engineering, Aquaculture and Biosystems, Animal Science, Biomedical science, Biochemistry and Molecular Biology, Biology, Bioengineering, Biomaterials, Biomechanics, Biophysics, Bioscience, Biotechnology, Botany, Chemistry, Chemical Engineering, Earth Sciences, Environmental Science, Food Science, Genetics and Human Genetics, Medical Science, Machinery, Pharmaceutical Sciences, Physics, Soil Science.

Edirne is not only a very nice, lovely and historical city at the edge of Europe, but located just at the heart of Balkan region and history endowed with monuments reminding imperial past. We are much pleased to host all of you in Edirne and Turkey.

We would like to thank all of you for joining this conference and we would like to give also special thanks to our sponsors and collaborators for giving us a big support to organize this event.

We wish you nice stay in Edirne!

Prof Dr Yalcin KAYA

Head of the Organizing Committee

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**(17965) CHARACTERIZATION AND DEVELOPMENT OF SUNFLOWER
(*HELIANTHUS ANNUUS* L.) GERMPLASM IN PAKISTAN**

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Sunflower is the fourth most important oilseed crop of humanity which contributes 12% of the total edible oil production of the world. Pakistan import edible oil in the form of palm and soybean oil as second major ingredient in its import bill raising questions of food security and sustainability in the country. Sunflower was introduced as an oilseed crop in 1960s and since then its cultivation fluctuated over the years within country. It peaked the highest area of 450 000 ha during 2007. However, the area is under declined and shrieked to 150 000 ha during 2016. Absence of high yielding hybrids resistant to biotic and abiotic stresses is the major hindrance of its area expansion. These factors reduce the profitability of the farmers and lowers its advantage with other competitive crops such as maize. Development and characterization of sunflower diverse germplasm is pre-requisite to overcome the shortcoming of sunflower in Pakistan. Sunflower breeding lines has been introduced from the collaborating institutes and developed through intra and interspecific hybridization. Introduced germplasm lines were being evaluated for fatty acids profile %, heat, salt stress environment and synchronization with local adapted restorer lines. Several experimental hybrids have surpassed in yield potential with commercial hybrids. Intraspecific hybridization and selection is being done to developed new inbred lines with better general combining ability, oil contents and diversify the sources of cytoplasmic male sterility. Several lines with better oleic acid%, general combining ability and heat tolerance has been developed which could be exploited in the development of indigenous stress resistant hybrids. The interspecific hybridization is being attempted to develop drought and disease resistant hybrids. *H. argopyllus* has been utilized for development of indigenous drought and disease (charcoal rot) resistant lines. Several project has been submitted with international collaboration to develop high yielding and oleic acid hybrids suitable for heat stress environment. Sunflower crop offers great opportunities to the public and private seed companies of Turkey for mutual collaboration of research and development in Pakistan.

Keywords: Fatty acids, Heat tolerance, Drought, Diseases, Yield potential

(17979) A NEW THREAT OF *PSEUDOMONAS SYRINGAE* PATHOVARS IN KHYBER PAKHTUNKHWA PROVINCE OF PAKISTAN

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Stone fruits, including peach, apricot and plum are very important in the economy of the Pakistan that earns a lot of foreign exchange but unfortunately their yield is not according to the potential. Bacterial canker has been a devastating problem in Pakistan. Current study was first time carried out in Pakistan for the determination of disease incidence and prevalence of major stone fruits (Peach, Apricot and Plum) growing areas of Khyber Pakhtunkhwa (KPK) (District Abbottabad, Mansehra, Haripur, Peshawar and Swat) in 2015. Almost 100% disease prevalence was calculated in KPK province of Pakistan while highest disease incidence in peach and apricot was in Swat i.e., 69% and 72%. Similarly, 67% DI was highest in Nowshera in plum orchards. Forty three gram negative isolates having florescent colonies were recovered showed Positive levan and tobacco hypersensitive response while negative oxidase test, pectolytic activity on potato tubers and arginine dihydrolase test confirmed that all 43 isolates were *Pseudomonas syringae* while positive gelatine, aesculin hydrolysis and lactate utilization test but negative tyrosinase and tartrate tests confirmed that 32 isolates were pathovar *syringae*. To refine results molecular characterization was done using two primer sets (16s rRNA and gyrB gene). After phylogenetic analysis it was confirmed that from 43 isolates 32 isolates were *P. syringae* pv. *syringae* while other 11 isolates were *P. syringae* pv. *morsprunorum*. The results highlighted the alarming situation of new threat in Pakistan, which must be further studied for its epidemiology for better management of bacterial canker of stone fruits in local environmental conditions.

Keywords: *Pseudomonas syringae* pv. *syringae*, *Pseudomonas syringae* pv. *morsprunorum*, Stone fruits, gyrB gene, 16s rRNA

**(18006) REFLECTION ON DEVELOPMENT PROSPECTS SPATIO-TEMPORAL
FOREST AND AGRICULTURAL LAND IN THE REGION OF BENI SAF
(ALGERIA)**

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This study highlights and develops a management plan spatio-temporal of forests and agricultural land in the region of Beni Saf. The pressure of the human activities has caused an imbalance in the land use. The methodology applied to superpose the map of potential land and the land use map, using the Geographical Information System (GIS), in partnership with the observations of the ground and the consultation of the forestry and agricultural history of the zone of study. The results obtained revealed a progression in forest space with a surface of 3.332 ha (54%) instead of 2.843 ha (46%), a regression of the space occupied by cernais with a surface of 690 ha or a rate of 11% and an extension of vines up to 600 ha (10%) instead of 5 ha (0.1%), the citrus 275 ha (4.5%) instead of 46 ha (1%) and rustic plantations with a surface of 336 ha (5%) instead of 104 ha (2%). With this planning which rests primarily on the aptitude of the grounds, we can achieve a harmonious balance of the use of the space.

Keywords: Cartography, TM land sat, Potentiality, Management, Beni Saf (Oran-Algeria)

(18119) IMPACT OF CLIMATE CHANGE ON SUGARCANE CROP PRODUCTION OF PAKISTAN: AN ARDL BOUND TESTING APPROACH

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Pakistan is in that part of the world, which is the one most vulnerable region to the climate change. Pakistan is placed in the list of top ten countries which are highly exposed to the climatic change. Being an Agrarian economy where approximately sixty percent of the peoples are directly or indirectly linked with agriculture activities and whose economy contributed approximately 22 percent to the GDP, climate change impacts on agriculture production are very important to evaluate. The current study would aim to identify the impacts of climate change on sugarcane crop production of Pakistan which is one the important cash crop of Pakistan. This crop is under great threat of climate unevenness. For conducting this study climatic and non-climatic data will be gathered for last thirty-five years from the sugarcane growing areas. Climatic variables would include average temperature, average rain fall, water availability and other important climatic variables (depending upon their availability). Non-climatic variables would consist of area under sugarcane crop production, fertilizer used and technology Factor. ARDL model (Auto Regressive Distributed Lag) will be the econometric technique that will be used to gauge the climate change impacts on sugarcane crop production. The study will help us in tracings the true impacts of climate change and will help policy makers to formulate suitable policy derivatives to safeguard sugarcane crop from climate change.

Keywords: Climate change, Sugarcane production, ARDL, Pakistan

**(18201) FLOWERING AND FRUITING OF YELLOW PASSION FRUIT
(PASSIFLORA EDULIS, VAR F. FLAVICARPA.DEG) AS INFLUENCED BY
DIFFERENT FERTILIZER APPLICATIONS IN KIAMBU AND EMBU COUNTIES,
KENYA**

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Yellow passion fruit (*Passiflora edulis f. flavicarpa* Deg.) is increasingly becoming an important fruit crop in Kenya and especially in Embu County due to its apparent adaptation to the hot arid conditions. The main objective of this study was to assess flower induction and fruit formation of yellow passion under varying fertilizer treatments. Sixty four plants belonging to KPF4 variety were grown in two sites at Kenyatta University (KU) Farm and at a selected farmer's orchard in Embu. The experiment was laid out in a Factorial Complete Randomized Block Design with planting and top dressing fertilizers as the main factors. The planting fertilizers were Farmyard manure and Diammonium phosphate (DAP) while the top dressing was Calcium ammonium nitrate (CAN) and Nitrabor. The treatments included 100g DAP+20kg Manure+50g Nitrabor; 100g DAP+10kg Manure+50g Nitrabor; 100g DAP+50gCAN; 100g DAP+50gNitrabor; 10kg Manure+50g CAN; 10kg Manure+50g Nitrabor; 20kg Manure+50g CAN; 20kg Manure+50g Nitrabor; 50g DAP+10kg Manure+50g CAN, 50g DAP+50g CAN, 50g DAP+50g Nitrabor and Control (no fertilizer). Data recording begun at the onset of the first flower bud and the number of unopened flower buds, open flowers and young unripe fruits was recorded on a weekly basis. Results indicate that there were significant differences (≤ 0.05) among the treatments for the three variables. Additionally, for the open flowers, there were differences for the two sites with Embu having the highest average of open flowers. The combined treatments of 100g DAP+10kg Manure+50g Nitrabor and 20kg Manure+50g Nitrabor showed the best results in terms of flower and fruit formation. Probably the commercial Nitrabor fertilizer (15.4% N + 25.9% CaO + 0.3% B) had an effect on the flowering possibly due to its enhanced boron content and improved solubility of calcium. The unripe fruits on the other hand had significant differences in the seasons but there were no major observational differences between the two sites. This probably can be attributed due to the high number of fruit drop and especially in the Embu which arose as a result of the prolonged dry spell. This study has demonstrated that varying fertilizer application can have significant impact on the flowering and fruit formation of yellow passion which are key determinants of the potential yield of an orchard.

Keywords: Agronomic management, Fertilizer application, Flowers, Fruits

**(18339) COMPARATIVE ASSESSMENT OF LAJTHIZA AND BOVELLA'S WATER
AT THE SOURCE, UP TO PRODUCTION-READY DURING 2017**

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With population increasing and knowledge development, the requirements for drinking water quality and safety have been increased. Nowadays, the request for high quality and safety drinking water has been increased, parallel to industrial, agricultural, energy and aquaculture usage. Water is one of the main ingredients for consumption and for use in the food industry, it has a high strength solvent to salts therefore, depending on the chemical composition of the layers from which water passes, enriched with various substances and thus has a content of different chemical. Water used for consumption and industry should be drinking. The drinking water is characterized by parameters such as organoleptic, chemical and bacteriological. Water than from all other juices falling shrink to a certain temperature (+4 °C) and then immediately abruptly begins to swell. When it freezes, it expands even more. For this reason, the solid water is easier than its liquid state. So, instead of ice water swim by the laws of physics should sink to the bottom of it. Water should be easier and less mineralized. The amount of minerals dissolved in water is a basic indicator for the natural mineral water, the label in the form of parameter "dry residue at 180 °C in mg/l". The lower this value is, the better is the water. This study takes into account the scientific evidence of the above, where the resources at any time of the year there are no variable composition and chemico-physical and to maintain equal treatment of the quality regulated by the technological process from storage, filtering varied and up on the packaging. Albania is considered a country with many natural water resources where there are many opportunities for the development of the water industry for human consumption.

Keywords: Water, Water features, Resources, Water quality

(18674) INFLUENCE OF DIFFERENT LEVELS OF POTASSIUM ON GROWTH, YIELD AND QUALITY OF CANOLA (*BRASSICA NAPUS* L.) CULTIVARS

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Potassium is one of the major nutrients whose deficiency decreased the growth and yield of canola. Current knowledge regarding K requirement of canola is limited. Thus the field study was carried out to assess the influence of different levels of K fertilization (0, 30, 60, 90, 120 kg/ha) on two canola cultivars viz. Bulbul-98 and Zafar-2000. Results revealed that increasing rate of K enhanced leaf area index and crop growth rate in both cultivars. Highest seed yield (3067.24 kg/ha) was obtained when K was applied at 120 kg/ha. While minimum seed yield (2353.85 kg/ha) was recorded in case of control. Variety, Zafar-2000 produced more seed yield than Bulbul-98. Oil content progressively decreased with increase of K level with highest (42.46%) in case of control and lowest (39.25%) with a K level of 120 kg/ha. Similarly, Zafar-2000 and Bulbul-98 produced 40.80% and 41.04% oil contents, respectively. From these results, it is concluded that potassium application at the rate of 120 kg/ha increased the growth, yield, and oil quality of canola.

Keywords: Canola, Oil contents, Potassium Fertilizer, Yield and yield components

(18675) GENOTYPIC VARIATION FOR POD YIELD, OIL CONTENTS AND FATTY ACID COMPOSITION IN PEANUT (*ARACHIS HYPOGAEA* L.) GROWN UNDER AN ARID ENVIRONMENT

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Peanut (*Arachis hypogaea* L.) is an important legume crop which is being grown in the arid and semi-arid regions of the world including Pakistan. Under climate change scenario, it is vital to explore the genotypic potential of peanut under arid climates to maximize its productivity. This 2-year study was aimed to evaluate the genotypic variation for pod yield, oil contents and fatty acid composition in various peanut genotypes viz. 12CG001, 12CG002, 12CG003, 12CG005, 12CG007, 12CG009, Golden and BARI-2011 under the arid conditions of Layyah, Punjab, Pakistan. The results of the study indicated that there existed a greater genetic diversity in the studied genotypes under the arid climate of Layyah. The highest number of pods per plant, number of leaves per plant, pod yield, seed weight, oil contents and palmitic acid were recorded in genotype BARI-2011. However, 100- seed weight was the highest in genotype Golden. Among the years, the morphological/yield parameters, oil contents and palmitic acid was the highest during second year of experimentation. The oil contents and palmitic acid varied from 48.9-52.5% and 9.2-12.0% in various peanut genotypes. In conclusion, greater genetic diversity in the studied genotypes must be exploited in future breeding programs. Genotype BARI-2011 should be used in future breeding programs for optimizing peanut production under arid climate of Layyah.

Keywords: Arid environment, Fatty acid composition, Peanut genotypes, Oil content, Yield

(18682) SILVER NANOPARTICLES IMPACT ON WHEAT GROWTH

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Nanotechnology is the science that works at molecular (nano) scale at which the physical, chemical and biological properties are frequently different from what they were at larger scale. By harnessing these new properties, valuable advanced products have been developed. Nanotechnology has created revolutions in different sectors from environment, agriculture/food, electronics, automobiles, optic, construction, energy, transport, health and medicine, sports, textile. Silver nanoparticles (SNPs) have definite potential to enhance growth and yield of wheat. Different concentrations of silver nano-particles variably affected germination and seedling growth. Application of 20 ppm SNPs predominantly enhanced germination percentage, germination index, shoot fresh weight, shoot and root dry weight of wheat. Silver nano-particles have significant impact on biochemical traits of wheat. Maximum free proline, total soluble sugar, total soluble protein and chlorophyll stability index were recorded at 40 ppm of SNPs and then started declined when concentration was increased. Enzymatic activities (SOD, POD, CAT and MDA content) of wheat increased by the application of silver nano-particles @ 40 ppm and tend to decline with higher concentrations of SNPs. Green house results reveal that silver nanoparticles enhanced growth and yield of wheat crop plants at lower concentrations (40 ppm of SNPs) while higher concentrations have detrimental effects. Silver nanoparticles can modify plant physiology to greater extent. Silver nanoparticles can be employed to improve germination indices, physiological attributes of plants to enhance resistance and stress tolerance which ultimately result in boosting growth and yield of crop plants.

Keywords: Proline, Sugars, Enzymatic activities, Yield, Wheat

(18737) EFFECT OF SOME BIOTIC AND ABIOTIC FACTORS ON POPULATION DYNAMICS OF *APHIS SPIRAECOLA* PATCH, 1914 ON CITRUS IN EASTERN MITIDJA (ALGERIA)

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The importance of the damage caused by *Aphis spiraecola* on Algerian citrus cultivation stimulated us to carry out this study. The sampling took place during the period from April 11 to July 24, 2013 at the specialized technical agricultural institute. The first apparition of *Aphis spiraecola* on the orange leaves are recorded towards the beginning of April, with 10.02 individuals per leaf on April 18th. During this period, we noted certain temperature stability around 11° C for Minima, 22°C for Maxima. This phase coincides with the first sap flow. The improvement of favorable conditions for the development of aphids and the host plant, mainly climatic factors: temperatures around 25°C, humidity ranging from 60-80% and the soil reserves by rainwater not yet exhausted, have done that the populations of *Aphis spiraecola* are steadily increasing, reaching the maximum level on July 07 with 110.84 aphids per leaf on orange tree, against 30.14 aphids per leaf on lemon tree. This period corresponds to the second sap flow. After July 07, the populations of *Aphis spiraecola* will regress and disappear permanently from the arboreal strata around July 21st. Because climate changes in the summer period, increases in maximum temperatures exceeding 35°C, absence of precipitation can affect the activity and development of aphids.

Keywords: Citrus, *Aphis spiraecola*, Temperature, Humidity, Sap flow

(18754) GENE ACTION OF DROUGHT TOLERANCE AND ACHENE YIELD RELATED TRAITS IN SUNFLOWER (*HELINANTHUS ANNUUS* L.)

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Sixty sunflower accessions were evaluated under Polyethylene glycol (PEG-6000) mediated drought stress. Selected tolerant and sensitive accessions were crossed in Line Tester fashion and resultant F1 along with their parents were evaluated for drought tolerance in field and PEG mediated drought in lab. Data were recorded on morphological and physiological parameters. Genetic variation among the entries under normal and drought stress treatments, indicated that this breeding material may be used for the development of drought tolerant types. Combining ability analysis exhibited variable direction and magnitude of general combining (GCA) effects among line and testers and specific combining ability effects (SCA) among crosses. The lines A-23, G-33 and 017583 and testers HA-133 and 017577 were best general combiners under normal and drought stress treatments. Results of SCA indicated that crosses G G-61 × 017577, A-79 × CM-621, A-48 × CM-621, 017592 × CM-621, 017592 × 017577, 017566 × HA-341, G-33 × CM-621, G-33 × HA-342, A-79 × HA-133, 017592 × HA-124, A-48 × HA-341, A-48 × HA-342, G-61 × CM-621, HBRS-1 × 017577, A-23 × CM-621, 017566 × HA-124 and A-75 × 017577 were best specific combiners. Crosses G-61 × HA-124 and A-48 × HA-341 had also mid parent, better parent and commercial heterosis for various traits under treatments. Additive type of gene action was observed for germination percentage, days to 50% flowering, days to 50% maturity, stem diameter and oil content while other traits showing non-additive gene action. Association of traits based on correlation and path analyses suggested that seedling fresh weight, dry weight and hundred achene weight might be used as criteria for selection of sunflower for drought tolerance and high achene yield. Sixty sunflower accessions were evaluated under Polyethylene glycol (PEG-6000) mediated drought stress. Selected tolerant and sensitive accessions were crossed in Line Tester fashion and resultant F1 along with their parents were evaluated for drought tolerance in field and PEG mediated drought in lab. Data were recorded on morphological and physiological parameters. Genetic variation among the entries under normal and drought stress treatments, indicated that this breeding material may be used for the development of drought tolerant types. Combining ability analysis exhibited variable direction and magnitude of general combining (GCA) effects among line and testers and specific combining ability effects (SCA) among crosses. The lines A-23, G-33 and 017583 and testers HA-133 and 017577 were best general combiners under normal and drought stress treatments. Results of SCA indicated that crosses G G-61 × 017577, A-79 × CM-621, A-48 × CM-621, 017592 × CM-621, 017592 × 017577, 017566 × HA-341, G-33 × CM-621, G-33 × HA-342, A-79 × HA-133, 017592 × HA-124, A-48 × HA-341, A-48 × HA-342, G-61 × CM-621, HBRS-1 × 017577, A-23 × CM-621, 017566 × HA-124 and A-75 × 017577 were best specific combiners. Crosses G-61 × HA-124 and A-48 × HA-341 had also mid parent, better parent and commercial heterosis for various traits under treatments. Additive type of gene action was observed for germination percentage, days to 50% flowering, days to 50% maturity, stem diameter and oil content while other traits showing non-additive gene action. Association of traits based on correlation and path analyses suggested that seedling fresh weight, dry weight and hundred achene weight might be used as criteria for selection of sunflower for drought tolerance and high achene yield.

Keywords: Achene yield, Biochemical analysis, Combining abilities, Drought, Morphogenetic traits

(18761) PROTECTION OILCROPS SAFFLOWER FROM DISEASES AND WEEDS

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The results of long-term studies of the biological, morphological and phenological features of the introduced new culture of safflower in the Central, Volga and North Caucasus regions are presented. Optimum parameters of depth of seeding (5-6 cm), seeding rates (300-350 thousand pieces/hectare or 12-14 kg), ensuring high productivity, oil content and quality of seeds are established. The vegetation period from full germination to full maturity safflower culture in the Central Federal District in an excessively wet, atypical in 2013 was 96 days, 2010-2012, 2014 research – 114 and in 2015 – 105 days, average for 5 years – 111 days, in the Southern Federal District – 94 days, in the Volga federal District – 95 days in the Central Tajikistan – 110 days (the average for all years of study). For the first time, the relationship between moisture availability of vegetation periods with accumulation of oil content and a change in the fatty acid composition was established. Oilseed (in untreated seeds) in the regions was from 14.5 to 31.2%, in excessively wet 2013 – 6.4% in the Moscow region and 8.6% in the Saratov region. Fatty acid composition revealed a high content of oleic acid in Krasa Stupinskaya variety – 13.6-16.8%, linoleic acid – 68.5-75.7%. The yield of oil in the Moscow region was 240 kg/ha. The yield of Krasa Stupinskaya in the Moscow Region was 0.6 t/ha, the Rostov Region 0.8 t/ha and Saratov Region 1.2 t/ha, with an average weight of 1000 seeds, respectively, by regions: 40.0 g, 47.3 g and 40.9 g. It has been established that excessive moistening during the flowering and seed filling period increases the harmfulness of enzyme-mycosis seed depletion (EMIS) – biological injury during maturation (enzymatic stage), followed by the seeding of the seeds with the phytopathogen *Alternaria carthami* Chowdhury. In the protection of safflower against harmful organisms used seed treatment for 1-3 months before sowing preparation Vincit, KS or Maxim, KS-1.5-2 l/t of seeds. A seedling of safflower does not have the ability to fight weeds. Were treated with pre-emergence soil herbicide is a new generation Dual gold EC of 1.3-1.6 l/ha. In a production environment used only a post-emergent drug Harmony-6-8 g/ha at a rate of 200-300 liters of water. Drugs stop the growth of monocotyledonous and dicotyledonous weeds, which gradually wither and die. Drugs do not affect the accumulation of oil and protein content.

Keywords: *Carthamus tinctorius*, Seeding rates, Regions, Oilseed, Yield, Disease, Weeds

**(18771) EVALUATION OF SPRING WHEAT (*TRITICUM AESTIVUM* L.)
RECOMBINANT INBRED LINES FOR DURABLE RUST RESISTANCE**

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Wheat rusts are the most serious constraints to wheat productivity in Pakistan. Incorporation of rust resistance is the only solution for sustainable yield in wheat. Recombinant inbred lines (F6) originating from cross SA42 × Parula were evaluated at six locations for leaf and yellow rust under natural infestation including the kaghan valley containing high infestation of rust inoculums. The two parents contained variable source of resistance which may able to produce transgressive segregants containing rust resistance from both parents, and thus having durable resistance against rust. 156 RIL populations were evaluated in randomized complete block design with two replications. These lines were morphologically scored for presence of rust over the leaves and stem. A large proportion of the RIL population was found to be resistant at particular locations. This may be due to the carrying of various rust resistant genes in RIL populations. Among various locations, Faisalabad (elevation 184 m, 31.4504° N, 73.1350° E) showed the highest frequency of susceptibility, thus this site may provide good screening data for rust infestation. A small proportion of RIL populations (12%) were found to be resistant at all locations in both years. These lines may be carrying rust resistant from diversified sources and may be good source of durable rust resistance. Marker assisted selection was performed to characterized these resistant RIL lines.

Keywords: Leaf rust, Marker assisted selection, Multi-locations, Durable resistance

**(18782) PHENOTYPING OF SEGREGATING GENERATIONS DERIVED FROM
SUNFLOWER INTERSPECIFIC CROSSES (*HELIANTHUS ANNUUS* ×
HELIANTHUS ARGOPHYLLUS) FOR DROUGHT**

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Drought is major production constrained in crop science and crop wild relatives are important source of resistance against biotic and abiotic resistance. A breeding program was initiated to introgress drought tolerance in sunflower through hybridization between argophyllus and annuus species. Selection was carried out in segregating generations for high cuticular waxes, smaller leaf area, single heading and high oil contents. The developed F5 breeding lines were compared with non-adapted elite sunflower germplasm under controlled conditions. Contrasting water regimes were developed by irrigating 100% field capacity or 75%, 50% and 25% of the total water applied in the control under randomized complete block design. The comparison between the two types of germplasm showed that drought resistant breeding lines showed superior traits such as leaf area, shoot weight and root to shoot ratio. Several drought resistant promising lines such as UCA-2, UCA-B5, UCA-B27 were identified which showed superior traits, root length and root to shoot ratio under high intensity of water stress treatment (T3).

Keywords: Yield loss, Root to shoot ratio, Introgression, Crop wild relatives

(18868) IDENTIFICATION OF DIFFERENT TRITICALE GENOTYPES YIELD AND QUALITY PERFORMANCE

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Our world exposed to natural events such as drought and heat. Researcher has to develop more resistance genotypes. Triticale is a good choice. In Turkey triticale is used especially for animal feeding and some part of human consumption. Last 30 years 17 triticale varieties were registered by MFAL (13/17) and private sector (4/17). Attention of triticale from stakeholders are increasing because of Government support. For the breeding side the priority of triticale production is high yield and good quality.

In this study we conducted a trial which has 20 line and 5 varieties (Tatlıcak-97, Alperbey, Özer, Karma-2001 and İvriz) with 4 replications to determine genotypes yield and some quality performance in 2016-2017 production season at 4 rainfed location [(3 in Konya province (Centre (L-1) and İçeriCumra (L-2) and Gözlü (L-3) and 1 in Aksaray province of Koçaş(L-4)]. Trial design is randomized complete block with 550 seed per m², 6 row -8 m² plot size. All data of grain yield (Kg/Ha) and quality [(Protein (%), Hektoliter (l) TKW(g), SDS (ml) and Cellulose (%)] statistically analysed. Differences between genotypes, location and Genotype x Location interaction was found important (p<0.01). Mean grain yield of trail is 4.286 kg/ha. Location-4 has the highest grain yield (5.029 kg/ha). TBVD-12 line (4.932 kg/ha) gave the highest grain yield, TBVD-7-8-9-13-14-21-22 lines are above the mean. Trials quality mean are: 1000 KW (40.2 g), Hektoliter (73.7 L), Protein ratio (% 15.2), SDS (15.16 ml) and Cellulose (3.4%). At rainfed condition line numbers: 7-8-9-12-13-14-21-22 and Alperbey and Ozer varieties can be recommended to use for gaining more grain seed with good quality around this region.

Keywords: Triticale, Yield, Quality, Drought

(18902) ASSESSMENT OF MICRO-ELEMENTS CONTENT IN SOFT ALBANIAN WHEAT GENOTYPES

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The increase of micro-elements content in wheat seed to reduce human malnutrition is a challenge for all agronomists during plant breeding. The objective of current study was to assess the micro-elements content as Cu, Fe, Mn, Cd, Zn and Cr in 20 accessions and 10 lines of soft wheat grown under organic farming system in Albanian region. The Cu, Fe and Zn contents were determined by flame atomic absorption spectrometry (FAAS) and the Mn, Cd and Cr contents were determined by electrothermal atomic absorption spectrometry (ETAAS). The obtained results showed significant variations in micro-elements contents in different wheat grains genotypes. Higher levels of Cu, Zn, Fe and Mn (6.79; 46.42; 66.78 and 34.87 mg/kg, respectively) were observed in wheat lines of the present study. These values were higher compared to reported data in previous studies which are performed in the conventional farming system. The concentrations of Cd as a potential toxic elements were below the EU limits in all analyzed samples. The present study showed that the analyzed wheat samples could be considered as a valuable source of micro-elements in human's diet.

Keywords: Concentration, Food requirement, Genotype, Micro-element, Soft wheat

(18904) ETHYLENE INFLUENCES IN YIELD PERFORMANCE OF MECHANICALLY WOUNDED AND STIMULATED *HEVEA* TREES

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Impacts of mechanical wounding i.e. mechanical boring and tapping following application of ethylene-based stimulant, Mortex on *Hevea brasiliensis* clones RRIM 2025 and PB 350 were instigated. Mortex at three different concentrations i.e. 0.75%, 2.5% and 5% were applied and their response in promoting wound (endogenous) ethylene, latex flow in term of yield, dry rubber content, sugar content and bark nutrient content were determined. Presuming these outcomes as part of defence responses of rubber trees, the optimum concentration of Mortex that gave minimum deleterious effects was suggested as the best stimulant to be implemented by the rubber harvesting industries. In relation this, data analysed against control 1 (untapped and unstimulated), control 2 (tapped and unstimulated) and application of ethylene action inhibitor nanosilver particles (NS), found that Mortex at 5% concentration applied locally at tapping panel, produced highest rate of wound ethylene evolution in the local tissue, shaved bark of ethylene sensitive clone, RRIM 2025. The significant highest rate of wound ethylene evolution was observed in shaved bark of ethylene insensitive clone PB 350, when applied with 2.5% Mortex. Wounding by tapping alone (control 2) produced wound ethylene at low level for both clones. Accumulated wound ethylene in bored holes at 2cm above tapping cut, induced at highest rate when Mortex at 2.5% concentration was applied to the tapping panel of RRIM 2025 but at lowest rate in PB 350. Effect of ethylene stimulation at the region 2cm above tapping cut was apparently not distinctive. Induction of wound ethylene by all concentration of tested Mortex in bored holes of PB 350 was not significant. Tapping activities and stimulation with ethylene-based stimulant induced slightly higher wound ethylene level in both clones tested. Application of NS successfully inhibits ethylene action by reducing wound ethylene evolution in localised and systemic tissues of both clones. Wound ethylene evolution in area 2cm above tapping panel (bored holes) and at the stimulation site was significantly increase from low to medium to high yielding period for both clones indicates that responses towards wounding and stimulation in different yielding period of *Hevea* sp were ethylene-dependent.

Keywords: Ethylene, *Hevea brasiliensis*

(18916) PRELUDE ESTIMATION OF CLIMATE CHANGE IMPACTS ON SUGARCANE PRODUCTIVITY IN SINDH PROVINCE OF PAKISTAN

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The sector of agriculture and its production system in Sindh province of Pakistan is primarily irrigated, and research results conclude that it derives 60 to 80 percent of its availability of water from melted snow-ice for the land cultivation. Now, it is completely under threat because of shifting in the weather pattern due to the climate change with its impact either in negative or positive way. Negative impact left footprints and it has showed drastic suffering of agricultural production in Pakistan since last decade specifically. Exploratory research method with the VAR econometric model “Vector Auto Regression” was used. The model revealed and analyzed the impacts temperature and precipitation causing the climatic variation. The projected figure for sugarcane availability/production would be 33 987.223 thousand ton. The country’s need is approximately 35 thousand tonnes. The intact results of the study screened that the somewhat negative impact of climate change and harm would be on productivity of the sugarcane crop for next years. The statistical calculated values were not significant enough of t-statistics for study variables but in other hand the F-statistics value were higher to make all the lag terms of study model statistically significant. Furthermore, the R-squared values of coefficient of determination for variables were within 0 to 1 which basically showed the integrity of fit in study model. So that, consider the VAR study model with lag 2 exclusively because the analysis values of Schwarz (Sc) and Akaike (AIC) and for the last twenty years’ time series data using, lag 2 is diminutive than of lag 3, with lag 4 and lag 5 respectively. The smaller values Schwarz (Sc) 14.28372 and Akaike AIC 13.5070 for the lag 2 make the study model more fitted. [u1] Therefore, the VAR study model was more suitable. The predicted values for overall sugarcane crop production and its productivity growth rate would be reported as -1.673 and -0.587. Likewise, the parameters of the study viz β_0 , β_1 , β_2 , β_3 .. β_n . In addition, projected climate change factors affecting on sugarcane indicated that the higher temperature and unexpected shifting of weather activities such as unwanted rainfall, higher temperature had negative impact on production practices and resultantly the productivity went into uncertainty due to climate change. Overall the 01°C to 01.8°C temperature will be increase and 10% to 18% precipitation will be decrease in the upcoming years up to 2030.

Keywords: Climate Change, Sugarcane, Productivity, Vector Autoregression (VAR), Sindh

(18936) CORRELATION IMPACT STUDY OF SUNFLOWER FARMER'S KNOWLEDGE AND DEVELOPMENT IN SINDH PROVINCE OF PAKISTAN

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The country Pakistan holistically is agrarian in nature and the lifeline of the country's economy. Since, couple of year the net import bill of edible oil has increased considerably and it's alarming situation and has huge extra burden on the country's reserves. In the country the Agriculture has the largest sector and has remained the mainstay of country economy as it contributes 20.9% of the GDP (Gross Domestic Product) and provides employment to 43.5 percent population and also provides inputs for agro based industry (GOP, 2015). Sunflower is an important oilseed crop of Pakistan. The main objective of this study is to demonstrate the case of crop production and protection technologies and management practices of farmers in the latest release of the different agro-climatic zones and agriculture fields. The cropped area for sunflower stood at 353 thousand hectares with little increased during 2016-17 against last year's area of that showing decline of 02.167 percent. Sunflower production for the year 2016-17 stood at 273 thousand tones seed and 167 thousand tones in oil production (GOP, 2016). The major oilseed crops grown in the country include Sunflower, Canola, Rapeseed/Mustard and Cotton. The major objective of the study is to identify the factors affecting on yield and timely decisions of sunflower market and its bottleneck in production practices. The results revealed that lower level of adoption of improved agricultural technology innovation diffusion process and a key aspect for improving agricultural production at a faster rate the most important. So that, related technical information about recommended production practices and its related marketing issues information should be and must be transferred to farmers' knowledge. Therefore, the administrators, planners and executers must give the focal importance to execute the frontline demonstrations concept and special orientation training should be given to the departmental staff for further to train the progressive farmers and grassroots extension workers around their demonstrations. Consequently, the administrators and implementing officers should also keep in view while selecting demonstrators because the results shows the height of the sunflower production potential and similarly that potation helps to overcome and reduce in the edible oil net import bills. Therefore, these demonstrators in turn motivate non-participant farmers for full adoption of recommended technologies of Sunflower to increase the income on sustainable basis.

Keywords: Sunflower, Production, Development, Knowledge, Sindh

(18964) RESPONSE OF UPLAND COTTON FOR VARIOUS PHYSIOLOGICAL, BIOCHEMICAL AND MORPHOLOGICAL PARAMETERS UNDER HIGH TEMPERATURE CONDITIONS

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Gossypium hirsutum is cultivated as fiber crop around the globe and leading cash crop of Pakistan like USA, India and China. Southern areas of Punjab and Sindh provinces are major contributors in the production at national level. Increasing temperature due to climate change had exerted negative impact on cotton production. The development of heat tolerant cotton cultivars is need of the present day to recover losses due to high temperature and it warns the cotton breeders for the identification and utilization of various approaches for development of lines having tolerance to high temperature. For this purpose, 154 genotypes of upland cotton were collected from various public and private research institutes of Punjab and Sindh provinces in Pakistan. This collection was comprised of cultivars, obsolete cultivars and some advance breeding lines. The germplasm was sown in the cotton field area of University of Agriculture, Faisalabad (Pakistan). The germplasm was sown in replications at two different dates under alpha lattice design. The sowing dates were planned to coincide the flowering stage with maximum annual temperature in first sowing and optimal temperature for cotton production in second sowing. The data was recorded at appearance of first flower, pollen viability, cell membrane thermostability and biochemical assays (H₂O₂, peroxidase activity and proline content). Bolls were also picked from each genotype to assess the fiber quality traits. The data on some morphological traits namely plant height, number of sympodia, number of bolls per plant, boll weight, seed cotton yield and GOT were also recorded. Biometrical analysis revealed the differential response of germplasm and highly heat tolerant, moderately heat tolerant and heat susceptible categories were made. Further, these techniques could be used as reliable approach for screening of cotton germplasm. The identified lines will be hybridized in next cotton season for the development of new germplasm having enhanced heat tolerance.

Keywords: Germplasm, Heat tolerance, Physiological, Upland cotton

(19000) EFFECTS OF REARING INTERLUDE AND GRAFTING TECHNIQUE ON HONEYBEE *APIS MELLIFERA* L. QUEEN UNDER FIELD CONDITIONS

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The proposed research work was conducted at Honeybee Research Institute of National Agricultural Research Centre, Islamabad on *Apis mellifera* linguistica honeybee colonies during the spring months of March-April 2017. The effects of four larval grafting techniques, addition of royal jelly (A), dry grafting (B), grafting with addition of one drop of distilled water (C) Royal jelly plus distilled water (D) on queen bee rearing were investigated under field conditions. A considerable variation in queen rearing success was observed as calculated by percentage of secluded queen cells vs. grafted larvae over the study interlude. The highest larval acceptance 80.85 ± 0.64 and 81.25 ± 2.05 was observed by addition of royal jelly in March and April and lowest 42.05 ± 0.69 and 48.21 ± 2.02 . The shortest pre oviposition period by addition of royal jelly in March and highest was by addition of distilled water droplet during March and April. The length of queen cell was highest in royal jelly added treatment followed by dry grafting, royal jelly plus distilled water and distilled water respectively. The queen emergence weight was slightly higher in the royal jelly added grafting than other treatments. The queen spermatheca diameter, emergence rate and mating rate were not found to be affected by the treatments and rearing interludes. Additional research is suggested and needed for clear recommendation.

Keywords: Honey bee (*Apis mellifera*), Queen bee rearing, Characteristics of queen, Grafting method, Royal jelly

(19044) COMPARATIVE EFFICACY OF SOME COMMERCIAL NATURAL PRODUCTS ALONE AND IN COMBINATION WITH SUGAR AND SULFUR AGAINST *VARROA DESTRUCTOR* IN COLONIES OF *APIS MELLIFERA* L.

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Varroa destructor (Anderson & Trueman), is the most rigorous and economical pest of *Apis mellifera* L. worldwide. Many control measures including application of chemicals are adapted to control the infestation of mites in honey bee colonies. Use of insecticides have created many problems e.g. honeybeemortality, resistance in mites and residues in honey etc. Natural products are considered as alternate to synthetic insecticides. These are more easily degradable and could show less negative environmental impact. So, the study was planned to check the efficacy of natural products (e.g. Apigurad®, Apilife®Var), sugar and sulfur to check the percent mortality of *Varroa* mites. Apigurad® and Apilife®Var were applied at recommended doses and sugar and sulfur were applied at 150g and 10g respectively / per colony. Percent mortality data were recorded at 24, 48, 72, 96 and 120hrs after treatment exposure. The results of experiment showed that all natural products gave satisfactory control of *Varroa* mite except sulfur when applied alone. The percentage mortality (54.73±4.66%) was observed maximum when Apigurad® and Apilife®Var were applied in combination. While sugar+Apiguard® gave 46.8±4.90% mortality of *Varroa*. Similarly, combination of sugar and sulfur also gave significant control (45.46±2.18%) of *Varroa* mites. It is concluded that the combination of Apigurad® and Apilife® can be used for better management of *Varroa* mites in honeybee colonies. This study can be helpful for beekeepers for the better management of *Varroa* mite and ultimately increasing the yield of honey.

Keywords: Efficacy, Commercial natural products, *Varroa destructor*, *Apis mellifera* L.

**(19084) INHERITANCE PATTERN OF FORAGE YIELD AND QUALITY
ATTRIBUTING TRAITS OF ALFALFA (*MEDICAGO SATIVA* L.)**

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The study was conducted to screen alfalfa accessions and their crosses for high biomass yield and quality traits. It was carried out also to collect information regarding genetic variability, general and specific combining ability effects, heterosis over mid and better parents, heritability, gene action and correlations for various seedling, biomass and quality traits of alfalfa. Genetic variation among the entries indicated that this breeding material may be used for the improvement of biomass yield and forage quality. Combining ability analysis showed variable direction and magnitude of general combining ability (GCA) effects among lines and testers and specific combining ability effects (SCA) among crosses. On the basis of GCA results Lines 262544, 37502, 37522 and tester 672753 and 262544 were found best general combiners while SCA results indicated that cross combinations 262544' 672753, 464765' 39483, 464769' 40095 and 262544' 40095 were found best specific combiners. Fresh plant weight, plant height, plant dry weight and crude protein were under the genetic control with additive gene action while other traits showing non-additive gene action. Plant height, leaf area, dry biomass, ash content, neutral detergent fiber, acid detergent fiber and crude fiber may be used as criteria for selection of alfalfa for biomass yield and bioenergy purpose.

Keywords: Fodder, Livestock, Forage yield, Quality parameters

(19085) INHERITANCE PATTERN OF ACHENE YIELD AND DROUGHT STRESS TOLERANCE RELATED TRAITS IN SUNFLOWER

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Sixty sunflower accessions were evaluated under Polyethylene glycol (PEG-6000) mediated drought stress. Selected tolerant and sensitive accessions were crossed in Line × Tester fashion and resultant F1 along with their parents were evaluated for drought tolerance in field and PEG mediated drought in lab. Data were recorded on morphological and physiological parameters to estimate genetic variability, general and specific combining ability effects, heterosis manifestation, gene action, correlation and path analyses. Genetic variation among the entries under normal and drought stress treatments, indicated that this breeding material may be used for the development of drought tolerant types. Combining ability analysis exhibited variable direction and magnitude of general combining (GCA) effects among line and testers and specific combining ability effects (SCA) among crosses. The lines A-23, G-33 and 017583 and testers HA-133 and 017577 were best general combiners under normal and drought stress treatments. Results of SCA indicated that crosses G G-61 × 017577, A-79 × CM-621, A-48 × CM-621, 017592 × CM-621, 017592 × 017577, 017566 × HA-341, G-33 × CM-621, G-33 × HA-342, A-79 × HA-133, 017592 × HA-124, A-48 × HA-341, A-48 × HA-342, G-61 × CM-621, HBRS-1 × 017577, A-23 × CM-621, 017566 × HA-124 and A-75 × 017577 were best specific combiners. Crosses G-61 × HA-124 and A-48 × HA-341 had also mid parent, better parent and commercial heterosis for various traits under treatments. Additive type of gene action was observed for germination percentage, days to 50% flowering, days to 50% maturity, stem diameter and oil content while other traits showing non-additive gene action. Association of traits based on correlation and path analyses suggested that seedling fresh weight, dry weight and hundred achene weight might be used as criteria for selection of sunflower for drought tolerance and high achene yield.

Keywords: Achene yield, Sunflower, Drought, *In vitro* screening, Polyethylene glycol

(19169) INTERACTIVE INFLUENCE OF BIOCHAR, PGPRS AND SYNTHETIC FERTILIZERS ON PRODUCTIVITY OF PEANUT (*ARACHIS HYPOGAEA* L.) UNDER AN ARID CLIMATE

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Peanut (*Arachis hypogea* L.) is an important oilseed crop of Pakistan which is grown widely in rainfed regions of Pakistan. It is very less input requiring crop which can grow well under diverse environment conditions. Pegging is the particular character of peanut which makes it unique among the other oilseed crop. The sandy loam soils are best for its production. However, it is not being grown in Thal area which may a potential area for its production. In our experiments, we found that peanut can be a cash crop in Thal region which can provide more profit than cotton from per unit area. In this study, we evaluated the role of PGPRs and synthetic fertilizers accomplished with biochar on peanut productivity. The experiment consisted of following treatments viz., i) control, ii) application of synthetic fertilizer, iii) application of PGPRs, iv) biochar (10 t/ha), v) chemical fertilizer + PGPRs, vi) chemical fertilizer + biochar, vii) biochar + PGPRs and viii) PGPRs + biochar + chemical fertilizer. This study indicated that the highest pod yield (1.94 Mg/ha) and seed yield (1.08 Mg/ha) was recorded when biochar was applied in combination with PGPRs and synthetic fertilizers which was attributed to more number of pod plant and highest seed weight in this treatment. In crux, biochar application might be a pragmatic option to boost peanut yield in Thal area combined with PGPRs.

Keywords: Oilseed, Peanut, Biochar, PGPR, Synthetic fertilizer

(19197) AN UNDERSTANDING OF *CERATOCYSTIS MANGINECANS* CAUSE OF SERIOUS DECLINE OF VARIOUS FRUIT AND FOREST TREES

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Ceratocystis is a genus of cryptic species in *Ceratocystis fimbriata sensu lato* species complex. The species of this genus are wilt causing in nature. *Ceratocystis manginecans* is one of these species which is responsible to cause decline disease in various fruit and forest trees. Recently, *C. manginecans* has devastated 60% losses in mango production of countries Pakistan and Oman. Simillary, 95% *Dalbergia sisso*, indian rose wood trees has been devastated in Pakistan. *C. manginecans* is also responsible to cause decline of *Pisidium gujava* (53%), *euclyptus* (20%), and *Acacia modesta* (40%). Though, due to increasing disease epidemics and rapid shift in host range leads to an alarming situation caused by this pathogen. If it is not to be controlled will be possibly effects pandemically. An understanding of the biology, population genetics, histopathology, resistant cultivars screening, host-pathogen interaction and transcriptomics of the host in response to pathogen needs to be studied to provide the solution to the problem to protect the farmers to escape from heavy losses. Therefore, a detailed study of this pathogen is described for the betterment of the society with productive fruit and forest regeimes.

Keywords: *Ceratocystis manginecans*, Decline, Fruit trees, Forest trees

(19215) THE BIODEGRADATION EFFICIENCY OF OCHROBACTRUM THIOPHENIVORANS ON HERBICIDE INDAZIFLAM

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In this study, we aim to reveal out the biodegradation performance of a soil bacteria *Ochrobactrum thiophenivorans* on the different concentrations of herbicide indaziflam (C₁₆H₂₀FN₅) (100, 150 and 200 ppm) under agitated (160 rpm) culture conditions at 280 via reduction of chemical oxygen demand (COD), biochemical oxygen demand (BOD₅) and total organic carbon (TOC). The COD experiments performed on the line of Standard Method 5220B Closed Reflux, BOD₅ experiments were done with Aqua Lytic 606 oxitop device while TOC experiments were performed with High Combustion Burning method. We have previously screening the growth of the bacteria in sabouraud dextrose broth (SDB) medium for 4 days. After the growing period finished, we added this growing bacteria to these concentrations of liquid media. According to our results; maximum biodegradation efficiency on 5 days were as 79% at 150 ppm in COD and 71% in BOD₅. The TOC removal rate was 73% in 150 ppm respectively in this time period. The worst biodegradation rates were for COD, BOD₅ and TOC were as 66%, 55% and 60% respectively on 5 days. We also determine the population dynamics of the bacteria during this study. We found that after the 4th day, bacterial number counted from the media covered all of the petri dishes in count agar media. Our results revealed that, *O. thiophenivorans* could be selective bacteria for treatment of wastewater contaminated with indaziflam.

Keywords: Biodegradation, Indaziflam, *Ochrobactrum thiophenivorans*, Agitated culture conditions

(19216) THE BACTERIAL REMEDIATION OF INSECTICIDE IMIDACLOPRID IN SOIL MEDIUM

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Imidacloprid (C₉H₁₀ClN₅O₂) was used as the most advised type of insecticide in some vegetable farming in Turkey. Two types of bacteria (*Methylobacterium radiotolerans* and *Microbacterium arthrosphaerae*) were isolated from the soil samples taken from Thrace region of Turkey, and a mixture of them was prepared from equal volumes (107 CFU/mL). Including the witness sample, three different soil test units including approximately 700 gr of sterile agricultural soil were filled into sterile glass bottles to which imidacloprid, with a concentration of 700 ppm was added. Bacterial stock cultures were enriched in sabourad dextrose broth (SDB). 40 and 80 ml of these mixed bacterial cultures were inoculated to these soil units and each unit was diluted with 250 ml of distilled water every 6 days for three weeks. The water filtered from the soil units was measured for chemical oxygen demand (COD) to determine to find out the optimum concentration of microorganism for gain the knowledge about the best removal efficiency on imidacloprid. At the end of the COD assays, the highest bioremediation was observed in the soil sample to which 80 mL and 40ml of mixed culture of microorganisms was added and COD remediation was observed as 98.7% and 96.4% respectively in 18 days. According to the results of this study, we sure that, both volumes (40 and 80 ml) and types of bacteria is very effective for bioremediation of this insecticide.

Keywords: Imidacloprid, Insecticide, Soil bacteria, Chemical oxygen demand

(19230) ANALYSIS OF GENETIC DIVERSITY AMONG SUNFLOWER GENOTYPES FROM MOROCCAN GENE-BANK SELECTED UNDER AUTUMN PLANTING CONDITIONS USING AGRO-MORPHOLOGICAL TRAITS

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Oilseed sector is among the priority sectors in the current national agricultural strategy, Green Morocco Plan. For several years, National Institute for Agricultural Research (INRA) has undertaken many studies on oilseed crops, which mainly deal with the management of genetic resources and plant breeding.

Agronomic potential of traditional sunflower spring varieties is low because its flowering and grain filling are often exposed to mid and end-season drought. To overcome this, a new breeding strategy was designed and implemented and it consisted of selecting varieties tolerant to winter cold in order to shift this crop to autumn or early winter planting. Nowadays, 'Ichraq' is the only one registered autumn variety and there are efforts to release other autumn varieties. The objective of this research is to evaluate various genotypes having been selected in different environments under autumn planting conditions. This germplasm, conserved in Moroccan Gene Bank, was planted early at winter during two years (2013 and 2014) at 'Annoceur', a mountain site known for its pronounced winter cold. Morphological, physiological, agronomic and technological parameters were studied for the germplasm assessment. Analysis of variance showed significant differences among genotypes for most of these parameters. Plantlet initial vigor average was 3.74 varying from 2 for genotype MGB18 to 5 for MGB29 and MGB26. Leaf area average was 144.14 cm² varying from 64.4 to 294.05 cm² for genotypes MGB6 and MGB13, respectively. Total chlorophyll content average was 50.73 mg/g, varying from 31.8 to 155 mg/g for genotypes MGB32 and MGB13, respectively. Number of days from sowing to flowering varied from 158 for genotype MGB13 to 166 for genotypes MGB1 and MGB27. Mean seed yield per plant was 60.75 g, with a large variation from 24.57 to 92.01 g for MGB8 and MGB7, respectively. Mean seed oil content was 35.28%, ranging from 23.28% for MGB26 to 43.88% for MGB5. Overall results indicated that some genotypes are promising for autumn or early winter sowing and brought all the traits of interest, mainly seed yield and oil content. These genotypes could be valuable genetic resources for future breeding programs to release performant and adapted varieties for autumn or early winter planting environments.

Keywords: Genetic resources, Breeding, Sunflower, Diversity, Early planting, Autumn variety

(19237) TREE DIVERSITY AND ITS ECOLOGICAL IMPORTANCE VALUE IN ORGANIC AND CONVENTIONAL COCOA AGROFORESTS IN GHANA, WEST AFRICA

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Agroforestry systems have the potential to conserve biodiversity and provide environmental or ecological benefits at various nested scales ranging from the plot to ecoregion. An integration of agroforestry and organic farming may further enhance this potential but currently this is poorly understood. Here we evaluated the potential of organic cocoa agroforests to conserve native floristic diversity in comparison with conventional cocoa agroforests. Species richness and Shannon, Simpson's reciprocal and Margalef diversity indices were estimated from 84 organic and conventional cocoa agroforests plots. Species importance value index and conservation status were used to evaluate the conservation potential of studied cocoa farms. Organic farms recorded higher mean species richness (5.10) compared to conventional farms (3.48). Similarly, mean Shannon diversity index, Simpson's reciprocal diversity index and Margalef diversity index were significantly higher in organic farms compared to conventional farms. According to the importance value index, fruit and native forest tree species were the most important in both organic and conventional farms for all the cocoa age groups but more so in organic farms. Organic farms maintained 14 native tree species facing a conservation issue compared to 10 in conventional cocoa farms. The results suggest that organic cocoa farms can serve as reservoirs of native tree species, including those currently facing a conservation concern thus may provide some support in the conservation of tree species in the landscape.

Keywords: Tree diversity, Organic cocoa, Agroforestry, Importance value index, Shannon diversity index, Ghana

**(19258) APPLICATION OF MOLECULAR MARKER VALIDATION TECHNIQUE
IN IDENTIFYING STRIGA RESISTANCE IN COWPEA (*VIGNA UNGUICULATA*
(L.) WALP) GENOTYPES, KANO, NIGERIA**

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The obligate root parasitic weed *Striga gesnerioides* poses a severe constraint to cowpea productivity in the dry savanna of west and central Africa, where cowpea is a major crop. At least seven races of *S. gesnerioides* have been identified within the cowpea-growing regions of west and central Africa, based on host differential response and genetic diversity analysis. Molecular markers linked to resistance to different races of *S. gesnerioides* have been identified. It was desirable to demonstrate the applicability and efficiency of such markers for use in marker- assisted selection (MAS) to fast –tract the development of cowpea with resistance to *S. gesnerioides*. The objective of the study was to validate a set of molecular marker for MAS (Marker Assisted Selection) in breeding Cowpea for resistance to *S. gesnerioides*. The study involved a cross between a land race (Borno Brown) which is a susceptible line and a resistant parent B301. Genetic analysis showed that resistance to *S. gesnerioides* in cowpea is inherited as a single dominant gene. A SCAR marker, 61RM2 was validated in the F2 population and subsequent recombinant inbred lines (RILs). It was able to discriminate between resistance and susceptibility and the genotypic score was quite similar to the phenotypic score with the marker showing greater efficiency in selection than phenotypic score. The 61RM2 had two bands in resistance cultivars and amplified a ~ 450 bp fragment with a marker efficiency of 99%. Based on the tight linkage with the resistant locus, 61RM2 was found to be a utility marker to initiate MAS in cowpea breeding for resistance to *S. gesnerioides*.

Keywords: Molecular marker, Striga, Cowpea, Resistance, Identification

(19287) SYNERGISTIC APTNESS OF ENTOMOPATHOGENIC FUNGI AND BACTERIA AGAINST PULSE BEETLE, *Callosobruchus chinensis* IN CHICKPEA, *CICER ARIETINUM*

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A propos 33% of the total food produced for human consumption is wasted, occurring between the harvest and the consumer. Chickpea ranks 2nd in area under cultivation and 3rd in production among pulses in the world. Pulse beetle (PB), *Callosobruchus chinensis* is a devastating insect pest, which causes huge losses in stored products including chickpea, pulses, wheat, rice and maize and renders grains unfit for human consumption. Synergistic effectiveness of the entomopathogenic fungi (EPF), *Beauveria bassiana* and *etarhizium anisopliae* and the entomopathogenic bacteria (EPB), *Photorhabdus emperata* and *Xenorhabdus nematophila* were studied against PB as the biological control. In addition, a formulation of bitterbarkomycin (BBM) with the diatomaceous earth (DE) was mixed with *B. bassiana* and percent conidial germination and % mortality of PB were recorded. Insect bioassays were executed at 25, 30, and 35°C with 70% relative humidity. The lowest number of eggs (0.66 per grain), number of holes (01 per grain), number of F1 adults emerged (5.6 per jar), days to 100% mortality of F1 (03), weight loss (4%) and damage (5%) whereas the highest inhibition rate (85%) of PB were observed in jars treated with synergistic concentration (1×10⁸) of EPB as compared to EPF. The best conidial germination (90%) of *B. bassiana* and PB mortality of 50%, 80% and 91% were recorded after 7, 14 and 21 days, respectively, when DEBBM was synergized with *B. bassiana* at 30°C.

Keywords: *Cicer arietinum*, *Callosobruchus chinensis*, Entomopathogenic fungi and bacteria, DEBBM, Mortality, Temperature

(19288) VIRULENCE OF SOME *HETERORHABDITIS* SPP. AND *STEINERNEMA* SPP. PRODUCED *IN-VITRO* AGAINST *GALLERIA MELLONELLA* L. AND LABORATORY REARED *APIS MELLIFERA* L. LARVAE

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Greater wax moth (GWM) *Galleria mellonella* (L.), a voracious pest of field-based honey bee colonies and stored combs. It is known to cause major losses and to transmit viral pathogens. Virulence of six entomopathogenic nematodes (EPNs) (i.e. *Steinernema carpocapsae*, *S. riobrave*, *S. xueshanense*, *S. diaprepesi*, *Heterorhabditis bacteriophora* and *H. indica*) were assessed against GWM and western honey bee *Apis mellifera* L. EPNs were used in four concentrations (1, 5, 25 and 50 IJs/ larva). GWM mortality was ranged from 39 to 100 % with *Steinernema* spp. and *Heterorhabditis* spp, while 11 to 50 % against *in-vitro* reared honey bees workers larvae. Minimum mortality was observed in honey bee larvae with *H. bacteriophora* (ranged 0 to 11%) and *S. xueshanense* (ranged 0 to 38 %). Concentration of 25/IJs/larvae, *H. bacteriophora*, and *S. xueshanense* caused 4.2 and 10.9 % mortality to honey bee larvae, respectively. However, both species caused significant mortality (>89 %) to GWM larvae. These results show that *H. bacteriophora* and *S. xueshanense* are less virulent to honey bee larvae and have potential as a biological control agent in IPM programs against GWM. This practice may become an economical and suitable control measure particularly for management practices in apiaries.

Keywords: *Steinernema*, *Heterorhabditis*, Honey bee larvae, *Galleria mellonella*, Entomopathogenic nematodes

(19298) SELECTION OF *TRICHODERMA* SPP. ISOLATES AS BIOCONTROL AGENTS AGAINST *FUSARIUM SOLANI*, THE CAUSAL AGENT OF CROWN AND ROOT ROT OF STRAWBERRY

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Strawberry crown and root rot is a disease caused by *Fusarium solani* which was observed early in the current decade in fruit crops as well as in nurseries that multiply plantlets to be used in production fields. Pathogenicity proofs of several isolates of the pathogen, recovered from symptomatic plants in different strawberry cultivars, were performed. Using a collection of 34 isolates of *Trichoderma* spp., their ability as potential biocontrol agents of the disease was evaluated in dual cultures on PDA performed to assess the restriction to the radial growth of four pathogenic isolates of *F. solani* growing in front of selected isolates of *Trichoderma asperellum*, *T. atroviride*, *T. harzianum* and *T. virens*. In addition, the possibility of metabolites release to the agar medium was checked growing the 34 isolates of *Trichoderma* spp. on cellophane-film deposited on the PDA medium, and later, after film removal, four isolates of *F. solani*, separately. In this way, determination of antibiosis due to metabolites in the medium acting as a biocontrol mechanism.

Half of *Trichoderma* isolates were found to significantly inhibit the radial growth of *F. solani* isolates, reaching growth reductions of 20-35%, relative to the untreated control of the isolates of the pathogen. The observations of interactions between pathogens and *Trichoderma* isolates allow to establish four types of interactions for combinations of seven isolates of *Trichoderma* spp. and four *F. solani* isolates, i.e., overgrowth, line of inhibition, colony delimitation, and halo of inhibition. The former could play a role of biocontrol of the disease, as it suggests the release of metabolites antagonistic to *F. solani*. Strawberry plantlets cv. Camarosa were pre-inoculated with three isolates of *Trichoderma* spp. selected as possible biocontrol agents, according to the *in vitro* tests. Aliquots of *T. harzianum* (T7), *T. asperellum* (T30) and *T. virens* (CH303) grown on sterile soaked grains of wheat for 2 weeks were placed (10 g/plant) surrounding the plant collar, then covered with substrate mixture and irrigated as needed during another 2-wk incubation period. Thereafter plants were inoculated with two isolates of *F. solani* either Fs174 or FsABG, selected for their high virulence, and the corresponding controls without the biocontrol agents, and/or the *F. solani* isolates. The effects on disease severity were evaluated by the weight of plants incubated in greenhouse for 2.5 additional months.

A drastic reduction of whole plants weight was observed following inoculations with isolates Fs174 and FsABG, and this was not much improved when pre-inoculated with *T. virens* (CH303). In contrast, pre-inoculation with T30 in advance to FsABG determined weight increase over FsABG alone of 38%, and with this *T. asperellum* isolate or with T7 before inoculation with Fs174, significantly improved plant weight 73 and 85%, respectively, over the control inoculated only with Fs174. Growth of the aerial part of the plants was much increased by the pre-inoculation with T30 prior to inoculations with Fs174 (219%) or FsABG (106%), whereas the mean weight increases attributable to T7 and CH303 pre-inoculations in advance to the inoculations with the pathogens Fs174 and FsABG were 175% and 97%, respectively.

Keywords: Soilborne fungi, Antagonists, Biological control

(19352) IN VITRO CONTROL OF *PIERIS BRASSICAE* (LEPIDOPTERA: *PIERIDAE*) BY LARVAL PARASITOID *COTESIA VESTALIS* (HYMENOPTERA: *BRACONIDAE*)

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Lepidopteran caterpillar are disastrous pests of many agricultural crops and render economic losses to human beings at their larval stages (caterpillar). So, need arise to control these pests. Use of chemicals has been very effective solution to handle such types of problems, but these have disastrous effects on ecosystem health and natural enemies. *Cotesia vestalis* is a larval parasitoid of hymenopteran family Braconidae, which is being used successfully in biological control programs worldwide. Most of the members of family Braconidae are endoparasitoids of holometabolous insects of *Lepidoptera*. Four species of *Lepidoptera* viz., *Pieris brassicae*, *Helicoverpa armigera*, *Trichoplusia ni* and *Spodoptera exigua* along with two species of braconid larval parasitoids namely, *Cotesia vestalis*, and *Cotesia plutellea* were selected on the basis of their relative abundance in the same cropland of district Faisalabad. These were subjected to study their life cycles while providing 4 lepidopteran species viz *P. brassicae*, *H. armigera*, *T. ni* and *S. exigua* to check their host suitability and preference. *C. plutellae* preferred none of the host species while *C. vestalis* used *P. brassicae* as host and not all the three remaining. As *C. vestalis* is endoparasitoid. Average incubation was recorded to be 10.33 ± 0.47 days. After completion of larval development larvae of parasitoid species ruptured caterpillars from dorsal side and attached to the surface of cage and spun a cocoon around them. Fourteen cocoons were spun by *C. vestalis* larvae. Pupal duration and Overall life duration in days was 6.33 ± 0.94 days and 18.66 ± 6.67 days respectively. From this study it can be predicted that if we conserve, augment or introduce this larval parasitoid in agroecosystem, a single *C. vestalis* gravid female is sufficient to control ten *Pieris brassicae* in environment friendly way without disturbing the sustainability of agro-ecosystem, and can help in decreasing economical losses and increasing crop production.

Keywords: Braconidae, *Lepidoptera*, Biological control

(19370) COMPARATIVE STUDY ABOUT PREDATORY POTENTIAL OF FOUR (SYRPHID: HOVERFLIES) SPECIES AGAINST FOUR APHID SPECIES IN PUNJAB PAKISTAN

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To sustain healthy environment, the natural control of herbivores is particularly important and natural enemies play a vital role in controlling the pest populations. Cropland hoverflies are one of the most important groups of natural enemies. Their larvae feed especially on aphids. Present study examined the predatory preference of syrphid species *Episyrphus balteatus*, *Melanostoma scalare*, *Ischiodon scutellaris* and *Eupeodes corolla* on four aphid species, i.e. *Brevicoryne brassicae*, *Schizaphis graminum*, *Myzuspersicae* and *Rhopalosiphum padi*. These were abundantly present in the croplands of Faisalabad Punjab, Pakistan. Prey consumption by different larval instars of these species was evaluated under laboratory conditions at an average temperature of $20\pm 5^{\circ}\text{C}$, $60\pm 5\%$ RH and photoperiod of 16:8 h D: L. The selection of prey species was carried out on the basis of relative abundance of species in cropland data of whole year and predator-prey interaction by applying regression analysis. Highly significant results were found against different species of aphids. Results showed that highest consumption of aphids was recorded by *E. corollae* larvae on *B. brassicae* as 532.3 ± 74.3 specimens and of *M. scalare* larvae on *S. graminum* as 504 ± 23 specimens. *E. balteatus* larvae showed greater predation on *M. persicae* and consumed 477.3 ± 43.7 specimens. This species also consumed greater numbers of other three aphid species. While *R. padi* with 377.3 ± 31 specimens were second most preferred prey of *E. corollae* larvae. Almost parallel consumption by *M. scalare* larvae was recorded on two aphid species, as 504 ± 23 specimens of *S. graminum* and 495 ± 48.6 of *M. persicae*. Larvae of *I. scutellaris* preferably consumed *R. padi* with total 361.3 ± 20 specimen. These studies are important for effective management and biological control of following aphid species.

Keywords: Cropland biodiversity, Hoverflies, Aphids, Predation, Biological control, Pakistan

**(19400) ECONOMETRIC EVALUATION OF PRICE TRANSMISSION
RELATIONSHIPS IN TURKEY**

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Turkey's agricultural commodity prices are prone to fluctuation but have gradually over time. A considerable amount of literature examines the changes in these prices by dealing with other commodities such as energy. Links between agricultural and energy markets have therefore been extensively investigated. We touch upon the red meat prices becoming increasingly volatile in Turkey. This study investigates relationships between red meat, crude oil and exchange rates, and reveals whether there is price volatility transmission among these variables. Turkey associates with the increase in red meat prices with two scenarios, which are firstly to produce more and secondly, to import more red meat. Hence, we can estimate that the changes in oil and exchange rates could be related to red meat prices, and there can be a transmission of the volatility from the crude oil and exchange rates to red meat prices.

This paper analyses the price volatility of veal, lamb and the relationship between red meat and crude oil, exchange rates in Turkey by applying the generalize all period unconstraint volatility model, which generalises the GARCH (p, q) model for analysing weekly data covering a period of May 2006 to February 2017. Empirical results show that veal and lamb prices present volatility during the last decade, but particularly between 2009 and 2012. Moreover, oil prices have a significant effect on veal and lamb prices as well as their previous periods and have exchange rates at time $t-2$ and $t-4$ have a significant effect on lamb prices but not on veal at all. Consequently, our research can lead policy makers to evaluate policy implementation in the appropriate way and reduce the impacts of oil prices by supporting producers.

Keywords: Red meat price, Volatility, Crude oil, Exchange rates, GARCH models, Turkey

(19461) ALGERIA PLACE ON THE WORLD OLIVE MARKET

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Algeria, the African country, fourth largest producer on the continent, is developing a specific strategy to boost and develop its olive sector. Algeria has a great history and tradition in olive growing and is one of the main actors on the African continent. It has 450 thousand hectares of olive trees for the production of olive oil. It is the fourth largest producer and the third largest consumer of table olives in the world and it has a specific strategy for the development of the olive sector. In fact, Algerian olive growing has undergone profound changes in recent decades to bring it up to date for its integration into the global economy. Competition resulting from trade liberalization has led firms in this sector to improve their performance and competitiveness. In this work, we propose to evaluate the competitive position of the olive oil sector in Algeria, the results show, although the actions put in place by the State have allowed to create conditions favorable to the growth and development of the olive sector, progress remains insufficient compared to the expectations of operators in the sector and the evolution of the international environment. Liberalization of trade will lead to considerable foreign competition in the local market, and the impact of opening borders will be difficult, especially for unstructured and uncompetitive actors. Under these conditions, actors in the olive oil sector in Algeria are challenged by the threat of importing olive oil products, adapting new measures to ensure their competitiveness and sustainability in the market.

Keywords: Olive sector, Market, Actors strategy, Algeria, Olive oil

(19463) ASSESSMENT AND MANAGEMENT OF OKRA YELLOW VEIN MOSAIC VIRUS DISEASE

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Okra (*Abelmoschus esculentus* L.) is an extensively grown vegetable crop that belongs to Malvaceae family. Okra yellow vein mosaic virus transmitted by whitefly (*Bemisia tabaci*) that can cause 100% losses depending on the stage of crop growth. The presence of virus was confirmed by chip grafting and whitefly mediated inoculation. The data of whitefly population and disease incidence was recorded. Electrolyte leakage and membrane stability index were compared among healthy and diseased leaves through EC method by using deionized and double distilled water respectively. For the management insect growth regulator, botanical and citric acid were used. Results showed that infected samples have more electrolyte leakage (9.70%) than in healthy ones (4.27%). Healthy samples have (57%) membrane stability index and infected membranes were 38% stable. Neem extract gave maximum reduction in disease control (62%) followed by buprofezin (53%) and citric acid (48%) as compared with control. Neem extract and citric are the best alternatives of insecticides for virus disease management as insect repellent and defense signal activation.

Keywords: Evaluation, Phytopesticides, IGR

(19464) NUTRITIONAL AND CHEMICAL MANAGEMENT OF POWDERY MILDEW (*SPHAEROTHECA FULIGINEA*) ON PUMPKIN VINES

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Pumpkin crop is greatly affected by a number of biotic and abiotic factors. Among the biotic factors *S. fuliginea* is a serious threat to the crop causing huge losses in the crop in terms of quality and quantity. Nutritional management of this disease is cost-effective and environmentally friendly, nutritional supplements are able to improve resistance against pumpkin powdery mildew infection. In order to manage the disease, experience with three treatments containing 1% potassium mono phosphate, 1% of potassium silicate and their combination (1:1) provided under the field conditions. Infection of the disease was determined by the spraying treatment prior to inoculation. The combination of mono potassium phosphate and potassium silicate yielded a maximum reduction of the disease on the control of 49%. The special effect of 1% potassium silicate and 1% potassium phosphate mono showed 43% and the reduction of the disease 39% respectively for contrast control. The effectiveness of fungicides Bravo (chlorothainal), score (Difenaconzole) and the combination of the two fungicides (Bravo + score) with standard dose were tested against *Sphaerotheaca fuliginea* in field. Combination of the two fungicides (Bravo+ score) resulted in the reduction of disease control (61%). The partition effect score and bravo resulted 56% and 54% of disease reduction, respectively, in contrast to control. Recorded correlation between the length of the vine, the number of leaves and number of fruits. Environmental factors have had a great effect on the progress of powdery mildew of pumpkin. The correlation between the incidence of disease and environmental factors was determined. Culture pumpkin showed an understandable response to environmental factors. Four environmental factor showed a significant influence on the disease. In conclusion, the environmental conditions conclude peak incidence of disease at 28-32°C temperature and relative humidity of 70-80%, combination of the two fungicides was recorded to have potential hight to prevent the powdery mildew fungus followed and the combination of the two salt solutions (potassium monophosphate or potassium silicate) in a foliar application of nutrients. Nutrients and fungicide control provide an alternative measure to inhibit *Sphaerotheaca fuliginea*.

Keywords: Powdery mildew, *Sphaerotheaca fuliginea*

(19472) INVESTIGATING THE FACTORS AFFECTING THE SUSTAINABLE DEVELOPMENT OF WATER RESOURCES IN THE IRAN AGRICULTURAL REGION

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The purpose of this study was to investigate the factors affecting the sustainable development of water resources in the agricultural sector of Urmia in west azarbaijan province in Iran. The statistical population of this study is experts in agricultural service centers and Urmia Agriculture Jihade-keshavarzi, whose number is 110 persons based on the information received. The method of sampling in this research was simple random sampling. Morgan's famous table was used for sampling. Therefore, the number of statistical samples was 86. This research was a researcher-made questionnaire consisting of 5 units. The questionnaire was designed according to the hypotheses and objectives of the research. After validation and validity, it was provided to the statistical sample to answer the questions. For statistical analysis, inferential statistics methods have been used using 22 Spss software. The results showed that there is a positive and significant relationship between dependent variable (sustainable development of agricultural water resources) and independent variables of ecology, infrastructure, social and economic status at 1%. The results of multiple regression analysis showed that the correlation coefficient (R) is 10.761 and according to degree of freedom, the mentioned factors explained 4% of the dependent variable variations.

Keywords: Effective factors, Sustainable development, Water resources, Agricultural Services Centers, Iran.

**(19475) PREVENTIVE COMPONENTS THAT AFFECTIVE IN EFFECTIVENESS
OF AGRICULTURAL ADVISORY SERVICES IN IRAN**

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Technologies and farming methods are constantly changing. Farmers should be informed about how to use these innovations in their fields. Utilizing the competence of the graduates' agricultures in the form of Agricultural Advisory Services companies (AASC) is one of the best solutions to transfer knowledge and technology to farmers and accelerating in agricultural development.

The main purpose of this study is study and identification of the problems that AAS is faced with. Statistical population of the study consisted of Agricultural Consultants (N=1731). Using the formula Cochran, sample size was determined 306. Questionnaire was the data instrument. The appearance and content validity of questionnaire was obtained by comments of extension experts. Reliability coefficient of questionnaire was obtained 0.89 by Cronbach alpha. The results showed that AAS increased participation of stakeholders in decision making and planning. AASC also provided the specialized context fields in agricultural extension. Results showed that AASC increased accountability and responsibility in extension services. By using exploratory factor analysis barriers are classified in four factors, including Infrastructure, Policy-making, Socio - cultural and Financial. These factors could explain 62.86 % of variance in reduce effectiveness of AASC among farmers in West Azerbaijan province.

Keywords: Preventive, Agricultural Advisory Services Companies, Factors, Effectiveness, Iran

(19479) ORGANIC AND INORGANIC FERTILIZERS IMPACT ON QUALITY ATTRIBUTES OF MUNGBEAN

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To find out the effect of seed inoculation, organic manure and chemical fertilizers on seed protein contents, N-content of nodules and shoot of mungbean and N-content of soil, investigations were conducted at University of Arid Agriculture, Rawalpindi, Pakistan. The research materials consisted of two mungbean genotypes (NCM-209 and Chakwal-97) with treatments as control, seed inoculation @ 10 g kg⁻¹, seed inoculation + 20 tons FYM ha⁻¹, seed inoculation + 20 tons poultry manure ha⁻¹ and seed inoculation + 20 kg N ha⁻¹ and 60 kg P ha⁻¹. Data were recorded on quality parameters of mungbean (*Vigna radiata* L.) like seed protein content, N-content of nodule, N-content of shoot of mungbean and N-content of soil. It was found that seeds produced in the plots treated with poultry manure and chemical fertilizers along with rhizobial inoculation showed higher protein content than in control and inoculation alone for both the varieties. Similarly, soil N-content at 0-15 and 15-30 cm was increased in all the plots when compared with control, however highest soil N-content was recorded in plots where chemical nitrogen was applied. It was also recorded that both the varieties did not differ for their ability to fix nitrogen. It is concluded that seed inoculation when combined with FYM, poultry manure and chemical fertilizers is a better option than inoculation alone for mungbean quality attributes in the area under study.

Keywords: Inoculation, Organic manures, Chemical fertilizers, Nitrogen, Protein, Mungbean

**(19481) ARTHROPOD BIODIVERSITY ASSOCIATED WITH SUNFLOWER
(*HELIANTHUS ANNUUS* L.) IN THE REGION OF BISKRA (ALGERIAN SAHARA)
AND AT ENSA OF ALGIERS**

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The sunflower is a plant that offers many opportunities, whether in human food, animal feed or the development of by-products of palm oil-industries. Given the lack of works on arthropodofaune sunflower in Algeria, we thought of making an inventory of arthropods species associated with this plant in Biskra. This region is located in eastern of Algeria, south of the Aures Mountains, appears as a true buffer zone between North and South; it is the gateway to the Sahara. It is characterized by a single hot dry period that lasts all year and belongs to the bioclimatic Sahara to winter temperate. The work was carried out during the summer, winter seasons, in two stations Laghrous and Tolga there are palm groves of 10 hectares and 8.5 hectares respectively, and whose sub-jacante herbaceous layer consists essentially of sunflower. Three sampling methods were used: the yellow plates, Barber pots and hand capture.

The overall inventory of arthropod species captured on sunflower in the wild and cultivated in summer and winter, for the three sampling methods, in both stations of studies showed the presence of 122 species in 5 classes (Gasteropoda, Arachnida, Collembola, Crustacea and Insecta) distributed in 15 orders and 73 families. The capture by hand was revealed the presence of nine species in each of the two stations of which 8 are common to both; it is the spider Thomisidae sp, thrips *Thrips tabaci*, 2 bedbugs *Pleoaria vagabunda* and *Orius* sp, 2 Homoptera *Jassidae* sp and *Homoptera* sp, the wasp *Polistes gallicus* and ladybug *psyllobora vigintiduopunctata*. The 9th species captured laghrous is *Componotus* sp ant and *Monomorium Salomonis* in Tolga. 24 arthropod species belonging to 19 families, 12 orders and 4 classes are caught by hand in greenhouses during the winter season at the ENSA Algiers station on Sunflower grown. The insect class is represented by 21 species among which include *Thrips tabaci*, the tabaci whitefly, 4 species of aphid *Aphis gossypii*, *Myzus persicae*, *Macrosiphum euphorbiae* and *Uroleucon sonchi*.

Keywords: Sunflower, Biskra, Algeria, Arthropod, Hand capture, Barber pots, Yellow plates

(19483) BIOLOGICAL CONTROL TRIALS IN ALGERIA

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As a means of alternative control, we favor biological control with the use of entomopathogenic fungi (*Metarhizium anisopliae* var., *Acridum* and *Beauveria bassiana*), toxic plant extracts such as *Azadirachta indica* (Juss.) (Meliaceae), *Melia azerdarach* L. (Meliaceae), and predatory insects such as the bugs *Nesidiocoris tenuis* and ladybugs and parasitoids *Trichogramma embryophagum*. The biological control attempts were conducted in 1983 against *Ectomyelois ceratoniae* (Lepidoptera, Pyralidae) using *Trichogramma embryophagum* (Hymenoptera, Trichogrammatidae). In 1985 *Aleurothrixus floccosus* (Homoptera, Aleyrodidae) was eliminated by the usage of *Cales noacki* (Hymenoptera, Aphelinidae). In 1996 four parasitoids were introduced to control *Phyllocnistis citrella* (Stainton, 1856). These are *Ageniaspis citricola*, *Semielacher petiolatus*, *Cirrospilus quadristriatus* and *Sympiesis* sp. *Metarhizium anisopliae* var. *acridum*, a biopesticide which called "Green Muscle" was used at El Oued in 2005 on the larvae of the Locust *Schistocerca gregaria*. More recently, in 2008 some releases of *Nesidiocoris tenuis* (Heteroptera, Miridae) were made (invented, artificially produced) for the control of *Tuta absoluta*.

Keywords: *Trichogramma embryophagum*, *Cales noacki*, *Nesidiocoris tenuis*, *Metarhizium anisopliae*, biological control, Algeria

(19495) PHYSIOLOGICAL AND BIOCHEMICAL RESPONSE OF WHEAT TO COMBINED APPLICATION OF SILICON AND SELENIUM UNDER WATER DEFICIT CONDITIONS

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Drought is one the serious problem that limiting agricultural productivity throughout the world. Therefore; a greenhouse study was conducted to investigate the potential of silicon (Si) and selenium (Se) in alleviating the adversities of drought in wheat seedlings. Treatments comprised of (ck) control (no drought stress nor Si and Se added), only drought [40% water holding capacity (WHC)], drought + Si (40% WHC with 40 mM Si), drought + Se (40% WHC with 40 mM Se) and drought + Si + Se (40% WHC + 40 mM Si + 40 mM Se). Deficit water irrigation inhibited the morphological attributes (root and shoot dry weight, root and shoot length), water relation parameters, chlorophyll contents, net photosynthetic rate, transpiration rate, stomatal conductance and CO₂ concentration of wheat seedlings. On contrary, the foliage applied Si alone and in combination with Se under water deficit conditions stimulated plant growth and photosynthetic attributes, water relations, transpiration rate and chlorophyll contents. In addition, an increase in antioxidants enzyme activity was recorded under water deficit conditions, which was higher in wheat seedling treated with combined application of Si and Se. To summarize that foliage applied Si alone alleviates the negative impact of water deficit condition, while in combination with Se, both collectively found more effective in mitigating adverse effects of drought stress.

Keywords: Drought, Water deficit condition, Wheat, Water holding capacity

(19516) GENETIC RELATEDNESS OF FUSARIUM VERTICILLIOIDES CAUSING EAR ROT IN QUALITY PROTEIN MAIZE

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Breeding for QPM ear rot resistance cultivars could offer a reliable environmental and economically control of mycotoxins especially for the resource-poor communities that require inexpensive protein diets. This research aimed at evaluating a testcross of QPM inbreds with ear rot resistant cultivars to develop resistant topcrosses with high grain protein quality and yield. Seven QPM inbreds (lines) and two open pollinated ear rot resistant varieties (testers) were crossed in a line \times tester method (2×7) in 2013. The 14 F1 topcrosses, 9 parents and 2 commercial hybrids (checks) were evaluated at the Lower Niger River Basin Authority, Oke-Oyi, Nigeria for three years (2014-2016) cropping seasons. The ear rot disease ratings in all topcrosses were low (< 3.0), relative to the two controls of 3.4. K2GCA/ K2SCA values were higher than unity for grain yield, ear rot rating, husk cover, tryptophan and lysine traits, signifying that additive effects were controlling inheritance of the traits. The three topcross hybrids (TZEQI 76 \times AMA TZBR YCF, TZEQI 74 \times AMA TZBR YCF, and TZEQI 81 \times TZEI 25) that possessed consistently low ear rot infection across years with outstanding grain yield and quality protein are recommended for further evaluation.

Keywords: Gene action, Grain yield, Lysine, Tryptophan

(19527) DETERMINATION OF FORAGE YIELD AND YIELD COMPONENTS OF SOME HUNGARIAN VETCH VARIETIES (*VICIA PANNONICA CRANTZ*) IN BILECIK ECOLOGICAL CONDITION

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The lack of grasslands-pasture areas in Bilecik and the inadequacy of the need for quality feed significantly increase the feed costs and thus the quantity of animal products is decreasing. This research was carried out in order to determine the economic entrepreneurship and quality of feeds that can meet the nutritional needs of animals and to determine the Hungarian vetch plant lines and varieties which could be the best adaptation to Bilecik and the passage belt zones. The study was carried out in 2016-2017 years in the Bilecik Seyh Edebali University Field of Agricultural Biotechnology Application and Research, according to the Randomized Blocks Experimental Design with four (4) replications. In this research, 4 lines (Hat-5, Hat-16, Hat-23, Hat-28) were used with 6 types of Hungarian vetch (Budak, Ege Beyazı, Tarm Beyazı, Erzurum Beyazı, Kansur, Oğuz).

According to the one year's average results, the differences between the hungarian vetch genotypes in terms of the forage yields, number of pods and number of pods found in a plant were not statistically significant. In terms of dry matter yield, main stem length, natural plant height and main stem thickness, differences between hungarian genotypes were found statistically significant. The genotypes showed a natural plant height of 59.13-33.63 cm, forage yield of 3577.78-2777.78 kg / da and dry matter yield of 1107.40-728.08 kg / da.

Keywords: Hungarian vetch, Variety, Yield, Yield components

(19528) DETERMINATION OF FORAGE YIELD AND YIELD COMPONENTS OF SOME GRASS PEA VARIETIES (*LATHYRUS SATIVUS* L.) IN BILECIK ECOLOGICAL CONDITION

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This study is aimed at removing the need for increased animal food, meeting the need for cost-effective feeds rich in quality nutrients, the primary objective is to determine the most suitable Grass pea varieties based on the principle of increasing the animal existence of Bilecik and Geit regions and contributing to the protection of soil and water conservation. This work; In 2016-2017 Bilecik Őeyh Edebali University was carried out with four (4) replications in the Field of Agricultural Biotechnology Application and Research, according to the Randomized Blocks Experimental Design. In this research, 6 varieties of Grass pea (Gurbuz, Gap Mavisi, Gurbuz 2001, Karadađ, İptaŐ, Eren) were used. According to the one year's average results, the differences in the number of beans in a plant, natural plant height, main stem thickness, and dry matter yield were not statistically significant. In terms of forage yield and main stem length, differences between varieties were found statistically significant. As a result of this study, it has been determined that the best varieties of forage yields were Karadađ and İptaŐ with a value of 3222 kg/da. In terms of dry matter yields, the best varieties were Gap Mavisi and Gurbuz with 36.67 kg/da and 36.11 kg/da values.

Keywords: Grass pea, Variety, Yield, Yield components

(19538) STUDY OF GRAIN YIELD AND QUALITY TRAITS IN ADVANCED WHEAT BREEDING LINES

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Improvement of grain quality is a major task in wheat breeding programs especially under climate change. Effective quality testing is essential for the recent release of new varieties which must have a consistent end-use quality in addition to high grain yield. In this regard 22 advanced breeding lines from wheat breeding program of IPGR – Sadovo, Bulgaria were studied for grain yield and some important quality traits during three growing seasons - 2015-2017 years. The majority of the lines (14) were obtained by the method of interspecific hybridization (crossing between durum wheat and common wheat as durum wheat was used as mother plant). The other 8 lines are derived from inter-varietal hybridization. All studied breeding lines were grown in comparative field trial by block method in 4 replications and compared with two standard wheat varieties – Sadovo and Enola. The following groups of quality traits were investigated: physical characteristics and quality of grain, rheological properties of flour and backing parameters. The results received were processed statistically via analyses of variance, correlation analyses and PCA. The analysis of variance reveals that the genotype and environment has a statistically significant influence on the variation of the grain yield and the most of the quality traits studied. Based on the coefficients of variation (CV %) the most stable quality parameters and the most stable genotypes for each studied traits were determined. The breeding lines MX 268/1008, MX 270-28, MX 270-27 , MX 270-86 and D-611-4 are distinguished with very good and stable quality traits in addition to high yield. Their rheological properties define them as good fillers.

Keywords: Common wheat, Inter specific hybridization, Advanced breeding lines, Quality parameters

(19545) HOST SPECIFICITY OF SUDAN WITCHWEED (*STRIGA HERMONTICA* [DEL.] *BENTH.*) SEED GERMINATION AND HAUSTORIUM INITIATION IN RESPONSE TO SORGHUM ROOT EXUDATES AND EXTRACTS

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Field surveys and laboratory experiments were conducted during the season 2009/10 and 2010/11 in witchweed (*Strigahermonthica* [Del.] Benth.) endemic areas in Sudan to investigate the host specificity of witchweed populations collected from different locations with respect seed germination and haustorium initiation in response to sorghum root exudates and extracts. Field surveys were conducted to collect seeds from witchweed plants growing under their respective hosts; sorghum and millet. A total of fifteen witchweed populations were collected. Tow *in vitro* experiments were conducted at the Phytopathology Center and Biology Laboratory, Faculty of Agricultural Sciences, University of Gezira, Sudan to study the effects of root exudates and root extracts of sorghum cv. Abu-70, cv. Wad Ahmed and cv. Hakika on percentage of seed germination and haustorium initiation. Treatments (fifteen witchweed populations and three sorghum cultivars) were arranged in a factorial completely randomized design with three replicates. Data were collected and subjected to analysis of variance. Means were separated for significant using Duncan's Multiple Range Test (at $p \leq 0.5$). The results showed that, there were significant differences in seed germination and haustorium initiation of witchweed in response to root exudates and root extracts among sorghum cultivars and among the witchweed populations. However, the highest seed germination and haustorium initiation percentages attained by each of the witchweed population were on their respective hosts. This study suggests two levels of physiological specialization in witchweed in Sudan: intercrop specialization and intra-crop specialization. Moreover, two strains of witchweed are suggested, one specific to sorghum and the other, to millet. The existence of variability and host specificity within witchweed populations are suggested to be based almost entirely on differential response of *Strigaisolates* to root exudates and root extracts from host.

Keywords: Extracts, Exudates, Germination, Haustorium, Host specificity, Sorghum, Striga, Variability, Witchweed

(19546) ALLELOPATHIC EFFECTS OF JIMSON WEED (*DATUA STRAMONIUM* L.) SEED ON SEED GERMINATION AND SEEDLING GROWTH OF SOME LEGUMINOUS CROPS

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Laboratory and greenhouse experiments were carried out at the Faculty of Agricultural Sciences, University of Gezira, Sudan in season 2014/15. Laboratory experiments were conducted to study the allelopathic effect of aqueous extract of Jimsonweed (*Datura stramonium* L.) seed on seed germination of common bean (*Phaseolus vulgaris* L.), cowpea (*Vigna sinensis* [L.] Walp.), pigeon pea (*Cajanus cajan* [L.] Mill sp.) and alfalfa (*Medicago sativa* L.). Six concentrations (0, 20, 40, 60, 80 and 100%) of the aqueous extract were prepared from the stock solution. Treatments, for each crop, were arranged in completely randomized design with four replicates. The seeds were examined for germination at three days after initial germination. Greenhouse experiments were conducted to study the allelopathic effect of Jimsonweed seed powder on seedling growth of the same crops. Seed powder was incorporated into the soil at rate of 0, 1, 2, 3, 4 and 5% on w/w bases in pots. Treatments, for each crop, were arranged in completely randomized design with four replicates. Experiments were terminated at 30 days after sowing and plant height, number of leaves and root length of crop seedlings were measured as well as plant fresh and dry weight. Data were collected and subjected to analysis of variance procedure. Means were separated for significance using Duncan's Multiple Range Test at $p \leq 0.5$. The results showed that the aqueous extract of Jimsonweed significantly reduced seed germination of the tested leguminous crops and there was direct negative relationship between concentration seed germination. Also, the results showed that incorporating seed powder into the soil significantly decreased plant height, root length of crop seedlings as well as seedling fresh and dry weight. In addition, the reduction in seedling growth was increased as seed powder increased in the soil. However, the number leaves were not affected. It concludes that Jimsonweed has allelopathic affects on seed germination and seedling growth of the leguminous crops.

(19549) DETERMINATION OF FORAGE YIELD AND YIELD COMPONENTS OF COMMON VETCH (*VICIA SATIVA* L.) VARIETIES IN BILECIK ECOLOGICAL CONDITION

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This study was carried out in Bilecik ecological conditions to determine the components of some common vetch (*Vicia sativa* L.) varieties related to forage yield and forage yield. The research was carried out in the winter growing season of 2016-17 at the Bilecik Sheyh Edebali University in the Field of Agricultural Biotechnology Application and Research, with four (4) replications, according to the Randomized Blocks Experimental Design. In this research, 8 varieties of vetch (Kralkizi, Dicle, Görkem, Özveren, Cumhuriyet-99, Yücel, Alnoğlu, Kubilay) and 5 lines (Line-1, Line-7, Line-8, Line-13, Line-17) were used. According to the one year average results, differences between the common vetch varieties in terms of number of flowering days, main stem length, main stem diameter, forage yield and dry matter yield were found statistically significant. The number of flowering days varied from 134.00 to 125.00 days, the main stem length was 96.33-50.40 cm, the main stem diameter was 3.28-2.30 mm, the forage yield was 2711.10-1600.00 kg/da, and dry matter yield was 1107.14-614.44 kg/da. However, the highest forage yield was obtained from the variety of Alnoğlu and Farukbey 2001 with the values of 2711.11 kg/da and 2644.400 kg/da respectively, and the highest dry matter yield was obtained from the Dicle variety with 1107.14 kg/da.

Keywords: *Vicia sativa*, Varieties, Forage yield, Yield components

(19571) OCCURRENCE AND BIOLOGICAL CONTROL OF CUCUMBER DAMPING OFF DISEASE UNDER PROTECTED CULTIVATION IN SULAIMANI, IRAQ

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Occurrence and cucumber damping-off disease incidence was determined in Sulaimani plastic houses in 2014 revealed from overall disease incidence of 6.82%. The highest incidence and severity reached to 23.7% and 5.0 respectively in Kharajian. While the lowest incidence and severity was detected in Arabit (0.2% and 0.6 respectively). Disease symptoms include pre and post-emergency damping-off of cucumber seedlings. Twelve fungal pathogens were isolated from roots and crown of infected seedlings and plants that explore typical damping-off and root rot symptoms. *Rhizoctonia solani* was the most frequently isolated fungi followed by *Pythium aphanidermatum*, *Fusarium solani* and *Pythium sp.* Morphology and characteristics of *R. solani* and *P. aphanidermatum* match with the original described characters of the fungi. The optimum growth temperature for *P. aphanidermatum* was 30°C and for *R. solani* was between 25-30°C. Pathogenicity test revealed that *R. solani* significantly surpassed all other treatment except *P. aphanidermatum* by inciting 53.3% pre and 66.4% post-emergency damping-off followed by *P. aphanidermatum* that incited 43.6% and 56.3% pre and post emergency damping-off respectively. *T. harzianum* showed high antagonistic ability against both pathogens. Antagonistic ability degree of *T. harzianum* reached to 37.02 against *P. aphanidermatum* and 32.00 against *R. solani*. The bio-control bacterial *Bacillus subtilis*, *Rhizobacteria*, *Streptomycescoelicolor* showed high efficiency in controlling the disease. *Rhizobacteria* and *S. coelicolor* completely inhibit *R. solani* growth at 10⁻¹ bacteria dilution and significantly surpassed all other treatments. dilution 10⁻¹ from all the used bacteria were significantly more efficient against *P. aphanidermatum*. This dilution was containing 21.4 × 10⁷ cell forming unit in each milliliter (CFU/ml) in *B. subtilis*, 28 × 10⁷(CFU/ml) in *Rhizobacteria*, 29.5 × 10⁷ (CFU/ml) in *S. coelicolor*, 32.2 × 10⁷(CFU/ml) in *Pseudomonas flourescence* and 22.6 × 10⁷ (CFU/ml) in *Azotobacter chroococcus*.

Keywords: *Cucumis sativus*, Biological control, Fungal diseases, Iraq

(19608) STUDIES ON ANTIBIOSIS MECHANISM OF RESISTANCE TO *CHILO PARTELLUS* (SWINHOE) (*LEPIDOPTERA: CRAMBIDAE*) IN MAIZE, *ZEA MAYS* L

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Study of the mechanisms of resistance in maize genotypes to *C. partellus* is useful for breeding resistant varieties. The following six maize genotypes were used: VIM308, VIM313, VIM319 and VIM322 (Highlyresistant) and VIM325 and VIM329 (Resistant) along with susceptible and resistant checks (Basi local and CM500), respectively. Growth and development of spotted stem borer, *Chilo partellus* (Swinhoe) was studied under screen house conditions by releasing neonate larvae of *C. partellus* on 20-days-old seedlings of maize genotypes. Antibiosis was observed in terms of low larval survival, long larval and pupal periods, reduced pupal mass and low growth index in three maize genotypes i.e. VIM325, VIM308 and VIM322. The moths emerging from these genotypes were deformed, less active and did not attain the normal size. Antibiosis is an important mechanism of resistance in these genotypes against *C. Partellus* and can be useful in a program of breeding maize for resistance to *C. partellus*. Slower larval development on the resistant plants would prolong the exposure to predators and parasites which might reduce populations of this insect.

Keywords: *Chilo partellus*, *Zea mays*, Survival, Antibiosis plant resistance

**(19839) DEVELOPMENT, STATUS AND PERSPECTIVES OF VINE-GROWING
AND WINE-MAKING IN BULGARIA**

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Grapes and wine production on the Balkan Peninsula dated back to the ancient times due to the favorable natural conditions for vine-growing. Despite its small territory, with its geographic location Bulgaria has an extremely varied relief and climate. On the basis of the diverse terroir the country was divided into 5 wine-growing regions where along with the common, globally known vine varieties, some local ones, characteristic and typical of each region, are also grown. Over the past two decades, the development of the wine sector in the country and the legislation had been in line with the requirements and arrangements with the European Union. From 2002 to 2010 there was a significant decline in the cultivated area of vineyards and the wine export. Full control has been introduced on the planting of wine grape varieties. During the years following the accession of Bulgaria to the EU, there has been a gradual expansion of the cultivated areas with wine and table grape varieties, although the process of setting up new plantations is extremely slow. The preservation and expansion of the vineyards of traditional Bulgarian varieties has been encouraged. Wine varieties dominate in the structure of vineyards and occupy 95% of the vineyards and the table grapes – about 5%. The red wine varieties are predominant, as they are about 58% of the area of the vineyards and white wine varieties are 42%. During the last decade, the interest in bio and organic produce has grown strongly and the areas for organic grape production are constantly growing. Over the past 100 years, viticulture and wine-making development in Bulgaria had marked times of rise and times of severe crises however it had always preserved its place as a subsector determining the structure of Bulgarian agriculture, being of great importance for the country's economy.

Keywords: Viticulture, Wine-making, Grape varieties, Wine

(19849) PREVENTIVE COMPONENTS THAT AFFECTIVE IN EFFECTIVENESS OF AGRICULTURAL ADVISORY SERVICES IN IRAN

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Technologies and farming methods are constantly changing. Farmers should be informed about how to use these innovations in their fields. Utilizing the competence of the graduates agricultures in the form of Agricultural Advisory Services companies (AASC) is one of the best solutions to transfer knowledge and technology to farmers and accelerating in agricultural development. The main purpose of this study is study and identification of the problems that AAS is faced with. Statistical population of the study consisted of Agricultural Consultants (N=1731). Using the formula Cochran, sample size was determined 306. Questionnaire was the data instrument. The appearance and content validity of questionnaire was obtained by comments of extension experts. Reliability coefficient of questionnaire was obtained 0.89 by Cronbach alpha. The results showed that AAS increased participation of stakeholders in decision making and planning. AASC also provided the specialized context fields in agricultural extension. Results showed that AASC increased accountability and responsibility in extension services. By using exploratory factor analysis barriers are classified in four factors, including Infrastructure, Policy-making, Socio - cultural and Financial. These factors could explain 62.86 % of variance in reduces effectiveness of AASC among farmers in West Azerbaijan province.

Keywords: Preventive, Agricultural Advisory Services Companies, Factors, Effectiveness, Iran

(19865) INCREASING NUMBER OF FRAGMENTS FOR GENOTYPING-BY-SEQUENCING WITH DIFFERENT RESTRICTION ENZYMES: A CASE STUDY IN SORGHUM

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Genotyping-by-sequencing (GBS) has emerged next-generation sequencing technology (NGS) platform which useful for exploring genetic differences and performing QTL analysis, diagnosis, systematic analysis and various molecular studies on a genome-wide scale. Differently from general NGS platforms, GBS provides low-cost adapters, multiplexing and avoiding size selection step for SNP discovery. In this approach, genome complexity is reduced by one or two restriction enzyme to produce multiplex sampling for lower cost sequencing. The type of restriction enzymes affects the number and position of fragments represented in GBS libraries, which in turn influences the number and genomic position of SNPs discovered. Here we reported optimum restriction enzyme with *in silico* distribution of digested fragments suitable for sequencing among the *ApeKI* (partially methylation sensitive), *PstI-MspI* (methylation sensitive-partially methylation sensitive) and *PstI-TaqI* (methylation sensitive-methylation insensitive) enzymes across the sorghum reference genome with the GBSX toolkit integrated GalaxyTM which is web-based cloud computing system. Results revealed that *ApeKI*, *PstI-MspI* and *PstI-TaqI* enzymes created approximately 1.3, 1.7 and 2.1 million fragments varied from 100 to 1000 bp. Especially we focused first 400 bp because very small and long fragments are not performed well on the Illumina sequencing platform during bridge amplification. Totally, 0.4, 0.5 and 0.8 million fragments were produced with the digestion of *ApeKI*, *PstI-MspI* and *PstI-TaqI* enzymes in the range of 100-400 bp. Genome reduction with double digestion system provides the higher number of fragments and also potentially more SNPs in sorghum.

Keywords: Genome reduction, NGS, Molecular markers

(19877) GENETIC ANALYSIS OF SOME POLYGENIC TRAITS OF *GOSSYPIUM HIRSUTUM* L. FOR DROUGHT TOLERANCE

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The present study was conducted to develop high yielding cotton genotypes having good fiber traits under water stress conditions. Ten genotypes were identified as drought tolerant whereas six as drought susceptible based on root and shoot related traits. These sixteen genotypes were grown in field conditions and crossed following Line × Tester mating fashion. In the next cotton season, these sixty hybrids along with parents were grown in field conditions. Analysis of variance revealed the presence of significant differences among the genotypes for all of the traits namely boll weight, ginning out turn, fiber length, fiber strength and fiber fineness. Further, the lines i.e. NIAB-111, CP-15/2, CIM-482 and CIM-446, and testers i.e. CIM-506, FH-1000 and MNH-129 had better performance under drought conditions. The combinations of CIM-707 × S-12, CIM-707 × NIAB Karishma, CIM-707, CIM-446 × NIAB Karishma, CIM-446 × S-12, CRIS-134 × S-12 were also identified superior for yield contributing parameters. These combinations may be exploited on large scale for the development new germplasm of upland cotton suitable for planting in drought conditions.

Keywords: *Gossypium hirsutum*, Genetic analysis, Line × Tester, Water stress

(19880) MAPPING OF MAJOR EFFECT QTL FOR CHLOROPHYLL CONTENT IN MAIZE BY BULK SEGREGANT ANALYSIS

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Chlorophyll is an important trait to improve crop production. To identify the QTL of this trait in maize, 170 pairs of polymorphic (34% polymorphism) SSR primers were used in high /low DNA pools of chlorophyll content using 235 F2:3 population individuals. The results showed that 4 pairs of primers could produce clear and stable bands (4.3% polymorphism). Of these 4 markers, 3 polymorphic markers basically fitted in 1:2:1 ratio on chi-square test. Linkage analysis showed that two markers (umc2036 and umc1221) exist linkage, which was located in chromosome 5. QTL analysis showed that one QTL of chlorophyll (qchlzl-5-1) content was detected on chromosome 5, between marker umc2036 and umc1221 having distance of 19.8cM. The distance of these two markers were 4.1cM and 15.7cM, with additive and dominance effect of 0.35, and -0.11 respectively. The gene controlling chlorophyll content had additive effect with phenotypic variation of 10.7%. These results could be further utilized in maize breeding programs.

Keywords: Chlorophyll, SSR, QTL, Maize

(19895) PHENOTYPIC PERFORMANCE AND SIMPLE SEQUENCE REPEAT ANALYSIS OF F1 POPULATION DERIVED FROM CROSSING OF GOGO-DRYLAND X PADDY-FIELD RICE VARIETIES

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Ninety six of F1 plants derived from four combined crosses were evaluated in morphological and agronomic characters. The objectives of the study were to study the phenotypic performance of F1 hybrid derived from the crossing of *gogo*-dryland rice (Situ Bagendit and Towuti) paddy-field rice (Ciherang and Cibogo) and to identify the F1 hybrid using simple sequence repeat (SSR) markers. To identify the F1 hybrid, four primers i.e. RM219, RM260, RM525, and RM318 were used. The result showed that there was significant difference in both morphological and agronomic characters between F1 and their respective female parents except in plant height character. The F1 hybrids that the female parent was Situ Bagendit had similar band with the male parents (paddy-field rice). In contrast, the F1 hybrids that the female parent was Towuti had similar band with Towuti itself (*gogo*-dryland). The true hybrids are the F1 hybrids having similar band with male parents.

Keywords: Phenotype, Crossing, F1 Population, Gogo-dryland rice, Paddy-field rice

(19896) GENETIC DIVERSITY OF M2 POPULATION OF BLACK RICE (*ORYZA SATIVA* L.) DERIVED FROM COLCHICINE MUTATION

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In Indonesia, the existence and genotypic distribution of black rice is relatively rare. The lack of distribution due to the consumption of the black rice is still low as well as lack of cultivation by farmers. The black rice varieties are commonly local varieties that have long harvest days and low productivity. In this research, a method to improve the phenotype and genotype diversity of black rice was using chemical mutagenic compounds called colchicine. The purpose of the research was to study the diversity of M2 population of black rice in the field at Batu city, East Java. The research had been conducted in 2017, precisely between March and June. The data was analyzed by student T test at 5% level. The planting materials were M2 generation namely U-K0, U-K250-67, U-K250-68, U-K500-79, U-K500-83, U-K750-5, U-K750-41 and local genotypes, called Ungaran. The coefficient of genetic diversity of M2 generation was low to medium for all quantitative traits.

Keywords: Diversity, Colchicine, Black rice

(19992) EFFECTS OF BLENDED FERTILIZER (NPSB) RATES ON YIELD COMPONENTS, YIELD AND GRAIN QUALITY OF DURUM WHEAT (*TRITICUM TURGIDUM* L. VAR. *DURUM*) VARIETIES IN MINIJAR SHENKORA DISTRICT, CENTRAL ETHIOPIA

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Use of appropriate varieties and balanced fertilizer recommendation are important agronomic practices used to increase the productivity and quality of durum wheat. Hence, field experiment was carried out to assess the effect of NPSB blended fertilizer rates on yield, yield related traits and end-use quality of selected durum wheat cultivars. Factorial combinations of four blended NPSB levels (0, 61, 122 and 183 kg/ha) with four durum wheat varieties (Alemtena, Mangudo, Ude, and Utuba,) were laid out in a randomized complete block design with three replications. All of the plots were supplemented uniformly with 46 kg N/ha. The main effect of blended NPSB significantly influenced all agronomic parameters except harvest index, and some quality parameters (protein content, dry gluten and vitreousness). The highest grain yield (3640 kg/ha), biomass yield (11772 kg/ha), the longest days to physiological maturity (104.5 days), longest spike length (6.5 cm), highest number of kernels per spike (42.7), highest plant height (78.5 cm) and maximum thousand kernel weight (44.8 g) were recorded at the highest (183 kg/ha) NPSB rate. Similarly, highest hectoliter weight (80.2 kg/ha), grain protein content (11.7%) and vitreousness (81.5%) were achieved at this rate. Varieties showed significant difference for plant height, thousand kernel weight and grain protein, vitreousness and dry gluten content. Variety, Mangudo recorded, the highest plant height (74.4 cm), maximum thousand kernel weight (44.7 g), highest grain protein (11.5%), and vitreousness (71.8%) whereas variety Utuba scored the highest dry gluten content (9.5%.) Interaction of blended NPSB rate and varieties significantly influenced the number of total tillers, productive tillers and wet gluten where highest total tillers (301.7 m²) and productive tillers (245 m²) were recorded at the combination of 183 kg NPSB/ha with variety Mangudo. Variety Ude combined with highest NPSB (183 kg/ha) recorded highest wet gluten (38.9%). The economic analysis revealed that Mangudo and Ude variety by application of 183 kg NPSB/ha gave net benefit of 44343.3 and 44335.6-birr/ha and marginal rate of return of 1317.9 and 1346-birr/ha, respectively, and considered to be recommended for farmers in Minijar Shenkora District and other areas with similar agro-ecological conditions.

Keywords: Durum wheat quality, Gluten Content, Protein Content, Virtuousness

(19995) DETAILED SOIL SURVEY OF A FOREST PEDOSITE AT MICHAEL OKPARA UNIVERSITY OF AGRICULTURE, UMUDIKE, ABIA STATE, NIGERIA

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A detailed soil survey of a forest pedosite at Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria was carried out. The forest pedosite covered an estimated area of 1.8 ha. Two soil mapping units (FOPED I and FOPED II) were delineated in the study area and five pedons were sunk. Three pedons (MFP-1, MFP-2, MFP-3) were situated within the forest while two (CS-1 and CS-2) were situated at adjacent farmlands (as controls). The pedons were sampled and studied for their morphology, physical and chemical properties. Mapping unit FOPED I (represented by pedons MFP-1, MFP-2 and CS-1) covered 86 % (1.548 ha) of the forest area. They were generally shallow soils with < 50 cm depth. Soil texture ranged between loam (sandy clay loam and sandy loam) and sandy clay. The forest pedons (MFP-1 and MFP-2) retained more moisture with mean moisture content at saturation (32.1 % and 38.4 %), and AWC (11.2 % and 16.7 %) than the farmland pedon (CS-1) having 19.1 % (saturated MC) and 8.54 % (AWC). MFP-1 and MFP-2 had lower mean bulk density of 1.54 g/cm³ and 1.56 g/cm³ respectively than CS-1 having 1.94 g/cm³. The soils ranged from very strongly acidic – moderately acidic with pH (H₂O) range of 4.60 – 5.80. ECEC ranged between 7.95 – 12.7 cmol/kg (moderate to high) across the pedons. Higher mean organic matter content was recorded in the forest pedon (MFP-2) 3.99 % than MFP-1 and CS-1 having 1.64 % and 2.60 % respectively. Base saturation ranged from 74.6 – 92.1 % (high – very high) across all pedons. Mapping unit FOPED II represented by (pedons MFP-3 and CS-2) covered 14 % (0.252 ha) of the forest area. They were deep soils > 100 cm depth. Soil texture was generally loam (sandy clay loam and sandy loam) across both pedons. The forest pedon (MFP-3) retained more moisture with mean moisture content at saturation (40.6 %) and AWC (18.6 %) than the farmland pedon (CS-2) having 23.0 % (saturated MC) and 10.4 % (AWC). MFP-3 had lower mean bulk density of 1.37 g/cm³ than CS-2 having 1.81 g/cm³. The soils were very extremely acidic – moderately acidic with pH (H₂O) range of 4.30 – 5.70. ECEC ranged between 5.88 – 12.8 cmol/kg (moderate to high) across the pedons. Higher mean organic matter content was recorded in the forest pedon (MFP-3) 3.36 % than the control CS-2 having 2.28 %. Base saturation ranged from 65.7 – 96.3 % (high – very high) across both pedons. Pedons under mapping unit FOPED I were classified as Lithic Udorthents (USDA) and correlated with Eutric Loamic Regosols (WRB) while pedons under mapping unit FOPED II were classified as Typic Paleudalfs and correlated with Stagnic Loamic Luvisols. Under the Fertility Capability Classification (FCC), both mapping units were dominated with Loamy surface and subsurface horizon ‘L’ they were acidic soils ‘h’ and had limitations of ‘m’ (low organic carbon). Mapping unit FOPED I was classified as ‘LR-mh’ indicating high erosion risk due to shallow soils while mapping unit FOPED II was classified as ‘Lmh’.

Keywords: Detailed soil survey, Forest, Pedosite

**(20002) DEVELOPMENT OF HIGH YIELDING SALINITY TOLERANT TYPES IN
BRASSICA NAPUS L**

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Six sensitive and ten tolerant lines were crossed in line × tester fashion during 2015-16. The resultant F1 crosses and their parents were evaluated at maturity stage. Data were recorded on various seed yield and salinity tolerance related traits (days to 50% flowering, days to 50% maturity, plant height, number of primary branches, number of silique per plant, seeds per silique, oil content, thousand seed weight, yield per plant and salinity tolerance related traits proline content, Na⁺/K⁺ ratio, osmotic potential). Recorded data were analyzed to estimate the genetic variability, general and specific combining ability effects. Results showed that genetic variability existed in present breeding material that may be used in development of high yielding salinity tolerant *Brassica napus*. Combining ability analysis revealed that lines R-3 and 23627 and tester Faisal were best general combiners for most of the traits under normal and salinity stress conditions. Crosses R-3×Laclone, RBJ-8007×Laclone and ZMR-1×ZMR-3 were best specific combiners for most of the traits under all treatments.

Keywords: *Brassica napus*, Combining abilities, Oilseed, Salinity, Heterosis

**(20040) AN ENTREPRENEURSHIP MODEL IN THE EARLY REPUBLIC PERIOD:
ATATÜRK ORMAN ÇİFTLİĞİ**

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Managers after the War of Independence encountered problems such as the construction of foreign debt, the construction of a small number of small enterprises, not the production of insolvent facilities, the backward and inefficient production of agricultural production, and the inadequacy of population structure for development. Besides, the lack of entrepreneurs to realize social development was also a serious question. Initiatives for social and economic development emerged from the founder and executive team of the young republic. Because the founding member of the republic from the Ottoman tradition was educated and had considerable experience (Ülkenli, 2017: 39). An important example of entrepreneurship that may be the model after the foundation of the Republic is Ataturk Forest Farm. The Atatürk Forest Farm has a special cultural value as well as an example in the development of country agriculture (Uslu and Keçeci, 2006: 55). Activities carried out by Atatürk Orman Çiftliği, which was founded by Ataturk himself in 1925 and managed by him until 1937, are listed as agricultural and livestock activities, industrial activities, commercial activities, educational activities and recreative (urban recreation) activities by Aydoğan (2012). The establishment functions of the farm are totally initiatives for economic and social development of the society. This is an important historical example of your social entrepreneurship. Initiatives that emerged in the early Republican period were made by social entrepreneurs. In social entrepreneurship, social problems are being sought from the perspective of entrepreneurship (Kırılmaz, 2014: 57). Social entrepreneurs are visionary people with social responsibility. Attracting attention to the historical gap in the concept of social entrepreneurship (Kırılmaz, 2014) with concept of multi-disciplinary approach and the aim of our study is contributing to Turkish business history.

Keywords: Atatürk Orman Çiftliği, Entrepreneur, Social entrepreneurship, Business history

(20041) BEFORE THE INDUSTRIALIZATION PROCESS INITIATIVES AND SPENDS STAGE FOR THE TEA INDUSTRY IN TURKEY

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The emergence of organizational structures is sometimes a long process. The transition of initiatives from idea to action and their transformation into organizational structure varies depending on the circumstances. This process, called historical transformation methodology in business history studies, provides a perspective on how the elements of the transformation process interact. One of the best examples of this is the tea industry. The phases of pre-industrialization of tea industry in Turkey are classified in different ways. Each stage is a reflection of the characteristics of the period. Starting with the first tea production experiment in 1888 and achieving production in the first industrial plant in 1947, our 59-year-old country has interesting features for its business history studies. Tarkan's (1973) process is evaluated in five different stages: first phase is the Ottoman Empire period, second phase is the work of Rice and Airy in 1924 to develop tea in the second phase, the third stage is the period when the people lost interest in tea production and tea activity, birth and final phase of the national economy for tea production in Turkey in 1935 after an absence of well-established plans and projects and a long period of pause live more. In short, initiatives made by different people at different periods before industrialization became vital for the industrialization of tea and the attainment of an organizational structure. The objective of our work is to contribute to the Turkish business history by demonstrating the commitment of the initiatives made before reaching the organizational structure with the multi-disciplinary approach to the conditions.

Keywords: Turkish tea industry, Multi disciplinary perspective, Entrepreneurship, Business history

(20044) EFFETCTS OF ROW SPACING ON FATTY ACIDS COMPOSITION IN WINTER RAPESEED (*BRASSICA NAPPUS L.*) CULTIVARS

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The study was carried out to determine the effect of row spacing on fatty acids composition in two rapeseed cultivars grown conditions of Diyarbakır in the production season of 2011-2012. The experimental design was arranged as split plots in randomized complete blocks with three replications. In the study, four different rows (20, 30, 45 and 70 cm) and two rapeseed cultivars (Licord and Licrown) were used as a material. The content of fatty acids composition in the rapeseed was investigated in the study. It was found that there were not significant differences between rapeseed cultivars in all of the other fatty acids composition except stearic and miristic acids. The results showed that row spacing and variety x row spacing interaction affected significantly on Linoleic, linolenic, palmitic, palmitoleic, stearic and miristic acid rate. According to average of row spacings, while the highest oleic acid rate was determined from application of 30 cm rows (%57.33), the average of varieties that the highest oleic acid rate was obtained from Licord cultivar (%56.03). The highest linoleic acid ratio was obtained from application of 20 cm rows (19.68%) and Licord cultivar (18.06%), the highest linolenic acid content was obtained from application of 30 cm rows (11.07%) and Licrown cultivar (10.71%).

Keywords: Rapeseed, Cultivar, Row spacing, Fatty acid

(20045) THE EFFECT OF DIFFERENT SULFUR DOSES ON SEED YIELD AND OIL CONTENT IN SOME RAPESEED CULTIVARS

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In recent years, S deficiency has been described as a limiting factor for crop production in most region of the world. It has been determined that S deficiency decrease quality and yield of plant tissue. Sulfur is a basic element in the formation of oil in oil plants. Therefore, it is known that there is a linear relationship between the oil contents of the plants and the sulfur contents. *Brassica napus* L. (*B. napus* L) (Cruciferae), is one of the cultivated medicinal food and oil plant. So, it is important to determine the most appropriate sulfur dose in the plant. The aim of this study was to determine the effect of different dosages of sulfur on the fatty oil with some agronomic properties in the rapeseed. This work, which was held in 2011 and 2012, was carried out in the experimental fields of the Faculty of Agriculture of the Dicle University. In the research, two cultivars of rapeseed (Licord and Licrown) and 6 of sulfur doses (0 kg / da, 3 kg / da, 6 kg / da, 9 kg / da, 12 kg / da and 15 kg / da) were applied. The highest yield in terms of seed yield was obtained from the 15 kg / da sulfur dose in Licrown cv. range with 294 kg / da in the second year, while the highest fatty oil content was obtained in 0 kg/da in Licrown cv. with 45.7% and 45.4% in both years.

Keywords: Rapeseed, Sulfur, Oil, Quality components

**(20048) DETERMINATION OF YIELD AND QUALITY PROPERTIES OF
DIFFERENT SEED COAT COLORED SESAME (*SESAMUM INDICUM* L.)
VARIETIES AND POPULATIONS**

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This investigation was carried out to determination of fatty acid composition of different seed coat colored sesame (*Sesamum indicum* L.) varieties and populations in the experiment fields of Dicle University, Agricultural Faculty, Field Crops Department in 2016 growing season in order to determine the fatty acid composition of 18 sesame varieties and populations collected from different regions of Turkey. In field experiment implemented through Randomized Block Experimental Design with three replications. The obtained data were subjected to analysis of variance by using the JMP Statistical Package Program. In the experiment; fatty acid composition was observed. According to the obtained data; while the highest content of oleic acid was obtained in the Sarısu variety (45.40%). The highest linoleic acid content (38.88%) and stearic acid content (5.53%) were obtained in Osmanlı-99 and the highest content of palmitic acid (8.70%) was obtained in the Lice-Kabakaya population. It was determined that the varieties and populations in white and beige groups according to seed coat colors contained higher amounts of oleic acid, linoleic acid and stearic acid. Varieties and populations in the dark group; higher linolenic acid content. There was no effect of the seed coat color on palmitic acid content. As a result of this study; Sarısu, Orhangazi-99, Adana (Yerli), Diyarbakır Yerli-2, Mardin-Kızıltepe ve Osmanlı-99 varieties and populations were more important than others.

Keywords: Sesame, Seed coat color, Fatty acid composition

(20061) CHEMICAL COMPOSITION OF SIX MOROCCAN ESSENTIAL OILS AND THEIR ANTIFUNGAL EFFECT ON CONTROLLING ASCOCHYTA RABIEI

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Investigation for developing natural plant protection product as an alternative to synthetic fungicides is become important regarding the environment impact. In this study the chemical composition of some essential oils extracted from six Moroccan aromatic plants *Oregano* (*Origanum compactum*), *Fenugreek* (*Trigonella foenum graecum* L), *Thyme* (*Thymus vulgaris*), *Eucalyptus* (*Eucalyptus camaldulensis*), *Mentha* (*Mentha pulegium* L) and *Myrtus* (*Myrtus communis*) were analyzed using Gaz chromatography-mass spectrometry (GC-MS analysis). The analysis showed that the major chemical components of *Thyme* were Thymol that represents 41.39%. *Oregano* was mainly composed of Carvacrol (38.67%) and Thymol (25.90%). *Mentha* was very reach in Pulegone (84%). 1.8-Cineole was predominating in *Myrtus* (48.81%) and *Eucalyptus* (34.22%). Phytol acetate was mainly present in *fenugreek* with 19.43%. The antifungal activity of these essential oils was investigated for controlling *Ascochyta rabiei*, *in vitro*. The pathogen is a seed-born causal agent of *Ascochyta* blight that is considered the most economic damaging disease of chickpea. The radial growth of *A. rabiei* was completely inhibited by *Oregano*, *Mentha*, *Thyme* and *Myrtus* at low concentrations (0.15-5µl/ml). However, the essential oil extracted from *Funegrec* and *Eucalyptus* were not effective on the radial growth inhibition up to 10µl/ml. The most important effect was obtained with *Oregano* (MIC- 0.15µl/ml), followed by *Mentha* (MIC -1.5 µl/ml). Therefore, these essential oils could be investigated for seed treatment of chickpea against *Ascochyta* blight infection.

Keywords: Essential oils, GC-MS analysis, Antifungal activity, *Ascochyta rabiei*

(20072) BIOECOLOGY OF THE PREDATORY BUG *NESIDIOCORIS TENUIS* (HETEROPTERA, MIRIDAE) (REUTERS, 1895) AT FOUKA MARINE TIPAZA (ALGERIA)

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Predators of eggs and larvae of insect pests are an important asset in biological control. *Nesidiocoris tenuis* is one of the most used Miridae in the fight against pests of crops. The study of *N. tenuis* biometry reveals a body size of 1.21 ± 0.19 mm for L1, 1.86 ± 0.16 mm for L2, 2.21 ± 0.17 mm for L3, 2.63 ± 0.3 mm for L4, 2.76 ± 0.62 mm for L5 and a size of 2.74 ± 0.53 mm for adults. This study is carried out with the aim of investigating a possible correlation between the presence of predatory bug *Nesidiocoris tenuis* and the tomato leafminer *Tuta absoluta* on three varieties of tomato in Fouka (Tipaza, Algeria). The results show a highly significant probability between tomato varieties and the presence of *Nesidiocoris tenuis* and *Tuta absoluta* and also between the presence of *Nesidiocoris tenuis* and the infestation rate of leaves by *Tuta absoluta*.

Keywords: *Nesidiocoris tenuis*, *Tuta absoluta*, Tomato, Algeria

**(20074) CITRUS POSTHARVEST DISEASES: EVALUATION AND DISTRIBUTION
IN PUNJAB PAKISTAN**

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Citrus is an important fruit crop all over the world. It is attacked by numerous biotic diseases which cause high economic losses. The present studies were conducted to record the disease position and update the existing statistics. Research was conducted in 67 orchards of six major citrus growing areas of Punjab during December 2015 to January 2016 to assess different diseases on Kinnow mandarin fruit. During assessment, 100% prevalence of all postharvest diseases was found. Melanose showed incidence of 30.2% followed by Scab (29.4%), Stem end rot (4.8%) and Canker (1.53%). Maximum severity of Stem end rot (51.9%), Melanose (45.1%), Scab (40.8%) and Canker (18.7%) was observed in Citrus orchards. Blue mould incidence on fallen fruits was higher than Green mould. Affected fruits displayed the symptoms of these diseases individually and also in combination. Isolations of different postharvest pathogens were also done. Pathogens viz. *Penicillium italicum*, *P. digitatum*, *Colletotrichum gloeosporioides*, *Botryodiplodia theobromae* and *Elsinoe fawcettii* were also isolated and identified from diseased plant parts collected from different citrus orchards. The current study confirms the presence of inoculum of postharvest diseases in citrus orchards. The results will be much helpful to devise eco-friendly disease management approaches in future.

Keywords: Assessment, Citrus, Kinnow, Management, Postharvest

(20091) EVALUATION OF PERFORMANCES OF SELECTED SOME WINTER CHICKPEA (*CICER ARIENTINUM* L.) GENOTYPES UNDER MEDITERRENEAN CLIMATE CONDITIONS

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This study was carried out to investigate the yield and yield components of some promising chickpea genotypes at Cukurova conditions. The experiment was performed according to complete randomized block design with four replications. This research was conducted with 9 genotypes (7 promising lines and 2 registered cultivars as a control originated in Turkey) at Çukurova university, Agricultural Faculty, Field Crop Department during winter season of 2015/2016 and 2016/2017. According to average of experiment years, plant height, first podding height, number of branches per plant, number of pods per plant, number of grains per plant, grain weight per plant, 100-grain weight, and grain yield varied from 61.1 to 72.0 cm, from 22.7- 35.4 cm, from 9.5 to 12.4 number plant⁻¹, from 56.6 to 103.5 number plant⁻¹, from 70.8 to 133.6 number plant⁻¹, from 27.3 to 45.5 g, from 32.5 to 44.0 g, from 1951 to 2690 kg ha⁻¹ respectively. There were positive and significant correlations between grain yield and plant height, number of branch, number of pod, grain weight per plant, 100-grain weight.

Keywords: Chickpea, Yield, Agronomic traits, Genotype, Correlation

(20135) RECENT DEVELOPMENTS OF SAFFLOWER PRODUCTION IN TURKEY

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Turkey is dependent on other countries in terms of both oil seed and its derivatives. Totally about \$ 3.4 billion was paid for oil seed, meal and crude oil imports in 2016. In order to increase production and reduce oil imports, it is important to spread the cultivation of oilseed crops such as safflower. In our country, safflower production areas have not increased regularly in recent years, and 50 000 tons safflower were produced from 27 376 ha area in 2017. Also the yield per hectare was 1830 kg in 2017. In the cultivation of safflower, the Central Anatolia Region has 76% of the total safflower sowing area, while Ankara is the city where the most safflower cultivation is performed. There are nine registered cultivars which are Yenice, Diñer, Remzibey, Balcı, Linas, Olas, Göktürk, Asol, Hasankendi and there are two cultivars which have production licences such as Zirkon and Olein. However, due to deficient number of cultivars and other oil crops (sunflower, canola etc.) with the inability to compete, safflower agriculture in our country is prevented from spreading. In our country, especially until 2014, there were significant increases in the areas of safflower sowing, but after this year there has been non-regular production. Although safflower is suitable for agriculture in almost every region of our country, significant increases have not been observed in sowing areas and production. In this research, safflower production and the future of our country were discussed as a whole.

Keywords: Turkey, Agriculture, Safflower, Oilseed crops

**(20182) ALTERNATING ELECTRIC CURRENT AFFECTS ADVENTITIOUS
ROOTING OF GRAPEVINE ROOTSTOCK 140 RU**

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One of the most commonly problems encountered in viticulture is low rooting capability of hardwood cuttings in difficult-to-root grapevine rootstocks such as 140 Ru, 41B, 420 A. In order to overcome this problem, it can be taken some measures by using various applications. This study was performed to find out influences of alternating electric current treatments at different voltages and treatment durations on root formation of grapevine rootstock 140 Ruggeri's (140 Ru) cuttings with rooting difficulty. Research findings obviously shown that certain voltage values and treatment durations of alternating electric current (AC) had favorable effects on adventitious rooting of 140 Ru cuttings.

Keywords: Grapevine rootstock, Difficult-to-root-cuttings, Adventitious root formation, Alternating electric current

(20229) MYCORRHIZAL FUNGI AND PGPR BACTERIA INOCULATION EFFECTS ON THE ENZYMATIC ACTIVITY OF DATE PALM TREES UNDER WATER STRESS CONDITIONS

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Date palm trees were always the basis of the oasis structure which plays a major economic, social and ecological role in Morocco. The country has seen a decrease in the total area of palm groves, this regression was mainly due to the Bayoud disease and prolonged droughts. A research program was thus launched for the selection of the most efficient mycorrhizal strains from Zagora palm groves to alleviate the effects of these issues.

Our study highlights the importance of selected mycorrhizal fungi and PGPR bacteria in improving the tolerance of the date palm to water deficit as well as improving their yield. The physiological parameters and enzymatic activities of the date palm plants infected by the selected mycorrhizae and PGPR bacteria were evaluated for different water stress levels (100%, 75%, 50%, 25% of Field Capacity (F.C)). The results have shown that the selected mycorrhizal fungi have the ability to infect the roots of the palm date and seem to allow the plants to withstand the application of a severe water stress, moreover the activities levels of both peroxidase and catalase have significantly increased in the roots of non-mycorrhized palms exposed to severe water stress. Furthermore, the presence of mycorrhizae fungi and PGPR seems to also improve the overall health of the plants. The improvement of Aerial dry mass of both mycorrhized and mycorrhized in presence of bacteria treatment is two times higher than non mycorrhized plants under severe water stress conditions (25% F.C). The use of these fungal isolates may increase the natural resistance of date palms and therefore this may be one of the most promising biological means against biotic and abiotic stress stress.

Keywords: Date palm tree, Water stress, Mycorrhizal Fungi, PGPR bacteria

**(20233) INFLUENCE OF CULTURE MEDIUM ON *IN VITRO* PROPAGATION ON
*KALANCHOE BLOSSFELDIANA***

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The research aimed at developing a protocol for breeding *in vitro Kalanchoe blossfeldiana* for the purpose of obtaining a large number of plants free of viruses and a good rate of multiplication. They were used three concentrations of the explants disinfection based on sodium hypochlorite (10%, 15%, 20%). To initiate the cultivation of uninodale segments were used three growing media enshrined, the Murashige & Skooq initiation, Murashige and Skooq with the IBA 0,1 mg/l and BAP 0,1 mg/l, Murashige & Skooq with BA 0,1 mg/l, IBA 0,5 mg/l and 30 g/l sucrose content and the multiplication crops has been made in Gamborg B5 additional with IBA 0,01 mg/l, BA 0,1 mg/l and sucrose 20 g/l. Of the three different concentrations of disinfection, best results have been obtained using 10 % sodium hypochlorite. For testing the culture media have taken into account the average number of leaves and roots, the results of the best were on Murashige and Skooq culture medium while the culture medium Gamborg B5 has been prograded with the significant differences in the bottom. The same applies to the average number of roots analyzed is on the same MS culture media. Based on the results obtained we can recommend for the purpose of *in vitro* propagation *Kalanchoe blossfeldiana* species culture medium Murashige & Skooq with BA 0,1 mg/l, IBA 0,5 mg/l and 30 g/l sucrose and rooting on MS without hormones.

Keywords: *Kalanchoe*, *In vitro*, Explant, Culture medium

(20243) TOMATO (*LYCOPERSICON ESCULENTUM* MILL) INOCULATION WITH ARBUSCULAR MYCORRHIZAL FUNGI (AMF) UNDER WATER DEFICIT CONDITIONS

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In the world's arid regions, tomato's production is severely affected by water deficit. In Morocco, the area allocated to tomatoes fell by 56% due to adverse weather conditions. However, the inoculation of tomato with Arbuscular Mycorrhizal Fungi (AMF), can improve its growth and overall health and also increase its resilience to water shortage. The main objective of this study is to evaluate the effect of the inoculation of tomato seedlings with these microbes alone or combined with a Plant Growth Promoting Rhizobacteria species (PGPR) under water deficit conditions. To do this, three different inoculation treatments were applied to tomato seedlings (a complex of AMF composed mainly of *Glomus* genus; a PGPR treatment composed mainly of *Bacillus* genus, and a combination of both) then they were subjected to different levels of drought stress (75%, 50%, and 25% of field capacity). Our results have shown that mycorrhizal and PGPR treatments, especially the combined one, do indeed improve the physiological parameters (leaf area, weight and length of the aerial and root parts, dry weight, and number of leaves), and also the biochemical parameters (proline content, total protein, soluble sugars and chlorophylls). Moreover, the enzymatic activities of the inoculated seedlings were highly increased, compared to the non-inoculated control plants in both the presence and absence of drought stress. In conclusion, the capability of AMF and PGPR to confer tomatoes a resistance to drought stress is very pronounced in our experiments, especially when they are combined, which may provide a biological mean of facilitating plant growth in arid environments where drought is endemic, and also using them as alternatives to the harmful chemical products.

Keywords: *Arbuscular Mycorrhizal Fungi (AMF)*, *Plant Growth Promoting Rhizobacteria (PGPR)*, *Drought stress*, *Inoculation*, *Tomato*

(20267) BIODEGRADATION OF ETHALFLURALIN HERBICIDE IN SUBMERGED CULTURE CONDITIONS VIA TURBIDITY

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The aim of this study is investigate the removal efficiency of certain soil bacteria on ethalfluralin biodegradation with Ethalfluralin, chemical oxygen demand (COD), Biochemical Oxygen Demand (BOD)₅, Total Organic Carbon (TOC) and reveal the population dynamics of these bacteria during biodegradation process under agitated culture conditions via turbidity and number of colony forming unit(CFU). Bacteria were firstly isolated from agricultural soil in agar media taken from Thrace region of Turkey. These cultures were used in experimental studies. For determination of Ethalfluralin active ingredient, EPA Method 8081B was used. COD experiments were done according to standard methods 5220C closed reflux titrimetric method, BOD₅ measurement was carried out in 24-hour intervals according to the Standard Method 5210B (5 day BOD₅ test) and for total organic carbon analyses, standard method 5310B High temperature combustion method was used according to APHA, (1998) and decreasing of the ethalfluralin followed about five days. Turbidity experiments were performed by Photolab 6600 UV-VIS Spectrophotometer. As a result of the study, best removal performance observed in *Bacillus thuringiensis* and *Bacillus muralis* as 88% and 82% for Ethalfluralin while 83% and 80% in COD at 5 days, 81% and 73% in BOD₅ and 74% and 61% in TOC parameters. The lowest performance was seen on *Fusarium fujikuroi* species for Ethalfluralin, COD, BOD₅ and TOC as 41%, 53%, 47% and 43% respectively on same time period. The performance for *Micrococcus luteus* and *Micrococcus yunnanensis* species occurred between 60% and 70% for these parameters.

Keywords: Bacteria, Ethalfluralin, Biodegradation, Removal efficiency

**(20282) PROPAGATION WITH HARDWOOD CUTTING SOME WILD PLUM
GENOTYPES OBTAINED BY SELECTION BREEDING**

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The use of plum rootstock at the apricot orchard is quite common, because it is good to be able to propagation vegetative. Kahramanmaraş is a region with a very rich variation as a wild plum population. This study was carried out to investigate the possibilities of propagation four types of wild plum rootstock candidates obtained by selection breeding in this region. In addition to this study between 2011 and 2013 years in the field and laboratories of the Eastern Mediterranean Transitional Zone Agricultural Research Institute was studied. Total of 49 clonal rootstock genotypes from four different wild plum species that *Prunus spinosa* 11, *Prunus domestica* 24 and *Prunus divaricata* 14 were used in the study. It was determined that the genotypes belonging to *Prunus domestica* species best rooting percentage with 87.71 %. In addition, the rooting percentage that 85.09 % in the genotypes belonging to *Prunus spinosa* species and 78.93 % in the genotypes belonging to *Prunus divaricata* was obtained end of this study.

Keywords: Plum, *Prunus* Apricot, Rootstock

**(20283) INVESTIGATION OF PROPAGATION IN VITRO CULTURE
CAPABILITIES OF SOME WILD PLUM GENOTYPES AS CLONAL ROOTSTOCK
CANDIDATE THROUGH SELECTION BREEDING**

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This study was carried out at the 2012 year to investigate the possibilities of propagation with *in vitro* tissue culture conditions some of the wild plum genotypes as a clonal rootstock candidate obtained by selection breeding from Kahramanmaraş natural environment. Total of 9 clonal rootstocks including *Prunus spinosa*, *Prunus domestica*, *Prunus divaricata* and Myrobolan 29C and GF 677 standart control rootstocks were used in this study. The highest rooting rate at SP-1 (*Prunus spinosa*) with 97.58%, SP-2 (*Prunus spinosa*) with 97.56% and Myrobolan 29C with 97.52% was determined, and these rootstocks by GF 677 rootstock with 96.67% were followed in the study. The lowest rooting rate at 11.30%, 14.38% and 27.00% the rootstocks of DI-1 (*Prunus divaricata*), Dİ-3 (*Prunus divaricata*) and Dİ-2 (*Prunus divaricata*) respectively was determined. In general, that propagation with *in vitro* tissue culture conditions of the rootstocks of *Prunus spinosa* better than other selected end control rootstock was showed.

Keywords: Rootstock, Plum, *In vitro*, *Prunus*

(20306) MORPHO-MOLECULAR CHARACTERIZATION OF PLANT GROWTH PROMOTING RHIZOBACTERIA AND THEIR ANTAGONISM AGAINST *PYTHIUM MYRIOTYLUM* D., AND *PHYTOPHTHORA CAPSICI* AFFECTING CHILLI PEPPER (*CAPSICUM ANNUM* L.) FROM PUNJAB, PAKISTAN

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Rhizobacteria play significant role in disease suppression and plant growth promotion in numerous crops. In this context, 45 rhizospheric bacterial isolates were recovered on NA and King's B medium and subjected to morphological and biochemical analysis. Out of 45 rhizobacterial isolates, 11 produced high levels (34.3-85.1 µg/ml) of Indole-3-acetic acid (IAA), 7 showed potential phosphate solubilizing ability (103-153 µg/ml), while 12 rhizobacterial isolates presented significant acetylene reduction activities. Out of total 45 tested isolates, 08 isolates showed maximum antagonism against *Pythium myriotylum* D. while 07 isolates were potential antagonist against *Phytophthora capsici*. The 16S rRNA-sequence analysis of most potential rhizobacterial isolates present 97 to 99% identity with *Pseudomonas koreensis*, *P. asaccharoticum*, *Serratia marcescens*, *P. putida*, *P. libanensis*, *P. aeruginosa*, *Bacillus subtilis*, *B. megaterium*, *B. cereus* and *Burkholderia* spp. All sequences of these identified rhizobacteria were submitted to GeneBank for accessions. Greenhouse experiments resulted that all identified agents suppressed the *Pythium myriotylum* D., infections (77.8-97.8%) and *Phytophthora capsici* (52-63%) and also significantly enhanced the plant growth characters in chilli pepper. Efficacy of most of these identified rhizobacteria were first time studied in Pakistan.

Keywords: Antagonism, Chilli pepper, Growth promotion, Molecular diversity, Rhizobacteria

(20342) MORPHO-MOLECULAR CHARACTERIZATION OF *MUCOR FRAGILIS* CAUSING BUNCH ROT OF GRAPES IN PAKISTAN AND ITS BIO MANAGEMENT THROUGH PLANT ESSENTIAL OIL

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Post-harvest disease of grape (*Vitis vinifera*) especially rot caused by *Mucor* sp. are responsible to minimize the market value of grapes. Twenty-two isolates recovered from different markets of Attock district, (33°46'07.9"N 72°21'43.0"E) of Punjab province. Morphological characterization was conducted using only pathogenic isolates, based on mycelia growth rate, sporulation, colony pigmentation, and conidial length and width i.e., During observation, light sulphur yellow, fluffy, fast-growing colonies on the upper side and light yellow on the reverse side of the plate were observed. Width of sporangiophores ranging from 6.5 to 10.5 µm with variable length, sporangia were globose to sub globose, light yellow to orange and multispored. Columella was obovoid, cylindrical, ellipsoidal, subglobose and ranged 16 to 28.5 - 15.5 to 27.5 µm. Molecular characterization was performed by amplifying internal transcribed spacer sequence (Accession no. KX550076 and KY290546) with previously reported isolates of *M. fragilis* (Accession no. AF474242, KX421446, KX421446). Essential oils were extracted from five herbal plants viz. thyme leaves (*Thymus vulgare*), fennel seeds (*Foeniculum vulgare*), carum seeds (*Carum capticum*), cumin seeds (*Cuminum cyminum*) and garlic bulb (*Allium sativum*) by using soxhlet apparatus. Extracted oils were evaluated for mycelial growth inhibition of *M. fragilis* at four concentrations (0.04, 0.06, 0.08 and 0.1 %) employing poisoned food technique with Czapekdox agar medium. Thyme oil showed the maximum inhibition (3.6 cm) 3 days after incubation at 25 ± 2 °C as compared to control (8.0 cm). The thyme oil was further evaluated for the presence of antimicrobial compounds viz. terpenoids, alkaloids and phenolics employing standard protocols. Oil was found positive for the presence of terpenoids, alkaloids possibly responsible for the inhibition of mycelia growth of the pathogen. Therefore, thyme oil possessing good inhibitory action upon *M. Fragilis* may be a potential candidate for preservation and extension of shelf-life of grapes commercially.

Keywords: Fungal post harvest pathogen, Fruit, Bio management

(20374) ENHANCED NEMATICIDAL EFFECT OF AMMONIA PRODUCING ORGANIC SOIL AMENDMENT USING DE-NITRIFYING MATERIAL.

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Plant parasitic nematodes caused annual crop yield losses of 12.3 % to global food production. This is estimated at monetary value of 157 billion U.S. dollars worldwide. Field experiment was conducted in 2014 and repeated in 2015 under rain fed condition at Research and Teaching Farm of University of Maiduguri, Nigeria. The aim was to test the enhanced nematicidal efficacy cow dung – an ammonia producing soil amendment using neem (*Azadirachta indica*) an organic denitrifying material in the control of lesion nematodes (*Pratylenchus* spp.) on maize (*Zea mays*). Cow dung and neem powder were applied singly and also mixed together to plots of size 2 M x 2 M using spot application method at the rate of 2400 g, 160 g, and 2800 g respectively. Un-amended plots served as control. Result obtained showed mean of 23.3 nematodes were recovered from plots treated with mixture of cow dung and neem which is the least population and significantly ($P = 0.05$) different from other treatments. Mean nematodes population of 30.7 and 98.3 were recovered from plots amended with unmixed cow dung and neem respectively. The highest mean nematodes population of 270.7 were recovered from un-amended (i.e. Control plots) which is significantly ($P = 0.05$) different from all other treatments. The highest maize yield of 5.6 kg per 4 M² plot was produced by mixture of cow dung and neem, which is significantly ($P = 0.05$) different from all other treatments. Plots amended with neem and cow dung produced maize yield of 2.6 kg and 2.2 kg per 4 M² plot respectively. Un-amended plots produced the least yield of 0.72 kg. Growth parameters of shoot height, root length, dry shoot and root weight followed the similar trend as yield.

Keywords: Cow dung, neem, nematodes, *Pratylenchus* spp, maize

(20429) TOWARDS AN ONLINE PHYTOECOLOGICAL DATABASE AND EXPLORATION SYSTEM FOR FLORA IN THE REGION OF MAAMORA, SAIDA, ALGERIA

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In order to best acquire knowledge of the floristic richness in Algeria a systematic annotation of flora is needed to be accomplished region by region to ultimately cover the whole nation. The online database system called “Flora in the region of Maamoura or FIMA” presented in this work concerns an endeavor to annotate floristic survey studies distributed over the entirety of the study area of Maamoura situated in the district of Saida, west of Algeria. Based on 70 floristic surveys distributed over the different vegetation encountered in the study area of 127100 hectares, six (6) areas floristically homogeneous were obtained to hold more than 91 plant species which demonstrates this area’s high richness in floral species. A phytoecological database has been created primarily to start and motivate a nationwide flora annotation endeavor and to give users a unique and consistent view richness and importance of its data. In addition to basic information about each plant like the plant classification, species names, biological type and description, the FIMA database provides key phytoecological information including topography parameters of the region where the plants grow (with GPS positions) together with properties such as the Abundance, Dominance and Sociability. Users of the database are also provided with images and interactive google-maps for the areas included in the study. FIMA database system is freely available online on the World Wide Web at the URL address: <http://www.bioinformaticstools.org/fima>

Keywords: Algeria, Annotation, Phytoecological database, Floristic surveys, Plant species, Floristically homogeneous areas, Google-maps

(20464) EFFECT OF SILICON ON ION DISTRIBUTION IN WHEAT (*TRITICUM AESTIVUM* L.) GROWN UNDER SALT STRESS

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Soil salinity is a major problem in arid and semi-arid regions which severely hampers plant growth and crop productivity. Wheat is the main dietary staple and its production decreases under increasing soil salinization. While silicon (Si) is the second most abundant element in the earth's crust and impart numerous nutritional benefits to plants, particularly under stress conditions. In order to investigate the role of Si on distribution and compartmentation of ions in the root and shoot tissues, eighteen-day old wheat plants were treated with 200 mM NaCl for 30 d in a hydroponic experiment, in the absence or presence of 2 mM Si. In order to test the hypothesis that Si supplementation improves the salt tolerance of plants, growth responses such as root and shoot length, and dry weight of roots and shoots were recorded initially. The data showed that the 30 d period of NaCl stress had significantly reduced the length and dry weight of both tissues, however, this inhibition was alleviated to various extents by Si supplementation. Further, the plants were investigated for physiological response by measuring IRGA parameters (such as stomatal conductance, photosynthetic rate, transpiration rate), electrolyte leakage (EL), total chlorophyll contents, and relative water contents (RWC). Growing wheat for 30 d in nutrient solution supplemented with 200 mM NaCl severely inhibited all physiological parameters studied, except for a significant increase in electrolyte leakage (EL) under salt stress. However, Si supplementation to the stressed plants significantly reduced the electrolyte leakage, and improved the stomatal conductance, RWC, total chlorophyll contents and ultimately increased the photosynthetic rate of the salt stressed wheat leaves as compared with stressed plants lacking Si. Furthermore, microanalysis of mineral elements (Na⁺, Cl⁻, K⁺, Ca²⁺, Mg²⁺ and silica ions) in wheat root and shoot tissues was documented by energy dispersive x-ray (EDX) mounted with scanning electron microscopy (SEM). The results revealed that salinity-induced enhanced root Na⁺ and Cl⁻ uptake decreased the K⁺, Ca²⁺ and Mg²⁺ contents in plants. While Si supplementation altered the ion distribution and contributed significantly to enhance salt tolerance in wheat. Based on these results, we suggest the inclusion of Si in nutrient formulation of plants grown under stress conditions, however, field trials are recommended before setting any recommendations for farmers.

Keywords: Silicon, Salt stress, Ion distribution, Wheat

(20481) IMPROVEMENT OF DIPLOID AND TETRAPLOID COTTON GENOTYPES TO ENSURE FOOD SECURITY

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Cotton is an important cash crop of tropical and sub-tropical regions and it has a major share in world economy, both as a fiber and feed crop. Lint of cotton is used as a fiber and seed is used to make edible oil for human consumption and press cake for feed industry. Cotton press cake is considered as premium feed for milking animals. *Gossypium hirsutum* is a tetraploid species of cotton grown in Pakistan but is prone to insect-pest and diseases. *Gossypium arboreum* is diploid species widely grown before the introduction of *Gossypium hirsutum* and is tolerant to insect-pest and disease. Seed products are very important in terms of food security, but most of the studies concentrate only on fiber. Therefore, this study was conducted to investigate genetic diversity of the two aforementioned cotton species for fiber and seed production and to assess the association of agronomic traits with seed cotton and seed yield. The study was conducted at the experimental form of The Islamia University of Bahawalpur, Pakistan. Twenty genotypes of each species were investigated in this study. Seed cotton yield of *Gossypium hirsutum* varied from 4000 kg/ha to 6500 kg/ha and seed yield varies from 2350 kg/ha to 3800 kg/ha. Seed cotton yield of *Gossypium hirsutum* varied from 3590 kg/ha to 5850 kg/ha and seed yield varies from 2410 kg/ha to 3500 kg/ha. In both species all agronomic traits (monopodial branches, sympodial branches, boll weight and number of locules) were positively correlated with seed cotton and seed yield. Presence of huge variation for seed cotton and seed yield and positive association of the both traits with agronomic traits depicts possibility of improvement in both seed cotton and seed yield which will contribute both in food security as a new food crop.

Keywords: Cotton, Seed yield, Oil and press cake, Food security

(20497) CHEMICAL CONSTITUENTS OF BAIKAR (*ADHATODA VASICA*), AN INDIGENOUS MEDICINAL SHRUB OF KHYBER PAKHTUNKHWA.

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The samples (leaves) were collected from *Adhatoda vasica* found at their natural habitat of Khanpur Valley in the sub Himalayan mountains of Pakistan and chemical analysis was carried out at the University of agriculture Peshawar. Significant effects were observed at different seasons and sites upon various bio-chemical substances. *Adhatoda vasica* showed significantly higher values for ash (19.5%) at Jabri during summer, crude proteins (14.7%) at Dabola during summer, crude fibers (12.6%) at Jabri during winter, essential oil (2.5%) at Mang during summer, NFES (55.8%) at Mang during summer, NFEE (194.6%) at Dam during summer, potassium (179.4mg/100g) at Dam during summer, phosphorus (171mg/100g) at Dabola during summer, copper (0.58mg/100g) at Dabola during summer and zinc (8.07mg/100g) at Mang during summer. It was concluded from the results of the current experiment that medicinal plant under study was rich in bio-chemical substances. *Adhatoda vasica* showed maximum bio-chemicals in the samples collected during last week of July.

Keywords: Chemical constituents, Adhatoda, Khyber Pakhtunkhwa

(20567) INVESTIGATING THE FACTORS AFFECTING THE SUSTAINABLE DEVELOPMENT OF WATER RESOURCES IN THE IRAN AGRICULTURAL REGION

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The purpose of this study was to investigate the factors affecting the sustainable development of water resources in the agricultural sector of Urmia. The statistical population of this study is experts in agricultural service centers and Urmia Agriculture Jihad, whose number is 110 persons based on the information received. The method of sampling in this research was simple random sampling. Morgan's famous table was used for sampling; therefore, the number of statistical samples was 86. This research was a researcher-made questionnaire consisting of 5 units. The questionnaire was designed according to the hypotheses and objectives of the research. After validation and validity, it was provided to the statistical sample to answer the questions. For statistical analysis, inferential statistics methods have been used using 22 SPSS software.

Research findings shows that ecological and infrastructure components affective in the sustainable development of water resources in the agricultural sector. Also research findings showed the most ecological factors that affecting the sustainable development of water resources in the agricultural sector is Fitness fitting with facilities and constraints and Covering irrigation canals to prevent waste and evaporate water and also the most the Infrastructure Influencing Factors on Sustainable Development of Agricultural Water Resources was mitigating river flows" and the "repair and reconstruction of water transfer channels" as well as the "prevention of increased water evaporation in Irrigation of farms (such as irrigation at appropriate times) was identified as the most important infrastructure components effective in increasing the sustainable development of agricultural water resources from respondents' point of view.

Keywords: Effective factors, Sustainable development, Water resources, Iran

(20637) RESPONSE OF CAPER CAPPARIS SPINOSA TO ARBUSCULAR MYCORRHIZAL FUNGI AND DROUGHT STRESS

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Abiotic stress conditions remain today among the main causes of the loss of crops in the world. Drought in particular is one of the most common constraints of normal growth and good metabolism of plants. Caper *Capparis spinosa* is a perennial shrub (xerophyte) and drought resistant plant which is well adapted to Mediterranean Ecosystem. In this study, we have assessed the effect of mycorrhizal arbuscular fungi (AMF) on the growth and tolerance of caper *C. spinosa* plants to water stress. Inoculation of the plants grown from seedlings was carried out by a complex of the indigenous AMF isolated from the rhizospheric soils of the caper in the Safi region of Morocco. It was dominated mainly by strains belonging to the genus *Glomus*. To induce water stress, healthy plants aged two-month-old are subjected to four levels of water stress 25%, 50%, 75% and 90% compared to the field capacity. After four months of greenhouse culture, the morphological parameters measured showed highly significant improvements in mycorrhizal plants compared to plants not inoculated with AMF. The water deficit significantly increases the efficiency of chlorophyll fluorescence (FV/FM) ($p < 0.001$) measured in all leaves of mycorrhizal plants. The results showed that mycorrhizal symbiosis improved the accumulation of antioxidant compounds, mainly proline, chlorophylls and carotenoids, and to a lesser extent total soluble sugars, total proteins, antioxidant enzymes superoxide dismutase (SOD), ascorbate peroxidase (APX), peroxidase (POX), catalase (CAT) and phenolic compounds in caper *C. spinosa* seedlings. These improvements were higher under water deficit than under optimal irrigation. Overall results suggest that fungal colonization positively affects the host plant on chlorophyll growth and fluorescence, and this promotes better production of fresh and dry biomass in case of stress imposed by low water levels. The caper seems able to tolerate water constraints in the presence of AMF, so the xerophytic potential of this species offers other possibilities for wider use of this species in rehabilitation programs for degraded environments in Mediterranean arid and semi-arid areas such as Morocco.

Keywords: Abiotic stress, *Capparis spinosa*, Water stress, Arbuscular mycorrhizal fungi (AMF), Chlorophyllous fluorescence (FV/FM)

(20702) COMPUTATION OF DIFFERENTIAL POTENTIAL IN SUNFLOWER GENOTYPES FOR ACCUMULATION OF LEAD (PB) AND ITS IMPACT ON ECONOMICALLY IMPORTANT ATTRIBUTES

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With the industrialization, soil contamination with heavy metals especially lead (Pb) and its accumulation in edible crops is becoming a major concern. This research work was designed to find out differential response of sunflower genotypes against Pb toxicity and selection of Pb tolerant genotypes for utilization in future breeding program. Research trial was conducted in net house of Department of Plant Breeding and Genetics, University of Agriculture Faisalabad. Fifty sunflower genotypes were collected from international sources and evaluated for 100-achene weight, achene yield per plant, oil contents, oleic acid, linoleic acid, palmitic acid and Pb contents in roots, shoots, leaves and achene under control and two levels of Pb toxicity (150 & 300 mgkg⁻¹). Significant results were obtained for treatments of Pb, Genotypes and their interaction for most of the traits. Principal component analysis was used for selection of sunflower genotypes for achene yield and oil quality under lead stress environments. The genotypes PI546356, CN42267 and CN36537 were Pb tolerant and the genotypes PI650582, CN36721 and CN31766 were Pb sensitive genotypes. Accumulation of Pb in roots, leaves and achene had significantly reduced achene yield per plant whereas 100-achene weight had significantly positive association with achene yield per plant. Oleic acid (omega-9) increases with the decrease in linoleic acid (omega-6) and vice versa. Sunflower genotypes had maximum accumulation of Pb in roots and leaves whereas very little amount was translocated to achene (edible portion).

Keywords: Genetic variability, Lead tolerance, Principal component analysis, Correlation, Oil contents, Fatty acid profile

**(20722) CONTRIBUTION TO THE STUDY OF INTERCROPPING WHEAT AND
FABA IN THE AREA OF MARRAKECH -MOROCCO**

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The intercropping is defined as the simultaneous cultivation of two or more species in the same space and for a significant duration of their cycle. It has been developed as a new productive agricultural system to cope with the intensification of agriculture permitted by variety selection, mechanization and the massive use of chemical inputs which has contributed in some areas to the emergence of environmental problems: soil erosion, environmental pollution by fertilizers and pesticides but also selection of diseases, pests and weeds resistant to chemical treatments. Faced these problems, the objective of researchers and farmers are to develop new productive, diversified and more respectful agricultural systems of the environment which answer at the same time the challenges of a sustainable agriculture and the challenges of world food safety. In this direction we are interested to determine the performances of intercropping soft wheat and faba in the area of Marrakech which is new in the context of Morocco by testing the presence or absence of nitrogen fertilization on agronomic parameters (yield, weed development and attack by diseases fungal), and biochemical parameters (protein content, chlorophyll, nitrate reductase activity, and on mineral nutrition P, K⁺, Ca²⁺ and Na⁺). Overall, many of the benefits of intercropping soft wheat and faba are mentioned, in particularly compared to the pure cultures: weed control, reduction of fungal diseases, very important increase in yield components, mineral enrichment of the soil, especially phosphorus and potassium, increase in protein content, chlorophyll content and stimulation of nitrate reductase activity. This allows us to conclude that this type of intercropping density (50% / 50%) gives the same results as pure culture with the density (50% & 100%) and that the intercropping replaces nitrogen fertilization in pure culture of wheat.

Keywords: Intercropping, Pure culture, Soft wheat, Faba, Fertilization

(20878) EFFECT OF LAND CONSOLIDATION ON ARRANGEMENT OF RURAL SETTLEMENTS

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Especially small enterprises in rural areas where agriculture is concentrated in our country have problems in terms of many indicators. For this reason, the current situation of rural settlements and lack of infrastructure of agricultural enterprises do not provide opportunity for adequate agriculture. Prevention of agricultural disruption, improvement of rural settlements and business centers, can be achieved by the way that applying land consolidation in rural areas. By applying of land consolidation projects; the rational delivery of services for rural areas, more efficient agricultural functions, the creation of rural infrastructure and the development of rural industry will accelerate. In addition, the arrangement of agricultural land and the simplification of land consolidation will be achieved. All these given issues have been evaluated from a different point of view.

Keywords: Rural settlements, Land consolidation, Village renewal, Rural transformation

(20918) COMPARATIVE VIEW OF ALBANIAN VEGETABLE PRODUCTION

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Albania has the opportunity to cultivate different kinds of vegetables based on the geographical position, climatic conditions and early tradition in their production. Nowadays, in our country are cultivated more than 30 types of vegetables and this number is always increasing. Even the total production of vegetables in the country has always been increasing. Also, more and more in Albania the vegetable production is being applied in different kinds of greenhouses. In these past years, the above mentioned factors have made the vegetable production in different areas of the country grow and extend throughout the year. The main goal is achieving the optimal levels of vegetable production in order to meet the country's needs, to reduce their import and to rise our country's export. This study, for this purpose, makes an assessment of our country's counties performance of vegetable production during 2013-2017. The performance in vegetable production is estimated using Data Envelopment Analysis (DEA). Based on this assessment, through a comparative view between the different counties, the opportunities and the appropriate ways to achieve optimal levels in vegetable production in our country are found.

Keywords: Vegetables, Performance, DEA, Counties

(20995) GENETIC PARADIGM FOR YELLOW RUST RESISTANCE AND YIELD TRAITS IN BREAD WHEAT

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The insight into the nature of gene action involved in the expression of a trait of interest is essential to a plant breeder for deploying a judicious breeding program. The aim of the present research work was to assess the inheritance pattern (additive vs. dominance) of yellow rust resistance and yield traits through diallel analysis in parental genotypes and their F1 and F2 populations in wheat during 2014-15, 2015-16 and 2016-17. Six wheat cultivars i.e., Pirsabak-85, Khyber-87, Saleem-2000, Pirsabak-04, Pirsabak-05 and Shahkar-13 were crossed in a half diallel fashion during 2014-15, and advanced to F2 generation during 2015-16. Parental genotypes along with their F1 and F2 populations were evaluated during 2016-17 through randomized complete block design with three replications. Genotypes differed significantly ($p \leq 0.01$) for all the traits in F1 and F2 generations. Additive-dominance model was partially adequate for resistance to stripe rust and yield-related traits. Greater values of additive (D) than dominance (H1, H2) components of genetic variance, the average degree of dominance and Vr-Wr graphs revealed that yellow rust resistance and yield traits were primarily controlled by additive gene action except for grain yield in F1 and flag leaf area in the F2 generation which governed by overdominance. In loci, unequal proportions of positive (H1) and negative (H2) alleles revealed the asymmetrical distribution of genes in parental genotypes for yellow rust resistance and yield traits. The preponderance of additive gene action suggested that selection could be made in early segregating generations for improvement in resistance to stripe rust and yield.

Keywords: *Triticum aestivum* L., Additive and non-additive gene action, Components of genetic variance, Vr-Wr graph, Broad and narrow sense heritability, Yellow rust resistance and yield traits

(21013) RAINWATER HARVESTING FOR INCREASED FOOD PRODUCTION IN PAKISTAN

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Agriculture grasps a paramount importance in Pakistan's economy. It is the mainstay of living of people in rural areas where 62% of the total population resides. Thus, agriculture significantly contributes to rural development in Pakistan. Despite being the largest sector of the economy, food production per unit area is low in Pakistan, particularly in the rainfed areas. An important reason for which is, inter alia, the inability of the farmers to meet 'crop water requirements' in the rainfed agriculture. This paper attempts to pinpoint the role of rainwater harvesting (RWH) schemes in increased food production in rural areas in the northwest Pakistan. Drawing on the field surveys, it is depicted that water shortage in the area was primarily because of the absence of large-scale irrigation arrangements. Nonetheless, farmers had developed small-scale RWH schemes such as channels, ponds, and bunds in their villages. The results of the paired-samples t-test indicate that yield was significantly higher in the areas where farmers used water from RWH schemes. However, the storage capacity of these schemes were low; and hence, farmers were unable to irrigate large piece of lands. The study concludes that the large portion of uncultivated land could be cultivated if water shortage problem is resolved through the promotion of community led RWH schemes in the area. This has important implications for rural and agricultural development, viz. improved living conditions of the farmers through increased food production and its contribution to food security at local and national levels. Agriculture grasps a paramount importance in Pakistan's economy. It is the mainstay of living of people in rural areas where 62% of the total population resides. Thus, agriculture significantly contributes to rural development in Pakistan. Despite being the largest sector of the economy, food production per unit area is low in Pakistan, particularly in the rainfed areas. An important reason for which is, inter alia, the inability of the farmers to meet 'crop water requirements' in the rainfed agriculture. This paper attempts to pinpoint the role of rainwater harvesting (RWH) schemes in increased food production in rural areas in the northwest Pakistan. Drawing on the field surveys, it is depicted that water shortage in the area was primarily because of the absence of large-scale irrigation arrangements. Nonetheless, farmers had developed small-scale RWH schemes such as channels, ponds, and bunds in their villages. The results of the paired-samples t-test indicate that yield was significantly higher in the areas where farmers used water from RWH schemes. However, the storage capacity of these schemes were low; and hence, farmers were unable to irrigate large piece of lands. The study concludes that the large portion of uncultivated land could be cultivated if water shortage problem is resolved through the promotion of community led RWH schemes in the area. This has important implications for rural and agricultural development, viz. improved living conditions of the farmers through increased food production and its contribution to food security at local and national levels.

Keywords: Crop water requirement, Monsoon rains, Rainfed agriculture, Rainwater harvesting, Food production

(21026) DETERMINATION OF SEED PRIMING IN GERMINATION AND SEEDLING GROWTH OF CHICKPEA, COWPEA, LENTIL, ALFALFA AND BARLEY

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For the purpose of studying the effect of moisture pretreatment on the seed of plants such as chickpea, cow pea, lentil, alfalfa and barely, an experiment performed in two phases, i.e in laboratory and in pot, based on totally random design with 4 replications at agricultural faculty of Tabriz Azad University in 2017. In greenhouse phase, plants were harvested after reaching flowering period, and traits such as leaf number, plant height, leaf wet weight, stem wet weight, aerial organ wet weight, leaf dry weight, stem dry weight and aerial organ dry weight were recorded. In laboratory experiment, plants were harvested according to static standards after completion of germination period, and traits such as radicle number, radicle length, stalk length, stalk wet weight, radicle wet weight, radicle wet and dry weight, were studied. The results showed that various plants showed different reactions to pretreatment exposure. In the case of alfalfa, pretreatments caused trait improvement of aerial organ. In barley, the best results were obtained at 16-hour pretreatment. Although hydro priming in cowpea did not increased measured traits, in some of traits even increasing pretreatment time to 22 hours, it acted weaker than the control. Increase in measured traits in plants resulted from pretreated seeds of lentil, was significantly more than the plants resulted from control seeds. However, aquatic pretreatment duration had no significant effect on these traits. In chickpea, 10-hour pretreatment was effective in developing of traits under consideration.

Keywords: Pretreatment, Chickpea, Cowpea, Lentil, Alfalfa, Hydropriming

(21034) COMPARISON OF THE OF YIELD AND AGRO-MORPHOLOGICAL CHARACTERS IN BARLEY (*HORDEUM VULGARE* L.) GENOTYPES

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Barley is one of the mainly field crops growing in Trakya region and biotic and abiotic stress factors causes because of the various environment conditions abiotic stress factors. It was investigated effect of the environment factor during growing season on yield and agronomic characters of winter barley genotypes. The research was established with 15 genotypes in RCBD with 4 replications in Edirne in 2011-2012 and 2012-2013 growing seasons. Grain yield, cold damage, 1000-kernel weight, test weight, protein ratio, days of heading, days of maturity, days of grain filling, plant height, *Pyrenophora teres* and leaf rust and relationship amongst traits were investigated. There were various relations among investigated parameters. Across two years, the highest average yield was 716.1 kg da⁻¹ in 2011-2012 and 769.8 kg da⁻¹ in 2012-2013 growing season. Based on mean yield the highest yield was obtained in Sladoran with 701.3 kg da⁻¹. Correlation coefficients among tested characters in 2011-2012 growing season showed that there was positive relationship between grain yield with TKW and significantly positively correlated with plant height ($r=0.690^{**}$). This result showed that tall genotypes had higher grain yield. TKW was negatively correlated with days of heading, maturity days, grain filling days, and positively significantly correlated with plant height ($r=0.677^{**}$). Also there was negatively association between test weight and grain filling ($r=-0.537^{*}$) and positive relation with 1000-kernel weight ($r=0.704^{**}$). Protein ratio was positively correlated with grain filling days, plant height, 1000-kernel weight and test weight. Correlation coefficients among tested characters in 2012-2013 growing season showed that there was positive relationship between grain yield with 1000-kernel weight and slightly negative relation with protein ratio. Grain yield was negatively correlated with *Pyrenophora teres*. Leaf rust and *Pyrenophora teres* was negatively correlated with each other and it means that same environment condition caused infection of both diseases. Test weight was negatively correlated with cold damage, days of heading, maturity days ($r=-0.556^{*}$), and positively correlated with TKW ($r=0.569^{*}$). There was positive correlation between protein ratio with 1000-kernel weight ($r=0.451$) and test weight ($r=0.645^{*}$). *Pyrenophora teres* in genotypes negatively affected 1000-kernel weight, test weight, and protein ratio. All the results showed that environment factors was the mainly effect on the investigated parameters in genotypes.

Keywords: Barley, Genotypes, Yield, Agronomic characters, Environment factor

**(21036) EFFECT OF THE NITROGEN APPLICATION ON YIELD AND
PHYSIOLOGICAL PARAMETERS IN BREAD WHEAT (*TRITICUM AESTIVUM* L.)
CULTIVARS**

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Bread wheat is an important staple crop in Trakya region of Turkey. However, the yield and agro-physiological of the crop is markedly constrained by low soil fertility, inappropriate rate and timing of nitrogen application. Therefore, an experiment was conducted to elucidate the effect of different nitrogen fertilizer application on the yield, quality, and nitrogen use efficiency of bread wheat varieties during 2016-2017 cropping seasons. The treatments consisted of four fertilizer of nitrogen Urea (46%), Compose (20-20-0), soil regulatory with 25 kg N da-1, and 50 kg N da-1. Five bread wheat cultivars were used which are Pehlivan, Gelibolu, Selimiye, Saban and Flamura-85. Three timing of N application (at sowing, at tillering, at shooting) were used. The experiment was laid out as a randomized complete block design with three replications. There was no seriously interaction of nitrogen application. The highest grain yields (732.8 kg da-1) of the crop were obtained in response to the application of SR 25 kg da-1. Urea application increased tiller number and seedling weight. The seedling weight ranged from 2.90 g at SR25 to 3.16 g at Urea application at sowing. Application of compose fertilizer (20-20-0) at sowing had a significant affect for NDVI from Z13 to Z60 growth stage and spike number per square meter. Relationships between characters were examined and some of the traits were found highly correlated to each other. The correlation coefficient varied according to level of the fertilizer application. Grain yield was slightly negatively correlated with seedling weight ($r=-0.469$) and tiller number ($r=-0.713$). The grain yield was positively correlated with biomass at Z13 ($r=0.877^*$), Z35 ($r=0.482$), Z45 ($r=0.741$), and Z60 ($r=0.789$). There was a positive association between grain yield and chlorophyll content ($r=0.447$) at Z60 plant growth phase. Canopy temperature at Z60 and Z70 plant stage negatively affected grain yield and it was found $r = -0.881^*$ and $r = -0.769$, respectively. Also there was positive association between grain yield and plant height, days of heading and spike number per square meter.

Keywords: Bread wheat, Nitrogen application, Grain yield, Physiological parameters

(21067) USING BOX-JENKINS MODEL TO FORECAST GUM ARABIC EXPORTS FROM SUDAN

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Time series modeling and forecasting has fundamental importance to various practical domains. Thus a lot of active research works is going on this subject during several years. Many essentials have been proposed for improving the accuracy and efficiency of time series modeling and forecasting, one of them is Box and Jenkins is an important model used in time series methods, which differ from other types of forecasting models. Sudan is the main um Arabic producer and exporter in the world that used in many manufactures such as Pharmaceutical, foods, cosmetics and other industries. It produced about 80% of the world Gum Arabic production, which exports to France, USA, Turkey, Germany and other countries. This study aims to put standard models for Gum Arabic quantities exported from Sudan by using Box and Jenkins by determining an ARIMA models and go further to forecasting. We consider data of Gum Arabic exports from official sources for the period 1980-2015. The model building process involves three steps: tentative identification of a model from the ARIMA class, estimation of parameters in the identified model and diagnostic checks. Results showed that the appropriate model is simply an ARIMA (1,1, 0) that used to forecast exports quantities, after that forecasting till 2023 and this used as scientific base to made exports plans.

Keywords: Sudan, Gum Arabic and ARIMA

(21082) SEED YIELD AND ITS RELATED TRAITS PERFORMANCE OF COMMON BEAN (*PHASEOLUS VULGARIS* L.) VARIETIES IN DAWURO ZONE, SOUTHWEST ETHIOPIA

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Poor addressing of all potential areas and slow turnover of old cultivars for more than 15-43 years are serious bottlenecks limiting production and productivity of common bean in Ethiopia. Farmers in the study area, Dawuro zone, had been cultivating common bean landraces for about five centuries and Red Wolaita for about 43 years. Red Wolaita is lower seed yielding and poor in quality due to loss of its genetic identity because of mixing up with landraces, genetic drift, and occasional natural out crossing. Hence, thirteen new and recently released common bean varieties reported for their higher seed yield potential and Red Wolaita were evaluated at seven locations for seed yield and its related traits performance using RCBD design with three replications in Dawuro zone, southwest Ethiopia, in the 2010 main cropping season to select higher seed yielding and broadly adapted varieties. Analysis of variance (ANOVA) and additive main effects and multiplicative interaction (AMMI) models were used to analyze the data. The analysis of variance revealed presence of highly significant difference ($P < 0.01$) between varieties for seed yield and its related traits performance. Combined AMMI model analysis of variance partitioned variability in seed yield performance of the varieties with the largest effect of location (50.27%) followed by variety effect (28.81%) and then variety x location interaction (GLI) effect (20.92%) indicating highly significant complication of GLI in selecting higher seed yielding and broadly adapted varieties with greater influence of location. AMMI 1 biplot analysis enabled identification of higher seed yielding and broadly adapted varieties, Zebra-90, GobeRasha, Roba-1, Nasir, and Omo-95. Higher seed yielding varieties were earlier to flower, but latest to mature. Longer plant height, and higher number of primary branches per plant, pods per plant, and seeds per pod had better contributed to higher seed yield performance. Generally, since broadly adapted varieties were the winners with rank change within themselves at all locations and no variety had performed specifically well the broadly adapted varieties, Zebra-90, GobeRasha, Roba-1, Nasir, and Omo-95 were recommended for production in the Zone and as a result, Nasir, which has similar seed color with the old and lower seed yielding cultivar in the Zone, Red Wolaita, has got greater acceptance by farmers and at popular production in the Zone.

Keywords: AMMI, Broad adaptation, Dawuro zone, GLI, Seed yield, Variety, Yield related traits

(21139) EFFECT OF TWO PHYTOECDYSTEROIDS ON DEVELOPMENT AND DETOXIFICATION ENZYMES ACTIVITIES OF THE INSECT PEST TRIBOLIUM CASTANEUM

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The indiscriminate use of insecticides is causing the appearance of pest populations resistant to insecticides and serious environmental and health issues. To avoid these problems, the search for new biopesticides of plant origin is currently one of the most actively investigated subjects. Phytoecdysteroids are secondary metabolites produced by many plant species. They represent analogs of insect hormones (ecdysteroids) which are involved in insect growth, development and reproduction. In this work, we carried out the effect of two phytoecdysteroids (20-Hydroxyecdysone and Makisterone-A) on the insect pest, *Tribolium castaneum* (Coleoptera: Tenebrionidae). We started our study by testing the ingestion effect of those molecules at different concentrations (300, 600, 900 and 1200 ppm), on some post-embryonic development parameters as mortality, pupation and adult emergence rate. We investigated our study further by testing the effect of these phytoecdysteroids on detoxification enzymes activity such as glutathione S transferase, esterase and cytochrome P450 monooxygenases of *Tribolium castaneum* larvae. Our results show that when 20-Hydroxyecdysone and Makisterone-A were incorporated to diet of *T. castaneum*, its induced an increase of larval mortality with a rate of 48% and 93% respectively, for 20E and MakA for the highest dose of 1200 ppm. A decrease of pupation with 42 and 7% and adult emergence rate achieving 32 and 0%, respectively, for 20E and MakA for the highest dose of 1200 was also registered. Makisterone-A was the most toxic phytoecdysteroid. Treatment provoked, also, an induction of the activity of glutathione S transferase achieving 337.4 ± 8.5 and 273.7 ± 6.8 , respectively, for 20E and MakA for the highest dose of 1200 ppm, whereas, the activity of cytochrome P450 monooxygenases and esterase using 1-Naphtyl acetate as substrate decreased. Indeed, esterase activity using 1-Naphtyl acetate as substrate achieved 0.31 ± 0.05 and 0.39 ± 0.02 for 20E and MakA, respectively for a dose of 1200 ppm.

This work establishes the potent bioinsecticide effect of 20-Hydroxyecdysone and Makisterone-A on *T. castaneum* and show that the small structural changes between these molecules were able to influence on their toxicity level. In addition, phytoecdysteroids are innocuous to vertebrate and environment and are thought to have potential value in crop pest management.

Keywords: *Tribolium castaneum*, Insect pest, Phytoecdysteroids, Bioinsecticides, Detoxification enzymes

(21143) CLIMATE CHANGE AND SUSTAINABLE AGRICULTURAL DEVELOPMENT

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Global agriculture will be under significant pressure to meet the demands of rising populations using finite, often degraded, soil and water resources that are predicted to be further stressed by the impact of climate change. The ongoing build-up of greenhouse gases in the atmosphere is prompting shifts in climate across the globe that will affect agro-ecological and growing conditions. In addition, agriculture and land use change are prominent sources of global greenhouse gas emissions. The application of fertilizers, rearing of livestock, and related land clearing influences both levels of greenhouse gases in the atmosphere and the potential for carbon storage and sequestration. Therefore, whilst ongoing climatic changes are affecting agricultural production, the sector itself also presents opportunities for emissions reductions. This paper provides an insight into the different climate change-related challenges that the agricultural sector in developing countries will face and explores opportunities for emission reductions and adaptation. The study concludes that adaptation measures in the agriculture sector are highly significant for poverty reduction. It also highlights that agriculture in developing countries can play a significant role in mitigating greenhouse gases and that it is critical to work out incentives that are conducive to emission reductions in this sector. Specifically, it may be worthwhile to explore the potential contribution to mitigation and mobilize resources from the carbon market for investment in pro-poor and sustainable agricultural development. It also reconfirms that sustainable management of natural resources is key to both mitigations of emissions and adaptation in the agricultural sector. In this paper, the impact of climate change on production and opportunities for emissions reductions is reviewed with a focus on developing countries, including the implications for food security and livelihoods for the poor. In order to highlight specific on-farm and soil management practices, this paper will focus on emissions and impacts related to food production (mainly crop and livestock production), plus corresponding mitigation and adaptation strategies. Following the introduction, the impact of agricultural production on global warming and climate change is considered, including possibilities for mitigation. The second part considers how the release of carbon and greenhouse gases will impact the agricultural sector, drawing heavily on future climate projections. Part three discusses adaptation strategies for individuals and governments and their capacity to respond to increasing climate variability. Part four offers a conclusion. The objective is to provide a synthesis of the evidence relating to the impact of agriculture on climate change, as well as the impact climate change is projected to have on this sector. The intention is to provide a clear message for development practitioners and policy makers in order to enable them to cope with the threats, as well as understand the opportunities, presented by ongoing climate change.

Keywords: Adaptation, Climate change, Greenhouse gases, Mitigation, Sustainable agricultural development, Policy makers

(21147) SEED YIELD STABILITY OF ANDEAN SUGAR BEAN (*PHASEOLUS VULGARIS* L.) GENOTYPES IN ETHIOPIA

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In Ethiopia, Andean common beans are lower seed yielding and unstable in productivity. Therefore, 16 advanced Andean sugar bean genotypes which had been part of the research system engagement were evaluated for seed yield performance using 4x4 triple lattice design with three replications at nine locations in the 2013 and 2014 main cropping seasons to select higher seed yielding and stable genotypes. Additive main effects and multiplicative interaction (AMMI) and Genotype plus Genotype x Environment (GE) interaction (GGE) models were used to analyze the data. Mean seed yield performance of genotypes ranged from 1261.28 kg/ha -2095.30 kg/ha. G1, G2, G4, G5, G6, G8, G12, G14, and G16 were higher seed yielding genotypes whereas G3, G7, G9, G10, G11, G13, and G15 were lower seed yielding genotypes. All sources of variance genotype (G), environment (E), and genotype x environment interaction (GEI) effects were highly significant ($p < 0.01$) and G, E, and GEI represented 9.97%, 67.88% and 22.15% of variations in the treatment sum of squares, respectively, indicating greater influence of environments in exerting effects on seed yield performance and importance of simultaneous consideration of mean performance and stability. PC1 and PC2 were highly significant ($p < 0.01$) and together contributed 66.17% variation in the GEI sum of squares. AMMI 1, GGE scatter, GGE comparison, and GGE ranking biplots enabled identification of higher seed yielding and stable genotypes, G2, G4, G12, G14 and G16. However, higher seed yielding and stability show of GGE comparison biplot was superior to others. Polygonal GGE biplot analysis showed repeatability of specific adaptability of genotypes in mega-environments and, thus, G12 was selected as ideal genotype for mega-environment consisting of ALT, MLK, ARK, and HRM. G6 was selected for JIM, ASS, MIS, and SRK. G8 was selected for ARN. Therefore, specifically adapted genotypes were verified and released for their respective mega-environments in addition to verification and release of higher seed yielding and stable Andean sugar bean genotypes for all dry bean growing agro-ecologies of Ethiopia.

Keywords: Yield stability, Sugar bean, GGE biplot, AMMI, Smm pecific adaptability, Mega-environment

**(21165) CHARACTERIZATION OF THE MYCORRHIZAL INFECTIVITY OF
RETAMA MONOSPERMA RHIZOSPHERIC SOILS IN MOROCCO**

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Legumes represent an important and varied family of angiosperms. The genus *Retama* belong to this endemic family of the Mediterranean basin, is distributed in different bioclimatic stages, from humid to arid and it characterizes the dune ecosystems, scrubland and desert. In Morocco it's a eu-monosperma subspecies, Webbii variety that is prevalent on the Atlantic coast from Tangier to Sous. *Retama monosperma*, object of our study, is particularly developed on the coastal road linking Safi to Souira kedima, along the Marrakech Safi road and along the road (A7) that connects Marrakech to Casa. It has the property of establishing symbiotic mycorrhizal associations favoring the biofertilization of saline and poor soils in which they thrive. The objective of this study is to evaluate the impact of *Retama monosperma* on the biological and chemical soil fertility in the Marrakech-Safi region through the evaluation of the mycorrhizal soil potential and the study of the richness and diversity from the community of arbuscular mycorrhizal fungi. The results obtained showed a higher mycorrhizal potential in *Retama monosperma* Rhizospheric soils, 829.30 infectious propagules/100 g of the soil were highlighted by the most probable number method, as for the non rhizospheric soils contained only 14.71 infectious propagules/100 g of soil. The isolation of the spores revealed the presence of 4 mycorrhizal fungi morphotypes with different arbuscules according to their predominant color. The rhizosphere soil of *Retama monosperma*, forms endomycorrhizal arbuscules symbioses with a colonization rate of important root systems which favor the soils biofertilization and the fight against desertification.

Keywords: *Retama monosperma*, Mycorrhizal potential, *Arbuscular mycorrhizae*, Morocco

(21183) THE KEY ELEMENT IN THE CONTROLLING OF EURYGASTER INTEGRICEPS; ECONOMIC THRESHOLD

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Wheat and barley have a significant insect pest, the sunn pest, *Eurygaster integriceps* Puton (*Heteroptera: Scutelleridae*) in Turkey. It affects the yield and the quality of flour of which bread is made. In this study; the yield loss due to white spike damage caused by overwintered adults and kernel damage by nymphs and new-generation adults in wheat fields were defined to set up an economic threshold (ET) for the sunn pest. To evaluate the relationship between overwintered adult density and white spike damage, and between percent kernel damage and sedimentation value of the flour, a regression analysis was performed. White spike damage comprised at low levels (0.1 – 1.7%) in the study fields and the relationship between overwintered adult density and white spike damage was not statistically important in bread and durum wheat. Kernels that were sucked by *E. integriceps* were 2.2% and 6.6% in bread wheat, and 8.0% and 2.8% in durum wheat in 2002 and 2003, respectively. A positive relationship between nymph and new-generation adult density, and kernel damage in bread and durum wheat was found. We determined the sedimentation values of flour that was made of wheat kernels on which the pest fed. It was 18-82 and 7-89 in 2002 and 2003, in bread wheat, and 9-22 and 9-28 in 2002 and 2003, in durum wheat, respectively. There was no effect of sunn pest density on gluten strength up to 2.1% kernel damage in bread wheat or up to 0.9% kernel damage in durum wheat, but kernel damages above these levels restrained dough quality. We assessed these limit values in the regression formula and we found the economic thresholds as 8.1 and 9.2 nymphs/m² in bread and durum wheat, respectively. While the existing ET (10 nymphs/m²) may still be acceptable in durum wheat, it may be reduced to 7-8 nymph/m² for some wheat varieties and regions, especially for low yield levels (~2000 kg/ha) in bread wheat.

Keywords: Economic threshold, White spike damage, kernel damage, Sunn pest

(21184) THE EFFICACY OF ENTOMOPATHOGENIC NEMATODES AGAINST ZABRUS SPP.

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Experiments were conducted to find out the susceptibility of the larvae of *Zabrus* spp. (Coleoptera: Carabidae), an important insect pest of wheat, against entomopathogenic nematodes (Rhabditida: Steinernematidae and Heterorhabditidae) in the laboratory first time in the World. The entomopathogenic nematodes used in the trials were *Steinernema feltiae*-Commercial, *S. feltiae*-Endemic, *S. carpocapsae*, *S. bicornutum*, *Heterorhabditis bacteriophora*, and *H. indica*. Small plastic pots with a lid (8 cm in height, 6 cm in diameter) containing autoclaved soil have been utilized in trials. In the experiments, rates of 50, 100 and 200 infective juveniles (IJs)/cm² at 15, 20 and 25°C applied and they were repeated 2 times. Raising rate and temperature expanded the mortalities caused by nematodes. *S. carpocapsae* produced 75% mortality at the rate of 200 IJs/cm², which was the highest at 15°C. The lowest mortality with 5% at the rate of 50 IJs/cm² was caused by *S. bicornutum* 15°C. *Steinernema carpocapsae* at the rate of 200 IJs/cm², and *S. feltiae*-Endemic and *H. indica* at the rate of 50 IJs/cm² provided the highest (85%) and the lowest (20%) mortality, respectively at 20°C. At 25°C, *S. carpocapsae* at the rate of 200 IJs/cm² was the nematode caused the highest mortality with 95% while *S. feltiae*-Endemic at the rate of 50 IJs/cm² was producing 25% mortality which was the lowest. As a result, *S. carpocapsae* performed the best efficacy against *Zabrus* spp. and it was followed by *H. bacteriophora* and *S. bicornutum*.

Keywords: *Zabrus* spp., Entomopathogenic nematods, *Steinernema*, *Heterorhabditis*, Biological control

(21185) ENTOMOPATHOGENS IN THE MANAGEMENT OF STORED PRODUCT PESTS

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Fumigation is mainly applied to control of stored product pests in the world and in Turkey. The ruining of natural balance among living organisms, the resistance of pests for pesticides, and residues on crops are produced by application of pesticides widely. Nowadays, incremental necessity has been occurred to find out alternatives to chemicals. Biological control is a novel method to replace chemicals. Insect pathogens which kill insects causing disease are agents such as bacteria, fungi, nematodes, viruses, protozoa. The mass of entomopathogenic bacteria are in genera *Coccobacillus* and *Bacillus*. *Coccobacillus acridiorum* produced disease in grasshoppers. *Bacillus thuringiensis* and *Bacillus popillia* are important disease causing agents against lepidopteran pests. Entomopathogenic fungi *Beauveria bassiana*, *Metarhizium anisopliae*, and *Verticillium lecanii* cause disease on larger insects than other pathogens. These are rather prevalent on the insects in orders *Lepidoptera*, *Homoptera*, *Hymenoptera*, *Coleoptera*, and *Diptera*. Insects, especially living in soil at one of its life cycle such as larva, pupa or adult are highly susceptible against entomopathogenic nematodes. *Neosteinernematidae*, *Steinernematidae* and *Heterorhabditidae* are the families containing these nematodes. They are obligatory insect pathogens in nature. Entomopathogenic nematodes impacts many insect species with a broad host range. Entomopathogenic viruses at least 16 families are very important in biological control to affect insect pests. Baculoviruses are produced commercially and applied as a biological control agent to manage significant agricultural and forestry insects, especially in Orders *Lepidoptera* and *Hymenoptera*. Entomopathogenic protozoans such as *Nosema locusta* are a substantial role in the ecologically management of populations of insect pests. In this review, application and potentials of entomopathogens as biological control agents of harmful insect species on stored products has been abstracted.

Keywords: Entomopathogens, Insect pests, Stored products

21187) SUNN PEST MANAGEMENT POLICY CHANGE IN TURKEY; FROM CLASICAL APPROACH TO INTEGRATED PEST MANAGEMENT

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Wheat, *Triticum aestivum* L. and barley, *Hordeum vulgare* L are important crops in Turkey. They are grown in about 13.5 million ha area annually. The sunn pest, *Eurygaster* spp. (*Hemiptera; Scutelleridae*) is the most important insect pest of wheat and barley. These insects were first reported from the South Anatolia region of Turkey in 1927 and caused many outbreaks through the 1950s to the present. Detailed studies on the sunn pest were started in the 1950s. Government, only itself has managed the sunn pest control since 1927. Farmers had no responsibility until 2001. Then an IPM approach has been adopted in control of the sunn pest; the sunn pest control policy has been changed to switch from aerial application to ground spraying and leave the responsibilities to farmers gradually. Now the sunn pest control sprays have been done by ground equipments completely. Government provides only technical support and farmers are supposed to apply the insecticide by their equipment, as determined by official technical consultants. After switching ground spraying, insecticide treated area decreased dramatically from about 1.9 million ha in 2003 to 0.6 million ha in 2014. This clearly showed us how appropriate decision it was. But there is always a danger that farmer may apply insecticide more than necessary because there is no good control of pesticide application and residue in the country.

Keywords: *Eurygaster* spp., Wheat and barley, Sunn pest, Integrated pest management, Policy

**(21196) ESSENTIAL OIL CONTENT AND COMPOSITION OF LEMON BALM
(*MELISSA OFFICINALIS* L.) GENOTYPES GROWN UNDER CENTRAL
ANATOLIAN REGION**

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Lemon balm (*Melissa officinalis* L.) is a perennial plant from *Labiatae* family widely used in alternative medicine. This study was conducted at to determine herbage yield, essential oil content and essential oil components of 6 lemon balm genotypes under the continental type of climate in 2015 – 2017 growing seasons. The experimental design was randomized complete blocks with three replications. The essential oil content was determined by steam distillation and the essential oil composition was determined with gas chromatography - mass spectrometry. The herbage yield varied between 2500-3250 kg/ha. The genotype ERU02 had highest herbage yield while the genotype ERU12 had the lowest. Essential oil contents varied between 0.09 and 0.3 %. The genotype CA03 had highest essential oil content while the genotype ERU09 had the lowest. The main essential oil components were citral, citronellal, geraniol, linalool, β -caryophyllene, cermacrene-d.

Keywords: *Melissa officinalis*, Lemon balm, Essential oil content, Essential oil composition

**(21197) ALLELOPATHIC POTENTIAL OF RAPESEED (*BRASSICA NAPUS* L.)
CULTIVARS ON WEEDS**

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Rapeseed (*Brassica napus* L., spp. *oleifera*) contains water soluble allelochemicals that can be used effectively and economically to control problem weeds in cultivated areas. Four rapeseed cultivars (Westar, Bristol, ACSN3 and Eureka), three development stages (rosette, flowering and harvesting) and three extract concentrations (2, 4 and 8%) were examined for their allelopathic potential against *Amaranthus retroflexus* and *Solanum nigrum*. Cultivars, development stages and extract concentrations had significant effects on the inhibition of seed germination, and shoot and root growth of the tested weed species. Cultivars Westar and ACSN3 had the highest inhibitory effects on the germination of *A. retroflexus* (42.6%) and *S. nigrum* (41.3%) seeds. The rate of germination and seedling growth inhibitions increased with increasing extract concentrations. The highest inhibition rates were obtained from 8 g 100 mL extract concentration for both weed species. Rapeseed extracts exhibited different levels of allelopathy at rosette, flowering and harvesting stages. Shoot powder extracts of the flowering stage had the highest allelopathy followed by rosette and harvesting stages. Rapeseed cultivars having higher allelopathic potential at the vegetative stage are potentially viable green manures, while cultivars having higher allelopathic potential at harvesting stage may be useful in crop rotation to control problem weeds. However, further studies are needed to determine the amount of residue, the time interval between rapeseed harvest and the planting of the following crop, tillage practices applied after rapeseed harvest and appropriate soil conditions for maximum release of allelochemicals.

Keywords: Allelopathy, *Amaranthus retroflexus*, *Brassica napus*, Germination, *Solanum nigrum*

**(21198) GIANT REED GROWTH FOR NEY MANUFACTURING IN SAMANDAĞ
DISTRICT OF HATAY PROVINCE**

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A ney is a musical instrument made from well dried firmly fibrous giant reeds (*Arundo donax* L.) having 9 homogeneously distributed short internodes along the cane. The best quality canes for ney manufacturing naturally grown in 6.5 km long and 100-250 m width sea shore of Asi delta plain Samandağ, Turkey. A good cane for ney manufacturing must have 9 homogeneously distributed short internodes. A cane with long internodes cannot used for ney manufacturing. To increase the number of canes that can be used for ney manufacturing plants that cannot be used for ney manufacturing must be cut and removed in the giant reed growing areas. In addition to plant removal, application of growth inhibitors shortened the internode length of canes. Either plant tinning or application of plant growth inhibitor can increase the number of canes suitable for ney manufacturing.

Keywords: *Arundo donax*, Asi delta plain, Giant reed, Ney production, Samandağ

(21199) DIURNAL VARIATION OF ESSENTIAL OIL CONTENT AND COMPOSITION OF THYME (*THYMRA SPICATA*)

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Diurnal variation in fresh and dry herbage for preparing essential oil of thyme (*Thymra spicata*) were studied. Plants were harvested hourly starting at 6 a.m. and ending at 5 p.m. Essential oils of fresh and dry plant was extracted by steam distillation and the essential oil composition was determined with gas chromatography - mass spectrometry. Essential oil content slightly varied among harvesting hours. The highest essential oil content was obtained from 6 a.m. harvest, the lowest was obtained from 2 p.m. harvest. Twenty-eight essential oil components were determined. Thymol, carvacrol, a-terpinen and cymol were the major essential oil components in both fresh and dry plant. Small variation in essential oil components were detected among harvest hours. The results indicated that the cooler hours of the day were the best harvesting time for essential oil yield with the highest active ingredients.

Keywords: Diurnal variation, Essential oil, Thyme, *Thymra spicata*

**(21220) OPTIMIZATION OF BIOSOLIDS AS A SUBSTRATE FOR QUALITY
TOMATO TRANSPLANT PRODUCTION**

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Tomato (*Solanum lycopersicum* L.) is an important fruit vegetable crop for human health and nutrition as well as for income generation. The quality of the transplant affects the overall quality and yield of the crop. However, poor soil conditions greatly affect growth of the seedlings. The objective of the study was to determine effect of biosolids from sewage treatment on quality of tomato transplant. This study was conducted at Egerton University, Njoro, Kenya. Tomato 'Maxim F1' was used as candidate plant. The experimental design was randomized complete block design (RCBD) replicated four times. Treatments were biosolids mixed with forest soil at 0% (forest soil), 10%, 20%, 30%, 40%, 50% and 60% (v/v), tea compost and coco peat. Growing media was evaluated for physic-chemical properties while the seedlings were evaluated for leaf number, plant height, collar diameter, root volume, and chlorophyll content, root and shoot dry matter content. Biosolid applied in moderate levels (30%) helped to improve the physic-chemical properties (bulk density, moisture content, organic matter, pH, N, P, K, and Mg contents) of the growing media. Seedlings grown using biosolid at 30% had more leaves than forest soil, biosolid at 60% and coco peat. Using biosolid at 30% resulted in taller seedlings than forest soil, biosolid at 40% and coco peat. Application of biosolid at 30% resulted in seedlings with thicker stems compared with all the other growing media. Biosolid at 30% and tea compost had the highest root volume while soil, biosolid at 10% and coco peat had the lowest root volume. Using biosolid at 30% resulted in higher leaf chlorophyll content than all the other growing media. The study demonstrates that using biosolid at 30% proved to be the best for tomato transplant production. Root dry weight was highest in tea compost and biosolid applied at 20, 30, 40 and 50%, while control and coco peat had the lowest root dry weight. Shoot dry weight was the highest in tea compost and biosolid applied at 30% while control and coco peat had the lowest shoot dry weight. This was attributed to more available nutrients in the biosolid hence better seedling physiological development as observed by higher leaf chlorophyll content. Results of this study suggest that 30% of biosolids in forest soil can be customized for their effective improvement on growth and quality of tomato transplants.

Keywords: Tomatoes, Biosolids, Potting substrate, Seedling quality

(21239) "ADAPOP 9D" SKEWNESS AND KURTOSIS VALUES IN TWO DIFFERENT CHARACTERISTICS OF SUPER SUGAR CORN POPULATION

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This study was carried out using the S1 recurrent selection method in the Adapop 9d population which has different characteristics such as grain structure, grain color, and maturity group in order to provide the source materials for the variety development studies carried out in the Sakarya Maize Research Station Directory 2012. The obtained data are the values of the Progeny Control Test. When written sources are examined, the prevalence indicates that the resulting data set is a measure of symmetry. If a data set shows the same distribution from a central point to the right and to the left, this data set is defined symmetrically. While the prevalence for a normal distribution is zero, the prevalence of a symmetric data set is close to zero. Positive skewness indicates that data are common to the right, while negative skewness indicates that data are common to the left. In our study, the skewness coefficient for the whole population was determined as 0.584. Kurtosis is the measure of the dataset being more frequent in near values and forming a peak or spreading to a wider range away from nearest values. A dataset with a high kurtosis tends to have near average values, whereas a dataset with a low kurtosis tends to have wider values than average. In our study, the kurtosis coefficient for the entire population was 0.059. The obtained data are important in knowing the properties of the material studied in breeding studies. In addition, this is important in terms of how we will shape our material in the future.

Keywords: Adapop 9d, Super sweet corn, Population, Skewness, Kurtosis

(21255) TREND ANALYSIS OF TEMPERATURE AND PRECIPITATION IN THRACE REGION, TURKEY

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Sunflower in Thrace region is the most grown plant with wheat and rice. When a small percentage of the sunflower plant in Thrace is being irrigated, it is usually grown under rainfed conditions. For this reason, seasonal precipitation is very crucial in sunflower farming. In addition, important indicators of climate change are temperature extremes and rainfall changes. These effects of climate change directly affect the yield of sunflower plant in the Thrace region. For this reason, temperature and precipitation trend analysis provide a basis informations for decision-makers to work towards correct drought strategies, the scheduling of irrigation, and plans to cope with climate change. Therefore, monthly and seasonal average temperature and total monthly and seasonal precipitation trend analyzes in Thrace region were carried out between 1965 and 2016 in this study. Mann-Whitney, nonparametric Mann-Kendall and parametric t-tests were applied. The seasonal trend analysis of the time series of rainfall and temperature was examined.

Keywords: Precipitation, Temperature, Sunflower, Thrace Region, Mann-Whitney, Mann-Kendall

(21263) “ADAPOP 11A” SILAGE MAIZE POPULATION

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This study was carried out using the S1 recursive selection method in the Adapop 11a population, which has different characteristics such as grain structure, grain color and morphology, to provide source material for the type development studies carried out in the Sakarya Maize Research Institute between the years 2014-2017. The method involves a four year process. However, the end-data was obtained in 2017. Literatures indicate that the most important stage of the hybrid maize development programs, when viewed, is the "Obtain Inbred Line", derived from developed populations based on self-contained lines (F2 generations of exposed open fertilization material, synthetic, composite and hybrid varieties). The Adapop 11a silage population is a population of F2 materials planted together with 3 silage corn sold in the market. At the beginning of silage populations, the green plant yield was determined as 7459.5 kg/da in Adapop 11a C0 and 8895.3 kg/da in Adapop 11a (S1) C1 at the end of a cycle. Dry matter quantities were 3176 kg/da in Adapop 11a C0 and 3675 kg / da in Adapop 11a (S1) C1 respectively. As a result, 19.2% improvement in green plant yield was obtained from Adapop 11a C0 to Adapop 11a (S1) C1. At the same time 18 Adapop 11a (S1) C1 materials were transferred to the silage corn rehabilitation program. These results were evaluated positively and it was decided that the material should be continued one more cycle

Keywords: Adapop 11a, Silage Maize, Population, S1 recurrent selection, Improvement

**(21274) BIOLOGICAL CONTROL POSSIBILITIES OF DOWNY MILDEW ON
SUNFLOWER**

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Plasmopara helianthii is the most destructive fungal disease of sunflower the all over the world. Using chemical control causes environmental pollution and resistant fungicide also in the plants. So alternative control possibilities have ben investigated about control of helianthus annus downy mildew. This review includes biological control researches of *P. helianthi* on sunflower in the field in the world. Three rhizosphere isolates of Antagonist fungi *Trichoderma harzianum* applied as seed treatment to a highly susceptible sunflower cultivare evaluated for the abbility promote growth and induce resistance in sunflower against downy mildew disease caused by *P. helianthi*. Mycorrhizal fungi and some plant activators applied as soil drenches and foliar sprays, wherease *P. helianthi* infection was obtained by root and cotyledone inoculations of the seedlings.

Keywords: *Plasmopara helianthi*, Sunflower, Biological control

(21277) FARMER FIELD SCHOOLS- A NOVEL APPROACH FOR CAPACITY BUILDING AND EMPOWERMENT OF FARMERS

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Farmer Field School (FFS) is a novel method and approach for training and empowering growers and farmers of crops, forests as well as livestock. The approach has successfully been tested and implemented around Asia and the Pacific region including Pakistan with positive results. In Pakistan the original concept was tested with Cotton Farmers for integrated pest management (IPM) in early 2000s but the approach has since been applied in other sectors including other crops, livestock and even rural development. FFS focusses on inquiry based science learning and the benefits go beyond the initial objective of activity; it changes the way of thinking and decision making, that can in turn empower the rural communities, resulting not only in making right decisions about farming but also reducing their poverty. Empirical evidence from the experiences and impacts of the approach will also be shared in the presentation.

Keywords: Farmers, Capacity building, Empowerment, Training

(21282) FACTORS AFFECTING THE DECISIONS OF YOUNG FARMERS TO MAKE AGRICULTURAL PRODUCTION (GAZIANTEP PROVINCE EXAMPLE)

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A large proportion of the population living in rural areas has get on with agricultural activities as a daily bread. Migration from villages to cities is mainly realized for reasons of economic origin like inadequacy of the revenues earned from agriculture because of growing population, conversion to low incomes small businesses of agricultural holdings with cleavage of lands the reduction of the demand for labor by increasing the use of the machine with the new developments in agricultural production. Experienced migration brings along reduction of the young labor force to work in agricultural production, the remains of lands people leave, the drop in agricultural production and productivity, many problems such as the increase in rural poverty. Young people is getting away from agriculture: as a result, the population in rural areas is declining and getting older in age. For this reason, it is necessary to determine the tendency of young people to be in agriculture, to determine the factors that cause agriculture or abandonment. In this study, it was aimed to determine the reasons underlying the agricultural activities of the agriculture-related young population. Within the scope of the study, 44 farmers aged between 18-40 were interviewed in Gaziantep province and it was tried to specify the factors affecting their tendency to prefer agricultural production. The decisions taken by the decision mechanisms of the results obtained are thought to be instrumental in the policies to be implemented.

Keywords: Young farmer, Staying in agriculture, Rural migration

(21291) BIOTECHNOLOGY: A TOOL TO CITRUS IMPROVEMENT

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Citrus is among the world's leading fruit crops in terms of area as well as production. There is a wide range of edible and non-edible species of *Citrus*. Genetic improvement through conventional techniques is a difficult task for plant breeders due to its complex reproductive biology, polyembryony, long juvenile phase and sexual incompatibility. Plant biotechnology offers a reliable solution for its efficient varietal improvement. Hence, it is challenge to improve citrus species using in vitro techniques. As citrus is a woody plant, it is prone to several tissue culture issues like browning, translucency, etc., yet continuous efforts made it possible to establish well-developed protocols for citrus tissue culture. Somatic hybridization is playing a vital role in intra-generic and inter-generic hybrids development. Another technique that has been developed as an important tool for introducing desirable genes into Citrus species is Agrobacterium-mediated transformation. Transgenic against biotic (viruses and bacteria) and abiotic stresses have been developed. On-going citrus research focuses mainly on incorporating resistant genes to improve quality and yield of citrus. This review covers the advancements in citrus improvement and suggests future directions.

Keywords: Citrus, Biotechnology, RAPD, SSR

(21318) ALIGNMENT OF FUSARIUM GENOME SEQUENCE BY OPTICAL MAPPING

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Fusarium wilt, and root rot diseases caused by *F. oxysporum* form. speciales, are very important biotic stress factors limiting production of tomato, pepper and eggplant, which are economically important crops in Turkey. The disease agents of Fusarium wilt are soilborn pathogens and could be transmitted by seeds. Next Generation Sequencing (NGS) platforms offer enormous opportunity in terms of time and cost effectiveness of genome sequencing. However, some features of genomes hamper the assembly of their sequences, with the size and complexity representing the most significant difficulties. The assembly of short sequence reads produced by the Next Generation Sequencing (NGS) platforms is complicated by various types of repetitive DNA elements. Many families of repetitive DNA elements, which populate genomes, can be impossible to resolve when only short reads are available. Optical mapping is promising technique to overcome these difficulties. In this study, isolate of *F. oxysporum* f. sp. melongenae was whole genome sequenced using Illumina HiSeq2500. The genome was assembled using the programs Velvet version 1.2.10, ABySS version 2.0.1, and SOAP denovo version 2.04. Initial version of assembly was 56.124.561 bp. N50 value was 612,414 bp. Approximately 16.000 protein-coding genes were predicted. The whole genome sequence was subjected to optical mapping using the Bionano Genomics. Optical mapping helped ordering right orientation the genome sequence.

Keywords: *Fusarium*, Genome sequence, Optical mapping

(21320) CUTTING MEDICINAL PLANTS (ROSEMARY AND OREGANO): A NEW APPROACH FOR A BETTER YIELD

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For the time being, the Rosemary and the oregano are very interesting curative plants in protection and conservation of health. They can be used as condiments in food. Rosemary is called also as a honey plant. Traditionally, it is used in allopathy. It is a plant with a nice perfume. For oregano, it has one of the best essential oils that are characterized by several biological and pharmacological activities. The use of oregano as a medicinal plant refers to the ancient Greek times. It was prescribed against gastric disturbances, stimulating the lazy stomachs and as means of conflict against constipation. Additionally, it is used to support the request of the increase and installation of large-scale farming (domestication), as well as to meet needs of globalization and trades. Our study offers a strategy to improve the rate of the success of cutting rosemary and oregano under the conditions of the greenhouses. As working methodology, we suggested the study of the effect of several parameters on the rate of cutting in the greenhouses. Therefore, the experiments were done on the dust's nature, on the effect of some products, on the rooting, on the position of cutting of the plant mother, and finally on the site of the vase in the greenhouses. With one total of 540 operation of cuttings realized of for every plant, we obtained a percentage of success according to the nature of the substratum varying of 27.47 %, 27.79 % and 44.73 % (rosemary) and 32.95 %, 34.09 % and 32.95 % (oregano) respectively for the substratum S1 (sand), S2 (1/2 sands 1/2 stamps) and S3 (1/3 sands 1/3 stamp 1/3 peat). Moreover, for the effect of the products of rooting, we obtained 26.72%, 22.67%, 27.12%, 23.48% (rosemary) and 22.64%, 20.88%, 26.17%, 30.29% (oregano) respectively for P1 (willow water), P2 (product based on AIB), P3 (a product based on mineral matter and amino acids) and P4 (a product based on free amino acid and polysaccharides). Concerning the effect of the position of buds, we found that the cutting of the apical party of two plants, gives the most well brought up rates, and the success of cutting depends also on the position of the greenhouses.

Keywords: Cuttings, Greenhouse, Substratum, Water of willow, AIB, Mineral, Amino acid, Polysaccharides, Left apical

**(21337) FIVE MAJOR REASONS BRING TO THE FOREFRONT CROP
IMPROVEMENT FOR PLANT YIELD EFFICIENCY**

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Plant yield efficiency (PYE) reflects the ability of individual plants to efficiently capture inputs. Improved PYE is followed by a positive response of the individual plant for higher yield when a bigger share of resources is available within the crop stand. It is now widely adopted that PYE is tightly connected with the ‘weak-competitor’ ideotype. Amid the concerns for climatic changes responsible for unpredictable growing seasons and the projected demands for increased global food production, five major reasons bring to the forefront varieties of improved PYE, particularly those used for grain production. Intra-crop variation (i), reflecting the interplant competition within the crop stand, is associated with ineffective resource use, contributing thus substantially to yield gap, i.e. actual yield lagging substantially behind the agroecosystem's attainable yield; to mitigate the interplant differences, varieties comprising weak-competitor(s) is an imperative need. Missing plants (ii) in the field is a common problem even in case the crop does not encounter any severe stress; higher yield potential of the surrounding plants thanks to their ability to take advantage of more resources will ensure better compensation for the missing plants. Multi-genotypic varieties (iii), comprising a mixture of compatible and homogeneous genotypes, deserve more room henceforth for resilience to the largely varying climatic conditions due to unpredictable abiotic and/or biotic stresses that may hazard one or more of the component genotypes; in such a case, the surviving genotypes should be distinguished for PYE so as to compensate for the missing ones and ensure homeostasis. Density reliance (iv), implying that optimum plant population density is very high for propitious seasons and largely varying across seasons, is a proximate causal element of yield loss; when a key input (e.g. water) is limited, plants of high populations hardly manage to survive, thus lower densities in an imperative need; improved PYE lowers the optimum density to ensure inter-seasonal stability. Expanding further the low-input agricultural system (v), a necessity stemming from climatic changes, will require varieties comprising individuals efficient to use limited resources. In addition, crop yield components such as high harvest index, reduced barrenness, and resistance to lodging, are tightly connected with lower plant population densities, therefore with improved PYE.

Acknowledgements: The work is based on novel ideas of Prof. Apostolos Fasoulas and dedicated to his memory

Keywords: Intra-crop variation, Missing plants, Multi-genotypic variety, Density-dependence, Low-input agriculture

(21338) IMPACT OF LAND FRAGMENTATION ON FARM PRODUCTIVITY

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This paper is focused on the study of the relationship between land fragmentations, structure and impact on the farm productivity in Kosovo, respectively in Dukagjini region covering Peja, Gjakova and Prizren municipalities. There are not many studies conducted related to the land fragmentation in the entire country and in particular at different farm levels. Most of the studies in Kosovo are focused on Agriculture and other related issues, which ignores the land fragmentation issues and structure even if it is crucial for the productivity. The study was based on the data gathered through the survey with 444 household's farms that were randomly selected. The collected data were processed by using the software program SPSS 17. It was aimed to build a statistical model that in our case resulted in the Cluster method. The results show strong correlations between fragmentation and productivity. Land fragmentation seems to be negatively correlated to farm productivity. Other key factors that were found to significantly affect on the farm productivity in combination with the farm fragmentation are the agricultural education, the farm structure and the access to market.

Keywords: Land fragmentation, Farm structure, Dukagjini region, Farm productivity

(21339) TISSUE CULTURE STUDIES IN ORNAMENTAL SUNFLOWERS

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The cultivation of ornamental sunflowers has been increasing worldwide over the years for the production of cut flowers, potted plants, or for use in the garden. Of all ornamental sunflowers, a common characteristic is breeding for desirable plant architecture and morphology, flower performances, and flowering period. The application of biotechnology methods for improving the ornamental sunflower traits is limited due to the low efficiency and poor reproducibility of regenerating plants. Sunflower regeneration capacity by organogenesis and somatic embryogenesis are highly variable and depend upon several factors including genotype, specific media components, explant type, age of seedling, concentrations and types of hormones, culture conditions and tissue culture methods. Although a variety of techniques for regeneration by organogenesis or somatic embryogenesis or haploid production have been described in this species, a reproducible, widely applicable and highly efficient regeneration protocol for various ornamental genotypes needs to be improved for use in sunflower breeding programs. In this presentation, some aspects of cotyledon and anther cultures in this species will be discussed.

Keywords: Anther culture, Ornamental sunflower, Tissue culture, *In vitro* regeneration

(21342) SUSTAINABILITY OF WEED MANAGEMENT AT WHEAT SUNFLOWER ROTATION SYSTEM

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Wheat as a stable crop and sunflower as an oil crop are both among the main crop species worldwide and produced in a rotation system where is possible and feasible. Weeds including parasitic plants are among foremost problems in the production of both crops in this age. In the Trace parts of Turkey, which will be used as example in this presentation, farmers prefer rotation of these crops but it is not easy to define a common system such as two-, three-, or four-year system because depending on climatic conditions and economic considerations farmers decide year by year. Main weeds are *Sinapis arvensis*, *Veronica* spp. *Cirsium arvense*, *Stellaria media*, *Avena* spp, *Lolium* spp., and *Phalaris* spp. in wheat as well as total flora of weedy plants, mainly winter annuals. Orobanche Cumana, a parasitic plant and *Chenopodium* spp., *Amaranthus* spp., *Xanthium* spp., *Convolvulus arvensis*, *Cirsium arvense*, *Polygonum aviculare*, and volunteer wheat in sunflowers as well as total flora of weedy plants, mainly summer annuals and some perennials. Currently ALS and ACCase herbicides in wheat, and imazamox and tribenuron in sunflowers are the most common. Broomrape control has two different strategies: broomrape resistant sunflowers and IMI resistant sunflowers. Also problems with *Xanthium*, *Convolvulus* and *Cirsium* are solved via IMI-sunflowers. Imidazolines followed by sulfonyleureas in the next crop is main driver of herbicide resistance and carry over problems. Using FOB or DIM herbicides or acetonifin to control broadleaves can postpone the problems. Dinitroaniline or phenoxy herbicides should not be forgotten in herbicide rotations. Although some methods cannot seem applicable but growing problems require to introduce new techniques even less feasible. Among these methods, it can be said cover crops, conservation tillage (even with rotating in few year normal tillage methods), alleopathic relations and crops in rotation, a system to help the farmers to be able to decide long term instead of yearly.

Keywords: Herbicide resistance, Broomrape, Herbicide carry over, IMI-sunflower, Broomrape resistant sunflower, Herbicide rotation

**(17994) RAW CAMEL MILK PRODUCTION IN FOUR ALGERIANS
SOUTHEASTERN ARID PROVINCES: COMPOSITION AND PHYSICO-
CHEMICAL QUALITY, CONSTRAINTS RELATED TO COLLECTION, STORAGE
AND TRANSPORT**

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Camel the most adapted species to arid's areas. Camel's milk, has nutritional, therapeutic properties, rich in salts, enzymes, inhibiting microbial activity, hence it's long shelf life and low ability coagulation. In Algeria, desert covers more than 85% of the total area. Dromedary is the only species able to valorize this desert ecosystem. Camel's population is about 315000 heads, distributed over seventeen provinces, with 75% in eight desert provinces and 25% in nine steppe provinces. Camel breeding, practiced in extensive, (Nomadic) dependent on climatic conditions, low milk productivity, because of the lack of collection system, intended more to camel's meat production. Although this milk, highly required in urban areas and Northern provinces, for therapeutic use. However, the collection and transport for long-distance alters it's physico-chemical quality. The study aimed to explore ten physicochemical parameters (pH, titratable acidity, viscosity, density, conductivity, total azote, protein, fat, whey and dry meter) during milking collection, transport and storage, for a total of forty-one raw camel milk sample's, collected in four provinces in the South-eastern of Algeria: M'sila, Biskara, Ouargla and El Oued. After statistical treatment by ANOVA program, results showed the heterogeneity and instability of physico-chemical tests explored. Freezing seems the ideal method for the collection, storage, preservation and transportation of raw camel milk which is accessible only in arid areas

Keywords: Camel milk, Stability, Physico chemical, Analysis, ANOVA

(17996) EVALUATION OF PROLINE ACID APPLICATION ON BIOCHEMICAL PARAMETERS AND ANTIOXIDANT ENZYME ACTIVITIES ON BROAD BEAN SEEDLINGS GROWN UNDER CADIMIUM STRESS

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Metal stress is a serious threat to the agricultural production. Therefore, the present experiment was aimed to study the effect of proline on the performance of faba bean under cadmium stress condition. The effect of exogenous application of proline with different concentrations (0, 25 or 50mg/l) on faba bean (*Vicia faba* L.) plant grown at cadmium levels (0 or 150µM/l.). Under Metal stress condition, all parameters [plant height and root length, root fresh weight, shoot fresh weight, root dry weight, shoot dry weight, total soluble carbohydrates (TSC), chlorophyll (Chl) *a* and *b*, and activity of peroxidase (POD), and catalase (CAT)] of faba beans were strongly depressed, except malondialdehyde (MDA) contents. From these results, proline traitement alleviated the adverse effects of metal stress through increased the photosynthetic pigments, polysaccharides, total carbohydrates, plant height, leaves number, fresh and dry weights of shoot, and seed yield as well as, total soluble sugars, total free amino acids and proline, compared with those of the corresponding cadmium levels, while decreased lipid peroxidation product as malondialdehyde (MDA) and the oxidative enzymes (polyphenol oxidase and peroxidase enzymes)..These results indicate that application of proline was effective, and helped the plant to restore the altered physiological process induced by cadmium stress.

Keywords: Growth, Metal stress, Cadimium chloride, *Vicia faba*, Proline

(18070) EPIDEMIOLOGY OF BAYOUD DISEASE ON DATE PALM (*PHOENIX DACTYLIFERA* L.) IN ALGERIA

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Date palm (*Phoenix dactylifera* L.) is one of the most important fruit trees growing in Algeria, Arabian world and some neighboring countries represents a good crop economy sources for many farmers. Date palm diseases are among the major factors that affecting the products. The bayoud disease, is a vascular disease on date palm caused by soil fungal pathogen named *Fusarium oxysporum* f. sp. *albedinis*. This tracheomycosis destroyed in this recent 50 years, more than ten million date palms in Morocco and three million in Algeria. All cultural, chemical and biological methods to control this epidemics, was inefficient. In this work, we studied the factors of progression and extension of bayoud disease with solution proposal to limit this disease for not coming to the east healthy groves, where the susceptible cultivar deglet-Nour represents 80 % of Eastern Algerian oases. The results of this study showed that the south west and central oases of Algeria are contaminated by bayoud disease, and the limits of this disease in Mizab region are Zelfana and Guerrara from east and Meniaa from south, when the healthy oases in Oued righ and Ziban have a risk to be contaminated by this disease. Then, it is necessary to protect these date groves by different prophylactic methods of control.

Keywords: Date palm, Bayoud disease, *Fusarium oxysporum* f. sp. *albedinis*, Progression, Date groves

(18073) SOURCES OF RESISTANCE OF 13 CHICKPEA GERMPLASM AGAINST RACES 1 AND 2 OF FUSARIUM WILT OF CHICKPEA

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Chickpea wilt caused by *Fusarium oxysporum* f.sp. *ciceri* is recently, the first destructive and widely distributed disease in Algeria and middle east. The present study has the objective to screen 13 chickpea germplasm for their resistance to two races (1 of yellowing and 2 of wilting), of fusarium wilt. Using two methods of screening, cut-twig and in the field, we inoculated the chickpea seedlings in the north west region of Algeria. The results of screening showed the sensitivity of two genotypes (ILC 482 and ILC 1929) to the two races 1 and 2, in both two tests. We found just one resistant genotype F 4107 and all other 10 genotypes showed their sensitivity to these two race with difference of sensitivity degrees. The similarity of results was observed in the two tests, cut-twig and field screening and we confirmed the presence of two races of fusarium wilt in Algeria.

Keywords: Chickpea, Fusarium wilt, Races, Resistance, Yellowing, Wilting

(18124) CONTRIBUTION TO THE STUDY OF SOME BIOLOGICAL CHARACTERISTICS OF SOIL AND RHIZOSPHERE FABA BEAN (*VICIA FABA* L. *VR EQUINA* AND *MINOR*)

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Studies on microorganisms have in recent years to develop the concept of "organic fertilizers" based primarily on properties known as "beneficial" in some organizations. Apart from these nitrogen-fixing bacteria widely used for making organic fertilizers are capable of some dissolved minerals in rhizosphere. These bacteria find a land application in agriculture in structuring the soil rhizosphere species *Vicia faba* beans or kidney beans (*v v equina* and the *minor*), presents an excellent host rotation enriches the soil with nitrogen by root excretion of nitrogenous products by detachments nodule or remaining roots. Before culturing the eleven floors of this rough textures, and heavy, after chemical and physical fronts *v f* crop *Vicia faba equina* and *minor* crops were put in the two species separately and has made the same physico-chemical, it was noted that the rate of carbon compared to the variety *equina* by against the latter seems more perfermente viewpoint nitrogen fixation and nitrogen falling on almost all soils after cultivation. The resulting C / N ratios vary, but the rate of phosphorus are significant and increase in both types of cultures nodulation tests were positive with a slight difference noted in favor of the *minor* variety, it rots due to be rhizoidal diversity of flora which is at the origin of nodulation and that would be specific to this variety has rather to the overall charge of this flora latter finding at least partly explain the difference in nitrogen levels between the two types cultures, which could be related to deficiencies flora associated symbiotic. The decrease was less pronounced in the variety *minor*

Keywords: Rhizobia, Symbiosis, Nodule, Fixing, *V equine*, *V minor*

(18355) EFFECT OF EXOGENOUS APPLICATION OF PHYTOHORMONES ON DURUM WHEAT (*TRITICUM DURUM* DESF) GROWN IN SALINE CONDITIONS.

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Excessive salinity affects the rhizosphere and limits the distribution of plants in their natural habitat. Durum wheat is an important cereal in terms of human consumption in many countries of the world. It is grown mainly in the countries of the Mediterranean basin with arid and semi-arid climate. In these areas, soil and irrigation water salinity is one of the limiting factors in plant productivity and agricultural yield. This work aims to study the effect of soil salinity using different levels of NaCl on some morphological and physiological properties of durum wheat (*Triticum durum* Desf) and its correction by spraying the stressed plants with four types of plant hormones in the Booting Stage. The results obtained allowed us to observe the negative impact of saline stress on the leaf area, pigments content at higher salinity levels. On the other hand, the proline content has excessively increased with the rise of osmotic stress levels, particularly at higher levels of salinity (15000 mg/l NaCl). Auxin and Cytokinin, are known to be involved in the regulation of plant responses to salinity stress and counteract the adverse effect of stress conditions. Exogenous spraying of Indole-3-Acetic acid (IAA) Indole Biotirique Acid (IBA), (Kinetin (Kn)) and Benzyl-Amino-purine (BAP) indicated that an increase in the leaf area, pigments content are accompanied with a decrease in the proline content.

Keywords: Auxin, Foliar application, Salt stress, Growth regulateurs, *Triticum durum* Desf.

(18423) THE CORRELATION BETWEEN INTERNAL AND EXTERNAL QUALITIES OF COMMON PHEASANT EGGS (*PHASIANUS COLCHICUS* L.)

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The objective of this study was to estimate as a correlations equation existing between egg fresh weight and some egg internal and external quality traits. A total of 50 eggs were collected in different times in the same laying period. egg weight(g), egg length(mm), egg width(mm), shape index, shell weight, yolk weight and albumen weight were measured. The overall mean value obtained for the different variables are respectively (28.63 ± 2.59) g, (43.89 ± 1.78) mm, (34.36 ± 1.12) mm, $(78.00 \pm 3)\%$, (3.58 ± 0.45) g, (9.97 ± 0.81) g, (13.89 ± 1.7) g. Concerning studies regression, it was considered only the regression between the egg weight and the different parameters studied. The ANOVA procedure was applied to estimate correlations for the external traits. The weights of the eggs being observed before incubation and egg length, egg width, yolk weight and albumen weight linearly correlated with a positive correlation coefficient of order 0.73, 0.93, 0.67 and 0.76 respectively. According to the results obtained, the study on the regression applied to the different biometric parameters, shows the existence of positive, good and average linear correlation between the weight and the other parameters.

Keywords: Pheasant, Egg, Morphometry of eggs, Hatching, Analysis of variance, Regression

(18470) TOXIC ACTIVITY OF THE ENTOMOPATHOGENIC FUNGUS *M. ANISOPLIAE* VAR *ACRIDIUM* “GREEN MUSCLE” ON THE CUTICLE OF THE DESERT LOCUST *SCHISTOCERCA GREGARIA* (FORSKÅL, 1775).

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Locust is causing significant losses in agricultural production in the countries concerned by the invasion. Up to the present control strategy has consisted only of the chemical treatment; they have proven harmful to the environment. For this, a new control method discovered which is the biological control based mostly by using microorganism. In this way we've made our contribution by using of an entomopathogenic fungus *M. anosopliae* var *acridium* "Green Muscle" on part of the larval cuticle of fifth instar locust *Schistocerca gregaria* (Forskål, 1775). Preliminary studies of the pathogenicity of *Metarhizium anosopliae* var *acridium* biocontrol agent, was tested in the laboratory on L5 *S. gregaria*, however we inoculated treatment on the cuticle of L5 of entomopathogenic solution with DL50 = 3.25 x10⁷ sp./ ml (median lethal dose estimated at earlier). The inoculum is sprayed directly on the L5 of *S. gregaria*. In the same time witnesses were sprayed with distilled water; 5 days after treatment individuals are sacrificed. After dissection of the cuticle we have done histological sections according to this technique of Martoja Martoja-Pierson (1967). Microscopic observation revealed alterations in the cuticle and destruction of the epithelium, indeed the fungus induced a disorganization of the architecture of the cuticle. Locust is causing significant losses in agricultural production in the countries concerned by the invasion. Up to the present control strategy has consisted only of the chemical treatment; they have proven harmful to the environment. For this, a new control method discovered which is the biological control based mostly by using microorganism. In this way we've made our contribution by using of an entomopathogenic fungus *M. anosopliae* var *acridium* "Green Muscle" on part of the larval cuticle of fifth instar locust *Schistocerca gregaria* (Forskål, 1775). Preliminary studies of the pathogenicity of *Metarhizium anosopliae* var *acridium* biocontrol agent, was tested in the laboratory on L5 *S. gregaria*, however we inoculated treatment on the cuticle of L5 of entomopathogenic solution with DL50 = 3.25 x10⁷ sp./ ml (median lethal dose estimated at earlier). The inoculum is sprayed directly on the L5 of *S. gregaria*. In the same time witnesses were sprayed with distilled water; 5 days after treatment individuals are sacrificed. After dissection of the cuticle we have done histological sections according to this technique of Martoja Martoja-Pierson (1967). Microscopic observation revealed alterations in the cuticle and destruction of the epithelium, indeed the fungus induced a disorganization of the architecture of the cuticle.

Keywords: Biological control, Green Muscle, Toxicity, Desert locust, Cuticle

(18593) PRACTICAL USE OF *PUCCINIA TRITICINA* ERIKS. ISOLATES FROM THE STATE COLLECTION OF PHYTOPATHOGENIC MICROORGANISMS OF THE ALL-RUSSIAN RESEARCH INSTITUTE OF PHYTOPATHOLOGY (ARRIP)

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The collection of isolates of leaf rust agent *P. triticina* exists in ARRIP more 50 years. Now all isolates of leaf rust agent are included in the State Collection of Phytopathogenic Microorganisms created in ARRIP in 1996. Research associates of institute study the genetic structure of leaf rust populations, select monopustule isolates, determine the virulence genes and transfer material to the State Collection. The main requirements for transfer of isolates to the Collection are viability, the known origin, the studied virulence and genetic stability. Currently the Collection contains more 1500 isolates of *P. triticina* from all wheat-growing areas in Russia. The genetic potential of the leaf rust collection is very various; there are the isolates with different spectrum of virulence genes including ones with unique infrequent virulence genes. In the State collection there is widely used the method of low-temperature storage of live biological objects, enabling the restoration of their biological functions after defrosting. Every year the Collection is replenished by the new leaf rust isolates. The Catalog of strains and Methodical recommendations for storage are placed on the institute website. According to requests of the external organizations and ARRIP laboratories the Collection takes from storage, multiplies and transfers to consumers the required isolates. Collection isolates are used to study the strategies for the breeding of rust resistant wheat cultivars, specificity of pathogen populations and the racial composition in different areas of wheat cultivation, to determine the effective resistance genes of wheat to regional populations of *P. triticina* and for creation of simulated infectious background in experimental rust nurseries.

Keywords: State Collection, *Puccinia triticina*, Isolates, Virulence, Wheat, Resistant cultivars

(18738) STUDY OF THE INTERNAL AND EXTERNAL PHYSICAL CHARACTERISTICS OF JAPANESE QUAIL *COTURNIX JAPONICA* EGGS ACCORDING OF BREEDERS AGE

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Phasianids are probably the most useful bird family for humans. It is also the most widespread in the world, with many species raised for food purposes such as chickens. Among small game, the Japanese quail is a species that is increasingly appreciated by consumers for its meat and eggs. Indeed, the work carried out focuses on the internal and external physical characteristics of eggs according to the age of the breeders. Measurements are taken, the weights of the egg, of the yolk and the shell. The large and small diameters are also measured. These with the weight of the egg, allowed us to calculate the density, volume, shape index and shell index. The 429 eggs analyzed belong to breeders aged 13 to 27 weeks. The results showed an average weight of 11.86 ± 1.21 g. For the weight of yolk and egg white, their respective averages are 3.78 ± 0.38 g and 6.82 ± 1.23 g. The weights of the latter and which represent the internal physical characteristics tend to increase with the age of the breeders. Based on measurements, the calculated shape index does not show any significant difference depending on the age of the breeders, its average is 1.37 ± 0.03 . This calculated index presents approximate values for all the eggs studied with values close to the average. As a result, the recorded hatching rate is high with percentages ranging from 77 to 90%. These first results allowed us to deduce that the age of the spawners does not influence the physical characteristics of the eggs nevertheless other biometric parameters will be exploited to be able to confirm.

Keywords: Quail japonese, Eggs, Physical characteristics, Breeders age

(18773) EFFECT OF SOWING DATE AND HARVEST STAGE ON FORAGE YIELD AND NUTRITIONAL VALUE OF WINTER AND SPRING TRITICALE GENOTYPES (G41, TCL821)

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A field trial was carried out in a rainfed experimental station of INRAT (National Institute of Agricultural Research of Tunisia) and aimed to evaluate forage yield and nutritional value of a winter (G41) and spring triticale genotype (Tcl821) issued from three harvest stages (first detectable node stage or Z31, late boot stage or Z50 and or soft dough stage, or Z85). The results showed that at Z31 stage, winter triticale presented a high forage potential of 2.8 T DM ha⁻¹ with nutritional value (CP: 25%, ME: 25 MJ kg⁻¹ DM, DOM: 58%). Harvesting triticale at stage Z50 provide, depending on genotype, a compromise between a forage yields and quality. At Z31 and Z50 stage, G41 showed its superiority to Tcl821 in terms of CP and ME yield. Whereas, Tcl821 present CP and ME yield at Z85 stage (1320 g/hand 146208MJ/ha) even if at this stage, the two genotypes tcl821 G41 produced significantly the same forage yields and the nutritional value. There was evident influence of harvesting stage on CP and ME yield. Regardless the harvesting stage, Tcl821 and G41 presented the same nutritive value.

Keywords: Triticale, Sowing date, Harvest stage, Forage yield, Forage quality

(18787) PHYSIOLOGICAL AND ANTIOXIDANT RESPONSES IN CAPE GOOSEBERRY SEEDLINGS (*PHYSALIS PERUVIANA* L.) TO PHOSPHORUS DEFICIENCY

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The present study aimed to better understand the physiological effects of phosphorus (P) deficiency and the antioxidant response in Cape gooseberry seedlings (*Physalis peruviana* L.). Seedlings were grown in soil with 5 P levels: 0 (P0), 6 (P6), 12 (P12), 25 (P25) and 50 (P50) mg of P₂O₅/kg. Growth, gas exchange, chlorophyll content, membrane integrity and the antioxidant response in Cape gooseberry were evaluated. In the P0, P6, P12 treatments, the seedlings showed a reduction in total biomass, the number of leaves, leaf area, root length density, shoot/root ratio, photosynthesis, transpiration, stomatal conductance, and chlorophyll content, as well as an increase in electrolyte leakage, the proline content and the activity of catalase and peroxidase compared with the P50 treatment. The P25 treatment was not different with respect to P50 in terms of photosynthesis, chlorophyll content and total biomass after 30 days of treatment, the number of leaves and root length density at 90 days of treatment, and in electrolyte leakage and peroxidase activity at 60 and 90 days of treatment. Doses less than 25 mg of P₂O₅/kg cause P deficiency in Cape gooseberry seedlings, inducing antioxidant and protection response mechanisms to deal with stress.

Keywords: Catalase, Electrolyte leakage, Mineral nutrition, Proline, Root length density

(18788) EFFECT OF *FUNNELIFORMIS MOSSEAE* ON PHYSIOLOGICAL AND ANTIOXIDANT RESPONSE OF *PHYSALIS PERUVIANA* UNDER PHOSPHORUS STRESS

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The purpose of this research was to study the mechanisms underlying phosphorus stress in cape gooseberry (*Physalis peruviana* L.) inoculated with arbuscular mycorrhizal fungi (AMF). Gooseberry seedlings were cultivated in inert substrate with nutrient solutions, using different levels of phosphorus 6, 12, 25 and 50 mg P₂O₅ / kg⁻¹ for non-inoculated plants (P6, P12, P25 and P50) and AMF inoculated (P12+AM, P25+AM and P50+AM). The results indicate a significant reduction in total dry weight (TDW), root and shoot for treatments P6, P12 and P25, compared to control-P50. The reduction in growth was 81.8% (P6), 49.5% (P12) and 24.3% (P25), at 50 days. These treatments showed decreases in leaf number (LN), leaf area (LA) and root volume (RLD), which can be attributed to the reduction of photosynthesis rates. The previous results contrast with the TDW increase of AMF inoculated plants, of 10.3% (P25+AM) and 19.1% (P50+AM), with higher rates of photosynthesis, LA, LN and RLD, possibly due to the increase in Carbon demand for the symbiosis AMF. The increase in photosynthesis of non-mycorrhizal treatments was 21% in P12+AM, 45% in P25+AM and 47% in P50+AM in relation to non-mycorrhizal. Mycorrhizal treatments also showed an increase in the activity of antioxidant enzymes, catalase (CAT) and peroxidase (POD) and proline in leaves at 30 day along with a reduction in the loss of electrolytes, suggesting a greater stability of the membranes, probably due to the increase in antioxidant defense mechanisms. In conclusion, the symbiotic association improved the parameters associated with biomass production in P25+AM (3.8%) and P50+AM (19.1%) in relation to the P50-control and promoted the increase in Phosphorus stress defense with production of antioxidants and proline.

Keywords: *Arbuscular mycorrhizae*, Cape gooseberry, Biomass, Photosynthesis, Antioxidants

(18790) *IN VITRO* ANTAGONISM OF RHIZOBACTERIA FROM SEMI-ARID SOILS AGAINST *FUSARIUM OXYSPORUM* F. SP. *ALBEDINIS* THE CAUSAL AGENT OF BAYOUD

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Fusarium wilt of date palm or “Bayoud” is a permanent threat to many phycultural countries in North Africa, including Algeria. The progressive extension of the bayoud poses ecological problems and enormous economic damage due to the importance of dates exports for the Algerian economy. This disease caused by *Fusarium oxysporum* f. sp. *albedinis* (FOA), a phytopathogenic telluric fungus, is manifested by the total decline of the date palm. Several methods are used to control this pathogen, especially by crossing and generating resistant palm varieties. This resistance is linked either to the plant itself or to microbiological interactions at ground level, and this is where the idea of biocontrol was born. The present work was devoted to the *in vitro* study of the antagonistic activity of rhizobacteria isolated from potato and wheat rhizospheres from a semi-arid region “Sétif” against FOA; first by direct confrontation and secondly by evaluation of the anti-fungal capacity of bacterial filtrates. Of the fiftieth isolates tested (isolated ones and two referenced strains: Ps. 30-84 and CHA0), four isolates inhibited it with a rate higher than 50% during the confrontation test. While using bacterial filtrates shows variability; the disc diffusion test shows inhibition zones ranked from 7-8mm (for eleven isolates) to 11mm(three isolates), but only two isolates one identified as *Bacillus* sp. and another as *Pseudomonas* sp. inhibited 100% spore germination. The results obtained are very promising when controlling the pathogen especially in the soil of crops associated with palm.

Keywords: Antagonism, Bayoud, Biological control, Rhizobacteria

(18791) BACTERIOCINS AS ALTERNATIVE ANTIBACTERIAL SUBSTANCES

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Bacteriocins are generally associated with bacterial competitiveness in the environment, this association represents a relatively unexplored topic and in our knowledge our study is one of rare ones done in screening bacteriocinogenic activity of plant-associated *Pseudomonas* spp. The aim of this work is to investigate bactericidal compounds production by rhizosphere bacterial strains which have antifungal activity against telluric phytopathogenic fungi. LB broth was used to evaluate the production of bacteriocins. The sensitive bacteria were cultivated on TSA medium before spotted with producers' supernatants. These metabolites are produced constrictively or in reduced amount. The tested strains such as XI29, XI30, XI48 which were identified as gram-ve bacilli produce these metabolites constitutively. The strain XI30 and the referenced ones CHA0 and S2 showed a large activity specter. In fact the supernatant of XI30 is active against *Listeria*, *Bacillus* sand *Salmonella*, while the one of XI48 has a narrow spectrum. In the other hand, the tested strains XI44, XI45, XI47 identified as gram+ve bacilli produce bactericide substances in the culture medium. The majority of the strains tested have a large spectrum of action, except the strains XI37' XI45 and XI47 which have a narrow spectrum.

Keywords: Antagonist activity, Bacteriocin, Rhizospheric isolates

(18826) DETERMINATION OF NUCLEAR DNA CONTENT OF PHASEOLUS VULGARIS L ACCESSIONS COLLECTED FROM TURKEY (THRACE) AND DIFFERENT PART OF THE WORLD

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Bean (*Phaseolus vulgaris* L.), which is an essential food for human beings, is widely cultivated in many countries and is an economically valuable species. The objective of this study was to determine nuclear DNA contents of 29 *P. vulgaris* accessions from domestic (Thrace) and abroad sources for use in breeding programs and then to associate them with the number of chromosome numbers of accessions. Nuclear DNA contents of five different plants for each of the 29 *P. vulgaris* accessions were determined using flow cytometry. Based on the results of flow cytometric analysis, nuclear DNA contents of the accessions varied between 1.31 -1.44 pg/ 2C. Nuclear DNA content differences observed among *P. vulgaris* accessions were statistically significant ($P<0.01$) and the Duncan test revealed that the accessions divided into a large number of groups. However, all accessions chromosome numbers are observed to be $2n=22$ after the counting of chromosome numbers in accessions having different nucleus DNA components. As a result of the study, variations have been observed in terms of nucleus DNA components in *P. vulgaris* genetic resource collection, and variations was statistically significant.

Keywords: *P. vulgaris*, Flow cytometry, Nuclear DNA content, Genetic variations

**(18838) A COMPARATIVE STUDY OF THE BIOCHEMICAL COMPOUNDS
FOUND IN THREE SPECIES OF VIGNA (VIGNA ANGULARIS L., VIGNA MUNGO
L. AND VIGNA RADIATA L.) UNDER SALT STRESS CONDITIONS**

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Soil salinity is one of the main sources of abiotic stress, limiting the growth of cultivated plants. The salinisation of soils and irrigation water recorded in arid and semi-arid ecosystems, particularly in the Mediterranean basin, is one of the factors that limits plants productivity and crop yield. Almost 10% of land is affected by salt, and 10 million hectares of farmland are affected by drought. As a result, plants adapt, reducing their water loss in order to maintain their vital functions. Salinity leads to water deficiency in plants which is caused by osmotic stress, and is sometimes combined, with biochemical disturbances induced by the influx of sodium ions. Identifying the varieties and genotypes that are salt-tolerant and capable of minimising the depressive effects of salinity on yield would almost certainly make it possible to improve crop yield in areas affected by salinity. We focused on the Vigna species and explored the effect of salinity on its biochemical behaviour.

Keywords: NaCl, Bean, Polyphenol, Flavonoid

(18839) GIBBERELIC ACID, SALICYLIC ACID AND KINETIN EFFECTS ON SEED GERMINATION AND SEEDLINGS GROWTH OF OKRA (*ABELMOSCHUS ESCULENTUS* L.) UNDER SALT STRESS CONDITION.

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Seedlings establishment at early growth stages of crop plants is severely affected by soil salinity. Therefore, high germination rate and vigorous early growth under salty soils is preferred. Seed priming is a way to *increase salt* tolerance of plants. This present study aims to minimize the harmful effects of NaCl salinity (50 and 100mM) on precocity, final germination percentage (GP %), The mean *germination* time (TMG) and seedlings growth (fresh and dry weight of hypocotyls and radicles as well as seedling length) of Okra, through presoaking seeds in selected phytohormones (Gibberellic acid, Salicylic acid, Kinetin) at 100 µM, 200 µM and 100 µM respectively. Results show that NaCl reduces significantly the precocity of germination without influencing its final rate; contrarily, it has a negative effect on hypocotyl and radicle growth, fresh and dry weight of seedlings. Priming seeds with phytohormones has a significant effect on seed germination as well as seedling growth under both normal and NaCl saline conditions compared to control, Kinetin stimulate germination from the first day of sowing (after 24 h) with 100% of germinated seeds under 50mM NaCl and 80% under 100mM NaCl, followed by gibberellic and salicylic acid treatments. Application of GA enhanced radicle and hypocotyl length, fresh and dry weight of hypocotyls in all salinity levels compared to untreated seeds. However, priming seeds with SA improve fresh and Dry weight of radicles of seedlings as compared to non-treatment of SA under non salinity and salinity conditions.

Keywords: Okra, Gibberellic acid, Salicylic acid, Kinetin, Germination, Seedling, Radicle, Hypocotyl, Salt stress.

(18865) OXIDATIVE STRESS IN OKRA (*ABELMOSCHUS ESCULENTUS* L.) LEADS TO BENTONISED SUBSTRATE UNDER SALINE STRESS.

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Salinization of soils is an important process of soil degradation. This is a growing phenomenon. This phenomenon is considered to be an abiotic factor limiting plant growth and productivity, degrading and polluting soils grown in arid and semi-arid areas. The study was conducted on young plants of okra (*Abelmoschus esculentus*) under salt stress and bentonisé substrate. The seedlings were made in plastic jars of 1kg with a diameter of 15cm. The gravel was deposited under the soil substrate of each pot to ensure proper drainage. The sandy substrate was subjected to a 7% bentonite dose. The 7-day-old plant was stressed at doses of salts (NaCl) of 0, 100, and 300 Mm. The objective of our work is to study oxidative stress, coupled with abiotic constraints of salinity. The behaviour of okra (*Abelmoschus esculentus* L.) in the presence of increasing doses of NaCl showed the formation of hydrogen peroxide accompanied by the intense biosynthesis of polyphenols qualified as antioxidants. In addition, the contribution of bentonite to the substrate of culture makes quantitative changes.

Keywords: Bentonite, Salinity, *Abelmoschus esculentus*, MDA, H₂O₂, Polyphenols

(18867) THE COMBINED EFFECT OF SALT STRESS, KINETIN AND SALICYLIC ACID ON THE GERMINATION OF OKRA SEEDS

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Abelmoschus esculentus L, lady's fingers or okra rich vegetable effective for interstitial tubular renal diseases, it improves kidney function and it reduces proteinuria and strengthens immunity. Okra is a non traditional crop in my town Oran wich is a coastal town in the west of Algeria, with a lot of area affected by salinity. Nowadays the problems related to salinity are increasing, that's why this experiment study the impact of growth regulators on okra germination under salt stress. Two types of growth-regulators was applied (Kinetin 500 µl, and salycilic acid 100 µl) and tow different concentration of salt solution (100 and 200 meq.L-1 of NaCl). The hormonal combination has a positive effect on seeds germination on the length of the roots, and the fresh and dry weight of the seedlings, on the chlorophyll, the proline and the sugar concentration. Witness does not germinate at 100 and 200 meq.L-1 of NaCl.

Keywords: NaCl, *Abelmoschus esculentus* L, Germination, Salycilic acid, Kinetin.

(18869) DETERMINATION OF THE REACTIONS OF SOME TRITICALE CULTIVARS TO STEM RUST

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Triticale (*X Triticosecale* Witt.), important cereal in Central Anatolian plato of Turkey. Stem rust, caused by *Puccinia graminis* f. sp. *tritici*, is one of the triticale limiting yield and quality worldwide and Turkey. The purpose of this study is to determine of adult plant reactions of ten cultivars (Presto, Karma 2000, Tatlıcak 97, Melez-2001, MİKHAM-2002, Alperbey, Ümranhanım, Egeyıldızı, Ayşehanım, Mehmetbey) to isolates of İkizce (Ankara/Turkey) and Seydiler (Kastamonu/Turkey) locations. All materials were sown a single row in row spacing 30-33 cm. of 1 m. and 2 replications in İkizce and Seydiler locations on October, 2014. Stem rust urediniospores suspensions in mineral oil were inoculated to plants at different times in İkizce and materials were also evaluated under natural epidemic condition at Seydiler. Stem rust development on each entry was scored on the modified Cobb scale in June-July 2015. The susceptible control check was 80-100 S disease severity. ≤ 20 Coefficients of Infection were considered to be resistant. As a result, all cultivars were resistant to (CI; $20 \leq$) İkizce and Seydiler locations in adult plant resistance. The results indicate that these ten cultivars might be useful sources for stem rust resistance.

Keywords: Triticale (*X Triticosecale* Witt.), Stem rust (*Puccinia graminis* f. sp. *tritici*), Reaction test

(18906) STUDY OF THE DEVELOPMENT AND ROOT ARCHITECTURE OF DATE PALM SEEDLINGS UNDER SALT STRESS

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The date palm (*Phoenix dactylifera* L.) is one of the most important crops in arid areas of North Africa. This is the most important plant both ecologically, economically and socially. Salinity is a major constraint that affects the growth and development of plants and in response to salt stress, the plant must develop adaptive mechanisms such as changes in the physiology and anatomy of plants to withstand to middle. The work aims to analyze the morpho-anatomical features of palm date tree seedlings stressed under different salts (NaCl, CaSO₄, and the two combined salts). The architecture of the root system was studied by biometric measurements: lengths and diameters of the primary roots, secondary and tertiary, counting numbers of secondary and tertiary roots at different ages of date palm seedlings. The results showed changes in the morphology of seedlings stressed, including a growth slowdown in the root system, reducing the number of secondary and tertiary roots and absence, yellowing or leaf badly formations. The histology of the root system showed no significant differences between batches of stressed seedlings and the witness.

Keywords: *Phoenix dactylifera*, Salt stress, Growth, Development, Histology

(18930) PERFORMANCE OF UPLAND RICE (*ORYZA SATIVA* L) AS AFFECTED BY WEED CONTROL TREATMENTS, POULTRY MANURE AND STAND DENSITY

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Field trials were conducted in 2011 and 2012 cropping seasons at the Institute for Agricultural Research, Samaru, Zaria in the Northern Guinea Savanna ecological zone Nigeria to evaluate performance of upland rice as affected by weed control treatments, poultry manure and stand density. The treatments consisted of three rates of five weed control treatments (0.6+0.4, 1.2 + 0.8, 1.8 + 1.2 kg a.i ha⁻¹ propanil+2,4-D and poultry manure (0, 5 and 10 t ha⁻¹) factorially combined in the mainplot while there were three stand density (2, 4 and 6 plants per hill) in the sub-plot given a total of 45 treatments. The treatments were laid out in a split-plot design with three replications. The result revealed that application of 1.2 + 0.8 kg a.i ha⁻¹ of (propanil+ 2-4 D) produced significantly larger leaf area, high leaf area index, higher crop growth rate, relative growth rate, net assimilation rate and grain yield of rice than the other rates but were comparable with the hoe weeded control. The application of 10 t ha⁻¹ of poultry manure gave significantly larger leaf area, high leaf area index, higher crop growth rate, relative growth rate, net assimilation rate and grain yield of rice than the lowest rates and the control (0 and 5 t ha⁻¹). The four plants per hill resulted in significant increase in leaf area, high leaf area index, higher crop growth rate, relative growth rate, net assimilatory rate and grain yield of rice and higher yield of rice in both locations. The study showed that application of 10 t ha⁻¹ of manure, 1.2 + 0.8 kg a.i ha⁻¹ of propanil+2, 4-D and four plants per hill gave the best yield of rice.

Keywords: Rice, Plant density herbicide, Poultry manure and grain yield

**(18999) INVESTIGATION ON THE ADAPTABILITY OF A GROUP OF TOPICAL
COMMON WINTER WHEAT CULTIVARS**

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Seventeen new Bulgarian common winter wheat cultivars developed at DAI – General Toshevo currently in mass production were investigated. The aim of the investigation was to evaluate their response to changes in the climatic conditions. The following important economic indices were assessed: productivity, protein content, test weight, bread volume, valorimeter value, sedimentation, wet gluten content, softening degree and H:D. The experiment was carried out during 2015 – 2017 according to the block design method, the size of the trial plot being 10 m². The interaction genotype x climatic conditions were studied using AMMI models. The assessed statistical parameters were at the basis of the ranking of the investigated cultivars by the economic indices regarding their adaptability to the changes in the climate. The cultivars were grouped according to the different indices through cluster analysis. The best adaptive varieties were proposed for the praxis. The estimated groups give chance the breeders to make the right choice for their future breeding program.

Keywords: Winter wheat, Adaptability, AMMI models, Cluster analysis

(19051) GREENHOUSES CULTIVATION IN ZIBAN REGION, TOWARDS A NEW SYSTEM OF PRODUCTION AND SELF-SUFFICIENCY IN MARKET GARDENING PRODUCTS (ALGERIA)

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Algeria is a country known for its agricultural vocation, because it is rich in natural resources and qualified workforce, which has knowledge in this field. But, unfortunately it is one of the countries which suffer from a food deficit, because despite all the efforts made, all the policies and all the means put in place to achieve a better production and a self-sufficient food; this sector is still very far from the goals and the desired performance. In recent years, greenhouses have proven its success especially in the town of Biskra long known for three main agricultural activities, namely phoeniculture, sheep farming and cereals, but the last thirty years this region has undergone a mutation in its production system with the appearance and development of greenhouse. This has allowed it to be a leader at the national level by supplying a large part of the Algerian market with off-season agricultural products, which largely, ensure the satisfaction of consumer needs throughout the year. Our contribution aims to define the situation of greenhouses in the region of Biskra through a technical-economic approach; then to identify the obstacles that prevent the development of this sectors; as well as to demonstrate the different strategies put in place to face the problems encountered; to maximize the production and the profit by the actors of this sector and to exploit their opportunities. For this, fieldwork was conducted through the combination of two complementary methodological approaches: a questionnaire survey of 45 farms and interviews with specialists and agricultural institutions with direct links to our research topic.

Keywords: Greenhouses cultivation, Biskra, Strategy, Obstacles, Production system, Self-sufficient

(19070) NEW ACCESSIONS IN THE COMMON WINTER WHEAT WORKING COLLECTION OF DOBRUDZHA AGRICULTURAL INSTITUTE, BULGARIA

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The storage and adequate management of the plant genetic resources is a main focus of the breeding programs. The priorities of the activities are determined by many factors, among which are the successful guarantee of sustainable agriculture, the climatic changes and the increasing consumption worldwide. The decrease of genetic variability imposes the necessity to apply new approaches with the aim to enrich it and to develop genotypes with improved morphological characteristics and adaptability. DAI is a main breeding center in Bulgaria and has a large plant gene pool of field crop species. The chamber for long-term storage contains a collection of 3435 accessions of genus *Triticum*. A working collection of Bulgarian and foreign breeding, which consists of 1745 varieties, is grown under field conditions, as well as lines with specific traits. Sixty of them were evaluated for main economic indices during three harvest seasons (2015 – 2017). The aim was: 1) characterization of the yield structure and the resistance to abiotic and biotic stress; 2) determining possibilities for hybrid combinations. The experiment was designed in plots of 10 m², in two replications. Phenological observations and biometric analysis were done on 25 plants per plot. The methodologies of UPOV and IPGRI were used. The accessions were well differentiated according to: date to heading, plant height, winter resistance, resistance to powdery mildew and brown rust, yield structure specificity and productivity. Within the period of investigation, the Bulgarian wheat varieties, which realized highest yield, were Rada, Kalina, Dragana and Kristi, and the highest yielding cultivars of European breeding were Fossil, Avenue, Moison, NS 407 and Andalou.

Keywords: Wheat, Genetic resources, Stress factors, Yield structure

**(19075) CHARACTERIZATION OF SOME MORPHOLOGICAL
CHARACTERISTICS OF RYE BREEDING MATERIALS**

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This study was carried out at the center of Konya Bahri Dağdaş International Agricultural Research Institute during the sowing season of 2013-2014. Characterization studies have been carried out on some morphological features of the Rye Breeding Project rye lines of head rows. For this study, 5 mature spikes were collected from a total of 258 hand-planted lines. Spike height was measured between 6.8 cm and 14.6 cm; The lines No. 55, 114, 158 and 65 belonging to the landraces (LR) and the line No. 8 belonging to the American Genetic Bank (AGB) have the lowest, LR lines of 107, 148, 50 and AGB lines of 35 and 47 the highest spike height was detected. The number of spike grain was measured between 11.8 and 64.8; The lines numbered 114, 105, 158, 63 belonging to the LR and the line 34-AGB are the lowest, lines 151, 148 belonging to the LR and AGB lines 49, 20, 18 are in the highest group. In terms of grain weight of spike, lines measured between 0,35 and 5,06 gr; the AGB lines with no. 34,8,35,1,6 gave the lowest grain weight and the highest grain weight determined from LR lines of 5,12,6,10 and 13. The plant height in the experimental material ranged from 60.5 to 160 cm; the lowest plant height was found at lines 161 and 182 of LR and AGB lines 8, 2 and 9 and on the otherhand LR lines 99, 154, 149, 147 and 148 given the highest degree. Those which gave the best morphological measurements from these genotypes used in rye breeding trials were used in the following year's studies, and the materials that will be evaluated according to characterizations in targeted breeding trials will be evaluated.

Keywords: Rye, Landraces, Morpholgy, Characterization

(19081) EFFECTS OF AN INSECTICIDE, CHLORPYRIFOS ON BLOOD BIOCHEMISTRY AND HISTOLOGICAL PROFILES IN WISTAR RAT

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This work aims to evaluate the effects of an insecticide, chlorpyrifos of the organophosphorus family, on some biochemical and histological parameters of some organs of mammals. The study was performed on male Wistar rats divided into 3 groups; the control and two groups treated at a rate of 0.00185 and 0.00286 mg/ml chlorpyrifos /kg per diet for 6 weeks. The results showed a significant increase in the concentration of cholesterols, triglycerides, glucose and total proteins. In addition, the histological study of the liver revealed a dilatation of the lumen of the centrilobular vein and swelling of the tissue resulting in a loss of trabecular architecture. Regarding reproduction, a reduction in the light of the seminiferous tubes and disappearance of the space between the different cells of spermatogenesis with more severe disorganization of the epithelial architecture, leading a decrease in the sperm count and degeneration of testicular tissue. To conclude, the reproductive profile was the most affected by chlorpyrifos.

Keywords: Chlorpyrifos, Biochemical parameters, Histological study, Spermatozoa, Rat

(19141) ISOLATION OF A SALT- AND METAL-RESISTANT METHYLOTROPHIC BACTERIA STRAIN ASSOCIATED WITH *RETAMA MONOSPERMA* (L.) BOISS

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A pink-pigmented facultative methylotrophic bacteria (PPFMB) was isolated from *Retama monosperma* root nodules. Due to their capacity to promote plant growth and to reduce environmental contamination, the bacteria were characterized by detailed 16S rRNA gene analysis, heavy metal tolerance, and visually determining the colonization behavior of the methylotrophic strain on and inside the roots of *Retama* through light and electron microscopy. Microscopy revealed that bacterial cells can colonize the root hair zone, the root elongation zone, and at lateral root emergence sites. However, the bacterial cells were also found in the intercellular spaces inside the root, especially in the epidermal cell layer and underneath this layer, forming sub-colonies inside the host cells. The heavy metal resistance analysis showed that this isolate was highly tolerant to salinity, Zn, and Cd up to 800 mM, 20 mM, and 16 mM respectively, and was less tolerant to Ni and Cu, with viability declining at eight mM.

Keywords: *Methylobacterium* sp.; *Retama monosperma*, Colonization, Microscopy, Heavy metal resistance, Salt stress tolerance

(19155) INFLUENCE OF FOLIAR ANTIBROADLEAVED HERBICIDES ON THE PRIMARY GERM LENGTH OF COTTON SEEDS (*GOSSYPIUM HIRSUTUM* L.)

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The trial was carried out during 2013-2015, with twelve cotton cultivars (*Gossypium hirsutum* L.). Influence of herbicides Bazagran 480 SL (bentazone), Pulsar 40 (imazamox) and Express 50 SX (tribenuron-methyl) was studied. These herbicides were used during the budding stage of cotton. The herbicide Bazagran 480 SL has the highest phytotoxicity on the primary germ length of seeds of cotton cultivars Chirpan-539 and Trakia and the lowest on cultivar Natalia. The herbicide Pulsar 40 has the highest phytotoxicity on the primary germ length of seeds of cotton cultivar Dorina and the lowest on the cultivars IPK-Veno and Viki. The herbicide Express 50 SX has the highest phytotoxicity on the primary germ length of seeds of the cotton cultivar Chirpan-539 and the lowest on the cultivars Helius and Trakia. From the viewpoint of cotton growing technology, technologically the most valuable are all cultivars, by foliar treatment with herbicide Bazagran 480 SL. Technologically the most valuable are cultivars Viki, IPK-Veno, Boyana and Natalia by foliar treatment with herbicide Pulsar 40. Technologically the most valuable are cultivars Helius, Trakia, Viki, Avangard and Nelina by foliar treatment with herbicide Express 50 SX. These variants combine high primary germ lengths and high stability of this index during the different years.

Keywords: Cotton, Herbicides, Foliar treatment, Cultivars, Primary germ length

(19156) INFLUENCE OF SOME HERBICIDES AND THEIR MIXTURES WITH GROWTH REGULATOR AND FOLIAR FERTILIZER ON THE PRIMARY GERM WEIGHT OF COTTON SEEDS (*GOSSYPIUM HIRSUTUM* L.)

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The trial was carried out during 2013-2015, with two cotton cultivars – Helius and Darmi (*Gossypium hirsutum* L.). Herbicides Goal 2 E (oxifluorfen), Linuron45 SC (linuron), Wing P (pendimethalin + dimethenamid), Merlin 750 WG (izoxaflutole), Bazagran 480 SL (bentazone) were studied. These herbicides were used alone or in combinations with the growth regulator Amalgerol premium or with the foliar fertilizer Lactofol O during the budding stage of cotton. From the viewpoint of cotton growing technology, technologically the most valuable are combinations of all herbicides with Lactofol O, which are followed by Wing-P + Amalgerol, Bazagran 480 SL + Amalgerol and sole use of herbicide Wing-P on cultivar Helius. Technologically the most valuable are herbicides Goal and Wing-P and tank mixtures Goal 2 E + Amalgerol, Wing-P + Amalgerol, Merlin 750 WG + Amalgerol, Bazagran 480 SL + Amalgerol, Wing + Lactofol O, Merlin 750 WG + Lactofol O and Bazagran + Lactofol O on cultivar Darmi. These variants combine biggest primary germ weight and high stability of this index during the different years. The alone use of the herbicides Linuron and Merlin has low assessment and should be avoided.

Keywords: Cotton, Herbicides, Foliar fertilizer, Growth regulator, Primary germ weight

(19194) QUALITATIVE ASSESSMENT OF REACTION NORM OF NEW COTTON LINES (*G. HIRSUTUM* L.)

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The qualitative side of reaction norm of eight promising cotton lines and of standard cultivar was studied. The lines were obtained by intra-specific and remote hybridization of the *G. hirsutum* L. species with some wild diploid species of the genus *Gossypium* L. The type of their dynamic regression (of their regression curve) and the structure of ecological environments in their dynamic rows were determined in order to characterize their reaction norm to the environmental conditions. The years of the study (2014-2017) appeared to be as different ecological environments and they were different in temperature security and rainfall supply. Four qualitative characters - seed cotton yield, ball weight, fiber length and fiber lint percentage were analyzed. It was found that in most cases the studied lines had reaction norm which considerably differed from that of the standard variety. The specificity of the lines reaction was less pronounced in its type (in 1/2 of cases) and stronger (in more than 7/8 of cases) in the structure of ecological environments in its dynamic row. By the type of reaction line 457 was closest to the standard cultivar, while line 449 was furthest from it. For the individual characters, the line reaction norm was manifested to varying degrees, from very high - for the ball weight, where matching with the standard was missing, to average - for the seed cotton yield, where for this character half of the lines were similar to the standard cultivar.

Keywords: Cotton, *G. hirsutum* L., Qualitative traits, Regression curves, Dynamic rows

(19195) EVALUATION OF NEW COTTON LINES IN VIEW OF SELECTION

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The selection value of 8 new promising lines of cotton and the standard variety was studied based on the significant differences and on the phenotypic stability for the most important economic traits over a four-year period 2014-2017. The years of the investigation appeared to be as different ecological environments. Four stability parameters were used: b_i (Finlay and Wilkinson, 1963), σ_i^2 , S_i^2 (Shukla, 1972) and YS_i (Kang, 1993). It was found that the studied cotton lines interacted significantly with the environmental conditions (years) by total yield, boll weight, fiber length and lint percentage. All lines had greater selection value than the standard variety - Chirpan-539 exceeding it by one or more traits. In a complex assessment as best for the studied period was line No. 550 distinguished by 9.7% higher yield than the standard, 0.4 mm longer fiber and 1.2% higher lint percentage. This line showed stability for the ball weight and fiber length, and responsiveness above the average to the environment conditions for the yield and lint percentage, but both traits were with low stability. Lines Nos. 553 and 426 showed simultaneously a high average level and high stability for yield, Nos. 489 and 535 – for ball weight, No. 553 – for fiber lint percentage and No. 489 – for fiber length, which makes them very valuable for the selection of these traits. A complex breeding value (average level and stability) for all studied traits was found for line No. 553.

Keywords: *G. hirsutum* L., Genotype-environment interaction, Phenotypic stability, Agronomic traits

(19208) DETECTION AND CHARACTERIZATION OF BACULOVIRUSES IN NATURAL POPULATIONS OF COTTON BOLLWORM, *HELICOVERPA ARMIGERA* (HUBNER) (*LEPIDOPTERA: NOCTUIDAE*)

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The cotton bollworm, *Helicoverpa armigera* (Hubner) (Lepidoptera: Noctuidae) larvae feed a wide diversity of agricultural products such as cotton, sunflower, tomato, okra, maize, tobacco, pepper, and soybean. It is a polyphagous pest that exists all over the world and also very destructive in Turkey on various agricultural products. In this study, we have detected three new baculovirus isolates from *Helicoverpa armigera* larvae (HearMNPV-O1, HearMNPV-O2 and HearSNPV-S1). They collected from cotton and sunflower fields in Osmaniye and Şanlıurfa, Turkey. These are the first records of baculovirus from *H. armigera* in Eurasia region. They were determined for the variation in their size and shape of polyhedral inclusion body and nucleocapsid, phylogenetic relations, restriction endonuclease profile and virulence against *H. armigera* larvae. Each isolate was applied with a 1×10^7 PIBs/mL⁻¹ to neonate, 3rd and 5th instars of the pest. HearMNPV-O1 isolate showed the highest insecticidal effect for all instars with 92 %, 88 %, 57 % within 14 days, respectively. Therefore, this isolate was selected for dose mortality tests. Dose-response tests were performed to five different concentrations (1×10^3 to 1×10^7 PIBs/mL⁻¹). LC50 values of HearMNPV-O1 isolate were calculated as 6×10^4 , 7×10^4 and 8×10^6 PIBs/mL⁻¹ against neonate, 3rd and 5th instars, respectively. These results indicate that HearMNPV-O1 isolate appears to be an encouraging biocontrol agent against *H. armigera* larvae.

Keywords: *Alphabaculovirus*, *Helicoverpa armigera*, Microbial control, Insect viruses, NPV

(19248) DETECTION OF CRY GENES IN LOCAL STRAINS OF *BACILLUS THURINGIENSIS BERLINER*

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Twenty-one local isolates of *Bacillus thuringiensis* were from fields of different regions of Syria were collected to detect of lepidopteran-specific *cry* genes. Characterization of isolates was based on morphological characteristics of crystals, biochemical tests as well as PCR analysis using specific primers for different *cry* genes encoding proteins active against Lepidopteran, coleopteran, dipteran insects. The results of this interaction showed eight different *cry*gene profiles were detected in this collection, some of them were found to be different from all previously published profiles a greater, the prevalence of *CryI*-type genes (*cry1* and *cry1Ac*) among isolates by 38.10%, followed by *cry3*gene at 14.29%. The least common is *cry4* gene, which was recorded in isolation. *Cry7.8*, *cry2*, *CRY2*, *CRY3* were not recorded among studied isolates. Finally, based on crystal morphology, and PCR, some strains were selected as potentially high lepidopteran- active for bioassays. Also our results showed that some of the isolates may harbor minimum a putative novel *cry* gene.

Keywords: *Cry* genes, *Bacillus thuringiensis*, PCR

(19261) INFLUENCE OF THE NITROGEN FERTILIZATION ON THE YIELD OF TRITICALE GRAIN VARIETY VIHREN

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The aim of this article is to show the analysis of yields results and some of its components found in triticale, fertilized with different nitrogen rates. In this respect, during the period 2011-2013, at the Centre for Agricultural Research in Sredets the Polish experience of the block method has been used in 4 repetitions, with size of the harvest plot of 20 m² without irrigation. The subject of the study was triticale, Vihren variety, grown at three nitrogen levels: T0 - (control) - without nitrogen fertilization; T1- N6; T2- N10 and T3- N14 on P10K5 background. Nitrogen rate has been introduced once before the active vegetation of the plants in the form of ammonium nitrate. Sowing has been carried out with seeding rate of 560 hp, after predecessor coriander. Except for the tested factor, the remaining agro-technological practices were in line with the triticale breeding technology adopted for the region. Grain yields (kg/ha) and some of its structural elements have been reported - number of stalks/m², plant height (cm), stalk length (cm), number of grains in a stalk, grain weight in a stalk (g) and the mass of 1000 grains (g). It has been found that grain yields increase from 123 to 150% when fertilizing with increasing nitrogen rates. The values of the indicators - number of stalks/m² and number of grains in a stalk increase and reach the maximum values for fertilization N14. In the conditions of Strandzha, for Vihren variety growing the most efficient fertilization is with N10.

Keywords: Strandzha, Triticale, Fertilization, Yield

(19265) EFFECTS OF DRYING METHODS ON THE QUALITY OF ESSENTIAL OIL FROM *ORIGANUM ONITES* AND *ORIGANUM VULGARE*

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The objective of this study was to evaluate drying methods (in the shade for 8,10, 12 days versus 30 °C and 40 °C for 2,4,6 days) on the yield and chemical composition of essential oils (EO) extracted from the leaves of *Origanum onites* and *Origanum vulgare* for a better quality control of aromatic and medicinal plants (AMP). The extraction of (EO) from each plant, dried under different conditions, carried out by hydro-distillation, represents yields between (1.98% and 4.87%) for *Origanum onites*, and (2.83% and 9.29%) for *Origanum vulgare*. The maximum content was obtained on the 8th and 10th day of drying in the shade for *Origanum vulgare* and *Origanum onites* respectively. According to the results obtained, for the ambient temperature in the shade and 30 °C, the increase of the drying time has a positive effect on the yield of EO. EO analyses by gas chromatography coupled with mass spectrometry (GC-MS) revealed that the majority compound was carvacrol varying between (80.15% and 95.27%) for *Origanum onites* and thymol varying between (42.33% and 61.32%) for *Origanum vulgare*. The different drying methods have no influence on the chemotype of the AMP, but they have significant effect on the yield and composition of essential oil from *Origanum vulgare* and *Origanum onites*.

Keywords: Drying, *Origanum onites*, *Origanum vulgare*, Hydrodistillation, Essential oil, GC-MS, Aromatic and Medicinal Plants

(19306) INVESTIGATION OF EFFECT OF NITROGEN FERTILIZER ON GRAIN PROPERTIES OF TRITICALE TILLER'S SPIKES

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This research was carried out considering the effects of nitrogen doses for kernel characters of first and second tillers in experimental field of Faculty of Agriculture of Eskisehir Osmangazi University in randomized split blocks design with four replications in 2006-2007 growing season. The width(cm), length(cm), thickness(cm), thousand kernel weight (g) and grain protein (%) belong to 11 hexaploid winter triticale (six triticale cultivars; 3 cultivars from Konya Bahri Dağdaş International Agricultural Research Institute(BDIARI); Tatlicak-97, Melez-2001, Mikham-2002 and 2 cultivars from Eskişehir Transitional Zone Agricultural Research Institute(TZARI); Presto, Karma-2001, and one from private sector; Samursortu and five lines) were examined with application of 4 different Nitrogen doses (0, 40, 80, 160 N kg/ha). When characterization of triticale kernel's examined, nitrogen application on kernel characters, yield and grain protein content was found significant differences. In conclusion, genotypic differences were found toward to nitrogen and triticale does not need so much nitrogen to apply.

Keywords: Kernel, Nitrogen, Spike, Thousand grain weight, Triticale

(19319) ARIA OF DISTRIBUTION OF THE PATHOGEN (*PLASMOPARA HALSTEDII*) IN THE REPUBLIC OF BULGARIA

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Downy mildew/*Plasmopara halstedii* Farl. Berlese et de Toni is observed all around the world where sunflower is produced. In Bulgaria, tracking of the pathogen is very important for sunflower production. Some scientists report the emergence of new, more aggressive kind of the pathogen or an increasing return of the "old" pathogen. According to other experts, these races show resistance to the fungicides currently used. This worrying data points to a need for annual research on the distribution range and diversity of the disease. Such surveys provide valuable information for both selection and real world application - we need zoning of varieties and hybrids. As a result of the study, three races of *Plasmopara halstedii* were isolated - 700, 731 and race 307. Their spread and attack rate are closely related to both the climatic conditions of the year and their resistance of varieties and hybrids cultivated in practice. It is particularly worrying that a "new" race was established in the DZI selection fields. After the test, it turned out to be a race 307 or a return to old races of the 300 group pathogen.

Keywords: *Plasmopara halstedii*, Races, Distribution

**(19336) EFFECT OF WATER STRESS ON LEAF GAS EXCHANGE,
CHLOROPHYLL CONTENT AND WATER STATUT OF DURUM WHEAT**

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The effect of water stress on Leaf gas exchange, chlorophyll content and water status of 10 genotypes of *Durum wheat* were investigated. The plants were grown in rhizotrons placed in a controlled chamber (Conviron E15, controlled environment Ltd., Winnipeg, Manitoba, Canada) cultivated under two water regimes (WW. well water and WS. water stress). Leaf gas exchange was measured at the end of the experiment, before harvest. Measurements were made with an open IRGA LI-COR 6400 system (LICOR Inc., Lincoln, NE, USA) fully expanded flag leaf blade for each rhizotron. Intrinsic and instantaneous WUE were estimated from gas exchange data. Agronomical water use efficiency (WUE_a) was estimated as a ratio of the aerial biomass to the cumulative plant transpiration *T_{cum}*. Chlorophyll content was measured in flag leaves using a portable leaf meter (Minolta SPAD 502 Meter). Water regime significantly affected all the gas exchange and water status parameters, except for intrinsic water use efficiency (WUE_{intrins}). Values of photosynthetic rate (*Asat*), stomatal conductance (*gs*), transpiration rate (*E*), intercellular to ambient CO₂ concentration ratio (*C_i/C_a*), leaf chlorophyll content (SPAD) and cumulative transpiration (*T_{cum}*) in the WS regime decreased by 23.8 %; 28.3 %; 40.2 %; 20.7 %; 30.9 %; 64.3 % respectively by comparison to WW regime values, while the instantaneous water use efficiency (WUE_{instint}), agronomical water use efficiency for biomass production (WUE_a) increased by 27.9 %; 25.9 % respectively, whereas WUE_{intrins} did not change.

Keywords: Durum wheat, Drought, Water stress, Gas exchange, Chlorophyll content

(19372) SPATIAL VARIATION ANALYSIS OF *CERATOCYSTIS MANGINECANS* CAUSE OF INDIAN ROSE WOOD QUICK DECLINE IN PUNJAB, PAKISTAN

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Indian Rose wood (*Dalbergia sissoo*) is a deciduous tree of family Papilionaceae. Indian rose wood is economically important for Asian subcontinent due to its timber quality. Unfortunately, Indian rose wood is facing a quick decline problem from last 20 years. Quick decline has ravaged the whole Indian rose wood plantation in Asian subcontinent. In Pakistan, 85% disease losses have been recorded. Quick decline is characterized by the presence of symptoms such as streaking in vascular tissue, reduced growth, shortened internodes, root necrosis, yellowing, loss of foliage, dieback of twigs and branches and ultimately the tree death. *Ceratocystis manginecans*, soil borne and decline causing fungus is responsible for the huge loss of Indian rose wood trees. Therefore, this study was conducted to map the disease incidence of this quick decline in different districts of Punjab Pakistan; Faisalabad (FSD), Islamabad (ISL), Sheikhpura (SKH), Sahiwal (SHL) and Rahim Yar Khan (RYK). Spatial variation analysis was conducted by GPS (Garmin) tagging, surveying and sampling of Indian rose wood trees and assessed by ARCGIS 10.2.1 and ARCVIEW 10.2.1 Software to make the semi-variograms. On the basis of spatio-variational analysis, the districts of Punjab are highly affected. Districts wise disease incidence was recorded; FSD 80%, ISL 90%, SKH 85%, SHL 70% and RYK 82%. Consistent with our hypothesis, SQD caused by *Ceratocystis manginecans* and is highly prevalent in all of the Punjab, Pakistan.

Keywords: Indian rose wood, *Ceratocystis manginecans*, Spatio-variational semivariograms

(19398) EVALUATION OF TWO-ROWED WINTER BARLEY MUTANT LINES

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The aim of this investigation was to study agronomic and morphological traits of winter two-rowed barley mutant lines in the M7 and M8 generations. Eighteen mutant lines, its parent – variety Kuber and national standard cultivars – Obzor and Emon were evaluated in Complete Block Design with four replications. The research was conducted in the 2015/2016 and 2016/2017 growing seasons in the experimental field of the Institute of Agriculture – Karnobat, Southeastern Bulgaria. The characters studied included days to heading, plant height, lodging, peduncle length, spike length, awn length, spikelet number per a spike, grain number per a spike, grain weight per a spike, 1000 grains weight, grain yield, protein content, extract content and grading (> 2.5 mm). Mutant lines significantly differ for all studied traits were found. Mutant 16/1-3, 16/2-19, 16/2-20, 16/1-16 and 16/1-21 produced a significantly greater grain yield than the parent and standard cultivars. Positive changes in grain number per a spike, grain weight per a spike, 1000 grains weight were observed.

Keywords: Barley, Mutation, Grain yield, Agronomic traits

(19444) NUTRITIONAL AND CHEMICAL MANAGEMENT OF POWDERY MILDEW (*SPHAEROTHECA FULIGINEA*) ON PUMPKIN VINES

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Pumpkin crop is greatly affected by a number of biotic and abiotic factors. Among the biotic factors *S. fuliginea* is a serious threat to the crop causing huge losses in the crop in terms of quality and quantity. Nutritional management of this disease is cost-effective and environmentally friendly, nutritional supplements are able to improve resistance against pumpkin powdery mildew infection. In order to manage the disease, experience with three treatments containing 1% potassium mono phosphate, 1% of potassium silicate and their combination (1:1) provided under the field conditions. Infection of the disease was determined by the spraying treatment prior to inoculation. The combination of mono potassium phosphate and potassium silicate yielded a maximum reduction of the disease on the control of 49%. The special effect of 1% potassium silicate and 1% potassium phosphate mono showed 43% and the reduction of the disease 39% respectively for contrast control. The effectiveness of fungicides Bravo (chlorothainal), score (Difenaconzole) and the combination of the two fungicides (Bravo + score) with standard dose were tested against *sphaerotheaca fuliginea* in field. Combination of the two fungicides (Bravo+ score) resulted in the reduction of disease control (61%). The partition effect score and bravo resulted 56% and 54% of disease reduction, respectively, in contrast to control. Recorded correlation between the length of the vine, the number of leaves and number of fruits. Environmental factors have had a great effect on the progress of powdery mildew of pumpkin. The correlation between the incidence of disease and environmental factors was determined. Culture pumpkin showed an understandable response to environmental factors. Four environmental factor showed a significant influence on the disease. In conclusion, the environmental conditions conclude peak incidence of disease at 28-32 ° C temperature and relative humidity of 70-80%, combination of the two fungicides was recorded to have potential high to prevent the powdery mildew fungus followed and the combination of the two salt solutions (potassium monophosphate or potassium silicate) in a foliar application of nutrients. Nutrients and fungicide control provide an alternative measure to inhibit *sphaerotheaca fuliginea*.

Keywords: Powdery mildew, *Sphaerotheaca fuliginea*

(19451) TRANSCRIPTOMICS OF COMMERCIAL VARIETIES OF MANGO AGAINST *CERATOCYSTIS MANGINECANS*; A CAUSE OF MANGO QUICK WILT DISEASE (MQWD)

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Ceratocystis manginecans; a cause of mango quick wilt disease (MQWD) is becoming an imminent threat to the economy of Pakistan. Pakistan is the major mango producing country and earning a good foreign exchange by exporting its mangoes to the international market annually. Unfortunately, MQWD pathogen is responsible for destroying thousands of mango trees in the mango growing areas of Pakistan and causing up to 74% yield losses. Understanding the plant-pathogen interaction of this disease is still needed to unveil to understand the susceptibility and resistance response of host in relation to the pathogen. Therefore, next generation sequencing (NGS) to reveal the whole transcriptome analysis of mango commercial cultivars (Chaunsa SB and Anwar Ratool) against *C. manginecans* was studied. One year old mango seedlings of commercial cultivars with proper irrigation and fertilizer application was established in screen-house and artificially inoculated with already purified isolate of *C. manginecans* i.e., CMTa 53. RNA from the diseased plant tissue samples was extracted. RNA sequence analysis was carried out using suitable bioinformatics software such as BLASTX and BlastGO. More than 94 million reads were identified through RNA-sequencing and assembling of these reads into 118,278 unigenes were done. Sequence similarity searches were employed to identify 59,645 unigenes, out of these unigenes 19,254 were used to form gene ontology categories and 48,434 unigenes were assigned to form orthologous groups, 31,432 were mapped to 108 KEGG pathways. The genes that are differentially expressed were detected, having 14,828, 24,063, and 19,156 DEGs respectively, after infection for 21, 42, and 73 days. The comparison analysis of the mango transcriptome shows that the resistance mechanism depends on the defense responses against pathogen attack. The transcriptional description revealed the host pathogen interaction more clearly and the prominent changes taking place at RNA level in response to disease progress. Better management strategies and key to resistance can be identified using these finding.

Keywords: *Ceratocystis manginecans*, Mango Quick Wilt Disease (MQWD), Transcriptome, Unigenes, Next Generation Sequencing (NGS)

**(19452) MOLECULAR CHARACTERIZATION OF CERATOCYSTIS FIMBRIATA;
CAUSE OF EUCALYPTUS WILT DISEASE**

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Eucalyptus is an important forest tree, facing decline problem worldwide due to the attack of fungal pathogen *Ceratocystis fimbriata*. *C. fimbriata* has devastated 40% eucalyptus plantation. The characterized symptoms of eucalyptus wilt includes discoloration, bark splitting, rapid wilting of leaves and ultimately death of tree. *C. fimbriata* also kills young seedling of eucalyptus, which may affect its natural regeneration and biodiversity. A survey was conducted in different districts: Faisalabad (FSD), Islamabad (ISL), Sahiwal (SHL), Sheikhpura (SHK), Multan (MLT) and Muzafargarh (MZG) of Punjab, Pakistan. Disease samples were collected and *C. fimbriata* isolates were isolated through carrot bating method and purified on malt extract at 25 °C temperature. Dark brown to black perithecia was produced with 102 to 152 x 101 to 147 µm in diameter. At base perithecial neck was (243 to 585 x 12 x 23 µm) and at apex was (8 to 15 µm). Morphologically ascospores were typical hyaline (hat –shaped) shaped with diameter of 3.3 to 4.6 x 3.2 x 5.6 µm. Morphological and cultural growth was similar with description of *C. fimbriata*. On pathogenicity testing, *C. fimbriata* was recovered from artificially inoculated eucalyptus plants. ITS based rDNA analysis also confirmed the fungus is *C. fimbriata* with 90% similarity in BLASTn. Furthermore, for the management strategies of disease, endobiophytes were employed for their antagonistic effects in vitro which revealed that *Nigrospora oryzae* and *Trichoderma viridae* are capable to manage this pathogen in an eco-friendly environment.

Keywords: *Ceratocystis fimbriata*, Pathogenicity, Endobiophytes, ITS, Biodiversity

(19469) VARIATION IN THE AGRONOMIC AND MORPHOLOGICAL TRAITS OF HULLESS BARLEY ACCESSIONS

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In this study, the variation of the agronomic and morphological traits of 38 six-rowed accessions of hulless barley, provided by ICARDA (International Centre for Agricultural Research in the Dry Area) was studied. Genotypes were evaluated in a randomized block design with three replications at the Institute of Agriculture – Karnobat, Southeast Bulgaria in 2015 and 2016 growing seasons. The traits studied included number of spikes per plant, days to heading, plant height, peduncle length, spike length, awn length, spikelet number per a spike, grain number per a spike, grain weight per a spike, 1000 grains weight and grain yield. The coefficient of variation was the highest in grain yield (52.71%) and lowest in days to heading (4.45%). Grain weight per a spike was strongly affected by 1000 grains weight. Grain yield of studied hulless accessions was found to be positively and significantly correlated with the number of spikes per plant.

Keywords: *Hordeum vulgare*, Coefficient of variation, Correlation, Yield

(19492) STUDY ON THE EFFECT OF PRESOWING ELECTROMAGNETIC TREATMENT ON THE LENGTHS OF ROOTS AND SPROUTS OF TRITICALE SEEDS OF THE CULTIVAR COLORIT

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On triticale seeds of the cultivar Colorit pre-sowing electromagnetic treatments with a specialized screw device were performed and the values of laboratory parameters number of roots and lengths of roots and sprouts were accounted. The aim of the study was after analyzing the resulting surfaces and lines of response of studied laboratory parameters to determine the optimum values of controllable factors of pre-sowing electromagnetic treatments of triticale seeds, the cultivar Colorit. Based on the found equations - models there were found the effects (Y_i , in percentage to the control) of the impact of pre-sowing electromagnetic treatments on the observed seed parameters. For each monitored parameter three cases were discussed. In these cases, one of the controllable factors of impact was excluded. Thus, at the interaction of the remaining two factors, the equation of the surface and lines of response of each concrete parameter was obtained. The surfaces and lines of response of all studied parameters were built. On their basis there were found the values of controllable factors that could affect beneficially on the development of laboratory parameters number and lengths of roots and lengths of sprouts, namely: voltage between the electrodes of screw processing device (factor) $U = (4.3...5.4)$ kV, exposure duration (factor) $= (28...54)$ s, and length of staying of seeds from treatment to their sowing (factor) $T \approx (14...22)$ days.

Keywords: Triticale seeds, Pre-sowing electromagnetic treatments, Surfaces and lines of response, Controllable factors

(19504) ISOLATION AND IDENTIFICATION OF ERWINIA AMYLOVORA THE CAUSATIVE AGENT OF FIRE BLIGHT IN ALGERIA

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Erwinia amylovora (Burrill) Winslow et al. is the causative agent of fire blight, a destructive bacterial disease of *Rosaceous* plants. In Algeria, fire blight was first detected in 2010 in many orchards located in the Mitidja region. This work aims to the isolation and identification of *Erwinia amylovora* causal agent of fire blight of pear orchards situated in Northern Algeria. Since the appearance of fire blight, samples from diseased trees were collected from different locations. After isolation, a total of 20 strains of *Erwinia amylovora* were obtained and characterized using biochemical techniques, hypersensitivity reaction on tobacco leaves, and serological tests using Ea Agristrip. Isolates exhibited identical morphological and biochemical profiles of *Erwinia amylovora*. Results also revealed differences in microbiological assays as levan formation and colony morphology on semi-selective media. Pathogenicity of isolated strains showed differences in necrosis and oozes formation on inoculated immature pear fruits. Algerian isolates were confirmed as *Erwinia amylovora* strains on the basis of molecular analysis by conventional PCR assays using G1-F/ G2- R primers for amplification.

Keywords: Fire blight, Pathogenicity, Biochemical, Molecular identification

(19506) GENETIC DISTANCE OF NEW BULGARIAN VARIETIES AND BREEDING LINES DURUM WHEAT CREATED IN FCI-CHIRPAN

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The durum wheat breeding program in Field crops institute (FCI) - Chirpan started in 1928. In the last ten years, a number of varieties have been created to meet modern cultural requirements. Genetic distance is of great importance for the success of the combining breeding. The study are included 13 varieties created over the last 10 years and 8 of the Institute's best advanced durum wheat breeding lines. The field experiment was conducted in experimental field of FCI-Chirpan during 2015-2017 year. A randomized block design was used by four replicates with a trial plot size of 15 m². A standard farming technology for durum wheat in the country was applied. The traits: grain yield, plant height, heading date, test weight, 1000 kernel weight, protein content, wet gluten and vitreousness were observed. The means of three-year trials for all studied traits were calculated and genetic differences between genotypes were found. The coefficients of variation (CV%) obtained for the individual traits show that the heading date and grain yields are the most variable. The correlation analysis determines significant coefficients for 9 out of 28 possible combinations of traits. The multivariate methods for determining the genetic distance between the involved genotypes in the study were used. According to the dendrogram of the cluster analysis, the distances between the four main groups formed are determined. The applied graphical PC analysis shows the interrelations between the traits and the grouping of genotypes in terms of the genetic distance between them. These methods can help for faster breeding progress using the established genetic distance as the basis for deploying the breeding program.

Keywords: Durum wheat, Genetic distance, Breeding

(19507) STUDY OF DIVERSITY AND ASSOCIATION BETWEEN AGRONOMIC AND QUALITY TRAITS IN SORTIMENT OF DURUM WHEAT GENOTYPES

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In the investigation were included 24 durum wheat genotypes – varieties and breeding lines of different origin – Bulgaria- Field Crops Institute – Chirpan, Europe, CIMMYT-Mexico and ICARDA-Syria. All genotypes were grown in field conditions in the competitive variety trials in four repetitions in harvesting years 2014/2016 and were analyzed for agronomically important traits and traits associated with grain quality. For statistical processing of the data were used variation analysis, analysis of variance and principle component analysis – PCA. Significant diversity for the studied traits based on the variation coefficients was found. In regard to the agronomic traits the greatest variation was determined for: yield, kernel weight per spike and kernel number per spike. For quality traits highest variation was recorded for: SDS-value, gluten softening, bug damage degree. Correlation between some agronomic and quality traits was found, too. Based on the PC analysis studied genotypes are divided into different groups. In the group with the highest SDS sedimentation fall 2 foreign varieties, 3 Bulgarian varieties and 3 breeding lines. The group, characterized by the highest content of protein and wet gluten - 4 foreign variety and in the group with higher yield fall 6 breeding lines.

Keywords: Durum wheat, Variability, Correlations, Multivariate methods

(19525) ANTIFUNGAL ACTIVITIES OF BACILLUS ISOLATES OBTAINED FROM RHIZOSPHERE SAMPLES

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The biological control has increasingly become more popular due to undesirable effects of synthetic chemicals on human health and environment. Plant diseases caused by fungi are widespread not only in Turkey but also all over the world. For controlling of these phytopathogen fungi, new biological control agents as an alternative approach to chemicals have been developing. In this study, rhizosphere samples were collected from agricultural areas in Giresun province and close districts. Samples were tenfold serial diluted with sterile distilled water. 100 µl of selected dilution was spread on Nutrient agar plate. Plates were incubated at 30° C for 1-5 days. *Bacillus* colonies were selected for study. Antifungal activities of *Bacillus* isolates against phytopathogen fungi (*Fusarium culmorum*, *F. graminearum*, *F. equiseti*, *F. subglutinans*, *Trichoderma* sp.) were determined by dual culture technique. Some isolates showing high antifungal activity were cultured in different liquid media. Activities of obtained culture supernatants were assessed against spore germination of some phytopathogen fungi. As a result, eight isolates against *F. culmorum*, 3 isolates against *F. graminearum* and 2 isolates against *F. equiseti* were showed activity. In addition, three isolates against *F. culmorum* and *F. equiseti*, one isolate against *F. graminearum*, *F. equiseti* and *F. subglutinans*, and one isolate against *F. culmorum* and *F. graminearum* were showed activity. Besides, supernatant of GML1A isolate was prevented the spore germination of *F. culmorum* and *F. equiseti*. Further researches will focus on the developing of some isolates as biological control agent against some phytopathogen fungi.

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Keywords: *Bacillus*, Spore, Phytopathogen fungi

(19533) INCIDENCE AND CAUSAL AGENTS OF AVOCADO DIEBACK IN SPAIN

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Avocado (*Persea americana* Mill.) production is decreasing all over the world due to branch cankers and fruit stem-end rot. Symptomatic trees exhibit red-brown cankers and dieback on branches associated with a characteristic white exudate. The first stages of infection are often caused by mechanical injuries, which allow the access of pathogens. Avocado dieback has been observed in different tropical and subtropical countries, such as South America and Europe, and many fungal agents have been identified, especially those belonging to the Botryosphaeriaceae family. An increased incidence of dieback from branches in several avocado orchards in southern Spain was observed in 2014. Surveys were conducted from May to October 2014 and 2015, sampling the affected branches to isolate the causal agents. A total of 183 fungal isolates, recovered from 44 avocado orchards, were identified, by morphological characterisation. To confirm the previous macroscopic fungal identification, DNA extractions from each isolate recovered with a similar colony morphology to Botryosphaeriaceae isolates were performed, and a sequence analysis of the internal transcribed spacer (ITS) nrDNA region using the primers ITS4 and ITS5 were performed. The sequences of each isolate were used to search for similar sequences in GenBank using BLAST (version 2.0, National Center for Biotechnology Information, United States National Institutes of Health, Bethesda, MD, USA). The fungal isolates were identified as belonging to the genera: *Neofusicoccum parvum* (64 %), *Neofusicoccum luteum* (14 %), *Colletotrichum gloeosporioides* (10 %), *Neofusicoccum australe* (9 %), *Neofusicoccum mediterraneum* (2 %) and *Lasiodiplodia theobromae* (1%). A decreasing level of virulence from 2014 isolates in artificial inoculations on avocado plants was observed in *N. parvum*, *N. luteum*, *N. mediterraneum*, *N. australe*, *C. gloeosporioides* and *L. theobromae*, there were significant differences among *N. parvum* and the rest of species of this genus, and significant differences were only observed between *N. luteum* and *C. gloeosporioides*. The geographical distribution of *N. parvum* and *N. luteum* covers different areas, and *C. gloeosporioides* and *N. australe* are located only in the areas around Benamocarra and Vélez-Málaga (southern Spain), while *N. mediterraneum* and *L. theobromae* appear only occasionally. This is the first study of avocado branch cankers in Spain which identifies the causal agents and establishes their pathogenicity groups, with *N. parvum* as the most important causal agent of avocado branch dieback in this area and which incidence on avocado orchards of southern Spain increased in 2015.

Keywords: Avocado, Aerial fungal, Botryosphaeriaceae, Etiology

(19536) OCCURRENCE AND RELATIVE PREVALENCE OF FUNGAL PATHOGENS ON DURUM WHEAT

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An assessment of six Bulgarian and six foreign varieties of durum wheat was carried out for the occurrence and development of leaf diseases caused by fungal pathogens on a natural background. Field experiments were performed at two locations (Chirpan and Sofia) for six successive growing seasons (2012 – 2017) with exception of 2015 in Chirpan. The results of this research showed some differences in symptom severity and relative proportion of leaf pathogens among varieties and years and between locations. Of the leaf spotting fungi, the causal agent of tan spot (*Pyrenophora tritici-repentis*) was the most prevalent in both prospected areas. The fungi belonging to Septoria leaf blotch complex (*Parastagonospora avenae* f. sp. *Triticea*, *Pa. nodorum* and *Zymoseptoria tritici*) were more frequently isolated from leaf samples taken in Sofia region. *Monographella nivalis* and *Cladosporium herbarum* also had contribution to the leaf spotting in both surveyed locations in some of the studied years. *Cochliobolus sativus* occurred only occasionally. Of the three rust fungi, *Puccinia striiformis* was the predominant species due to the appearance and distribution of a new race (Warrior). The first record of stripe rust was made in 2013. It was the most common disease in both localities in 2014 and 2017. The weather conditions were exceptionally favourable for the development of specific diseases in some years. In this relation the influence of some elements of the climate on the pathogen prevalence was discussed. Except the weather other factors like cultivar characteristics, inoculum level, soil type, and predecessor played a role in changing spectrum of phytopathogenic fungi. In common the level of fungal diseases in Sofia region was higher compared to Chirpan. The studied varieties differed in their susceptibility to fungal diseases.

Keywords: Leaf diseases, Septoria leaf blotch, Rust, Phytopathogenic fungi, Weather conditions

(19574) DETECTION OF BURNED AREAS BEFORE AND AFTER A FOREST FIRE FROM A SERIES OF SATELLITE IMAGES SENTINEL-2A BY THE MAXIMUM VALUE COMPOSITE METHOD IN THE WILAYA OF EL TARF (ALGERIA)

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This poster addresses the problem of mapping burned areas from high-resolution satellite images. The model relies on the processing of a series of images SENTINEL-2A, acquired before and after the fire to automatically detect burned areas in the wilaya of El Tarf. Vegetation indices, widely used in remote sensing, give an estimate of geophysical variables: vegetation cover (density, health), soil moisture content, and so on. They are obtained by a calculation generally involving two spectral bands. They thus make it possible to quickly and simply estimate environmental variables. Many methods are based on the analysis of the variation of vegetation indices between the pre-fire and post-fire images acquired by the same satellite in order to test the efficiency of the indices as a function of the spectral bands of the different satellites. The NDVI is the most used index for the mapping of burned areas. BAI and NDII have better sensitivity to discriminate burned areas than NDVI or GEMI and avoid confusion with water and shadows, NDII gives very good results for detection of burned areas with Sentinel-2A images. In fact, the reflectance decreases in the PIR (0.84-0.94 μm) and increases in the MIR (2.19-2.29 μm). The most common method for using time series of images is the Maximum Value Composite (MVC) method. For each pixel, the maximum NDVI is calculated over a period of 10 days or one month. The region whose value of NDVI is maximum over such an interval when the weather time should not be clouded. The multi-temporal method is based on change detection techniques, that is to say on the differences in the spectral characteristics of the same object located in images acquired before and after forest fires. Indeed, in this case, the satellite requires a very short revisit time and a wide spatial coverage, which implies a coarse resolution.

Keywords: Indices of vegetation, Satellite image, Burned areas, Wildfires, Maximum Value Composite

(19604) THE EFFECT OF SUPPLEMENTARY IRRIGATION ON GRAIN YIELD AND YIELD COMPONENTS OF DURUM WHEAT (*TRITICUM DURUM* DESF.) CULTIVARS UNDER STRESSED AND IRRIGATED CONDITIONS

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The present study was led on the experimental site of ITGC (Technical Institute of Field Crops) station of Setif, Algeria. The objective of this study is to evaluate the effect of irrigation on grain yield and its components under irrigated and non-irrigated conditions using a randomized complete block design for each of the environment. Ten durum wheat cultivars were evaluated under both moisture stress and non-stress field environments for three treatments (I0: no irrigation; I1: 20mm irrigation at tillering stage and I2: 40mm at heading stage). The highest grain yield (6.6 t ha⁻¹) was obtained under irrigation treatment (I2) whilst the lowest (5.8 t ha⁻¹) was observed in the (I0) treatment. Water deficit decreased grain yield at the different growth and development stage, although the highest negative effect was observed in the I0 treatment. These grain reductions were 6% and 12% under the I1 and I0 treatments respectively compared to I2. In addition, water limitation decreased the number of spikes per m² with 14.11% and 9.67 % in the I0 and I1 treatments compared to the I2.

Keywords: Durum wheat, Water stress, Irrigation, Grain yield, Yield components

(19622) MOLECULAR CHARACTERIZATION OF FUNGAL ISOLATES ASSOCIATED WITH SHISHAM QUICK DECLINE (SQD) AND ITS INTEGRATED DISEASE MANAGEMENT

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Shisham is one of the most common cultivated forest tree grown all over the world. Shisham quick decline disease has caused devastating effect on shisham. Survey of different districts of Punjab (Pindi Bhattian, Multan, Sahiwal, Rahim Yar Khan) was conducted by geo-tagging for spatio-variational disease incidence. Sampling of SQD affected trees was carried out and isolation was done with the help of carrot bait and Malt extract agar. morphological and molecular characterization of fungal isolate was carried out. Pathogenicity test was carried out on 50 healthy shisham seedlings. After disease progression, histopathological studies were carried out on both healthy and diseased stem. the efficacy of systemic fungicides was tested against fungal isolates associated with SQD *in vitro* which included carbendazim, Topsin-M and Propiconazole. More than 80% disease incidence was recorded in the surveyed districts. 37 samples were collected from which 29 isolates were extracted successfully. Morphological and molecular analysis of the fungal isolate revealed to be 99% identical to *C. manginecans* (accession no. KC261852.1). Histopathological studies revealed that diseased samples have disintegrated vascular tissues, tylosis, production of phenolic compound and hyphal proliferation. While chemical evaluation revealed that carbendazim exhibit more significant results at 700 PPM than Topsin-M and propiconazole.

Keywords: Ceratocystis, Shisham

(19636) SUSTAINABLE PLANT NUTRIENT MANAGEMENT IN AGRICULTURAL SYSTEMS

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As it is well known, despite the fast increases in the world population, agricultural areas and production inputs that will meet the needs of this increase, are in danger because of both misuse and pressure of increasing population. At this point, sustainability statement that is multidimensional and on which very intensive scientific and social discussions are held, comes in sight. Although there are numerous descriptions of sustainable agriculture, most put emphasize on an intense need to meet demands for production uncompromising the natural resources upon which agriculture depends. In the frame of sustainable agriculture, important research activities have been carried out in different activity areas of agriculture such as agronomy, plant breeding, plant nutrition, plant protection, irrigation, land management, and animal production. The most important characteristic of sustainability is its multidimensionality. It means that it does not cover only one dimension (e.g. social, economical, or environmental) in isolation, but rather all of them at the same time. Grouping the social, economical or environmental dimensions as capital in five categories, one effective way of interpretation the multiplicity of resources involved in the functioning of agriculture: Natural capital, social capital, human capital, physical capital, and financial capital. According to effect of agricultural systems on gains described above, their sustainability of can be determined. Agricultural applications and technologies that guide to a flexible growth in natural, social, human, physical, or financial capital can be approved to be sustainable. As it is well-known, management of plant nutrition can be applied to a wide range of systems, from extensive areas of rangeland and pasture used for feeding, to intensive production of annually seeded crops in open field, and even to controlled greenhouse culture of fruits, vegetables, and ornamentals. Such systems around the world are located in different soils and climates. This presentation aims to point out the common principles of plant nutrition across these diverse systems, and characterize a framework for the continuous improvement of practices involved in managing plant nutrients according to principles of the 4R Nutrient Stewardship, a scientific nutrient management approach accepted broadly. Since application of the 4R Nutrient Stewardship might have diversified positive effects on the assets mentioned above, it is accepted as an essential tool in the development of sustainable production systems by world fertilizer industry (IPNI, 2015). The 4R Nutrient Stewardship is a new innovative approach and takes economic, social, and environmental dimensions of plant nutrient management in consideration. Although the concept is so simple as applying the right source. There is an immediate connection between applying the right nutrient source, at the right rate, right timing, and right placement, application of it to the practice must be knowledge intensive and site-specific. Detailed plant nutrition management applications, are decided according to farmer's goals, available sources, plant growth system, soil conditions, weather conditions and any other factors, which might affect management decision.

Keywords: Environment, Nutrient management, Sustainability, Sustainable agriculture

**(19686) QUANTITATIVE REPRESENTATION OF DOCIOSTAURUS
MAROCCANUS ON TOBACCO**

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The locusts are historically known for wiping out fields of crops in a day. *Docioptaurus maroccanus* Thunberg (1815) is polyphagous species which is distinguished by extreme voracity, enormous fecundity and capability to migrate in swarms. In its gregarious phase, swarms of this locust have often occurred in Mariovo, Prilep. A sweep net method was used around the tobacco plots, at 10-day intervals, during June and July 2016/2017. During July-September 2016/2017, a method of survey of 100 randomly selected tobacco plants was applied at 10-day intervals. In tobacco biocenosis Moroccan locusts live separately or in small groups and they eat almost all forms of vegetation. Adults and nymphs often share the same food source and make damages on tobacco. The locusts make irregular holes on tobacco leaves. During 2016/2017 an increased number of locusts have been identified. In spring Moroccan locusts feeds on weeds around tobacco plots. According to quantitative representation, in 2016/2017 were recorded 456 locusts on weeds, from which 52.2% in 2016 and 47.8 % in 2017. *D. maroccanus* is present on tobacco fields from July until the end of September. In 2016/2017, quantitative representation of locusts on 900 analyzed stalks in plot margins is almost the same 297 and 296 individuals or 33%. In the middle of the plots 2016/2017 it is 270 and 210 locusts respectively, or 30% and 23.3%. Sometimes three locusts per plant were occurred. In 2016 the locusts were most numerous in June with 140 individuals on weeds and 281 locusts on tobacco plants in August. In 2017 locusts were most numerous in July with 121 locusts on weeds and 267 on tobacco plants. Quantitative investigations of *D. maroccanus* can be of great help in predicting potentially severe infestations.

Keywords: *Docioptaurus maroccanus*, Tobacco, Quantitative representation

(19700) CONTRIBUTION TO THE STUDY OF HARMFUL PARASITIC INSECTS AND THEIR PARASITIDS ON *EUCALYPTUS GLOBULUS* (MYRTACEAE) IN ALGERIA

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Eucalyptus globulus is an essence of the family Myrtaceae. Robust and resistant. Despite its robustness, this tree is subject to many factors of degradation which, for some time, that of the parasitic insects which for the most part are fatal to it. Field trips (Msila, Ras El Oued and Beni Aziz in the North Est of Algeria) from October 2016 to October 2017, helped advance the causes of decay of *Eucalyptus globulus* related to insects. The results made it possible evidence the presence of 3 harmful species: *Leptocybe invasa*, *Ophelimus maskelli* (gallicolous insects, Hymenoptera, Eulophidae), and *Glycaspis brimblecombei* (Hemiptera, Psyllidae). A procession of other species has been studied highlighting the presence of parasitoids such *Closterocerus chamaeleon* (Hymenoptera) parasitoid of *Ophelimus maskelli* and *Psyllaephagus bliteus* (Hymenoptera, Encyrtidae) parasitoid of *Glycaspis brimblecombei*. To these pests of other insects live on this essence permanently or temporarily. In all 6 orders divided into 15 families comprising 18 species that have been determined. Three main orders, Hymenoptera, Coleoptera Diptera, and Hemiptera alone represent 13 species, while Lepidoptera, Dermaptera are represented by only one species.

Keywords: *Eucalyptus*, Parasitic insects, Parasitoids

(19745) SORGHUM CROP AN ALTERNATIVE FOR DOBROGEA FARMERS IN THE CONTEXT OF CLIMATE CHANGES

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Dobrogea is the most drought area of Romania (average 1961-2016 :464 mm rainfall precipitation). Climate change in recent years has accentuated this phenomenon. For farmers from this area sorghum crop is a solution. At Sport Agra in Amzacea, in the last few years there have been experimented new sorghum crop technologies designed to face the current climate changes. These technologies include the following elements: changing the sowing epoch with one month before the usual period recommended by classical technologies; (– beginning of April in order to benefit from the soil's humidity la 4-5 cm depth boosting the germination process); choosing early hybrids in order to avoid the drought season which starts in June; applying adequate crop protection treatments, with pre-emergent and post-emergent herbicides and last generation insecticides. The agricultural crops in this area are not irrigated, so the farmer proposed a new technology, with the sowing of the crops earlier. This way the plants will benefit from the moisture from the soil accumulated in the winter. The obtained production from sorghum crop was over 10t/ha for most of the varieties tested.

Keywords: Sorghums, Climate changes, Technologies

(19840) AROMATIC PROFILE OF GRAPES FROM WHITE AND RED VARIETIES

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The aromatic composition of grapes from the white varieties Dimyat clone 6/46, Aligote clone 4/10, Muscat Ottonel clone 7/46, Misket Vrachanski clone 9/5, Plevenska Rosa and the red varieties Pamid clone 5/76, Gamza clone 52-9-4, Gamza clone 52-9-5, Kaylashki Rubin, grown in the soil and climatic conditions of Pleven, Central Northern Bulgaria, was studied. Twenty-one flavor-determining components influencing the aromatic profile of the wine – 9 esters, 7 terpenes and 5 higher alcohols were identified. The number of the analyzed groups of compounds was the greatest in the white aromatic varieties (Muscat Ottonel, Misket Vrachanski, Plevenska Rosa), being their specific feature. The content of esters in white and red varieties was similar, unlike the terpenes and the higher alcohols, the sum of which was higher in the white ones. In the experimental samples the quantity of esters was prevailing with the highest concentration of ethylbutanoate, diethylsuccinate, ethyldecanoate. The 2-phenylacetate content was the lowest. From the terpenes group, in the white varieties the representatives of linalool, nerol and geraniol predominated qualitatively, while in the red ones linalool and the isomers of linalool oxide were prevailing. From the identified higher alcohols, the highest concentrations found were of 3-methyl-1-butanol and 2-methyl-1-butanol.

Keywords: Grapes, Gas chromatography, Esters, Terpenes, Higher alcohols

(19860) ROLE OF INOCULATION WITH RHIZOSPHERIC *PSEUDOMONAS* ON GERMINATION OF *VICIA FABA* SEEDS UNDER SALT STRESS

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Soil salinity poses many great difficulties for plant life, which are manifested on all plant organs in all vegetative stages. Osmotic tension is the main mechanism of alteration exerted by salt stress on the plant. It strongly affects the hydrolysis of starch in seeds and the bursting of the embryo during the germination process. The inoculation of plants with bacterial strains as PGRR is one of the treatments mostly tested by the researchers in recent years to reduce the inhibition effect abiotic stress on plant physiology. The aim of this study is to examine the action of rhizosphere *Pseudomonas* on the improvement of seed germination of two varieties of *Vicia faba* (Super Aguadulce variety and local variety) in saline environments. This experiment was carried out in in-vitro two separate parts under aseptic conditions for each variety, treated with two salinity levels (100 mM and 200 Mm of NaCl), three bacterial inoculums and one control (distilled water). The results show that the salinity proportionally decreased the germination rate and prolonged the germination time of the two tested varieties of *Vicia faba* in the presence and absence of bacterial inoculation. Bacterial inoculation also decreased the germination rate and speed of seeds treated with no saline solutions, whereas the germination rate and speed increased in the inoculated seeds of super aguadulce variety, but not in the local variety. The Super Aguadulce variety showed a superiority in the speed of germination in saline and non-saline conditions under the action of bacterial strains, and in the germination rate, especially in saline conditions. However, the inoculation strains not showed an improvement effect on germination of local variety seeds

Keywords: Salt stress, *Pseudomonas*, PGPR, *Vicia faba*, Germination

(19878) EFFECTS OF SALT AND WATER STRESS ON GERMINATION OF FIELD PEA (*PISUM SATIVUM* L.)

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Salinity and water deficit can be major environmental constraints which affect seed germination and seedling growth of many forage crops in semi-arid and arid regions. Pea (*Pisum sativum* L.) is one of the most important grain legume crops around the world, is famous for its high biomass yield and nutritional value for livestock. In the present study we tested, under controlled conditions two separate factorial experiments were conducted based on a randomized complete block design under polyethylene glycol 6000 simulated drought stress and NaCl salinity stress conditions. The used saline concentrations were: 0 (distilled water); 25; 50; 75 and 150 mmol/l of NaCl, whereas for the water deficit, simulated with PEG 6000, the following osmotic potentials were used: 0 (distilled water); -0.03; -0.1; -0.7 and -1.0MPa. Germination percentage, root and shoot length, seedling fresh and dry weight and water content were measured in the study. Higher concentrations of NaCl (150 mmol/l) were more inhibitory to seedling fresh and dry weight and water content than osmotic PEG solutions. The influence of PEG (-1.0MPa) was more inhibitory to germination percentage and seedling root and shoot elongation. The germination percentage was higher (100%) but mean germination time were lower in PEG than NaCl conditions. Seeds of *P. sativum* were able to germinate at all concentrations of NaCl after 3 days but mean germination time of 5 days was observed at -1.0 MPa of PEG treatments. PEG had less inhibitor effect on seedling growth than the germination. It was concluded that inhibition of germination at the same water potential of NaCl and PEG resulted from osmotic effect rather than salt toxicity. The percentage germination of seeds incubated is 100%, incubating seeds of *P. sativum* with a saline solution of NaCl and PEG solution for 7 d had no adverse effect on their germinability.

Keywords: *Pisum sativum* L., Germination, PEG 6000, Salt stress, Osmotic potential, Seedling growth

**(19891) PHYSIOLOGICAL STUDY OF CULTIVARS CARRYING THE 1BL.1RS
WHEAT-RYE CHROMOSOMAL TRANSLOCATION IN BREAD WHEAT**

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In order to study the effect of the 1BL.1RS wheat-rye chromosome translocation, on yield and other agronomic traits, three Hellenic spring wheat varieties with (cvs. Acheron, Elissavet and Orfeas) and six cultivars without the translocation (cvrs. Apollonia, Acheloos, Vergina, Doirani, Nestos and Strymonas) were used. The Russian cultivar KVZ/Cgn, one of the donators of the aforementioned translocation to modern wheat cultivars, was used as check. The complete randomized block design was used with four replications and the experiments were established in the main farm of the Western Macedonia University of Applied Sciences in Florina for two successive years. The following physiological traits were measured: total chlorophyll content, chlorophyll fluorescence, CO₂ assimilation rate, stomatal conductance, intercellular CO₂ concentration and transpiration rate. Significant differences were recorded in yield and in three traits, i.e. total chlorophyll content, CO₂ assimilation rate and transpiration rate. Regarding yield, despite the existing variability between cultivars with and without the translocation, no effect of the translocation was noticed. The two cultivars with (Elissavet and Acheron) performed equally with three of the top yielding varieties without translocation (Doerani, Apollonia and Achellos). Also, the same three wheat cultivars without the translocation were ranked in top three places according to the total chlorophyll content but they did not differentiate from cv. Elissavet which is one of the translocation carriers. In CO₂ assimilation rate, no significant effect of the translocation was observed and a similar situation was noticed in the transpiration rate. In order to find out the effect of the physiological traits on yield potential, the above results were compared to the yield performance of the corresponding cultivars. This comparison led to the conclusion that the 1BL.1RS chromosome translocation does not give any significant advantage regarding the physiological traits studied. Further research is needed to confirm the results of the present study.

Keywords: Yield potential, Drought resistance, Chlorophyll, Assimilation rate

(19900) YIELD, CHEMICAL COMPOSITION, ANTIOXYDANT AND ANTIBACTERIAL ACTIVITY OF ESSENTIAL OILS ISOLATED FROM SOME AROMATIC AND MEDICINAL PLANTS DOMESTICATED IN THE NORTHERN OF MOROCCO

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The objective of the present work was to study the physical and chemical properties, chemical composition (GC-MS), the antioxidant and antibacterial activity of essential oils (EO) of some aromatic and medicinal plants domesticated in the northern region of Morocco (*Thymus vulgaris*, *Thymus satureioides*, *Salvia officinalis*, and *Rosmarinus officinalis*).

The chemical analyzes of EO by GC- MS of *T. vulgaris*, *T. satureioides*, *S. officinalis*, and *R. officinalis* showed that the major constituents for each species are respectively Thymol (63.92%), carvacrol (52.37%); β -ocimene (23.92%) and 1,8-Cineole (42.00%).

The antioxidant activity evaluated by the scavenging power DPPH radical (2,2-diphenyl -1-picrylhydrazyl) showed that *T. vulgaris* generated the strongest antiradical potential compared to other EO.

Essential oils were also evaluated for their antibacterial activity against bacterial strains. Bacterial strains showed varying degrees of sensitivity, Gram negative is generally more resistant. Among these oils, *T. vulgaris* and *T. satureioides* were the most active. EO of *S. officinalis* showed a good antibacterial activity but is not bactericidal against some strains, while EO of *R. officinalis* showed a low antibacterial activity.

Keywords: Essential oil, *Thymus vulgaris*, *Salvia officinalis*, *Rosmarinus officinalis*, *Thymus satureioides*, GC/MS, Antioxidant, Antibacterial activity

(19907) THE INFLUENCE OF DIFFERENT AMOUNT OF NITROGEN ON THE YIELD AND QUALITY OF ORIENTAL TOBACCO PRODUCED IN PELAGONIA REGION, R. MACEDONIA

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Pelagonija is one of the larger regions for small leaf aromatic tobacco production, in the Republic of Macedonia. Yield and quality of oriental tobacco are closely associated with its availability to absorb nutrients from soil. Tobacco is particularly sensitive to the quantities of nitrogen in soil. This very important nutrient has a positive impact on yield and quality of tobacco to a certain limit. After that, the yield can be increased but the quality of produced tobacco substantially declines.

Field experiments were carried out during 2010 - 2012 in v. Dobrishevo, in the Pelagonija Region, to investigate the effects of different nitrogen rates upon yield and quality of oriental tobacco varieties: Prilep P-23, Prilep P-79-94 (domestic varieties), and Basma1 and Elenski 817 (introduced varieties). Investigation included four varieties, three nitrogen rates (0, 20, and 30 kg/ha) and constant amount of phosphorus (60 kg/ha) and potassium (40 kg/ha).

To evaluate the fertilizers effect on investigated characters of tobacco all results were statistically processed by analysis of variance and LSD test.

According to the results, the best effect on the yield had fertilized varieties with the 30 kg N/ha where yield increases of 24.50% and 27.23% respectively, as opposed to the control. The variety Prilep P23 as standard, achieved the highest average yield per unit area (3219 kg/ha, or 100 %), the variety P79-94 yielded 3109 kg/ha, or 3.42 % lower yield than the standard variety, while the varieties Elenski 817 and Basma 1 have significantly lower average yield than the standard variety, 2420 kg/ha or 24.82% and 2350 kg/ha 26.99%, respectively.

The fertilization has a positive effect and statistical significance on the average yield and gross income, per unit area.

The average purchase price of tobacco, expressed in % of quality classes, has a slight decrease with increasing nitrogen rates, in all investigated varieties.

In all investigated varieties was observed increasing content of nicotine, total nitrogen, proteins and mineral matter, and decreasing content of the soluble sugar with increasing nitrogen quantities.

Keywords: Oriental tobacco, Nutrients, yield, Quality, Chemical composition

**(1998) INTERSPECIFIC HYBRIDIZATION BETWEEN CULTIVATED
SUNFLOWER AND WILD ANNUAL SPECIES *HELIANTHUS BOLANDERI* A.
GRAY**

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Interspecific hybridization was carried out between sterile analogues of cultivated sunflower lines with normal cytoplasm and wild annual *Helianthus bolanderi* accession E-009 from collection of DAI-General Toshevo. Hybrid plants were produced using classical breeding methods and applying the *embryo rescue*. The degree of crossability and the inheritance of some morphological traits were determined. The obtained F1 progenies were characterized from morphological and phytopathological point of view. Hybrid forms distinguished with resistance to stem canker, phoma and downy mildew were obtained. The hybrid plants, carriers of Rf genes for CMS Pet 1, could be used in sunflower breeding programs for developing restorer lines. *Embryo rescue* could be successfully applied for overcoming the difficulties of classical breeding methods, connected to incompatibility of cultivated sunflower. Plants from hybrid combinations 712 A x E-009, 383 A x E-009, 704 A x E-009, 349 A x E-009 and 353 A x E-009, carriers of Rf genes for CMS Pet 1, could be used for obtaining of new resistant restorer lines and included as initial material in sunflower breeding programs.

Keywords: Interspecific hybridization, Sunflower, *Helianthus bolanderi*, Embryo rescue, Resistance

(19934) INVESTIGATION OF THE ANTICANCER AND PROLIFERATIVE EFFECT OF BROCCOLI EXTRACT ON DU145 PROSTATE CANCER AND MEF HEALTHY FIBROBLAST CELL LINES

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In recent years, many researchers have focused on the health effects of plant-derived foods. In this context, foods with high content of flavonoids and phenolic substances have received a great deal of attention as potential agents for cancer prevention and treatment. Studies on the broccoli plant have revealed that broccoli has antioxidant and anti-carcinogenic properties. However, effective dose of broccoli needs to be determined for the cancer treatment. In this study, the effects of broccoli extracts on du145 prostate cancer and Mef fibroblast healthy cells were investigated at different doses for 48 hours.

Du145 and Mef cells were grown with Dulbecco's Minimum Essential Medium (DMEM) and HAMS F 12 (1: 1) supplemented with 2% FBS. Broccoli extracts at ten different doses (0,19% - 100%) were added into cultures and incubated at 37°C for 24 and 48 h in 5% CO₂. The viability of the cells was determined by the MTT method (3- (4,5-dimethylthiazol-2-yl) -2,5-diphenyltetrazolium bromide). Probit analysis by SPSS software revealed that the broccoli extract at a dose of 4.070 % dose killed du145 cancer cells at 48 h. At the same time, MTT results showed that the viability of Mef cells was increased during 48 h of incubation.

As a result, broccoli extract showed a significant level of anticancer activity in Du145 cells, while increasing the viability of Mef healthy cells. This result suggests that broccoli extract is a potential candidate for cancer treatment.

Keywords: Broccoli, Cancer cells, Healty cells, Anti-cancer

**(19940) MORPHOLOGICAL CHARACTERISTICS OF SOME POMEGRANATE
(*PUNICA GRANATUM* L.) VARIETIES**

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The morphological characteristics of eight domesticated pomegranate varieties (Lifanka, Bejnarija, Karamustafa, Ropkavac, Valandovska, LC, Zumnarija and Hicaz) from R. Macedonia were investigated using computer vision software methods. The great differences in the dimension of pomegranate shrubs at the varieties were determined. The variety Bejnarija (Locality 2) is characterized with the greatest height (4.4 m), vertical area (11.6 m²) and vertical perimeter (13.8 m) of the shrubs. Leaf characteristics (area 1413.6 mm²; perimeter 206.4 mm; length 77.2 mm; width 23.2 and mass 0.239 g) indicate that the variety Lifanka is characterized with the largest leaves. Investigation showed that the variety Hicaz is characterized with the biggest fruits (mass 551.9 g; length 89.7 mm; total aril mass 285.5 g; aril number in fruit 1057.6). With thinnest fruit bark is characterized the fruits from Bejnarija variety (1 mm). Principal component analysis separates two varieties Lifanka and Hicaz in high rank position among the investigated pomegranate varieties by the positive fruit characteristics.

Keywords: *Punica granatum* L., Variety, Morphology, Fruit

(19980) INDUCTION OF POLYPLOIDY OF ROBINIA BY SOAKING SEEDS ON COLCHICINE

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A study was conducted in the nursery and silviculture in the Forestry Department/College of Agriculture and Forestry/Mosul University/Iraq. This study aimed to achieve chromosomal polyploidy in *Robinia pseudoacacia* L. to note the effect of colchicine on some genetical, morphological and chemical characteristic of Robinia by soaking their seeds in different colchicine concentrations (0, 500, 1000, 2000 mg/l) and for periods soaking (6, 12, 18, 24 hours). The results show that chromosomal polyploidy when soaking seeds in the 500, 1000, 2000 mg/l colchicine and different rates depending a period soaking, as the percentage of tetraploid seedlings reached 34.68%, 5.55% when soaking seeds in the 1000, 500 mg/l colchicine respectively while we couldn't see any tetraploid in other treatments. As for the studied characteristic, the treatment of soaking 1000 mg/l colchicine caused significant increase in the total chlorophyll content 1.341 mg/g, largest leaf moisture content 85.14, main root length 41.73 cm and number of secondary root 10.21 from the other hand this colchicine concentration causes significant decrease of the stomata number.

Keywords: Robinia, Colchicine, Tetraploid, Polyploidy

(19991) SPATIAL VARIABILITY OF NUTRIENTS IN CULTIVATED SOILS OF PRILEP, REPUBLIC OF MACEDONIA

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Understanding nutrients distribution and diagnosing the soil fertility is very useful for applying certain measures for agricultural and environmental management. This paper studied the spatial distribution characteristics of pH, organic matter, total nitrogen, available phosphorus and available potassium in cultivated soils of Prilep region in the Republic of Macedonia. This region is recognized as mostly oriental tobacco production region. 500 topsoil samples (0-30 cm) from different localities were taken during 2014-2016. According to distribution, all investigated parameters were normally or log normally distributed. It was shown that 60 % of the area had low organic matter and total nitrogen content. 42 % of the area has low content of available phosphorus, and 22 % accounted phosphorus > 50 mg/100 g distributed mainly in the northwest area (Varoš). Available potassium content was 10-25 mg/100 g or 58 %, mainly distributed in the east, northeast and the middle. pH analyses point out 70.9 % with neutral to slightly acidic soil reaction that seems suitable for cultivation of the oriental tobacco. According to the results, soil parameters were moderately space dependent, except for total nitrogen that according to semivariograms was strongly spatially dependent. In some of the study sites, adjustment of macronutrient contents can be helpful to improve productivity and reduce environmental risks

Keywords: Nutrients, Spatial variability, Tobacco, soil

**(19997) ANALAYSIS OF IMPOTANT INDICES IN NEW BULGARIAN HYBRIDS
LINZI AND DEVEDA**

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Hybrids Linzi and Deveda are conventional hybrids and created at Dobroudzha Agricultural Institute, General Toshevo, Bulgaria. They are the last hybrids for our new sunflower selection. A structural analysis on important biometric indices related to the production potential of sunflower hybrids Linzi and Deveda and their parental lines. The dates were analyzed by dispersion analysis, regression and correlation. The indices 1000 seed weight (g), kernel and husk (%), oil content in kernels and oil content of whole seed (%), protein content in kernels and protein content of whole seed (%). The mathematical models clearly demonstrated that a correlation was established between the investigated indices. They have a strong influence on the productivity of the two hybrids.

Keywords: Sunflower, Hybrid, Dispersion analysis, Regression, Correlation

(20015) THE SOLUBILITY OF TURKEY OAK (*QUERCUS CERRIS* L.) AND HUNGARIAN OAK (*QUERCUS FRAINETTO TEN*) IN COLD WATER

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Albania has an area of 28,748 km² where forests cover occupies an area of 1.5 million hectares. Coppice forests dominated by oaks occupy an area of 623,799 hectares, where the occupied surface by oaks goes to 132,910 ha with a standing volume of 6.5 million cubic meters. Oaks forests are relatively young, and 82% of them have an age from 1-30 years. There are many types of oak in Albania, but the species that have the greater spread and the largest area are: Turkey oak (*Quercus cerris*. L) and Hungarian oak (*Quercus frainetto* Ten). The study was carried out in six sites along longitudinal gradient. Three stem discs from the bole R1, middle R2 and top R3 of the stem were taken from each tree. Extraction conducted at $23 \pm 2^{\circ}\text{C}$ with constant mixing for 48 hours. The main components of wood parts, soluble in water, consist of carbohydrates, proteins, and inorganic salts. Average values for solubility of stem wood in cold water, in disks at the base of the trunk (R1), for the analyzed samples of Turkey oak trees (*Q. cerris*), from all stations resulted Mean of SCW % = $7.0 \pm 1.83\%$ and for the analyzed samples of Hungarian oak trees (*Q. frainetto*), resulted Mean of SCW = $8.96 \pm 2.68\%$. Results for solubility in cold water SCW (%), in samples of Turkey oak, are grouped in narrower margins and lower limit values than in the samples of Hungarian oak. There was no correlation found between solubility in cold water SCW (%) and variables such as the cutting diameter, age and annual rings width TRW, for samples of both species. Solubility in cold water, SCW % the disks at the base were significantly higher than those in R2 disk and fallen further towards the top gasket.

Keywords: Hungarian oak, Turkey oak, Wood solubility, Wood extractives, Carbohydrate

(20020) INFLUENCE OF HUMIC ACID AND SEAWEED EXTRACTS ON VEGETATIVE GROWTH, PHYSIOLOGICAL AND ANATOMICAL CHARACTERISTICS OF *PINUS PINEA* L. SEEDLINGS

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This study was carried out in nursery of forest department\ college of agriculture and forestry. Mosul University, Iraq. The aim of this study to investigate the effect of organic fertilizer by Pow humus matter (humic acid) at concentrations (0, 1, 2) g\l. and two seaweed extracts matters (Hypra tonic and Alga 300) at concentrations (0, 1, 2) ml\l. on vegetative growth, physiological and anatomical characteristics of *Pinus pinea* L. seedlings two years aged. The results showed that all applications of organic fertilizer matters in experiment gave a significant increase of most characteristics study compare with control treatment. Adding application treatment of Pow humus 1g\l. to the seedlings soil caused a significant increase higher in leaves chlorophyll a and b content, while treatment of Pow humus 2g\l. caused a significant increase higher in leaves moisture ratio content. Adding application treatment of Hypra tonic 1 ml\l. to the seedling soil recorded a significant increase higher in stem diameter, moisture ratio content in root and stomatal density in leaves. Foliar application treatment of Alga 300 1ml\l. caused a significant increase higher dry weight in root, protein content in leaves and tracheid length, while treatment of Alga 300 2ml\l. caused a significant increase higher in stem length, dry weight in leaves and tracheid diameter.

Keywords: Humic acid, Seaweed extracts, *Pinus pinea*

(20024) CUTTINGS VIABILITY AFTER TREATMENT OF THE MOTHER VINEYARD WITH HERBICIDES

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During the period 2014–2016 at the Institute of Viticulture and Enology a trial was carried out to study the impact of the herbicides Gardoprim plus Gold (312.5 g/l s-metolachlor + 187.5 g/l terbuthylazine), Lumax 538 SC (375 g/l s-metolachlor + 125 g/l terbuthylazine + 337.5 g/l mesotrione) and Wing P (pendimethalin 250 g/l + dimethenamid P 212.5 g/l) on the yield of high-quality cuttings for production of vine propagation material. The treatments in the mother vineyard of Cabernet Sauvignon variety (clone D-1) were performed in the spring before the buds germination. The obtained cuttings were grafted in 2015, 2016 and 2017 on Berlandieri X Riparia SO4 rootstock. After the stratification, the grafted cuttings were planted in the nursery and their vegetative manifestations were monitored.

The cuttings from the herbicide-treated variants showed viability similar to the control, and their buds germinated with the same intensity. The yield of rooted vines did not differ significantly from the cuttings grown without herbicides, as the highest rate of standard propagation material was obtained with Gardoprim plus Gold (55.45%). The vine biometric indicators exceeded those of the control variant. The application of the herbicides Gardoprim plus Gold, Lumax 538 SC and Wing P for keeping the soil surface free from weeds did not adversely affect the cuttings quality and was a suitable method for improving the agro-technology in the mother vineyards.

Keywords: Vine, Cuttings, Grafting, Mother vineyard, Nursery, Herbicides

(20026) APPLICATION OF THE HERBICIDES WING P AND STRATOS ULTRA FOR WEED CONTROL IN NEWLY-PLANTED VINEYARD

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At the Experimental Base of the Institute of Viticulture and Enology, Pleven, Bulgaria it was carried out a three-year planting (2014, 2015 and 2016) of a vineyard for chemicals testing for weed control. Each variant included 20 Cabernet Sauvignon vines grafted to Berlandieri X Riparia Selection Oppenheim 4 (SO 4) rootstock as it was repeated every year of the study. A single spray with Wing P (pendimethalin 250 g/l + dimethenamid P 212.5 g/l) at doses of 0.4 and 0.6 l/da was performed immediately after planting the vines and once with Stratos Ultra (100 g/l cycloxydim) at a dose of 0.2 l/da during the active vegetation stage of the wheat weeds. It was not found a negative impact on the bud germination and the shoot growth and maturation. Applied at a dose of 0.6 l/da, Wing P showed the best control over one-year weed vegetation in the vineyard as the treated vines had more intensive development and mature growth of greater length and mass.

Keywords: Newly-planted vineyard, Weeds, Herbicides, Pendimethalin, Dimethenamid, Cycloxydim

(20033) INVESTIGATION ON SOME TRAITS OF BRANCHED SUNFLOWER FERTILITY RESTORER LINES DURING THE BREEDING PROCESS

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Five branched restorers of fertility in sunflower were investigated (27R, 154R, 185R, 240R, 242R). They possessed very good general and specific combining ability and were the father components in high-yielding hybrids. The aim was to investigate the development of the fertility restorers when left with their branches and to compare them to the development of the plants with removed branches. There were differences in the values of some main traits related to the breeding of sunflower where mainly manual labor is involved. The question arises whether and to what extent the removal of branches in this type of lines is justifiable. The traits subjected to investigation were the following: number of seeds per head, plant height, head diameter, oil content in seeds, absolute weight, germination energy and germination. The experiment was carried out for three years in the trial fields of Dobrudzha Agricultural Institute – General Toshevo. In most of the cases, the number of seeds in the branched plants was higher than in the plants with removed branches, but this was always at the expense of the absolute weight, which was higher in the lines without branches. The trait plant height was not influenced by the presence or absence of branches. The head diameter was lower in the normal plants in comparison to the plants with removed branches. In the fertility restorer lines with normal branches, the oil content in seeds was always higher in comparison to the lines without branches. The traits germination energy and germination were not affected by the

Keywords: Sunflower, Lines, Fertility restorers, Traits, Branches

(20035) A PROPOSED METHOD FOR OBSERVING THE EFFECT OF THE PESTICIDES ON ARCHIPS ROSANA (LINNAEUS, 1758) (LEPIDOPTERA: TORTRICIDAE) ADULTS

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The European leafroller (ELR), *Archips rosana* (Linnaeus, 1758) (Lepidoptera: Tortricidae) is an important pest species causing various levels of economic losses in different fruit trees. Adult emergence begins in the second week of June, and usually continues through mid- August. Adults live for 2–4 weeks. Studies were made in northwestern Turkey (Edirne province) in 2010-2014, during which larvae and pupae of *A. rosana* were collected on some Rosacea families. Each individual larvae and pupae were maintained in large Petri dishes (10 cm diameter) containing honey-water (1:1 ratio) absorbed on cotton pieces and rose leaves and kept under laboratory conditions at $25 \pm 2^{\circ}\text{C}$, 16:8 hours Light:Dark cycle and 70% relative humidity. We allowed the material (larvae and pupae) collected from unexposed trees to grow to adult forms. After growth, we removed the lepidopteran adults from petri plates with the aid of a vacuum hose and placed them in new petri plates. Rosacea leaves from unsprayed trees and shrubs, washed air dried, made 5cm diameters discs, and dipped in test solutions for 10 sec and allowed to dry. The solutions were prepared according to recommended dose (r.d.) used in agricultural areas, and diluted concentrations of this r.d. Pesticide exposed leaves were placed in large Petri dishes, and adults (10 specimen) was maintained in these petri dishes under laboratory conditions. To find out LC50 concentrations of pesticides of r.d or lower concentrations, mortality ratios of adults were calculated after 24, 48, 72 and 96 hours. The results we observed after adult exposure showed that mortality increased. As a result, a high mortality rate was observed even at doses much lower than the recommended doses, by using this method. In most cases, the recommended dose was affected not only pests but also beneficial organisms (parasitic insects). The use of pesticides under the recommended dose may be important for the survival of beneficial organisms. A pesticide applied under the r.d. is more sufficient to kill target organisms.

Keywords: *Archips rosana*, Edirne, *Lepidoptera*, Method, Adult

**(20052) INFLUENCE OF FERTILIZATION AND ENVIRONMENTAL CONDITIONS
ON THE PHONOLOGICAL AND MORPHOLOGICAL DEVELOPMENT OF
CARROT PLANTS DURING SEED PRODUCTION**

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The main goal of the present study was to establish the influence of different rate of fertilization with nitrogen, phosphorus and potassium and interaction with the environmental conditions and their effect on phenological development of the carrot seed plant. The experiment was carried out in Experimental fields of the Agricultural University of Plovdiv, Bulgaria with carrot variety Tushon. The plants were grown by conventional technology with steckling. Two way of fertilization was applied. In the first one the total amounts of fertilizers were put in the autumn soil treatment and in the second one, it was split twice - in autumn the half and the other in spring stecklings planting. The phenophases of beginning and mass: developed of leave rosette; appearing, flowering, developed and maturity of the seed of central, first, second and tertiary umbels were recorded. Morphological characteristic of seed plant as a high, diameter and weight of stem, number and weight of leaves, number and weight of branches was established. The average daily temperature, total active temperature sum, maximal and minimal temperature, rainfall, relative humidity and the hydrothermal coefficient of vegetation period were calculated. The relations between phenological behaviors morphological development and elements of climatic conditions were determinate. The correlation between average daily temperature total active temperature sum form one hand and periods between different stage of development form other hand calculated. The regressions analysis between duration of different phenophases, plant development, and total active temperature sum were also done. The significant of the environmental conditions on the phonological development, especially for appearing of the umbels and flowering as well as the maturity of the seeds was established.

Keywords: Seed, Temperature, Phenophases

**(20094) SOIL MICROORGANISMS QUANTITATIVE DYNAMICS
CHARACTERIZING THE OVERALL BIOLOGICAL STATE IN RHIZOSPHERE
OF TOBACCO AND TOMATO PLANTS INFECTED BY BROOMRAPE**

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The quantitative dynamics of soil microorganisms in the rhizosphere of tobacco and tomato plants infected by broomrape (*Phelipanche ramosa*) was investigated. Parallel pot experiments with the two hosts of the parasite - Oriental type of tobacco variety Plovdiv 7 and tomatoes - Miliana variety were presented. The variants were: By introducing contamination into the soil - seeds by broomrape and control pots - without the seeds by broomrape. Experiments were carried out under controlled conditions - in a phytostatic room. Soil samples for microbiological analyzes were taken from the rhizosphere, in dynamics. The microbiological analyses were executed according to Koh's, in three replications (MPN/g a.d.s), with confidence level 0.05. The surveyed set of soil microorganisms includes indicator groups characterizing the overall biological state of the microbial communities: Autochthonous, Oligotrophic, Aerobic cellulosolitic microorganism and microscopic fungi. The relative share of Actinomycetes in the cellulosolitic microorganism group was determined. For each trophic group the Shannon (H) diversity index and the distribution evenness (E) in the microbial communities were determined. The obtained results show that the quantities in the major groups of microorganisms increased around and after 20 days to 40-60 days. After this period, they were reduced and were significantly lower than controls. Only in oligotrophic microorganisms the reported trend was reversed. These periods coincide with the phases of broomrape development - germination, formation of a haustorium and attachment to the root of the host (up to about 40-60 days) and the above-ground phases (80-100 days).

Keywords: Broomrape, Soil microorganisms, Tobacco, Tomato

(20108) PHYSIOLOGICAL AND MOLECULAR STUDY OF DROUGHT TOLERANCE OF BULGARIAN WINTER WHEAT

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Drought stress severely affects growth, development and production of crop plants, making tolerance to dehydration an important selection *trait* in breeding programmes. Identifying morphological, physiological, biochemical and molecular changes in crop varieties that differ in drought tolerance is essential to understanding the mechanisms of plant survival during drought periods.

We evaluated more than 100 winter wheat genotypes from the collections of both wheat centres in Bulgaria (DAI, G. Toshevo and IPGR, Sadovo) using association mapping approach and phenotypic data. Bulgarian winter wheat varieties showing difference in their response to drought stress were selected. Among them 15 wheat genotypes were subjected to severe but recoverable drought stress at the seedling stage in controlled conditions in order to evaluate the drought stress tolerance mechanism and identify markers associated with stress tolerant phenotypes, applicable in marker-assisted selection.

The assessment of relative soil water content, leaf water deficit and electrolyte leakage displayed that three of the varieties (Guinness, Katya and Yoana), behaved as drought tolerant, while the other three (Farmer, Bozhana, Dobrudzanka), behaved as drought sensitive. We found drastic differences between drought-tolerant and drought-sensitive varieties regarding the photosystem II (PSII) photochemistry, the effective dissipation of unstrapped excitation energy from the active PSII reaction centres, and the efficiency of QA- reoxidation.

Differences among protein patterns and protease activity were also observed among wheat genotypes differing in their drought stress tolerance.

Acknowledgement: This work was supported by the grant No DH06/12, financed by the National Science Fund of Bulgaria.

Keywords: Winter wheat, Drought stress response, Photosystem II (PSII) Photochemistry, Biochemical and molecular analyses

(20128) STUDY OF THE OLFACTORY AND TASTE SENSILLA IN THE GREGARIOUS STATE OF *DOCIOSTAURUS MAROCCANUS* (THUNB., 1815) (ORTHOPTERA, ACRIDIDAE)

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The study of organs involved in chemo-reception: olfactory and taste sensillions in wrasses and antennae, in *Dociostaurus maroccanus* Thunb, 1815, was undertaken in the laboratory on a gregarious population of the Marhoum region in 2010 (Wilaya of SidiBel Abbes). It pointed out that the most important sensilla are the sensilles of the forms 3 and 4 and that the number of males' sensilles is higher than that of the females'. Thus, the sensilla of forms 1 and 5 are more numerous in males and the numbers of sensilla of other forms 2, 3 and 4 are similar in both males and females.

It can be seen that there are two main categories of sensilla (zone A1 and zone A2) and two other less represented categories of antennal sensilla (zone A3 and zone A10). Some similarity in the number of sensilla in each category in males and females was also noted.

We can hypothesize that there is a relationship between the variation in the number of taste sensillions and the locust diet.

Keywords: Sensilles, *Dociostaurus maroccanus*, Locust-plant relationship

(20130) INHERITANCE STUDY OF THE VEGETATION PERIOD (DURATION BETWEEN INDIVIDUAL PHENOPHASES) IN HYBRID COMBINATIONS OF SUNFLOWER THE CONDITIONS OF NORTH-EASTERN BULGARIA

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The investigation was carried out during 2012-2015 in the trial field of Dobrudzha Agricultural Institute (DAI). The 15 hybrids combinations were studied. We have investigated the inheritance of the vegetation in hybrids combinations relative to parental lines. The periods between the different pheno phases in hybrids and parental lines were investigated. From the study, it was found that the hybrids were 217A x 87R (107 days), 217A x 85R (110 days). The hypothetical and real heterosis of the vegetation period in the investigated hybrid combinations was established.

The vegetation period in sterile lines is 115 days, while the fertility restoration period is 110 days.

Keywords: Sunflower, Heterosis, Heritability rate, Hybrid

**(20148) NEW HABITATS OF *GONIOLIMON DALMATICUM* (C. PRESL) RCHB. F.
IN BULGARIA**

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The conducted research was focused on monitoring three new habitats of Balkan endemic species *Goniolimondalmaticum*, all three found in the Hadjidimovo Municipality, Blagoevgrad in 2011. The habitats are located near the villages Nova Lovcha, area “Polianite” and “Kosharite”, and Gaitaninovo, area “Omaya”. The habitats in “Kosharite” and “Omaya” occupy an area of about 2 ha and “Polianite” – 2.5 ha. The populations contain 2400, 3750, and 2850 plants, respectively.

All three populations are very well developed, with one to three flowering stems per plant. Over the years no change was observed in the ratio of generative and vegetative plants within the populations. Generative plants dominated in the populations, which is an indicator of the population stability.

Keywords: Protective, Endemic, Habitat, Population, *Goniolimon dalmaticum*

(20157) NEW COMMON WINTER WHEAT LINES WITH RESISTANCE TO LEAF RUST (*P. TRITICINA*)

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Wheat is the most important cereal crop in global agricultural economy and cultivated in diverse agroclimatic regions of the world. Breeding for disease resistance is the most economically and environmentally safe method to reduce crop losses. The long term success of breeding for disease resistance depends on the nature of the pathogen and virulence spectra in the pathogen population, the availability, diversity and type of genetic resistance in the host and the methodology for screening and selection for resistance. During 2013-2015, under conditions of an infection field at Dobrudzha Agricultural Institute-General Toshevo, Bulgaria, 680 common winter wheat lines were tested to a population of races of leaf rust *P. triticina*. Forty-two of the lines, which exhibited resistance under field conditions, were tested to 9 pathotypes of the pathogen at seedling stage under controlled conditions. Some of the tested lines carried adult plant resistance (APR), while others had combination of race specific and race nonspecific resistance. The combination of various mechanisms of resistance is of great importance for the durability of resistance. In this relation, the investigated 42 lines can be considered efficient sources of resistance which can be used in breeding programs.

Keywords: Wheat, *P. triticina*, Sources of resistance, Race specific resistance, Race nonspecific resistance

(20158) PHENOLOGICAL BEHAVIORS AND PRODUCTIVITY OF DIFFERENT PEPPER GENOTYPES IN DEPENDING ON ENVIRONMENTAL CONDITIONS

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The main goal of the present study was to investigate the responses of different pepper genotypes and breeding lines to their phenological development and productivity according to the environmental conditions. The experiments were carried out in 2015-2017 years under the South Bulgarian conditions, Agricultural University-Plovdiv region with ten different pepper genotype and breeding lines. The plants were grown by the conventional for middle yearly field production technology. The phenophases of beginning and mass: sprouting, developed of cotyledons, first true leaf, flower bud, flowering, fruit set, fruiting and maturity of fruit were recorded. Four harvests were done and productivity was determined. The average daily temperature, total active temperature sum, maximal and minimal temperature, rainfall, relative humidity and the hydrothermal coefficient of vegetation period were calculated. Between phenological behaviors on one hand and productivity on the other hand and elements of climatic conditions, high relations were determinate. High correlation coefficients between average daily temperature, total active temperature sum and periods between different stage of development and productivity were established. The regressions analysis of duration of different phenophases, total yield, and total active temperature sum also calculated. Strong dependences of the phenological development and productivity from environmental conditions were established. High genotype responses between different breeding lines were observed.

Keywords: Development, Phenophases, Pepper, Harvest

(20175) THE INVESTIGATION ON SELECTED CHERRY LAUREL TYPES BY SELECTION IN BLACK SEA REGION

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Black Sea Region Cherry Laurel Selection II project between the years 2005 and 2008, studies in Giresun Location were carried out by Hazelnut Research Institute. The orchard was established with three plants for each 78 types and 4x5 m row spacings in 1999 and 2000. As a result of this research, prominent types (52 K 12, 55 K 04, 52 K 20, 53 K 05, 52 K 17, 52 K 08, 08 K 02, 52 K 18, 54 K 03, 28 K 04, 14 K 05, 61 K 04, 55 K 03) were determined regarding production and quality criteria. In this project, antioxidant activities, total phenolic content, phenolic compounds, anthocyanin, fructose, glucose, sucrose are determined in of 13 types. Antioxidant activity, total phenolic, flavonoid and anthocyanin content of types 08 K 02 and 55 K 04 were higher than other types. In fruits DPPH values ranged from 151.62 to 216.94 μmol Trolox equivalents (TE)/100 g fresh weight, ABTS values ranged from 114.67 to 280.15 μmol (TE)/100 g, FRAP values ranged from 17.09 to 70.92 μmol (TE)/100 g, total phenolic content ranged from 53.36 to 146.20 mg Gallic acid equivalents (GAE)/100 g, flavonoid content ranged from 30.48 to 176.55 mg Catechin equivalents (CE)/100 g, anthocyanin content ranged from 50.08 to 117.62 mg/100 g. The sugars were analyzed by hplc. Fructose, glucose, and very little sucrose were identified in the chromatograms. Their contents were highest in 53 K 05 (% 8.79 for glucose), in 52 K 12 (% 2.57 for fructose). The phenolic compounds analyzed by HPLC were caffeic and chlorogenic acid. The levels of caffeic and chlorogenic acids were determined as 30.89 – 57.97 mg/100 g and 5.13 – 25.48 mg /100 g respectively.

Keywords: Cherry laurel, Phenolic compounds, Antioxidant activity, Total phenolic

(20187) RESPONSES OF CALLUSING ATTRIBUTES OF CABERNET SAUVIGNON/5BB GRAFTING COMBINATION TO APPLICATIONS OF DIFFERENT PHENOLIC COMPOUNDS

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Grafting is employed for various aims in grape growing and one of these grafting methods used in viticulture is omega grafting. It is utilized from different grapevine rootstocks to get over detrimental effects of biotic and abiotic stress factors in vineyard conditions. Successful grafting is associated with well-formed callus in grapevine sapling production. Sometimes, there can be failures, resulting from various reasons in omega grafting process. Present research was carried out to determine effects of various doses of different phenolic compounds on attributes of omega grafting in Cabernet Sauvignon/5BB combination. At the end of study, positive results were obtained from the applications.

Keywords: *V. vinifera* L., Rootstock, Omega grafting, Callus stimulation, Phenolic compounds

(20191) IN VITRO MICROGRAFTING IN HORTICULTURE

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In vitro micrografting is a technique which used for various purposes in horticulture. Generally, it has been used in Citrus for virus elimination. But there are many applications in many fruit species including almond, grape, cherry, apple, olive, peach, mulberry, pistachio, walnut, etc. Besides the virus free plant production, it has been used for the studies of rootstock-scion relation, early diagnosis of graft compatibilities, histological and physiological studies, rejuvenation, etc. Because of the plant materials used for micrografting are so small and undifferentiated, the graft formation rates are quite high. On the other hand, *in vitro* micrografting technique requires a lot of knowledge, investment and specialized labor. But still it has a successful applications and increasing potential.

Keywords: Micrografting, *In vitro*, Horticulture

(20227) FUNGICIDAL ACTIVITY OF COMPOSTS AGAINST *FUSARIUM OXYSPORUM* F. SP. *CICERI*

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Fusarium oxysporum f. sp. *ciceri* is a causal agent of Fusarium wilt that is one of the most important soil born disease of chickpea (*Cicer arietinum* L.). For eco-friendly option to control plant disease, compost have been widely explored. This study was performed to evaluate the Fungicidal activity potential of Two agronomic composts (poultry manure (PM), cattle manure (CM) and two commercial composts (CM), (CD)) against *F. oxysporum* *in vitro* and *in vivo* conditions. Results showed that all composts extract had inhibited the mycelium growth of *F. oxysporum* *in vitro* by 53 to 62 %. The isolation of 11 bacteria from compost water extract was realized to identify the effective antagonistic agent in the compost against the pathogen. The individual dual test of each bacteria had showed variable growth inhibition. Two bacteria had presented the best effect in controlling pathogen growth by 54%. In glasshouse bioassay *in vivo*, the effect of soil amendment of different composts on disease suppression was evaluated in comparison with two chemical fungicides. A significant effect of disease control was observed using seed treatment fungicides in reducing disease severity index (DSI) by 58 %. However the effect of compost application on disease suppression was not very important. Results suggests the presence of active role of several microorganisms in composts in controlling the pathogen, however more investigation has to be done to develop soil suppressiveness of the disease using these composts.

Keywords: Composts, Suppressive effect, *Fusarium oxysporum* f. sp. *ciceri*, Chickpea

(20232) THE INFLUENCE OF POLLEN GERMINATION CAPACITY TO SUCCESSFUL THE ARTIFICIAL HYBRIDIZATION IN *CYCLAMEN* SP.

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The artificial hybridization it's one of the most important method to create variability in breeding programs. The success of artificial hybridization very often depends on the fertility of the pollen grains which require a minimum 30% germination level. The aim of our study was to identify the correlation between the level of pollen grain fertility and success of hybridization in several cyclamen cultivars. We take under study seven cultivars of *Cyclamen* sp. very different from phenotypic point of view (maxi, midi, mini). In the first step we determinate the germination capacity of pollen grain trough viability and germinability percentage and the correlation between these two determinations. Our results show a high ratio of viability then germinability in all cultivars. The best results of artificial hybridization were registered in hybrid combinations that were used cultivars with the highest percentage of pollen fertility. Out of seven cyclamen cultivars tested in 18 hybrid combination, three cultivars show the high level of fertility when were use like a male genitor ("Curly White"; "Curly Magenta Picotee" and "Allure Salmon Flamed").

Keywords: Breeding, Pollen grain germination, Pollen grain viability, *Cyclamen*

(20289) CONTRIBUTION TO THE STUDY OF HARMFUL PARASITIC INSECTS AND THEIR PARASITOIDS ON *EUCALYPTUS CAMALDULENSIS* (MYRTACEAE) IN THE NORTH EAST OF ALGERIA

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Eucalyptus camaldulensis is an essence of the family Myrtaceae. Robust and resistant, native to Australia. Despite its robustness, this tree is subject to many factors of degradation which, for some time, that of the parasitic insects which for the most part are fatal to it. Field trips (Zrazria, Ras El Oued, Setif and Beni Aziz in the North Est of Algeria) from October 2012 to October 2013, helped advance the causes of decay of *Eucalyptus camaldulensis* related to insects. The results made it possible evidence the presence of 3 harmful species: *Leptocybe invasa*, *Ophelimus maskelli* (gallicolous insects, Hymenoptera, Eulophidae), and *Glycaspis brimblecombei* (Hemiptera, Psyllidae). A procession of other species has been studied highlighting the presence of parasitoids such *Closterocerus chamaeleon* (Hymenoptera) parasitoid of *Ophelimus maskelli* and *Psyllaephagus bliteus* (Hymenoptera, Encyrtidae) parasitoid of *Glycaspis brimblecombei*. To these pests of other insects live on this essence permanently or temporarily. In all 7 orders divided into 18 families comprising 22 species that have been determined. Three main orders, Hymenoptera, Coleoptera and Hemiptera alone represent 18 species, while Lepidoptera, Zygentoma, Dermaptera and Diptera are represented by only one species.

Keywords: Eucalyptus, Parasitic insects, Parasitoids

(20300) INVESTIGATION OF ANTICANCER EFFECTS OF SPECIES BELONGING TO THE GENUS *SONCHUS* L. (ASTERACEAE) EXTRACTS IN EUROPEAN PART OF TURKEY ON HT-29 (COLON CANCER) CELL LINE

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Sonchus L. (Asteraceae) is known to be a cosmopolitan weed all over the world except the Antarctic continent. Besides, many researchers have extensively studied about the nutritional content, chemical components and especially the medical biological activities of this genus *Sonchus* in recent years. The results of these studies have shown that they have therapeutic properties in many medical fields and also contain rich chemical and nutritional components. This proves that *Sonchus* species must be among the pharmacologically important plant species.

In this study it was aimed to compare the anticancer activities of the *S. asper* (L.) Hill, *S. oleraceus* L., *S. tenerrimus* L. belonging to the genus *Sonchus* in European part of Turkey. Viability % of HT-29 cells treated with five different doses (1000-62,5 µg/L) of belonging to three different *Sonchus* species aqueous leaves extracts were analyzed after 24h of experiment by MTT method. Also live, dead and apoptotic cells were visualized with Fluorescent Microscopy.

As a result of experiments with different concentrations in the HT-29 cell line, with increased concentration of all plant extracts, anticancer effects have been found to increase. According to the results obtained, extract of *S. tenerrimus* and *S. oleraceus* showed that viability % were decreased statistically significant at $p < 0.0001$ after 24h of experiment. In these two plant species, the highest values for the dead cell ratio compared to the control group were obtained at a concentration of 1000 µg / L; these values were determined $63.98\% \pm 0.036$ for *S. tenerrimus* extract and $62.87\% \pm 0.053$ for *S. oleraceus* extract. At the lowest concentration (62.5 µg/l), *S. tenerrimus* extract killed $25.64\% \pm 0.061$; *S. oleraceus* extract killed $34.60\% \pm 0.071$ HT-29 cancer cells at 24 h. IC50 values were calculated by Probit analysis (STATISTICA-SPSS.18 Stat Soft Inc.). IC50 values were detected in each extracts: 485.199 µg/l and 485.238 µg/l, respectively for *S. tenerrimus* and *S. oleraceus* extracts on entreated HT-29 cells.

Extract of the leaves of *S. asper* showed that $59.65\% \pm 0.075$ dead cell ratio at a dose of 1000 µg/l on HT-29 colon cancer cells at 24 h. At the lowest concentration (62.5 µg/l), *S. asper* extract was shown no effect on cell death at 24 hours.

These results of this study suggest that *Sonchus* extracts had the anticancer effects on HT-29 colon cancer cells, which may be used as a auxiliary source of cancer prevention. At the same time pharmacological strategies can be developed by introducing the anticancer mechanisms of *Sonchus* plant extracts.

Keywords: Anticancer, Colon cancer, HT-29, *Sonchus*

(20312) RESPONSE OF FOUR POTATOES CULTIVARS TO SOIL APPLICATION WITH ORGANIC AND AMINO ACIDS COMPOUNDS

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A field experiment was implemented at vegetables field, Department of Plant Production, Agriculture Technical College, Mosul, Iraq, during spring season of 2018 to study the response of four potato cultivars (Actrice, Arizona, Riviera and Universa) to four organic and amino acids compounds (Azomine 4ml/l, Tecamin Max 3 ml/l, Delfan plus. 3 ml/l, Humibest 4 g/l) as soil application. The experiment was subjected in a factorial experiment in randomized complete block design with three replications. The results revealed that the cultivar (Riviera) give the highest shoot number, fresh and dry weight of plant, leaf area, total Chlorophyll content, tubers number per plant, plant yield and total yield. Applying (Azomin) as amino acid compound increased dry weight of plant, leaf area, total Chlorophyll content, tubers number per plant, average tuber weight, total yield, starch percentage, N and P content in tuber significantly.

On the other hand, the interaction treatments between cultivars and organic and amino acids compounds resulted in a significant effect in many studied parameters.

Keywords: Potato, Organic acids, Amino acids, Tuber

(20362) COLLECTION OF INDIRECT RESISTANCE TRAITS DISTURBANCE VIRULIFEROUS INSECTS TO ELONGATE THE PERIOD BEFORE THE FIRST INFECTION OF ZYMV

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Zucchini Yellow Mosaic Virus (ZYMV) is one of very important viruses that causes high yield losses of cucurbit in Iraq and the world. In a program of selection of resistance traits for cucurbit viruses, four aspects of squash upper leaf shape and coloration which were (entire silver leaf coloration, white coloration of the leaf veins which appeared as white net, white spots between the main leaf veins branching on the upper leaf surface, and downy upper surface shape that cause insect disturbance) of indirect resistant characters that repelling or fairing or disturbance of viruliferous insect lead to late the visiting of virus vector insects to the plants, and thus they delayed and diminished the infection percent and so elongated the period of disease dissemination, and accordingly increased the health productivity period of plants. The variants had possessed these aspects were selected and developed to pure lines of cucurbits indirect resistant origin. Number of genes responses of each character and their heritability nature were determined in previous studies. Then they introduced in a program of hybridization between every two genotypes to obtain the dual hybrids, which then crossed together to obtain the quadrilateral hybrids that have all the aspects of upper shape or coloration and so elongate the period of delaying of first infection from 14 to 55 days after control infection, as these traits appeared successively each followed the other.

Keywords: ZYMV, Cucurbits viruses, Squash diseases, Squash breeding, Genetic resistance

(20366) DETERMINING THE EFFECT OF BORON TOXICITY ON STRAWBERRY GENOTYPES GROWN IN TURKEY

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Turkey is one of the major strawberry producing countries in the world; however, the production still faces several challenges, primarily because of the abiotic stress factors including soil nutrient deficiency and toxicity. A vast region of Turkish agricultural soils is calcareous in nature with high pH, thereby decreasing the availability of nutrients such as Boron (B) to plants. B is a crucial micronutrient for plant growth and development with a minute difference in its deficiency and excess range. The too much or too little of the available soil B weakens the defense system of a crop allowing for pathogenic infections, and effectively reducing the crop yield. Since poor soil aeration in the root zone region can also exacerbate these pathogenic infections, it is recommended to grow strawberries in high-porosity environments. Soilless farming and the use of perlite material, which has a relatively high-water content and porosity, provides an ideal growing environment for strawberry production. Although numerous studies have been carried out to determine the effects of toxicity and deficiency of B application on different fruit groups, studies on strawberry under greenhouse conditions are not sufficient. For these reasons, the objective of this study was to examine the effects of B toxicity and deficiency on morphological and physiological parameters, and mineral composition of different strawberry genotypes adapted to the cultivation areas in Turkey. Project outputs may contribute to identify B stress tolerant varieties that can be successfully used not only in Turkey, but also in arid and semi-arid agricultural areas around the world.

Keywords: Abiotic stress, Boron deficiency, Boron toxicity, Plant nutrition, Strawberry

(20375) NEW SUNFLOWER FORMS, RESISTANT TO HERBICIDES

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As a result of the realized studies of 126 sunflower forms it was established that they show a different response to herbicides Pulsar 40 and Expres 50 after only one treatment. The resistance to these herbicides was transferred completely into some of the sunflower lines (these lines were resistant to both of the herbicides - totally 2 numbers). Other forms showed full resistance only to the Pulsar 40 (totally 22 numbers), while some were resistant only to Expres 50 (totally 11 numbers). There were ones from one line that showed different reactions. A violation at the base of the stems of the plants has also been reported. It results in a refraction of the sunflower and appears in the adult plants after flowering.

Keywords: Herbicides resistance, Imidazolines, Sulfonylurea, Sunflower line

(20376) LIFE CYCLE ANALYSIS OF ORGANIC MATERIALS

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The search for ecological means to management of agricultural pests and diseases conjoin with the investigation on environment-friendly disposal of municipal solid wastes form two important challenges of the present era. However, these are interrelated issues in which through innovative technologies organic wastes will be recycled into organic soil amendments (OSA) for utilization in control of agricultural soil borne pest and diseases. At present, plant parasitic nematodes have caused annual crop yield losses of 12.3 % to global food production (Sasser and Freckman 1987), which is estimated at the monetary value of 157 billion U.S. dollars worldwide (Abad *et al.* 2008). An additional 1 billion U. S. dollars is spent annually on nematicides (Fugate 2012) leading to further deterioration of the ecological and environmental wellbeing of the world. For this reason, the attention of nematologists worldwide is now focused on alternative control strategies including cultural methods (Akhtar 1998a).

Currently, about 1.3 billion tons of municipal solid wastes are being generated annually all over the world and this is expected to increase to 2.2 billion tons by the year 2025. Organic materials constitute 46% of this MSW and more than 95% of this end up in landfills dumps or incinerators with only about 5% recycled for use (Hoornweg and Bhada-Tata 2012). Organic wastes not properly disposed of create ecological problems of toxicity to biodiversity that leads to fast extinction of global fauna and flora and also their decomposition end products are sources of greenhouse gases and leachates that are harmful to the ecosystems (USEPA 2006). This necessitates the need for environment-friendly means of disposal for these wastes. One important way to recycle these organic wastes is by converting them into OSA for use in agriculture as alternative to chemical nematicides to control nematodes and other soil borne pests and diseases.

Keywords: Organic soil amendment, Sustainability, Waste materials

(20547) RAPD BASED ASSESSMENT OF GENETIC DIVERSITY IN 16 CULTIVATED ACCESSIONS OF SORGHUM IN MOROCCO

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Sorghum (*Sorghum bicolor*) is one of the widest spread cultivated grass species in the world. In this study, we analysed the diversity and genetic relationship among 16 accessions of local Moroccan sorghum (*Sorghum L Moench bicolor*) by using 40 random Amplified Polymorphic DNA (RAPD) markers. 315 alleles were detected ranging between 225 and 2995 bp, 189 (60%) were polymorphic and informative to differentiate the accessions. The number of alleles per locus varied, depending on the accession, from 3 to 11 with an average of 8.66 alleles per locus. The dendrogram, based on UPGMA analysis using similarity of Jaccard coefficient grouped the accessions according to their geographical origin. RAPD markers proved to be a reliable, rapid and practical technique of revealing phylogenetic diversity, which is, should prove valuable for sorghum breeding programs.

Keywords: Sorghum bicolor, Accessions, RAPD markers, Genetic diversity

(20583) EVALUATION OF THE INSECTICIDAL ACTIVITY OF THE AQUEOUS EXTRACTS, POLYPHENOLS AND ALKALOIDS OF BOXWOOD "BUXUS SEMPERVIRENS" AGAINST GALLERIA MELLONELA

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Boxwood is an ornamental plant belonging to the family Buxaceae, it contains alkaloids mainly buxine, which give it a toxicity against insects.

The objective of our study is initially to perform a phytochemical study of *Buxus Sempervirens* L. known as boxwood. This study allowed us to determine the different chemical compounds present in the plant. In a second step, we evaluated the biological activity of the extracts of the leaves of this plant (aqueous extract, polyphenols and alkaloids) on the larvae of the wax moth *Galleria mellonella*, the doses applied are the following ones 15, 30 and 60 µl/ml. After that, we tested the effect of the aqueous extract on the chemical compositions of the haemolymph of these larvae.

The results obtained are positive for all the parameters tested. Indeed, it has been found that the bioactive substances studied have a high insecticidal activity.

The results of the LT50 obtained for the highest dose show LT50 values of 2.06 days, 1.27 days and 0.27 days for the aqueous extract, alkaloids and polyphenols respectively. The results of the LD50 obtained 2 days after treatment show a value of 32.42 µl/ml for the aqueous extract, 7.63 µl/ml for the polyphenols and 31.71 µl/ml for the alkaloids.

In parallel, a significant increase in the concentration of proteins and lipids and a decrease in the concentration of carbohydrates in the haemolymph, were recorded after the injection of the aqueous extract of boxwood and this compared to the controls. As a result, the tested boxwood extracts cause a disruption of the biochemical metabolism and the physiology of the insect.

Keywords: Boxwood, Ringworm, Biological activity, Extract

**(20687) SINGLE AND COMBINED EFFECT OF BOTH FUNGICIDES
TRICYCLAZOLE AND CYPROCONAZOLE OF *FUNGUS ALTERNARIA
ALTERNATA***

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In a study on *Alternaria alternata*, which was isolated from the salad plant *Beta vulgaris subsp. cicla*, the minimum inhibitory concentrations of Tricyclazole and Cyproconazole were measured. The minimum inhibitory concentration of the Tricyclazole was 750 µg/ml while for Cyproconazole was 0.2 µg/ml. Spontaneous mutants were also isolated for each fungicide, it turns out that the frequency of spontaneous resistant mutants of Cyproconazole is 30.8×10^{-4} Which is less than half frequency of the Tricyclazole (66×10^{-4}). In order to study the effect of the fungicides mixture, the minimum inhibitory concentration was measured. It was about 0.15 µg/ml of Cyproconazole when Tricyclazole 75 µg/ml, and when the Tricyclazole was increased to 250 µg/ml, it required a lethal concentration of Cyproconazole which was 0.1 µg/ml in the mixture, proving an inverse relationship between the effects of the pesticides in their mixture. The spontaneous resistant mutants of the mixture were isolated and calculated at lethal concentrations in their mixture in two successive experiments for three replicates were performed. The first experiment gave a frequency of 134.1×10^{-4} while the second experiment gave 24.5×10^{-4} . The resistant mutants were also distinguished in the color of conidia because they were affected by the active substances of these fungicides even though they were in the same mixture. We conclude from the above that the process of mixing pesticides is a process that not only leads to positive results as it accelerates the process of killing fungus pathogen, but at the same time lead to the growth or emergence of resistance between pathogenic fungi of plants, which may cause results contrary to the expected.

Keywords: Tricyclazole, Cyproconazole, Fungicides mixture, Spontaneous resistant mutants, *Alternaria alternata*

(20855) EVALUATION OF NIGELLA SATIVA ECOTYPES FOR DROUGHT STRESS TOLERANCE

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Lack of soil moisture is one of the most important factors limiting plant growth. This experiment was conducted to evaluate the black cumin ecotypes in terms of tolerance to drought stress in the Ardabil province of Iran in a split plot arrangement based on a completely randomized block design with three replications. The main plot factor of the experiment consisted of two levels of irrigation (full irrigation and irrigation until the flowering stage then no irrigation) and the subplot factor including 10 different black seed ecotypes (Khomeini Shahr, Semirom, Mashhad 1, Kazemin, Isfahan, Ardestan, Tabriz, Shabestar, Shahreza and Mashhad2). The results of analysis of variance showed that drought stress decreased significantly all measured traits except for the flowering date and accelerated the black seed maturation time. Comparison of mean values showed that the highest grain yield (141.95 g/ m²) and oil content (35.5%) were obtained in Semiram and Kazmin ecotypes, respectively. Also, the highest 1000 kernel weight (2.75 g) was obtained in full irrigation treatment in Ardestan ecotype, which was categorized with Khomeini Shahr ecotype in full irrigation conditions. According to the results of the principle components analysis and biplot diagram, Khomeini Shahr, Semirom and Ardestan ecotypes were selected as superior ecotypes compared to other ecotypes. Also, these genotypes had high values of MP, GMP, STI and HARM indices.

Keywords: Black cumin, Grain yield, Oil percentage, Drought tolerance index

(20880) INVESTIGATION OF FIRE SITUATION IN RANGELAND AND ITS CONTROL STRATEGIES

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Fire is one of the most environmental hazardous event in global range that every time it affects the forests. Iran country is not exception from this event and occur several times every year. Fires occurred in forests and ranges in Iran several times and disturb 1000 ha from trees and shrubs and planets. Fires have not only economical damage but also environmentalist detriment. Frequency fires event in different regions of Iran in last years and caused to natural resource researches have done newly researches in forest to prevent from fire. Iran have placed in tropical zone and around of dry land, therefore have provided a lot of fire circumstances in ranges and forest. Also human factors such as passengers and carelessness citizens are made fire in Iran different regional, caused damaged very much in ranges and foresters. therefor in this research was tried to investigated reason of fire, expressed science and management approaches to fire controlling

Keywords: Fire, Trees, Rangelands, Environment

(20911) ANALYSIS OF NUMERICAL METHODS FOR APPROXIMATING DDE SOLUTIONS IN WHEAT PRICE DYNAMICS IN ALBANIA

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Interactions between delay differential equations (DDEs) and economical models have been popular and developed rapidly in recent years. In mathematics, DDEs are known as differential equations in which the derivatives of some unknown functions at present time are dependent on the values of functions at previous time. Nowadays, such equations are used as a fundamental tool in describing the behavior of dynamical systems and appear frequently as mathematical models in natural sciences, economics, population dynamics, epidemiology, medicine and engineering. Many methods have been proposed for the numerical approximation of these equations. The purpose of this paper is to analyze the price dynamics of wheat in Albania, in context of mathematical modeling using linear and nonlinear DDEs. The data are obtained from the Ministry of Agriculture, Food and Consumer's Protection, Statistical Department and from Institute of Statistics for a period of 10 years (from 2007 to 2017). Fundamental methods for solving DDEs are used to study the effects of time delay on the behavior of solutions, which include steady states, periodic and oscillatory solutions, bifurcations and stability switches. In the analysis are used numerical illustrations to confirm the theoretical findings. The economical interpretations of delay effects are briefly discussed.

Keywords: Delay differential equations, Numerical methods, Price stability

(20974) RESPONSE OF WHEAT GENOTYPES HAVING DIFFERENT STATURE TO EARLY DROUGHT PERIOD IN WHEAT

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Drought is a polygenic strain and is counted as one of the major factor limiting the crop yields around the world. The shortage of the water on any stage of growth can be damaging for plant growth, physiological aspects and yield. To study the impacts of early drought on wheat genotypes having different stature an experiment was directed at Agronomy area of research, University of Agriculture Faisalabad through in the growing season 2017-2018. The experiment was laid out in Randomized Complete Block Design with split plot arrangement. The early drought treatment such as I0 (Control with all irrigations), I1 (first irrigation 30 days after sowing), I2 (first irrigation 45 days after sowing) and I3 (first irrigation 60 days after sowing) were in the main plot while wheat cultivars having different stature i.e. Faisalabad-2008 (standard height and low tillering), Td-1(low height and low tillering) and Galaxy-2013 (standard height and high tillering) were in sub plots. The plot size was 6 m × 1.8 m, row to row distance 0.225 m and seed rate will be 100 kg/hac. All other crop management practices were kept constant during whole crop period. Data in respect of germination, growth, physiology and parameters related to yield was recorded on the basis of standard procedures and methods. Data was analyzed using split plot design under RCBD, and treatments means were compared using Dunnett's test and was contrasts at 5% level of significance. Drought stress among cultivars regarding to plant height showed maximum effect on TD-1 (71.10 cm), where as minimum effects were seen in Galaxy 2013 (83.42 cm). Likewise, length of spike was also maximum in Galaxy-2013 (8.11 cm) and minimum in TD-1 (7.79 cm). Produced grain yield in controlled condition was maximum and effect of drought could be seen clearly in the treated plots. Grain yield was maximum in Galaxy-2013 in all treatments where as FSD-2008 and TD-1 was almost same in yield. Yield and parameters of yield were affected significantly by various drought levels. Productive tillers, No. of grains per spike, biological yield and grain yield were significantly affected by drought. Different levels of drought affected cultivars differently, difference in 1000 grain weight showed that clearly.

Keywords: Wheat, Drought, Cultivars

(21108) EVOLUTION OF THE PHYSICOCHEMICAL QUALITY DURING THE MATURITY OF THE FRUIT OF THE MOROCCAN LOQUAT (*ERIOBOTRYA JAPONICA*)

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In Morocco, the loquat (*Eriobotrya japonica*) occupies an area of approximately 434 hectares, with an estimated annual production of 5933 tonnes. In the Berkane region, it occupies 80% of the national surface, with an annual production of 4548 tons. Despite the importance of this culture in the socio-economic development of mountain areas, few studies have been undertaken to improve yields, expand the existing range of varieties and enhance production. It is in this perspective that the current work, which aims to study the evolution of the physicochemical quality during the ripening of the fruit of the loquat of north-east of Morocco, is included.

The evolution of the physicochemical characteristics during the maturity of the fruit revealed that all the studied physical characteristics increase significantly during the stages of the development of the fruit, with the exception of the firmness of the fruit which has decreased considerably. However, it should be noted that there are differences between the growth rate of fruit between different varieties. This is probably due to the precocity and tardiness of each variety that is related to climatic conditions arising during the period of growth of the fruit. With regard to the evolution of the chemical characteristics, an increase in the soluble solids content during the ripeness of the fruit was observed in all the varieties studied. However, the titratable acidity and pH of the juice evolved negatively during fruit development, with rates of reduction that differ from one variety to another.

Keywords: *Eryobotria japonica*, Physicochemical quality, Firmness, Precocity and tardiness, Chemical characters, Zegzel Valley

(21172) STEVIA: A NEW GENERATION NATURAL SWEETENER

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Nowadays, rapid changes in dietary habits, especially an increase in sugar consumption are the basic cause of human diseases like obesity, diabetes, tooth decay and cardiovascular diseases. Hence, utilization of natural sweetening agents other than sugar has been initiated around the world and more than 20 sweeteners are being used according to the priority and availability. One of such known natural sweeteners is *Stevia rebaudiana Bertonii* that belong to family Asteraceae and was discovered in 1887 in South America. More than 80% of *Stevia* species have been detected in North America and around 200 native species are found in South America. It is an endemic, perennial species that grows in moist environment with an average temperature of 25°C. On one hand, where countries like Paraguay and Brazil used it as a sweetener and therapeutic agent, countries like Japan has been using it as a food additive over thirty years. Although its production is dominant in Mediterranean region of Turkey, some parts of the Aegean, Black Sea and Central Anatolian regions are known for its small-scale production. Despite the presence of several sweetening compounds, Stevioside is the main sweetening agent in the plant. Being an ideal natural product to replace sugar, *Stevia rebaudiana* has attracted many researchers because of its non-toxic and non-mutagenic nature with low calorie glycosides. Thus, we are working to determine the chemical properties of *Stevia* plant under different growth conditions so that its production can be increased. Specifically, we aim to determine the effect of Boron application on the changes in steviol glycoside content and the germination level of *Stevia rebaudiana* plant.

Keywords: Diabetes, Glycosides, *Stevia*, Stevioside, Sweetener

(21200) EVALUATION OF THE EFFECTS OF COMPOUNDS N-(1H-BENZIMIDAZOL-2-YL)-1-(4-CHLOROPHENYL) METHANIMINE AND N-(1H-BENZIMIDAZOL-2-YL)-1-(4-NITROPHENYL)METHANIMINE ON GERMINATION OF SOME BREAD AND DURUM WHEAT VARIETIES

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Today, benzimidazoles form a group of molecules which are used as drug agents and which are in the heterocyclic structure. Imidazole and benzimidazole structures are quite common in the structure of many natural compounds. The benzimidazole core has a structure that is biologically important and exhibits significant biological activities. Benzimidazole and its derivatives play an important role in the medical field with a multitude of pharmacological activities such as antimicrobial, antiviral and antidiabetic activity. In addition, benzimidazole compounds are one of the heterocyclic compound groups that researchers have been focused on cancer treatments.

Biological response of the plant to a chemical stimulus can be studied by the germination of plant seeds. By germination test, germination potentials of seeds can be determined and effects of chemicals can be observed. For this reason, in this study, some of the bread and durum wheat varieties were germinated using compounds N-(1H-benzimidazol-2-yl)-1-(4-chlorophenyl) methanimine (4ClSB) and N-(1H-benzimidazol-2-yl)-1-(4-nitrophenyl) methanimine (4NO2SB) to study their germination characteristics. Three cultivars of bread wheat (Tosunbey, Bayraktar 2000, Demir 2000) and three durum wheat (Eminbey, Kızıltan-91, Çeşit 1252) were applied for germination. The synthesized materials 4ClSB and 4NO2SB solution in methanol were prepared at 10⁻⁶ M for germination test of wheat seeds. Germination was carried out in the germination chamber at 20°C in the dark. At the end of the 8th day of germination, root and stem lengths, stem and root fresh and dry weights were measured. With the control solution, the stem length of the Demir 2000 variety was 8.57, whereas when 4ClSB solution was applied, this ratio reached to 9.94. With the control solution, the Tosunbey variety germinated at 96.0% and was germinated with 4NO2SB at 98.67% and 4ClSB at 100.0%.

Data were analyzed using JMP 7.0 statistical software (SAS Institute Inc.). According to the result, a significant correlation was obtained between root fresh weight and stem fresh weight (0.830*) and between stem dry weight and stem length value (0.640*).

Keywords: Benzimidazoles, Schiff bases, Wheat, Germination

(21211) EFFECT OF DIFFERENT SOURCES OF NUTRIENT ON GROWTH, YIELD AND QUALITY OF GARLIC (*ALLIUM SATIVUM* L.) UNDER ORGANIC FARMING

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An experiment on organic cultivation of garlic (*Allium sativum* L.) was conducted at Kargua ji farm, Bundelkhand University Jhansi, Uttar Pradesh, India by using Randomize Block Design with nine treatments replicated thrice. Among all treatments, T0= RDF (@100%), T1= Form Yard Manure(@100%), T2= Vermicompost(@100%), T3= Poultry Manure(@100%), T4= Bardman khad(@100%), T5= FYM + VC(@50%), T6= FYM + PM(@50%), T7= FYM + BK(@50%), T8= FYM + VC + PM (@33%), incorporated as prescribed dose in prepared microplot with size of 1.8x2m² by maintaining boarder 0.30x0.50cm² between treatments and replications at sowing of garlic variety (Cv-G-1) following the spacing 15x10cm². During the cropping season of garlic, all necessary crop husbandries had been followed. To evaluate the efficacy of each treatment incorporated alone and in integration, a wide spectrum of growth and yield attributes has been selected as key factor. Among all organic sources applied in soil alone and in integration as accordance with their prescribed dose in their respective treatment, FYM (@33%) in integration with VC (@33%) and PM (@33%) was found most effective to enhance all the attributes concern with growth and yield of garlic. Among growth attributes, significantly maximum height of plant (87.1cm), number of leaf (7.8), length of leaf (44.7 cm), fresh weight of plant (62.43g), dry weight of plant (10.29g), length of root (22.2cm), moisture % in plant (8.43), moisture % in root (77.6), relative growth rate (0.27g/day). Among yield attributes, maximum fresh weight of bulb (54.55g), biological yield (70.36g), , fresh weight of 10 bulbs (51.47g), girth of bulb (5.26cm), weight of clove (2.23g), length of clove (3.6cm), girth of clove (4.59cm), number of cloves (26.89), moisture % in clove (75.90%), ash % in clove (0.79), sulphur % in garlic (1.24 dry basis) and yield (113.51 q/ha). Among all the treatments, FYM (@33%) in integration with VC (@33%) and PM (@33%) was found far better in cost benefit ratio considering the quality attributes and it would be a significant organic package for growers after technology validation through repeated trails.

Keywords: Garlic, Organic source sulphur, Growth, Yield, Farm yard manure, Vermicompost, Poultry manure

(21232) INVESTIGATION OF DIFFERENT SUBSTRATES FOR VEGETATIVE PROPAGATION WITH WOODY CUTTINGS OF SPOTTED LAUREL (*AUCUBA JAPONICA THUNB.*)

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The spotted laurel is one of the suitable plants for outdoor landscaping. It is very good to be used for are with high acidity and moist soils and with high relative humidity. This is one of the new and non-traditional decorative plants for Bulgarian conditions. At present, the country's climatic conditions are becoming more suitable for its cultivation. One of the main problems with the growth of this species is its propagation. The main goal of this study was to investigate the possibilities for propagation with woody cuttings of spotted laurel in different substrates. The perlite and sand as substrates for propagation were applied. The 50 woody cuttings of spotted laurel with four buds and 7-9 cm length were used in this experiment in each variant. The cuttings were planted in two buds deep. The optimal moisture during rooting was mentioned. The percentage of rooting cuttings was established in the mass appearing of the first normal developed leaf. The length of root, the number of roots, numbers of leaves were determined. The best rooting was registered in perlite. The differences between both investigated substrates are small. However, it can be pointed out that in a sandy substrate the development of the root system is stronger.

Keywords: *Aucuba*, Rooting, Propagation, Perlite, Sand

(21258) EFFECT OF APPLYING IRON NANO-FERTILIZER AND ZINC ON QUANTITATIVE AND QUALITATIVE ATTRIBUTES OF *LALLEMANTIA* MEDICINAL PLANT

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Lallemantia royleana is an annual medicinal plant belonging to Lamiaceae family. In order to investigate the effect of nano-iron and nano-zinc fertilizers on some qualitative and quantitative attributes of *Lallemantia*, an experiment was carried out in a factorial based on randomized blocks design with three replications at spring-summer 2017. Experimental treatments consisted of nano-iron fertilizer in four levels (0, 1.5, 3, 4.5 g/l) and nano-zinc fertilizer in the same levels. Studied morphological attributes consisted of plant height, flower height, stem diameter, yield, etc. Some of phytochemical attributes consisted of antioxidant activity, chlorophyll a, b, etc. Analysis of variance results showed that nano-iron fertilizer affected the plant height, antioxidant activity, chlorophyll a and carotenoid at 1%; while it was not significant on flower height, etc., at 5%. There was no significant effect on other studied attributes. Nano-zinc fertilizer significantly affected the plant height, antioxidant activity, chlorophyll a and carotenoid at 1%, and no significant effect was observed regarding other attributes. Interaction effect of nano-iron and zinc fertilizers was achieved about some of morphological and phytochemical attributes.

Keywords: Fertilizer, Iron, *Lallemantia*, Nutrition, Quantitative and qualitative attributes, Zinc

(21275) ALTERNARIA DISEASE SCREENING OF SAFFLOWER (*CARTHAMUS TINCTORIUS* L.) GENOTYPES UNDER NATURAL CONDITION AND RELATION SOME AGRO-MORPHOLOGICAL PARAMETERS

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Safflower (*Carthamus tinctorius* L.) is an of the oldest oilseed crop adapted to drought arid and semi-arid environment conditions. Under humid and rainy weather condition various fungi of the genus *Alternaria* spp. can cause *Alternaria* leaf spot. Stem spotting and a head rot can also occur. The disease can be severe during warm, humid weather. Disease occurs when spores (conidia) land on leaves or stems, germinate in the presence of free moisture, and directly penetrate and infect the plant. Plants are most susceptible to infection beginning at flowering and continuing through maturity. The aim of the study was to evaluate some safflower genotypes based on *Alternaria* leaf spot under natural disease condition. The experiment was conducted in randomized completely blocks design with three replications at Trakya Agricultural Research Institute experimental area, Edirne, in 2018 growing years. A total of 55 safflower genotypes were evaluated to *Alternaria* disease under both natural and laboratory conditions. Natural disease screening was carried out during in 2018 at Trakya Agricultural Research Institute, Edirne, Turkey. Disease screening for *Alternaria* 0-9 score was done. The disease ranged from 55 to 99 % affected leaf area of genotypes. Based on intensity of disease screening genotypes 9 (Seledas-114), 12 (BJ-929), 13 (LESAF 175), 48 (TRE-OA05-02-122110T), 49 (TRE-OA05-02-252110T) and 54 (TRE-OA06-04 631110T) were tolerant to *Alternaria* spp. with the disease intensity of 55-57 per cent. Remaining all genotypes along with checks were classified under highly susceptible and susceptible group with more than 60 per cent disease intensity.

Keywords: Safflower, Genotypes, *Alternaria* leaf spot, Natural condition

(21279) EVALUATION OF CANOLA (*BRASSICA NAPUS* L.) GENOTYPES UNDER FIELD CONDITION AND RELATIONSHIP OF YIELD OIL CONTENT AND SOME PARAMETERS

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Canola (*Brassica napus* L.) is an important oilseed crop adapted to various environment conditions. Yield variability in canola due to variable rainfall and delay in sowing is a key constraint to canola production in the agricultural region of Trakya region, Turkey. Canola yields and oil content were highly variable because of their dependence on seasonal rainfall other climate and agronomic practices. The aim of the study was to evaluate some canola genotypes based on yield and some agro-physiological traits under natural condition. The experiment was conducted in randomized completely blocks design with four replications at Trakya Agriculture Research Institute experimental area, Edirne, in 2018 growing years. Yield, oil content, florets days, days of maturity, plant height, carob pod number, and grain number in carob pod were investigated. Combined analysis of variance revealed highly significant variation among genotypes for yield and other investigated characters. The mean grain yield was in the range of 262.3- 346.9 kg da-1, and mean grain yield of the genotypes was 316.1 kg da-1. Oil content of the genotypes varied from 41.00 to 45.39%. Genotypes TK-08-IMI-16 had higher grain yield and oil content. Plant height of the genotypes varied between 155-165 cm and carob pod number between 174 and 195. Based on yield and oil content TK-08-IMI-16 was the prominent genotype in the research.

Keywords: Canola, Oil content, *Brassica napus* L.

(21326) EXPRESSION OF GENES RELATED WITH PROLINE PATHWAY IN BORON TOXICITY-TOLERANT PLANT PUCCINELLIA DISTANS

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Boron stress has a significant effect on yield of plants, which are grown in arid and semi-arid regions. This study was conducted in *Puccinellia distans* (Jacq.) Parl. subsp. *distans*, which is remarkably tolerant to high level of salinity and boron. This species can thrive around borax mines in Anatolia that holds 72.8 % of boron reserves worldwide. There is still a dire need of more studies to understand the tolerance mechanisms to boron stress of *P. distans* at molecular level. In this study, *P. distans* plants treated to 0 (deficiency condition), 2.5 (considered sufficient for this plant), 250, 500 and 1000 (high concentration) ppm boron dosages were grown in hydroponic system. Proline, an amino acid, is an essential parameter to determine the stress tolerance level of plants. The enzymes P5CR and δ -OAT, involved in proline pathway, regulate homeostasis of proline in plants. Previously, our research group had measured the amounts of proline in shoots of this plant under investigation. Due to the scarcity in sequence information of *P. distans*, primers were designed based on P5CR and δ -OAT genes sequences available for the other species of Poaceae in order to amplify candidate gene fragments in shoot of *P. distans*. The amplifications of gene fragments were performed *via* QRT-PCR. The QRT-PCR results were consistent with previous measurements of proline in shoots, subjected to different B dosages. According to our results, there were more proline accumulation and amplification level of both genes were also higher in shoots under B deficiency (0 ppm) compared with highly B toxic conditions (1000 ppm).

Keywords: *Puccinellia distans*, Boron toxicity, Boron tolerance, B hyperaccumulator, Proline, P5CR, δ -OAT

**(21327) GENETIC DIVERSITY OF BREAD WHEAT (*TRITICUM AESTIVUM* L.)
GENOTYPES BASED ON PRINCIPAL COMPONENT ANALYSIS AND CLUSTER
FOR YIELD AND YIELD COMPONENT**

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Drought is the mainly abiotic stress factor and amount of the rainfall during grain filling period affect bread wheat yield. The study was carried out in the experimental field of Trakya ARI, Edirne (Turkey), in 2008-2009 and 2009-2010 years. A totally 15 genotypes were planted in RCBD in a split-plot with three replications. The main plots were assigned to five moisture regimes, which included 3 drought stress environments, one non-stress and one non-treatment environment. Grain yield, biological yield, harvest index, 1000-kernel weight, test weight, plant height, spike length, peduncle length, spike/m², spikelet number in spike, and grain number in spike were investigated. Principal component analysis (PCA) and cluster analysis was used to determining for genotypes environment interaction. Principal component analysis (PCA), indicated that the first (65.07%) and second (12.40%) components justified 77.47% of variations in grain yield of the genotypes. Based on GGE biplot results Kate A-1 and Tekirdağ was determined as most stable cultivars for grain yield. Mean values of the genotypes varied between 29.7-43.5 g for TKW, 73.6-83.2 kg/hl for test weight, 2017.0-2539.4 kg da-1 for biological yield, 68.6-110.9 cm for plant height, 30.2-38.3 for kernel number in spike, 328.8-486.6 for spike number per square meter and 21.4-35.2 cm for peduncle length. The cluster analysis was done and 15 genotypes divided into 2 clusters based on Ward's method. According to the results of the experiment, genotypes in terms of examined parameters were selected for national breeding program of bread wheat.

Keywords: Bread wheat, Biplot analysis, Cluster, Genotypes environment interaction, Yield component

(21341) GENETIC ANALYSIS OF QUALITY TRAITS IN SOME PAKISTANI WHEAT (*TRITICUM AESTIVUM* L.) UNDER TERMINAL HEAT STRESS CONDITION

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Climate change plays a key role in wheat production. High temperature stress is one of the major causes of yield loss in wheat all over the world including Pakistan. The objective of this study was estimation and selection of efficient parental and cross combinations on the basis of combining ability under heat stress conditions. To study heat stress, 50 crosses and 15 parents were evaluated under stressed condition. Fifty crosses were generated from crossing 15 parents by using Line \times Tester mating design in 2014-15. These genotypes were sown in randomized complete block design (RCBD) under normal and heat stressed conditions. Parameters like protein, moisture contents, starch, ash percentage, gluten and test weight were investigated. Highly significant differences were observed among genotypes for all traits. Dominance type of gene action was observed that played a predominant role in the inheritance of all traits in this study. General combining ability (GCA) effects, showed only 3 parents, MISR1, Faisalabad-08, and V-13241 proved to be good general combiners for protein, starch, gluten, test weight and ash in both normal and heat stress conditions. From crosses, AARI-11 \times V-12082, V-13241 \times Millat-11 and V-13013 \times ND64 revealed the best specific combining ability (SCA) under both environments for different quality traits like protein and moisture contents. The parents and crosses which exhibited excellent results in terms of higher GCA and SCA estimates may be exploited in improving quality traits under terminal heat stress conditions of Pakistan.

Keywords: Heat stress, Gene action, General combining ability, Specific combining ability

(18208) IMPACT OF IRRIGATION ON THE DYNAMICS AND LEACHING OF NITRATE NITROGEN IN SOIL

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This work aims to study the impact of irrigation on the dynamics and leaching of nitrate nitrogen in the soil. This is to develop an irrigation management approach, and to provide adequate applications to manage the effect of irrigation on the leaching of nitrogen fertilization, in order to preserve the quality of the environment. Irrigation management requires the control of doses, but also the control of irrigation frequencies and the choice of the type of irrigation that will influence the spatial distribution of the water dose. This work comes within this framework. It deals with the use of a model of mathematical simulation of the effect of the application of the different irrigation doses on the leaching of nitrate nitrogen under two types of crops, wheat and sugar beet, in using lysimetric data as well as the hydrodynamic characteristics of the soil. The results showed that the application of a water depth of 1 m gives rise to a displacement of nitric nitrogen of the order of 7.1 mm and 8 mm in the soil profiles respectively expressed for wheat and sugar beet. Thus the quantities of nitrate nitrogen leached calculated by this simulation model are of the order of 59.8 kg N/ha for wheat and 86.2 kg N/ha for sugar beet.

Keywords: Irrigation, Nitrogen fertilization, Leaching, Mathematical simulation

(18816) COMPARISON OF FLAT FAN NOZZLES USED IN HERBICIDE APPLICATIONS IN TERMS OF WEED CONTROL EFFICIENCY

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A considerable proportion of the pesticides used in agricultural production are herbicides. In order to reduce the amount of herbicide used in recent years, thereby reducing the environmental impact, nozzle manufacturers have produced low-drift nozzles. The objective of this study was to compare droplet diameter, droplet density, coverage rate, and weed control efficiency of DG (Drift Guard), TT (Turbo Teejet) AI (Air Induction) and twin fluid AJ (Air-jet) and standard flat fan (XR) low drift nozzles recommended in chemical weed control in agricultural production. Water sensitive paper was used for determining the drop diameter, droplet density and coverage rates of the nozzles. Droplet spots on water sensitive papers were processed via an image processing program (Image Tool 3.0) to determine droplet diameters, coverage ratios and droplet density. In addition, field trials were also carried out by using a herbicides in an application volume rate (200 l ha⁻¹) in order to determine the level of weed control provided by each nozzle used in a second crop maize field.

According to the results, all nozzles achieved different coverage rates and different droplet density under the same operating parameters. It was determined that the highest coverage rate was achieved by the AJ (TK-5) spray nozzle with 20.50 % and the size AI04 spray nozzle with the lowest coverage rate of 6.20%. When comparing the droplet density values, the highest droplet density was 182 spots/cm² with XR015 spray nozzle, and the lowest droplet density was 10 spots/cm² with AI04 spray nozzle. In the second crop maize field experiments, the highest efficiency in terms of weed control was 85.42% with DG spraying nozzle, 82.95% with TT spraying nozzle, 81.91% with AJ spraying nozzle, 79.07% with XR spraying nozzle and 77.54% with AI spraying nozzle weed control level.

Keywords: Herbicide applications, Weed control efficiency, Drift reduction nozzles, Coverage rate, Droplet density

(18886) EVOLUTION OF THE DIFFERENT ASSESSMENT METHODS ON LEG WEAKNESSES AND LAMENESS OF BROILERS

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In this study, firstly, a brief evolution of the chickens was mentioned and then 'leg weakness' and what leg weakness means in the broiler sector were investigated. "Leg weakness" is a vague term used to describe properties of infective and non-infective nature that occur in modern, fast-growing broilers. Modern broilers commercially grown are prone to foot problems, including lameness, footpad dermatitis and hock-burn. Lameness is an extensive term used for some damages of broiler chickens with infective and non-infective source. Lameness is a very big problem in the broiler industry. For the United State in 2002, the costs of lameness were predicted to be between \$80 million and \$120 million. However, in literature, it has been proven that the lameness strongly correlated with weight, growth rate and activity. The time before the chick reaches, a live weight of 1500 g was reduced from 120 days to 30 days in 80 years. As results of fast growing, severe problems have been occurred in broiler chickens. For example, the animals with severe problems have a reduced feed efficiency and lower growth. The carcass quality of these animals has also been decreased in value. Additional to the welfare problems that have been caused by leg problems, also financial losses have been occurred for the producers. Therefore, the first purpose of this study is created as to review the leg weaknesses of broilers and provides to readers a brief discussion of the factors influencing this problem. The second purpose of this study is to review the lameness and lameness assessment methods for broilers. Additionally, the advantages and disadvantages of these methods are discussed. At the end of this review, brief conclusions can be found with related reference list.

Keywords: Broiler, Leg Weaknesses, Lameness, Chicken, Technology

(18887) PRECISION LIVESTOCK FARMING APPROACH TO MEASURE THE LIVE WEIGHT OF ANIMALS

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The accurate estimation of the animal body weight is important to provide some information about the slaughter weight, growth, feeding level, uniformity, treatment doses and feed conversion efficiency. Between the many methods used for live-weight determination, a weighing scale is considered as a reference method (gold standard). In addition to that, farmers sometimes rely on visual observations to determine the animal live weight. However, it is a subjective method due to accuracy depends on farmers' experience. Traditionally, the animal live weight is predicted by manual weighing scale with a random sample of animals. Conventional method of animal weighing usually includes the basic procedure of penning a group of animals or catching and weighing these animals individually. This traditional method is time consuming, labour intensive, open for human errors and stressful for animals and farmers. Therefore, there is a huge need a novel technique. These days, the potential of computer and digital imaging system offer a novel way to predict the animal live-weight by detecting animal body dimensions with a non-intrusive way. Although the precision of live weight prediction depends on different factors, the development of automated monitoring systems for weighing animal is feasible. Due to the important correlation between body size and weight of animals, image monitoring and processing systems with Precision Livestock Farming (PLF) approach can detect the main sizes and the shape of animals. Furthermore, by combining these relations, animal live weight can be predicted accurately. There is a lot of advantage of this technique like non-contact measurements, fast and labour saving. Further studies should focus on the control of image quality, position of the camera and 3D cameras.

Keywords: PLF, Automatic weighing, Image analysis

**(18888) MIGRATION BEHAVIOUR AND SPATIAL USE OF BROILER CHICKENS
IN COMMERCIALY REARED FARMS**

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Broiler chickens that commercially reared in the farms are genetically chosen to reach higher body weights in shorter time. Additionally, these animals are raised in crowded farm conditions with less movement opportunity. Understanding spatial use patterns, movement and use of space is essential to determine the health and welfare of broilers. In this research, activity behaviour of the birds in a commercial farm of 1800 broilers was analysed. Analyses were repeated in six growth periods with 12 chickens once a day during the span of life. It was detected that the activity of the birds was not decreased during the life period. Activity of the chickens were not reduced in the last 3 weeks of the experiments ($p>0.05$, Mann-Whitney U test). Broilers chose to be in the next area to the wall farthest to the entrance. The analysed broilers did not restrict themselves just around the feeders and the drinkers. They also used the complete area during the experiments. The results of the research show that to be encouraging in achieving the good health and welfare of broiler chickens even with high stocking density in commercial farms. Activity of broilers is important for their life and has therefore important impact on the efficient production of farms.

Keywords: Activity, Broiler Chicken, Welfare

(18889) THE ROLE OF PRECISION FARMING IN PEST MANAGEMENT AND CROP YIELD

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Farmers encounters weeds, insects and diseases as major pests during crop cultivation. Although, there are different kind of pest management methods like cultural, mechanical, and biological, farmers continue to rely upon chemical method for its easy handling, greater efficacy and quick results. Nevertheless, the over application of pesticides leads to chemical residues in soil and crop. However, Precision Farming (PF) includes the best useful technologies to make soil and crop management decisions precisely by obtaining the information about specific conditions. Precision farming uses Global Positioning System (GPS), Geographic Information System (GIS), and Remote Sensing (RS) technologies to help farmers for their management decisions. The main purposes of precision farming are to increase production efficiency and quality, efficient chemical use, energy conservation and protection of soil and water. The use of precision farming can provide so many benefits like the identify, diagnose, and communicate crop and field problems, improved equipment efficiency through better scheduling and improved varietal choices like crop rotation. In addition, it can be used for better records of field operations, location of equipment, production output, and employee performance, crop conditions, and required inputs, more accurate and precise application of chemicals and fertilizer to reduce the potential for leaching and runoff. Precision farming helps the farmers to use crop inputs such as tillage, fertilizers, pesticides and irrigation more effectively for greater crop yield and quality, without polluting the environment. However, the most important reasons for non-adoption of precision farming are the lack of finance, credit facilities and the lack of knowledge about precision farming technologies. Therefore, farmers should be trained adequately to be able to monitor the dynamics of pests and to take right decision when it required.

Keywords: PLF, Pet management, Image analysis

(19460) STUDY OF THE MORPHOGENESIS RELATIONS BETWEEN THE ROOT SYSTEM AND THE AERIAL PART IN DURUM WHEAT (*TRITICUM DURUM* DESF.) UNDER DIFFERENT WATER REGIMES

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The water deficit is regarded as one of the principal abiotic stresses affecting the durum wheat productivity (*Triticum durum* Desf.) in Algeria, following the scarcity of the water resources. The objective of this study is to appreciate the performances of two systems, racinaire and foliar, under three water déficit situations (100, 60 and 30%CC) on five genotypes (Waha, ACSAD1361, Mexicali75, Zenati Wadi, Langlois), in order to establish a model of growth of this two parts.

The data collected showed variations for each measured characteristic. These variations depended on the hydrous mode and genotype considered. Structural modifications relate to the two types of roots, adventitious and seminal, were measured. These modifications refer to racinaire elongation, which was accompanied by a reduction of the rate of the adventitious rhizogénèse. We also registered anatomical transformations such as the reduction of the diameter of the roots, which is explained by a reduction of the cortical parenchyma. This transformation would support a better circulation of the sap during his horizontal transport.

Keywords: Durum wheat, Water deficit, Relation of morphogenesis, Sawdust.

**(19524) STUDY THE ROLE OF RURAL AND AGRICULTURAL COOPERATIVES
IN IMPROVING THE SITUATION OF DAIRY FARMERS (CASE STUDY:
SHAHINDEJ COUNTY, IRAN)**

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The main purpose of this research is to study on the role of rural and agricultural cooperatives in improving the situation of dairy farmers (Case Study: Shahindej County). This research from point of view target is applicable, from point of view of analys is descriptive and correlational. The study population based on the Krejcie and Morgan Table included 100 dairy farmers is a member of the cooperative. A questionnaire was used to collect data. Also, its reliability was gained using Cronbach's alpha coefficient ($\alpha=0.878$). Data analysis was performed using SPSS21. Descriptive statistics such as tables and frequency distribution, percent, percent cumulative, and each questionnaire were analyzed, and the analytical and inferential statistics, correlation and one sample t-test and factor analysis were used. The results showed that agriculture and rural cooperative role in improving the economic situation is average and agriculture and rural cooperative role in, improve production (Providing various services to the members and to feed livestock and livestock needs) and improving the social and technical improvement is meaningfully higher than average ($p<0/01$). The results of factor analysis showed that 6 factors including services, economical, technical, production, environmental and social Impoverment, altogether make 59/864 percent of agriculture and rural cooperative role in improving the situation of dairy farmers.

Keywords: Rural cooperatives, Dairy farmer, Improving of situation, Shahindej county

(19701) CLOUD COMPUTING USAGE IN INTELLIGENT AGRICULTURE

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In recent years, the use of computers and information technology has been used in agriculture as well as in many other arenas. There are distributed structures due to the presence of farmland in different places and features. In intelligent agriculture, cloud computing will provide an appropriate solution for collecting, storing, and analyzing data. In this study, how cloud computing solutions can be used in intelligent agriculture will be discussed and their advantages and disadvantages will be examined.

Keywords: Cloud computing, Distributed systems, Intelligent, Agriculture

(19935) EFFECT OF WATER HARVESTING TECHNIQUES ON THE SOIL PROPERTIES IN THE SOUTH OMDURMAN AREA- SUDAN

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This study was conducted at Khartoum New International Airport, South Omdurman area Khartoum State, Sudan, following a complete randomized block design (CRBD), to study the effect of water harvesting techniques (Holes and Crescents) two water harvesting techniques on the soil moisture content was measured prior and immediately after rains and measured at three weeks intervals.

The results indicated that the holes and crescents water harvesting techniques affected positively some soil physical properties especially at the upper soil layer (0 – 30 cm) which was subjected to excavation by a loader. These properties included porosity, field capacity, infiltration rate and hence moisture content. The holes water harvesting techniques showed better improvement of the soil physical properties compared to the crescents water harvesting techniques as it resulted in increase of 15.1% in soil moisture content compared to holes techniques.

Keywords: Holes and Crescents, Two water harvesting techniques, Infiltration rate, Moisture content

(19985) TEMPERATURE CHANGE IN ARID, SEMI-ARID AND DRY SUB-HUMID REGION OF NORTHERN INDIA

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Temperature is the second most important meteorological variable after precipitation because it can be related to solar radiation and thus with both evaporation and transpiration processes which constitute an important phase of the hydrologic cycle. The remotely sensed Land surface temperature (LST) may be most valuable in prediction and characterization of spatial-temporal patterns of air temperature due to typical paucity of meteorological stations. Examining the spatio-temporal dynamics of temperature particularly in countries where rainfed agriculture is predominant, is vital to assess climate-induced changes and suggest feasible adaptation strategies. To that end, trend analysis in spatio-temporal scale is carried out to inspect the change in air temperature in North Indian state of Haryana using gridded daily temperature data of 1 by 1-degree resolution from 1951-2015. The study area is divided into three climatic zones namely arid, semi-arid and dry sub-humid based on Thornthwaite classification and investigation is carried out. Further, a relationship is developed between observed temperature and satellite derived MODIS/Terra LST during the year of 2001 to 2015. Mann-Kendall test and Sen's slope estimator test were used to detect monotonic trend direction and magnitude of change over time on monthly and annual basis. To explore the spatial distribution of trends, linear regression value is interpolated using ArcGIS 10 software. The results show a significant increase in maximum, minimum and mean air temperature in the study area. However, this increase is high in arid region followed by semi-arid and dry sub humid region. The strong relationship is found between LST and air temperature that suggest that MODIS offers a great potential for monitoring surface temperature changes and provides a promising source of input data for integration into spatially-distributed permafrost models.

Keywords: Air temperature, Land surface temperature, Mann Kendall test, Haryana, India

(20011) COLD STORAGE OF CARROTS GROWN IN KIRIKHAN (HATAY) REGION

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This study aimed to investigate quality changes in ‘Nanco F1’ variety carrots from Nantes group grown in Kırıkhan during cold storage. Harvested carrots were perforated bag, imperforated bag and modified atmosphere packaging (MAP) after washing with tap water and immersing in sodium hypochlorite containing 0.5% of chlorine, 3 minutes and stored at $0\pm 0.5^{\circ}\text{C}$ and $90\pm 5.0\%$ relative humidity for 5 months are used analyzed every month. In addition to carrots were kept at $20\pm 0.5^{\circ}\text{C}$ and $75\pm 5.0\%$ relative humidity for 7 days in order to similar shelf life. The weight loss, CO₂ concentrations in the bag, carrot color (L^* and h°), appearance (1-9), rooting and sprouting rate and rooting and sprouting degree, incidence of fungal decay and physiological disorders, carrot firmness, total soluble solid content, pH value, titrable acid content and taste (1-9) were determined during shelf life and storage. In the light of our findings, weight loss in perforated bags was higher than imperforated bags and MAP bags. There was no difference between washing with tap water and soaking in sodium hypochlorite in terms of weight loss. It was determined that ‘Nanco F1’ type carrots could be stored for 3 months at $0\pm 0.5^{\circ}\text{C}$ and $90\pm 5.0\%$ relative humidity without losing much of the quality for local and distant markets. In order to reduce the weight loss in carrot, MAP application was necessary.

Keywords: Kırıkhan, Carrot, MAP, Storage, Quality

(20122) EVALUATION OF SWEET SORGHUM (*SORGHUM BICOLOR* (L.) MOENCH) GENOTYPES FOR SALINITY TOLERANCE

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Abiotic stresses such as salinity are important environmental factors that influence plant growth, development and productivity. Sweet sorghum (*Sorghum bicolor* (L.) Moench) is considered as a salt tolerant crop and has the potential to grow in salt-affected areas. Germination is critical for seedling establishment especially under salinity. This study was therefore conducted to assess the response of sweet sorghum genotypes to salinity during germination stage using NaCl (sodium chloride). 242 different sweet sorghum genotypes were subjected to salt stress with and without 200 mM NaCl in petri dishes in a growth chamber maintained at 24 °C with darkness. Deionized water was used as control and treatments. Subsequently, 65 out of 242 genotypes which were identified tolerant to 200mM were advanced to subject with 300 mM NaCl. 24 from 65 well-tolerant genotypes were selected and evaluated with 300 mM NaCl with three replicates of each genotype. The obtained results indicated that 10 sweet sorghum genotypes showed significant tolerance to salt stress treatments. Morphological and additional quality tests to confirm the tolerance are being under investigation

Keywords: Abiotic stress, NaCl

**(20251) DETERMINATION OF SURFACE ENERGY FLUX OF PLANTS WITH
REMOTE SENSING: REEM MODEL APPLICATION**

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Remote Sensing is an important tool in terms of being able to carry out the results obtained on a macro scale after being checked with micro scale studies. For this reason, researches with remote sensing in agriculture are increasing in recent years. In our semi-arid country, the water losses are quite high with the evapotranspiration coming from the plants. However, there are limited practices in the methods used in our country to measure actual evapotranspiration values in plants. The reflection of the macro scale results after the approaches in other countries related to remote sensing based on the surface energy balance are calibrated by terrestrial studies in our country will cause to get healthier results. For this reason, the Regional Evapotranspiration Estimation Model (REEM) model, which is one of the models used to determine the surface energy flux in the world, will compare the energy flux measurement results obtained with the local measurements made on the basis of the micro meteorological approach on the surface of a plant grown at Atatürk Soil Water and Agricultural Meteorology Research Institute and it will be determined how much the model reflects to the reality.

Keywords: Remote sensing, Surface energy flux, REEM, Evapotranspiration

(20461) DEVELOPMENT OF A DRUM TYPE TRAY VACUUM PRECISION SEEDER FOR VEGETABLE SEEDS

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The purpose of this study was to develop, construct and test a tray vacuum precision seeder for vegetable seeds. The developed tray seeder was fabricated by “Tehmash” implement manufacturing company in Minsk. It was also designed to seed vegetable seeds in trays with 64 and 144 cells to replace the conventional manual tray seeding in Belarus. Experimental tests were investigated under laboratory and greenhouse conditions at Belarusian State Agrarian Technical University and in Agro-complex ‘Zhdanovich’ both in Minsk respectively under different operational parameters to optimise the design and operating parameters for vegetable seeds. These parameters were three levels suction holes diameters (1.0, 1.4, and 1.8 mm), three levels of vacuum pressure (1.0, 2.5 and 4.0 kPa), and a constant conveyor belt speed of 2.4 m/min. Measurements were taken for the actual single seeding, miss seeding and multiple seeding in 64 cells trays. Results from the analysis of graphical relationship showed that the maximum number of single-seed seeding of white cabbage "valentine" variety will be obtained when the vacuum values created in the drum cavity varying from 3.0 to 3.6 kPa and the diameter values of suction holes varying from 1.0 to 1.1 mm. With the optimal combination of factors, single-seed seeding of cabbage seeds is 97.0%, the number of misses is 2.0%, and the number of multiples (doubles) is 1.3%. Therefore, it was established that the design and operation conditions of the seeder for single-seeding are significantly influenced by vacuum while the influence of the diameter of the suction holes is less pronounced.

Keywords: Cell tray, Cabbage, Optimization, Vacuum pressure, Suction hole, Precision seeder

(20508) TEMPORAL VARIATION OF GREENHOUSE GAS EXCHANGE OVER CROPS ESTIMATED BY EDDY COVARIANCE METHOD

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Since 1990's, global greenhouse gas (GHG) emissions in the world, which are resulting from different reasons such as usage of fossil fuel; industrial processes; agriculture, deforestation, etc., have been significantly raising. Emissions from agriculture are mainly caused by livestock, cultivation of crops and soil. For this reason, agricultural activities are important components of global GHG budget. For this reason, in recent years, there have been some efforts and suggestions to find related solutions such as climate friendly agriculture to reduce GHG emissions from agriculture and increase the amount of sinks.

On the other hand, there is a clear need to (i) increase the number of studies to be done by internationally accepted methods and technology which should be based on situ measurement, and (ii) determine greenhouse gas emissions and sinks from agricultural fields in developing countries.

In this study, CO₂ exchanges (Gross Primary Production, Respiration and Net Ecosystem Exchange) over crops planted area in Atatürk Soil Water and Agricultural Meteorology Research Institute were investigated by a widely used micrometeorological method (Eddy Covariance). Analysis and gap filling of the collected data were applied by considering commonly used scientific technique and approaches. Finally, temporal variations of CO₂ flux components were investigated over selected crops and obtained results of the field studies are presented for the City of Kırklareli.

Keywords: Carbon dioxide, Climate change, Micrometeorology, Agricultural meteorology, Flux

(20978) COMPARATIVE ANALYSIS OF DIFFERENT *IN VITRO* HEAVY METAL CONTAMINATION IN SUNFLOWER

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Sunflower (*Helianthus annuus* L.) is cultivated as a food and feed crop as well as for bioenergy production, and it has an important role as a plant. Growing sunflower plants have shown the potential to absorb various metal contaminants apart from industrial applications of dry sunflower biomass. The plant tissue culture techniques can be used in study of metal tolerance of a plant by exposing it in culture media containing known quantities of the specific heavy metal.

In this study, sunflower plants were exposed to the MS medium having concentrations nickel-Ni, lead-Pb, copper-Cu and cadmium-Cd in 10 ppms and their genotoxic effects were evaluated by flow cytometry analysis and morphological observations comparison with seeds cultivated in heavy metal-free MS medium during 21 days.

Flow cytometry analysis showed that the roots were more affected plant tissues than leaves for all heavy metal treatments on sunflower. The results show the highest genotoxic effect was obtained for the 10 ppm Pb treatment in leaf tissue while the highest genotoxic effect was obtained for the 10 ppm Cd treatment in root tissue. As a result of morphological observations, Cd (10 ppm) is much more abnormalities having percentage than Pb, Cu and Ni, as it induced more black nodules in the roots of all treated plants unlike the control group. Also, Cd is induced the lowest germination percentage (76.83%), root length (2.84%), stem length (2.59%), total plant length (5.44%) and stem/root rate (3.87).

Both flow and morphological results will be useful in environmental monitoring of the genotoxicity of metals and with the help of tissue culture experiments the potential of plant for heavy metal stress can be studied easily.

Keywords: Sunflower, Heavy metal contamination, Flow analysis

(21022) DETERMINATION OF YIELD AND YIELD ELEMENTS IN SUNFLOWER VARIETIES GROWN AT DIFFERENT INTERVALS

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In the second crop sunflower cultivation, it is essential to ensure the most appropriate environmental conditions necessary for the growth and development of plants and to ensure that the best practices of the existing production techniques are implemented and to obtain high yield and increase quality in the products. The aim of the research was to determine the optimum plant size table diameter and seed weights and adaptation abilities after planting in sire, LG-5566 - LG-5452, LG-548 plants, which were grown in range in 2017 in the experimental area of Harran University Faculty of agriculture in Şanlıurfa Province. In the plants which were analyzed quantitatively, the core weight and table diameter were statistically different in sirean cultivars and in the LG-5485 cultivars. The plant provides a better yield because the distance between the rows is 20 cm. It was observed that in other varieties, distances over the top were better than 40 cm. In Şanlıurfa climate conditions, it was observed that sirena cultivars became a table for early flowering. LG-5485 has been identified as the latest complementary species of the vegetative period. In all kinds of plants examined, the root dry weight, leaf dry weight, total plant dry weight, leaf thickness, plant height and yield rate reached the highest values and was found to be recommended.

Keywords: Table diameter, Varieties, Distance over row, Yield

(21158) EFFECTS OF STARTER CULTURE COMBINATIONS ON THE CHARACTERISTICS OF WHITE CHEESE

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Heat treatment of the milk in cheese production reduces the level and diversity of raw milk microflora, inactivates enzymes and changes the biochemical and microbiological properties of the cheeses. By the way, microbial characteristics of cheese are influenced by different factors such as the microflora of the raw milk, starter cultures and cross contamination from unhygienic conditions during processing. Mesophilic and thermophilic cheese cultures are used in different proportions in soft, semi-hard, hard white cheeses produced in our country. In this study, the effects of different combinations of two selected cultivars on cheese yield, microbiology, physico-chemical, textural and sensory properties were investigated in medium cheese production. In the study, the whey contents were also examined during the production of the cheeses. During the process, important steps have been described for the process to ensure that non-starter bacteria in milk, clot, curd. Important steps can be taken towards the process so that non-starter bacteria do not exhibit faster activity than starter culture bacteria.

In this study, the effects of using mesophilic and thermophilic cheese cultures at different ratios on White cheese yield, microbiological, physico-chemical, textural and sensory properties were investigated. *Enterobacter* spp., yeast, mold and *Staphylococcus aureus* counts were determined. The number of *Enterobacter* spp. was found lower in cheese with high acidity, while the number of yeast was high. Despite the differences in acidity during the cheese production process, the acidity value and the physico-chemical properties were found to be the same in both cheese at the end of the production.

As a result, it has been observed that starter culture ratios, which contain different bacterial strains, can affect the technological and functional properties of freshly consumed cheese. The process conditions should be controlled by considering that the cultivation activity used in each operation will change according to the production environment temperature and the fermentation temperature.

Keywords: White cheese, Starter culture, Texture

**(21159) PERFORMANCES OF NEW INDUSTRIAL TOMATO CULTIVARS
(*LYCOPERSICUM ESCULENTUM*) IN THE GHARB REGION OF MOROCCO**

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Considering the importance of the cultivars performance in improving productivity, comparative study of ten new industrial tomato cultivars was conducted at the experimental field of Sidi Alla Tazi in the Gharb region of Morocco, for their phenological and production parameters. The objective of this experiment is to study the agronomic performance of 10 Tomato cultivars in order to seek the most adapted and high yield potential in the Gharb agro-climatic conditions. The cultivars trial was transplanted with dual lines and led by fertigation. The tested plant material consisted of cultivars with fixed growth. The adopted trial is a randomized block with four replications. Obtained results have statistically identified four cultivars; Num 0058 (120 t/ha), Artix (118 t/ha), Mariflor (117 t/ha) and Riotinto (116 t/ha), which differ by the best morphological, agronomic and technological criteria as: height, vegetative port, Leaf Area Index (LAI), yield, synchronized maturity, precocity and Brix. These cultivars expressing the highest yields and the best brix have shown the best performance of growth and development. The lowest yield was obtained by Heinz 2710 control (100 t/ha). In viewpoint of precocity, cultivars Num 0058 and NPT 63 are the earliest.

Keywords: Performance, Cultivars, Brix, Industrial Tomato, Morocco

(21238) EVIDENCES TO SHOW CASE STUDY TO IMPROVE AGRICULTURAL LINKAGES SYSTEM TO REDUCE POST-HARVEST LOSSES

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One of the main global challenges is how to ensure food security for a world growing population whilst ensuring long-term sustainable development. According to FAO, food production will need to grow by 70% to feed world population which will reach 9 billion by 2050. The term "post-harvest loss"- PHL refers to measurable quantitative and qualitative food loss in the post-harvest system. This system comprises interconnected activities from the time of harvest through crop processing, marketing and food preparation, to the final decision by the consumer to eat or discard the food.

This paper produce evidences that post-harvest and value addition are integral components of strategies to improve agricultural productivity and linkages between farmers and markets which will help contribute to food security and economic development of its target population.

Keywords: PHL Post-harvest losses

(18369) METHOD OF PROTECTING MICROORGANISMS-AGENTS OF BIOLOGICAL CONTROL FROM SUN RADIATION WHILE USING THE BIOPRODUCTS UNDER FIELD CONDITIONS

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Lack of protection of agricultural crops from pests and diseases prohibits the realization of the genotype productivity and impairs yield. Two main methods are used to ensure such protection: chemical and biological. The chemical method is still leading today, but in regards to certain pests biological means can replace chemical ones. Chemical methods of plant protection have tangible side effects such as creation of resistance in pests and environment pollution. Biopesticides do not have these side effects, are safe for animals and humans. The effective agents of such preparations are the microorganisms - agents of biological control: bacteria, fungi, actinomycetes. Sun radiation is the main factor that inhibits the viability of the microorganisms when the bioproducts are applied to plants under field conditions. "Fungipack" has developed a method to protect microorganisms serving as the basis of the bioproducts by placing them into microcontainers made of polyurea with perforations for placing the microorganisms. The shell's material is non-reactive with the spores and environment, environmentally safe (degrades to water and carbonic oxide by the microorganisms), and is heat resistant (does not change its characteristics within temperature range of -50 to +150°C). During our experiments conducted in the State collection of the phytopathogenic microorganisms of the All-Russian Research Institute of Phytopathology we have demonstrated that in the lab tests the viability of a number of the microorganisms did not decline under UV radiation. The test objects were bacterium *Bradyrhizobium japonicum*, actinomyces of the *Streptomyces* genus, micromycetes *Beauveria bassiana*, *Trichoderma viride*, *Gliocladium catenulatum*. The suspensions of the microorganisms under certain conditions were mixed with the microcontainers and exposed to UV. The samples were plated to agar medium and colony-forming units per milliliter were determined. The results of the experiments have demonstrated that usage of microcontainers in bioproduct production can prevent the loss of microorganisms from destructive impact of the UV radiation, which inevitably accompanies insolation.

Keywords: Biopesticides, Microorganisms, Sun radiation, Method of protecting

(18801) MYCORRHIZATION APTITUDE OF SIX MEDITERRANEAN BREAD WHEAT GENOTYPES

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Mycorrhizal inoculant has been tested on different varieties of bread wheat (*Triticum Durum*) at full field experiment. Some morphological, physiological and agronomic parameters were followed. Thus, the effect of mycorrhizal inocula (*Glomus* genus) has been studied on 6 Mediterranean genotypes of bread wheat.

It was observed that plant height, spike and awn length, number of grains per spike, 1000-grain weight, number of tillers/m² and grain yield are higher in plants that received treatment. The symbiotic association has significantly contributed to the improvement of plant growth but also its biological and grains yield. The results also show that mycorrhizal inoculant have enriched soil fertility by significantly increasing the majority of measured parameters at soil.

Moreover, among tested varieties, the autochthone genotypes 'Biskri' and 'Mahmoudi' (with 65% und 70% mycorrhization frequency, respectively) better responded to this biological treatment by significant yield improvement. They would seem, therefore, more adapted to the biological crop system.

Keywords: *Triticum durum*, *Glomus* genus, Mycorrhization, Genotypes

(18914) SEARCH FOR PHYSIOLOGICAL AND ANATOMICAL PARAMETERS OF SALT TOLERANCE IN BEANS (*PHASEOLUS VULGARIS* L.)

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The mechanisms of tolerance or sensitivity are experimentally investigated on a local variety of *Phaseolus vulgaris* L. grown under a growing regime of NaCl and CaCl₂ salts (control, 100 and 200 meq.gl⁻¹ NaCl + CaCl₂), under semicontrolled conditions. Bean (*Phaseolus vulgaris* L.) appears as a plant more or less sensitive to salt during its growth. The action of salt results in decreased stem and root growth in *Phaseolus vulgaris* L. The plants cultured in salty medium have morphological characteristics different from those of the controls, because the results obtained show that the growth of the stem and the root are not affected by the nutrient solution (control) by cons to high concentrations of salt (200meq.L⁻¹, NaCl, CaCl₂, mixture), the stem shows a marked regression, while the plants treated at the 100meq.L⁻¹ concentrations exhibit stress sensitivity characteristics. The action of salinity is illustrated by a reduction in the length of the stem in the lens (benaceur, 2001) and can result in a stunting of the plant until complete dwarfism (Belkhodjaand Soltani, 1992). When the plants receive saline from NaCl, CaCl₂ and the mixture (NaCl, CaCl₂) 100meq.L⁻¹, the diameter of xylem vessels is reduced as compared to the diameter of the xylem of the plants sprayed with the nutrient solution. After 40 days of growth, the diameter of xylem vessels decreased sharply after just one day of stress, this diameter slowly decreased in plants treated with 100 and 200meq.L⁻¹NaCl, CaCl₂ and (NaCl + CaCl₂). At the level of the stems, the results clearly show the action of the salt on the conductive tissue compared to the control, results in an increase in the number of the xylem vessel and the writing of its diameter. The diameter of the vessels of the root xylem and compared with that of the stems and much more affected by the action of the salt since it shows a strong reduction compared to the vessels of plants watered to the nutrient solution and whatever saline treatment to bring or Adure of exposure. Most of the plants are able to adapt to saline environments. This adaptation is accompanied by morphological, anatomical and biochemical changes (Kylin, 1975; Paljakouf, 1988). The biomass of the aerial part hydroponically grown is more developed and greater compared to culture on substrate. It is advisable in the last 20 years to use the technique of hydroponic cultivation for several economic advantages. Understanding these phenomena will be very useful for better conduct of natural plant communities, as well as for defining the ideal characteristics for plants of agricultural importance

Keywords: Salinity, Hydroponics, *Phaseolus vulgaris*, Morphological parameters, Anatomical

(18941) TOXICITY OF SOME INRET DUSTS KAOLIN, SILICA AND ZEOLITE AGAINST COWPEA SEED BEETLE *CALLOSOBRUCHUS MACULATUS* (F.) UNDER LABORATORY CONDITIONS

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Inret Dusts toxicity of Kaolin, Silica and Zeolite were tested against adults of Cowpea seed beetle *Callosobruchus maculatus* (F.) (Coleoptera, Bruchidae) using the following concentrations 5, 10, 20, 40 and 80 g/kg of cowpea seed. The study was carried out in incubator at fixed temperature and humidity at Biotechnology Research Center, Al-baath University. Readings were taken after 24, 48 and 72 h after treatment, corrected mortality rates and values of LC50, LC90, LT50 and LT90 were calculated. Results showed that mean of corrected mortality rate after 24 hours at concentrations of 5, 10, 20, 40 and 80 g/kg were 11.34, 35.73, 42.45, 47.72 and 53.71 % respectively with significant deference $P \geq 0.01$, whereas for Kaolin, Silica and Zeolite were 46.18, 38.46, 29.93 % pectively with significant deference $P \geq 0.01$. The values of LC50 and LC90 were 3.285 and 7.303 g/kg for Kaolin, 7.607 and 25.176 g/kg for Silica and 8.909 and 151.902 g/kg for Zeolite after 48h. The values of LT50 and LT90 were 23.03 and 30.43 h for Kaolin, 24.00 and 40.37 h for Silica and 31.23 and 86.04 h for Zeolite hours at 40 g/kg. As a result, Kaolin showed higher toxicity and minimal mortality time.

Keywords: Toxicity, Powder, Inret dusts, Kaolin, Silica, Zeolite, Cowpea seed beetle, *Callosobruchus maculatus*

(19184) EFFECTS OF A BIOPESTICIDE AZADIRACHTIN ON DEVELOPMENT OF THE MEDITERRANEAN FLOUR MOTH, *EPHESTIA KUEHNIELLA* ZELLER

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Insect pests, considered as one of the major problems in agriculture, can also be vectors of pathogens and pose a threat to animals, including humans. Thus, in the context of sustainable development, non-polluting pesticides have been marketed by pharmaceutical and phytosanitary firms. Among these molecules, biodegradable and low environmental impact azadirachtin. Therefore, the purpose of this study is to evaluate the lethal effects (DI50) of a commercial formulation of azadirachtin, Neem oil, in a lepidopteran pest of stored *Ephestia kuehniella*, on embryonic development. Azadirachtin was administered in vivo to newly emerged female pupae of *E. Kuehniella*, by topical application at the dose 1.37 µg; For inhibition of 50 (ID50). This insecticide was diluted in acetone and 2µl was deposited on the ventral surface of the abdomen of the pupae. The aim of our study was to evaluate the action of this molecule on pupal development by examining its effect on: (i) the duration of pupal development, (ii) the induced different morphological types, and (iii) weight changes of chrysalis in a major pest of stored products: *Ephestia kuehniella* Zeller (*Lepidoptera* :*Pyralidae*).The results showed that azadirachtin had no effect on the duration of nymphal development, showed a high level of morphological types by comparison with the controls and significantly reduced the weight of the pupae at different days compared to the controls.

Keywords: *Ephestia kuehniella*, Biopesticide, Development

(19189) SOME DURUM WHEAT (*TRITICUM DURUM*) LINES EVALUATION WITH BILOT ANALYSIS METHOD

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Research was carried out in Konya and Gözölü circles in order to determine suitable durum wheat lines for dry conditions during 2015-2016 breeding period and to evaluate them in the breeding program. In the study, 17 pieces of durum wheat line and 3 standard varieties (Çeşit-1252, Eminbey, Mimmo) were used as material. The experiment was carried out under dry conditions, in Konya, Merkez and Sarayönü (Gözölü) with four randomly selected randomized blocks trial design.

At the end of the study; It was found that the grain yield was changed to 606.87-374.14 kg/da, the grain weight was 40.86-30.04 g, the protein ratio was 14.95-12.82, the SDS sedimentation was 31.75-15.25 ml and the color (b) value was changed between 23.00-19.99 when evaluated together in both circles among the properties examined, yield and grain weight in genotype-environment interactions were at $p < 0.01$ level; SDS sedimentation was found to be significant at $p < 0.05$ level.

In the analysis of the basic components formed by using these data belonging to genotypes; Genotypes with biplot PC1 (major component 1) > 0 have high-efficiency good characteristics (Çeşit-1252, lines 8 and 9) while genotypes with PC1 < 0 are genotypes with low productivity and characteristics (Eminbey, 16 and 1 lines).

The genotypes near the PC2 value have stability properties. Those with absolute values greater than zero were identified as non-stable genotypes.

As a result of the study, the genotypes in the foreground in both regions were determined and transferred to the upper level in terms of the improvement stage

Keywords: Durum wheat, Yield, Quality, Biplot analysis

(19196) DETERMINATION OF THE ADVANCED BARLEY (*HORDEUM VULGARE* L.) GENOTYPES RELATIONS BETWEEN SOME AGRICULTURAL CHARACTERISTICS AND THESE TRAITS

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This study was carried out to determine yield and some spike characteristics of advanced stage barley hybrid lines. In the study, 16 lines of in the Bahri Dağdaş International Agricultural Research Institute Barley Improvement Program and 4 standard varieties (Larende, Konevi 98, Aydanhanım, Bolayır) were used. The trial was conducted in Konya, with 3 replications in a trial design of random blocks in the growing season of 2014-2015, as a field experiment. In the experiment, grain yield (kg/da), spike length (cm), number of grain in the ears (number), grain weight (g) traits and relations between these traits have been examined. According to the results of the research, the grain yield of genotypes ranged from 534-732 kg/da, while the experimental average was 626 kg/da. The highest yield was obtained from line-12. In the experiment, the spike length ranged from 6.38 to 8.71 cm, the number of grain in the ears was between 18.7 and 26.4, and the grain weight in the ears was between 0.94 and 1.50. Positive and significant (1%) relationship was found statistically between spike length and spike number ($r = 0.54^{**}$) between spike length and spike weight and between spike number and spike weight. In addition, there was no significant relationship between spike characteristics and grain yield.

Keywords: Barley (*Hordeum Vulgare* L.), Kernel, Yield

(19222) DETERMINATION OF NDVI (VEGETATION INDEX) AND CHLOROPHYLL VALUE (SPAD) OF SOME BREAD WHEAT GENOTYPES

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This study was conducted to determine the NDVI (vegetation index) and chlorophyll levels (SPAD) of some bread wheat genotypes in Konya ecological conditions.

In the research, 20 high grade bread wheat lines and Bayraktar 2000 and Tosunbey varieties belonging to Bahri Dağdaş International Agricultural Research Institute and Karahan 99 and Eraybey varieties belonging to Field Crops Central Research Institute were used as standard varieties. The experiment was carried out at the experimental site of Bahri Dağdaş International Agricultural Research Institute in the 2017-2018 production season with 3 replications according to the design of random blocks. In the experiment, each genotype was planted with 6 rows and 5 meters. NDVI and Chlorophyll values of the genotypes in the study were measured at the the beginning of each genotype's spike (Zadoks 50). The difference between the genotypes in both of the features discussed in the study was statistically significant at P <0.01 level. NDVI values ranged from 0.50 to 0.83 and while the line 25 had the highest value, there were no statistical differences between the lines 11, 21, 9, 12, 20, 10, 13,18 and the varieties Bayraktar 2000, Tosunbey and Eraybey. Chlorophyll values ranged from 43.6 to 53.3, while the Eraybey variety had the highest value, there were no statistical differences between the lines 10,18,6,17,14,12, 9 and the variety Karahan 99.

NDVI and Chlorophyll values, which are important criteria to be used in selection in bread wheat breeding trials, have also been used in this research. It has been determined that lines 9, 10, 12 and Eraybey variety before harvest gave high NDVI and chlorophyll values at the beginning of the spike (Zadoks 50).

Keywords: Bread wheat, NDVI, SPAD, Selection, Variety

(19374) INVESTIGATION OF YIELD AND SOME AGRICULTURAL CHARACTERISTICS OF BARLEY (*HORDEUM VULGARE L.*) GENOTYPES IN DRY CONDITIONS OF KONYA PROVINCE

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This study was conducted to determine the yield and some agricultural characteristics of barley lines and varieties. In the study, 30 lines of in the Barri Dağdaş International Agricultural Research Institute Barley Improvement Program (15 line obtained from crossing, 15 line selected from local populations) and 6 standard varieties (Karatay 94, Tokak 157/37, Tarm 92, Anadolu 98, İnce-04 and Çıldır 02) were used. The trial was carried out in Konya as a 3 replicate field experiment in a 6 * 6 partly balanced lattice trial design in the growing season of 2013-2014. In the experiment, grain yield (kg/da), plant height (cm), number of days to maturity, number of ripening days and cold damage properties were investigated.

According to the results of the research, the grain yield of the genotypes ranged from 225-395 kg/da, while the experimental average was 335 kg/da. The highest yield was obtained for line-33. It was determined that the plant size ranged from 66.8 to 85.3 cm, the number of days of heading ranged from 128 to 139 days, the number of maturing days ranged from 177 to 186 days and the cold damage varied from 1.86 to 5.19. The plant height characteristics were found to be insignificant while there were significant differences between the genotypes at the 1% level statistically due to grain yield, number of days of maturation and ripening, and cold tolerance characteristics. In this study, it has been seen that the hybrid and local lines are left behind the standart varieties especially in terms of grain yield and certain properties. It is thought that the use of these advanced lines should continue to be used in breeding programs.

Keywords: Barley (*Hordeum Vulgare L.*), Grain yield, Breeding, Heading, Cold damage

(19392) DETERMINATION OF THE STABILITY OF SOME ADVANCED BREAD WHEAT (*TRITICUM AESTIVUM* L.) GENOTYPES BY BILOT METHOD

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This research was carried out to determine the biplot stability of some advanced bread wheat genotypes.

In the study, 20 advanced bread wheat lines and 5 standard varieties (Bayraktar 2000, Gerek 79, Karahan 99, Tosunbey, Eraybey) were used as material. The experiments were carried out for two years (2015-2016, 2016-2017 production season), in Çumra and Gözölü locations, with randomized blocks trial design in 4 replications. According to the results obtained from the experiments; yield averages were between 2149 kg/ha and 3248 kg/ha, and variety, variety x year and variety x location interactions were found statistically significant. The highest yield was obtained from line 15, while the lowest yield was obtained from the Tosunbey variety. The BiPlot graph generated with the average yield results showed that 49.05% of the variation was composed of Main Component 1 and 24.01% of Main Component 2. Main Component 1 and Main Component 2 together included 73.06% of the total variation and genotypes of line 15 and Bayraktar 2000 in terms of genotypes were determined to be the most stable.

According to the results of this research conducted at 2 locations for 2 years; line 15 has been identified as a very promising line because of its high efficiency and high stability.

Keywords: Bread wheat, Yield, Stability, Biplot, Genotype

(19600) THE INTENSITY OF PESTS ON FIGS DRIED AT DIFFERENT ALTITUDES

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Almost all of the dry fig cultivation in Turkey is made in Büyük and Küçük Menderes basin. It is stated that 22% of the figs are grown in the plain conditions (50-250 m) and 78% are cultivated in mid and high altitudes (250-900 m). Dried figs pass through the stages of harvest, drying, storage, processing until reaching the consumer. At this step due to the contamination with *Ephestia cautella* and *Carpophilus* spp., quality losses occur. Dried fruit beetle *Carpophilus* spp. and fig moth *Ephestia cautella* are important storage pests that adversely affect the quality of dried figs. Due to the difference in temperature and humidity, the density of these pests varies on different altitudes. In this study, 8 and 44 samples are taken from drying areas under 250 m and above 250 respectively and totally 520 fruits analyzed in terms of dried fruit beetle and fig moth. At high altitudes, the rate of contaminated fruit was determined as 7.72%, while this rate was determined as 11.25% in lowland conditions. In terms of pest number, 0.5 insect/fruit were found in the plain conditions while 0.17 insect/fruit were found in the high-altitude regions. For positive samples with insect damage, 4.44 and 2.29 insect/fruit populations were found under the conditions of the plain and at high altitudes, respectively. With this study, it was revealed that the insect density decreases as the altitude increases. As a result, separate storage of figs come from different altitudes can be recommended to reduce pest damage for warehouses.

Keywords: Dried fig, Storage pests, *Ephestia cautella*, *Carpophilus* spp.

(20897) EXPERIMENTAL STUDY AND MODELING BY SOLAR CONVECTIVE DRYING OF MOROCCAN SESAME PODS

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Drying is one of the methods used widely for dehydration and conservation of agricultural products. Sesame (*Sesamum indicum L.*) seed, an aromatic plant is one of the important oil seed crops in the world. It is not only a good source of edible oil, but also widely used in baked goods and confectionery products, playing an important role in human nutrition. In this paper, the effects of air temperature, air-flow rate on drying kinetics of sesame pods were investigated. Convective air-drying characteristics of sesame pods were evaluated in a cabinet dryer. Drying was carried out at 50, 55, 60, 65, 70, 75, 80°C and drying volume flow rates 150 m³/h and 300 m³/h. Four mathematical models available in the literature were fitted to the experimental data. The Midilli and Kucuck model is given better prediction than the other models and satisfactorily described drying characteristics of sesame pods.

Keywords: Sesame pods, Drying, Mathematical modelling

(20982) EFFECTS OF NANO ZINC CHELATE APPLICATION ON SEED GERMINATION AND SEEDLING GROWTH OF PERIWINKLE (*CATHARANTHU ROSEUS* L.)

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Periwinkle (*Catharanthus roseus* L.) is an ornamental plant with medicinal values. It is an evergreen shrub and found to grow in many regions around the world. Alkaloids of this plant have a great medicinal importance to treat diabetes, malaria, cancer and etc. With attention to the importance of this medicinal plant, this experiment was carried out to study the effects of seed priming with Nano zinc chelate on seed germination and growth of periwinkle seedlings. The experimental design arranged as a completely randomized design with three replications. For this, Periwinkle seeds were soaked in Nano zinc chelate solutions with 4 and 5 g/L concentrations for 12, 24, 48, 60 and 72 hours at 20°C and then dried. The results showed that the percentage and rate of germination, length and dry weight of seedling were significantly influenced by Nano zinc chelate priming. Percentage and rate of germination, length and dry weight of Periwinkle seedling were increased with increasing duration and concentration of Nano zinc chelate treatment, so that the highest percentage and rate of germination, seedling length and dry weight were obtained from primed seeds with of 5 g/L Nano zinc chelate for 72 hours, which was significantly higher than those of the control. On the other hands, the utilization of the seed priming with Nano zinc chelate was significantly improved the germination and growth of Periwinkle seedlings through improvement of seed vigor. According to the results, application of 5 g/L Nano zinc chelate for 72 hours, considered as the best priming treatment for improvement of periwinkle seed germination and growth properties.

Keywords: Germination, Medicinal plant, Nano zinc chelate, Priming, Seedling dry weight

(21166) EFFECT OF THE POPULATION DENSITY AND DAMAGE OF SAFFLOWER FLY [*ACANTHIOPHILUS HELIANTHI* (ROSSI, 1794)] ON YIELD AND IN SAFFLOWER GENOTYPES

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The safflower fly, *Acanthiophilus helianthi*, is one of the most important pests of safflower and causes a lot of loss to the crop. The sensitivity of safflower to some pests as safflower fly (*Acanthiophilus helianthi*) has limited its production. Objectives of the study to determine interaction parasitism of the safflower fly with genotypes, yield and seed was damaged by safflower fly. The experiment was conducted 25 genotypes in randomized completely blocks design with three replications at Trakya ARI experimental area, Edirne, Turkey in 2016 and 2017 growing cycle. Seed yield, seed number in head, damaged and non-damaged seed, and number of larvae/pupae in head and relation among investigated parameters were investigated. According to the results it was found various differences among genotypes based on studied characters. The mean yield of the genotypes was 119.9 kg da-1 and Seledas 235 was the highest yielding cultivar with 195.5 kg da-1 yield, followed by Oleic Leed and W6 9821 genotypes. Seeds were totally counted in 20 heads and ranged from 245.3 to 581.0, the mean was 366.1 seeds. The mean seed in head ranged from 12.3 (Seledas 144) to 29.1 (Oleic Lead). The highest non-damaged seed number with an average of 557.7 and the lowest with an average of 226.7 were obtained from Oleic Leed and Seledas 144, respectively. The highest larvae/pupa number was determined with 78.0 in Seledas 222 and the lowest with 19.7 in Line22. The mean larvae/pupae were 2.39 in per head and the highest 3.90 in Seledas 222 and lowest was 0.98 in Line 22. In the research it was determined that positive correlation between grain yield with total and mean seed per head. Highest canopy temperature increased damaged kernel number per head. Also increasing in biomass caused more damaged kernel number per head.

Keywords: Safflower, Safflower fly, Genotypes, Agronomic traits

(21178) IDENTIFICATION OF THE BLOWING PROBLEMS CAUSED BY THE CLOSTRIDIUM GROUP BACTERIA IN HARD CHEESE AND SUGGESTIONS FOR SOLUTION

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Cheese is a dairy product that is produced and consumed in almost every place and country and has close to 4000 cheeses in the world. There are spore form bacteria that cause late blowing which causes the cheese to lose its unique taste, structure and aroma, whether consumed without being matured or ripened. *Clostridium* group bacteria are the leading bacteria of these bacteria which have visually different blowing in cheese. *Clostridium tyrobutyricum*, *Clostridium butyricum*, *Clostridium sporogenes*, *Clostridium beijerinckii* are the most known.

The most common approaches to prevent this defect include bacterofugation or microfiltration of milk, and addition of nisin, nitrate or lysozyme. Lysozyme, on the other hand, is able to lyse the cell walls of the vegetative form of *Cl. tyrobutyricum* through the enzymatic cleavage and consequently to control clostridial growth and butyric acid fermentation during the maturation of cheeses. The lysozyme is obtained from the egg whites, the bacteria is *Cl. tyrobutyricum*. On the other side, for example, the appearance and inactivation of *Clostridium sporogenes*, *Clostridium beijerinckii* in cheese are different. At this point, it is important to determine the most appropriate solution after the detection of bacteria or bacteria that cause blowing problem in the cheese.

The eyes of these spores are variable, and the steps for resolving the problems are not clearly known. Cheese producers have had huge economic losses due to this cheese problem. Since the separate problem can not be clearly identified from these losses, it is seen that the methods applied as solutions do not work and the money that is separated from the budget of the operator for this does not find its place either. We see that there are always hesitations about the problems with the eye problem in cheese and the solution methods are not clearly known. For this reason, in the cheese presented in recent years, especially in hard cheese such as kaşar, it is beneficial to look at the causes of this problem and the precautions to be taken to prevent it. This article is intended to address such a problem.

Keywords: Cheese, Blowing problem, Spore bacteria

(21190) DETERMINATION OF GENOME SIZE OF LOLIUM SPECIES BY FLOW CYTOMETRY METHOD AND ITS USAGE IN TAXONOMIC IDENTIFICATION

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The genus *Lolium* consists of 8 annual and perennial species. They are distributed through out temperate regions of the world. Two species in the genus, *L. perenne* and *L. italicum* are among the most important forage crops. *L. perenne* is also widely used in the creation of green areas. *Lolium* species are quite similar to each other morphologically. Interspecific hybridization also often occurs among the species. This close morphological similarity among *Lolium* spp. makes identification and classification of species a difficult problem for forage and turf grass scientists.

Therefore, new methods are needed to facilitate the taxonomic identification and classification of *Lolium* species. The genome size is the total amount of DNA included in the cell nucleus. The genome size is stable among individuals of a species and cells of a single plant. However, it differs approximately 1000 folds in angiosperms. Therefore, genome size is species specific. These characteristics of genome size make it useful in many areas of biology such as genetics and evolution. Today, flow cytometer is the method of choice in genome size determination due to its accuracy, quickness and easiness.

The objective of this study is to determine genome size of 8 *Lolium* species by flow cytometry and to use the information for the taxonomic identification of species. Based on the results of the study, the mean 2C genome size of *Lolium* species varies from 7.76 pg to 4.87 pg. The differences between species are statistically significant.

In conclusion, genome size determined by flow cytometer can be used in taxonomic identification of *Lolium* species and facilitate their classification.

Keywords: *Lolium*, Flow cytometry, Genome size, Taxonomy

(21191) RHEOLOGICAL MODELING EVALUATION OF THE EFFECT OF TEMPERATURE ON DIFFERENT DILUTIONS OF HONEY

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Honey is the natural viscous food produced by honey bees from the nectar of plants. Honey available in Albanian market was characterized for rheological and physicochemical properties. Honey was serially diluted with different percentages of water (10 – 50 %). The density and viscosity of diluted honey were experimentally determined as a function of temperature (20 to 60°C).

Viscosity is an important quality attribute of honey and there is various physical that influence this property. Several physicochemical and rheological characteristics of floral honey were investigated: density, pH, free acidity, ash, electrical conductivity, dynamic viscosity and kinematic viscosity. To study the temperature and dilution effect on viscosity Arrhenius, Abramovic and power law models were considered. The evaluations of the models were done by R² and mean absolute percentage error. According to the results Abramovic model provides a good description of honey viscosity as a function of the combined effects of temperature.

Keywords: Honey, Density, Viscosity, Temperature, Arrhenius model

(21194) DETERMINATION OF NUCLEAR DNA CONTENT AND PLOIDY LEVELS OF NATURALLY GROWING BERMUDA GRASS [*CYNODON DACTYLON* (L.) PERS] PLANTS IN NAMIK KEMAL UNIVERSITY CAMPUS BY FLOW CYTOMETRY

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Bermuda grass is a rhizomatous and long-lived perennial warm season grass species originated in India and South Africa. The species has quite different forms, from small and thin leaf types used for the formation of green areas to large and broad leaf types used as forage crops. Bermuda grass grow commonly in Turkey. However, the number of studies on naturally growing bermuda grass ecotypes in Turkey is very limited. Based on the previous studies, the species has a ploidy series from diploid to hexaploid. However, there was no information on ploidy of bermuda grass ecotypes growing naturally in Thrace region of Turkey prior to this study.

The objective of this study was to determine the nuclear DNA content and ploidy levels of bermuda grass genotypes naturally growing in Namik Kemal University main campus by flow cytometry method.

In this study, 31 bermuda grass genotypes collected from different points of the campus were used as plant materials. According to the results of the flow cytometric analysis, it was determined that the 2C nuclear DNA content of genotypes used in the study varied from 2.13 to 3.32 pg. The genotypes were separated into two groups based on their nuclear DNA content. When the chromosomes of one genotype from each groups were counted, it was found out that the genotype from the first group had $2n=36$ chromosomes while the genotype from the second group had $2n=54$ chromosomes. Based on the results of this study, ploidy of the bermuda grass genotypes varies between tetraploid and hexaploid.

In conclusion, based on the results of this study, bermuda grass ecotypes growing naturally in Thrace region of Turkey have at least two different ploidy levels. Therefore, it is necessary to determine the ploidy levels of bermuda grass genotypes before include them in a breeding programme.

Keywords: Flow cytometry, Bermuda grass, Nuclear DNA content, Ploidy

(21202) MODELING THE EFFECT OF TEMPERATURE ON PHYSICOCHEMICAL PROPERTIES OF OLIVE OIL

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Olive oil is used throughout the world, especially in regions around the Mediterranean Sea. Oils help to improve the taste, color and quality of the food, so plays an important role in health and in life. The main goal of this work is to study the dependence of viscosity of olive oil on temperature, since is a fundamental characteristic property of all liquids. The dynamic viscosity of olive oil was experimentally determined as a function of temperature (20 to 60°C). Several physicochemical and rheological characteristics of olive oil were investigated. The studied parameters were: density, moisture content, pH, free acidity, electrical conductivity, dynamic viscosity and kinematic viscosity. The viscosity of olive oil was represented as a function of temperature by using two, three and multi-constant proposed mathematical models. The evaluations of the models were done by the correlation coefficient, percentage of average absolute deviation and standard deviation of the data.

Keywords: Olive oil, Mathematical models, Density, Viscosity

(21206) DEVELOPMENT OF CALIBRATION EQUATIONS FOR SOME QUALITY PARAMETERS OF CHICKPEA FLOUR USING NEAR-INFRARED REFLECTANCE SPECTROSCOPY (NIRS)

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Chickpea (*Cicer arietinum L.*) is grown in over forty countries around the World. As a nutritional value, it has higher content of P and Ca and higher protein than other legumes. The superiority of chickpeas to other legumes is not limited to widespread use. Because of the high protein it contains, it is very important as a resource to meet protein needs for people with low-income resources or who choose not to consume animal food. During the commercial transactions, the material need to be characterized in very short times. For these reasons, a fast technique such as a classification based on NIR spectra acquired on the wheat flour samples of interest could be a very useful tool. NIR spectroscopy is already widely used in the cereal context with the aim of quantifying different chemical components of the flour, such as moisture and proteins. In this study, the chickpea flour samples were scanned by using NIR System model 6500 to obtain NIR spectra between 400-2500 nm in every 2 nm. The ISI scan and Win ISI III 161 programs were used to collect the data for spectra and perform the calibrations. The 205 samples analyzed with classical method, were predicted by determined calibration equations. In order to ascertain which Mathematical treatment was better to develop calibration equation of chosen material, quality parameters were selected to develop calibration equations with different mathematical treatments (1,4,4,1; 1,6,6,1; 1,8,8,1; 2,4,4,1; 2,6,6,1; 2,8,8,1; 3,4,4,1; 3,6,6,1; 3,8,8,1) and scatter correction (None, SNV only, Detrend only, Detrend and SNV, Standard MSC, Weighted MSC and Inverse MSC) Prediction equations for these material were developed by modified partial least squares regression. The results showed the effects of different mathematical treatments with (None, SNV only, Detrend only, Detrend and SNV, Standard MSC, Weighted MSC and Inverse MSC) for calibration equations with the chickpea flour samples for the equations of protein, the pretreatment of 1,8,8,1 combined with «SNV only» were much better than the others (RSQ=0.956). For the equations of dry weight, the pretreatment method of 2,4,4,1 with «SNV and Detrend» had a better effect (RSQ=0.975). For the equations of moisture, the pretreatment method of 1,6,6,1 with «none» had better effect (RSQ=0.936) than the other pretreatment methods and for wet weight, the pretreatment method of 1,4,4,1 «Standard MSC» was much better than the other pretreatment methods (RSQ=0.485). It can be concluded that NIR spectroscopy technique can be used reliably to predict protein, dry weight and moisture parameter values in chickpea flour samples but not for wet weight parameter.

Keywords: Chickpea, Quality Parameters, NIRS

(21208) EFFECT OF IRRIGATION AND NITROGEN LEVELS ON YIELD, QUALITY AND NUTRIENT STATUS IN BROCCOLI

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Determining of fertilizer application rates in order to maximizing the yield is often coming with the challenges of environmental implications. Reducing the risk of environmental implications in greenhouse cultivation is more challenging task for growers since nitrogen is often applied in large quantities due to the higher yields and extended crop cycle. Yield response to irrigation of broccoli in reducing nitrogen levels allows better use of water and N fertilizer in protected cultivation. In order to examine the possibilities of reducing fertilizer N amount in two irrigation levels, field trials were conducted in an unheated greenhouse in fall-winter period. Treatments consisted of four fertilizer N levels (0, 40, 80 and 120 kg N/ha) and two irrigation levels (restoring 50 and 100% of water volume at field capacity). N fertilizer was applied as ammonium nitrate in eight split applications via fertigation in both irrigation levels. The yield of broccoli heads increased with increasing N rates in both irrigation levels. Yield difference between lowest (0 kg/ha) and highest (120 kg/ha) N levels was approximately 1 ton/ha in 100% irrigation while it was approximately 3 tonnes/ha in 50% irrigation. However, 0 and 40 kg N/ha fertilization levels were more restrictive to the relative head weights in 50% irrigation than in 100% irrigation with 0 kg N/ha (control). Agronomic fertilizer efficiency, soil yield N use efficiency and apparent N recovery indices increased with increasing fertilizer N levels. Standardized N removal was highest with the highest N levels. Results indicated that the amount of nitrogen required for broccoli plant to produce one ton of head changed between 27,5 and 31,7 kg/ha in 100% irrigation and 27.5 and 30 kg/ha in 50% irrigation based on fresh weights.

Keywords: Broccoli, NUE, Deficit irrigation, Protected cultivation, Nitrogen

(21209) EFFECT OF P, ZN AND EC OF SOLUTION ON GROWING AND QUALITY OF PEPPER SEEDLING

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Seedling quality response to moderate salinity conditions is of importance in greenhouse growing. This study aimed to determine the effects of different levels of phosphorus and zinc in liquid fertilizer with different EC levels. Ten different fertigation solutions consist of three P levels (30, 40 and 50 mg/l), three Zn levels (0.2, 0.3 and 0.4 mg/l) and two EC levels (1.5 and 2.5 dS/m) were applied to pepper seedling from two true-leaf stage to planting stage. Application of liquid fertilizer with salinity of 2.5 dS/m was decreased the fresh and dry weights of bell pepper seedlings while it was positively affected the fresh and dry weights of sweet pepper seedlings. In addition, it was increased seedling stem diameter of sweet and hot pepper. P and Zn levels had no significant effect on quality of pepper seedlings in both salinity levels.

Keywords: Salinity, Pepper, Transplanting, Zinc and phosphorus

(21210) YIELD ADVANTAGE OF STRIP INTERCROPPING OF GHERKIN WITH SWEET CORN

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Intercropping concepts have key role in sustainable agriculture to achieve higher yields by using the sources in higher efficiency. In order to evaluate the yield response of gherkin/sweetcorn intercropping, a field experiment was conducted based on a randomized block design in late spring-summer period in 2017. For the purpose of enabling cropping more adept to necessities of commercial cultivation strip intercropping pattern was preferred and treatments included gherkin (cv. Selin) monoculture, sweetcorn (cv. Flinta F1) monoculture and strip intercrops of three rows of gherkin and two rows of sweetcorn. Land equivalent ratio (LER) and relative crowding coefficient (K) values indicated that intercropping system had a yield advantage over monocropping system. LER values of gherkin/sweetcorn strip intercropping with ratio of 64% and 36%, respectively, showed that yield produced in total intercrop would have required 34% more land if planted in monocropping. Relative interspecific competitiveness (RC) and relative competition intensity (RCI) values higher for both species, though sweetcorn was the dominant species in the intercropping system.

Keywords: Intercropping, Land equivalent ratio, Monocropping, Yield, Corn, Gherkin

(21235) THE PRECISION CONTROL OF WEED IN WHEAT CULTURE

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Wheat is the world's most important culture both because of the cultivated areas and because of the importance they have in people's food is the culture that occupies the highest. Weed control is a basic component in wheat crop technology without which no production can be obtained at the production potential. Under pedoclimatic conditions in the area of the Roman Plain weed control of wheat crops consists of combating weeds in the spring until the formation of the first interlock BBCH EC32, when the weeds are in the rosette stage. In the conventional farming system weed control is achieved by uniform application over the entire surface of the herbicide solution. According to the researches carried out it was found that the area occupied by weeds is in all cases less than 50% of the total area. The researches consisted in the realization and testing of equipment for automatic weed control of wheat weeds. The equipment consists of a video camera, a Raspberry Pi 3 module and an electrovalve that closes and opens a nozzle. By implementing an algorithm to discriminate weeds and crop plants, herbicides are administered only where weeds are identified. Research results have shown that the proposed technical solution has reduced the amount of herbicide used by more than 60%, which confirms the potential for using this equipment. The research was founded by executive agency for higher education, research, development and innovative funding (UEFISCDI), by contract 33BG/2016, *PN-III-P2-2.1-BG-2016-0472*

Keywords: Wheat culture, Precision control, Weed, Automatic control

(21249) USING THE NEAR INFRARED REFLECTANCE SPECTROSCOPY (NIRS) METHOD TO EVALUATE CALIBRATION EQUATIONS FOR SOME QUALITY PARAMETERS OF BARLEY

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Due to the rapid population growth both in the world and in our country, vegetable and animal production needs to be increased in parallel with the increasing rate of consumption of nutrients. Barley (*Hordeum vulgare L.*) is the fourth most common type of cereal after wheat, rice and maize produced the most in the world. It is accepted that Anatolia has a long history of barley cultivation. Barley grain is generally used as raw material of animal feed, malt and beer industry as well as in obtaining certain nutrients as malt additive. In addition, the structure of barley, starch and enzyme richness make it an indispensable raw material in the brewing sector. In order to achieve the desired production increase in crop production, it is necessary to have high yield potency, to adapt to the growing conditions, to obtain high quality, resistant to diseases and harmful varieties, or to improve and spread the varieties in production. It is desirable that the quality analysis of cereals in breeding programs should be economical and completed accurately in a short time. In this study, we used NIR System model 6500 to obtain NIR spectra between 400-2500 nm in every 2 nm. The ISIScan and WinISI III 1.61 packet programs were used to collect the data for spectra and perform the calibrations. In order to ascertain which Mathematical treatment was better to develop calibration equation of chosen material, quality parameters were selected to develop calibration equations with different mathematical treatments (1,4,4,1(1:derivative; 4:gap; 4:smooth and 1: smooth 2); 1,6,6,1; 1,8,8,1; 2,4,4,1; 2,6,6,1; 2,8,8,1; 3,4,4,1; 3,6,6,1; 3,8,8,1) and scatter correction (None, SNV only, Detrend only, Detrend and SNV, Standard MSC, Weighted MSC and Inverse MSC). Prediction equations for barley material were developed by modified partial least squares regression. Among thecalibration equations developed for moisturecontent, the pretreatment of 2,4,4,1 combined with «Detrend only» were much better than the others (RSQ=0.988). For friability, the pretreatment method of 2,4,4,1 with «SNV and Detrend» had a high correlation (RSQ=0.982). For the equations of protein content, the pretreatment method of 2,6,6,1 with «Detrend only» had better effect (RSQ=0.939) than the other pretreatment methods and for test weight, the pretreatment method of 2,6,6,1 «Weighted MSC» was much better than the other pretreatment methods (RSQ=0.939). It can be concluded that NIR spectroscopy technique can be used reliably to moisture content, friability, protein content and test weight quality parameter values in barley samples.

Keywords: NIRS, Calibration, Quality parameters, Barley

(21271) EFFECT OF ORGANIC SOIL AMENDMENT ON POTATO CROP

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The present work aims to study the effect of a soil biological amendment on Potato SPUNTA cultivated on open field. It is a commercial liquid inoculant named "VESTA" based on microbes (mycorrhizal fungi and bacteria) which acts on the plant, the tubers quality and on the soil. For this, three treatments have been applied:

T0: 100% mineral fertilization (Control)

T1: 100% mineral fertilization + VESTA

T2: 75% mineral fertilization + VESTA.

The results analyzed showed that the studied treatments influenced the growth parameters (plant height, main stem diameter, leaf number and SPAD index), the composition of the leaves in bioactive compounds (total phenols, flavonoids and antioxidant activity), the mycorrhizal root intensity and frequency as well as soil chemical composition and bacteria number per gram. In fact, the results showed that T2 improved the majority of the studied parameters followed by T1 in comparison to T0. Treatment (T2) improved the total yield by 10% over control (T0). In addition, it has resulted in the increase of large tuber size number compared to the control. While T1 treatment improved only organic matter and soil phosphorus levels and some parameters related to tuber quality such as total phenols and flavonoid contents. The results revealed that the use of Vesta is promising for agriculture. Its use combined with a mineral fertilization reduced by 25% is more advantageous and because of this, it is recommended in potato cultivation in Tunisia.

Keywords: Mineral fertilization, Mycorrhiza, Bacteria, Potato, SPUNTA, Vesta

(21287) BREEDING FOR HEAT TOLERANCE IN COTTON

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With global warming and climate change, high-temperature stress has become a major factor affecting crop growth and yield. High temperature is a major environmental factor limiting crop productivity. Cotton (*Gossypium hirsutum L.*) crops experience periods of extreme high temperatures during flowering and boll development, but information is lacking on the physiological response of cotton to high temperature stress and appropriate techniques to quantify this response. Warming directly affects the rate of plant respiration, photosynthesis, and other biochemical processes. For instance, enhanced CO₂ concentration can increase photosynthetic rate especially for plants growing under warm and dry condition such as plants. Naturally, plants have their own mechanism to tolerate a certain level of increased temperature. Current adaptations to high temperature developed to technical and management systems are insufficient to sustain yield. For this reason, breeding for heat-tolerant crops is in high demand. This review provides an overview of the effects of high temperature on plant physiology, fertility and crop yield and discusses the strategies for breeding heat-tolerant cultivars.

Keywords: Heat tolerance, High temperature, Photosynthetic rate, Cotton

(21355) RELATIONSHIP BETWEEN ALKALINE WATER RETENTION CAPACITY (AWRC) AND OTHER QUALITY PARAMETERS IN SOME CHICKPEA (*CICER ARIETINUM L.*) LINE AND VARIETIES

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Chickpea (*Cicer arietinum L.*) is an important pulse crop grown and consumed all over the world, especially in Turkey. It is quite rich in terms of complex carbohydrates, proteins, vitamins and minerals. When the quality parameters are determined, the water intake capacity has an important place in determining the quality of the chickpea. The Alkaline Water Retention Capacity (AWRC) test is also widely used for evaluation of soft wheat flours.

In this study, some selected chickpea lines were analyzed for alkaline water retention capacity with sodium bicarbonate solution which is usually done with wheat flour, in legume flours. The results were evaluated in a similar way to wheat flour. The correlations between protein, size (6mm, 7mm, 8mm, 9mm) cooking time, wet weight, dry weight, swelling capacity, wet volume, dry volume, swelling index and water uptake index were investigated. The use of acidic or basic solutions in flour tests is quite common. Hydration capacity, which is an important quality parameter in bread and durum wheat, is also very important for legumes. Hydration capacity is highly correlated with the alkaline water retention capacity. It has been determined that AWRC parameters is related to other quality parameters such as swelling index, wet volume, wet weight as well as hydration capacity.

The data were evaluated using JMP 7.0 statistical software (SAS Institute Inc.). There was no significant relationship between cooking time, sieve analysis, dry weight and dry volume and alkaline retention capacity. It was found positive correlation between alkaline water retention capacity data and swelling index ($r=0.613^{**}$), water intake index ($r=0.616^{**}$), wet volume ($r=0.320^{**}$), swelling capacity ($r=0.459^{**}$), hydration capacity ($r=0.378^{**}$). For protein content ($r=-0.345^{*}$) there was also found an important negative correlation.

There was a very high positive correlation between wet weight and wet volume; wet weight and dry weight; wet volume and dry volume; wet volume and hydration capacity ($r=0.994^{**}$; 0.963^{**} ; 0.948^{**} ; 0.980^{**} , respectively). In this study, it has been shown that the alkaline water retention capacity test can be successfully used in the selection of aspect for the quality of pulse breeding material.

Keywords: Chickpea , AWRC, Quality analysis

(18746) FOOD SECURITY THROUGH ORGANIC PROCEDURES

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Food plays very vital role in maintaining proper health and also helps in prevention and cure of diseases. Good nutritive food makes health, but at the same time bad or unhealthy food give rise to several diseases (FAO 1996, Rome Declaration). According to 2015 World Hunger and Poverty Facts and Statistics, the most suffering countries are the Asia: with 525.6 million people starving, Sub-Saharan Africa with 214 million, and Latin America and the Caribbean with 37 million deprived of food (“Know Your World: Facts about Hunger and Poverty”, 2015). This study aimed to answer the following: a) What are the effects of organic processes in farming on the quality of the resources and to its consumers; and b) How does vegetables scraps help in eradicating hunger? This action research made use of interview to the residents of Barangay Polipo, San Gabriel, La Union. As a result, the researchers came up with an action plan on addressing the SDG number 2 which is entitled Zero Hunger that focuses on Food Security Through Organic Procedures. With the said program, animal manures and food waste will be fully used for food production for security. Philippines as being considered as an agricultural country providing alternatives that are convenient to the farmers will help aid the problems related to hunger.

Keywords: Food, Hunger, Organic procedures

(18752) PHYTOCHEMICAL CHARACTERIZATION AND ANTIBACTERIAL ACTIVITY OF METHANOLIC EXTRACT OF *CAULERPA RACEMOSA* VAR *CYLINDRACEA* COLLECTED FROM MOSTAGANEM COAST, WEST ALGERIA

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The study aims to screen the phytochemical composition and to assess the antimicrobial activity of the marine algae *Caulerpa racemosa* var *cylindrea* from Salamandre beach (Mostaganem coast, west Algeria). The green seaweed, handly harvested from the intertidal zone of Salamandre (Latitude N: 35°54'37.94", Longitude E: 0°3'17.37") between April and May 2017, was subjected to Soxhlet extraction with methanol solvent. Preliminary phytochemical tests and polyphenols, flavonoids and tannins content were performed. The antioxidant activity was evaluated using the free radical DPPH reduction method. GC-MS analysis was performed using non polar and polar capillary column. The extract was tested *in vitro* for its potential antimicrobial activity against *Bacillus cereus* (ATCC 10876), *Enterococcus faecalis* (ATCC 29212), *Staphylococcus aureus* (ATCC 25923), *Echerichia coli* (ATCC 25922), *Pseudomonas aeruginosa* (ATCC 27853) and *Proteus mirabilis* (ATCC 35659). Phytochemical tests revealed the presence of polyphenols (flavonoids and tannins), alkaloids and amino acids. The measured polyphenols, flavonoids and tannins reached 66.61 ± 0.66 mg GAE/g DM, 114.16 ± 0.52 mg QE/g DM and 19.06 ± 3.76 mg CE/g DM, respectively. The IC₅₀ was estimated to 42.06 mg/ml. Eighty seven compounds were identified by GC-MS analysis. Among the major compounds: Stigmast-5-en-3-ol (12.9%), 1-Hexadecanol (9.05 %), Oleyl oleate (4.2%), Squalene (1.96%), Methyl melissate (2.79%), 1-Decanol, 2-hexyl- (2.19%) from non- polar column, and Palmitic acid (14.92 %), 4-hydroxy-2-methylpyrrolidine-2-carboxylic acid (11.79%), Myristic acid (4.49%), Hexagol (2.75 %), 18-Crown-6 (2.57%)Oleic Acid (1.2%), Hexa-hydro-farnesol (1.13%) from polar column. The antibacterial activity was most effective on *Pseudomonas aeruginosa* 10 ± 0.00 mm compared to *Staphylococcus aureus* (8.83 ± 0.16 mm) and *Bacillus cereus* (7.33 ± 0.88 mm) ($p < 0.05$). The remaining bacteria were resistant to the methanolic extract. The results of the present study indicate the potential use of *Caulerpa racemosa* from Algerian west coast as a source of bioactive compounds.

Keywords: *Caulerpa racemosa*, Antibacterial activity, Phytochemical components, GC-MS, Mostaganem coast

**(19250) PHYTASE SUPPLEMENTATION IN THE DE-OILED PLANT MEAL
BASED DIET IMPROVES THE GROWTH PERFORMANCE OF AN INDIAN CARP
(*LABEO ROHITA*)**

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A 80-days experiment was designed to study the effect of phytase in the plant meal based diet on growth performance of *Labeo rohita*. Two iso-nitrogenous (crude protein-14%) test diets (T1 and T2) were formulated. Sixty (60) juveniles of *L. rohita*, with an average weight 5.11 ± 0.02 g were stocked in six uniform size tank in triplicates with 10 fishes per tank following a completely randomized design (CRD). At the end of the 80 days growth performance and nutrient utilization of *L. rohita* were evaluated and found that enzyme supplementation @ 0.01% in the diet significantly ($p < 0.05$) improved the growth performance and nutrient utilization (weight gain % from 73.8% to 88.7%, SGR from 0.78 to 0.87 and FCR reduced from 3.71 to 3.09) of *L. rohita*. Carcass composition of fishes did not vary significantly. Hence, the experiment concludes that phytase in the De-oiled plant meal based diet improves the growth performance of *L. rohita*.

Keywords: *Labeo rohita*, De-oiled meal, Phytase, Carcass, FCR

(19580) IMPACT OF MALATHION ON BLOOD BIOCHEMICAL PARAMETERS OF A FRESHWATER FISH, *CRRHINUS MRIGALA*

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Both the aquatic and terrestrial ecosystems are interconnected. Deterioration of one can affect the productivity of the other. To investigate the possible effect of malathion widely used as pesticide in agricultural fields of Pakistan on the aquatic organisms a laboratory study was carried out in small concrete ponds by using normal tap water. For this purpose, a successful Indian major carp specie, *Crrhinus mrigala* was exposed to different concentrations of malathion for different durations. The physico-chemical analyses of ponds water were carried out by following APHA methods. The time duration used was 24, 48, 72 and 96 hours acute toxicity tests. The malathion concentrations used were 5 µl/L (one day), 4µl/L (2 days), 3 µl/L (3 days), 2 µl/L (4 days). At the end of experimental periods fish blood was collected and analysed. On analysis of fish blood decreased levels of glucose, cholesterol, triglyceride, high density lipid, low density lipid, total protein, lactate dehydrogenase while increased concentrations of alkaline phosphatase, alanine amino transferase were recorded. The results suggest the exposure of the fish to sub lethal concentrations have altered the metabolism and blood composition of the target animal. The study gives scope to further biochemical studies for the assessment of effects of pesticide on other organisms, as pesticides are becoming alarming part of our ecosystem, because of increasing human food demands.

Keywords: Lipid, Fish, Toxicity, Malathion, Pesticides, Cholesterol, Glucose, Total protein

(19956) AQUARIUM ROOM AUTOMATION SYSTEM

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Main goal of this study is to observe 25 aquarium specifications and set them for the adequate situations with microcontrollers and sensors in the aquarium room. These specifications for aquariums are pH, temperature, conductivity and water level of the aquarium.

Data for water temperature, conductivity and water level for aquariums measured for master sensor microcontrollers. Besides this pH data of aquariums are measured from a rechargeable hand-unit with a pH sensor, 7-segment display for aquarium numbers (these numbers indicates the instant measured aquarium) and a button to select aquarium number to measure. With the help of this hand unit, pH values of the aquariums, measured and sent to the master microcontrollers for data logging (data logging provided with instant time), web view and LCD display. LCD display provides in-field data control of aquariums with aquarium numbers. Logged data can be downloadable from the web server of this lab system with the time attachment. Web server of the lab system provides current data of the aquariums at the mean time to the server that can be accessible from global network. Also with the help of air temperature sensor values, AC climate in lab can be controlled via web server for the adequate temperature in the aquarium room. Security of the room is provided by PIR sensors to detect any action in lab while closed. Mobile application for android devices, is in progress for retrieve data from phones and tablets instantly with notifications and necessary messages with the help of web server data.

The automation system is a pioneering work on aquarium room automation.

Keywords: Aquarium, Room, Automation, Microcontrollers

(20886) EVALUATING SALINITY LEVELS FOR OPTIMAL GROWTH OF NILE TILAPIA (*OREOCHROMIS NILOTICUS*) FINGERLINGS

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The study was conducted to evaluate the effect of different salinity levels on growth, survival and hematological parameters of Nile Tilapia (*Oreochromis niloticus*) fingerlings. One hundred and eighty fingerlings having average initial weight 11.6 ± 3.4 g were acclimatized to laboratory conditions and exposed to four salinity levels (n=180) denoted T0 (0ppt), T1 (6ppt), T2 (10ppt) and T3 (14ppt) in glass aquaria with dimensions (3.5"× 2.5"× 3.5") for 90 days in triplicate. Fingerlings were offered "Oryza organic feed", twice a day @ 4% of body weight. Results revealed that electrical conductivity, bicarbonates, sodium ions and chloride ions increased significantly ($p < 0.05$) with salinity. The highest weight gain, length and feed conversion ratio were recorded in T3 group (11.0 ± 2.80 g, 5.06 ± 0.43 cm and 2.61 ± 0.92 , respectively). The values of WBCs, RBCs, MCV, MCH and platelets were also recorded optimum in T3 group. Survival rates were recorded 100% in all experimental groups. It is concluded that fingerlings of Nile Tilapia can be successfully cultured in saline water up to 14ppt with optimum growth.

Keywords: *Oreochromis niloticus*, Salinity, Growth, Hematology, FCR

(19663) POST MORTEM CHANGES IN MORI DURING REFRIGARATION

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A study was carried out to examine postmortem changes in mori during refrigerated storage. Fishes of weight near about 1kg were taken from a local market, slaughtered and transported (in ice) to the laboratory. During the storage process at 0, 5, 10 and 15 day analysis were performed. Fillets were analyzed for proximate composition including; moisture crude protein, crude ash and crude fat. TBARS (thiobarbituric acid reactive substances), WHC (water holding capacity), water extractable protein, salt extractable protein and peroxide value after each storage period. Obtained data of parameters were subjected to One way analysis of variance to evaluates the treatments. Results showed that proximate composition (moisture, crude protein, crude fat and crude ash) of fillets significantly ($p > 0.05$) decreased by increasing storage time. TBARS values also decreases by increasing the storage duration. Water holding capacity values decreases by showing that water extractable protein (WEP) and salt extractable protein (SEP) also reduced with the increasing of storage duration. Likewise, TBARS values, peroxide values of the refrigerated fillets also significantly decreased as the storage period increases. The interaction of storage time and fillet quality was found to be significant for proximate composition (moisture, crude protein, crude fat and crude ash), TBARS values, Water holding capacity (water extractable protein and salt extractable protein) and PV (peroxide values). In conclusion, fillet quality reduced by increasing storage duration as all the parameters proximate composition, TBARS values water holding capacity and peroxide vales were decreased.

Keywords: Changes, Mori, Refrigeration, Storage

(19861) WATER QUALITY AND BIOMETRIC CHARACTERISTICS IN COMMON CARP (*CYPRINUS CARPIO*) (LINNAEUS, 1758) IN OUM EL GHELLAZ LAKE IN WESTERN ALGERIA

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The wealth of wetlands attracts humans to exploit these riches without realizing the damage that can cause.

The aim of this work is to evaluate the quality of Lake Oum El Guellaz, for that we conducted two water sampling companions in February and April by choosing three sites, fishermen site, the mouth of Oued Tlelet and Oued Tlelet.

In order to assess the level of water pollution we measured COD, BOD, the concentration of nutrients (nitrate, nitrite and phosphorus), chlorophyll a, pH, dissolved oxygen and electrical conductivity. We found a high level of pollution in the lake especially in Oued Tlelat river and the mouth of this river, with an effect of seasonality.

In a second time, we conducted a biometric study of common carp (*Cyprinus carpio* Linnaeus, 1758), 62 individuals were sampled during 3 months including 29 males and 33 females, despite the poor quality of water, this fish has shown a great adaptation to this environment especially the males with a condition factor K of 1.2365.

The results obtained in this work highlight an alarming situation of the water quality of Lake Oum El Guellaz, and confirm the presence of a significant level of anthropogenic pollution which threatens its proper functioning.

Keywords: Oum El Guellaz Lake, Water quality, *Cyprinus carpio*, Biometric characteristics

(20053) TECHNIQUE OF OBSERVING THE EFFECT OF PESTICIDES ON ARCHIPS ROSANA (LINNAEUS, 1758) (LEPIDOPTERA: TORTRICIDAE) PUPAE

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Increase of agricultural applications by use of high-yielding crop varieties, fertilization, irrigation, and pesticides has contributed substantially to the tremendous increases in food production over the past 50 years. But, many of the adverse effects of pesticides on the environment depend on the interactions between the physicochemical properties and other factors. In this study, it is aimed to define the method used to determine effective doses on pupae of pest *Archips rosana* (Linnaeus, 1758) (*Lepidoptera: Tortricidae*).

Last instar larvae and pupae of the pest were collected from Edirne province. We fed *A. rosana* larvae on an artificial diet in a laboratory in petri plates. We maintained each individual larvae in large Petri plates (10 cm diameter) containing a 50% solution of diluted honey embedded in cotton pieces, which we used as the food source during the experiments and Rosacea leaves, under laboratory conditions at $25 \pm 2^\circ\text{C}$, 70% RH and a photoperiod of 16:8 h (L:D) until emergence of larva to pupa stage. Test solutions were prepared according to recommended dose (r.d.) used in agricultural areas, and diluted concentrations of this r.d. We dipped *A. rosana* pupae in test solutions for 1 s, placed them in clean petri plates with clean leaves, and kept them under identical laboratory conditions. The mortality rate was recorded at 7, 12 and 15 days, and LC50 values were calculated according to 7 days' mortality data. We opened unmaturing death pupae to determine the presence of cephalic structures of parasitoids, in the event of death due to the effect of insecticide or to parasitism. We therefore excluded death pupae due to parasitism from the data.

Lethal dose LC50 was calculated based on pupae deaths at the experimental stage. In many studies using this method, a high mortality rate was observed even at doses much lower than the recommended doses. In most cases, the recommended pesticide dose was affected not only insects but also beneficial organisms such as parasitic wasps.

The use of pesticides under the recommended dose may be important for the survival of beneficial organisms. A pesticide applied under the r.d. is more sufficient to kill target organisms. New application methods can help reduce these problems.

Keywords: *Archips rosana*, Pest, Pupae

(20551) OXYGEN CONSUMPTION AND SWIMMING BEHAVIOUR OF STERLET STURGEON (*ACIPENSER RUTHENUS*) IN RELATION TO WATER VELOCITY

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The purpose of this study was the evaluation of water velocity effect upon oxygen consumption and behaviour for sterlet sturgeon (*Acipenser ruthenus*). The experiment was conducted at the Romanian Center for the Modeling of Recirculating Aquaculture Systems (MoRAS), facilities of University Dunărea de Jos, Galați. The experiment consisted in measuring the oxygen consumption at different water velocities (MO₂), at a temperature of 22±0.5 °C, for seven fish with an average weight of 553 ± 65 g and a total length 51±1.67 cm. MO₂ of individual fish was measured using a swim tunnel with a 90L volume, intermittent-flow respirometry system (Loligo Systems, Denmark), using the AutoResp software and an oxygen sensor connected at Witrox 4 device. After 1h accommodation period, the swimming velocity was increased by 0.3 bl/s steps until the fish was exhausted. After the experiment ended, the following parameters were counted: standard metabolic rate (SMR), maximum metabolic rate (MMR), optimum velocity (U_{opt}), critical speed (U_{crit}), the excess post-exercise oxygen consumption (EPOC), tail beat frequency (TBF), opercular beat frequency (OBF). Sturgeon behavior can be described as docile and bottom holding at lower speed and free-swimming at higher speed. Generally, the frequency of tail and opercular beats per minute increased significantly with water velocity. This work aims to provide data on the physiology and behavior of *Acipenser ruthenus* and will help to support conservation of this important species.

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Keywords: Sterlet sturgeon, Swimming capability, Swimming Behavior, Oxygen consumption

**(18009) PARASITES AND PATHOGENS OF THE HONEY BEE (*APIS MELLIFERA*)
IN ALGERIA AND COLONY LOSSES**

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The decline of honey bee populations is of great concern around the world, including in Algeria. The global colony losses of *Apis mellifera* (Hymenoptera, Apidae) are believed to be caused, in part, by parasites, pathogens, and pests. This review discusses important pests, pathogens, and parasites in native honey bees in Algeria to provide an overall picture of honeybee health in the region and future threats to the apiculture industry. This review synthesizes the works on native honey bees (*A. mellifera intermissa* et *A. mellifera sahariensis*) sampled from different regions of Algeria. The screening concerned microsporidia (*Nosema ceranae*, *Nosema apis*); protozoa (*Apicystis bombi*, *Crithidia mellificae*); mites (*Varroa destructor*, *Acarapis woodi*) and bacterial (*Paenibacillus larvae*, *Melissococcus plutonius*) pathogens and viruses. The studies revealed the presence of *V. destructor*, *N. ceranae*, *P. larvae*, *A. bombi*, *C. mellificae* and viruses (DWV, ABPV, IAPV, SBV, LSV, SBPV, CBPV, BQCV) were detected. In addition, a parasitism of a phorid flies species: *Megaselia scalaris* (Diptera: Phoridae) and *Senotainia tricuspis* (Diptera: Sarcophagidae) was reported in honey bees. Despite the presence of multiple virus infections and pathogens in the colonies screened, these colonies showed no obvious clinical signs of diseases and colony losses were low. These data will contribute to the growing knowledge concerning bee pathogens and their global spread in climate regions.

Keywords: *Apis mellifera*, Parasites, Pathogens, Health, Colony losses

(18399) EPIDEMIOLOGY OF DIARRHEAL DISEASES OF BOVINE CALVES IN LAHORE, PUNJAB, PAKISTAN

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Diarrhea is a common problem which causes high morbidity and mortality in bovine calves. The present project was designed as disease poses severe adverse effects on animal health and performance. For that purpose, cow and buffalo calves up to six months of age in district Lahore, Punjab, Pakistan were examined under epidemiological investigation. The surveys of Government, military and private farms and different veterinary hospitals were conducted to perform active and passive surveillance of diarrhea. A total number of 600 calves (300 cow and 300 buffalo calves) were examined in detail to investigate the cause of diarrhea during the period of one year. The samples were collected on monthly basis under that study. For the diagnosis of various etiological agents of diarrheal disease and clinical pathology was done. Caprological examination, staining of fecal smears, cultural examination, ELIA and pH on ruminal ingesta were carried out and postmortem of dead calves was done on spot.

The epidemiological investigations were categorized into descriptive epidemiology, analytical epidemiology and experimental epidemiology. Under descriptive epidemiology, active disease surveillance was carried out to determine the incidence, morbidity rate and mortality rate of the disease. The morbidity, mortality and case fatality rates were 19.65%, 3.98% and 20.2%, in cow and 18.30%, 5.1% and 28.03% in buffalo calves. The over all incidence percentage of parasitic infection was 29% and 23% in cattle and buffalo calves respectively. The percentage of dietary diarrhea was 9% both in cow and buffalo calves. The prevalence of bacterial infection was also quite high viz 32% in cattle and 27% in buffalo calves. The viral infection was at lowest. In the case of calves less than one month of age the incidence of disease was cryptosporidial infection 23.8% and 25.9% in cow & buffalo calves. The incidence of bacterial infection was also quite high. Regarding the incidence of diarrheal diseases in age group above one month coccidial infection was found 16.45% and 28% in cow and buffalo calves respectively. The parasitic infection was found as 36.7% and 28% in both the groups respectively. Miscellaneous causes were observed in 6.3% and 5.33% of cattle and buffalo calves respectively.

Keywords: Calves, Diarrhea, Virus, Bacteria, Parasite

(18433) TICK-FIGHTING IN DOMESTIC AND WILD ANIMALS

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Arthropods that live on the surface of their host are called ectoparasites (ticks, lice, fleas, etc.). Some are very specific to their host that they never leave, while others are not and move from one animal to another. In the most innocuous cases, they cause irritation or itchy skin when they are in large numbers. However, they can transmit serious diseases to humans.

In our study, we were interested in ticks of some reptiles, and wild mammals, as well as domestic animals. These are the Greek turtle (*Testudo graeca*), wild boar (*Sus scrofa*), ruminants (sheep, cattle and goats), dogs and cats. Harvesting of biological material is carried out in the region of Algiers, Tizi Ouzou, Blida, Bouira and Medea. We realized a morphological identification thanks to determination keys and a binocular loupe. The results highlight the importance of ticks in mammals and turtles. They belong to the genera *Hyalomma*, *Rhipicephalus* and *Ixodes*.

Keywords: Ticks, Wild animals, Domestic animals, *Hyalomma*, *Rhipicephalus*, *Ixodes*

(18747) THE EFFECTS OF OZONATED, CHLORINATED, CELESTITE STONE-TREATED, NATURAL SPRING AND PINE RESIN-TREATED WATERS ON PERFORMANCE, OXIDATIVE STRESS AND CARCASS PARAMETERS IN JAPANESE QUAIL

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This study was conducted to assess the effects of 5 types of water: Ozonated, Chlorinated, Celestite Stone-treated, Natural Spring Waters and Pin Resin-treated water on performance, oxidative stress and carcass parameters in Japanese quail. A total of 150, 3-day old mixed female-male quails were used into 5 groups of 30 birds for each water group; each group was divided into 3 replicate subgroups of 10 birds. The experiment was continued for 7 weeks and quail were fed one experimental diet, and the different water sources were given ad libitum during in the trial. Statistical differences among water sources were observed on pH and Electrical Conductivity and content of Ca, Mg, Cl and Total Bacteria. Live weight, daily live weight gain, water and feed intake were the highest in the drinkers of Natural Spring Water, while the lowest for drinkers of Resin-treated Water ($p < 0.001$). The lowest level of serum malondialdehyde of was observed in drinkers of Natural Spring Water ($1.54 \mu\text{M/l}$), and the highest malondialdehyde level in drinkers of Resin-treated Water ($4.27 \mu\text{M/l}$; $P < 0.001$). The sources of water of trial were determined to have no effects on slaughter weight, carcass weight and carcass yield ($p > 0.05$). As a result, the amount of total dissolved solids of water were the positive effect on live weight, feed consumption, water intake, feed conversion ratio and oxidative stress biomarkers. This study was conducted to assess the effects of 5 types of water: Ozonated, Chlorinated, Celestite Stone-treated, Natural Spring Waters and Pin Resin-treated water on performance, oxidative stress and carcass parameters in Japanese quail. A total of 150, 3-day old mixed female-male quails were used into 5 groups of 30 birds for each water group; each group was divided into 3 replicate subgroups of 10 birds. The experiment was continued for 7 weeks and quail were fed one experimental diet, and the different water sources were given ad libitum during in the trial. Statistical differences among water sources were observed on pH and Electrical Conductivity and content of Ca, Mg, Cl and Total Bacteria. Live weight, daily live weight gain, water and feed intake were the highest in the drinkers of Natural Spring Water, while the lowest for drinkers of Resin-treated Water ($p < 0.001$). The lowest level of serum malondialdehyde of was observed in drinkers of Natural Spring Water ($1.54 \mu\text{M/l}$), and the highest malondialdehyde level in drinkers of Resin-treated Water ($4.27 \mu\text{M/l}$; $P < 0.001$). The sources of water of trial were determined to have no effects on slaughter weight, carcass weight and carcass yield ($p > 0.05$). As a result, the amount of total dissolved solids of water were the positive effect on live weight, feed consumption, water intake, feed conversion ratio and oxidative stress biomarkers.

Keywords: Celestite stone-treated water, Chlorinated water, Ozonated water, Resin-treated water, Water types

(18772) COMPARATIVE STUDY OF INTAKE, DIGESTION AND GROWTH IN BARBARINE LAMBS FED OATEN HAY AND OF WINTER TRITICALE-HAIRY VETCH MIXTURE HAY

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In a national context characterized by an increasing demand for food, the use by ruminants of a large quantity of concentrate can be seen as an important waste. The low nutritive value of forage produced mainly as oaten hay (70%, Chakroun et Ghaous, 1998) is the main cause of this failure. In this context, an association between triticale and hairy vetch was developed and compared to conventional hay on lambs performances. Ten Barbarine lambs (20 ± 2.0 kg) were allocated into two equal groups and housed in individual crates. Each group received either oaten hay or triticale (20%)-hairy vetches (80%) mixture hay and 300 g of barley grains. Results showed a higher nutritive value of mixture hay in term of CP (15.2% DM vs. 6% DM in oaten hay). Mixture hay intake was significantly higher (30%). DM and OM digestibility did not show a significant difference. However, CP and NDF digestibility of mixture hay were higher than those of oaten hay. The same trend was observed with digestible organic matter intake and digestible crude protein intake. Nitrogen intake and urinary and faecal loss, thus N retention ($P = 0.0014$) increased with mixture hay intake. Diet digestibility increased, the increase of feed intake and N retention ($P = 0.028$) could explain the important increase of lambs growth rates (111 and 71 g/d for mixture and oat hay, respectively). Production cost of one kilogram of meat was lower with mixture hay compared to that with oaten hay. It is concluded that the higher nutritive value of the winter triticale-hairy vetch mixture hay affected positively the performances of lambs.

Keywords: Hay, Lambs, Intake, Digestion, Growth, Cost production

(18783) COMPARISON OF THE FATTY ACID COMPOSITION AND LIPID NUTRITIONAL INDICES OF MEAT IN TWO LINES OF SLOW-GROWING CHICKENS AND THEIR CROSSES

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The study was carried out to compare the fatty acid profile and related lipid nutritional indices in the breast and thigh meat of two slow-growing lines of chickens La Belle (LB) and Bresse Gauloise (BB) and their crosses (♂LBx♀BB, ♂BBx♀LB). The birds were reared indoors in the experimental poultry farm of the Institute of Animal Science –Kostinbrod, Bulgaria. At the age of 12 weeks, 6 male chickens of each line were slaughtered and lipid analysis of the breast and thigh meat was done. The differences in the fatty acid profile and related nutritional indices of the meat between the lines were assessed by one-way ANOVA. The fatty acid composition was affected by the crossing of the lines but to a different extent in breast and thigh meat. The highest amount of monounsaturated fatty acids (MUFA) was observed in the meat of ♂BBx♀LB chickens due to the significant increase of C16:1n-7 in breast and C18:1n-9 in the thigh of these birds. On the other hand, this crossbred line exhibited the lowest levels of polyunsaturated fatty acids (PUFA). Furthermore, the lowest contents of MUFA was observed in the breast of the pure lines and thigh in BB and ♂LBx♀BB, while the highest PUFA level was determined in the breast of LB and thigh of ♂LBx♀BB. The differences in the meat dietetic quality described by the lipid indices showed no consistent patterns in the pure and crossbred lines depending on the type of meat. When compared with the rest, the breast meat of the LB male chickens showed significantly higher P/S ratio, while lowest n-6/n-3 and thrombogenic index (TI). The values of the atherogenic index (AI) and h/H ratio were also improved in this line. Thigh meat however, showed best characteristics in terms of P/S and n-6/n-3 in the ♂LBx♀BB line.

Keywords: Slow-growing chickens, Meat, Fatty acids, Lipid indices

(18828) CARCASS AND MEAT COMPOSITION IN F1 CROSSES OF TWO SLOW-GROWING LINES OF CHICKENS REARED IN CONVENTIONAL OR ALTERNATIVE SYSTEM WITH ACCESS TO PASTURE

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The study was carried out to compare the carcass quality, meat chemical composition and its fatty acid profile in the two F1 slow-growing crosses obtained from La Belle (LB) and Bresse Gauloise (BB) parents, reared in conventional or alternative system with pasture access. At the age 12 weeks, male chickens of each crossbred line were slaughtered. Two-way ANOVA was used to assess the effect of the rearing strategies as well as the cross on the carcass quality and meat chemical and fatty acid composition. The live and carcass weight of both crossbreds, as well as the dressing percentage were influenced mostly by the rearing system, showing advantage of the indoors grown birds. Despite the reduced values of these parameters, no deposition of abdominal fat was detected in the pastured birds from both crosses, which is a positive influence of the outdoors system observed in the particular crosses. In regard to the chemical composition of the meat, the pasture access decreased the protein content in both breast and thigh meat but increased the moisture. Ash content was strongly affected by the interaction of both factors. The cross and the rearing system had different effect on the fatty acid composition of the meat and the related lipid indices, associated with its dietetic quality. While the thigh meat was mostly affected by the cross of the chickens, showing higher content of monounsaturated (MUFA) but lower in polyunsaturated fatty acids (PUFA) in the ♂BBx♀LB birds, the fatty acid of the breast meat displayed different response according to the crossbreed and the rearing system. The differences were more pronounced in the ♂LB x ♀BB, indicating certain advantage of the pastured chickens from this line with lower content of saturated fatty acids (SFA) but higher of PUFA and improved values of P/S and n-6/n-3 ratios.

Keywords: Chickens, Slow-growing crosses, Pasture access, Carcass quality, Meat chemical composition, Fatty acid profile

(19043) THE INFLUENCE OF HERBAL SUPPLEMENT ON THE PRODUCTIVITY AND HEALTH CONDITION OF FATTENING PIGS

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Agricultural Institute – Shumen has carry out a scientific and economic experiment with 26 swine of the breed combination ♀Danube White Swine x (English Landrace x Pietrain) x ♂Danish Landrace. The animals were divided into two groups of 13, raised in separate boxes. The experiment was divided into two sub-periods, starting at an average live weight of 30.63 kg and ending at 110 kg live weight. During the first sub-period (30 to 60 kg live weight), the swine from first group were given a combined feed containing 16.4% crude protein, 0.80% lysine, 0.87% calcium and 0.66% phosphorus, and during the second period (from 60 to 110 kg live weight) – 15.5% crude protein, 0.85% lysine, 0.64% calcium and 0.45% phosphorus. Animals from the second group were given the same combined feed, accordingly for the first and second sub-periods, with the addition of herbal supplement (30% nettle leaves, 5% dandelion, 5% hawthorn, 10% weeds grass, and 50% rosehip flour) at 10g per day. The usage of herbal supplement in the compound feed for fattening pigs from the Danube White breed, from 30 to 110 kg live weight, does not significantly affect the growth rate and feed conversion ratio per kg gain. The animals from the experimental (II) group have a higher average daily increase during the period from 60 to 110 kg live weight with 3.66% (0.061g), in comparison to those from group I, but all differences are statistically insignificant.

There is a tendency for slightly better fat characteristics in animals receiving the herbal supplement.

The usage of the tested herbal supplement needs additional studies to detect the effects on fattening pigs.

Keywords: Fattening pigs, Compound feed, Health condition

(19268) GENETIC MARKERS ASSOCIATED WITH CANINE HIP DYSPLASIA

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Dogs were domesticated from its wolf ancestors about 15,000 years ago. Beginning with the wolf, mankind has created dog breeds that are hunters or herders, big or small, and lean or squat. Thus, dogs became the most diverse mammal species morphologically. On the other hand, the selection of some morphological traits made some dog breeds more susceptible to orthopedic diseases. Hip dysplasia, one of these diseases, is the most common orthopedic disease in dogs. But still, the etiology, mechanobiology, and pathology underlying this disease are not well understood. Canine hip dysplasia (CHD) tends to be more common in some breeds (German Shepherds, Rottweilers, Great Danes etc.) than others and in some lines than others, which indicates that there is a genetic component to the disorder. Various attempts have been made to identify genetic loci underlying CHD development with the goal to develop a DNA test that would outperform, and eventually obviate, phenotype-based selection for CHD. Several initiatives have been made to develop a DNA test to determine the genetic loci underlying CHD. As a result of the investigations, many genetic variations have been reported to be associated with CHD. This review focuses on these markers of dogs.

Keywords: Canine, Hip dysplasia, SNP, PCR, MAS

(19269) INVESTIGATION OF GENETIC MARKERS ASSOCIATED WITH RESISTANCE TO INFECTIOUS DISEASES IN CATTLE

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Infections lead to cattle an increase in the mortality rate, a decrease in the fertility rate, a decrease in meat-milk quality and quantity. The immune response of cattle against a wide range of disease agents (viruses, parasites and, bacteria) varies. This variability is related to the genetic inheritance of the animal. Nowadays, vaccines and antibiotics are used intensively in order to fight against diseases and they are usually successful. However, increased use of antibiotics has increased the resistance of pathogenic microorganisms. Since antibiotics cause environmental pollution and consumers demand organic food, restriction of the use of antibiotics has come to the agenda. Antibiotic use can be reduced in the long-term run with breeding studies conducted by selecting more resistant animals. However, this period can be shortened by the application of genetic marker-assisted selection (MAS) programs. Indigenous breeds are the most important gene source for the investigation of markers associated with resistance to diseases. Anatolian indigenous cattle breeds are at the forefront with their ability to be resistant to some diseases and adapt to the harsh environmental conditions. By determination of molecular mechanisms that confer resistance features to indigenous breeds, MAS studies will gain speed. Major histocompatibility complex (MHC) is the best-defined gene region that associated with susceptibility and resistance to a wide spectrum of disease. Comparing variations of MHC gene regions in sensitive and resistant animals (cultures and indigenous breeds) can provide important information. The object in this paper is to provide information on disease-associated SNPs in the MHC genes for use in future MAS studies.

Keywords: Cattle, Infectious diseases, Major histocompatibility complex, SNP, MAS

(19349) EFFECT OF FOUR SELECTED CROP PLANTS ON GROWTH, LIFE CYCLE AND FORAGING OF *PIERIS BRASSICAE* (LEPIDOPTERA: PIERIDAE).

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Photosynthesis is directly related with net primary production. The herbivores decrease photosynthesis and cause decrease in production. Quantitative analysis of consumption and utilization of host plants by insect herbivores is a commonly used tool in studying plant- insect interaction. The cabbage butterfly *Pieris brassicae* (Lepidoptera: pieridae) is one of the most destructive insect pests. So, it was taken to know its response on four crop plants namely, bassica, cabbage, cauliflower and turnip. Larvae were provided with pre-weighed crop as feed to estimate the life cycle and extent of foraging. The length and weight of larvae along with weight of feed was calculated. Longevity was estimated by providing 20% honey solution. Each trial was replicated three times. One way analysis of variance with tucky contrast at 0.05 probability was applied to check the host preference. *P. brassicae* was found to be a destructive pest species of brassica by consuming 21.36 ± 0.72 g during its entire larval duration. This species showed least consumption on turnip (8.22 ± 0.60 g) with maximum larval duration of 17.67 ± 0.47 days. Pupal weight and percent adult emergence was directly correlated with food consumption. Such types of work is very helpful in planning Integrated Pest Management Programs (IPM).

Keywords: Extent of damage, Feeding efficiency, *Lepidoptera*, *Pieris brassicae*, *Pieridae*

(19510) BEEF QUALITY DEFINED BY GENETIC AND ENVIRONMENTAL FACTORS: AN OVERVIEW

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Meat quality is defined by those traits the consumer perceives as desirable. Over the last decades, the primary objective of meat industry has gradually evolved from meat quantity to quality in many countries. Data concerning the quality of meat are often obtained after slaughter. Therefore, it is difficult to analyse meat quality-related properties in a living animal. In this respect, genomic evaluations have provided confidential and effective aspects in selection procedures. Genotypic investigations provide time efficiency and contribution of territorial economy in determining the meat yield and quality. Thus, marker-assisted selection for genetic improvement of meat quality has a significant impact on animal breeding programmes. In recent years, many genes associated with growth rate, carcass weight, lean meat, marbling, beef colour, and texture have been specifically determined. However, a key point to highlight here is that environmental factors should be considered to perform an adequate evaluation. The environmental effects on meat quality are best defined as those not attributable to genetics, and include on-farm, pre-slaughter, and post-slaughter processes. Several factors have been identified when trying to evaluate meat quality such as breed of animal, slaughter age, pre- and post slaughter conditions, aging process, meat pH, amount of connective tissue and packaging method. It is worth noting that, stress is the inevitable consequence of the process of transferring animals from farm to slaughter. The effects of chronic stress on muscle glycogen depletion and the consequent dark cutting condition have been well documented. Apart from these environmental factors, many studies have investigated genetic effects on the mentioned traits and on the other hand, several genes associated with meat quality have been identified and single nucleotide polymorphisms (SNPs) or mutations of many candidate genes have been determined to be highly effective markers in beef production. Moreover, epigenetics and maternal effects through mitochondrial DNA are potentially exciting new areas of research. Recent knowledge on beef quality has indicated that, traditional methods based on phenotypic values can not provide sufficient criterions for an efficient selection, therefore, it is necessary to develop novel and genotype-assisted procedures which are more reliable for prediction of the genotypic value of a quantitative trait.

Keywords: Meat quality, Genetic effects, Environmental impact, Cattle

(19512) GENETIC BACKGROUND OF PHYSICAL PERFORMANCE IN THE HORSE

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The horse (*Equus caballus*) evolved to move a large body mass with great speed and endurance or to develop great pulling power for transportation of goods. The physical performance of horses including racing, riding, working, and endurance has gradually improved since their domestication. This species has remarkable adaptations for both functional and structural properties with respect to exceptional athletic performance. The performance properties of horses involve development of muscle mass and type of muscle fibres, advances in density of mitochondria, oxygen-carrying and CO₂ transport capacities of blood, improvements in intramuscular glycogen storage, lactate depletion capacity of the liver and muscles, and the balance of thermoregulation. A major contribution to horse genomics was the publication of the whole horse genomic sequence, however, there is a plenty of room left for improvements in understanding the molecular mechanisms behind athletic performance of horses. Thus, the genomic knowledge may be useful to complete the annotation of this sequence and facilitate its use for management improvement of horse populations. Studies in different species including humans, rats and mice have indicated a large number of genes involved in elite athletic performance. In this context, evaluation of the breeding values and the selection of horses with better race performance is one of the main objectives for breeders to achieve high acquisition of economic concepts. Taken together, the primary objective of this presentation was to evaluate the genetic background of race performance of horses and to discuss the impact of the candidate genes including actin binding protein alpha actinin 3 (*ACTN3*), myosin light chain kinase (*MYLK*), insulin-like growth factor (*IGF-1*), myostatin (*MSTN*), bradykinin β receptor (*BDKRB2*), hypoxia-inducible factor-1 α (*HIF1A*), β 2-adrenergic receptor (*ADRB2*), creatine kinase (*CKM*), glycogen synthase (*GYS1*), vitamin D receptor (*VDR*), peroxisome proliferator-activated receptor alpha / delta (*PPARA*) / (*PPARD*), nuclear respiratory factors (*NRF1* / *NRF2*), vascular endothelial growth factor (*VEGF*), endothelial PAS domain protein-1 (*EPAS1*), angiotensin I converting enzyme (*ACE*), haemochromatosis protein (*HFE*), muscarinic acetylcholine receptor M2 (*CHRM2*), adenosine monophosphate deaminase 1 (*AMPD1*), collagen type 1 (*COL1A1*), matrix metalloproteinase 3 (*MMP3*), tenascin-C (*TNC*), dopamine receptor (*DRD2*), serotonin receptor (*5HT7*), brain derived neurotrophic factor (*BDNF*), toll like receptors (*TLR4*), interleukin receptors, transforming growth factor β (*TGF- β*), activin A receptor type 1 (*ACVR1*), frizzled related protein (*FRZB*), xin actin-binding repeat containing 2 (*XIRP2*), BMP-binding endothelial regulator (*BMPER*), carboxypeptidase vitellogenic-like (*CPVL*), anillin actin-binding protein (*ANLN*). Consequently, achieving optimal physical performance will entirely depend not only on the environmental factors but also on the molecular mechanisms and biochemical pathways.

Keywords: Performance, Candidate genes, Genome, Polymorphism, *Equus caballus*

(19553) LIVE WEIGHT VALUES AND SOME EGG CHARACTERISTICS OF DIFFERENT GENOTYPES OF BREEDER QUAILS DURING THE LAYING PERIOD

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This study was aimed at monitoring the live weight gain and egg yields of quail (*Coturnix coturnix japonica*) and yellow Japanese quails, and at determining certain characteristics of their eggs, as of 7 weeks of age, during a certain time frame of the laying period between August and November in 2017.

The study material comprised of quail (*Coturnix coturnix japonica*) and yellow Japanese quails. The breeder quails were individually weighed at 7 weeks of age to determine their live weight, and were randomly allocated to separate cages, such that mixed groups including both males and females were housed in each cage. The live weight values of the animals were measured by individually weighing each quail at 15 day-intervals, at weeks 7, 9, 11, 13, 15, 17, 19 and 21. The live weights measured at the beginning of the study, at week 7, and at the end of the study, at week 21, were 253.95 g and 349.37 g, respectively, for the quails (*Coturnix coturnix japonica*), and 271.81 g and 328.10 g, respectively, for the yellow Japanese quails. The average live weight measured at 7 weeks of age was higher in the yellow Japanese quails when compared to the quail (*Coturnix coturnix japonica*). On the other hand, the average live weight measured at the end of the study, at 21 weeks of age, was higher in the domestic quails in comparison to the yellow Japanese quails.

The egg yields of the quail (*Coturnix coturnix japonica*) and yellow Japanese quails were ascertained based on the number of eggs recorded to have been collected per day. Immediately after being collected from the cages, the eggs were weighed to determine the egg weight values. Using the number of eggs collected, the monthly quail/pen egg yields (%) were calculated. Accordingly, the quail/pen egg yield was determined as 64.72% for the yellow Japanese quails and as 67.54% for the domestic quails. The egg mass was ascertained to be 7.77 g/day/quail for the eggs of the yellow Japanese quails and 8.09 g/day/quail for the eggs of the domestic quails. It was observed that egg weight, egg length, egg width, eggshell weight, eggshell thickness, yolk weight, and albumen weight values increased with laying age in both the yellow Japanese and quail (*Coturnix coturnix japonica*).

The average weight of the eggs of the yellow Japanese quails was greater than that of the eggs of the domestic quails.

This study provides a non-comparative investigation of the egg characteristics and egg yields of two different quail genotypes. The results obtained suggest that quail (*Coturnix coturnix japonica*) and yellow Japanese quails show interesting differences for egg yield, egg characteristics, and live weight during the laying period, which are worthy of further investigation.

Keywords: Egg production, Egg mass, Egg quality, Yellow Japanese quail

(19595) EFFECTS OF MAGNETIZED DRINKING WATER ON EGG PRODUCTION OF FAYOUMI HENS DURING THE LATE LAYING PERIOD

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Poultry industry has been grown worldwide to meet the increase demand of consumers. Improving number and quality egg are of great importance to the egg industry because they directly affect revenues of stalk holders. Magnet technology has shown great application potential for different fields, such as plant irrigation and animal production (Barton, 1996). The theory of action of magnetic treatment of water depends on re-arranging the water molecules into uniform structured clusters (Ali et al., 2014; Alabi et al., 2015). Moreover, Ali et al. (2014) mentioned that the physical change in water molecules can ease water passage in plants and animals. This study was carried out to evaluate production and quality of eggs from Fayoumi laying hens receiving magnetized drinking water. Sixty Fayoumi hens, 54 wk of age, were housed, in individual cages, in an open sided house. On d 1 of the trial, hens were randomly allotted to treatment groups of control (un-magnetized water line) or polyvinylchloride water line with 3000 Gauss magnet (MW) on the exterior surface. Standard laying diet and water were provided ad libitum. The trial was conducted for 30 days. Throughout the experimental period, the total number of eggs, egg weight, egg mass and egg production % were recorded. Egg production% assumption of ANOVA was tested (Shapiro-Wilk test for normality). No transformations were needed to meet assumptions. All analyses were performed using JMP Pro 5 statistical analysis program. One-way ANOVA was used to investigate treatment effect on the total number of eggs, egg production %, egg weight and egg mass. The results showed that the hens received magnetized drinking water have greater egg number compared to the number of eggs produced by hens received non-magnetized water during the experimental period ($p \leq 0.0001$). Consequently, the egg production % of MW group (32.9%) is higher than this (24.9%) of control group. The results of egg average weight of eggs laid by hens received either magnetized drinking water or non-magnetized water are similar ($p= 0.44$). Although the MW does not affect the egg weight, the egg mass of eggs from MW group (536.9 g) was significantly heavier than egg mass (345.9 g) of control group. Also, El Sabry et al. (2016) found that magnetized drinking water improved egg quality. it could be concluded that the magnetized drinking water could enhance the egg production during the late laying period.

Keywords: Drinking water, Egg production, Egg weight, Egg mass

(19805) USE OF ETHNO VETERINARY MEDICINE BY TRIBAL FARMERS IN HILLY AREAS OF INDIA

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The knowledge of ethno veterinary medicine and its significance has been identified by the tribal communities of India through a process of experience over hundreds of years. The study was carried out in hilly areas of Jammu and Kashmir. The data was collected by means of well structured questionnaires. Interview schedule was used to collect the information about the use of ethno veterinary practices and their effectiveness. The paper deals with 23 ailments commonly found in different categories of livestock/animals and their treatment with 41 medicinal plant species that occur in forests as well as close vicinity of the rural settlements. Out of the total population, majority of the people (more than 70%) was found dependent on traditional (herbal) system of treatments while rest of the people preferred modern (allopathic) system of treatments for curing veterinary ailments. Moreover, it was found that first line of defence was the use of local herbs and traditional knowledge. Tribal's last option was to use allopathic medicine or a veterinary practitioner. In this study we observed that old aged people have more knowledge and experience particularly in remote areas for curing veterinary ailments. The traditional system of treatment is one of the most important prevailing systems in the area where modern veterinary health care facilities are still in developing stage due to hilly terrain and long distance.

Keywords: Tribal, Gujjars, Bakerwals

(19828) EFFECT OF *QUILLAJA SAPONARIA*, *AGAVE AMERICANA* AND *TRIGONELLA FOENUM-GRÆCUM* ON FEED INTAKE, MILK YIELD AND COMPOSITION OF SICILO-SARDE EWES

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It has been reported in the literature that plant secondary metabolites supplementation such as saponins in ruminants' diets could increase nutrient absorption and had a defaunating activity, thus improved livestock performances. Since ruminal protozoa had a bacteria predating action, it would be expected that defaunation enhances nitrogen utilization and consequently increases milk production. This hypothesis was tested in our experiment by incorporating different sources of saponins (*Quillaja saponaria*, *Agave americana* and *Trigonella foenum-græcum* seeds (fenugreek)) on milk yield and quality in ewes.

Twenty four Sicilo-Sarde ewes, fed oaten hay (500 g), barley silage (*ad libitum*) and concentrate (400 g) were randomly assigned to 4 dietary treatments: The control group did not receive any additive (D1) while the three other groups received either fenugreek (40 g, D2), Quillaja (400 ppm, D3) or Agave powder (15 g, D4).

Feed intake and milk yield ($P > 0.05$) of ewes were not affected by these additives. However milk composition was significantly influenced by saponins sources supplementation. The proportion of C20:2n6 increased ($P < 0.05$) in the milk of ewes receiving fenugreek. Quillaja supply increased C14:1n5 and specially C16:1n-7 proportions in milk. Animals receiving agave powder exhibited an increase in the levels of C16:1n-7, C20:1n-9 and C20:5n-3 in milk. It was found that supplementation with saponins sources to ewes diet did not show negative effect on the proportion of short fatty acids. It is concluded that under our experimental conditions, administration of fenugreek, Quillaja and Agave in Sicilo-Sarde ewes diets improved milk quality particularly fatty acids profile with a limited effects on feed intake and milk yield.

Keywords: *Quillaja saponaria*, *Agave americana*, Fenugreek, Saponins, Sicilo-Sarde, Milk

(19837) PREDICTION OF MASTITIS IN INDIGENOUS BREED OF DAIRY CATTLE USING SOFT COMPUTING MODEL

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Mastitis is an important problem in dairy cattle. Soft computing models i.e. Adaptive Neuro Fuzzy Inference System (ANFIS) can be possible way out for detecting this disease. Therefore, the present study was undertaken for predicting the subclinical mastitis in indigenous breed such as Sahiwal cows and Murrah buffaloes of dairy cattle using soft computing model (ANFIS). Milk pH, electrical conductivity, temperature (udder, milk and skin), milk yield and dielectric constant were taken as input variables. Output variable was milk somatic cell counts analysed from samples collected from each 100 lactating Sahiwal cows and 100 lactating Murrah buffaloes. Animals were judged healthy and infected as per milk somatic cell counts. Accordingly, animals were classified into three categories, i.e., healthy, subclinical and clinical mastitis animals. These basal values were utilized for developing ANFIS models to identify healthy versus mastitis animals. Also, Multiple Linear Regression (MLR) models were developed for comparing classification accuracy of proposed models using Root Mean Square Error (RMSE) technique. ANFIS models were found to be superior (RMSE=0.203) as compared to MLR models (RMSE=4.08). Hence, it is deduced that ANFIS can be used as a suitable technique for detecting mastitis in indigenous breed of dairy cattle.

Keywords: Adaptive Neuro Fuzzy Inference System, Mastitis, Murrah buffaloes, Sahiwal cows, Soft computing models, Subclinical mastitis

(20208) DETECTION OF ADULTERATION AND IDENTIFICATION OF MEAT AND MILK SPECIES USING MOLECULAR GENETIC TECHNIQUES

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For the fast, specific and sensitive identification or determination of goat's, dog's, cat's, buffalo's, cattle's, sheep's, camel's, donkey's, horse's and pig's meat and milk, species-specific PCR and PCR-RFLP techniques were developed. Where, DNA from small amount of muscles (0.05 gm) and very little of fresh milk (100 µl) was extracted to amplify the gene encoding species-specific repeat (SSR) region and the mitochondrial DNA segment (*cytochrome-b* gene). The results of PCR amplification were 855 bp in length in goat, 808 bp in dog, 672 bp in cat, 603 bp in both buffalo and cattle, 374 bp in sheep, 300 bp in camel, 221 bp in both donkey and horse, and ≤100 bp in pig. To differentiate between buffalo's and cattle's meat and milk, as well donkey's and horse's meat and milk, *cytochrome-b* gene in the four species was amplified (359 bp) and digested with restriction enzymes. By *TaqI* restriction enzyme, two different fragments (191 bp and 168 bp) were generated in buffalo, whereas no fragments were obtained in cattle. With *AluI* restriction enzyme, three different patterns were generated in horse (189 bp, 96 bp and 74 bp), while in donkey no digestion was obtained. The proposed PCR and PCR-RFLP assays represent a rapid and sensitive method applicable to the detection and authentication of meat and milk species-specific.

Keywords: Identification, Species-specific meat and milk, Cytochrome-b gene, PCR, PCR-RFLP

(20284) EVALUATION OF CORN STEEP LIQUOR AND ENZOSE MIXTURE ON NUTRIENT DIGESTIBILITY AND PERFORMANCE OF BROILER CHICKS

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The intent of this study was to explore the nutritional potential of corn steep liquor and Enzose mixture on growth performance, nutrient digestibility and carcass characteristics of broiler chicks. Two hundred day old Hubbard Broiler chicks were randomly divided into five experimental groups having forty chicks in each group. Each group was further divided into four replicates having ten chicks each. Five iso-nitrogenous (21% CP) and iso-caloric (2920 kcal/kg ME) starter rations were formulated with 0, 3, 6, 9 and 12% levels of corn steep liquor and Enzose mixture and fed to broiler chicks from 0-21 days. Likewise five finisher rations were also formulated with the same levels of Corn steep liquor and Enzose mixture having 18.5% crude protein (CP) and 2950 kcal/kg ME and fed to broiler chicks from 22-42 days. Weight gain, feed intake and feed conversion ratio of broilers fed 3% level of corn steep liquor and Enzose mixture was significantly better as compared to control. Similar results were observed in nutrient digestibility and carcass characteristics of broilers fed 3% level of corn steep liquor and Enzose mixture as compared to control. Organ weights of broiler chicks didn't show any response. It is concluded that corn steep liquor and Enzose mixture could be used up to 9% in the diet of broiler chicks without any harmful effects. However 3 and 6% levels yielded better results among all treatments.

Keywords: Cornsteep liquor, Enzose, Broiler, Performance

(20495) USAGE POSSIBILITIES OF CHICKEN EGGSHELL POWDER IN HUMAN AND ANIMAL NUTRITION

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Millions of chicken eggs are produced annually in the world and consumed in homes or industrial purposes then their shells are also thrown largely into trash. Whereas chicken egg shell powder (ESP) can be an attractive source of calcium (Ca) for human and animal nutrition. Because of calcium deficiency is a common problem in human and animal nutrition. Although people want to meet Ca needs from dairy products, but this need cannot usually be met. Instead, you have to go cost-effective way to meet needs with costlier tablets. In recent years, some scientific articles have been published about the supplementation of Ca deficiency in humans and animals with ESP as Ca source. For example, there is a report that a single egg shell contains about 2.07 +/- 0.18 grams of Ca, and that half egg shells powder can accommodate the daily Ca needs of an adult person. There is also a suggestion that the best way to use ESP as a Ca supplement is in the form of bread, pizza, spaghetti and similar products in the form of dough, without changing the taste. In Turkey, 18 billion eggs are produced in 2016. In this study, the advantages and disadvantages of the use of ESP as a Ca source in the human and animal nutrition as sterile powders are discussed on international literature context.

Keywords: Chicken egg shell powder, ESP, Ca, Human nutrition

(20539) LOW DOSES OF OCHRATOXIN-A DECREASE IGY AND IGA PRODUCTION IN BROILER CHICKS

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The mycotoxin ochratoxin-A (OTA), produced by some fungi, is a natural contaminant 18 of many foods and feeds worldwide. Due to its toxic effects, the recommended maximum daily level of OTA for poultry feeds is 0.1 mg OTA/kg (ECR2006/575/EC); this dose does not induce changes in hepatic/renal parameters but decreases thymus size and serum globulin concentrations. Accordingly, in this study, we quantitatively assessed total circulating IgY and IgA serum levels in chicks consuming 0.1 mg OTA/kg diet (limit) and higher doses (0.3–1.1 mg OTA/kg diet) for 14 or 21 days. We also evaluated other immunological parameters (thymus, bursa of Fabricius, and spleen weights and leukocyte profiles) at 21 days. Decreased IgY serum levels was observed in all OTA-treated groups ($P < 0.05$). In the low-dose group, IgA levels were decreased at 21 days, but not 14 days. Thethymus and bursa of Fabricius sizes were decreased in all OTA-treated groups ($P < 0.05$), whereas reduced spleen size and altered leukocyte profiles were detected only in the high-dose group ($P < 0.05$). We concluded that chronic exposure to OTA, even at the recommended highest dose, affected IgY and IgA production in chicks.

Keywords: Lymphocyte, IgA, IgY, Mycotoxin

(20617) EFFECT OF USING DISTILLERY YEAST SLUDGE AS A PARTIAL REPLACER OF SOYBEAN MEAL ON PRODUCTION PERFORMANCE AND EGG QUALITY TRAITS OF LAYER

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To overcome prevailing animal protein scarcity in developing nations there is urgent need to search for quality economical protein sources. In conjunction with these efforts a completely randomized design with five treatments, each with 4 replicates and 10 chicks per replicate was planned to evaluate the effects of dietary distillery yeast sludge on layer performance and egg quality after replacement with soybean meal on protein equivalent basis. Seventeen week old (n=200) Hy-line layer were assigned into six treatment group. Treatment T0, served as control. Treatment T1, T2 and T3 contained distillery yeast sludge 5, 10 and 15%, respectively. Whereas, Treatment E contained distillery yeast sludge (DYS) 20%. Dietary DYS treatments significantly ($p < 0.05$) improved feed intake, egg production, and feed conversion ratio of layers. However, lowest values for performance indices were in the birds fed 20% DYS. Gradually increased DYS inclusion significantly reduced egg quality traits of layer. The result suggested that 5 % DYS may be included to improve production performance and egg quality traits of laying hen successfully.

Keywords: Haugh unit, Thickness, Eggs, Yeast, Layer chicks

(20793) EFFECT OF CRYODILUENTS ON QUALITY, ENZYME LEAKAGE AND FERTILITY OF ZEBU BULL SPERMATOZOA

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The study was planned to evaluate the effect of liposome and egg yolk based cryodiluents on semen quality, extracellular lactate dehydrogenase enzyme leakage and fertility of zebu bull spermatozoa. Five Zebu bulls of Sahiwal breed were used in study for semen collection for five weeks (replicates), diluted with OptiXcell (liposome based extender), tris citric-egg yolk and egg yolk citrate extenders at 37°C (50×10^6 spermatozoa/ml). After dilution, semen was cooled to 4°C in 2 hours, equilibrated for 4 hours and filled in 0.5 ml French straws. The semen filled straws were kept over liquid nitrogen vapours (5cm above the level of LN2) for 10 minutes and plunged in liquid nitrogen. After 24 hours of storage frozen semen was thawed at 37°C for 30 seconds, and assessed for motility, plasma membrane integrity, viability, DNA integrity and lactate dehydrogenase enzyme activity. Sperm motility was recorded higher ($P < 0.05$) in OptiXcell compared to tris-citric egg yolk and egg yolk citrate extender. Sperm plasma membrane integrity, viability and DNA integrity were recorded higher ($P < 0.05$) in OptiXcell followed by tris-citric egg yolk and egg yolk citrate extender. Nonetheless, extracellular leakage of lactate dehydrogenase enzyme was recorded lower in OptiXcell followed by tris-citric egg yolk and egg yolk citrate extender. Data recorded on AI, 90-days post insemination, analyzed with contingency table chi square test showed, significantly higher fertility rate with OptiXcell compared to tris-citric egg yolk extender under field conditions. It is concluded that OptiXcell is superior in protecting zebu bull spermatozoa and produced higher fertility rate under field conditions compared to egg yolk based extenders.

Keywords: OptiXcell, Cryodiluent, Tris-citric egg yolk, Zebu bull semen, Cryopreservation

(20866) SEMEN QUALITY AND FERTILITY OF LIQUID-STORED BUFFALO SEMEN IN ANDROMED®, SKIM MILK AND TRIS-CITRIC EGG YOLK EXTENDER

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The milk and/or egg yolk in extender have sanitary risks being of animal origin that can be ameliorated by using soya-lecithin based extender. The present study was designed to compare AndroMed® with commonly used extenders (tris-citric egg yolk and skim milk) for buffalo bull spermatozoa at 5°C. Semen from three Nili-Ravi buffalo bulls diluted with AndroMed®, tris-citric egg yolk and skim milk extender at 37°C, cooled to 5°C, stored for five days at 5°C and assessed for semen quality parameters at alternate day of storage. The whole experiment was repeated five times independently. Sperm motility, viability and DNA integrity remained similar ($P > 0.05$) in AndroMed®, tris-citric egg yolk and skim milk extender for five days of storage at 5°C. Sperm plasma membrane integrity was similar in AndroMed®, tris-citric egg yolk and skim milk extender at 1st day of storage. Nevertheless, higher ($P < 0.05$) values for plasma membrane integrity were recorded in AndroMed® compared to tris-citric egg yolk and skim milk extender at 3rd and 5th day of storage at 5°C. Multivariate regression analysis showed significant ($P < 0.01$) negative impact of storage days on semen quality parameters in AndroMed® ($R^2 = 0.877$), tris-citric egg yolk ($R^2 = 0.894$) and skim milk extender ($R^2 = 0.951$). The *in vivo* fertility rates were similar ($P > 0.05$; $\chi^2 = 0.37$) with AndroMed® (64%), tris-citric egg yolk (60%) and skim milk (61%) extenders under field conditions. It is concluded that AndroMed® can be used for storage of buffalo semen at 5°C in artificial insemination program with effectiveness equal to tris-citric egg yolk and skim milk extender.

Keywords: Soya-lecithin, Extender, Liquid, Buffalo, Fertility, Semen

**(21182) SELECTION FOR GROWTH TRAITS IN BEETAL GOATS:
COMBINATION OF CONVENTIONAL AND MOLECULAR APPROACH**

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Goat meat is the preferred meat in Pakistan but not much growth traits related genetics is explored especially in our local breeds. Use of conventional methods for selection and supplementing it with different advanced molecular technique can further enhance the breeding success. Beetal goats have potential for an improved growth but there is a need to critically select the animals for breeding. Records of tag no, doe no, buck no, birth weight, type of birth, date of birth, monthly weight, date of death/auction of Beetal breed of goat from Small Ruminant Research and Training Centre were collected. Birth weight, weaning weight, yearling weight, pre-weaning average daily gain and post-weaning average daily gain were the traits under study. Year of birth (YOB), sex, type of birth (TOB) and season of birth (SOB) were the considered environmental factors. Results indicated that males were heavier than females, singles were having more weight than twins and triplets, twins were heavier than triplets. ANOVA table indicated that YOB, Sex and TOB significantly affected all traits under study while SOB is showing non-significant results. Heritabilities were 0.57, 0.17, 0.16, 0.01, 0.009 for birth weight, weaning weight, yearling weight, pre-weaning and post-weaning average daily gain respectively. Estimated Breeding values (EBVs) of whole flock for all the five traits were estimated using WOMBAT software. EBVs ranged between -2.82 to +1.76 for all the traits. *LEP* SNP was genotyped in the current flock by using PCR-RFLP method. Seventy-three out of seventy-five individuals were homozygous for the TT genotype. Gene and Genotypic frequency was calculated by PopGene software indicating T = 0.99, C = 0.01, TT=0.97, TC= 0.02 and CC= 0.00. Chi-squared (χ^2) tests showed that the *LEP* SNP was in Hardy–Weinberg equilibrium in the studied population ($P > 0.05$). General Linear Model (GLM) was used to find the association between the genotype and EBVs by using SAS software which showed significant results for birth weight and weaning weight while non-significant for the yearling, pre and postweaning average daily gain. This type of study should be conducted on large populations for selection of better-performing animal generation after generation.

Keywords: Beetal goat, *LEP* SNP, EBVs, Association study, Environmental factors, Heritability, BLUP

(21243) EFFECT OF GROWTH PROMOTERS ON GROWTH PERFORMANCE, CARCASS CHARACTERISTICS, HEMATOLOGICAL AND BIOCHEMICAL PARAMETERS OF IRAQI SHARBI CALVES FATTENED UNDER NINEVEH PROVINCE ENVIRONMENT, IRAQ

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The experiment was carried out at the calves farm of Al-Rasheida Animal station, Mosul, Iraq. To investigate the effect of using growth promoters on some growth and carcass traits, hematological and biochemical traits of Iraqi sharabi calves, 16 Iraqi sharabi calves were used (140-165 kg) live body weight and 8-10 months old. Divided into 4 main groups (4 calves/group), each main group was divided into 2 subgroups (2 calves/group) according to their live body weight. 1st group was fed on control ration only, while 2nd, 3rd and 4th groups were fed on control ration and supplemented with 200g of Biolaczym, or 200g of Sorbotiol or 25 g of Stymulan /100kg control ration, respectively, for 16 weeks. The rations and wheat straw were given on base of 2.5% and 1% of B.W., for all the groups respectively. At the end of 16 weeks of feeding trails, blood samples were withdrawal from jugular vein from each animal during experiment period, and all calves were slaughtered.

The results indicated that adding growth promoter stymulan to 4th ration has significantly ($p \leq 0.05$) increased in daily gain, total body gain, final weight, somebody dimensions, hot and cold carcass weights, hemoglobin, red and white blood cell count, packed cell volume, lymphocyte cell percentages total protein and globulin, while cholesterol, triglycerides and urea were decreased significantly ($p \leq 0.05$) as compared with other rations (1st, 2nd and 3rd) respectively. It was concluded that using Stymulan as growth promoter in fattening Sharbi calves had improved on some growth and carcass traits, hematological and biochemical parameters

Keywords Growth promoters, Growth performance, Carcass characteristics, Hematological and biochemical parameters, Iraqi Sharbi calves

(21289) ULTRASOUND DIAGNOSIS OF HEPATIC LIPIDOSIS IN COWS FOR MILK PRODUCTION AS INDICATOR OF SARA (SUB ACUTE RUMEN ACIDOSIS)

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Metabolic diseases in the cow have been and remain the challenge of veterinarians around the world. The main problem is related not only to nutrition and the environment but also to the individual characteristics of animals and the physiological period. Immediately after calving is the most favorable terrain for the development of many metabolic diseases. Very common pathologies are SARA, ketosis, puerperal paresis, etc. Studies show that there is a strong relation between ruminal environment disorder by subclinical acidosis and hepatic lipidosis. Since subclinical acidosis or SARA presents many diagnostic difficulties, hepatic lipidosis as frequent episode of this pathology, may serve as an important indicator for SARA's diagnosis. The simplest, fast, non-invasive and low cost method for diagnosis is ultrasonography of liver. Through this method, it is possible to see the hepatic changes caused by the increased deposition of the adipose tissue. The main purpose of this article is to inform the reader that hepatic lipidosis serves to raise doubts that dairy cows are suffering from SARA condition.

Keywords: SARA, Hepatic lipidosis, Ultrasonography, Cows, Diagnosis

(18745) PARASITIC COPROLOGY COMPARED BETWEEN THE PARTRIDGE GAMBRA ALECTORIS BARBARA BREEDING AND WILD IN THE ZÉRALDA REGION

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Given the importance of the gambra partridge as a protected species, its breeding has become a necessity in order to repopulate the native regions of this species. The hunting centre is one of the centres that launched the breeding of the *Alectoris barbara* species in the Algiers region. A coprological study is carried out in the farms in order to better manage them. The same study is followed in the wild and this within the same region in a hunting reserve. Partridge droppings are collected in both stations, they are in number of 32. In the laboratory, the method used for their analysis is the flotation method. Results from parasitic coprology of farmed and wild gambra partridges showed the dominance of protozoa of the genus *Eimeria* spp. with respective prevalences of 100% and 61.54%. Nematodes come in second position 73.68 % in farms and 38.48 % in wild gambra partridges. Ectoparasites occupy third place with 15.75% in the farms and 23.08% in the hunting reserve. In addition, the chi-square independence test shows a significant name difference between the two species of Partridge gambra. Indeed several factors can explain the similarity between farmed and wild partridges.

Keywords: Parasitic coprology, Partridge gambra, Breeding, Wild, Prevalence

(18864) CHRONOLOGY OF GALL'S EMERGENCE OF *OPHELMUS MASKELLI* ASHMEAD, 1900 (HYMENOPTERA: EULOPHIDAE) OF *EUCALYPTUS CAMALDULENSIS* (MYRTACEAE) IN ALGERIA

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In the last years, an insect is detected on the foliage of *E. camaldulensis* trees in Algeria (North-East region). *Ophelimus maskelli* Ashmead, 1900 (Hymenoptera: Eulophidae) has been detected in 2006, The Chronology of Gall's emergence of *L. invasa* and its field infestation rate were followed since 2010, in *Eucalyptus* plantation in the North-East Region. Some statistical methods of Gall's emergence of this pest is reviewed and discussed.

First, after exploration, we selected the most affected trees, second, we organized the samples of each tree, we respected the orientation (North-South-East-West). For each study site 10 trees were marked. 30 leaves of each tree were removed, so it is 300 leaves for each site, which were analyzed. We used the method of time series that connects the time with the number of galls. This study is based on the number of galls observed, on both sides of the leaves. In order to highlight the degree of attack of pests the outputs were made from October 2012 to October 2013, due to two outputs per month.

Keywords: *Eucalyptus*, Gall wasps, *Eulophidae*, Gall inducers, Algeria

(19042) COMPARATIVE EFFECT OF CHANGES IN PLASMA UREA IN EWES "OULED - DJELLAL" FED ON UREA-TREATED STRAW OR ALFALFA HAY

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The purpose of the trial is to study the effect of long-term consumption of any food rich in nitrogenous (urea-treated straw or alfalfa hay) on animal health. 24 ewes bred Ouled-Djellal aged eight months, followed for 5 months (from 22/10/2005 to 23/03/2006) were divided into three lots of weight in homogeneous, in October 2005. Lot 1 and Lot 2 received straw treated with urea (PTU) and supplemented respectively with 200 and 300 g of concentrate, lot 3 received alfalfa hay and 100 g of concentrate. The 3 groups received a mineral and vitamin supplements. Three blood samples were taken monthly by puncture in the jugular vein of all animals: fasting. The plasma urea, practical witness of the excess nitrogen was determined by spectrophotometry. The results showed that uremia ewes of Lot 1 and 2 consuming PTU is 0.15 g/l and 0.38 g/l and that of alfalfa hay lot exceeds 0.4 g/l and are located the upper limit usually reported in the literature (0.28 ± 0.4 g/l) but not affecting the health of animals during the test. The results for uremia in ewes consuming STU are broadly comparable to those reported in the literature concluding that consumption of UTP in a 5-month period does not appear to have a toxic effect on animals. On the other hand, the results of uremia obtained on alfalfa hay lambs, they are often located at the upper limit of the norms. Alfalfa hay, on the other hand, is forage that will have to be rationed because it may cause an abnormal rise in uremia.

Keywords: Plasma urea, Ewes, Ouled - Djellal ", Urea-treated straw, Alfalfa hay

**(19179) POSITION OF AROMATIC AND MEDICINAL PLANTS IN THE DIET OF
OEDIPODA MINIATA IN THE FAR WEST OF ALGERIA TLEMEN
(GHAZAOUET)**

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We therefore want, through this work, to contribute to the study of the position of aromatic and medicinal plants in the diet of the main species of *Orthoptera* in the wilaya of Tlemcen, (*Oedipoda miniata* is a species of *Orthoptera*) to better understand the insect plant relationship and see the floristic procession of insect nutrition.

Our study was conducted from 2015 to 2016 in a natural ecosystem of the wilaya of Tlemcen. West Coast.

The floristic procession and composed mainly of aromatic and medicinal order plants. Especially *Lavandula dentata* (Lamiaceae), *Thymus ciliatus*, *Inula viscosa* and *Pistacia lentiscus* etc.

More than 70% of the floristic procession consisting of aromatic plants.

Despite the low percentage of *Inula viscosa* (12%) in the field, the consumption rate is 41.38% and an index of attraction of 51.04%, which implies a food choice of the locust and an attraction by the odoriferous plants of medicinal origin.

Keywords: *Oedipoda miniata*, Diet, Aromatic and medicinal plants, Tlemcen, Ghazaouet

(19548) EPIGENETIC APPROACHES TO MEAT QUALITY

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The term ‘epigenetics’, in a broad sense, can be defined as anything other than DNA sequence that affects the protein synthesis. It involves the biochemical mechanisms which induce modifications of specific genes or gene-associated proteins (e.g. histones) of a complex organism. Epigenetics has provided novel aspects to genetic analyses because most of the modifications were defined as reversible. An indication of the potential importance of epigenetic mechanisms was performed when it was found that heritable epigenetic changes in gene expression are responsible for cancer. Although these mechanisms have been studied widely in human genome, it is a very new research field in animal breeding and genetics. Epigenetics does not investigate changes in DNA sequence (which is a common research design in animal genetics) but is, however, able to influence heritable gene expression through a number of processes such as DNA methylation, modifications of chromatin and non-coding RNA (e. g. miRNA, siRNA, shRNA). Aberrations in DNA methylation are common contributors to quantitative traits and are key epigenetic modifications that control gene expression in the metabolic process and adipose deposition of mammals. Apart from DNA methylation, one of the most important genetic modifiers is miRNAs which are biomolecules of 22-24 nucleotides in length that control post-transcriptional gene translation. In addition, they have crucial roles in many pathways such as development and differentiation. While a large number of candidate gene analyses and identified QTLs for economic traits have been previously reported in various domestic species, epigenetic modifiers and their expression patterns are not well studied. Moreover, the current knowledge on chromatin modifications and non-coding RNAs, other than miRNAs, is quite limited. Improvement for quantitative traits related to meat quality is the key concern in meat production. Clearly, genetic analyses and gene expression patterns are important for establishing the expression of economic traits. Hence, epigenetic studies may increase our understanding of the behavior of genomic mechanisms in the molecular regulation of myogenesis, adipogenesis, and metabolism, which play key roles in meat quality.

Keywords: Epigenetics, Gene expression, Meat quality, QTL

(19629) EFFECTS OF SACCHAROMYCES CEREVISIAE AS YEAST CULTURE IN FEED SUPPLEMENT ON FATTENING CATTLE ON GROWTH, INTAKE PARAMETERS AND NUTRIENT DIGESTIBILITY

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This study was carried to explore the interest of incorporation of yeast culture (*Saccharomyces cerevisiae*) in the concentrate on the in vitro digestibility and growth of the fattening cattle's. The trial has concerned livestock fattening farm. The farm contains 20 cattle's divided into two homogeneous groups according body weights initial (396.4 ± 69.7 kg and 404.6 ± 97 kg) (Pr.>F) respectively for the control group (C) and experimental one (Y) at the beginning of trial. The ration used is composed of wheat straw and concentrate. The same ration was distributed for (Y) group plus an amount of 10 g/head/day powder in the food concentrated of yeast culture. The quantity of food distributed has been fixed by the breeder and it was 3 kg DM of wheat straw and 8kg DM of the food concentrate. The Trial lasted 112 days (included adaptation period). The weights are made every 2 weeks with a livestock weighing scale. The refusal quantities of wheat straw are also weighed each control. A significant ($P < 0.01$) increase was noted of adg during all trial (average) by 450g/head. And a significant ($P < 0.01$) increase of final weight gain (fwg) by 51.6 kg/head for "yeast" group in comparison with "control" one. The intake doesn't differ yeast. Determination of the total gas was performed on the contents of the rumen filtered from cattle just after slaughter. In syringes, were put 0.3g of substrate (concentrate ground to 1mm), 10 ml of rumen juice and 20 ml of artificial saliva. The syringes are then placed vertically in a water bath at 39°C; the reading is done each 2 hours after mixing syringes until a bearing

Keywords: Fattening cattle's, Acidogenic diet, Yeast, Productivity, Rumen facies

(19662) CHARACTERIZATION OF UTERINE CAPACITY AND FETAL DEVELOPMENT IN RABBIT OF LOCAL ALGERIAN POPULATION AND SYNTHETIC LINE

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The aim of this experiment was to compare the uterine capacity and some factors affecting the fetal weight at the 25th day of pregnancy. Forty- seven uniovariectomized multiparous rabbit does (27 Synthetic line and 25 Local Population) were mated, then sacrificed on the 25th day of pregnancy. In Synthetic line females, the ovulation rate and the number of implanted embryos were higher (+ 26%, $P < 0.001$). At the same ovulation rate, no difference between both groups was noted for these two last parameters. Embryonic, fetal and prenatal survival rates were comparable between females. The Synthetic line fetuses had a lower weight (-20%, $P < 0.001$), reduced size (-3%, $P < 0.01$), poor development of internal organs (-22.9%, $P < 0.01$) and lower development of placentas (-18.8%, $P < 0.001$). The fetuses implanted in the oviductal position has shown a better weight compared to those implanted in the median position of the uterine horn (+ 5%, $P < 0.05$). Similarly, fetal organ weights, available uterine space, amniotic liquid volume and fetal placenta weight are related to the intra uterine position, the best performances are recorded for the fetuses implanted near to oviduct. The effect of fetal vascularization is highly significant on all parameters measured in favor of fetuses receiving a number of blood vessels ≥ 6 . No significant effect of fetal sex was recorded. The litter size measured at the first three parities was higher in SS females (+ 24%). In conclusion, the higher litter size at birth recorded in rabbit of Synthetic line is mainly due to a higher ovulation rate rather than to the improvement of their uterine capacity.

Keywords: Rabbit, Local Population, Synthetic line, Uterine capacity, Litter size, Fetal

**(19715) IMPROVEMENT IN RABBIT BUCK SPERM MORPHOLOGY AFTER
FEED SUPPLEMENTATION WITH CELMANAX®**

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This study is carried out to investigate the effect of 2 prebiotic doses of Celmanax® on sperm morphology features and viability in rabbit bucks. The animal sample is composed of 24 INAT breed bucks, divided into 3 groups: a control group (C, n=8) fed on a basal diet and two treated groups fed on a basal diet supplemented with 0.3 g/kg (T1, n=8) and 1 g/kg (T2, n=8) of Celmanax®, respectively. Semen was collected from bucks using an artificial vagina over 8 weeks. The sperm concentration (SC) was determined using a Thoma cell chamber. Sperm viability and sperm morphology features were determined through an eosin-nigrosin stain exam. The percentages of live spermatozoa (%LS), abnormal heads (%AH), abnormal mid-pieces (%AM), abnormal flagella (%AF) and abnormally shaped sperm (%AS) were determined for the 3 groups. ANOVA was carried out to study the effect of Celmanax® doses on the sperm parameters, using the software SAS (SAS, Institute, Inc®). In addition, the Duncan test was used to compare variables between groups. Data analysis pinpoint that the SC and %LS tend to be more important in T2 than in T1 and C, but this variation was not significant. No variation is recorded in the %AH between the different groups. However, the %AM and %AF decreased in T2 (13% and 55%), in comparison with T1 (18% and 61%) and C (21% and 60%) ($p < 0.05$). Moreover, the %AS decreased in T2 (0.3%) and in T1 (0.4%) compared to C (0.8%) ($p < 0.05$). Our results show that the feed supplementation of Celmanax® at the rate of 1g/kg could improve the sperm morphology in the INAT breed rabbit bucks. This experiment should be continued on more bucks in order to confirm the results on sperm concentration and viability.

Keywords: Doses, Celmanax®, Sperm morphology, Viability, Concentration, Bucks

(19716) POST-PARTUM PERIOD IN TUNISIAN ARAB MARES: WHICH FACTORS INFLUENCE THE FOALING HEAT?

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This work aims to study the influence of some factors on the expression of the foaling heat in Arab mares. This study was held in Tunisia, from January to May 2018. For this, 59 Tunisian Arab mares were separated into 2 groups (young mares, age <15 years, n=41; and old mares, age ≥15 years, n=18), and monitored amid the post partum period. The parturition mode (eutocic, dystocic) was noted, and the onset of the foaling heat and its duration recorded. Follicular activity was monitored using ultrasonography to track the side at which the ovulation occurred. ANOVA was carried out using the software SAS (SAS Institute Inc.®) to study the effect of age and parturition mode on the onset of foaling heat and its duration. The Duncan test was used to compare the variations according to the age and the parturition mode. The onset of the foaling heat and its duration did not vary with the age class (7.5±0.2 vs 7.3±0.2 days; 5±0.5 vs 7.8±0.3 days), but had more important values in mares with dystocia (8±1.2 vs 7.4±0.2 days, p<0.05; 6±1.8 vs 5±0.5 days, p<0.05). Significantly more ovulations occurred in the left ovary than in the right one (55% vs 45%). Furthermore, silent heat occurred at the rate of 20%, while all females resumed an ovulatory function. Our results suggest that dystocia increase the onset delay of the foaling heat and its duration, and that the left ovary tends to retrieve its function faster than the right one.

Keywords: Onset of foaling heat, Duration, *Post-partum*, Factors, Arab mares

(19801) TYPOLOGY AND PHYSICOCHEMICAL CHARACTERISTICS OF GOAT'S MILK PRODUCED IN THE REGION OF SÉTIF

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The objective of this work is to identify the diversity of quality of goat milk at the semi arid region of Setif, and to classify milk samples according to the physicochemical parameters in order to have a real and correct view of the milk quality produced in the region. In total four hundred forty of milk mixture samples were collected from different regions and communes of the wilaya of Setif for physicochemical analyzes. The analysis results were processed to bring out a typology close to the reality of the goat milk product quality in the study area. Milk quality parameters are highly variable and generally satisfactory. The classification has identified five distinct classes of milk distributed unevenly and with distinct characteristics. The distribution of milk samples in different classes confirms the irregularity of the quality of milk produced in farms in the study area. Nevertheless, 50% of the samples collected have high fat and protein content and satisfactory, while only 8.33% of goat milk samples have low fat content and unsatisfactory.

Keywords: Goat breeding, Milk, Physicochemical quality, Semi-arid

(19803) EFFECT OF THYMOL AND CARVACROL SUPPLEMENTATION ON GROWING PERFORMANCE, CARCASS CHARACTERISTICS AND MEAT QUALITY OF FATTENING RABBITS

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Increased concern of the antibiotic residues in animal products among the consumers enhanced researchers to other alternative such as essential oils and their main components.

The aim of this trial is to estimate the effect of dietary supplementation with two commercial component of several essential oils derived from plant species belonging to the Lamiaceae family “thymol and carvacrol” at different levels, on growth performance of fattening rabbits, carcass characteristic's and meat quality. After weaning, a total of 210 rabbits were divided in 7 groups (5 replicates*6 rabbits each) each group received a different dose of thymol or carvacrol (100, 200 and 300 mg/kg of diet) and a control group from day 35 to 77.

Our results showed no significant effect on average daily gain (ADG), feed conversion ratio (FCR), mortality and carcass yield. However, supplementation with thymol or carvacrol affected meat hardness. Groups supplemented with 300 mg/kg of carvacrol or 200 mg/kg of thymol had meat more tender than the other groups ($p < 0.001$).

Keywords: Rabbit, meat, Carvacrol, Thymol, Daily gain, Mortality, Carcass yield, Feed conversion

(19812) EFFECT OF YEAST CULTURE ON GROWTH PARAMETERS AND SPERM QUALITY IN THE QUEUE FINE DE L'OUEST RAMS

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The goal of this work was to evaluate the effect of dietary supplementation by yeast culture (*Celmanax*®, Arm and Hamer, USA) on zootechnical parameters and sperm quality of Queue Fine de l'Ouest rams. Fourteen rams aged between 2 and 4 years, with a mean weight of 55.28 ±3.85 kg were divided into two groups. The control group (T, n=7) received a diet based on straw and concentrate feed. The experimental group (Exp, n=7) received the same ration, supplemented with 10g/ram/day of yeast culture (Celmanax). The sperm of these rams were collected (2 x 2 times/week) using an artificial vagina for 4 months (March-June). Food intake, live weight, body score, testicular diameter, sperm volume and concentration, massal motility and percentage of dead spermatozoa and spermatozoa abnormalities were recorded. Mann-Whitney U test was used to compare food intake, body weight and sperm parameters between both groups. The threshold of significance was fixed at 5 %.

Our results showed that food intake and live weight were not affected by the addition of yeast culture. There were no differences between animals. However a significant ($p < 0.05$) effect of yeast culture supplementation was observed on massal motility of fresh semen at the end of the experiment (1.5 vs. 3.5 respectively for T and Exp groups). The percentage of dead spermatozoa was also significantly lower in Exp Group when compared to the T one (10% vs. 30%, $p < 0.05$). The results of this study suggest that yeast culture could improve semen quality in sheep. However we recommend to extend this to frozen semen and also to investigate the effect of yeast culture on growth performance in lambs.

Keywords: Sheep, Semen quality, Yeast culture

(20240) EVALUATION OF THE CHEMICAL COMPOSITION OF ALFALFA GROWN IN THE SEMI-ARID REGION OF OUM EL-BOUAGHI ALGERIA

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In Algeria, the animal production sector, mainly ruminants, has long suffered from protein deficiency, for which nitrogen-rich varieties have been introduced to alleviate this persistent problem.

The main objective of this study is the determination of the primary chemical composition of perennial alfalfa *Medicago sativa* over two years on both soil types (saline and unsaline soil) during three physiological stages: vegetative stage, budding stage and flowering for the first cycle, and four cuts at the vegetative stage (regrowth) with a frequency of 35 days. Our study was carried out in the irrigated plains of the semi-arid region of Souk Nouaaman in Oum Bouaghi province, extreme east of Algeria.

The parameters studied are dry matter (DM), mineral matter (MM), organic matter (OM), crude protein (CB) and crude fiber (CF).

The results obtained by chemical analysis showed the nutritional interest of our variety for ruminants and this for their organic (89 %DM), nitrogenous (33 %DM) and mineral (11 %DM) content. In addition, the cut number is the main factor of variation for all the chemical studied parameters (CB, MM, OM, and CF). Nevertheless, our cultivar seems to be well adapted to the salinity of the soil

Keywords: Alfalfa, Chemical composition, Semi-arid, Algeria

(20285) STUDY ON SOME BIOCHEMICAL PARAMETERS AND THEIR ASSOCIATION WITH GENETIC DIVERSITY OF CAST GENE IN SHEEP BREEDS KEPT IN BULGARIA

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The aim of present study was investigation of genetic diversity of CAST gene and its association with some blood biochemical parameters responsible for meat quality in sheep. By using PCR-RFLP method 8 sheep breeds were genotyped – Northeast Bulgarian Merino, Askanian merino, Karakachanian (two different herds), Il de France, Synthetic population Bulgarian milk, Cooper Red Shumen, Karnobat Merino and Caucasian Merino. Blood samples were collected from *v. jugularis* and genomic DNA was extracted. For PCR technique a specific set of primers was used and for RFLP it was used restriction enzyme *MspI*. Some blood biochemical parameters were studied: urea, creatinine, ASAT, ALAT, AF and LDH. Polymorphism in CAST gene was found in four of studied breeds. The frequency of allele *M* was between 0.79 and 1.00 and for allele *N* – between 0.00 and 0.21. Expected heterozygosity (*He*) was within 0.000 and 0,331 and observed heterozygosity (*Ho*) was within 0.000 and 0,354. The analysis of results showed statistically significant differences between levels of ASAT, urea and LDH and different genotypes in CAST gene in Northeast Bulgarian Merino and Askanian merino sheep breeds.

Keywords: CAST gene, PCR-RFLP, Sheep breeds, Blood biochemical parameters

(20338) NONSPECIFIC RESISTANCE OF THREE BREEDS OF SHEEP GROWN IN BULGARIA

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The genetic potential of productivity is impossible to be assessed without results of immunological reactivity. Resistance is considered not only as a biological factor reflecting the ability of the animals to withstand the adverse effects of the external environment, but also as an economic indicator.

Natural resistance is essential first-line defenses against the most of foreign agents and is presented by many cell and humoral factors.

Investigations were carried out on 180 sheep from the breeds Karakachan, Copper-Red Shoumen and Synthetic Population Bulgarian Milk. The results of studies of nonspecific resistance parameters: neutrophil phagocytic activity and serum bactericidal activity, showed higher values in the animals of Karakachan breed. The nitroblue tetrazolium assay and lysozyme activity, showed a significant higher levels in sheep from breed Synthetic Population Bulgarian Milk.

The immune parameters obtained for the three local sheep breeds may serve as a basis for further research on lamb systemic immune responsiveness regarding differences among breeds.

Keywords: Sheep, Synthetic Population Bulgarian Milk breed, Karakachan breed, Copper-Red Shoumen breed, Phagocytic activity, NBT test, Serum bactericidal activity, Lysozyme activity

(20626) PHYSIOLOGICAL AND CHEMICAL RESPONSES OF BARBARINE EWES TO SUN EXPOSURE DURING SUMMER SEASON UNDER SEMI-ARID CONDITION

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This study aimed to compare physiological and chemical responses of Barbarine ewes placed outdoors under direct exposure to sun during summer season to counterparts placed indoors. The study was conducted during the month of August. 20 ewes were divided to 2 groups balanced for age and live weight. Group 1 was kept indoors with adequate ventilation whereas group 2 was kept outdoors without shade. Animals were weighed every two weeks. Heart and respiration rates were evaluated in the first, second and the fifth week of the trial. In other hand, rectal temperature was measured every week. Blood samples were taken in the beginning and in the end of the trial in order to assess energetic, nitrogen and ionic balances. Results showed that exposure to the sun had no influence on body weight (50.33 ± 0.74 vs 50.78 ± 0.78 kg respectively for indoors and outdoors groups). Solar exposition significantly ($P < 0.05$) increased respiration and heart rates (respectively 53 vs 100 and 83 vs 93; for indoors and outdoors). The average rectal temperature was significantly higher ($p < 0.05$) for animals placed in the sun (39.33 ± 0.15 and 39.5 ± 0.24 °C respectively for indoors and outdoors groups). The evaluation of serum metabolites showed that cholesterol concentration decreased and triglyceride concentration increased ($P < 0.001$) in animals in the sun. In the other hand we recorded a significant increase ($P < 0.001$) of total proteins, creatinine and urea blood values. The present study provides a better understanding of the adaptation mechanisms of Barbarine sheep that raised, in majority, in dry condition on the effect of solar exposition during summer season on physiological and chemical changes.

Keywords: Ewes, Solar exposition, Physiological traits, Blood parameters

(20981) EVALUATION OF DIFFERENT DIAGNOSTIC TESTS FOR SUBCLINICAL MASTITIS OF DAIRY COW

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Mastitis represents one of the pathologies, which are the most expensive in milk cattle breeding. Their early and efficient detection is one of the control keys. The objective of our research is to assess the frequency of subclinical mastitis in TABLAT (ALGERIA) region using various diagnostic tests. 50 cows were tested by the CMT, including 11 cows were positive, they are the subject of our study and undergo various diagnostic tests: the conductivity of milk Electric (CE), the Counting Somatic Cells neighborhoods mixture of milk, physicochemical and bacteriological analysis of milk.

Following our results, screening for subclinical mastitis using CMT revealed a prevalence of 22%. Bacteriological analysis resulted in the isolation of 60% *Streptococcus*, 20% *Staphylococcus Aureus* and 13.33% coliforms.

CMT is the best diagnostic method, because of its easy applicability, speed and low cost. Its disadvantage is the subjective nature of reading. Furthermore, the Cell count is the best indicator of a breast inflammatory process.

Despite the various diagnostic devices, none is able to effectively detect subclinical mastitis simply based on the value of the electrical conductivity and physicochemical analyzes.

Finally, bacteriology remains the reference method since it has allowed the isolation of pathogens.

Keywords: Detection, Subclinical mastitis, Cell counting, Electric conductivity, CMT, Bacteriology and physicochemical, Milk production, Dairy cow

(21207) INFLUENCE OF LITTER SIZE ON GROWTH PERFORMANCE OF OULED DJELLAL LAMBS IN A SEMI-ARID REGION OF ALGERIA

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This study was carried out in a semi-arid region of Algeria with a population of 20 lambs Ouled Djellal, in the aim of analyzing growth performance and specifying litter size influence. The analysis of the least squared variance was carried out. The results showed that the lamb weighed 4.19 kg at birth, 6.04 kg to 10 days, 7.29 kg to 20 days, 8.44 kg to 30 days and 18.30 kg to 90 days. The mean growth rate was 179.55 g/d between birth and 10 days, 120 g/d between 10 and 20 days, 107.41g/d between 20 and 30 days and 149.26 g/d between 30 and 90 days. Birth weight was very strongly related to weights at typical ages (10, 20, 30 and 90 days), also the average daily gains were highly correlated with each other. The litter size had a very significant influence on birth weight at 10 days, 20 days, 30 days, 90 days and all daily average gains ($P < 0.05$).

Keywords: Litter size, Average daily gains, Lambs OULED DJELLAL, Growth performance, Birth weight

**(21288) HYPOTHETICAL RADIOLOGICAL FINDINGS IN DOGS AND CATS
SUFFERING FROM INSOMNIA**

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Sleep is a vital body function, regulating several biological phenomena. Deprivation studies are one of the ways used to examine the physiological functions and the regulation of the sleep. Sleep deprivation is a stressor, and its' effects depend on an individual's prior sleep deficit and distribution during the day. Sleep deprivation can be partial, total, acute, or chronic or specifically focused on one of the sleep phases. Sleep deprivation affects a large spectrum of vital systems such as thermoregulation, energy and mineral balance, and immunofunction. Based on the fact that sleep is a very important process for the normal development of many metabolic pathways, it is logical to think that insomnia has serious organism consequences. Functional irregularities of different organs are always reflected in structural changes that can be identified with imaging techniques. Imaging methods can also help identify problems of animal insomnia.

Keywords: Radiology, Diagnosis, Insomnia, Sleep, Biology

(21290) RADIOLOGIC FINDINGS OF DOG OSTEOSARCOMA

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Osteosarcoma is a primary mesenchymal tumor that is characterized histologically by the production of osteoid by malignant cells. Patients typically present with localized pain and swelling of the affected area, with the most frequent sites of disease in descending order being the metaphyseal bone of the distal femur, the proximal tibia, and the proximal humerus. Pain may initially be described as activity-related, but over time it often progresses to pain at rest and night pain. Pain is typically reproducible with palpation. Clinical symptoms frequently last for weeks to months prior to presentation and are commonly attributed to “growing pains.” Approximately 7–25% of patients present with macroscopic evidence of metastatic disease and approximately 76% of patients present with microscopic metastatic disease, which is subclinical or undetectable using current diagnostic modalities. Imaging studies include plain radiographs of the involved bone and adjacent joint. Osteosarcoma typically appears as a mixed radiodense and lytic lesion arising in an eccentric manner from the metaphyseal bone. There is frequently mass extension into the adjacent tissue. Cortical destruction and periosteal reaction are common, and typically manifest in a sunburst pattern. In addition, a Codman’s triangle, or elevation of the periosteum at the tumor’s periphery, is a classic though nonspecific feature. Osteosarcoma mineralizes in a centrifugal manner and should not be confused with myositis ossificans, which has an overall benign appearance and which ossifies in a centripetal fashion. The plain radiograph is very suggestive, and classic radiographic features should prompt the assumption that the lesion is a primary bone sarcoma until otherwise proven.

Keywords: Dogs, Radiology, Osteosarcoma, Diagnosis, Bone

(21340) FEED ADDITIVES PRODUCED BY BIOTECHNOLOGICAL METHODS

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Biotechnology is a multidisciplinary field that includes studies on the application of modern techniques to biological systems. It is mainly used in industry such as medicine, agriculture, animal husbandry and food. Biotechnological applications widely used in animal nutrition are the production of feed additives. Various feed additives produced by using biotechnology, improve the utilization of feed, increase the yield, promote growth and contribute to the protection of health in animals. Among these feed additives produced by recombinant DNA technology are antimicrobials, probiotics, prebiotics, various enzymes, organic acids, aromatic compounds, amino acids, yeast, vitamins and some polysaccharides. These compounds are produced from microorganisms that contain the insert gene introduced to vector plasmid through recombinant DNA techniques. Probiotics are at the forefront of biotechnological feed additives. These are biological products made up of cultures of beneficial microorganisms that are used to regulate the microflora balance in the digestive tract, to prevent growth of pathogenic microorganisms from becoming harmful, thereby increasing the utilization of feeds. Other product that complements probiotics in regulation of intestinal flora is the prebiotics. Prebiotics are non-digestible oligosaccharides that affect the development and activity of beneficial bacteria in large intestines by a positive way without being absorbed through digestive system. The most commonly used prebiotics in animal nutrition are; non-digestible mannooligosaccharides, fructooligosaccharides, transgalactooligosaccharides and fructose derivative inulin. Enzymes such as β -glucanase, pectinase, amylase, xylanase, phytase and proteases, which are commonly used in the nutrition of monogastric animals, are recombinant enzymes. Organic acids such as lactic, propionic and butyric acids, which are used as feed additives, are produced biotechnologically too. Organic acids create an acidic environment and prevent the development of pathogenic microorganisms in the digestive tract by lowering pH, increase enzyme activity and improve utilization of feed. Today's developments in biotechnology make a great contribution to the efforts to increase yield and quality, which is the most important goal in animal production. It is a fact that biotechnological developments will continue to open new horizons in the fields of animal production as in other areas. In this review, brief information was given about feed additives produced by biotechnological methods.

Keywords: Biotechnology, Enzymes, Feed additives, Probiotics, Organic acids

**(19148) ANTIBACTERIAL ACTIVITY AND SYNERGY OF EXTRACTS OF
DITTRICHIA VISCOSA AND ANTIBIOTICS**

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The objective of this study is to test the antibacterial power and to evaluate the possible synergistic effect between antibiotics with aqueous and ethanolic extracts, of aerial part of *Dittrichia viscosa*.

Antibacterial activity was determined by the microdilution method against four pathogenic and multi-resistant organisms. *Staphylococcus aureus*, *Listeria monocytogenes*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. Concerning the synergy between the extracts and the antibiotics, it was estimated by comparison of the diameters of the zones of inhibition on solid medium.

The extracts showed interesting antibacterial activity whose MICs ranged from 0.858 ± 0.29 to 66.66 ± 0.00 mg/ml.

The association between the two extracts and seven antibiotics against the four strains tested, showed an amplification of the antibacterial power of the antibiotic of five combinations showing a synergy whose rate varies from 100% to 471%.

This study is used to renovate and improve the weakened efficacy of antibiotics by acquiring bacteria with multiple resistance to antimicrobial agents.

Keywords: *Dittrichia viscosa*, Aerial part, Aqueous extracts, Ethanolic extracts, Antibacterial activity, Synergistic effect, Antibiotics

**(19624) ANTIPROLIFERATIVE EFFECT OF A CONJUGATED FATTY ACID
FROM *MENTHA ROTUNDIFOLIA* ON HUMAN LUNG CARCINOMA**

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The genus *Mentha* L. is one of the most important members of the Lamiaceae family. It comprises more than 25 species distributed all over the world. *Mentha* species are widely used for culinary purposes, in cosmetics, and in traditional medicine. Furthermore, *Mentha* species reports revealed interesting biological activities.

Mentha rotundifolia (MR) has been considered as an hybrid between *M. longifolia* (L.) and *M. suaveolens* Ehrh. This species is widely used in the traditional medicine for its hypotensive, antispasmodic, sedative, anti-convulsive, insecticidal, analgesic, anti-inflammatory, cytotoxic, and antifungal activities.

Several researches have been conducted on *Mentha rotundifolia* particularly on essential oils and phenolic compounds, Nevertheless, studies on fatty acids in *Mentha* species are not well developed.

In the current study, we did a purification of a conjugated fatty acid (P5), reported for the first time to be present in Lamiaceae family. Similar compounds previously extracted from different phyto-sources (e. pomegranate) exhibited potent anticancer activity.

The P5 showed high affinity for TRPA1 receptor highly expressed in transformed cells. Moreover, a significant antiproliferative effect has been found on human epithelial lung cells (A549) expressing the target gene.

Our purified compound displayed a high activation of TRPA1 receptor compared to synthetic drugs commercialized in the market, which suggest using it as a potent anticancer agent.

Keywords: Fatty acid, *Mentha rotundifolia*, Human lung carcinoma

(19962) THE EFFECTS OF NANOPARTICLES ON THE EXPRESSION OF CATALASE ENZYME IN SHORT-TERM ADMINISTRATION ON BREAST CANCER CELLS

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Catalase is an enzyme found in almost all living organisms exposed to oxygen. Catalase enzyme, hydrogen peroxide separates water and oxygen. It's found in carrot and potatoes. Another task is to detect the peroxidase in foods. In this study, the therapeutic effects of nanoparticles on breast cancer cells were investigated. SiO₂, ZnO and Ag compounds and elements are used as nanoparticles.

Silicon dioxide: chemical compound containing oxygen and silicon. The chemical symbol is SiO₂. It has been known since the 16th century. It is used in many materials such as glass, concrete, tiles, porcelain. SiO₂ is in the form of crystalline forms (polymorph) rather than any material. There are 17 different crystal forms such as quartz, topaz and amethyst. There are some stones and quartz in the land. For this reason, it is spreading as dust. Long-term inhalation has been shown to increase lung cancer risk.

Zinc oxide: Has a bitter taste, white powder appearance, odorless. With carbon dioxide in the atmosphere has the property of absorbing ultraviolet rays. It is soluble in acids and alkalis but does not dissolve in water and alcohol. Zinc Oxide is a non-toxic substance but is highly flammable.

Silver: ductile metal that reflects light very well. It shows a great resistance to oxidation in the atmosphere. It is to oxidize more difficult than copper and easier than gold. Standard electrode potential is 0.7978 V. It is resistant to acids and a few organic substances. But it is easily dissolved in nitric and concentrated hot sulfuric acid. It is especially used for burn and skin problems thanks to its curing properties.

Our aim in this study is to investigate the chemo preventive effects of nanoparticles on direct breast cancer cells in 24-48-hour time period.

After 24 to 48 hours of application of the above nanoparticles, the H₂O₂ uptake catalase activity is increased by using water in the cell and these effects are exerted through the expression of catalase enzyme. We quantified amount of catalase enzyme produced by measuring relative amount of RNA-cDNA by Quantitative PCR. As a result, compared with control cells, Ag nanoparticles decreased catalase activity in breast cancer cells compared to other 2 nanoparticles and increased 5 times in ZnO and 2.5 times in SiO₂. These results show that the oxidative effect of Ag nanoparticles on breast cancer cells can be evaluated as a therapeutic agent with a high degree of oxidative effect.

Keywords: Breast cancer, Nanoparticule, Catalase enzyme

(20800) STUDY OF THE CHEMICAL COMPOSITION, ANTIMICROBIAL AND ANTIOXIDANT ACTIVITY OF *ORIGANUM COMPACTUM* ESSENTIAL OIL FROM THE MUNICIPALITY OF TIDILI MESFIOUA IN MOROCCO

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Worldwide, there is a research impulse on natural antimicrobial agents used as an alternative to food preservation and human drugs. The antimicrobials molecules come from the synthetic or the natural path. The excessive and inappropriate use of the antibiotics can be responsible for the emergence of the resistant organisms. Thus several research showed that the conservatives used proved to be endocrine disruptors, even carcinogenic. Morocco is provided with a floristic potential rich and varied in the aromatic plants field. This wealth can be exploited notably concerning essential oils extraction given their biological importance, and there therapeutic, odoriferous proprieties.

In this study, the essential oil of *Origanum compactum* was analyzed and its chemical composition was identified by high-performance liquid chromatography. The average essential oil content was 1.16% by dry matter. Of the fourteen components, carvacrol (81.75%), γ -terpinene (6.83%) and thymol (1.64%) were imparted as the main components. The essential oil was studied for its antimicrobial activity in vitro against five microbial strains from the European Pharmacopoeia. The essential oil was found remarkably active against all the strains tested, with the exception of *Pseudomonas aeruginosa* that was insensitive. In a liquid medium, the minimum inhibitory concentrations (MIC) and the minimum bactericidal / fungicidal concentration (CMB) were 1.25 and 5 mg / ml respectively. The antioxidant activity was studied by Determination of radicals (1,1-diphenyl- 2-picryl-hydrasyl (DPPH)). The results of this study reveals that the essential oil have a strong antioxidant activity starting from the concentration of 0.65 μ g / ml, due to the various phenols present in the oil.

In the light of these results, *Origanum compactum* essential oil shows an important antimicrobial effect, antioxidant property, and can present a promising and safe alternative to synthetic products used in pharmaceutical and food industry.

Keywords: *Origanum compactum*, Essential oil, Antimicrobial, Antioxidant, Pharmacopoeia

**(20996) MEASURING EYE FATIGUE OF RADIOLOGIST AT READING ROOM
AND DAYLIGHT ILLUMINATION CONDITIONS**

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With the revolutionary development in technology, diagnostics methods that are used in radiology have started to change with visual display terminals; however, traditionally the ambient light should be as low as feasible in order to maintain image contrast which may have a negative effect on the amount of eye fatigue of radiologists. The main objective of this study is to investigate the relation between the eye fatigue and ambient light as well as to show the amount of eye fatigue at reading room (0, 50 lux) and daylight (500 lux) conditions using three different eye fatigue measurements methods (CFF, Eye Blink rate, Subjective Test). In order to stimulate eye fatigue, 400 X-ray chest images with pre-marked nodules were given to the five non-radiologist subjects for evaluation under three different ambient lighting settings. Each image was present on the screen for 10 seconds; therefore, one session took 66 minutes for each subject to complete and was repeated for each ambient lighting settings. Measurements were taken before and after each session. Repeated measures ANOVA for CFF results showed that there was no significant difference between ambient lighting levels in terms of eye fatigue ($p=0.962$); however, same statistical test for eye blink results showed that there was a trend to be significant ($p=0.064$) and pairwise comparison showed that the difference in respect of eye fatigue came from mainly the difference between 0 - 50 lux ($p=0.054$) as well as 0 - 500 lux ($p=0.044$). According to the Friedman statistics for subjective test, subjects felt significantly different fatigue under different ambient lighting settings ($p=0.008$). In conclusion, eye fatigue was found to be diminishing with increasing ambient light between 0 and 50 lux and between 0 and 500 lux; however, there was no statistically significant difference between 50 and 500 lux.

Keywords: Ambient light, Critical flicker frequency, Eye blink, Eye fatigue, Radiology

(18785) ALGERIEN NATIONAL SURVEY ON FEMALE INFERTILITY: ABOUT 300 CASES

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Infertility is estimated to affect 15% of couples worldwide. In One third of the infertile cases, the cause is due to the female partner.

The aim of this study is to assess female infertility in western Algeria in order to determine the main etiologies and risk factors that may be the origin of this major public health problem.

We conducted a cross section study between 2012 and 2017, on 300 patients consulting for fertility disorder at Oran, Western Algeria. The patients were interviewed using questionnaire inquiring about their demographics, general health issues, lifestyles and infertility factors.

The average age of the patients was 33.26 ± 3 years and the average duration of infertility was 7 ± 2 years. The infertility was of primary type in 82% cases. Regarding the different etiology of female infertility, it is mainly due to tubal (45%) and ovulatory (43%) problems. The study showed many risk factors for female infertility such as advanced age of women, passive tobacco smoking, overweight.

It is important to educate infertile women as to raise their awareness to the risk factors to enhance the natural fertility. We believe that this will allow better assessment and management of female infertility.

Keywords: Fertility, Women, Risk factors, Etiology

(19513) ANTI-INFLAMMATORY AND ANTI-NOCICEPTIVE ACTIVITY OF VANILLOIDS

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Introduction. Analgesic properties of capsaicin, expressively manifesting themselves in chronic neurotic pains, are described in detail and are widely used in medical practice. Therefore, it is interesting to study analgesic and anti-inflammatory activity of other vanillin-based compounds. As potential vanilloid receptor ligands, these substances may have useful analgesic and anti-inflammatory activity.

Purpose of the Study. Study of anti-inflammatory and analgesic properties of vanillin and its derivatives using various nociceptive and inflammatory experimental models.

Materials and Methods. Vanillyl alcohol, vanillic acid and vanillin oxime were obtained by modification of vanillin aldehyde radical. Ointments containing 2% of the active substance (vanillin, vanillyl alcohol, vanillic acid or vanillin oxime) were used as dosage forms. Ointment base consisted of polyethylene glycol 1500, polyethylene oxide 400 and 1,2-propylene glycol at the ratio of 4:2:3. The study was performed on male Wistar rats with body weight 180-240 g and male CBA mice with body weight 16-20 g. In order to evaluate analgesic effect, the ointments were applied on the right hind paws of the mice 10 minutes before administration of capsaicin (6 mg of capsaicin in 20 µl of 1,2-propylene glycol) or allyl isothiocyanate (AITC) (20 µl of 0.5% AITC solution in 1,2-propylene glycol). Upon administration of algogenic substances the researchers evaluated total time of licking within 5 minutes. Anti-inflammatory effect was studied on carrageenan-induced oedema model. Rats received subplantar 0.2 ml injection of 0.2% aqueous solution of carrageenan. Upon administration width and range of the oedema were measured for three days. Treatment included application of the ointment on the flogogenic injection site immediately after administration, in 2 hours, and then daily once a day.

Results. Pre-application of the ointment containing vanillin and vanillin oxime increased response (licking) time by 1.75 and 1.5 in capsaicin test and by 1.18 and 1.21 in AITS test in comparison with reference values (41 seconds) respectively. Application of the ointment containing vanillyl alcohol and vanillic acid reduced response time by 1.64 and 1.86 in capsaicin test and by 1.89 and 1.74 in AITS test in comparison with reference values (68 seconds) respectively. Use of ointments containing vanilloids for treatment of carrageenan-induced oedema gave positive therapeutic effect for all the studied compounds. Thickness and range of the oedema in experimental animals were on average 1.4 less on the second day of treatment and 1.5 less on the third day of treatment than in control animals.

Analysis and Discussions. We believe that positive and negative analgesic effect on vanillin and its derivatives in capsaicin test can be explained by the different level of affinity of the studied compounds to receptors binding site capsaicin interacts with. Change in nociceptive response in AITS model after treatment with vanilloids is probably connected with impact of nucleophilic binding site (vanilloid binding site) on electrophilic site (AITS impact site) and modulation of its activity. Injection of carrageenan triggers numerous pro-inflammatory and inflammatory processes leading to development of the clinical picture of inflammatory oedema. Continuous impact of the studied vanilloids on TRPV and TRPA in carrageenan-induced oedema leads to their desensitization, reduces release of pro-inflammatory neuropeptides (substance P) and mitigates pain reaction.

Conclusion. We believe that detected pharmacological effects of vanillin and its derivatives have significant practical and theoretical relevance and require further study in detail.

Keywords: Inflammation, Vanilloids, Capsaicin, Pain

**(19585) GENOTOXIC AND APOPTOTIC EFFECTS OF HEAVY METAL MIXTURE
IN HUMAN AORTIC SMOOTH MUSCLE CELLS**

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Human aortic smooth muscle cell proliferation and apoptosis plays an important role in regulating many vascular pathologies. In this study, we aimed that the determination of genotoxic and apoptotic effects of a mixture of four heavy metals in human aorta smooth muscle cells (TG-HA-VSMC). With this aim TG-HA-VSMC (ATTC®CRL-1999) were treated with a mixture of four (Cu, Zn, Pb and Fe) heavy metals in permitted limits in drinking water and tenfold higher at 24 and 48 h. The genotoxic and apoptotic effects were determined with reference to RAPD-DNA polymorphism, expressions of antioxidant enzymes [manganese superoxide dismutase (Mn-SOD), copper-zinc superoxide dismutase (CuZn-SOD), catalase (CAT), glutathione-S-transferase (GST)], heat shock proteins (HSP) and apoptosis pathway genes. Apoptotic effect was also analyzed by image-based cytometer.

According to results of the study, heavy metal mixture caused DNA polymorphism and induced oxidative stress and apoptosis in TG-HA-VSMC. Statistically significant increases in the expressions of CuZnSOD, MnSOD and GST genes were determined at both concentration and exposure times. However, the significant increases in the expressions of HSP27, HSP60 and HSP70 were only determined at 48 h after exposure. Apoptotic effect was evidenced by the induction of p53, Bax, Cyt-c and caspase-3 expressions and apoptotic cell percentage especially at the 48 h.

In conclusion, heavy metal mixture in permitted limits in drinking water caused oxidative stress and apoptosis in human aorta smooth muscle cells. Considering that apoptosis in vascular smooth muscle cells plays a role in the pathophysiology of diseases such as atherosclerosis and hypertension, it was thought that these limits should be revised with further studies.

Keywords: Human aorta smooth muscle cell, Apoptosis, Antioxidant enzymes, HSPs, qRT-PCR

(19947) IDENTIFICATION OF POTENTIAL METHYLATION REGIONS IN THE HUMAN SMAD4 GENE MRNA AND DETERMINING PRIMER SEQUENCES FOR MS-PCR WITH THE COMPUTER PROGRAM

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SMAD4 is a member of an intracellular signaling pathway protein family that is widely expressed in human tissues. This protein is responsible for carrying a chemical signal from the cell membrane to the nucleus. Since reduced SMAD4 expression leads to several tumors and neural disease, it is important to elucidate the mechanisms affecting the expression of this protein. Methylation is among the major factors that affect the expression of the SMAD4 gene. While methylation of the promoter and non-coding exons of SMAD4 gene appear to affect expression, there is no information regarding the other regions of this gene in this regard. Furthermore, cytosine methylation in mRNA is also important in gene activity. For this reason, the demonstration of possible cytosine methylation in mRNA of the SMAD4 gene may be important in understanding gene activity. In this study, we aimed to determine the potential methylation regions in the exons corresponding to SMAD4 protein generation which have not been investigated before. In order to do this, we used the MethPrimer program and identified 25 single CpG sequences and a double CpGpCpG across the exons as potential methylation regions. In addition, 5 pairs of methylated/unmethylated primer sequences were designed with the same program. The study results have shown the presence of potential methylation sequences that are candidates to affect SMAD4 gene expression.

Keywords: Smad4, Methylation, mRNA

(20172) IN VITRO CYTOTOXIC AND ANTIBACTERIAL ACTIVITIES OF COMBINATION OF 5,7-DIHYDROXY-4-METHYLCOUMARINE AND SELECTED EXTRACTS FROM MEDICINAL PLANTS

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Medicinal plants have been acknowledged as potential sources of new lead compounds of therapeutic value for drug design and development. These include coumarins, which have attracted the attention because of their diverse pharmacological properties, structural variability and substitutions in their basic structure. Many coumarin compounds have been identified from natural sources. The current study was designed to investigate the cytotoxicity and antibacterial activity of combination of 5,7-dihydroxy-4-methylcoumarine and crude extracts from three selected medicinal plants (*Trigonella foenum graecum*, *Matricaria recutita*, *Silybum marianum*).

The cytotoxicity of tested substances was evaluated on 24h and 48h by three methods: cell morphology characterization by inverted light microscopy and cell viability tests using the Trypan blue dye exclusion method and the MTT assay. Two monolayer cell lines were used in our experiments: larynx carcinoma cell line (HEp-2) and monkey kidney cells (Vero). Based on the data of cytotoxicity were determined maximal nontoxic concentration (MNC) and cytotoxic concentration, which reduce cell viability by 50% (CC50). The antibacterial activity of the combination was tested on methicillin sensitive or resistant strains from the Gram-positive species *Staphylococcus aureus* (MSSA and MRSA, respectively). The minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) were evaluated following ISO 20776-1:2006(E). In parallel, the redox activity of treated bacteria at MIC was measured using the MTT dye (Abs550nm) versus untreated control.

The results obtained revealed that the combination of tested substances express concentration-dependent cytotoxic and antiproliferative activities. The data presented here showed that the tested herbal combination exhibit low cytotoxicity. It was found to reduce cell viability by 50% when applied at concentration > 30 mg/ml for 48h. The combination showed a moderate bacteriostatic effect against both types of strains tested (MIC=2.5 mg/ml). The redox activity at MIC ranged negligible depending on the strain.

The present study was the first report related to the cytotoxic effect and antibacterial activity of combination of 5,7-dihydroxy-4-methylcoumarine and crude extracts from three selected medicinal plants (*Trigonella foenum graecum*, *Matricaria recutita*, *Silybum marianum*). In particular, these substances exhibit low cytotoxicity against several mammalian cell lines and a moderate antimicrobial effect on MSSA and MRSA strains.

Keywords: Cytotoxicity, Antibacterial activity, 5,7-dihydroxy-4-methylcoumarine, medicinal plants

(20176) IN VITRO EVALUATION OF ANTIBACTERIAL AND ANTIOXIDANT ACTIVITIES OF LEAF EXTRACTS OF *CISTUS LADANIFER* AND *INULA VISCOSA*

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Due to the great economic losses caused by the deterioration and poisoning of food products by food pathogens, there has been an increasing global interest in bio-preservation systems. Plant derived natural products have been suggested as a solution for food preservation. They are widely known for their abundance in antimicrobial and antioxidant compounds, thus providing protection to humans against infection and food born diseases.

Inula viscosa of the Asteraceae family is an herbaceous perennial plant that grows from southern Europe and Turkey, to the Middle East and northern Africa. It is widely reputed for its medicinal values.

Cistus ladanifer, also known as rockrose, is a resinous and extremely fragrant bush that belongs to the Cistaceae family. The plant grows wildly in the Mediterranean region. Both plants have long been used in folk medicine for their anti-inflammatory, antiseptic, and anti-diarrheal activities.

In the present work, we studied the antibacterial and antioxidant activities of leaf extracts of *Cistus ladanifer* and *Inula viscosa* growing in Northern Morocco. The plant extracts were obtained by soxhlet extraction using three solvents (Hexane, dichloromethane, methanol) and distilled water. The antibacterial activity was evaluated by the well diffusion method against *E. coli* ATCC25922; *L. monocytogenes* ATCC19144; *P. aeruginosa* ATCC 27853; *E. faecalis* ATCC 19433; *S. aureus* B1 and *S. typhimurium* ATCC14028, followed by the microtitration assay in order to determine the MIC and MBC of the active extracts. The antioxidant activity was determined using a quantitative DPPH (1,1-diphenyl-2-picryl hydrazyl) assay.

The plants extracts have revealed a considerable inhibitory effect against most organisms, with low MIC and MBC values. The results obtained for the antioxidant activity showed that all extracts followed a concentration dependent pattern with a great capacity to trap DPPH.

Keywords: Antibacterial activity, Antioxidant activity, Medicinal plants, Plant extracts

(21157) NYDA® NEX: A PROMISING HIGHLY EFFICACIOUS OVICIDE AND PEDICULICIDE FORMULATION CONTAINING DIMETICONE AGAINST PERMETHRIN-RESISTANT HUMAN HEAD LICE

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Insecticide resistance to currently-used pediculicides with a neurotoxic mode of action, such as permethrin and malathion, is increasing in incidence and geographic extent and is certainly contributing to increased incidences of pediculosis. As a consequence, the search for new products with novel modes of action is a critical need. Of these types of products, dimeticone-based antilouse products (silicone oils) have attracted a good amount of attention because of their low mammalian toxicity, novel modes of action that are not neurotoxic and the possibility that they will have a low potential for the development of resistance. The efficacy of NYDA® NEX, a new pediculicide formula containing a high concentration of dimeticone, was assessed against permethrin-resistant human head lice (SF-HL strain) using the *in vitro* rearing system in conjunction with the hair tuft bioassay and compared with a reference product (Nix® containing 1% permethrin). *In vitro* assays with NYDA® NEX on newly hatched-first instars elicited very high efficacy (98-100%) with significantly faster mortality response (LT50 <10 min) compared to that of Nix® treatment (LT50 = 4.7 days), indicating that the NYDA® NEX formulation is an effective pediculicide for controlling permethrin-resistant head lice. On the other hand, *in vitro* assays on lice eggs showed that NYDA® NEX was more ovicidal than the Nix® formulation on both young and mature eggs. NYDA® NEX with a solvent rinse following exposure was more ovicidal on young eggs than mature eggs but achieved 100% egg mortality following a 60 min treatment exposure. Nevertheless, a 15 min exposure to NYDA® NEX followed by a soapy water rinse as would be used in daily practice resulted in 100% egg mortality. Moreover, the results for survivorship showed that after treatment with NYDA® NEX, the life cycle of the head louse was impaired as only small number of nymphs that hatched reached adulthood (3.9% and 4.0% of nymphs that emerged from mature eggs treated for 10 and 15 min, respectively). These surviving adult lice died within 48 hours of emergence and did not lay any eggs. All other hatched nymphs did not reach adulthood but died as 1st instars. In conclusion, our data show that NYDA® NEX formulation is highly effective in killing head lice nymphs and eggs *in vitro*. Such products that probably kill head lice by physical means may prevent the development of resistance.

Keywords: NYDA-NEX formulation, SF-HL strain, Dimeticone, Pediculicide, *In vitro* bioassay

(21171) ANTIBACTERIAL ACTIVITY OF THE ESSENTIAL OILS AGAINST BACTERIAL MULTIRESISTANT STRAINS ISOLATED FROM NOSOCOMIAL PATIENTS

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Emerging resistance of bacterial species is one of the most serious threats to successful treatment of microbial diseases. Thus, there is an increased interest in finding alternative methods of treatment, including natural compounds such as essential oils (EOs)

The present study was undertaken to evaluate the antibacterial activity of EOs from aerial parts of *Thymus riatarum*, *Eucalyptus vulgarise* and *Rosmarinus officinalis* against 17 strains of nosocomial bacteria- *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Acinetobacter baumannii*, *Enterococcus faecalis*, and *Klebsiella pneumonia*.

The essential oils were extracted using steam distillation method while antibacterial activity of the essential oils was evaluated by disc diffusion method and the microtitration assay.

The EOs of *thymus riatarum* revealed promising antibacterial activities against the - Gram-negative pathogens with *acinitobacter baumannii* being the most susceptible. The moderate activity was shown by *Rosmarinus officinalis*Eos against bacteria gram positif, however, no activity was shown by *Eucalyptus vulgarise* Eos The minimum inhibitory concentrations and minimum bactericidal concentrations of *thymus riatarum* and *Rosmarinus officinalis* Eos on the test bacteria were in the ranges of 2.5–20µl/mL and 10–>20µl/mL respectively.

Overall, these findings suggest that the EOs from *Thymus riatarum* and *Rosmarinus officinalis* could have potential for use as alternative remedies for the treatment of infectious diseases and could lead to new choices to overcome the problem of bacterial resistance

Keywords: *Thymus riatarum*, *Rosmarinus*, Essential oils, Nosocomial bacteria, Disc-diffusion, Microdilution method

**(17967) PLANT HEDERA NEPALENSIS CONTAIN NATURAL COMPOUNDS
HAVING INSULINOTROPIC EFFECT**

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Glucagon-like peptide-1 (GLP-1) and glucose-dependent insulintropic polypeptide (GIP) are incretin hormones that potentiate insulin secretion in a glucose-dependent manner. Selective GLP-1 and GIP secretagogue are in development as novel treatments for type 2 diabetes. The recent reports in this research areas indicate that *H. nepalensis* (crude extract and fractions) and its isolated compound lupeol stimulates secretion of GLP-1 and GIP in pGIP/neo STC-1 cells. Lupeol stimulated GLP-1 and GIP secretion from STC-1 cells in a concentration-dependent manner in our study. Futhermore, proglucagon, GIP and prohormone convertase 3 genes regulating GLP-1 and GIP biosynthesis were analyzed by RT-PCR. Lupeol also promoted proglucagon, GIP and prohormone convertase 3 mRNA expression. The present results first time demonstrated that *H. nepalensis* (crude extract and fractions) and its isolated compound lupeol showed its modulation on both incretine hormones via promoting their secretion and biosynthesis.

Acknowledgment: We are thankful to Higher Education Commission of Pakistan (17-5-7(Bm7-088)/HEC/Sch-Ind/2011) for financial support.

Keywords: *Hedera neplansis*, Antidiabetic, Incretines hormones

(18850) EFFECT OF RUTA CHALEPENSIS ON ZINC, LIPID PROFILE AND ANTIOXIDANTS LEVELS IN BLOOD AND TISSUE OF STREPTOZOTOCIN-INDUCED DIABETIC RATS FED ZINC DEFICIENCY DIET

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In diabetes, oxidative stress and lipid abnormalities are frequent, pronounced and represent important factors, which are involved in the development of diabetic complications. Zinc deficiency induces oxidative stress although antioxidant *Ruta chalepensis* induces modulator role on oxidative stress in metabolic diseases. Therefore, *Rutachalepensis* may be useful treatment of diabetes in zinc deficient rats. Thus the aim of this study is to investigate the effect of *Ruta chalepensis* extract on blood biochemical parameters, tissue zinc status and antioxidant system in streptozotocine diabetic rats fed zinc deficiency diet.

Twenty eight male albino (Wistar) rats were divided into four groups: two groups fed a zinc-sufficient diet one non-diabetic and the other diabetic, while the others two groups diabetic rats were fed a zinc-deficient diet, one non-treated group and the other treated with the extract of *Ruta chalepensis*. After three weeks of the dietary manipulation, fasting animals were scarified.

Body weight gain of zinc-deficient diabetic animals was lower than that of zinc-adequate diabetic animals. It was noticed also that inadequate dietary zinc intake increased glucose, cholesterol, triglycerides, urea, uric acid, creatinine and lipid peroxidation levels. In addition zinc deficiency diet led to a decrease in zinc tissues (femur, liver, kidney), glutathione concentration and both glutathione peroxidase and glutathione-S-transferase activities. However, *Ruta chalepensis* treatment ameliorated all the previous parameters approximately to their normal levels.

It seems that *Ruta chalepensis* supplementation is a potent factor for reducing the oxidative severity of zinc deficiency in experimental diabetes through its hypoglycemic and antioxidant actions.

Keywords: Experimental diabetes, Rat, Zinc deficiency, *Ruta chalepensis*, Antioxidant

(18942) MORPHOGENETIC TOOLS USING FOR REASSESSMENT OF MENTHA SPECIES COLLECTED FROM AZAD JAMMU AND KASHMIR, PAKISTAN

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Mints are perennial aromatic herbs used both for medicinal and aromatic purposes. Flora of Pakistan has reported six species of genus *Mentha*. Taxonomy of genus *Mentha* is more complex and confusing due to inter specific hybridization. The present research was the first documented report from Pakistan to dissect *Mentha* specimens using morphological as well as molecular tools. SCoT and SSR molecular markers were used to dissect morphogenetic variations among *Mentha* species. Results revealed substantial variation among forty one mentha specimens. The molecular and morphological data were analysed using NTSYS and SPSS software's. Molecular dendrogram recorded four main groups. PIC value was recorded in the range of 5-8 and high level of genetic polymorphism was detected whereas, mean genetic distance was estimated in the range from 0.35% to 100%. Maximum GD was recorded in two combinations P2-P4 and B12-M35 so these genotypes can further be used for breeding programs. Present study explored the efficiency of SCoT and SSR markers for evaluating the genetic diversity studies of medicinal plants. Dendrogram based on morphological traits allocated the forty one specimens into 4 main groups. The present research concluded that both morphological and molecular dendrograms determined considerable level of diversity among *Mentha* species. Furthermore, Specific primers could be needed for further molecular analysis to refine the data more up to varietal level.

Keywords: Essential oil, Mint, Diversity, Medicinal plants, SCoT, SSR

(19355) LC-ESI-MS ANALYSIS AND ANTIOXIDANT ACTIVITIES OF AQUEOUS EXTRACTS FROM TWO ENDEMIC ASTRAGALUS SPP. (SOUTH-EASTERN ALGERIA)

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The use of medicinal plants is still today the most widespread form of medicine around the world; this is essentially because the plant kingdom is an inexhaustible and important source of bioactive substances and natural compounds. *Astragalus* genus is a medicinal plant used in south Algeria for various diseases. The current study was conducted to characterize the aqueous extracts of aerial parts for two species using liquid chromatography coupled with mass spectrometry (LC-ESI-MS) analysis. The aqueous extract showed a great richness of biomolecules such as quinic acid, rutin and hyperoside (quercetin-3-O-galactoside). The results showed that total phenolic compounds (TPC), flavonoids and condensed tannins were high in aqueous extracts. The antioxidant activity was investigated using five different methods: ferric reducing antioxidant power (FRAP), 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging method, ferrous ion chelating ability (FIC), total antioxidant capacity (TAC) and β -carotene bleaching test (BCBT). The aqueous extract of *A. cruciatus* exhibited strong inhibition of β -carotene bleaching comparable to BHA with EC50 (216.91 \pm 1.79 and 267.35 \pm 1.42 μ g/ml, respectively). Thus, *Astragalus* genus represented natural sources of antioxidant compounds that could be used in pharmaceutical and food preparations.

Keywords: *Astragalus* genus, LC-ESI-MS analysis, Phenolic compound, Antioxidant activities

(19465) DETECTION OF MEASLES AND RUBELLA ANTIBODIES IN DRIED BLOOD SPOTS

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Viral infections weaken the immune system and open the door to secondary health problems such as pneumonia, blindness, diarrhea, encephalitis and etc. The main methods of diagnosis on viral infections are based on detection of specific antiviral antibodies in blood specimens. The high contagious index (>90%), the presence of heavy, leading to debilitating complications with high frequency, determine healthy and socio-economic importance of measles and rubella infection.

This study aims to determine the frequency of evidence of measles and rubella antiviral antibodies in dried blood spots in Bulgaria.

The total 101 patients with two types of clinical material (serum samples and dried blood spots) were tested. The specimens were collected according to a research project funded by the National Science Fund, Bulgaria, Contract №DM 03/1,12.12.2016. Serological (indirect ELISA) methods for the detection of specific viral markers - IgM/IgG antibodies against measles and rubella were used.

In the present study tested Bulgarian patients were divided into 11 age groups and the median age was 39 years. The majority of patients were under 30 years of age from capital Sofia. In three patients (serum samples and DBS) was confirmed acute measles infection by ELISA-IgM. No acute rubella infection was detected. Measles and rubella IgG seroprevalence was found in 83/101 (81%) and 79/101 (78%) serum samples, and in 79/101 (78%) and 73/101 (72%) DBS, respectively. In combination immunoenzymatic testing of measles and rubella IgM/IgG markers coincidence for both types of clinical materials were found in ≥80%. No significant differences in the results in terms of gender and age were found.

In recent years there appears a variety of new and innovative applications of the dried blood spots, namely in medicine, neonatology, virology, microbiology and etc. The optimizing of DBS technique as an alternative approach (non-invasive, inexpensive, not requiring trained staff and cold chain for transport and storage) of venipuncture in virology is very important in conducting seroepidemiological studies and to a certain extent in the surveillance of epidemic outbreaks. Serum-based technology remains a major approach to the immunoenzymatic diagnosis of viral infections.

Keywords: Measles, Rubella, ELISA IgM, ELISA IgG, Dried blood spots

(19570) AZACYTIDINE-INDUCED DRUG RESPONSES TO DOXORUBICIN IN HETEROGENEOUS AND SINGLE CELL-DERIVED CLONES' POPULATIONS OF HUMAN BREAST CANCER CELLS IN IN-VITRO

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Breast cancer carries a high degree of intratumoral morphological heterogeneity, responsible for poor clinical prognosis. Additionally, the presence of heterogeneous cell populations is associated with tumor aggression, high metastasis, and the development of drug resistance. The aim of this study was to investigate the variations in cell phenotypes and its impact on the responses to various anticancer drugs in breast cancer cells. First of all, single-cell-derived clones were developed and characterized it morphologically and cytochemically in MCF7, MDA-MB-231, MCF-GAPDH-RFP and MDA-GAPDH-RFP human breast cancer cells. Secondly, the MCF7 cells were treated with 5-10 μ M 5-azacytidine (AzaC) and 50-500 nM doxorubicin (Dox) separately or together (co-treatment or sequential treatment) for 24- and 48 h. Using 3-(4,5-dimethyl-2-thiazolyl)-2,5-diphenyl-2H-tetrazoliumbromide (MTT) proliferation assay, clonogenic assay, Hoechst 33342 and propidium iodide (PI) staining, ROS estimation and Western blot analysis, the role of AzaC in chemosensitization of MCF-7 cells to Dox was evaluated. Thirdly, the single-cell-derived clones of mentioned cell lines were treated with 5 μ M AzaC and 500 nM Dox in the same way for 48 h. The morphological and cytochemical analysis was carried out for different groups after drug treatments. Phenotypic and functional heterogeneity was observed in single-cell-derived clones of breast cancer cells. Moreover, high level of intraclonal heterogeneity was found for CD44, CD140a, vimentin (VIM), fibronectin (FN), focal adhesion kinase (FAK), paxillin (PXN) and vinculin (VCL) in MCF7 and MDA wild type and GAPDH-overexpressing clones during different stages of clonal development. In the case of MCF7 cell line, cellular activity and clonogenic potential were significantly reduced in AzaC/Dox group in the dose- and time-dependent way compared to other treatments ($p < 0.05$). The rates of ROS production and cell death was significantly induced with AzaC+Dox and AzaC/Dox treatments at 48 h ($p < 0.05$). The activities of ERK1/2 and p38MAPK, P53, BAX, P27, and caspase-3 were markedly increased in the AzaC/Dox group. However, BCL-2 was down-regulated in Dox and AzaC+Dox compared to other treatments. The levels of phospho-nuclear factor kappa B (pNF-kB) (Thr) and heat shock protein 70 (HSP70) fell with increasing dosage of Dox in different groups. In drug-treated clones, the colonies sizes and number were significantly reduced after 48 h of drug treatment. The expression levels of α -smooth muscle actin (α -SMA) and VIM cytokeratin (CK8) and CK19 and CD31/PECAM-1 were significantly induced in drug-treated MCF7 and MDA-RFP clones compared to wild type. Altogether, our results demonstrated that cellular heterogeneity is highly linked with drug resistance in breast cancer cells. Also, AzaC significantly induced chemosensitivity to Dox in MCF7 cells line and single-cell-derived clones. This study provides the base for further investigation of the detail mechanisms of pathways mentioned here to develop comprehensive therapeutic strategies in future.

Keywords: Heterogeneity, Clonal analysis, Surface markers, Epithelial to mesenchymal transition, Drug-resistance, Azacytidine, Chemosensitivity, Doxorubicin, Oxidative Stress, Apoptosis, MCF7, MDA-MB-231

(20124) STUDY OF THE ANTIOXIDANT ACTIVITY OF THE METHANOLIC AND AQUEOUS EXTRACTS OF THE ROOTS OF THE MEDICINAL PLANT *GLYCYRRHIZA GLABRA* L.

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Antioxidant compounds are the subject of much work because, in addition to their use as preservatives in food substitutes for synthetic antioxidants, they are involved in the treatment of many diseases. In the context of the discovery of new antioxidants from natural sources, we are interested in this work to the study of phenolic compounds and the evaluation of the antioxidant properties of extracts of *Glycyrrhiza glabra* L. from four regions in Algeria (M'lili, Djamaa, Djalfa and Rhilizane).

The first part of this study concerns the extraction and quantification of total phenols, flavonoids and tannins condenses. The second part is the study of the antioxidant activity of plant extracts using three techniques: DPPH radical scavenging, iron reduction, total antioxidant capacity.

The results obtained show the richness of the Polyphenol Rélizane region (289.3 mg/g) compared to the other extracts (Djamaa, Djelfa, M'lili), and the M'lili region has a better content of flavonoid and tannins (416.7 mg/g), (6.93mg/g) respectively. The methods of the antioxidant activity show that all the extracts of the plants studied have antioxidant properties at different levels. The Djelfa region has a better total antioxidant capacity (54.92) compared to the other regions, the Djamaa region has a strong DPPH radical scavenger (IC50 = 0.12) compared to ascorbic acid (0.41) and for the test of FRAP Djelfa region (0.38) has a better reducing capacity by the other regions.

Finally, it can be deduced that climatic factors have an influence on antioxidant activity and as well as on the chemical composition of the plant.

Keywords: *Glycyrrhiza glabra* L., Polyphenols, Flavonoid, Tannins, Reduction iron, Activity antioxidants, DPPH

(20131) INVESTIGATION OF EXTRACELLULAR ALPHA-AMYLASE ACTIVITY OF *PENICILLIUM CYCLOPIUM*

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A variety of fungus species have been screened for α -amylase activity by a starch plate culture method. *Penicillium cyclopium* was found to be 2.25 ± 0.06 having the highest starch degrading activity in which starch degrading activity is defined as the ratio of the diameter of clear zone to the diameter of fungus colony (DCZ/DFC). Extracellular amylolytic activities of *P. cyclopium* is evaluated under varying pH and temperature reaction conditions. The optimum pH and temperature for reaction were found to be 5 and 30°C, with the enzyme activity values of 2.94 ± 1.01 and 2.06 ± 1.04 U/ml, respectively. The starch hydrolysis percentage of *P. cyclopium* was also investigated with starches from different sources. The highest hydrolysis percentages were found for corn starch in 5, 10 and 15 min, however rice starch was ranked the highest hydrolysis percentage in 30 minutes.

Keywords: Alpha-amylase, *Penicillium cyclopium*

(20270) INSIGHT INTO THE RESPONSE MECHANISM OF SOYBEAN ROOT TOWARDS VARIABLE SIZES OF SILVER NANOPARTICLES

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Silver (Ag) nanoparticles (NPs) are excessively used as antibacterial agents; however, environmental interaction specifically with the plants remain uncertain. To study the size-dependent effects of Ag NPs on soybean under flooding stress, a gel-free proteomic technique was used. Morphological analysis revealed that treatment with Ag NPs of 15 nm promoted soybean growth under flooding stress compared to 2 and 50-80 nm. A total of 228 common proteins that significantly changed in abundance under flooding without and with Ag NPs of 2, 15, and 50-80 nm. Under varying sizes of Ag NPs, protein synthesis related proteins decreased compared to flooding stress while amino acid synthesis related proteins were increased under Ag NPs of 15 nm. Hierarchical clustering identified the ribosomal proteins that increased under Ag NPs of 15 nm while decreased under other sizes. *In silico* protein-protein interaction indicated the beta ketoacyl reductase 1 as the most interacted protein under Ag NPs of 15 nm while least interacted under other sizes. The beta ketoacyl reductase 1 was up-regulated under Ag NPs of 15 nm while its enzyme activity was decreased. These results suggest that the different sizes of Ag NPs might affect the soybean growth under flooding stress by regulating the proteins related to amino acid synthesis and waxes formation.

Keywords: Soybean, Proteomics, Root, Silver, Nanoparticles

(20274) BIOCHEMICAL ALTERATION IN GYNECOLOGIC CANCER

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The basic aspect of cancer treatment is prevention through early identification and diagnosis. Patient identification is done with laboratory tests specific to the type of cancer. The diagnosis is made based on the respective tumor markers. The aim of the study is to monitor the alteration of tumour markers after chemotherapy.

This is a prospective study performed during the period 2014-2016 with 107 patients diagnosed with Ca mamal, uterus and ovaries in the hospital of Vlora district who also were treated with chemotherapy. For all patients, laboratory tests: biochemical, hematologic, tumor markers: CEA (mg/l) CA15.3 (U/ml) CA 125 (U/ml) were performed after the first and second cycle of chemotherapy. Patients were compared to a non-Ca group control group for comparing the values of tumor markers between the two groups and for determining cut-off values and predictive parameters of tumor markers for Ca.

The study included 107 patients with Ca, with a mean age of 57.1 (\pm 8.13) years and ranging from 38 to 70 years of age. By comparing the median values of hematobiokemic and tumor parameters after the 1st and 2nd cycle of chemotherapy, the statistically significant difference was found only for SGOT which showed decrease after the second cycle. Concerning the types of Ca, significant decrease of CA 15.3 was observed in all three types of Ca following the second cycle of chemotherapy. Significant decrease of CA 125 was observed in all three types of Ca following the second cycle of chemotherapy ($p < 0.01$). The values of the three tumor markers are higher in metastatic patients, with statistically significant change in metastasis-free patients ($p < 0.01$).

The values of hematobiokemic parameters and tumor markers are important in identifying the course of therapy as well as predicting malignant conditions.

Keywords: Cancer, Hematobiochemical parameters, Tumor markers

(21192) ANTIOXIDANT EFFECTS OF NIGELLA SATIVA OIL AGAINST SODIUM HYPOCHLORITE-INDUCED IN VITRO OXIDATIVE DAMAGE ON ALBUMIN

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Albumin is a thiol-containing most abundant plasma protein. It has a wide range of functions as an antioxidant, also in ligand binding and transport in plasma. Sodium hypochlorite (NaOCl) has been widely used as a universal antiseptic agent. Hypochlorous acid (HOCl) is synthesized via myeloperoxidase catalyzed reaction. Reaction of HOCl with primary amines and other N-compounds can result in the modification of amino acid structure, protein fragmentation and cross-linking depending on the concentration of HOCl. NaOCl mimics the reaction of HOCl with proteins. Impaired redox homeostasis (IRH) is the imbalance between the production and the inability of removal of the oxidants. IRH leads to a macromolecular damage and results in the alteration of albumin's structure and function. Nigella sativa oil (NSO) has been widely used as a medicinal plant due to its biological activities such as antioxidant, anti-inflammatory, antihypertensive effects. Our study aimed to evaluate the ameliorative and protective effects of Nigella sativa oil on hypochlorite- induced oxidatively modified albumin in in vitro conditions. Our study groups were divided into six groups as control, stress, ameliorative and protective effects of high and low concentrations of NSO. We analyzed oxidative protein damage biomarkers as advanced oxidation protein products (AOPP), protein carbonyl groups (PCO) and total thiol groups. Results and discussion: We found that high concentrations of NaOCl lead to increased AOPP and PCO and decreased thiol levels. NSO reduced the elevated levels of AOPP and PCO and lead to increased thiol levels ($p < 0.001$). Exposure to high levels of NaOCl resulted in elevated AOPP levels which is associated with hypochlorite radicals. NSO reversed these oxidative effects of NaOCl. We found that NSO has protective and ameliorative effects on high concentration of NaOCl-induced redox imbalance. NSO can be highly recommended as a complementary therapy in various diseases in which the pathophysiology depends on oxidative damage.

Keywords: *Nigella sativa*, Oxidative stress, Antioxidant, Sodium hypochloride, Albumin

(21212) COMBINATIONAL TREATMENT OF CISPLATIN AND GALLIC ACID INHIBITS PROLIFERATION OF LUNG CANCER (A549) AND BREAST CANCER (MCF-7) CELLS BY ALTERING THE EXPRESSION OF APOPTOTIC-ANTIAPOPTOTIC GENES

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Cancer is a devastating disease that causes great losses in worldwide. The increasing incidence of cancer is necessitating the development of new clinical approaches against this relentless disease. There is a huge interest to development of combined therapies that can provide both decreased the side effects and increased the effect at lower doses of chemotherapeutics. Among men and women, lung cancer and breast cancer have the highest incidence, respectively. Apoptosis is programmed cell death and several genes such as p53, Bcl-2, Bax, and mTOR are involved in regulation of apoptosis. Cisplatin is a chemotherapy drug used in the clinical treatment of many cancer types such as breast, bladder, lung, cervical cancers and it has significant side effects. Gallic acid (GA), 3,4,5-trihydroxybenzoic acid, is a phenolic compound that abundant in plant sources such as fruits and green tea. Gallic acid has anticancer potential, but studies which exhibit the molecular effect mechanism of this compound in combination with cisplatin are limited in the literature. This study is aimed to investigate the antiproliferative, apoptotic and antiangiogenic effects of gallic acid on human *non-small cell lung cancer* cell line (A549) and breast cancer (MCF-7) cell line and their synergistic activities with cisplatin.

A549 and MCF-7 cells were treated with gallic acid and cisplatin combination and anti-proliferative effects were examined by WST-1 and clonogenic assay. To examine apoptotic effects, Cell Death Detection Elisa assay was performed and Human VEGF Elisa method was used to determine the amount of VEGF *in vitro*. p53, Bax, Bcl-2, mTOR and PTEN gene expression levels were measured by RT-qPCR. β -actin was used for optimization as house-keeping gene. Each experiment was performed in triplicate.

The combination of cisplatin and gallic acid decreased cell viability in both cell lines depending on the combination rate. The increase in apoptosis as a result of treatment with IC50 doses was found 7.3 and 5.7 fold in A549 and MCF-7 cell lines, respectively. The amount of VEGF which optimized in the control group as 100 pg/ml, determined as 65.9 pg/ml in A549 cells and 73.1 pg/ml in MCF-7 cells. In both cell lines, the combination of cisplatin and gallic acid significantly increased the expression of apoptotic p53 and Bax genes, also this combination significantly reduced antiapoptotic Bcl-2 and mTOR genes expression levels compared with the control group ($p < 0.0001$). There were no significant changes in PTEN expression levels. The antiproliferative and apoptotic effects of cisplatin, may be increased by combination with gallic acid and be synergistically enhanced in some cancer types.

Keywords: PTEN, Cell viability, VEGF, Gallic acid, Lung cancer

(21268) EVALUATION OF THE THERAPEUTIC EFFECTS OF PROCYANIDINES EXTRACTED FROM *PINUS MARITIMA* (PYCNOGENOL) ON OXIDATIVE/NITROSATIVE STRESS IN EXPERIMENTAL DIABETES MODEL

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Herbal supplements and remedies have been used around the world because of their beneficial effects on human health. Extracts from grape seed have become popular dietary supplements in recent years. Some of the most pharmacologically active components of grape seed extracts are oligomeric procyanidin complexes (OPCs) which have antioxidant properties. OPCs are also called Pycnogenol (PYC), which is a registered trade name, when they are derived from pine barks of *Pinus maritima* tree. The terms PYC, OPC's, and grape seed extract are used interchangeably. PYC is reported to have a significant free radical scavenging activity against oxidative/nitrosative stress arising during normal cellular metabolism and via environmental factors and have the potential to regenerate endogenous antioxidant molecules. Evidences have suggested that oxidative/nitrosative stress plays a major role in the pathogenesis of diabetes mellitus (DM), also appearing to be the pathogenic factor in underlying diabetic complications. The present study was designed to investigate the protective antioxidant effects of PYC in experimental diabetes. Male Wistar Albino rats were divided into three equal groups: 1. Control 2. Diabetic 3. Diabetic+PYC. Diabetes was induced to rats in the diabetic group by single dose of STZ (65 mg/kg) injection intraperitoneally. PYC was given intragastrically by gavage (50 mg/kg/day) for four weeks. Four weeks later, the levels of TBARS and SOD enzyme activities were measured as oxidative stress biomarkers and NOx and 3-NTyr levels were measured as nitrosative biomarkers in the blood samples of the rats.

TBARS, NOx and 3-NTyr levels were found higher in diabetic rats when compared with the control group, and SOD activities were found lower due to a depletion of endogenous antioxidants. PYC consumption lowered the levels of TBARS, NOx and 3-NTyr when elevating the activities of SOD.

It is clear that oxidative/nitrosative stress was markedly enhanced in diabetic rats. Consuming PYC is quite effective in lessening the probable injury can be said.

Keywords: *Pinus maritima*, Pycnogenol, Oxidative Stress, Nitrosative Stress, Diabetes mellitus

**(18061) THE VALORIZATION OF MEDICINAL AND AROMATIC PLANTS FOR
NATURAL ANTIOXIDANTS**

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According to the results of scientific research, the premature cellular aging triggered by the oxidative stress gives rise to many diseases like: obesity, diabetes, and other health complications. The oxidative stress caused by free radicals, chemical species, extremely unstable containing an electron not paired. This compound may react by attacking the more stable molecules cells of our body to match its electron, thus speeding up the cellular aging. Ibn El-Bitar Project is for the valorization of medicinal and aromatic plants. GM foods, meat from animals fed artificially, artificial food additives (preservatives, flavors, dyes), excessive consumption of drugs and emotional stress is the main source of free radicals. To address this serious problem of free radicals in the project, we tried to have a solution by production of the nutraceutical products based on medicinal plants, rich in natural antioxidants that they have the ability to inhibit the free radicals by creating the covalent addition, thus inhibits the triggering oxidation chain reactions and stop their propagation.

Keywords: Ibn El-Bitar Project, Startup, Medicinal plants, Natural antioxidants, Premature cellular aging, Oxidative stress, Free radicals, Nutraceutical products, Diseases

(18744) EVALUATION OF ANTIBACTERIAL AND ANTIOXIDANT ACTIVITIES OF FLAVONOIDS FROM FLOWERS AND LEAVES OF (*HIBISCUS ROSA-SINENSI* L.).

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The Malvaceae family comprises about 120 genera and 1700 to 2000 species. The species of this family, has been used as herbal plants in folk medicine for treatment of different diseases. All parts of these plants are antiphlogistic, astringent, demulcent, diuretic, emollient, expectorant, laxative and salve.

Hibiscus rosa-sinensis L. (family Malvaceae) is a profusely flowering, perennial, woody ornamental shrub distributed widely in the tropical regions. Previous studies have indicated *H. rosa-sinensis* to possess bioactive properties and is recommended to be used as an herbal alternative to cure many diseases.

Furthermore, it has reported that *H. rosa-sinensis* possesses anti-complementary, anti-diarrhetic and anti-phlogistic activity. *H. rosa-sinensis* flowers have anti-spermatogenic, androgenic, anti-tumor.

The aims of this study were to evaluate the antioxidant and antibacterial activities of flavonoids from flowers and leaves of (*Hibiscus rosa-sinensi* L.). The flowers extract of *H. rosa-sinensis* is the richest in flavonoids (FFR: 3.19%).

The Antioxidant activity showed the flavonoids extracts from flowers of (*Hibiscus rosa-sinensi* L.) to highest activity for inhibition of DPPH free radical.

For antibacterial activity, the flowers and leaves extracts of *Hibiscus rosa-sinensis* inhibited the growth of some pathogens such as *Serratia rubidae* and *Enterobacter sp.*

According to our results of this study and comparison with other studies in the same field, we can indicate the potential of exploiting the (*Hibiscus rosa-sinensi* L.) in traditional medicine as a source of natural antibiotics.

Keywords: Flavonoids, *Hibiscus rosa-sinensis*, Antioxidant activity, Antibacterial activity

(18836) HPLC-DAD ANALYSIS, ANTIMICROBIAL AND ANTIOXIDANT PROPERTIES OF THE ETHANOLIC EXTRACT OF *MELISSA OFFICINALIS* FROM ALGERIA

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Melissa officinalis (Lamiaceae) has been used to treat several conditions such as gastrointestinal disorders, skin infections, nasal congestion, fever and cramps. The objective of this study was to evaluate the chemical composition of ethanol extract from leaves of *Melissa officinalis*. HPLC-DAD was used to determine the fingerprint chromatogram of the extract for the isolation and characterization of heterosides of *M. officinalis* dried leaves of *M. officinalis* and determination of antimicrobial and antioxidant activity, of the extract of *M. officinalis*. The results of the study of analysis by HPLC-DAD were identified the compounds: vitexin (0.04%), quercetin-3- β -D-glucoside (0.29%), luteolin-7-glucoside (1.38%), apigenin-7-glucoside (1.80%) and isorhamnetin (1.74%).

The results of the study of antibacterial and antifungal activities are reported. We noted that the three flavone extract samples of *Melissa* leaf are active against Gram-positive bacteria (*Micrococcus luteus* (Ml), *Bacillus subtilis* (Bs) and *Staphylococcus aureus* (Sa)) with inhibition of 14 to 41 mm in diameter and even greater than that of the control antibiotic (Gentamicin). Depending on the scale of performance, one can therefore consider that these strains are very sensitive. They are less active and sometimes inactive against Gram-negative bacteria (*Klebsiela pneumoniae* (K.p)).

Keywords: Antimicrobial activity, Antioxidant activity, *Melissa officinalis*, HPLC

(18862) ANTIOXIDANT PROPERTIES OF METHANOLIC EXTRACT AND DIFFERENT FRACTIONS OF *CRATAEGUS AZAROLUS* LEAVES AND FLOWERS FROM ALGERIA

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Crataegus azarolus is a medicinal plant belonging to the Rosaceae family, known as Hawthorns. Traditionally, hawthorns are used to treat diabetes, cardiovascular diseases, hypotensive, cancer and other diseases. The aim of the present study is to investigate the antioxidant activities of crude methanolic extract and its different fractions obtained from Algerian *Crataegus azarolus* leaves and flowers using different tests such as DPPH (1, 1-diphenyl-2-picrylhydrazyl radical), reducing power and β -carotene assays. The obtained results indicated that ethyl acetate fraction (EAF) showed the highest DPPH radical scavenging activity with an IC₅₀ value of 9.72 ± 0.102 $\mu\text{g/ml}$, followed by crude methanolic extract (CME) and diethyl ether fraction (DEF) with an IC₅₀ value of 20.96 ± 0.340 and 68.69 ± 2.490 $\mu\text{g/ml}$, respectively. However, the ethyl acetate fraction showed a good reducing power (EC₅₀ = 30.96 ± 0.563 $\mu\text{g/ml}$) as compared to other fractions. In β -carotene/linoleic acid assay, the best inhibition was found in chloroform fraction (CHF) with an IC₅₀ of 65.45 ± 1.027 $\mu\text{g/ml}$. As a conclusion, the results of the present study indicate that the aerial part extracts of *Crataegus azarolus* is a good source of natural antioxidant constituents.

Keywords: *Crataegus azarolus*, Antioxidant activities, Leaves, Flowers

**(19093) ANTIINFLAMMATORY AND IMMUNOMODULATORY EFFECTS OF
GLOBULARIA ALYPUM METHANOLIC EXTRACT**

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The plant *Globularia alypum* L. belongs to the family Globulariaceae, very abundant around the Mediterranean basin. In traditional medicine the aerial part a of *Globularia alypum* is used to treat several diseases. The present study was designed to evaluate the anti-inflammatory effect of methanolic extract (Met. E) of *Globularia alypum* on cotton pellet-induced granuloma model and on cytokine (TNF α , INF γ IL1 and IL8) released from human monocytes. Results showed that Met. E at 200 mg/kg reduced granuloma dry and wet weights by 16 and 18%, respectively. Moreover, this extract at 1 - 100 μ g/mL exhibited remarkable inhibitory effect on TNF α , INF γ and IL1 production. The percentages of inhibitions were 95-100%, 92-100%, and 74-98, respectively. In contrast, Met E of *Globularia alypum* exerted moderate inhibition on IL8 release, with only 33-40% of inhibition. The overall results suggest that *G. alypum* methanolic extract exerted anti-inflammatory activity and it may serve as a potential source of anti-inflammatory and immunomodulatory agents.

Keywords: Cytokines, *Globularia alypum*, Inflammation, Monocyte, Neutrophile, Plant extract

(19312) BIOMOLECULE OXIDATION PROTECTIVE ACTIVITY OF *SANTOLINA CHAMAECYPARISSUS* AQUEOUS EXTRACT

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Overproduction of reactive oxygen species (ROS) is responsible for the oxidative damages including DNA lesions and protein fragmentation within the cells. It is well known that ROS are involved in aging processes and in many diseases like cancer, inflammation, cardiovascular and neurodegenerative diseases. Therefore, the protective activity of aqueous extract (AE) of *Santolina chamaecyparissus* L. (*S. chamaecyparissus*) against DNA and protein oxidative damage was investigated. pBluescript M13+ plasmid DNA damage was induced by photolysing H₂O₂ with UV radiation; whereas BSA degradation induced by Fe³⁺/H₂O₂/ascorbic acid system. Results showed that DNA oxidation damage was inhibited dose independently in the presence of AE of *S. chamaecyparissus*. Indeed, the AE at 0.25 mg/ml suppressed DNA cleavage by 87.6%, while the AE at 0.5 mg/ml suppressed DNA cleavage by 93.1%. The protein oxidation was also inhibited by the treatment with AE of *S. chamaecyparissus*. At 1 mg/ml, AE protected BSA fragmentation by 98%. The overall results suggest that AE of *S. chamaecyparissus* exhibits antioxidant activity by protecting cell macromolecules; hence it may serve as a potential source of natural antioxidants.

Keywords: Antioxidants, Reactive oxygen species, *S. chamaecyparissus*, DNA oxidation, BSA oxidation

(19477) ANTIOXIDANT, TOTAL PHENOLIC AND FLAVONOID CONTENT OF VARIOUS SOLVENT EXTRACTS FROM *ASTRAGALUS GOMBO*

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Many species of *Astragalus* genus are valued in the folk medicine throughout the world and used as medicinal herbs, in fact, *Astragalus gombo* is a medicinal plant used in south Algeria for various diseases. The present investigation was directed to estimate the total polyphenols compounds (TPC), flavonoids and condensed tannins. The results showed that the methanolic extract revealed higher content of TPC, flavonoids and condensed tannins than the aqueous extract with (98.74±1.75 mg GAE/g DW, 48.77± 0.44 mg QE/gDW and 25.82±1.39 mg CE/g DW, respectively). The antioxidant activities of extracts were studied via three methods: FRAP (ferric reducing antioxidant power), DPPH (2, 2-diphenyl-1-picrylhydrazyl) and beta-carotene linoleic acid bleaching. The methanolic extract of *A. gombo* was characterized by high reduction power close to the positive control BHA with IC50 (109.36± 2.73µg/ml and 100.56± 5.71µg/ml, respectively). A high Pearson's correlation between TPC and DPPH method (R2=0.99) also a strong correlation between DPPH method and content of condensed tannins (R2=0.98) were registered. *Astragalus gombo* represents a source of potential antioxidants that could be used in pharmaceutical and food.

Keywords: *Astragalus gombo*, Phenolic compounds, Flavonoids, Antioxidant activities, Pearson's correlation

(19654) ANTIBACTERIAL ACTIVITY OF ALGERIAN SUN-DRIED RAISINS EXTRACTS AGAINST CLINICAL ISOLATES OF EXTENDED-SPECTRUM BETA-LACTAMASE ESBL-PRODUCING ENTEROBACTERIACEAE

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The relationship between diet and health has been recognized since ancient times. Until as recently as the early 20th century, physicians prescribed specific foods and diets as remedies for illness and for their disease preventive value. The present study deals with the evaluation of the *in vitro* antimicrobial potential of three different sun-dried Raisins extracts by using agar diffusion methods and minimum inhibitory concentration (MIC)-determination. Moreover, the extracts were investigated for their polyphenolic content. The quantitative assays of total polyphenols by the Folin-Ciocalteu test revealed the richness of the different extract by polyphenol, content varies from 10.65 ± 1.59 mg to 23,25 GAE/100g of fruit this value. The phenolic compounds were abundant in acetone and ethanolic extracts. It's depends on the polarity of the solvent and the extraction method. According to the results of the aromatoграмme, all the phenolic extracts showed antibacterial effect against all extended-spectrum beta-lactamase ESBL-producing Enterobacteriaceae with a strong inhibitor with MIC = 36,25µg/ml power.

Keywords: Sun-dried raisins, *Enterobacteriaceae*, β-lactamase, Polyphenols, Antibacterial activity

(20018) PHYTOCHEMICAL SCREENING OF A RARE SPECIES (*ANTHYLLIS BARBA-JOVIS*) COLLECTED FROM NORTH EASTERN ALGERIA

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Anthyllis beard of jupiter (*Anthyllis barba-jovis*) an endemic fabaceaceous shrub located in the North Eastern of Algeria. Current knowledge on this species of the genus Anthyllis is very limited especially in the medicinal side. It is in this vision ours study was undertaken.

So we tried to carry our modest contribution, which constitutes a phytochemical characterization performed on the aerial part of our plant material harvested at altitude from a rocky area, this is the indispensable means to highlight the presence of groups of chemical families (flavonoids, saponins, tannins, terpenes and sterols, alkaloids, coumarins, essential oils, anthocyanins, etc.). The principle is either based on the formation of insoluble complexes using the precipitation reactions, or on the formation of the colored complexes, using the coloring reactions.

Our results show that our studied species has an exceptional richness in chemical compounds mainly of secondary metabolites which make it a medicinal plant par excellence. This will probably allow us an opportunity to value it in the field of pharmacognosy

Keywords: Anthyllid beard of jupiter, Secondary metabolites, Phytochemical, Valorization, pharmacognosy

(20241) THE ROLE OF ABC TRANSPORTER PROTEIN GENES IN THE INSECTICIDE RESISTANCE AGAINST TO DELTAMETHRIN IN *DROSOPHILA MELANOGASTER* ADULTS

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Insecticide resistance is a major problem that has developed in almost all insect classes in recent years. Although the mechanisms of the ABC transporter family have been studied extensively in humans, the mechanisms in insects are still unclear. The aim of this study is to investigate the molecular mechanisms of insecticide resistance using deltamethrin, one of the commonly used insecticides in the *Drosophila melanogaster* Oregon R+ model organism. For this purpose, multidrug resistance was improved by repeated Deltamethrin application through five generations of *D. melanogaster*. Drug resistance and LD 50 concentrations were determined by probit analysis. Relative gene expression levels of multidrug resistance (ABC), heat shock family and apoptosis genes were analysed by real time PCR, morphological differences were observed with a stereo microscope. The gene expression levels of control and resistant individuals were normalized using the RP49 endogenous control gene. Data were analyzed using the SPSS 18 statistical analysis program T-test method. ABC-C genes (*PMRP1*= 1.64 fold ve *PSUR*= 3.95 fold), Apoptosis genes (*PBAX*= 6.46 fold, *PBCL-2*= 3.86 fold ve *PCAS3*= 6.91 fold) and HSP genes (*PHSP27*= 7.02 fold, *PHSP60*= 2.00 fold ve *PHSP70*= 3.67 fold) showed a significant increase in resistant individuals compared to respective control group. ($P \leq 0.005$). In this study increased expression levels of MRP1 and SUR belong to ABC genes suggests that deltamethrin resistance of *Drosophila* evolved via ABC-C subfamily transport proteins. Increased expression levels of HSP genes have been implicated in the misfolded proteins in *Drosophila* cells resulting from deltamethrin exposure. The increased expression levels of apoptotic genes have shown that the cells damaged by deltamethrin are eliminated by apoptosis and act as molecular mechanisms that contribute to insecticidal resistance.

Keywords: *Drosophila melanogaster*, Deltamethrin, Insecticide Resistance, ABC genes

(20364) DECOLORIZATION OF REACTIVE BLACK 5 DYE BY *PLEUROTUS OSTREATUS* LACCASE

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Reactive azo dyes are expressed as the largest class of textile dyes are used in the textile industry due to have different color shades, low energy consumption and ease of application. These dyes which are extremely resistant to degradation are highly toxic for natural ecosystems. A wide range of physicochemical methods has been developed for the degradation of dye-containing wastewaters but, these classical processes could be cause different major environmental problems. To overcome these problems, enzymatic processes which are more ecofriendly have developed. Laccases (EC 1.10.3.2), have natural ability to act on a wide range of substrates make them highly useful biocatalysts for various biotechnological applications such as textile dye decolorization, paper pulp biobleaching and bioremediation. They can transform chromatic groups of dyes to less harmful products. Laccases are widely distributed in higher plants and fungi and nowadays, reports about the isolation, purification and characterization of laccases from fungi have been increasing. The white rot fungus *Pleurotus ostreatus* is an edible basidiomycete with increasing agricultural and biotechnological importance and, it is one of the most widely cultivated mushrooms in the world. In this study, laccase was isolated from fruiting bodies of *P. ostreatus*. The homogenate which is obtained was partially purified by using Three-phase partitioning (TPP) method. After dialyses of supernatant obtained by using three phase participation, the specific activity of dialysate was determined as 231 U/mg proteins and for the decolorization studies the dialysate was used as source of *P. ostreatus* laccase. Dye decolorization was determined spectrophotometrically by monitoring the decrease in the absorbance peak at 595 nm, which is the maximum wavelength for Reactive Black-5 (RB-5). The decolorization activity of *P. ostreatus* laccase was determined to be about 18.9, 33.2, 40.8 % within 12, 24 and, 48 h, respectively. *P. ostreatus* laccase was immobilized on Celite-545 with 98.1% successful by adsorption method and also, the immobilized laccase was used for the decolorization assays of RB-5 dye. The decolorization studies were performed with immobilized laccase and the results were compared to the decolorization activity of free laccase.

Keywords: Laccase, *Pleurotus ostreatus*, Decolorization, Reactive Black-5, Immobilization

(20675) EXTRACTION AND ANTISTAPHYLOCOCCAL STUDY OF THE ESSENTIAL OIL OF *ORIGANUM VULGARE* L. (GUELMA-ALGERIA)

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Antimicrobial properties of plants essential oils (EOs) have been investigated through several observations and clinical studies which purpose them as potential tools to overcome the microbial drug resistance (MDR) problem. The aim of this research is to study the antibacterial effect of a traditional plant EO, *Oraginum vulgare* L. against clinical isolates of methicillin resistant *Staphylococcus aureus* (MRSA) through disk diffusion and agar dilution methods. The EO showed a very effective bactericidal activity towards the majority of tested bacterial strains with inhibition zone diameters in the range of 9.9-31.9 mm and a minimum inhibitory concentration (MIC) ranging from 0.314 to 0.628mg/ml. These results suggest that essential oil of *Origanum vulgare* L. may be a useful alternative to antibiotics for the control of the infections caused by *S. aureus*.

Keywords: *Origanum vulgare* L, Essential oil, Antibacterial activity, *Staphylococcus aureus* MRSA

(20882) A NEW SIGHT IN PARTIALITY AND IN WHOLENESS ON THE ORGANISM IDIOTYPE ACTION

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In this work is given, with a dose of conditionality, a new concept for the ingredients of the results of action of one or another combination of the genetic determinants.

First is the action of the so cold *non-Mendelian-,cytoplasmic-*, or preferred by the author of this article *extrachromosomal inheritance (heredity)*, valid for all the bionta, excluding the species of pre-cellular organisms. That is why, the sum of the action of these genetic determinants is named *ech-zigosis* and *ech-osis* or *eci-zigosis* and *eci-osis*, and designated with the symbol *d eci*.

The second sum of actions is the named as *hemizygosis* or *hemisis*, marked with the symbol *d hem*.

The third sum of actions is named *homosis* or - *homozygosis*, here designated as *d hom*.

And the fourth sum of actions is - the *heterozygosis* or *heterosis*, here symbolized as *d het*.

The last three single summary effects are joined together, and named with the terms *ch-osis* and *ch-zygosis* or *ci-osis* and *ci-zygosis*, and their total sum is marked with the symbol *d ci*.

New terms are also implemented for the summary effect of the whole or holistic combination of the hereditary determinants - *holozygosis* or *holosis*.

For the pre-cellular organisms are suitable only the terms *hemisis* and *holosis*.

But the terms *ech-osis* or *eci-osis*, *hemisis*, *ch-osis* or *ci-osis* and *holosis* are suitable for all the species of prokaryotes, and during all the phases from the so-named stadium of *gametobiont*, being either *androgametobiont* or *gynogametobiont*, from the particular contiguous windings (generations) of the screw lines of the survivals of the birth populations of eukaryotes, either diploid, auto- or allopolyploid.

The terms *ech-zigosis (eci-zigosis)*, *hemizygosis*, *homozygosis*, *heterozygosis*, *ch-zygosis (ci-zygosis)* and *holozygosis* are suitable during all the phases from the so-named stadium of *zygotobiont* from the particular contiguous windings (generations) of the screw lines of the survivals of the birth populations of eukaryotes, either diploid, auto- or allopolyploid, while in these circumstances the terms *homosis* and *heterosis* have not to be used.

This whole or holistic effect is designated with the symbol *e hol*, and is composed by the sum of the four summary single effects and by the addition of all possible interactions between them. Interactions are labeled with the symbol *b* with subscripts for the respective double, triple or quadruple combination of *ech (eci)*, *ch (ci)*, *hem*, *hom* and *het*.

Mathematical expressions of the *holozygosis* - or the *holosis* in any definite environment are given with the respective equations for the pre-cellular organisms, for the prokaryotes or during all the phases of the aforementioned stadium of *gametobiont* of the eukaryotes, and during all the phases of the aforementioned stadium of *zygotobiont* of the eukaryotes

Keywords: Androgametation, Hemisis, Hemizygosis, Heterosis, Heterozygosis, Holosis, Holozygosis, Homosis, Homozygosis, Ch-osis, Ch-zygosis, Ci-osis, Ci-zygosis, Ech-osis, Ech-zygosis, Eci-osis, Eci-zygosis, Gametobiont, Androgametobiont, Gynogametobiont, Zygotobiont

(20885) ASSESSMENT OF THE ANTIBACTERIAL, ANTIOXIDANT AND ANTIBIOFILM PROPERTIES OF AQUEOUS THYMUS FONTANESII EXTRACT AGAINST STAPHYLOCOCCUS AUREUS

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Thymus fontanesii is a Mediterranean plant widely used in traditional medicine for its biological benefits attributed mainly to polyphenols. The purpose of this study was to evaluate the quality of the aqueous extract of the plant and to investigate some of its biological properties (antibacterial and antioxidant activity). Two extraction techniques were used, maceration at 70°C during 2h and sonication at 36 KHZ. The maceration extract had higher amounts on polyphenols and flavonoids in the range of 219.71 ± 2.583 mg EqAG /g extract and 225.20 ± 1.543 mg EqQE /g extract respectively. The antioxidant power determined by the DPPH and FRAP method confirmed that this plant has an important antioxidant power. Therefore the aqueous thymus extract inhibited growth of *S. aureus* by 23% and reduced their ability to organize into biofilm by 56% respectively.

Keywords: *Thymus fontanesii*, polyphenols, flavonoids, antibacterial activity, DPPH and FRAP, Biofilm

(21148) BIOSENSORS FOR ENVIRONMENTAL MONITORING

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Recent advances in the development and application of biosensors for environmental analysis and monitoring are reviewed in this study. Recent years have seen increasing interest in the application of simple, rapid, inexpensive and disposable electrochemical sensors for use in the fields of clinical, environmental or industrial analysis. Biosensors and chemical sensors represent analytical devices that utilise the sensitivity and selectivity of a biomaterial, chemical compound or a combination of both attached onto the surface of a physical transducer for sensing purposes.

For environmental applications, the main advantages offered by biosensors over conventional analytical techniques are the possibility of portability, miniaturization, work on-site, and the ability to measure pollutants in complex matrices with minimal sample preparation. Although many of the developed systems cannot compete yet with conventional analytical methods in terms of accuracy and reproducibility, they can be used by regulatory authorities and by industry to provide enough information for routine testing and screening of samples. Biosensors can be used as environmental quality monitoring tools in the assessment of biological/ecological quality or for the chemical monitoring of both inorganic and organic priority pollutants. In this review we provide an overview of biosensor systems for environmental applications, and we describe the various biosensors that have been developed for environmental monitoring, considering the pollutants and analysis that are usually mentioned in the literature.

Keywords: Biosensor, Environmental monitoring

(21160) AUTHENTICATION OF VARIOUS BOTANICAL ORIGINS HONEY FROM MOROCCO BY IDENTIFICATION OF BIOMARKERS VIA SOLID PHASE MICRO-EXTRACTION (SPME-GC/MS)

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Honey has a very complex biological composition, which gives it a multitude of properties, both nutritionally and therapeutically. The aim of the present study was to evaluate, through the application of a method of identifying by biomarkers which makes it possible to its characterize each type of honey according to its composition in volatile compounds of Moroccan honeys. The analysis of the volatile fraction of honeys highlighted a variable richness of honey to another in volatile organic compounds (VOCs). These compounds are grouped into chemical categories such as aldehydes, ketones, acids, alcohols, alkanes, norisoprenoids, terpenes and benzene compounds and derivatives thereof and furan and pyran derivatives. They could be used to discriminate the floral origins of honey. However, only compounds derived from plants and their metabolites such as terpenes and their derivatives have been used extensively to characterize the honeys studied. The results of the present study show clearly that orange honey is characterized by the lilac aldehyde and 8-hydroxylinalol, eucalyptus honey by the abundance of nonanal, thyme honey by 2,4- dimethoxybenzaldehyde, euphorbia honey by 2 -hydroxy-3,5,5-trimethyl-2-cyclohexen1,4-dione, carob honey by the abundance of isomers of linanool oxides, daghmouss honeys by 2,2,4,6, 6- pentamethylheptane, finally the jujube honeys with 1,2-dihydro-1,1,6- trimethylnaphthalene.

Keywords: Honey, Biomarkers, Volatile fraction, VOC

(21204) ANTICANCER AND APOPTOTIC EFFECTS OF VARIOUS SOLVENT EXTRACTS OF *ACHILLEA BIEBERSTEINII* ALONE AND COMBINATION WITH 5-FU ON HT-29 COLORECTAL CANCER CELL LINE

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Cancer is a growing health problem and the second most important cause of death after cardiovascular disease worldwide. Colorectal cancer is the third most common cancer type among men and the second most common type of cancer among women. Apoptosis is a programmed cell death that occurs under normal physiological conditions and within genetic control. Abnormalities in cancer cells are usually caused by mutations in genes that encode proteins that regulate cell proliferation and apoptosis. 5-FU is frequently used in cancer therapy, but due to side effects, the development of non-toxic combination therapies has a major appeal. *Achillea* genus contains approximately 85 species and many of these species are endemic to Europe and the Middle East. Antimicrobial, antioxidant, antiinflammatory, antidiabetic and antitumor effects of different *Achillea* species have been reported. *A. biebersteinii* is used in the treatment of abdominal and stomach pain, injury and cancer in folk medicine.

In this study, anticancer and apoptotic effects of different solvent extracts of *Achillea biebersteinii* plant and the combined treatments of these extracts with 5-FU were investigated by *in vitro* cell culture analysis. *A. biebersteinii* was collected from north of Bingol province, 1150 meters altitude, in May 2014. Plant samples were dried in a moisture free conditions. Aerial parts of plant were extracted by sequential fractionation method using hexane, chloroform and methanol which have different polarity. A549 and MCF-7 cells were grown at 37 °C, 95% humidity and 5-6% CO₂ using a high glucose DMEM medium containing 10% FBS, 1% L-glutamine and 1% penicillin-streptomycin. MTT assay was used to determine cell viability. Isobologram analysis was used to quantitatively determine the synergism of drugs and extracts. Cell Death Detection Elisa method was performed the determination of apoptotic cell death as colorimetric. The Human VEGF ELISA method was used to quantitatively determine the amount of VEGF *in vitro*. Changes in apoptotic genes and proteins (p53, Bax, Bcl-2, p38 MAPK, mTOR, PTEN and AKT) expression levels were assessed by qRT-PCR and Western blotting analysis. β -actin was used as housekeeping in optimization. Each experiment was performed independently in three repetitions.

Combined treatment of 5-FU with *A. biebersteinii* hexane, chloroform and methanol extracts, the cell viability was determined as 26%, 19.1% and 14.9% respectively ($p < 0.0001$). *A. biebersteinii* hexane, chloroform and methanol extracts in combination with 5-FU increased the apoptosis 7.3, 9.7 and 9.5 fold, and decreased the amount of VEGF to 85.2, 78.5 and 69.7 pg/ml, when compared with the control group. Changes in apoptotic and anti-apoptotic genes and proteins expression levels were statistically significant in almost all combined treatment ($p < 0.0001$). These findings reveal that the molecular mechanism of combined treatment of 5-FU and *A. biebersteinii* extracts in colorectal cancer cells. This combination can reduce the high cytotoxic effects of 5-FU.

Key words: Cancer, MTT, Apoptosis, Bcl-2, *Achillea*

(18852) INFLUENCE OF SACCHAROTHRIX ALGERIENSIS NRRL B-24137 ON THE EXPRESSION OF VASCULAR WILT OF DATE PALM

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Actinomycetes are filamentous bacteria that naturally inhabit soils. They are of great importance in biotechnological process because of their ability to produce a large number of antibiotics and other bioactive secondary metabolites. *Saccharothrix algeriensis* NRRL B-24137 is an actinomycete isolated from Algerian Saharan soil. This strain produces several antibiotics with strong antifungal activities, which belong to dithiopyrrolone group. This group consists of a two-cycles (resulted from the condensation of two cystines) containing nitrogen and sulfur.

Our study aimed to investigate the possible usefulness of *Saccharothrix algeriensis* (SA) to control *Fusarium oxysporum* sp. *albedinis* (FOA) a persistent soilborne pathogen, which causes devastating wilt to date palm.

Antagonistic property of the strain SA was primarily evaluated *in vitro* on ISP2 medium by the streak method. This strain of actinomycete showed the significant antifusarium activity against FOA with an inhibition distance of 13 mm.

Consecutively, strain SA and FOA soil-development were assed during 9 weeks after an initial inoculation of 108 colony-forming units (CFU)/gds (gram of dry soil) and/or 104 conidia/gds, respectively. The SA-soil treatment permitted an important decrease (3 times) of the FOA density infestation. Moreover, the actinomycete soil-density seemed maintaining after 9 weeks treatment at an appreciable level of 0.090×10^4 cfu gds⁻¹.

Through different pot experiments, soil pre-treatment with the strain SA significantly reduced of the disease incidence of FOA. The effectiveness (% decrease of the disease) reached 85% after 7 weeks of treatment. Other parameters were considered, such as, the presence or absence of soil microflora (sterile or non-sterile soil) and the influence of SA on germination and plant growth.

Keywords: Biocontrol, Date palm, *Fusarium oxysporum* f.sp *albedinis*, Fusarium wilt, *Saccharothrix algeriensis*

(19001) EFFECT OF GIBBERELIC ACID ON YIELD AND YIELD ATTRIBUTES OF CANOLA (*BRASSICA NAPUS* L.) VARIETIES

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Gibberellic acid (GA3) is a phytohormone that is needed in small quantities at low concentration to accelerate plant growth and development. So, favorable condition may be induced by applying growth regulators exogenously in proper concentration at a proper time in a specific crop by GA3. Gibberellic acid is such a plant growth regulator, which can manipulate a variety of growth and development phenomena in various crops. GA3 enhances growth activities to plant, stimulates stem elongation. The early days to flowering, plant height, number of branches plant-1, *siliqua* plant-1, *siliqua* length, seed *siliqua*-1, 1000 seeds, seed yield and oil content under concentration of GA3 10 g/ha, while days to maturity and number of branches-1 were observed under concentration of GA3 5 g/ha. The maximum plant height and oil content in Con-II, number of branches in Oscar, *siliqua* plant-1 in Dunckled, *siliqua* length and 1000 seed in Abasin, seeds *siliqua* and seed yield were observed in Rainbow. The interaction of varieties and concentrations indicated that maximum plant height and *siliqua* plant under concentration of 10 g ha⁻¹ GA3, number of branches plant-1 under concentration of 20 g/ha GA3 in Dunckled, *siliqua* length, seed *siliqua*-1, 1000 seed, seed yield and oil content were observed under concentration of 10 g/ha GA3. The present results concluded that Rainbow, Dunckled, Con-II and Oscar under concentration of 10 g/ha GA3 found the best concentration for yield and yield attributes of canola.

Keywords: Canola, varieties, Gibberellic acid, Yield attributes

**(19502) BIOAUTOGRAPHY AND ANTIFUNGIC ACTIVITY OF FOUR TAR
PLANTS OF SOUTH WESTERN ALGERIA.**

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This work is interested in the physicochemical estimation of 4 vegetable tars marketed in southwest Algeria as well as the evaluation of their antifungal activities. The density varies from 0.870 to 1.025, a refractive index which varies from 1.4735 to 1.5115, a slightly acid pH which varies from 5.75 to 6.59 and a water content is estimated from 14.10% to 36.65%.

The antifungal activity results show that T3 and T4 plant tars totally inhibit the growth of the fungal strains tested. For T3 the MIC is of the order of 0.090mg/ml for *Alternaria alternata* and FOA (2), and MICs of 0.136mg/ml, 0.272mg/ml and 0.408mg/ml respectively for *Fusarium oxysporum f sp albedinis* FOA(3), FOA(AN) and *Aspergillus flavus*. T4 inhibited the growth of *Alternaria alternata*, FOA (2) and FOA(3) by an MIC of 0.084mg/ml and 0.168mg/ml for FOA(AN) and has 0.337mg/ml for *Aspergillus flavus*. Note that tars T1 and T2 have only a moderate effect on all strains tested.

Bioautography by TLC revelation of tar extracts by P-Iodo-nitro tetrazolium revealed the existence of 3 anti-FOA effect molecules.

Keywords: Plant tar, Algeria, Physico-chemical analysis, Antifungal activity, Bioautography

(19653) *IN VITRO* ANTIMICROBIAL AND ANTIOXIDANT ACTIVITIES OF OLIVE (*OLEA EUROPEA* L.) FRUIT EXTRACTS AND THEIR CHEMICAL CHARACTERIZATION

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In last decade, there is an increasing interest in researches for production of biologically active compounds from natural sources. The aim of the current study is to investigate the content of phenol compounds and flavonoids class extracted from “*Chemlali*” olive fruit collected from Mascara region situated in the west of Algeria followed by antioxidant and antimicrobial activity *in vitro* of the phenolic extracts against representative resistant human pathogens bacteria.

Extraction was conducted at room temperature using four solvents: 80% methanol (80% MeOH), 70% ethanol (70% EtOH), and Diethyl *ether*. Total phenols and total flavonoids were measured using the Folin-Ciocalteau and aluminium chloride colorimetric methods, respectively. The antioxidant properties have been determined by DPPH test and antimicrobial was evaluated by MIC and MBC assay.

Results showed that the total phenol and flavonoid contents of the olive fruit extracts ranged from 33.49 in Diethyl *ether* extract to 575.46 mg gallic acid/100g DFW and from 13.33 to 21.47 mg catechol /100g DFW, respectively. The IC₅₀ values of DPPH varied from 0.20 to 0.57 mg/ml. In another way our results revealed that extracting solvents have a significant influence on the antioxidant and antimicrobial properties. The three extracts possessed antibacterial activity against tested Gram-positive and Gram-negative bacteria particularly ethanolic extract their broad spectrums of antimicrobial activity may be due to the presence of secoiridoid class. While *Candida albicans* was insensitive to the three extracts samples

In conclusion, the data obtained in this study confirming the traditional use of this plant in treatment of infectious diseases. We suggest that the phenolic compounds in olive fruit are major contributors to the anti-oxidant and antimicrobial effects. However, further detailed studies are required to determine the active ingredients responsible for these effects and to determine the mechanism of action of these compounds in the anti-microbial activity.

Keywords: Olive fruit, *Olea europea* L, Phenolic compounds, Antibacterial activity, Antioxidant activity

**(19854) A SURVEY OF *ALEIODES WESMAEL*, 1838 (*HYMENOPTERA*:
BRACONIDAE: *ROGADINAE*) OF TURKISH WESTERN BLACKSEA REGION**

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Western Blacksea Region which is located in north-west part of Turkey. Geographic structure of the region is composed of mountains rising parallel to the sea and forest areas. This region of Turkey consists of forests, agricultural fields and meadows. The study was carried out between 2000-2003 of *Aleiodes* Wesmael, 1838 (Hymenoptera: Braconidae: Rogadinae) in Turkish Western Blacksea Region to determine the species belonging to the genus in 21 localities. The rogradin genus *Aleiodes* is worldwide in distribution, but is particularly species rich in the Holarctic region. *Aleiodes* species are koinobiont endoparasitoid of Macrolepidopteran larvae (especially Noctuidae and Geometroidae). For this reason, the members of this group are potentially very important biological control agents for pest insects. Nine species are reported for the first time in the study area. This research is the first faunistic study on *Aleiodes* fauna of Western Blacksea Region of Turkey. *A. (A.) bicolor* (Spinola) is found in 6 of the 9 habitats, and appears to perform the highest ecological valance. In this study that have given distribution of Turkey and Zoogeographic, and hosts of these species.

Keywords: *Aleiodes*, Hymenoptera, Rogadinae, Fauna, Turkey

(20065) INVESTIGATION OF THE EFFECT OF ARSENIC, LEAD, CADMIUM ON SOME PHYSIOLOGICAL AND BIOCHEMICAL PARAMETERS IN BARLEY SEEDLING

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This study was conducted to determine the effects of the arsenic, lead, and cadmium mixtures on "Hasat", a variety of barley, which were registered by Trakya Agricultural Research Institute in 2014.

Barley seeds were grown in the plant growth cabinet at 20°C for 10 days by applying photoperiod. At the end of the 10th day, while the control group was watered with distilled water, among the other groups, the 1st day group and the 5th day group were watered with the freshly prepared solutions of the mixture containing arsenic, lead, and cadmium at the concentrations of 15 µM, 30 µM, and 60 µM for 1 day and 5 days, respectively. The germination percentages, root and stem lengths, root and stem wet and dry weights, total protein contents, metal accumulation in barley plants were measured.

A decrease were observed in all groups, in which metal ion mixture was applied, in terms of the germination rate depending on the increased concentration, and a decrease were showed in the root and stem dry weights of the plants in all groups compared to the control group. The concentrations of MDA were showed increases under heavy metal stress ($p < 0.05$). Along with the increase in the heavy metal concentration applied to the plant, it was determined that the amount of heavy metal accumulated in the plant increased.

The results indicate that the heavy metals application at increasing concentrations decreases the growth of barley plants and increases oxidative damage.

Acknowledgement: We would like to express our appreciation to the Trakya University Scientific Research Project Commission, which supported this study (TUBAP 2015-38).

Keywords: Wheat, Arsenic, Lead, Cadmium, Germination, Metal accumulation

(20084) THE INFLUENCE OF LEAF LITTER ON THE DISTRIBUTION OF AQUATIC MACROBENTHIC FAUNA IN TUNCA RIVER (EDIRNE/TURKEY)

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The study was carried out in Tunca River that rises and is mostly located in Bulgaria and only a part of it is located in the European part of Turkey. With Arda and Ergene River, Tunca River constitutes a portion of Meriç basin that is one of the largest river systems in East Balkan Basin. The length of this river is 384 km-long and its basin area is 7.884 km². Tunca River 12 km along forms the border with Turkey-Bulgaria. Then flowing for a while inside Turkey (approximately 30 km) missed with Meriç River in the South-west of Edirne. Our experiment was designed to comparison potential differences on colonisation of macrobenthic fauna in various leaf packages. Tree localities were chosen on the river and 4 different leaves of trees found in the environment and artificial boxwood were used to take samples. Macrobenthic samples were taken between May 2012 – October 2012. 20 kg sacks of potatoes were used while packaging of leaves and a total of 25 packs were put in localities. The collected samples were kept in 70% alcohol and brought to the laboratory and they were sorted and identified to the lowest possible taxonomic level under a stereomicroscope. As a result, various invertebrate groups were detected in leaf packs. these groups: Chironomidae larvae, Chironomidae pupae, Oligochaeta, Gastropoda, Tabanidae, Odonata, Ephemeroptera, Tricoptera, Plecoptera, Isopoda, Hirudinae, Cructacea, Tipulidae, Lumbricidae. Then ANOVA test was used for analysis of macrobenthic fauna according to dates, stations and leaf various and 0.05 α statistical significance was used for all tests. When there was a meaningful difference, the reason was revealed by the Tukey test. The number of organisms in artificial boxwood was found to be the most intense. This result has shown that leaf packages are for protection purposes.

Acknowledgements: This research has been supported by Trakya University BAP (2011-130 project no). I am deeply grateful to them for their financial support.

Keywords: Macrobenthic organism, Leaf litter, Tunca River, Edirne

(20206) THE ANTIMICROBIAL EFFECT OF PHYTOSYNTHESIZED SILVER NANOPARTICLE AGAINST SOFT ROT DISEASE FACTOR *PECTOBACTERIUM CAROTOVORUM*

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Plant protection is a potential application area for silver nanoparticles (AgNPs) due to their antimicrobial activity. Green synthesized AgNPs with their superior biocompatibility, eco-friendly nature is more acceptable for biological applications than chemically synthesized ones. This study is focused on the antimicrobial effect of phytosynthesized AgNPs to control soft rot disease caused by plant pathogen *Pectobacterium carotovorum* on pepper. Pepper seedlings were grown under greenhouse conditions and were infected by the bacterium after one-month growth period. AgNP was green synthesized from laurel leaf extracts. Synthesized silver nanoparticles were characterized by using UV/Vis spectrophotometer, Fourier transform infrared spectroscopy (FT-IR) and Zeta sizer. The different concentrations of AgNP were chosen according to *in vitro* minimum inhibition concentration (MIC) and minimum bactericidal concentration (MBC) experiments. *In vitro* studies showed that MIC value of AgNP was 62.5 ppm and MBC value was 125 ppm. Disease severity was decreased with increasing concentration of AgNP. The results showed that phytosynthesized silver nanoparticles may be used as control agents against *Pectobacterium carotovorum* for pepper soft rot disease.

Keywords: Silver nanoparticles, Pepper, Silver nanoparticles, *Pectobacterium carotovorum*, Green synthesis

(20391) DOES SALT PRE-TREATMENT PROVIDE AMELIORATION EFFECT ON TOXIC BORON LEVELS IN TWO SUNFLOWER CULTIVARS?

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Boron (B) is an essential micronutrient for plant growth and development such as photosynthesis and plasma membrane integrity, however its toxicity levels limit productivity throughout the world. This study was conducted to reveal whether the salt (NaCl) pre-treatment alleviate the adverse effects of increasing B concentrations on two sunflower (*Helianthus annuus* L., Tarsan-1018 and Sanbro) cultivars. On the 15th day after sowing, plants were divided into two groups, NaCl pre-treated (75 mM for 5 days) and/or B treated (2, 4 and 8 mM B for 10 days). The responses of the photosynthetic activities of two genotypes against the treatments was investigated by measuring polyphasic chlorophyll *a* fluorescence. Photochemical activity was decreased with increasing boron concentrations in both cultivars. PIabs and some JIP test parameters [PHI(D0), DI0/RC, FV/F0, TR0/RC, TR0/ABS] were changed significantly in both cultivars. In addition to that, the electron acceptor side of PSI [RE0/ET0, RE0/ABS] were negatively affected in only Sandro cultivar. Meanwhile, water content and, shoot and root growth were decreased in both cultivars, on the other hand membrane damage was increased with increasing B concentrations. These results indicated that the cultivars are adversely affected from increasing B concentrations. However, salt pre-treatment ameliorated the adverse effects of the B toxicity in both cultivars. Consequently, Tarsan-1018 protected photosynthetic apparatus, exhibiting better performance compared to Sanbro against B toxicity.

Keywords: Sunflower (*Helianthus annuus* L.), Boron toxicity, Salt pre-treatment, Polyphasic chlorophyll *a* fluorescence

**(20664) THE COLONIZATION PERIOD OF BENTHIC MACROINVERTEBRATES
IN RICE FIELDS FROM TURKISH THRACE REGION**

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Rice fields are 15% of the World's wetlands and priority ecosystems for conservation because of their high biological diversity. A single rice cultivation cycle has three ecological phases; aquatic, semi-aquatic and a terrestrial dry phase. The rice fields are rapidly changing ecosystems and harbour a rich biological diversity maintained by rapid colonization as well as rapid reproduction and growth of organisms. These organisms colonize firstly in the terrestrial phase by resting stages in soil with eggs; secondly in the aquatic phase by air and irrigated water.

The study was carried out in the Meriç-Ergene River Basin (MERB) which is located on Turkish Thrace at north-western of Turkey and hosting important rice field areas. The benthic macroinvertebrate sampling was performed in spring, summer and autumn 2016 at 8 different localities during the cultivation periods. As a result, three groups of benthic macroinvertebrates were observed; 1- resistant group which emerge preliminary colonization period in the spring sampling; 2- migrating and flying group which colonize by active migration and life history in the summer sampling; 3- predator group which emerge in the autumn sampling. Thus the sampling periods to determine biological diversity of these important wetlands were suggested.

Keywords: Biodiversity, Zoobenthos, Meric-Ergene, Rice fields, Turkish Thrace

(20789) MORPHOMETRY OF INDIAN RED JUNGLE FOWL (*GALLUS GALLUS MURGHI*) SPERMATOZOA

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The morphometry of the sperm varies from species to species and strain/breed of the same species. Sperm morphometry plays an important role in intraspecies competition and is associated with many prominent traits that are well adapted. Morphology of the Indian red jungle fowl spermatozoa is lacking in published literature, therefore, present study was carried out to describe the measurements of various parts of Indian red jungle fowl spermatozoa. For this purpose, semen was collected from eight mature Indian red jungle fowl raised under captive conditions and replicated for five times. Semen samples were placed on glass slide, mixed with lake glutamate solution and air dried after preparing thin smear. Ten slides were prepared for each bird, 200 hundred unstained and morphologically normal sperm were evaluated for morphometrics measurements using ocular micrometer at 1000x under oil immersion. The total length of the Indian red jungle fowl was recorded $81.3 \pm 0.5 \mu\text{m}$, while sperm head, mid-piece and tail length was recorded $14.4 \pm 0.4 \mu\text{m}$, $4.9 \pm 0.1 \mu\text{m}$ and $62.0 \pm 0.6 \mu\text{m}$, respectively. The head width, perimeter and area was recorded $1.1 \pm 0.0 \mu\text{m}$, $31.0 \pm 0.7 \mu\text{m}$ and $16.5 \pm 0.4 \mu\text{m}$, respectively. There was non-significant ($P > 0.05$) difference between all individual birds in the study. The morphometrics analysis of Indian red jungle fowl sperm showed higher measurements of each parameter compared to its decedent i.e. domestic fowl. In conclusion, Indian red jungle fowl sperm exhibit larger size compared to domestic chicken that illustrate decrease in sperm size in the course of evolution.

Keywords: Indian red jungle fowl, Morphology, Head, Mid piece and tail

(21264) MONILINIA FRUCTICOLA FROM PEACH IN CANAKKALE, A MOLECULAR APPROACH TO CHARACTERIZE THE PATHOGEN

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Brown rot disease has been recognized as one of the serious problem of peach fruits in Canakkale province of Turkey. Species causing the disease belongs to fungal genus of *Monilinia*. The prominent pathogenic species of the genus are *M. laxa*, *M. fructicola* and *M. fructigena* worldwide. In this study, isolates were collected in 2016 from peach orchards in Canakkale. All the isolates were identified as *M. fructicola* based on some species-specific molecular markers. Sequence data from *translation elongation factor 1_alpha* was used to investigate any phylogenetic lineage within the species and the results indicated for one genotype. Besides, this genotype from our collection was compared with the sequence data of *translation elongation factor 1_alpha* for *M. fructicola* from California and Brazil, which this data was obtained from GenBank. Our genotype was closely related with one of the genotypes from California according to the Maximum Likelihood and Maximum Parsimony trees. Specifically, for *Monilinia* pathogens, identification of the pathogen species is important for quarantine programs.

Keywords: Brown rot, Molecular markers

**(21283) DESCRIPTION OF A FRUIT FLY, *BACTROCERA DORSALIS* (HENDEL)
WITHIN GENUS *BACTROCERA MACQUART* (DIPTERA: TEPHRITIDAE:
DACINAE) FROM PAKISTAN**

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Fruit flies have great economic importance due to threat to food security in the world and in Pakistan. Their incidence reduces both yield and quality of fruits and vegetables. The females puncture the fruits and vegetables with their syringe-like ovipositor and lay eggs just under their skin. The maggots after hatching, tunnel into the fruits and vegetables for feeding on the pulp and thus render them unfit for human consumption. In certain fruits and vegetables, rotting starts at the puncture points. By broad trapping program for the collection of fruit flies fauna of Pakistan, adults or larvae samples of fruit flies were collected from different localities. After sampling, to characterize fruit fly fauna involved, the collected samples were brought to the laboratory for their species identification. Based on extensive literature records, the presence of fruit fly species, *Bactrocera dorsalis* (Hendel) (Diptera: Tephritidae: Dacinae) belonging to genus *Bactrocera* Macquart has been found on different fruits and vegetables. This species is described and illustrated on the basis of morphological characters, supported by data on its ecology and geographic distribution. Information is also given on host plant and location of type specimen, distinguish remarks and diagnosis are as well included.

Keywords: Fruit fly, Distribution, Characterization

(18060) RELATIONSHIP BETWEEN GRAIN YIELD, SEASON AND GROWTH TRAITS OF DURUM WHEAT (*TRITICUM DURUM* DESF.) IN THE TIARET REGION (WESTERN ALGERIA)

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Water stress is the major environmental stresses that affect agricultural production worldwide, especially in Mediterranean conditions. Field experiments were conducted over three seasons (2010-11, 2011-12 and 2012-13) using twenty durum wheat genotypes varying in grain yield in the the Tiaret region (Western Algeria). The main objective of this study is to relate the wheat yields of the different genotypes with season and other plant traits.

Yield variability between sites was mostly due to rainfall, with variability between cultivars within a site being due to season.

The observations concern the effects of season constraints on wheat yield and traits associated with it. Results confirm particularly that correlations between yield and associated characters exist and that various genotypes respond differently with the season. Improved genotypes and precocious ensure the best yield. The early stage of heading is a trait often sought in Mediterranean areas, since it allows to avoid the terminal water deficit or deficiency.

Keywords: Durum wheat, Season, Field, Grain yield, Growth traits, Genotype

(18779) EFFECT OF SALINITY ON BIOMETRIC, ION AND BIOCHEMICAL CONTENT OF FABA BEAN (*VICIA FABA* L.)

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Plants of *Vicia faba* (L.) were exposed to gradual salinity stress for 4 weeks. The salt used to induce salinity was NaCl added in 4 concentrations (100, 200, 300 and 400 mM), so gradual salinization was achieved by transferring the plants sequentially every week by NaCl concentrations. The aim of this work is to determine the effect of salt stress on of biometric, biochemical and ion content characters of *Vicia faba* L. Application of salt treatments significantly increased glycine betaine, proline and soluble sugars content in leaves. The NaCl at high concentrations advantage accumulation osmoticum involved in osmotic adjustment mechanisms. Chlorophyll a, b, and total carotenoids are declining during times of stress. The biosynthesis of chlorophyll pigments would be linked to the proline biosynthesis activity. Leaf K⁺/Na⁺ ratio records optimal results for plants treated with saline water. Results indicated that salinity caused significant reduction, plants lengths, fresh and dry weight. The study showed that the salt has a depressive effect on growth.

Keywords: NaCl, Sodium, Potassium, Glycine betaine, Proline, Soluble sugars, Chlorophyll, Carotenoids, Growth

(18780) ABSCISIC ACID EFFECTS ON WATER AND PHOTOSYNTHETIC CHARACTERISTICS OF TWO ECOTYPES OF *ATRIPLEX HALIMUS* L.

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The aim of this study is to compare the water and photosynthetic characteristics of two xerophilic ecotypes of *Atriplex halimus* (L.). Seeds collected from two different Algeria sites, Djelfa and Oran, are germinated in controlled greenhouse. After 6 months, the plantlets were treated 21 days with increasing concentrations of abscisic acid (0M, 10⁻⁶ M and 10⁻⁴ M). The results show that ecotype of Djelfa reduced water loss through transpiration because of high stomatal resistance. Consequently, the content of chlorophyll a and b decrease significantly compared to Oran ecotype which show an increase of the osmotic potential and relative water content. Osmotic adjustment to reduce dehydration and maintain a good photosynthesis seems efficient in Oran ecotype. Djelfa ecotype reacts quickly to dehydration by the total or partial closure of the stomata. This decreases the amount of water that will be absorbed by the roots as a result of slow growth and inhibited photosynthesis.

Keywords: Phytohormone, Drought, Xerophyte, Water status, Stomatal resistance, Chlorophyll

(18847) ATRIPLEX HALIMUS L. BIOCHEMICAL RESPONSE TO LEAD

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Soil pollution is one of the main environmental stresses due to the effect of various contaminations by heavy metals like lead. The main of this study is to examine the response of a halophile species of the genus *Atriplex*, *Atriplex halimus* L. under lead stress. Seed of *Atriplex halimus* L. are sown in a controlled greenhouse in a mixture of peat and sand. This species is studied at the germination stage in the presence of different concentrations of lead nitrate under 1000, 3000, 5000 and 7000 ppm during 100 days. Watering is done three times a week for 100 days using alternating distilled water, nutrient solution and lead treatment. The response of plants is evaluated by an analysis of tree biochemical parameters: chlorophyllian pigments, proline and total proteins. The results indicate that chlorophyll pigments amount reduces under the effect of different treatment lead. In contrast, proline and total proteins contents increased in leaves and roots of *Atriplex halimus* L. as a response to stress.

Keywords: *Atriplex halimus* L., Lead nitrate, Chlorophylls, Proline, Total proteins

(18870) THE COMBINED EFFECT OF SALT STRESS, KINETIN AND SALICYLIC ACID ON THE GERMINATION OF OKRA SEEDS

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Abelmoschus esculentus L, ladies fingers or okra rich vegetable effective for interstitial tubular renal diseases, it improves kidney function and it reduces proteinuria and strengthens immunity. Okra is a non traditional crop in the town Oran wich is a coastal town in the west of Algeria, with a lot of area affected by salinity.

Nowadays the problems related to salinity are increasing, that's why this experimental study the impact of growth regulators on okra germination under salt stress. Two types of growth-regulators were applied (Kinetin 500 µl, and salycilic acid 100 µl) and tow different concentration of salt solution (100 and 200 meq/l of NaCl). The hormonal combination has a positive effect on seeds germination on the length of the roots, and the fresh and dry weight of the seedlings, on the chlorophyll, the proline and the sugar concentration. Witness does not germinate at 100 and 200 meq/l of NaCl.

Keywords: NaCl, *Abelmoschus esculentus* L., Germination, Salycilic acid, Kinetin

(18873) BIOACTIVITY OF ESSENTIAL OILS FROM *LAURUS NOBILIS* BY THE EVALUATION OF THE ACARICIDAL EFFECT ON VARROASIS

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Beekeeping appears to be increasingly threatened worldwide with a multifactorial origin (diseases, parasites, pesticides, climatic factors). Among the biological agents involved, the *Varroa destructor* parasite seems to be responsible for a large part of the collapses and mortalities of the bee colonies it infests. This parasite is probably the one with the strongest economic impact both in weakening the beekeeping sector and also indirectly in reducing the yields of pollen-dependent crop production, the main being the honey bee *Apis mellifera*. To do this in the field of hygiene and prophylaxis of this insect requires or even requires draconian methods of control among which the use of natural acaricidal molecules. Our experimental work revolves around two aspects, mainly honey bees and bee products. Our results show that the mite closely follows the development of its host. To control this parasite, we studied the acaricidal effect of essential oils from *Laurus nobilis*. To determine the efficacy of this treatment, we performed (Apiguard). The results obtained showed that this plant not gave 100% efficacy because of the presence of the brood, but in the light of our results, It is clear that this essential oils have shown appreciable results and appear to have greatly reduced the final infestation rate to 0.6% for laurel Which is not negligible. The untreated control batch had a fairly large natural mortality of varroa, the infestation rate rose from 33.24% to 22.1% during the treatment period.

Keywords: Beekeeping, *Apis mellifera*, *Varroa destructor*, Treatment, Essential oils, Apiguard, *Laurus nobilis*, efficiency

(19019) SEASONAL QUANTIFICATION OF TANNINS OF THE MEDICINAL PLANT *BALLOTA HIRSUTA* BENTH IN THE TESSALA MOUNTAINS (WESTERN ALGERIA)

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Secondary metabolites are molecules synthesized by plants, when they react with their environment. To demonstrate this, we followed the seasonal variation in the amount of condensed and hydrolysable tannins of the *Ballota hirsuta* Benth that grows in the Tessala Mounts (western Algeria). Our results show that the leaves organs are richer in tannins in the four seasons. The accumulation of condensed tannins in the leaves was measured much in the summer and spring. However, the highest concentrations of hydrolysable tannins were recorded in winter and autumn. The stems and roots contain low concentrations of tannins. The uneven variation in the concentration of these metabolites between the three types of organs and between different seasons of harvesting is closely linked to environmental conditions and the phenological stages of the plant. Our results show that the leaves accumulate relatively high amounts of tannins in four seasons, by contribution stems and roots, it is closely related by the influence of environmental conditions (temperature). This unequal distribution of measured metabolite confirmation that the secretion of secondary metabolites responding to abiotic stress.

Keywords: Secondary metabolites, *Ballota hirsuta* Benth, Condensed tannins, Hydrolysable tannins

(19083) PROPINEB AFFECT THE THYROID ACTIVITY AND HISTOLOGICAL STRUCTURE OF TESTIS AND EPIDYDIMIS AFTER MEDIUM EXPOSURE IN THE MALE RAT

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Ethylenebis (dithiocarbamate) (EBDC) as Propineb are heavily used in plant diseases control and they are metabolized to ethylene Thiourea (ETU) which is known to cause a decrease in the level of thyroxine, an increase of (TSH) in rodents. This study aims to evaluate the toxic effect of the used fungicide on thyroid activity and histopathological effect on the target organs by pesticides. The different groups of animals (7 in each one) was treated with Propineb by doses 1/20 of LD50 and 1/50 LD50 in the diet for 6 weeks with the control group. The results showed an increase in body weight particularly with the higher dose as compared to control group. A perturbation in the biochemical parameters in the treated animals was noticed as compared to the control group. The weight of testis and epididym decrease significantly. However, the histological examination indicates many alterations in the testis, epididym and thyroid in the treated rats as compared to the control. In conclusion, our data demonstrate that the administration of propineb with the used doses after 6 weeks causes thyroid alteration associated with a perturbation in the biochemical parameters and affects histological deformation of the studied organs in the treated groups as compared to the control.

Keywords: Propineb, Toxicity, Thyroid, Biochemical parameters, Histology

**(19186) BIOCHEMICAL INVESTIGATION OF PARIETAL POLYSACCHARIDES
FROM *RETAMA RAETAM* ROOTS**

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This study characterizes the cell wall hemicellulose and pectins polymers of *Retama raetam*. This species develops a particularly important root system and is adapted to arid areas. The cellulose, hemicelluloses and pectins were extracted. The cellulose remains the major component of the wall (27% for young roots and 80% for adult roots), hemicelluloses (14.3% for young roots and 3.6% for adult roots) and pectins (17.3% for young roots and 4.1% for adult roots).

The monosaccharidic composition of water soluble extracts determined by gas liquid chromatography (GLC). The analysis of the young and adult roots, confirmed their pectic nature by the high rate of galacturonic acid (13.4 and 14.6% for the WE of the young and adult roots respectively, 28.6% and 19% at the OE respectively). The rhamnose rates varied from 5 to 10%. Other identified monosaccharides (mannose, glucuronic acid) were detected at low rates (less than 5%). The hemicellulosic fractions extracted with KOH were rich in xylose (from 47.8 to 59.5 %) which indicated the presence of xylans. The presence of arabinose (8 to 30.6%) indicated the presence of arabinoxylans. Galactose and galacturonic acid were also present (from 6 to 17.9% and 10.3 to 11.7%, respectively). The final residue of the extraction was largely composed of glucose (86 to 90%).

These results indicate the presence of the homogalacturonans and rhamnogalacturonans in pectin. This study constitutes the preliminary data obtained in the biochemical analysis of the parietal compounds of the roots of a species which grows in an arid area in comparison with those of its aerial parts.

Keywords: *Retama raetam*, Chemical analysis, Roots, Cell wall, Polysaccharides

(19543) EFFECT OF SOME PHENOLIC ACIDS ON THE LIPID PEROXIDATION

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The rabbit brain homogenate represents a significant source of lipids directly used in the study of lipid peroxidation. The rate of peroxide usually expressed in equivalent of malondialdehyde (MDA) was determined using 1, 1, 3, 3-tetramethoxypropane as standard. The aim of this study was to evaluate the lipid peroxidation effect of some phenolic acids. The effect of caffeic acid, gallic acid, ellagic acid, and tannic acid on lipid peroxidation was studied *in vitro*. The lipid peroxidation rate is measured on a homogenate of the rabbit brain. The level of peroxides is measured according to the method described by Ohkawa and al. (1979). This method is based on the reaction between peroxides and thiobarbituric acid (TBA) which leads to the formation of a pink color complex indicative of lipid peroxidation. Examination of the data revealed a significant inhibition of the relative rate of peroxidation by caffeic acid, gallic acid and ellagic acid compared with the control representing 100% of peroxidation. No significant difference was observed when the concentration of these compounds is increased from 10 to 50 µg/ml. A mean inhibition of 51% was observed with caffeic acid. The inhibition rate recorded with gallic acid and ellagic acid are respectively 49.2% and 42%. The addition of tannic acid to the homogenate of the brain causes a similar effect to that of the other phenolic acids (inhibition rate is 50%). Phenolic acids used in this study are able to inhibit lipid peroxidation *in vitro*.

Keywords: Caffeic acid, Ellagic acid, Gallic acid, Lipid peroxidation, MDA, Phenolic acids, Tannic acid, TBARS

**(19798) ETHNOBOTANICAL STUDY AND PHYTOCHEMICAL SCREENING OF
ARISTOLOCHIA LONGA L.**

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Aristolochia longa L. (from the *Aristolochiaceae* family) is used in Algerian traditional medicine. The ethnobotanical study conducted in the region of Setif (East Algeria) has as an objective of evaluating the potential of the region of *Aristolochia longa* L. used in the treatment of different diseases. A questionnaire was used which consisted of the diseases treated by this plant, the part of the plant used in the treatment and how to use this plant. The survey targeted 100 people from the local population. We also evaluated the phytochemical composition of the aerial parts (stems and leaves), fruits and tubers. Our results showed that *A. longa* is widely used to treat several ailments such as cancer (43%), diabetes (17%), and treatment of wounds in cattle (12%), and intestinal and stomach diseases (9 and 7%), the most used part is tubers by 70%. Crushed tubers are commonly mixed with honey (44%), milk (24%), water (8%). Results of the phytochemical screening revealed that *A. longa* contained various bioactive compounds, including polyphenols, flavonoids, saponins, terpenoids, carotenoids and alkaloids. These preliminary results could be used to justify the traditional use of this plant and their bioactive substances could be exploited for therapeutic purposes such as antioxidant, antimicrobial and anti-inflammatory, and may be considered as a promising source of new drugs for treating cancer.

Key words: *Aristolochia longa* L., Ethnobotany, Setif (Algeria), Phytochemistry

(19834) EVALUATION OF WEED SEEDS TOLERANCE TO WATER STRESS AT THE GERMINATION STAGE USING POLYETHYLENE GLYCOL 6000.

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The present study was conducted to evaluate the behaviour of different weed species under water stress effects at the germination stage. Nine species (*Torilis arvensis* Huds.) Link., *Lactuca serriola* L., *Bromus madritensis* L., *Centaurea diluta* Ait. Algeriensis Cross. & Dur., *Convolvulus arvensis* L., *Vicia monantha* Retz., *Hordeum murinum* L., *Sinapis arvensis* L., *Datura stramonium* L.) were used for germination under controlled conditions. Water stress was simulated using polyethylene glycol 6000 (PEG 6000), according to different levels of water potential (-0.03, -0.1, -0.7, -1, -1.6 MPa). Water stress has a negative effect on the germination potential of the nine species; the germinative behavior of these species under water stress, differs according to the species and the concentration of the PEG 6000 applied for most studied variables. High water potential (-0.03 MPa) increase the germination of *Bromus madritensis* L and *Hordeum murinum* L. Indeed, a maximum of 86% was achieved for species *Bromus madritensis* L and *Hordeum murinum* L to High water potential (-0.03 MPa). By contrast, at the lowest water potential (-1.6 MPa), the percentage of germination was reduced and was less than 4% (*Lactuca serriola* L., *Vicia monantha* Retz. and *Sinapis arvensis* L.). With these results, we have found a superiority of tolerance between species. There are tolerant, moderately tolerant and sensitive species. However, germination time is slightly higher for all species in high water stress levels.

Keywords: Water stress, Germination, Weeds, Tolerance, Polyethylene glycol 6000

(19836) STUDIES ON SHAPE, SIZE AND WEIGHT OF CERTAIN WEED SEEDS IN THE SETIFIAN HIGH PLATEAU

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In agriculture the identification and classification of weed seeds are technically and economically important. This work bears on the study of the morphological characteristics of the widespread weeds seeds in the north east of Algeria (the Setifian high plateau). Three characteristics were used to identify 15 species of weeds seeds which belong to different botanical families. The morphological characteristics in which the study was based on are: shape, size and weight. We found that the single character is not enough to distinguish the species, because the seeds of more than one species posses the same mean value. So these characteristics may serve as a convenient method for identification and classification of weeds on the basis of their seed bank available in the soil which considered that seeds are the main cause of big differences can be shown by species, races, and families because; all differences are in the seed which gives birth to the new plant. Each weeds species shows the morphological characteristics different from the plant or other species. Seeds morphological description is related to external description of seed. Weeds seeds show very big differences as well as seeds of the same species which also can show many morphological differences because of many factors especially the degree of maturity. Climatic changes from one year to another, some botanical diseases and environmental differences and many other factors affect change difference of morphological characteristics (form, color, size). The study of morphological characteristics of seeds allows identifying the different seeds mixed with cultivated plant, it also allows knowing the various species of weeds in fields. So such studies help to develop different strategies to control weeds.

Keywords: Weed, Seed, Identification, Shape, Size, Weight

**(19856) A CONTRIBUTION TO THE FAUNA OF *MICROCHELONUS SZÉPLIGETI*,
1908 (*HYMENOPTERA: BRACONIDAE: CHELONINAE*) OF ÇANAKKALE
PROVINCE**

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Çanakkale province consists of land on both sides of the Dardanelles and is naturally bordered by Koru Mountain on the Gelibolu peninsula in the north, the Marmara Sea in the north-east, the Aegean Sea in the north-west and west, and Kaz Mountain and the Aegean Sea in the south. This study area consists of forests, agricultural fields and meadows. The study was carried out in spring, summer and autumn periods between the years 2008-2016 various localities and habitats of Çanakkale Province. This study increases about ten times the number of localities of *Microchelonus Szépligeti*, 1908 (*Hymenoptera: Braconidae: Cheloninae*) previously known from the Çanakkale province of Turkey. Samples collected from short plants using standard insect sweeping nets were transferred into tubes containing 70% ethanol and labeled following their preparations according to museum techniques. Members of Cheloninae are solitary koinobiont egg-larval endoparasitoids on Lepidoptera (especially Tortricidae and Pyralidae), Diptera, Hymenoptera and Coleoptera, and therefore are potentially very important biological control agents to be used against pest insects. Eight solitary egg-larval endoparasitoid *Microchelonus* species were collected from pastures, vegetable garden, crop fields, orchards, pine and mixed forests at different altitudes in Çanakkale province. The distributions of the determined species in Turkey as well as their general distributions were given and discussed zoogeographically. For each species its chorotype was reported.

Keywords: *Microchelonus*, *Hymenoptera*, *Cheloninae*, Fauna, Turkey

(19890) EVALUATION OF ANTIOXIDANT ACTIVITY AND POLYPHENOLS CONTENTS OF EXTRACTS FROM FLOWERS OF *OPUNTIA FICUS- INDICA* L.

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The aim of this study is to determine the content of polyphénols by the method of Folin-ciocalteu and flavonoïds by the method of Aluminium trichloride, and to evaluate the antioxidant activity of the aqueous (AqE) and methanolic (ME) extracts of flowers of *Opuntia ficus- indica* L. a médicinal plant traditionally used in the treatment of liver disorders, rheumatism, renal diseases, hypoglycemic and hypocholesterolemic in Algeria. The ME was richer in polyphénols ($167.1 \pm 1.74 \mu\text{g EAG/mg extract}$) than the AqE ($120.9 \pm 4.24 \mu\text{g EAG/mg extract}$). The ME contains ($3.58 \pm 0.16 \mu\text{g EQ/mg extract}$) of flavonoïds and the AqE contains ($3.08 \pm 0.06 \mu\text{g EQ/mg extract}$). Antioxidant activity *in vitro* was evaluated using chelation of ferrous iron and reducing power tests. The two studies extracts have a chelation activity, compared with the EDTA, the AqE has higher chelation activity (inhibition of the formation of Fe²⁺-ferrosine complex) with $\text{IC}_{50} = 4.62 \pm 0.12 \mu\text{g/ml}$ than the ME with $\text{IC}_{50} = 22.64 \pm 1, 53 \mu\text{g/ml}$. The ME has the higher reducing power ($\text{IC}_{50} = 0.39 \pm 0,005 \text{mg/ml}$) than AqE ($\text{IC}_{50} = 1.22 \pm 0.126 \text{mg/ml}$).

Key words: *Opuntia ficus-indica* L., Polyphenols, Flavonoids, Antioxidant activity, Ferrous ion chelating activity, Reducing power

(19902) GROWING PLANTS AROUND EDIRNE USED AS ALTERNATIVE TREATMENT IN ASTHMA

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Asthma is one of the most common chronic diseases in the world in recent years. Asthma is a chronic disease characterized by wheezing, shortness of breath, and symptoms of cough, with airway inflammation, airway hyperresponsiveness, and varying degrees of airway obstruction. Depending on the developing technology and air pollution, people are more likely to get sick day by day. People are using alternative treatment methods for the fight against this disease. The articles related to the subject were examined and the plants growing around Edirne and used as public medicine in asthma were selected. Photographs of these plants were given and localities, plant parts used, doses of application, administration patterns and therapeutic effects were compared with each other with tables. According to the results of the literature studies; *Helianthus annuus* L., *Prunus dulcis*, *Juglans regia* L., *Sesamum indicum* L. is recommended as a handful of daily food from any of them. In addition, research has shown that *Phaseolus vulgaris* L., *Portulaca oleracea* L., *Spinacia oleracea* L., *Brassica oleraceae* L., *Allium porrum* L. should be consumed at least once a week, and Cucumi melo especially the nuclei play a therapeutic role in asthma.

Keywords: Asthma, Edirne, Folk medicine

(20073) PHYTOCHEMISTRY AND BIOLOGICAL ACTIVITIES OF MEDICINAL PLANTS

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Lycium is one of the genera of the Solanaceae family, including about 80 species; this genus is well known as the basis of the plants of medicine traditional and functional food. Previous phytochemical studies on the genus *Lycium* indicated the presence of alkaloids. The objective of this study was to evaluate *in vitro* the antioxidant and anti-enzyme activities of crude ethanolic extract and fractions from the leaves and roots of *L. europaeum*; phenolic compounds and flavonoids were quantitatively analyzed. The antioxidant effect was determined by the β -carotene bleaching method, the DPPH test and the FRAP method. The anti-enzyme activities of the extracts were tested against acetylcholinesterase and butyrylcholinesterase which are the key enzymes involved in the pathogenesis of Alzheimer's disease. For what, concerning the antioxidant activities, the plant extracts exhibited high activities in all assays. Moreover, the extracts showed also anti-cholinesterase activity. The obtained results indicate that the plant extracts can serve as a potential source of natural antioxidants and cholinesterase inhibitors.

Keywords: *Lycium europaeum*, antioxidant activity, anti-cholinesterase activity, flavonoids, phenolics

(20160) AN INVESTIGATION ON PATHOGENICITY POTENTIALS AND VIRULENCE GENES EXPRESSIONS OF FOOD BORNE *SALMONELLA* ISOLATES IN BALB/C MICE AND *CAENORHABDITIS ELEGANS*

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Microbial food safety is one of the most important public health concerns and should be considered in terms of food-borne diseases one of which is Salmonellosis caused by non-typhoidal *Salmonella* enterica serovars with the consumption of contaminated food. In the present study, we tested the pathogenicity potentials of foodborne *Salmonella* isolates in BALB/c mice and virulence genes expression differences between mice and the *Caenorhabditis elegans* nematode model. *S. Enteritidis* (n=2), *S. Infantis* (n=3), *S. Kentucky* (n=1) and *S. Telaviv* (n=1) serotypes isolated from retail chicken carcasses in Edirne province of Turkey were used. The strains were selected according to pathogenicity potentials in *C. elegans*. The pathogenicity potentials of the isolates in BALB/c mice (8-10 weeks old) were tested using eight experimental groups (n=5 for each). All mice were inoculated intraperitoneally (i.p.) with approximately 10⁶ cfu of the strains. Animals were monitored daily during 21 days and individuals showing extreme distress (lethargy, hunched posture or ruffled coat) or became moribund were sacrificed. Heart blood of animals was collected on which RNA Later Solution was added to avoid RNA degradation. Bacterial colonization in liver, spleen, ileum, cecum, and colons of the animals was tested by harvested each organ at end-points, homogenizing and inoculating serial dilutions on selective XLD-agar plates. Synchronized *C. elegans* were initially exposed to each of the serovars for six days. One nematode of each group was mechanically disrupted by a microtube pestle in M9 Buffer with 1% Triton X-100. Serial dilutions were plated on XLD agar plates. Black *Salmonella* colonies were used for RT-PCR analysis which was applied to detect expression differences of virulence genes, *invA* (invasion), *stn* (enterotoxin) and fimbrial gene *fimA* between BALB/c mice and *C. elegans* nematode model systems. cDNAs which were generated from RNA samples extracted from *Salmonella* strains recovered from *C. elegans* and mice blood samples were used as a template. The PCR products were analyzed by electrophoresis in 1.5 % agarose gel with ethidium bromide staining.

The results showed that two strains, *Kentucky* (A10) and *Telaviv* (A22), were fully virulent in mice causing all animals to show extreme stress in two days similar to the virulence effect of *Salmonella* Typhimurium ATCC14028 strain which was used as a positive control. One of the *Enteritidis* (A30) strains caused four mice to show extreme stress in four days. As expected, i.p. infection with these serovars characterized by the high bacterial load. *Infantis* (A8, A18, A32) and other *Enteritidis* (A17) strains did not cause any extreme stress and were defined as avirulent in mice. The *Infantis* serovar is known not to cause pathogenicity in BALB/c mice. We showed that three isolates showing pathogenicity in *C. elegans* did not cause pathogenicity in mice and that the pathogenicity of *S. Enteritidis* (A30) isolate was different in the two model systems. The RT-PCR analysis showed that only 284 bp amplicon belonging to *invA* gene was generated from *C. elegans* fed with *Salmonella* strains. *fimA* and *stn* genes were not expressed in mice and nematodes but *invA* gene which is related to pathogenicity was expressed only in nematodes. Comparison of the BALB/c mice and *C. elegans* nematode models revealed differences in terms of both their pathogenicity phenotypes and expression of virulence genes showing inefficacy of working with only one animal model system for pathogenicity of strains at phenotypic and molecular levels.

Keywords: *Salmonella*, BALB/c mice, *Caenorhabditis elegans*, Pathogenicity, Virulence gene expression

(20164) AMELIORATIVE EFFECTS OF BLACK SEED OIL (*NIGELLA SATIVA*) ON METABOLIC DISORDER INDUCED BY ALUMINIUM CHLORIDE IN WISTAR RAT

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In the context of Mediterranean flora valorization, this study interested in the evaluation of beneficial effects of *Nigella sativa* oil Supplementation against Aluminium chloride (AlCl₃) induced metabolic disorder in rats.

In order to determinate the biological potent of black seed oil (*Nigella sativa*), a preminilary phytochemical Screening was achieved, initiated by a qualitative analysis several chemical groups with potential biological activities, flowed by a quantitative determination of the secondary metabolites (phenolic compounds).

The obtained results indicate the presence of different components they also show that this specie contain quite high concentration of phenolic compound.

Our experimental study was performed on 36 male rats; were equally divided into two groups control group (A) and black seed oil (2 ml/kg of body weight) treated group (B). After five weeks each group was divided again into two subgroups of six animals each and treated for other 3weeks: subgroup A1 was served as a control which received standard diet, subgroup A2 received AlCl₃ (34mg/kg bw mixed with food), subgroup B1 received both AlCl₃ and NSO and subgroup B2 received NSO only.

Our results showed that Aluminium chloride induced disturbance of lipidic and glucidic metabolism (hypercholesterolemia, hypertriglyceridemia and hyperglycemia) as well as a marked decrease in thyroid hormones.

In parallel, our results suggest that black seed oil supplementation in rats treated with Aluminium chloride restore all the metabolic perturbation, diminished the decreased levels of thyroid hormone and reduced the intensity of oxidative stress caused by Aluminium.

It can be concluded that AlCl₃ has induced the oxidative stress, altered the metabolic process and it is possible to use black seed oil supplementation in order to reduce this toxicity.

Keywords: Metabolic disorder, Aluminium chloride, Black seed oil (*Nigella sativa*), Rats

(20189) EFFECT OF DIFFERENT EXTRACTING SOLVENTS ON ANTIOXIDANT ACTIVITY AND PHENOLIC CONTENT OF TUBERS FROM ALGERIAN *BUNIMUM INCRASSATUM*

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Bunium incrassatum is a medicinal plant belonging to the *Apiaceae* family; it is widely distributed in Algerian east and locally called "Talghouda". The tubers of this plant are traditionally used as antidiarrheal and to regulate glandular secretion especially in the thyroid gland; they are also very nutritious and thus used as food. In this work, antioxidant activity of extracts prepared from tubers of the plant is evaluated for the first time. The extracts are prepared using maceration technique with four solvents of different polarities; the extraction yield is 24.48% for aqueous extract and 11.28% for hexane extract, while for methanol and acetone fractions it was lower (3.36% and 0.52%, respectively). The highest amount of polyphenols is found in acetone extract (47.10 µg gallic acid equivalent/mg extract). Hexane and acetone fractions showed the highest levels of flavonoids (32.84 and 27.60 µg quercetin equivalent/mg extract, respectively) and also of tannins (32.06 and 22.50 µg tannic acid equivalent/mg extract, respectively). The studied extracts did not show an important antiradical power against DPPH; the highest activity was presented by methanolic fraction with IC50 of 21.11 mg/ml. The best capacity to reduce iron was shown by acetone extract which possessed a dose-dependent activity with a maximal absorbance value of 0.74 at a concentration of 6 mg/ml. The β-carotene/linoleic acid test showed that aqueous extract possesses a higher activity than organic extracts with percentage inhibition equal to 88.63%.

Keywords: *Bunium incrassatum*, Aqueous extract, Organic extracts, Antioxidant activity, Polyphenols, DPPH, FRAP, β carotene

(20204) EFFECTS OF GREEN SYNTHESIZED SILVER NANOPARTICLE ON PHOTOSYNTHETIC APPARATUS OF TOMATO (*SOLANUM LYCOPERSICUM* L.)

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Silver nanoparticle (AgNP) is a great interest for agriculture because of its impact on plant growth, development and control of plant pathogens. The aim of this study is to reveal AgNP effects on the photosynthetic mechanism of tomato plants by a non-destructive chlorophyll fluorescence method. AgNP was synthesized from laurel leaf extracts by green synthesis method. The synthesized nanoparticles were characterized by UV/Vis spectrophotometer, FT-IR, Zeta sizer. The experiment was carried out in greenhouse conditions and one-month-old seedlings were sprayed with two different concentrations (500 and 2000 ppm) of AgNP. Distilled water sprayed seedlings were used as a control. The Imaging-PAM measurements were made periodically before and 6, 24, 48 hours and 6 days after spraying. Imaging-PAM results did not show any variation in parameters between the treatments compared to the control until the 6th day. The measurements showed decrease in photosynthetic efficiency of photosystem II in a dark-adapted state (Fv/Fm), quantum yield of photochemical energy conversion in PS II (Y(II)), quantum yield of regulated non-photochemical energy loss in PS II (Y(NPQ)), quantum yield of non-regulated non-photochemical energy loss in PS II (Y(NO)), non-photochemical quenching parameter describing regulated dissipation of excess energy (NPQ), photochemical quenching (qP), electron transport rate (ETR) parameters while non-photochemical quenching (qN) remained unchanged compared to the controls on the 6th day. The results revealed that green synthesized AgNP did not interact with photosynthetic apparatus up to the 6 days and offers a nanoparticle for agricultural applications due to its non-destructive impact on the photosynthetic mechanism.

Keywords: Silver nanoparticles, Tomato, Green synthesis, Photosynthesis

(20298) ANTIBACTERIAL ACTIVITY OF FOUR DIFFERENT OILS OF MENTHA GENUS

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The aim of this study is evaluated the antimicrobial activity of some medicinal plants. The essential oils were obtained by hydrodistillation of the aerial parts “stems, leaves and flowers” from four species appartient to *Mentha* genus (*Mentha rotundifolia*, *Mentha aquatica*, *Mentha pulegium* and *Mentha spicata*), the antibacterial activity was tested by using the agar diffusion test and the Gram positive and negative pathogenic bacteria: *Staphylococcus aureus* ATCC 25923, *Shigella sonnei* and *Escherichia coli* and *Pseudomonas aeruginosa* ATCC27853 were used to evaluated this activity. The results are expressed by measuring the diameter of inhibition of the different concentrations of the samples. The essential oil of *Mentha aquatica* showed significant effect against *Staphylococcus aureus* ATCC25923, *Shigella sonnei* and *Escherichia coli* ATCC 25922, with inhibition zone of 52.35mm, 39.41mm and 34.01mm respectively, while this essential oil present weak activity against *Pseudomonas aeruginosa* ATCC27853. The bacteria strains studied were low sensitive to the essential oils of *Mentha rotundifolia*, *Mentha pulegium* and *Mentha spicata*.

Keywords: *Mentha rotundifolia*, *Mentha aquatica*, *Mentha pulegium*, *Mentha spicata*, Antibacterial activity, Eessential oil

(20316) EVALUATION OF THE TOXICITY OF FUNGICIDE PROPINEB ON THE HAEMATOLOGICAL PARAMETERS IN THE MALE RAT

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Propinebe, a dithiocarbamate fungicide, is commonly used for the control of diseases in a wide range of crops in agriculture. The fungicide most used in the region of Algeria. The toxic effect of propinebe characterized by its ability to cause many disorders of various organs. This study aims to evaluate the toxic effect of propinebe, on some hematological parameters in male *Wistar* rats. 21 male pupal rats were divided into three groups of 7 rats in each one, the control group and the other two groups were respectively treated with Propinebe in the diet at doses 1/50,1/90 LD 50 for 5/7 days during 6 weeks. The results show a decrease in the number of red blood cells and the hemoglobin level in the two treated groups compared to the control group, as well as increase in the number of white blood cells, lymphocytes, hematocrit levels and platelets. We there fore assume that propineb can cause disruption of hematological parameters in male rats.

Keywords: Propineb, Rat, Haematological parameter, Toxic

**(20321) *KLEBSIELLA PNEUMONIAE* RESISTANT TO BETA LACTAMINE
ISOLATED FROM THE INERT SURFACES FROM HOSPITAL IN ALGERIA**

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Enterobacteriaceae an ubiquitous Gram-negative bacilli, usually colonizing the gut environment. Their spread in hospitals environment create a major hygiene tread. To solve this problem, scientist use antibiotic molecules mainly broad-spectrum beta-lactam antibiotics and sodium chloride and alcohol to disinfect inert surfaces. However, a large number of enterobacteria such as *Klebsiella pneumoniae* have developed resistance to numerous antibiotic drugs; namely Beta lactam, thus giving them the character of multi resistance and their spread on inert surfaces. The presence of these *Klebsiella pneumoniae* in the hospital environment prompted us to study the sensitivity of these *Klebsiella pneumoniae* isolated mainly from inert surfaces at Akbou hospital, Algeria. Strains of *Klebsiella pneumoniae* are isolated by swabbing method from different surfaces, such as toilet, bed and table patient's, at the pediatric, surgery and maternity services. Resistance gene carriage was investigated using double disc synergy production tests. The obtained results reveal a high prevalence in pediatric service mainly from sink. The study of the sensitivity of *Klebsiella pneumoniae* strains to Beta lactama tested shows a variable resistance for cephalosporins and sensitivity to carbapenems. The double-disc test reveals the presence of *Klebsiella pneumoniae* producing Beta Lactamase Large Spectrum (ESBL). The results obtained reveal interesting information on the spread of these Gram-negative ESBL-producing bacilli in the hospital environment and encourage us to think about a prevention strategy.

Keywords: *Klebsiella pneumoniae*, Environment, Hospital, Inert surface

**(20322) *KLEBSIELLA PNEUMONIAE* RESISTANT TO CARBAPENEMS
RESPONSIBLE FOR URINARY TRACT INFECTIONS**

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Klebsiella pneumoniae multi-resistant strains mostly associated with different types of infection. These Gram-negative bacilli have the virulent arsenal to cause bacteremia, septicemia and urinary tract infections. The aim of our work is to study the sensitivity of these multi-resistant *Klebsiella pneumoniae* causing urinary tract infections to different classes of antibiotics and to determine their resistance phenotypes. Strains of *Klebsiella pneumoniae* are isolated from the urinary specimens of the internal and external patients of Hospital from Bejaia, Algeria. These latter strains were the subject of a phenotypic study of resistance profile. The study of the susceptibility of *Klebsiella pneumoniae* isolated to Beta lactamins tested shows a variable resistance for third and fourth generation cephalosporins and carbapenems. The double-disc test and the metallo beta lactam production tests reveal the presence of large-spectrum Beta Lactamase (BLSE) producing *Klebsiella pneumoniae* and carbapenemase-mediated gene in these *Klebsiella pneumoniae* strains. The results obtained reveal interesting information on the emergence of these Gram-negative carbapenemase-producing bacilli in the hospital environment and encourage us to think about a prevention strategy.

Keywords: *Klebsiella pneumoniae*, Carbapenemase, Urinary tract infection

(20437) CHEMICAL COMPOSITION, ANTIBACTERIAL ACTIVITY AND ANATOMICAL STUDY OF *TEUCRIUM POLIUM* L.

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The essential oils from *Teucrium polium* L. was obtained by hydrodistillation method with a Clevenger apparatus with a yield of 0.11%. The extraction produced yellowish essential oils with a very strong odor. Chemical analysis of these oils was carried out by gas chromatography and gas chromatography-mass spectrophotometry CPG/MS; this allowed us to count 27 compounds. The major compounds were: β -pinène (30.61%) followed by Carvacrol (13.09%) and α -pinène (10.40%). Essential oils of this plant exhibited an antibacterial effect on *E. coli* and *S. Aureus* and *P. aeruginosawas* resistant. The anatomical study of this plant shows three different types of glandular trichomes on leaves and stems.

Keywords: *Teucrium polium* L., Chemical composition, Antibacterial activity, Anatomical study.

(20449) ANTIBACTERIAL ACTIVITY OF THREE STORED OLIVE OILS

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The stored olive oil (*Olea europea* L.) was used widely in Algerian traditional medicine. This study aimed to evaluate the antibacterial activity of three samples stored of olive oils (1 year, 12 years and 33 years). These samples were provided by local farmers (Older people). The oils were extracted using traditional method. Two Gram positive bacteria: *Citrobacter freundii* ATCC 8090 *Staphylococcus aureus* ATCC 25923 and four Gram negative bacteria: *Pseudomonas aeruginosa* ATCC 27853, *Escherichia coli* ATCC 25922, *Klebsiella pneumonia* ATCC 700603 and *Schigella sonnei* were used in present study. The results show that the third sample has evident antibacterial activity against bacteria strains used specially against *Citrobacter freundii* ATCC 8090 and *Staphylococcus aureus* ATCC 25923 (38.76±1.08 in 50%, 25.67±0.49% w/w) respectively. This difference in the antibacterial activity between the samples is due to the difference in chemical composition of the oils according to Boukhebti and *al.*, 2016.

Keywords: *Olea europea* L., Stored olive oil, Chemical composition and antibacterial activity

(20586) PHYTOCHEMICAL CHARACTERIZATION AND ANTIMICROBIAL POTENTIALITIES OF POLYPHENOLIC EXTRACTS OF TWO MEDICINAL PLANTS *CHAMAEMELUM NOBILE* L. AND *CHAMOMILLA RECUTITA* L.

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The work presented in this study aims to valorize two medicinal plants of the family Asteraceae growing spontaneously in the region of Boumerdes namely *Chamaemelum nobile* L. and *Chamomilla recutita* L. characterizing them by an evaluation of antimicrobial activities different polyphenolic extracts; methanolic, chloroformic and aqueous.

The phytochemical screening of the aerial part of chamomile allowed to highlight different families of chemical compounds namely; flavonoids, total tannins, catholic tannins, gallic tannins, alkaloids, saponosides, glucosides, mucilages and total absence of anthocyanins and starch.

This was confirmed by a quantitative analysis based on the determination of the polyphenols by spectrophotometry in the presence of the Folin-Ciocalteu reagent determined from the calibration curve of gallic acid. The polyphenols of both chamomile species were extracted by maceration: methanol, chloroform and water and we observed that the aqueous extract was the best extraction solvent.

The antimicrobial activity of the three polyphenolic extracts was determined on six microbial strains such as *Staphylococcus aureus*, *Bacillus thuringiensis*, *Escherichia coli* and *Fusarium sp*, according to the disk diffusion method, and gave zones of inhibition ranging from 7 to 15 mm.

Thus, the three polyphenol extracts have a moderately inhibitory activity and they reacted positively at least on one of the microbial strains tested except the fungal flora, as well as the methanolic extract of *Matricaria chamomilla* L. has a strong activity with regard to *Pseudomonas. sp.* with an estimated inhibition zone of 22.5 mm.

Keywords: *Chamaemelum nobile*, *Matricaria chamomilla*, Phytochemical Screening, Polyphenols, Antimicrobial activity

(20618) GLUTAMATE PRODUCTION BY *CORYNEBACTERIUM GLUTAMICUM* 2262 ON WHEAT BRAN: OPTIMIZATION OF FERMENTATION CONDITIONS USING THE BOX-BEHNKEN STATISTICAL MODEL

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This work focuses on optimizing the culture conditions for the production of glutamic acid by *Corynebacterium glutamicum* 2262 on wheat bran hydrolyzate by optimizing the nutritional parameters. The culture method used is a batch in which the excretion of glutamic acid is heat-inducible. An optimization concept of Box-Behnken was realized in order to obtain the maximum of information on the parameters which influence the glutamic fermentation, four parameters were examined: the hydrolyzate of the wheat bran, the sulphate of ammonium, KH₂PO₄ and urea to determine optimal values. The results obtained show that the production of glutamic acid has been verified by the correlation coefficient (R²). The optimal values of glutamic acid production estimated by the equation of the model are as follows: the total wheat hydrolyzate sugars are 82.72 g/l, ammonium sulphate (13.18 g/l), KH₂PO₄ (9.68 g/l) and urea (6.65 g/l). Indeed the concentration of glutamate obtained (11.51g/l) is correlated with that predicted by the established model (9.83g/l).

Keywords: *Corynebacterium glutamicum* 2262, Glutamate, Box-Behnken statistical model

(20652) INVESTIGATION OF OLEANOLIC ACID FROM FLOWERS OF *EUGENIA CARYOPHYLLUS* USING OF MODERN SPECTROSCOPY AND STUDY OF THEIR ANTIMICROBIAL ACTIVITY

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We obtained (0.03) gm from Oleanolic acid by using (1) gm of acetonic & ethanolic crude extracts from the flowers of *Eugenia caryophyllus*, using multiple column chromatography and using of chloroform-methanol, (1:10) as solvent system. Oleanolic acid was identified by modern spectroscopy methods like (¹H, ¹³C NMR and MS) and chromatographic methods, that available in Bangor university (UK) and the bands was related to (48) protons and 30 carbon atoms belong to Oleanolic acid. Mass spectroscopy was showed the extract molecular weight (456.3621). Also the test of inhibitory effect of isolated Oleanolic acid against three types of MO (*Staphylococcus aureus*, *Escherichia coli* and *Candida albicans*) by using spectrophotometer that provided with LT-4000 plate reader that contend (96) cells for to concentration from (512-1) microgram/ml and using MIC method. Moreover, the Oleanolic acid gave different inhibitory effect against three mentioned MO.

Keywords: *Eugenia caryophyllus*, Oleanolic acid, ¹H, ¹³C NMR, Mass spectroscopy, Antibacterial activities

5(20695) INNATE IMMUNITY TLR4 RECEPTOR SIGNALING MODULATES SERTOLI CELLS METABOLIC PROFILE AND INDUCED NF-KB IN MAPK1-DEPENDENT MANNER

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Sertoli cells are epithelial cells that maintain the blood-testicular barrier. They have been shown to be able to initiate a pro-inflammatory cytokine response in result of innate immunity receptor TLR4 challenge in presence of danger signals like ATP.

Mitochondria are responsible for cell adaptation to the environment and could potentially interact with innate immunity cell signaling. Most epithelial cells have specific metabolic profile upon metabolic stress. Mitogen activated protein kinase 1 (MAPK1) plays a role in cell motility, and both autophagy and intracellular metabolic regulation as well. We hypothesized that metabolic and innate immunity signaling interplay could have impact on Sertoli cell function and hence an impact on male fertility. We questioned how does innate immune signaling through the TLR4 receptor affect Sertoli cells response to metabolic stress. We also questioned if metabolic regulation involved MAPK1 play a role in pro-inflammatory transcription factor NF- κ B trans-activation induced by TLR4.

An Agilent Seahorse XFe Analyzer was used to measure aerobic and glycolytic energy consumption under metabolic stress conditions with and without activation of TLR4. MAPK1 was silenced using small interfering RNA (siRNA) and stable Sertoli cell line harboring pNifty2-SEAP plasmid was used to detect LPS (TLR4 challenge) induced NF- κ B transactivation. Sertoli cell migration was assessed using *in vitro* scratch assay.

Activation of TLR4 resulted in a Sertoli metabolic profile shift in the direction of an enhanced mitochondrial respiration, unlike most epithelial cells that respond with enhanced glycolysis, cell migration and NF- κ B transactivation in MAPK1-dependent manner. Silencing MAPK1 abrogated NF- κ B activation and altered cell migration.

Activation of innate immunity signaling via TLR4 shifts cell energy profile towards increased oxygen consumption and energy production to prepare cell for pro-inflammatory response.

Acknowledgment: This study is a part of National Science Fund supported project DCOST 01/23, 2016.

Keywords: Sertoli cell, Metabolic profile, Seahorse Analyzer, TLR4, MAPK1

(20825) CHRONIC TYPE I IFN IS SUFFICIENT TO PROMOTE IMMUNOSUPPRESSION THROUGH ACCUMULATION OF MYELOID-DERIVED SUPPRESSOR CELLS

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Failure of the immune system to eradicate viruses results in chronic viral infections, which are associated with increased susceptibility to secondary infections. Pathogenic HIV or lymphocytic choriomeningitis virus chronic infections display a persistent type I IFN signature. In chronic lymphocytic choriomeningitis virus infection, blockade of type I IFN signaling partially restores antiviral responses. In a mouse model, we tested whether chronic administration of type I IFN, at doses mimicking chronic viral infection, induced immunosuppression. Chronic exposure of mice to IFN- α alone was sufficient to strongly suppress specific CD8⁺ T cells responses to subsequent vaccinia virus infection. It resulted in the accumulation of Ly6Chi monocytes. These monocytes were similar, phenotypically and functionally, to the myeloid-derived suppressor cells found in cancer because they exerted a potent suppression on CD8⁺ T cell responses in vitro. They acted at least partly through the L-arginine pathway. In vivo, their elimination restored antiviral CD8⁺ T cell responses. Our work provides a specific mechanism accounting for the role of IFN- α in immunosuppression and predicts that type I IFN modulation will be pivotal to cure human chronic infections, cancer, or autoimmune diseases.

Keywords: Infection, Interferon, Immunosuppression, MDSC

(21077) DIAGNOSIS PLUM POX VIRUS IN DIFFERENT REGIONS OF UKRAINE

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The plum pox virus (PPV) is a pathogen that causes a dangerous disease of stone fruit crops, widespread throughout the world. It attracts much attention of researchers as a quarantine object and causes significant economic losses. PPV is widespread in almost all regions of Ukraine and poses a serious threat to horticulture of our country. The aim of this research was to conduct diagnosis of PPV in Ukraine. The samples were visually selected from the central and northern regions of Ukraine. Nowadays, a promising and accurate method for detecting viral infections is a polymerase chain reaction (PCR). In the studied regions, PCR detected strains and found that the most common was the D strain (apricot, peach, plum), and the least common was the M strain (apricot, peach), while in some cases the researchers observed a mixed infection. Depending on the strain, different kinds and varieties of plants can be damaged and crop losses can significantly vary. In result the examination planting stone fruit crops Kyiv, Cherkasy and Odessa regions characteristic symptoms for PPV found very rarely. As a result, serological diagnosis of detected lesions (15.8%). RT-PCR method detected in samples PPV plums, apricots, peach, cherry and plum, which as a result have found that the most common in the studied regions is D strain, rare strain of M, in some cases observed joint infection. Using phylogenetic analysis conducted comparative characterization of samples from famous previously. It was found that isolates from the Odessa are the most related to PPV strains with the United States and Germany, isolates from the Kiev region are the most related to PPV strains with the United States and Canada, isolates from Cherkasy region are the most related to strains PPV from Belarus, Poland and Germany. Phylogenetic relationship between Ukrainian isolates of the plum pox virus plan will predict the development of spread of the virus in different regions of Ukraine and neighboring countries to establish the origin and predict the development of possible epidemics caused by more aggressive strains.

Keywords: Plum pox virus, Phylogenetic analysis, Sequencing, Strain diversity

(21223) FATTY ACID COMPOSITION OF THE TOTAL, TRIACYLGLYCEROL AND PHOSPHOLIPID USED AS OF MAGGOT DEBRIDEMENT THERAPY OF *LUCILIA SERICATA*

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The use of maggot debridement therapy (MDT) in all of world has gained interest. This re-emerging treatment known as a Maggot Debridement Therapy (MDT) is used worldwide due to its efficacy, safety and simplicity. Mechanisms of action of maggots on wound healing include three beneficial effects as debridement, disinfection and enhancement of wound healing. Sterile maggots (*Lucillia sericata*) are applied to chronic wounds where conventional treatment has failed.

The fatty acid composition of *Lucillia sericata* were determined by gas chromatography. Fatty acid methylesters (FAMES) were analyzed by capillary gas chromatography using a Shimadzu GC-2010 Plus equipped with a flame ionization detector (FID) and a fused silica capillary column (DB-23) (Bonded 50 percent cyanopropil, 30mx0.25mmx0.25mm film thickness, J&W Scientific, Folsom, CA, USA). The main fatty acids were determined as linoleic, palmitic, oleic acids. Palmitic, oleic, linoleic acid, which are the major fatty acid of *Lucillia sericata*, was found to be as 28.72 (Triacylglycerol), 43.40 (Triacylglycerol) and 11.28 (Phospholipid) % in respectively. Other fatty acids such as myristic, palmitoleic and stearic acid were present only in trace proportions.

Keywords: Maggot, Fatty acids, *Lucilia sericata*, Triacylglycerol, Phospholipid

**(21224) ANALYSIS OF PHOSPHOLIPID SUBCLASSES FATTY ACID
COMPOSITION OF *LUCILLIA SERICATA***

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Larvae of *Lucilia sericata* are used in maggot debridement therapy (MDT) because of their known ability to preferentially remove necrotic tissue from wounds, disinfect the wound by causing bacterial death, and stimulate the production of new-growth cells, thereby inducing healing.

The fatty acid composition of *Lucillia sericata* were determined by gas chromatography. Fatty acid methylesters (FAMES) were analyzed by capillary gas chromatography using a Shimadzu GC-2010 Plus equipped with a flame ionization detector (FID) and a fused silica capillary column (DB-23) (Bonded 50 percent cyanopropil, 30mx0.25mmx0.25mm film thickness, J&W Scientific, Folsom, CA, USA). The main fatty acids were determined as linoleic, palmitic, oleic acids. Palmitic, Palmitoleic acid, Oleic acid and Linoleic acid, which are the major fatty acid of *Lucillia sericata*, was found to be as 42.68 (Phosphatidylcholine), 18.47 (Phosphatidylinositol), 34.79 (Phosphatidylethanolamine) and 19.79 (Phosphatidylinositol) % in respectively. Other fatty acids were present only in trace proportions.

Keywords: Maggot, Fatty acids, *Lucilia sericata*, Phosphatidylcholine, Phosphatidylinositol, Phosphatidylserin, Phosphatidylethanolamine

(21284) EFFECTS OF IMAZAMOX APPLICATIONS ON ACCUMULATION OF SOME ELEMENTS IN SUNFLOWER (*HELIANTHUS ANNUUS* L.) LEAF TISSUE

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In this study, a kind of imidazolinone (IMI) group herbicide which is commonly used in sunflower farming and sunflower types which are resistant to this herbicide group in different rates were used. Sunflower seeds which were used as study material were provided from Directorate of Trakya Agricultural Research Institute. In the study, four different types of sunflower were used as normal group (sensitive to IMI) SN:8 and resistant groups to IMI SN:9, SN:10 ve SN:14. Seedlings which were germinated under controlled conditions in climate chamber were then transplanted to the experimental parcels in arboretum. 3 different doses of herbicide (1 dose, 2 doses and 3 doses) were implemented to the seedlings which were in 4-6 leaves phase. In this implementation the doses that are used in agriculture were based on and adapted in the study (Agricultural use 125ml/da). After 7 days from herbicide application leaf samples were taken and element analysis was performed in ICP-MS.

As a result of analysis, the amount of 11 elements (Li, B, Mg, Al, K, Ca, Mn, Ni, Sr, Cd, Ba) in SN8 and SN9 varieties was found to be decreased compared to control. An increase in the amount of 14 elements (Li, Mg, Al, K, Ca, Cr, Mn, Fe, Ni, Cu, Zn, Ga, As, Sr) was observed in the SN14 variety. In SN10 variety, increase of Li, B, Cr, Cu, As and decrease of Ba and Fe were observed. In all of the varieties of sunflower, the amounts of Na, V, Co and Se were increased with respect to the control.

Keywords: *Helianthus annuus* L., Herbicide, Element accumulation

(21286) BILHARZIASIS IN MOROCCO: SUCCESS STORY

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The objective of this study is (i) to describe the epidemiological profile of urinary schistosomiasis, (ii) to analyze the different steps of the evolution of this disease in Morocco and (iii) to draw attention at the risk of reintroduction of the disease. This is a retrospective study, based on files collected from the DELM between 1960 and 2017 and published articles. The data analysis was performed using the Excel software.

During this period, 127 786 cases were recorded in Morocco. The majority of cases were reported in the following cities: Agadir (25%), Er-Rachidia (18%), BeniMellal (13%), Tata (10%), Ouarzazate (7%), El KelaaDes Sraghna (6%) and Marrakech (6%). With national program for the control of schistosomiasis in Morocco (PNLS), the prevalence of this disease reached zero indigenous cases in 2004. Since the consolidation phase until 2017, 25 residuals and 27 imported cases have been detected.

Through Morocco's efforts for more than three decades, the goal of eliminating the transmission of schistosomiasis has been favorably assessed towards a cessation of transmission since 2004. The detection of a number of imported and residual cases each year as well as that the presence of the intermediate host in certain lodging constitutes a risk of reintroduction of this disease. A possible resumption of the transmission of schistosomiasis in Morocco should be considered with great attention.

Keywords: Schistosomiasis, Epidemiology, Elimination, Reemergence, Morocco

(19041) INTEGRATION OF STATIC ELECTRIC SYSTEMS INTO BIO RECOGNITION SYSTEMS

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Static electricity is one of the most frequently seen incidents that occur between any two surfaces on us every day. The mechanism behind electrification is still being examined with debate. Contact electrification based charge carriers, which involve ions, electrons, occurs when two surfaces are brought into contact and then separated. Charges move from one material to another to equalize their electrochemical potential after two different materials come into contact. We have showed that nanopatterned composite films contributing roughness of surfaces can provide a sustainable way for converting mechanical energy into electrical signals. They can also be used as self-powered active monitoring sensors. By using the spin coated multicomposite films, it is a simple and cheap way to build mass fabrication of triboelectric collector films based composite monolayer arrays. In this study, we have examined whether new composite films designed as an electrode for self-powered triboelectric generator (TEG) that can sense change of temperature, environment surveillance, and electrical power signals by having palms size. Better electrical signal enhancement might be improved if the device is further functionalized by structured surface area. An excellent electrode stability is obtained as a result of robust design made of polycarbonate, and polyurethane matrix films. Therefore, this study can contribute to current applications of the static electric generators in bioengineering processes, diagnostics, and environment monitoring.

Keywords: Contact electrification, Self-power, Colloidal monolayer, Monitoring sensors

(19113) FILTRATION OF MACROMOLECULES BY NANO TEMPLATES

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In order to fabricate a broad range of practical periodic nanostructures for biotechnological applications, colloidal lithography (nanosphere lithography) techniques are commonly used. Therefore, two-dimensional (2-D) colloidal arrays have been a significant area of research in these biotechnology applications. Simple and scalable colloidal transferring techniques allow the fabrication of 2-D highly-ordered nano arrays based on non-close-packed colloidal crystals on a large variety of substrates, such as plastics and glass.

There are not many mass fabrication techniques for monolayer structures that use the current top-down and bottom-up approaches. By using the transfer technique for monolayer arrays, the mixture of urethane and acrylate monomers might be one of the most common materials as a transfer material or even a nano pore membrane. In this study, it is demonstrated that the transfer method might achieve mass production of monolayer nanostructures for potential applications, for example nanopores used to filtrate biomolecules such as miRNAs, and tRNAs.

Keywords: Bioseparation, Biotechnology, LbL transfer, Medical diagnosis, Nano membrane filtration

(20105) STUDY THE ROLE OF PH IN TRANSCRIPTIONAL ACTIVATOER (CSGD) GENE EXPRESSION IN ENTEROBACTER CLOACAE LOCALI ISOLATES

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Enterobacter cloacae is the most commonly isolated species of genus *Enterobacter* which has been accepted as the etiological agent of many infections in hospitalized and enfeebled patients and has been known as significant bacterial pathogen in recent years. *E. cloacae* are common gram negative opportunistic type of bacteria that cause disease after the host immune system has been weakened by another infection or injury and is associated with nosocomial infections. The infection may be contracted through the skin GIT, UTI or cross contamination. Aims of present study were to the presence of transcriptional activator of the csgBAC operon gene (csgD) and study the role of pH as environmental factor in gene expression of (csgD). In this study urine samples from 75 patients clinically diagnosed with urinary tract infection in Baghdad city, for gram staining, culture, Api20E system and gene expression of (csgD) gene in standardized pH7 and acidic pH4 was done by RT-PCR using specific primers. Conventional methods of gram staining, culture and API 20E system showed positive results for *E. cloacae* in 10(13.3%) out of 75 patients. The results found the highest values of gene expression fold for the csgD gene in pH7 (1) while lowest value of fold for (csgD) at acidic pH4 (0.076) therefore the change conditions growth such as pH of bacteria *E. cloacae* leads to change of gene expression of (csgD). *rpoB* gene expression results, which was used as reference gene confirmed that this gene was well suited as housekeeping gene.

Keywords: *E. cloacae*, Gene expression, Transcriptional activator (csgD) gene

**(20109) STUDY THE ROLE OF pH IN CURLI BIOGENESIS GENE EXPRESSION
IN *ENTEROBACTER CLOACAE* LOCAL ISOLATES**

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Enterobacter cloacae is the most commonly isolated species of genus *Enterobacter* which has been accepted as the etiological agent of many infections in hospitalized and enfeebled patients and has been known as significant bacterial pathogen in recent years. *E.cloacae* are common gram negative opportunistic type of bacteria that cause disease after the host immune system has been weakened by another infection or injury and is associated with nosocomial infections. The infection may be contracted through the skin GIT, UTI or cross contamination. Aims of present study were to the presence of major curli biogenesis gene (*csgA*) and study the role of pH as environmental factor in gene expression of curli biogenesis gene (*csgA*). In this study urine samples from 75 patients clinically diagnosed with urinary tract infection in Baghdad city, for gram staining, culture, Api20Esystem and gene expression of (*csgA*) gene in standardized pH7 and acidic pH4 was done by RT-PCR using specific primers. Conventional methods of gram staining, culture and API 20E system showed positive results for *E. cloacae* in 10(13.3%) out of 75 patients. The results found the highest values of gene expression fold for the (*csgA*) gene in pH7 (1) while lowest value of fold for (*csgA*) at acidic pH4(0.23006) therefore the change conditions growth such as pH of bacteria *E. cloacae* leads to change of gene expression for biogenesis gene. *rpoB* gene expression results, which was used as reference gene, confirmed that this gene was well suited as housekeeping gene.

Keywords: *E.cloacae*, Gene expression, Curli biogenesis gene

(21237) FABRICATION AND CHARACTERIZATION OF CHITOSAN/GUM ARABIC/POLY(VINYL ALCOHOL) NANOCOMPOSITE FILMS

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Recently, natural and synthetic polymeric biomaterials, as well as their composites, have found wide applications in regenerative medicine and tissue engineering due to their favorable chemical, physical, and biological properties such as biocompatibility, biodegradability, and non-toxicity. In this study, natural polymers; chitosan and gum Arabic were combined with polyvinyl alcohol (PVA), which is a biocompatible and biodegradable synthetic polymer, and nanosphere based nanocomposite films were fabricated through electrospraying technique. The morphological observations, determination of the average diameter and diameter distribution of nanospheres were conducted by scanning electron microscopy (SEM). The possible chemical interactions between the components and the existence of relevant functional groups were characterized with Fourier transform infrared spectroscopy (FTIR). Thermal degradation behavior of the nanocomposite film was investigated through thermogravimetric analysis (TGA).

Keywords: PVA, Gum Arabic, Chitosan, Biomaterials, Electrospraying, Nanocomposite, Nanosphere

(18917) VARIATION OF THE PHYSICOCHEMICAL PROPERTIES OF STAPHYLOCOCCUS AUREUS AND IT ADHESIVE BEHAVIOR ON GLASS IN THE PRESENCE OF DIFFERENT SURFACTANTS

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The adhesion of bacteria to solid surfaces is a mechanism of interest for medical, industrial and ecological problems. It is considered the first step in the development of biofilms and may be influenced by different microbiological, physical, chemical or material parameters. The physicochemical properties of the cell surface as well as that of the substrate are a subject of great importance in the adhesion phenomenon. Numerous studies have shown the influence of the physicochemical properties of a surface on the microbial adhesion phenomenon. For the control and use of adhesion of bacteria and biofilms, the physicochemical approach, based on Lifshitz-van der Waals, electrostatic and acid-base interactions, has provided a model of bacterial adhesion.

The aim of this work is to understand the adhesive behavior of *Staphylococcus aureus* ATCC25923 in the presence of surfactants. Surfactants are characterized by the possession of both hydrophilic (polar) and hydrophobic (non-polar) groups on the same molecule. These molecules are surface active as a result of the combination of the hydrophobic and hydrophilic properties. The surfactants used in this study are: nonionic: Tween 20, anionic: Sodium Lauryl Sulfate (SLS) and cationic: Benzalkonium chloride (BAC). To achieve this objective, we determined the physicochemical properties (hydrophobicity and acceptor character of electron acceptors) of the model bacteria in the presence of surfactants using the method of the contact angle measurement. Afterwards, a study of the adhesion of the microbial suspension of *Staphylococcus Aureus* ATCC25923 (in the presence and absence of surfactants) on the glass was performed.

The results obtained show that the studied *Staphylococcus aureus* has a strong electron donor character and a low electron acceptor character. The physicochemical properties changed when adding the surfactants in suspension with the bacteria and also the adhesive behavior of *Staphylococcus aureus* on the glass.

Keywords: Microbial adhesion, *Staphylococcus aureus*, Physicochemical properties, Contact angle, Glass, Surfactants

**(19342) JOINTING AND GLULAM OF NORTH AFRICAN'S ALEPPO PINE: III.
DELAMINATION TEST OF GLUED JOINT**

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The Aleppo pine is the most common species of wood in North Africa with for example 800,000 hectares in Algeria. The limited dimensions of the trees and the presence of several defects such as knots make that this timber is not used in structure and therefore downgrades it. Using the technique of finger jointing and glulam will probably allow the use of this wood as structural timber. This paper is part of a series of work on the feasibility of glued-laminated Aleppo pine from the Guelma region in northern Algeria, it presents the results of delamination test of the glued joint. Several glues available on the market are tested. The results confirm those of the other works already carried out, Sika epoxy glue is the most appropriate for this use, it gives the best results of delamination of the joints. The specimens and tests are in accordance with European standard NF EN 391.

Keywords: Aleppo pine of North Africa, Glulam, Glued joint, Delamination test

(19560) ESTIMATION OF ANTI-HEMOLYTIC AND ANTI-INFLAMMATORY EFFECTS OF *DAUCUS GRACILIS* STEM. METHANOLIC EXTRACT FROM EASTERN ALGERIA

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This study aims to exploit the biological virtues of the local plants studied for the first time. The methanolic extract (ME) of *Daucus gracilis* was tested for possible antimicrobial, anti-hemolytic and anti-inflammatory properties. The ME was prepared by hydro-alcoholic maceration in a water/methanol mixture, and then the total polyphenols were assayed by the Folin-Ciocalteu method. The antimicrobial activity was carried out by the agar diffusion method using disks containing 70 mg/ml. The anti-hemolytic test is carried out by the stabilizing power of human red blood cell (HRBC) and that of the anti-inflammatory activity by the measurement of protein denaturation. The extract showed moderate activity on 28% of the tested strains; *B. cereus* (9.5 mm), *L. monocytogenes* (8mm), *P. Aeruginosa* (8mm) and *C. freundii* (7mm). The anti-hemolytic activity was dose-dependent and interesting but far from being compared to the Diclofenac Sodium (P<0.05). For the anti-inflammatory test, the Diclofenac (IC50: 218.67 µg / ml) was slightly more active than the extract (IC 50: 554.07 µg/ml). In conclusion, we can say that our extract is moderately endowed with interesting biological activities that can be exploited later.

Keywords: *Daucus gracilis*, Apiaceae, Antimicrobial, Anti-hemolytic, Anti-inflammatory

(21228) BIOPOLYMERS FOR MEDICAL APPLICATIONS

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Polymers play a central role both in the natural world and in modern industrial economies. Some natural polymers, such as nucleic acids and proteins, carry and manipulate essential biological information, nature's family of sugars-provide fuel for cell activity and serve as structural elements in living systems. With advances in chemistry and materials science, a vast array of novel synthetic polymers has been introduced over the past century. Synthetic polymers such as nylon, polyethylene, and polyurethane have transformed daily life. Most plastic materials, for instance, are not biodegradable and are derived from nonrenewable resources. The very properties of durability and strength that make these materials so useful also ensure their persistence in the environment and complicate their disposal. In addition, the synthesis of some polymeric materials involves the use of toxic compounds or the generation of toxic byproducts.

In recent years, biopolymers have received more attention in medical applications involving novel biomaterials because of their biocompatibility, biodegradability, and ease of processing. To date, many biopolymers have been developed to increase the value of raw biopolymers obtained from natural sources or microbial systems. Recombinant DNA technology has allowed researchers to exercise unprecedented control over the purity and specific properties of polymers. It is remarkable that microbial organisms are able to create sophisticated materials at normal temperature and pressure, without causing environmental disruption. This is certainly not the case for many man-made materials. Thus, biopolymer research could also lead to the development of new environmentally sensitive manufacturing methods.

This study covers general information on various biopolymers highlights recent research on biopolymers used in various medical applications.

Keywords: Biopolymer, Polysaccharide, Medical applications

**(18781) MORPHOLOGICAL EXPRESSION OF IMPOSEX IN MURICOID
GASTROPOD POPULATIONS DWELLING PAKISTAN COAST**

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Phenomenon of imposex was studied during baseline surveys conducted along the Pakistan coast to assess toxic effects of organotin contamination. Study presents the data of four surveys (4) conducted during 1993 to 2006 as a part of long term imposex studies along the Pakistan coast. Efforts were made during prolonged studies to trace the extent of organotin contamination in coastal waters of Pakistan using morphological expression for analysis. Muricoid species *Thais bufo*, *T. rudolphi* and *T. hippocastanum* were examined from six (6) different polluted and unpolluted sites along the Sindh and Balochistan coast. Study presents the first record of imposex in these species from Pakistan. Results have clearly shown the localized effects of organotin in all three examined species in terms of imposex that was found only at Manora Channel the largest shipping hub in the country. The highest incidence of imposex was found in *T. rudolphi* (100 %) during third survey (2003-2004). However, vas deferens sequence (VDS) stages exhibited by imposex individuals were found up to stage four (4) in all three species.

Keywords: Imposex, Biomonitoring, Toxicity, Port area, Pakistan

(19537) EFFECT OF COLD PLASMA TREATMENT ON THE SEEDS GERMINATION, GROWTH AND PRODUCTIVITY IN DURUM WHEAT

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The effect of cold plasma treatment on seed germination, growth and productivity in durum wheat was studied in this investigation. In the preliminary experiment the seeds of 3 durum wheat varieties were treated with cold plasma. Two types of plasma sources were used: underwater diaphragm discharge and plasma torch sustained by travelling electromagnetic surface wave. The cold plasma treatment time is varied being 5 min and 10 min in the underwater discharge and 5 s, 10 s, 20 s and 60 s in the torch, respectively leading to 12 different variants of treatment of each durum wheat variety. After the treatment the seeds were placed in petri dishes for germination and the following traits were observed: germination potential %, germination rate %, roots length – mm, shoots length – mm, seedlings weight – g. Based on the obtained results 3 variants of treatment with the most significant positive impact on the studied germination traits were selected and used in the second experiment. After the cold plasma treatment, the seeds were sown in pots with three replications for each treatment and genotype and cultivated to maturity in green house conditions in Field Crops Institute – Chirpan, Bulgaria in 2017/2018 year. The effect of the treatment on the important agronomical traits related to growth and productivity were studied. The results received were processed statistically via two-way ANOVA and Duncan's multiple range tests. The analysis of variance reveals that the treatment with cold plasma has a statistically significant influence on the variation of the germination potential, shoots and roots length and weight of seedlings but did not affect the germination rate. It was found stimulating effect of the cold plasma treatment on the plant development at 2 of the studied genotypes. Plants of cultivar Kehlibar headed rapidly after the treatment with variant 2 (20 s in the torch), while plants of cultivar Progress – after both treatment variants 1 – and 1 + (underwater diaphragm discharge). The results from the influence of cold plasma on traits related to productivity will be processed after the plants maturation and will be included in the final version of the paper.

Acknowledgments: This work was supported by Bulgarian National Science Fund under Grant No DH08/8, 2016.

Keywords: Cold plasma treatment, Seeds germination, Growth and productivity, Durum wheat

(19046) SILICON DIOXIDE NANOPARTICLES INDUCES APOPTOSIS AND MITOCHONDRIAL OXIDATIVE STRESS IN HT-29 AFTER 24 AND 48 HOURS EXPOSURE

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Nanomaterials are an increasingly important product of nanotechnologies. Mitochondria can release to inhibit pro-apoptotic factors such as cytochrome-c (Liu, Kim et al. 1996), apoptosis inducing factor (AIF) (Lorenzo, Susin et al. 1999), smac/diablo (Chai, Du et al. 2000), endonuclease (EndoG) (Li, Luo et al. 2001).

The apoptosis assay was performed with a commercial kit according to the instructions provided by Biocolor Ltd. (Northern Ireland). The APOPercentage assay is a dye-uptake assay, which stains only the apoptotic cells with a red dye. When the membrane of an apoptotic cell loses its asymmetry, the APOPercentage dye is actively transported into cells, staining apoptotic cells red, thus allowing detection of apoptosis by spectrophotometry.

DHR 123 is a nonfluorescent, noncharged dye that easily penetrates cell membranes. Once inside the cell, DHR 123 becomes fluorescent upon oxidation to yield rhodamine 123 (Rh123), fluorescence being proportional to ROS generation. The cells were washed in PBS. The fluorescence intensity of Rh123 was measured in an automatic microplate reader (Infinite pro200). Excitation was set at 498 nm and emission at 522 nm. Treatments were carried out in triplicate.

Cells were incubated with 1 µM JC-1 for 15 min at 37 °C as previously described. The cationic dye JC-1 exhibits potential-dependent accumulation in the mitochondria. It indicates mitochondria depolarization by a decrease in the red to green fluorescence intensity ratio. The green JC-1 signal was measured at the excitation wavelength of 485 nm and the emission wavelength of 535 nm, the red signal at the excitation wavelength of 540 nm and the emission wavelength of 590 nm. Fluorescence changes were analyzed using a fluorescence spectrophotometer (Plate Reader Infinite Pro200).

We demonstrated that nanoparticles induced oxidative stress and apoptosis HT-29 cells. These results showed that SiO₂ exposure exerted toxic effects and altered cell viability. In summary, exposure to SiO₂ nanoparticles resulted in a dose-dependent cytotoxicity in cultured cells that was associated with increased oxidative stress.

Keywords: Nanoparticles, ROS, Apoptosis

(19047) SILICON DIOXIDE NANOPARTICLES INDUCES APOPTOSIS AND MITOCHONDRIAL OXIDATIVE STRESS IN MCF-7 AFTER 24 AND 48 HOURS EXPOSURE

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Across the globe, humans are exposed to particulate matters which originates from any activity involving burning of materials or any dust generating activities such as volcanic ashes, dust storms and other natural processes. With the continuous reign of nanotechnology, research shows that nanoparticles may have adverse effect and potentially negative impacts on human health. In the first in vivo studies, applying micro and nano-sized SiO₂ particles in rat brains resulted in damage of neurons and induction of inflammation in brain astrocytes (Rees and Cragg 1983). Apoptosis was induced by ROS and mitochondrial membrane depolarization in the HUVEC cell line exposed to 50, 100 and 200 µg/ml SiO₂ nanoparticles, whereas apoptosis was not induced at 25 µg/ml (Liu and Sun 2010).

The apoptosis assay was performed with a commercial kit according to the instructions provided by Biocolor Ltd. (Northern Ireland). The APOPercentage assay is a dye-uptake assay, which stains only the apoptotic cells with a red dye. When the membrane of an apoptotic cell loses its asymmetry, the APOPercentage dye is actively transported into cells, staining apoptotic cells red, thus allowing detection of apoptosis by spectrophotometry.

DHR 123 is a nonfluorescent, noncharged dye that easily penetrates cell membranes. Once inside the cell, DHR 123 becomes fluorescent upon oxidation to yield rhodamine 123 (Rh123), fluorescence being proportional to ROS generation. The cells were washed in PBS. The fluorescence intensity of Rh123 was measured in an automatic microplate reader (Infinite pro200). Excitation was set at 498 nm and emission at 522 nm. Treatments were carried out in triplicate.

It has been observed that when the exposure time increases in cell line, doses of administration increase. Overall, our data suggesting that nanoparticles may induce apoptosis in MCF-7 cells via p53, bcl-2 and caspase pathways. Our findings demonstrate that SiNPs can initiate variable and complex mechanisms in response to their exposure.

Keywords: Nanoparticles, ROS, Apoptosis, Mitochondrial membrane potential

(19535) STUDY OF THE EFFECT OF COLD PLASMA ON THE GERMINATION AND GROWTH OF CONTAMINATED WITH *FUSARIUM GRAMINEARUM* DURUM WHEAT SEEDS

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Cold plasma is a potentially new method of controlling diseases caused by fungal pathogens. In this investigation the influence of treatment with cold plasma of contaminated with *Fusarium graminearum* durum wheat seeds on the germination and growth of plants was studied. Plants of 6 durum wheat varieties were pre-contaminated with spore's suspension of *Fusarium graminearum*. The harvested seeds were treated with cold plasma in 4 variants: 1–direct treatment with Argon plasma torch sustained by travelling electromagnetic wave; 2 – treatment with the same plasma torch of seeds in 20 ml distilled water; 3 – underwater diaphragm discharge treatment in the container with the applied voltage of 15 kV electrode, denoted by “+”; 4 – underwater diaphragm discharge treatment in the container with the grounded electrode, denoted by “–”. Two control variants were used – dry not treated contaminated seeds and wet not treated contaminated seeds. After the treatment the seeds were placed in petri dishes for germination. Sprouted seeds were planted in pots with soil mixture and cultivated to maturity in green house conditions in Field Crops Institute – Chirpan, Bulgaria in 2017/2018 year. The effect of the treatment on the following traits were studied: germination rate, days to heading, plant high, parameters of chlorophyll fluorescence during the grain feeling, spike length, kernel number per spike, kernel weight per spike, TKW and obtained ill (*Fusarium graminearum*) and healthy seeds. The results received were processed statistically via two-way ANOVA and Duncan's multiple range test. The analysis of variance reveals that the genotype, treatment with cold plasma and interactions between them has a statistically significant influence on the variation of the germination rate. Best germination rate (means from all genotypes) was obtained by treatment with cold plasma variant 1120 sec. dry (F1) and variant 3 (5 min - red (B +)). After the germination the number of contaminated with *Fusarium graminearum* seeds was the lowest after the variant 4 of the treatment at three of the studied varieties. It was found stimulating effect of the cold plasma treatment on the plant growth at 4 genotypes. Varieties Elbrus, Progres, Deni and Zvezdica were with higher PH during the grain feeling. The results from the influence of cold plasma on other studied traits will be processed after the plants maturation and will be included in the final version of the paper.

Acknowledgments: This work was supported by Bulgarian National Science Fund under Grant No DH08/8, 2016.

Keywords: Cold plasma, *Fusarium contamination*, Durum wheat

(18095) DETAILED ANALYSIS OF SEAWEED FOR ITS UTILIZATION

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Globally, seaweeds have been as a source of food, fertilizers and medicines. In this work, biochemical analysis, antibacterial and anticoagulant activities, phytochemical and mineral contents of some seaweed collected from Arabian Sea near Pakistan Coast were investigated. Biochemical analysis revealed occurrence of carbohydrate (11.43 to 24.57 %), protein (8.29 to 19.62 %) and lipid (2.65 to 4.97 %). *Sargassum muticum* exhibited the maximum antibacterial activities (methanol, 12.4±0.2 mm; ethanol, 4.9±0.1 mm; water, 3.5±0.5 mm). Sulphated Polysaccharide from *Codium iyengarii* showed much similar results of anticoagulant activities (APTT, 11s, 57s and 116s respectively; TT, 21s, 52s and 81s respectively) when compared to the heparin (APTT, 23s, 132s and 295s respectively; TT, 286s, 293s and 299s respectively) and dermatan sulphate (APTT, 14s, 27s and 38s respectively; TT, 25s, 58s and 87s respectively). Phytochemicals were extracted by using three solvents (water, ethanol and methanol) in which methanol was the best one the highest flavonoid content was measured in methanol extract of *Ulva fasciata* (287±13 µg/g), tannin content in *Codium iyengarii* (1958±49 µg/g), chlorophyll content in *Codium iyengarii* (729±13 µg/g) and carotenoid in *Ulva fasciata* (326±37 µg/g). There were variations in the mineral contents, specie to specie, in seaweeds. *Stoechospermum marginatum*, brown specie, had the highest Calcium (15.7±1.4 g/kg), *Sargassum ilicifolium*, the highest Potassium (47.7±5g/kg). The highest mean Zn (30.8±28 mg/kg) was present in *Ulva fasciatalatum*, the green seaweed and specie of red algae, *Sarconema fucellatum* showed the highest Manganese (262±14mg/kg) concentrations. The major outcome of the study is the detailed information about the potential of seaweeds, collected from Arabian Sea, to be used for human consumption and other utilizations.

Keywords: Seaweed, Biochemical analysis, Antimicrobial activity, Anticoagulant activity, Mineral content

**(21293) RAPID DETECTION OF LACTOBACILLUS PLANTARUM FROM
FERMENTED TABLE OLIVES**

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Table olives are one of the main fermented food in the world. Lactic acid bacteria (LAB) and yeast have the main role in fermentation of table olive. In this study, 65 lactic acid bacteria spp. were isolated from 100 samples of brine olive waters which were collected from Izmir and Aydın. We used traditional pure culture methods and Real-Time PCR for isolation and detection of isolates respectively. There are two different duplex 5' nuclease assays targeted on rRNA intergenic spacer regions primers and probs to identify both *Lactobacillus sp.* and *Lactobacillus plantarum*. As a result, all of the 65 isolates were identified as *Lactobacillus spp* and 41 isolates as *L. plantarum*. In conclusion these study shows that Real-Time PCR assay could be apply as a rapid and repeatable method for detection of lactobacilli and the other fastidious microorganisms.

Keywords: *Lactobacillus* spp., Real-time PCR, Fermented food

(21230) RELATIONSHIP WITH OBESITY OF INTESTINAL FLORA AND PROBIOTICS

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The intestinal flora (microbiota) primarily consists of more than 100 trillion microorganisms including bacteria, fungi, protozoal and archeal species affecting the physiology of the environment and altering its susceptibility to disease. Changes in the number and quality of microorganisms in the intestinal microbiota may cause enteral and other diseases by negative affecting the bowel's barrier function. One of the factors that play a role in the development of obesity, genetic, environmental and immune system-related factors, as well as intestinal microbiota. Alleviation of basic factors that are effective in obesity and dietary practices as well as alternative ways have begun to be investigated. While the use of probiotic / prebiotic is considered to be an effective alternative to reduce the likelihood of obesity, there is a need for more studies related to microbiota and obesity.

Keywords: Obesity, Probiotics, Microbiota, Microbiom, Intestinal Flora

**(18014) AGRO-MORPHOLOGICAL VARIABILITY OF PEARL MILLET
(*Pennisetum glaucum* (L.) R. BR) ACCESSIONS PLANTED IN ARID AND
SEMI-ARID REGION IN PART OF KENYA.**

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The experiment was conducted in Marigat and Koibatek in Kenya from 2013 to 2014 under irrigation conditions in two environments. The main objective of the study was to investigate the morphological variability of 36 pearl millet (*Pennisetum glaucum* L.) accessions sourced from ICRISAT Kenya. Eight agro-morphological parameters were measured using the pearl millet descriptors. The experimental design was randomized complete block design (RCBD) with two replications. They were significantly different among all parameters measured. Thirty-six genotypes were analyzed using multivariate hierarchical cluster analysis. The hierarchical dendrogram resulted in the formation of twelve clusters depicting high level of genetic diversity among the thirty-six accessions. The results of agro-morphological parameters, that is, vegetative tillers, reproductive tillers, panicle diameter (cm), plant height (cm), panicle height (cm), panicle weight (g), 1000 seed weight (g) and grain yield (g/plant) revealed significant different at 5% level. The main objective of the study was to (1) determine agromorphological diversity of pearl millet accession in two locations and (2) evaluate yield performance of pearl millet accession in two locations.

Keywords: Agro-morphological, Variability, Cluster analysis, Accession

(18178) IMPROVED PRODUCTION, PURIFICATION AND CHARACTERIZATION OF INVERTASE FROM *PENICILLIUM LILACINUM* BY SHAKEN FLASK TECHNIQUE OF SUBMERGED FERMENTATION

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Recent years researchers have been motivated towards extensive exploring of living organism, which could be utilised effectively in intense industrial conditions. The present study shows enhanced production, purification and characterization of industrial enzyme, invertase (Beta-D-fructofuranosidase) from *Penicillium lilacinum* (Thom, 1910). A range of various cellulosic wastes (cotton stalk, sunflower waste, rice husk) and agricultural based industrial by-products (molasses and date syrup) were utilized as energy source. The highest amount of enzyme (13.05 Unit mL⁻¹) was produced when the fungal strain was cultured at growth medium added with date syrup as energy source and yeast extract as nitrogen source, after incubation time span of 96 h, at a temperature of 40° C, initial pH of medium 8.0, inoculum size of 6x10⁶ conidia and 200 rev/min of agitation rate. The enzyme was also purified (7 folds than crude) and characterized. Molecular mass of purified enzyme (65 kDa) was determined by 10 % SDS-PAGE. Lineweaver-Burk Plot was used to determine Kinetic constants (V_{max} 178.6 U/mL/min and K_m 2.76 mM). Maximum enzyme activity was observed at a temperature of 55 °C and pH of 5.5. The fungal strain was showing enzyme activity even at extreme conditions of pH (up to 9) and temperature (up to 60 °C) so it could be a possible candidate for industrial use.

Keywords: Invertase, *Penicillium lilacinum*, Submerged fermentation, Industrial enzyme

(18803) ENHANCEMENT OF AJMALICINE PRODUCTION BY ELICITATION OF CATHARANTHUS ROSEUS HAIRY ROOTS BY SALICYLIC ACID

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Catharanthus roseus is very important medicinal plant. Which, this plant produces a wide range of medical interest terpenoid indole alkaloids, including antihypertensive molecules as ajmalicine. The main limiting hurdle to produce sufficient amount of these compound are the low yield. Therefore, many phytochemical, physiological, genetics and genomic, and biochemical analysis and studies have been investigated to increase the content of various *in vitro* plant systems such as shoot cultures, cell suspension cultures and hairy roots.

Hairy roots are an excellent system to study the regulation mechanisms of ajmalicine production. In the present work, we report the analyses of the kinetics of growth and the accumulation of ajmalicine in few selected hairy root lines. The maximum production of ajmalicine coincides with the exponential biomass growth phase. In other hand, the application of different concentration of salicylic acid during this biomass growth phase showed an important enhancement of ajmalicine production. Specially, after application of 0.0001 M of salicylic acid during 48 hours, allowed to increase the ajmalicine content by 40.54 % and 60.97 %, respectively, for hairy root lines LP10 and L54.

Keywords: Ajmalicine, Medicinal plant, Salicylic acid, Terpenoid indole alkaloids

(19294) COMPLETE GENOME SEQUENCE ANALYSIS OF THE *HYPHANTRIA CUNEA GRANULOVIRUS* (HYCUGV) FROM TURKEY

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The fall webworm *Hyphantria cunea* is a worldwide pest of many broad-leaved trees. Insecticides are the major means farmers use for management. A naturally occurring baculovirus, *Hyphantria cunea* granulovirus (HycuGV), has been isolated from the larvae of *H. cunea* and this has the potential for use as microbial agent. In this report we describe the complete genome sequence of a granulovirus isolate (HycuGV) that infects larval stages of the *H. cunea* and compared it to other baculovirus genomes. The HycuGV genome is a circular double-stranded DNA molecule of 114,825 bp in size with a nucleotide distribution of 39.3% G+C. Bioinformatic analysis predicted 131 putative open reading frames of (ORFs) ≥ 150 nucleotides. Comparison between the other baculovirus species, HycuGV genome revealed some differences on the basis of ORF. The gene parity plot analysis and phylogenetic analysis showed that HycuGV is a beta-baculovirus. Furthermore, HycuGV isolate is closely related to *Xestia c-nigrum* granulovirus. This study expands our knowledge about genetic variation among HycuGV isolates and provides novel information on the granuloviruses occur.

Keywords: Granulovirus, *Hyphantria cunea*, Complete genome sequence

(19322) BENZOXAZOLE DERIVATIVES DECREASED THE PRO-INFLAMMATORY ACTIVITIES OF MACROPHAGES

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Previous studies support anti-proliferative and, therefore anti-cancer potential of bis-benzoxazole derivatives. Although their effect on tumor cells have been extensively studied their possible effects on the immune system cells have not gathered as much of an attention yet. Delineation of their effect on the immune response not only would improve our ability to use them in inflammatory disorders but also it would be useful in cancer setting when these molecules are utilized as chemotherapeutics.

Our research team synthesized a series of symmetric bis-benzoxazole derivatives. These molecules immune-stimulatory and immune-modulatory activities were tested by using a mammalian macrophage cell line (RAW 264.7). Based on our results, these compounds exerted an anti-inflammatory activity on LPS induced macrophages. Decreases in TNF- α , IL-6 and IL1 β production levels were both substantial and statistically significant. These molecules acted in a dose dependent manner and they were effective even at low concentrations.

Our results support that these new bis-benzoxazole derivatives have potential therapeutic effects in inflammatory diseases. Generation of new series of bis-benzoxazole derivatives and their characterization in terms of their biological activities will substantially contribute to the repertoire of the anti-inflammatory drug candidates.

Keywords: Bis-benzoxazole, TNF- α , IL-6, IL-1 β , Inflammation, Macrophage, Anti-inflammatory agents

(19433) A PRELIMINARY STUDY FOR DETECTION OF THE ENTOMOCIDAL POTENTIAL OF NATIVE *BACILLUS THURINGIENSIS* ISOLATES FROM TURKEY

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In pest market, the products of the bacterium *Bacillus thuringiensis* (Bt) have been the most widely used microbial biopesticides in recent decades. Bt plays a major role in biological control by producing insecticidal proteins, both at sporulation and vegetative phase, called as delta endotoxins (Cry and Cyt proteins) and Vip proteins (vegetative insecticidal protein), respectively. In this study, we examined the entomocidal potential of native Bt strains in our collection. First, PCR was performed to screen for the presence of *vip3* genes in Bt isolates also carrying *cry1* and/or *cry2* genes. Then, the insecticidal activity of spore-crystal mixtures and culture supernatants of 18 *vip3*-positive Bt strains was tested against *Spodoptera exigua*, *Spodoptera littoralis* and *Ostrinia nubilalis* neonate larvae. Dose-response assays with *S. exigua* showed that the spore-crystal mixture from the Bt strain KH58 was significantly more toxic (LC₅₀ =15 ng/cm², FL= 9-24) than the strain HD1 (LC₅₀ =48 ng/cm², FL= 30-74) used as a reference and present in many commercial bioinsecticides. The most significantly active Bt strains against *S. littoralis* were 13MY and 45MY with LC₅₀ values of 1.31 ng/cm² (FL= 0.59-2.18) and 1.57 ng/cm² (FL= 0.94-2.50), respectively. On the other hand, none of the strains was significantly more toxic than HD1 against *O. nubilalis*. The detection of the Cry proteins in the crystal from the highly toxic Bt isolates KH58, 45MY, 6A, 42MY and 51MY was done by LC-MS/MS. The results conclusively identified the Cry1Ac protein and a Cry2A-type protein in all strains, Cry1Ea in 3 of them and Cry1Aa in one. The analysis of broth supernatants showed that those of 6A and 45MY Bt strains gave a 100% mortality against both *S. exigua* and *S. littoralis*. The lack of mortality when assays were performed with autoclaved supernatants confirmed the results of HPLC in that all strains were negative for type I β -exotoxin.

Keywords: *Bacillus thuringiensis*, *vip3* gene, Cry protein, Bioactivity, LC-MS/MS

(19617) THE INFLUENCE OF LIGHT INTENSITY AND PHOTOPERIOD ON THE GROWTH OF TWO FRESH WATER GREEN ALGAE ISOLATED FROM ESTUARY

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The culture of microalgae requires a rigorous control of all growth factors: nutrients, pH, temperature, and light. Among these factors, the light that directly influences photosynthesis mechanism is an important factor in defining optimal conditions for the culture. In this study, the effects of various intensities and its photoperiods on the growth of two fresh water green algae (*Tetranephris brasiliensis* and *Scenedesmus* sp) were studied. Three different light intensities (50, 100 $\mu\text{mol}/\text{m}^2/\text{s}$ and daylight) and three photoperiod cycles (24:0, 18:06 light: dark and natural photoperiod) are lunched at constant temperature of 23 °C. Microalgal growth was measured using cell count, specific growth rate and OD in three replicates. The results showed that under the light intensity of 100 $\mu\text{mol}/\text{m}^2/\text{s}$ and photoperiod of 18 h light: 6 h dark cycle, *Tetranephris brasiliensis*, *Scenedesmus* sp. was found to grow favorably with a maximum cell concentration of 2.88×10^7 cells/ mL, which corresponds to the growth rate of 0.253/d for *Tetranephris brasiliensis* and 2.56×10^7 cells/ mL which corresponds to the growth rate of 0.190/d for *Scenedesmus* sp. These results confirm the real effect of photoperiod on the microalgae growth rate and show a good correlation between the absorbance measurements and cell concentrations.

Keywords: Microalgae, Light intensity, Photoperiod, Batch culture, Growth rate, Cell counting, Optical density

(19824) COMPARISON OF DIFFERENT DNA MARKERS FOR SELECTION OF HIGH OLEIC TYPE SUNFLOWER GENOTYPES

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Sunflower is one of the most important oilseed crops due to high oxidative stability of its oil with high oleic acid content. Determination of high oleic sunflower by standard methods such as gas chromatography is time consuming and expensive. On the other hand, marker-assisted selection analysis with molecular markers associated with high oleic acid trait is a useful and powerful tool in order to facilitate sunflower breeding programs. For the purpose of genotyping the sunflower genotypes for high oleic content four molecular markers were used; SSR marker, HO PCR specific fragment, INDEL markers (FAD2-F4/FAD2-R1 and FAD2-NF/FAD2-NR and FAD2-IS-F/FAD2-IS-R primer set). The results showed that high oleic containing hybrids expressed a specific SSR band at 246 bp length and also HO PCR specific fragment at 870 bp length. INDEL marker FAD2-F4/FAD2-R1 has an insert specific band at 653 bp length and INDEL marker FAD2-NF/FAD2-NR has a specific band at around 695 bp. The results were also confirmed by estimating the fatty acid composition. The results of this work allowed to validation of four DNA markers in sunflower inbred lines for high oleic acid traits. According to results, showing the insertion site which is linked to the Pervenets mutation by the insertion specific PCR primers is more reliable than the SSR marker for selection of the high oleic type sunflower genotypes.

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Keywords: *Helianthus annuus*, INDEL markers, Marker-assisted selection, SSR, Oleic acid composition

(19847) ISOLATION AND IDENTIFICATION OF CELLULOLYTIC BACTERIA FROM SOIL FOR INDUSTRIAL EXPLORATION

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Cellulases are known to convert cellulose into monomeric or dimeric structure hence playing important role in bioethanol production along with applications in textile and paper industries. In this study cellulase producing bacteria were isolated and screened from different soil samples on CMC agar plates followed by iodine staining. Six strains showed zone on CMC agar plates revealing as potential producers of cellulases. These strains were identified by 16S rRNA gene sequencing and identified as *Bacillus megaterium*, *Pseudomonas stutzeri*, *Bacillus aerious*, *Bacillus paralichniformis*, *Bacillus flexus* and *Bacillus wiedmanni*. These strains were cultivated in submerged fermentation using various agricultural wastes such as corn cob, rice husk, wheat straw, seed pods of bombyx ceiba and eucalyptus leaves as substrates for cellulase production. Results showed that *Pseudomonas stutzeri* is the best cellulase producer among these strains followed by *Bacillus flexus*, *Bacillus paralichniformis*, *Bacillus megaterium*, *Bacillus aerious* and *Bacillus wiedmanni*. The cellulase enzyme could be potentially used for industrial exploitation particularly in biofuels and textiles.

Keywords: Bacteria, Cellulase, 16S rRNA gene sequencing, Fermentation

(19911) DEVELOPMENT OF ANIMAL BIOTECHNOLOGY IN THE WORLD AND IN TURKEY

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Biotechnology provides new tools for improving human health and animal health and welfare and increasing livestock productivity. Animals are playing a growing role in the advancement of biotechnology, as well as increasingly benefiting from biotechnology. Biotechnology improves the food we eat - meat, milk and eggs. Biotechnology can improve an animal's impact on the environment. And biotechnology enhances ability to detect, treat and prevent diseases. Just like other assisted reproduction techniques such as artificial insemination, embryo transfer and in vitro fertilization, embryo and sperm sex sorting, cryopreservation of genetic materials, livestock cloning improves animal breeding programs. Animals long have been selectively bred for agriculture, leading to dramatic improvement in growth rate, milk or egg yield, and other productivity-related traits. With advances in gene transfer techniques comes the prospect of producing animals with safety and quality product, made possible through biotechnology. In Biotechnology recombinant DNA techniques is the use of to insert DNA from one plant, animal, or microorganism into another. This technology may be used to enhance food production or quality (e.g., faster growth, improved disease resistance); to produce pharmaceutical products for therapeutic use; to enhance human interaction with animals (e.g., new color varieties of aquarium fish); to develop animal models for biomedical research; or to produce industrial or consumer products (e.g., fibers for multiple uses). Many transgenic animals help by serving as models of disease. Those animals are often used to help us understand how new drugs will work and whether or not they'll be safe for humans and effective in treating disease. Biotechnologists also use cells obtained from animals to produce antibodies which are proteins made by the immune system and that are used in many ways in biotechnology. In agriculture, biotechnology methods such as genetic testing are used to identify the best animals for producing milk or meat and finding animals that are most resistant to disease. Biotechnology can also help produce environmentally friendly animals, as well as conserve endangered species. In our country, several transgenic animals model were produced, An Anatolian native cattle breed was cloned by using somatic cell nuclear transfer first time in the world, first national animal gene bank was established by using cryopreservation technologies. The point reached shows that animal biotechnology will continues to improve with increasing momentum all over the world.

Keywords: Animal, Biotechnology, Transgenic, Cloning, Cryobiology

**(19913) CRY-CONSERVATION AND SYNCHRONIZATION OF ANIMAL CELLS
FROM LIVESTOCK**

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Cloning of organisms with nuclear transfer (NT), namely production of genetic copy of organisms, is the most advanced point of today's modern biotechnology and assisted reproductive technique. One of the main material for cloning process is the cell of animal which is chosen for cloning. Therefore, the most important step of NT is to isolate the cells of desired animal for cloning and also to cryopreserve them for long period. The first aim of the project is to isolate different type of cells (such as; skin fibroblast, muscle cells, cartilage cells and granulosa cells) obtained from various species (such as; cattle, sheep, goat and buffalo) and cryopreserve them by using different cryoprotectant combinations. While the ratio of necrotic and apoptotic cells was increased when the serum ratio in the freezing solution decreased. The highest cell viability was obtained from freezing solution containing 10% DMSO, 40% serum, in dextran 40 or dextrose. Another important step of NT is to synchronize the cells of desired animal at desired cell cycle stage for cloning. The second aim of the project is to synchronize different type of cells (such as; skin fibroblast, muscle cells, cartilage cells and granulosa cells) obtained from various species (such as; cattle, sheep, goat and buffalo) at a particular cell cycle stage using a variety of methods (serum starvation, contact inhibition and roscovitin), to determine the potential harmful effects of methods on these cells, and to determine the less hazardous and the best method. After synchronization experiments, cells were analysed by flow cytometry for cell viability, apoptosis, necrosis and cell cycle stage. As a result of this study, one or a few cell synchronization options giving highest rate of G1/G0 and having lowest harmful effect on cells were identified for four different cell types used at least on time for nuclear transfer studies and resulted live birth.

Keywords: Animal cell, Cloning, Cryopreservation

(19964) SCREENING OF PHENOL OXIDASE ENZYMES FROM SOME MEDICINAL PLANTS IN KOCAELI AND PURIFICATION OF ENZYME BY THREE-PHASE PARTITIONING

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Phenol oxidases, among the antioxidant enzymes, are enzymes which have highly oxidative activity on phenolic and nonphenolic aromatic compounds found in many cell groups. They are frequently used in various areas of industry. In this study, the presence of phenol oxidases from naturally grown plants in Kocaeli such as rosemary, kaki persimmon, fig, medlar, blackberry, Rose-of-Sharon, wild strawberry, common mallow, garden sage and spearmint. The plant with highest activity was identified and the phenol oxidase enzyme was purified by Three-Phase Partitioning. Plant specimens were collected from the localities listed on the Kocaeli Province flora list during the vegetation periods covering spring and summer months. 30 grams of plant leaves were homogenized in 200 ml of 100 mM phosphate buffer (pH 7.0) using a sterilized mortar and pestle at 4°C. The solution was centrifuged at 14,000xg for 30 min at 4 °C and the resulting supernatant enzyme was used as crude extract. The pH (6.0-8.0) effect was studied for homogenization optimization. In the purification of the enzyme by a triple phase separation system, 2 ml of enzyme extract was mixed with different concentrations of ammonium sulfate (20%, 30%, 40%, 50% and 60%) and different crude extract / t-butanol ratios (1.0: 0.5, 1.0: 1.0, 1.0: 1.5, and 1.0: 2.0). The mixture was allowed to stand at room temperature for 5 minutes, then centrifuged at 4,000xg for 5 minutes to observe phase separation. The highest phenol oxidase activity among the plants tested in the study was observed in Rosemary (*Rosmarinus officinalis*). The activity of crude extract was measured as 936 U/ml after homogenization. Optimal purification parameters in three-phase partitioning were 50% (w/w) ammonium sulfate saturation at pH 6.5 with 1.0:1.0 (v/v) ratio of crude extract to t-butanol ratio. Under these conditions, the phenol oxidase enzyme was purified 15 fold with 59% yield in the intermediate phase. It has been discovered that the amount of phenol oxidase enzyme in rosemary is three times higher than cultivated mushroom which is known as the oxidase producer. This suggests that the rosemary plant is an alternative source of antioxidants.

Keywords: Antioxidant, Phenol oxidase, Activity, Medicinal plant

(20022) METHANOLIC EXTRACT OF TRANSFORMED *AJUGA BRACTEOSA* PLANT EXPRESSING *ROL* GENES SHOWED SIGNIFICANT INCREASE IN ANTIBACTERIAL, ANTIOXIDANT, ANTIPROLIFERATIVE AND ANTIDIABETIC ACTIVITIES *IN VITRO*

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Ajuga bracteosa is a valuable yet endangered medicinal plant containing many important compounds, including withanolides, phytoecdysteroids, neo-clerodane and iridoid glycosides. A great wealth of information of analgesic, anabolic, antihypertensive, antioxidant and cytotoxic activities of these compounds is available. However, the production of these therapeutically valuable secondary metabolites is extremely low in wild *A. bracteosa* plant and their chemical synthesis is impractical and costly. The increased demand of natural products for medicinal purposes coupled with the low product yields has renewed interest in large-scale *in vitro* plant culture technology. Among different strategies used to improve plant secondary metabolite production, recombinant DNA technology has allowed the expression of biosynthetic genes to be altered, and the manipulation of metabolic traits. Several studies show that *rol* genes are powerful activators of secondary metabolism in various plants. In the current study, *A. bracteosa* plant was subjected to *in vitro* culturing with the aim to study the effect of plant growth regulators on somatic embryogenesis for mass production and uniform plantlets for further genetic transformation and to evaluate the possible impact of *rol* genes transformation on phytochemistry and pharmacological properties (antibacterial, antioxidant, antidiabetic and anti-proliferative) of *A. bracteosa* plant harboring *rol A* and *rol C* genes. Leaf explants cultured on B5 medium containing 1mg/L 1-naphthaleneacetic acid (NAA) + 0.5 mg/L 6-Benzyl amine purines (BAP) proved to be the most effective combination for somatic embryo induction. *Agrobacterium tumefaciens* strain GV3101 harboring pPCV002-A and pPCV002-CaMVC was used to obtain transgenic *A. bracteosa* plants. Transgene integration was validated through PCR while the transcripts of *rol A* and *rol C* genes were monitored by semi-quantitative RT-PCR. Transformation efficiency of 38% for *rol A* gene and 31% for *rol C* was obtained. Furthermore, a significant difference in phytochemistry and the pharmacological activities (antioxidant, antibacterial, antiproliferative and antidiabetic) was observed not only between the transgenic and control/untransformed plants but also among the transgenic lines themselves. The *rolC* transgenic lines in general showed better results compared to *rolA*. These data allow us to present a novel model for the effect of *Agrobacterium* *rol* genes on enhanced production of pharmacologically active secondary metabolites in transformed plants of *A. bracteosa*.

Keywords: Medicinal plant, *Agrobacterium tumefaciens*, Genetic transformation, *Ajuga bracteosa*, Antioxidant, Anti diabetic, Anti inflammatory, Anti bacterial

(20025) LINKAGE MAPPING OF CAROTENOID CLEAVAGE DIOXYGENASES IN LENTIL GENOME

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Plant Carotenoid Cleavage Dioxygenases (CCDs) play a crucial role in plant development and growth. They are a family of enzymes that catalyze the oxidative cleavage of carotenoids and apocarotenoids such as abscisic acid (ABA), strigolactones and other volatile compounds that provide to the aroma of flowers and fruits and color for attracting pollinators. The objective of this study was to identify and map CCDs in lentil recombinant inbred line (RIL) population (LR39). A linkage map of LR39 was consistent of 1 784 (SNPs based on DArT and CCD markers), covered a total of 4 060.6 cM with an average distance of 2.3 cM between adjacent markers and constructed 7 linkage groups representing 7 chromosomes of the lentil genome. The localization of the CsCCD4af, CsCCD4a/b-r and CCD4-P-r2 markers on the linkage map were in LG4, LG5 and LG7 at 102.5 cM, 52.6 cM and 846.7 cM, respectively. CCDs contain several highly conserved motifs. Conservation of exon-intron structure in clades of orthologous genes, support the use of gene features as sources for phylogenetic inference so that the knowledge of the genomic structure is very essential in order to characterize gene families and for the establishment of evolutionary relationships.

Keywords: Lentil, Carotenoid Cleavage Dioxygenases, Linkage map, SNP, DaRT

(20121) IMPROVEMENT OF NEW SWEET SORGHUM LINES FOR EFFECTIVE SOURCES OF BIOENERGY (BIOFUELS AND BIOMASS)

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Sweet sorghum [*Sorghum bicolor* (L.) Moench] is one of the principal sources of bioenergy and grows well in harsh environments with minimum inputs, where other crops yield poorly. Extensive efforts in crop improvement have resulted in the development of a number of cultivars with traditional breeding methods over the years. The application of modern breeding approaches; such as QTL mapping and DNA markers, helps to effective selecting and is fasten the process of identification of desirable genotypes. These effective selecting methods were used for in sweet sorghum breeding for biofuels and biomass. 551 different sorghum genotypes with 10 control cultivars were analyzed with molecular markers specific to sorghum aphid and plant height. Sweet sorghum types, aphid (*Melanaphis sacchari*) resistant and high biomass types with long plant stature were selected from molecular and field evidences conducted in upland and lowland in two consecutive years under the financial support of the TUBITAK 113O092 project. The identified genotypes with high bioenergy potential with biomass, the Brix content and the aphid resistance were crossed with their contrasting counterparts. F1s were selfed and the segregating F2 populations were created. F2 plants are now phenotyping for the bioenergy related traits and genotypic data will be produced using GBS approach.

Keywords: Aphid, DNA, Plant height

**(20214) ANTIOXIDANT, CYTOTOXIC, ANTIBIOFILM, AND ANTIMICROBIAL
ACTIVITIES OF GREEN SYNTHESIZED COPPER OXIDE (CUONP)
NANOPARTICLES**

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Advances in nanotechnology have gained momentum with the development of innovative synthesis protocols and characterization techniques. Traditionally, NPs have been synthesized by physical, chemical, and biological methods. In recent years, researchers have been interested in NP synthesis by biological methods as they are less toxic, less costly, and more environmentally compatible than physicochemical NP synthesis methods. For the preparation of CuONPs, *T. spicata* (zahter) plant extract was mixed with 1 mM CuSO₄·5H₂O solution to get a final volume of 500 ml. The mixture was left stirring for 4 hours at 80°C. The color of the reaction mixtures gradually changed during the heating process and this conversion was accepted as an indicator for the formation of CuONPs. The mixture obtained at the end of the reaction was washed with deionized water twice at 10,000 rpm and 4°C for 15 minutes and then dried at 100°C for 24 hours. The final dried powder obtained at the end of the drying process was stored at 4°C. The synthesized CuONPs were characterized by UV-vis spectroscopy, Fourier transform-infrared spectroscopy (FTIR), Zeta-sizer and Zeta-potential, Scanning electron microscopy (SEM), Energy dispersive X-ray spectroscopy (EDS), Transmission electron microscopy (TEM). The results obtained from TEM characterizations revealed that CuONPs were in the size range of 20–30 nm. In vitro susceptibility of selected gram-positive bacteria (*Bacillus cereus* and *Staphylococcus aureus*) and gram-negative bacteria (*Escherichia coli* and *Salmonella typhimurium*) to biosynthesized CuONPs were determined by disk diffusion and microdilution methods. The experimental results obtained show that biosynthesized CuONPs have antibacterial activity on gram-positive bacteria.

Keywords: Antioxidant, Cytotoxic, Antibiofilm, Antimicrobial, Copper oxide nanoparticle

(20224) UTILIZATION OF MARKER-ASSISTED SELECTION METHOD TO DEVELOP SALT TOLERANT WHEAT

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Salinity stress is one of the major threats for agricultural crops production affecting more than 20% of the arable land worldwide. Although several ions are responsible for high salinity, accumulation of sodium and chloride ions in plant tissues has a major role in developing salt stress causing reduced plant growth and development. Thus, crops with enhanced salt tolerance are required to fulfill the food requirement in the world. Wheat is the second largest cereal crop produced in the world that is consumed by a large population. However, it suffers from major production losses due to salt stress conditions. Hence, it is required to develop efficient resources of salt tolerance that can be efficiently utilized in breeding programs. Aiming this objective in a molecular breeding program, we have utilized Australian hexaploid and tetraploid wheat genotypes as donors of salt tolerance to develop Turkish salt tolerant wheat lines. *Nax1* and *Nax2* genes that are responsible for salt tolerance in Australian germplasm have been transferred using Marker-Assisted Selection (MAS) and classical breeding method. Crossed wheat material up to fourth backcross stage has been developed, that after few self-crossing cycles will be estimated for seed quality and salt tolerance level. The developed wheat lines can be further employed in wheat breeding programs as salt tolerant wheat resources.

Keywords: Backcross, Molecular breeding, Salinity stress, SSR, Wheat

(20324) COMPARATIVE STUDY OF BIOSURFACTANT PRODUCTION BY BACILLUS SP. AND PAENIBACILLUS SP. ISOLATED FROM ALGERIAN SOIL

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The production of biosurfactant (s) by two bacterial strains *Paenibacillus* sp. (1C) and *Bacillus* sp. (1J) isolated from an Algerian soil contaminated with crude oil and the comparison of the two biosurfactants produced properties were investigated.

The results show that biosurfactant production by both strains is maximal when olive oil is used as a source of carbon and energy. The maximum production is recorded after 20 h and 24 h of incubation. The two biosurfactants produced by the two strains 1C and 1J reduce the surface tension to 32.6 and 33.3 mN / m, respectively. Both biosurfactants retained their surfactant properties after exposure to elevated temperatures (70 ° C), relatively high salinities (0-20% NaCl) and a wide pH range (2-10). The critical micellar concentrations (CMC) of the biosurfactants produced by strains 1C and 1J are 0.5 and 1g / l respectively. Olive oil and sunflower oil were emulsified only by the biosurfactant produced by the strain 1J while the kerosene was emulsified by the biosurfactant produced by strain 1C. The 1C biosurfactant is more effective in solubilizing PAHs.

Keywords: Characterization, Emulsification, Bioremediation, Production

(20929) POINT MUTATIONS: CRUCIAL BIOLOGICAL KEYPOINTS, FROM ANIMAL BREEDING TO HUMAN HEALTH, BIOTECHNOLOGY AND EVOLUTION

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Single-nucleotide substitutions are an important and common mechanism for altering gene function not only for prokaryotic genomes but also for eukaryotic genomes. At the level of translation, when RNA copied from DNA is converted into a string of amino acids during protein synthesis, point mutations often manifest as functional changes in the final protein product. However, how can simple genetic modifications, which are frequently the result of mistakes made during DNA replication, be capable of creating new species or reshape their biological circumstances? The process of understanding quantitative genetic mechanisms have begun with the first geneticists in biology history, including Gregor Mendel and Hugo de Vries. Although ultimately wrong in his idea, de Vries and his theories rode high on the wave of experimentalism which was the harbinger of a new era in evolutionary theory. Nearly two centuries later, the 21st century has been formed as ‘Century of genetics’ by novel technologies and brilliant scientists. Currently, screening for known or unknown point mutations is one of the most common key methods in modern biology and is utilizable among human/animal health, animal breeding schemes and selection procedures, and evolutionary biology. Advances in our understanding of the genetic mechanisms behind carcinogenesis, disease resistance responses and behavioral psychology have enhanced the tendency towards gene mutations. On the other hand, evaluating these genomic modifications has enabled the superior phenotypes for both plant and animal sources. Current efforts have focused on enhancing single-nucleotide selectivity, including the development of digital PCR, barcode-based assays, nanopore approaches and next-generation sequencing. Plenty of room for improvement remains however, because a wide range of genetic modifications are waiting to be explained, such as non coding RNA interactions and epigenetic alterations.

Keywords: Genetic modification, Mutation, Genome, Molecular biology

(20956) MORPHOLOGICAL EVALUATION AND DNA BARCODING IN PLANTS

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Identification of plant species is very important because of the basic research in taxonomy, cataloguing hidden diversity, improving environmental monitoring, sustaining natural resources, protecting endangered species, etc. Plant species are identified using a variety of methods, including analyses of morphologic characteristics and molecular genetic variations. In spite of the effects of air and soil conditions on plant growth, plant morphology is an easy and convenient method for identifying different plant species. The classical use of morphological traits for species identification has several limitations. So, identification of species can be completed by using more reliable molecular methods such as DNA barcoding approach representing the best solution for identifying species when their morphology is of limited use by being faster and cheaper. In this study, morphological characterization and DNA barcoding analysis were performed together to identify *Colchicum* species reference to horticulture, ornamental and generation of metabolites for pharmaceutical industries. In this work, 168 *Colchicum* L. genotypes of the wide variety of 49 *Colchicum* species in Turkey 35 of which are endemic and 16 candidate *Colchicum* species were characterized with important 38 morphological traits. As a result of the morphological measurements, *Colchicum* technical certificate based on UPOV was prepared and color catalog was created. When the morphological measurement results were evaluated, it was determined that morphological characterization is inadequate for identifying of species. For this reason, *rbcL*, *matK* and *trnH-psbA* chloroplast genes were used to determine *Colchicum* species using DNA barcoding method. The discrimination power of these genes were compared to each other. As a result, it was determined that the *matK* barcode gene region was more successful than *rbcL* and *trnH-psbA* gene regions in discriminating species. In comparison morphological and DNA barcoding data obtained in this study, DNA barcoding method was found to be more successful and easier for identifying *Colchicum* species.

Keywords: Morphological characterization, DNA barcoding, *Colchicum* L.

**(21011) *IN VITRO* REGENERATION IN SELECTED *CUCURBITA* SPP.
GERMPLASM**

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The genus *Cucurbita* is an important vegetable food and crop in around the world and Turkey is the 7th biggest squash (*Cucurbita pepo* L.) producer in terms of annual production ranged 300 to 400 thousand tons. *Cucurbita* species constitutes 20% of the total vegetable production in the world and 31% of the vegetable production in Turkey. *In vitro* techniques are very helpful for acceleration of breeding studies, quick mass production, cloning and disease-free plant production.

In this study, we aimed to develop suitable protocols for direct and indirect regeneration of *Cucurbita* hybrid variety through different explant for 5 different hybrid squash lines which obtained from the Trace Agricultural Research Institute. Seeds were surface sterilized by immersion in 70% ethanol solution for 3 minutes and keeping in 15% bleaching solution (with 2-3 drop of Tween 20) for 15 minutes. Sterilized seeds were cultured on MS medium with 30 g/l sucrose. Explants were isolated from 15-21 days *in vivo* grown plants by collecting cotyledon, leaf, node, internode, shoot tip and hypocotyl explants and were prepared in sterile cabin. Inoculation of explants was made singly per culture vessel in solid MS supplemented with different concentrations and combinations of BAP (1mg/ml, 2 mg/ml, 3 mg/ml) and 30 gr/l sucrose. Cultures were assessed according to callusing, shooting and rooting. Among different concentrations, 3.0 mg/l BAP showed best response for *In vitro* regenerated shoots induction. *In vitro* regenerated shoots were rooted well in strength MS with no plant growth regulator and MS with 1 mg/l IBA and micro plants were acclimatized successfully in natural condition.

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Keywords: *In vitro* regeneration, *Cucurbita*, Explant type

(21072) BIOTECHNOLOGICAL APPROACHES FOR IMPROVEMENT THE VARIETIES OF POMEGRANATE

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The *in vitro* regeneration of pomegranate have been established basically for creating sustainable varieties in conditions of salinity of the Mirzachul Oasis in Uzbekistan. Have been used efficient methods for clonal the elite genotypes and the modern genetic methods to improvement varieties of pomegranate from cell and tissue. Regeneration from existing meristems and vegetative and reproductive pomegranate parts have been attempted with some success. Moreover, existing methods as micropropagation, organogenesis, somatic embryogenesis for genetic transformation has been slow. The method *in vitro* has opened up new vistas of breeding and management germplasm of pomegranate. In this work has been effected the regeneration cell and tissue of pomegranate.

Keywords: Pomegranate, *In vitro*, Regeneration

(21089) INDUCTION OF PARTHENOGENETIC HAPLOID EMBRYOS AND PLANTS AFTER POLLINATION BY IRRADIATED POLLEN IN SUNFLOWER

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The method of irradiated pollen induced parthenogenesis followed by in vitro culture of immature embryos as an efficient method for production of sunflower (*Helianthus annuus* L.) doubled haploids. The influence of gamma ray doses and genotypes on the induction of haploid embryos obtained by irradiated pollen technique was studied in sunflower. The female flowers were bagged before flowering to avoid to avoid undesirable pollinations. The pollen was collected from the pollen sources on alternate days and stored at 4oC till irradiation and pollen was irradiated with γ -rays at the doses of 500, 750 and 1000 Gy. Only bagged and opened female flowers were pollinated. Pollination was done by hand by brushing the stigmas with irradiated pollen, and thereafter the pollinated flowers were re-bagged to eliminate contamination by foreign pollen. All pollinations experiments were conducted in the field. Embryos were rescued from 12 to 20 day- old and cultured in magenta boxes containing solid A (Aspiroz, 1988), FM (Freyssinet, 1988) and D (Dağüstü, 2010) medium. The conditions of the experiment, best results were obtained in inactivation of the pollen with 750 and 1000 Gy. After in vitro culture, a total of 6 haploid plantlets were obtained. To determine the ploidy level of in vitro obtained from rescued embryos and subjected to ploidy analysis using flow cytometry technique. As a result of the present study, haploid embryos and haploid plants were obtained, with haploid production strongly influenced by gamma ray doses, embryo stages and genotypes.

Acknowledgements: This research has been supported by TUBITAK TOVAG (Project No: 214O274) and Marmara University Research Foundation-BAPKO (Project No: FEN-C-YLP-081117-0627).

Keywords: Sunflower, Haploid plant, Irradiated pollen, Embryo rescue

(21145) RACE EVALUATION, DISEASE RESISTANCE AND GENDER DETERMINATION IN PLANTS BY KASP GENOTYPING ASSAY

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The development of single nucleotide polymorphism (SNP)-based genotyping platforms has led to an increase in the number of protocols available for analysing the genetic variation in numerous species. Competitive allele-specific PCR (KASP) is a genotyping technology for screening of trait-specific SNP markers for plant breeding programs. One of the issues requiring marker-assisted breeding is resistance for *Plasmopara halstedii* responsible for downy mildew disease. In this study, SNP markers linked with the downy mildew resistance genes *Plarg*, *P113*, and *P18* in sunflower were analyzed via KASP. According to the allelic discrimination results, *NSA002867* and *NSA006138* markers were discriminative in all crosses for *Plarg*, *NSA000354* marker was discriminative for *P113*, and *NSA002220* and *NSA002251* markers were discriminative for *P18*. Evaluation of *Orobanche cumana* races which is holoparasitic plant called as sunflower broomrape, lead to loss of yield discount up to 100% by KASP assay has been also performed and *SNP197* marker converted from the one SSR marker (*Ocum-197*), was found as a distinctive marker for *O. Cumana* races. The dioecious character (being a male/female) affects the anatomical or structural traits of individuals like picking season or fruit size so identify the individual is very crucial for Pistacia producers. In this research, Pistacia species were analyzed with KASP technology and it was focused on gender determination based on SN). Three SNPs were converted to KASP primer according to their positions. On the result of KASP assay, 167992 (A/T) SNP discriminated the 3 female individuals of Pistacia which are *P. atlantica* Desf, *P. vera* L. and *P. terebinthus* L., 133396 (C/G) SNP primer discriminated only *P. vera* L. female and any polymorphism was not seen for SNP 176863 (A/G) position. These results were supportive to Pistacia's ZW/ZZ (female/male) sex determination system.

Acknowledgements: This research has been supported by Marmara University Research Foundation (Project No: FEN-C-YLP-090217-0049).

Keywords: Sunflower, *Orobanche cumana*, Pistacia, Race, Downy mildew, Gender determination

(21146) AN OVERVIEW OF GYNOGENETIC AND ANDROGENIC HAPLOID PLANT PRODUCTION RESPONSES OF SUNFLOWER

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Haploid production and thereby doubled haploid production to produce homozygous lines is a valuable technology in plant breeding and genetics of many species. Haploids can be mainly induced by regeneration from the male gamete or from female gamete. In situ parthenogenesis, induced by irradiated pollen, is like anther or microspore culture, one of the techniques used for haploid production. This method is commonly used in plant species in which in vitro pollen embryogenesis has not been applied successfully, and consists of rescuing immature seeds or embryos obtained through pollination with irradiated pollen. The present study, was carried out for the induction of haploid plants in sunflower through in vitro anther and microspore culture and in situ parthenogenesis by pollination with gamma-irradiated pollen treated with 500, 750 and 1000 Gy gamma ray doses followed by in vitro culture of immature embryos. The irradiation treatment does not affect the pollen's ability to germinate, grow and penetrate the embryo sac, but does disable the sperm. Thus pollination occurs without subsequent fertilization, the method is used in many species. Successful haploid induction in sunflower through in situ-induced parthenogenesis with gamma-ray irradiated pollen has been achieved but not from anther and microspore culture in this study. Haploid plants were produced in two CMS lines pollinated with 750 Gy and 1000 Gy doses of gamma radiated pollens, and one emasculated line pollinated with 1000 Gy dose of gamma radiated pollens. Ploidy analysis via both flow cytometry and chromosome counting verified that these lines were haploid. This is the first report of successful haploid lines in sunflower developed by in situ parthenogenesis followed by embryo rescue in local hybrid lines and it will further help the breeding program and genetic research of sunflower in our country.

Acknowledgements: This research has been supported by TUBITAK TOVAG (Project No: 214O274).

Keywords: Sunflower, Haploid plants, Anther and microspore culture, Irradiated pollen, Embryo rescue

(21226) EFFECT OF PH AND TEMPERATURE ON EXTRACELLULAR PRODUCTION OF RECOMBINANT MICROBIAL TRANSGLUTAMINASE IN *PICHIA PASTORIS*

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Transglutaminases catalyses the formation of an isopeptide bond between the group of g-carboxamides of glutamine residues and primary amine groups of proteins. It is widely used in different food industry such as; dairy, meat, and bakery. Transglutaminases can be obtained from plants, animal tissues, and microorganisms. However, the isolation of enzyme from these sources is time-consuming and the amount of isolated enzyme is insufficient to use in industry. To overcome these problems, transglutaminases are produced recombinantly by using different host organisms like bacteria and yeasts.

In this study, microbial transglutaminase (MTGase) enzyme was produced under the control of constitutive *GAP* promoter in methylotrophic yeast *Pichia pastoris* extracellularly. Shake flask experiments were conducted to evaluate the effect of pH (pH 5, 6, 7 and 7.5) and temperature (20°C, 25°C and 28°C) on the production of MTGase. The cultures were harvested after the clones were grown in BYED medium containing glucose for 40 hours. The supernatants were analysed by SDS-PAGE and the enzyme activity was measured. pH and temperature had very significant effect on extracellular production of MTGase. Highest enzyme activity was obtained at pH 7.5 and 20°C as 9.12 U/ml. The results show that the clones developed in this study could be used for a large-scale transglutaminase production.

Keywords: Microbial transglutaminase, *GAP* promoter, *Pichia pastoris*

(21234) INVESTIGATIONS ON TISSUE CULTURE OF SILK TREE (*ALBIZIA JULIBRISSIN* DURAZZ.)

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The silk tree (*Albizia julibrissin* Durazz.) is native to Asia and the Middle East and has been planted as an ornamental plant in Europe since the mid 18th century. It also widely planted as an ornamental plant in Turkey. Silk tree is propagated by generative and vegetative methods. Seeds of *A. julibrissin* have a seed dormancy as in many legumes. In this study, micropropagation of silk tree with the explants obtained from in vitro seedlings is aimed. To obtain sterile seedlings, seeds were sterilized with 30% commercial bleach for 15 minute and then rinsed sterile distilled water for 3 times. Seeds were treated with sulphuric acid for 15, 30, 60 or 90 minute and cultured on hormone free MS medium. Maximum germination rate (55%) and healthy seedlings occurred at 60 minutes acid treatment. Root, epicotyl, leaf and petiole segments were cultured on MS medium containing 4 different combinations of NAA and BA. The best callusing and regeneration rate (100%) obtained from root explants on medium containing 0.5 mg/l NAA and 4 mg/l BA. No regeneration was observed in leaf explants in any medium. All surviving healthy plants were acclimatized. As a result, we can say that, silk tree can be propagated rapidly and massively by using micropropagation technique.

Keywords: *In vitro*, Micropropagation, Ornamental plants, Biotechnology

(21259) DOUBLED HAPLOID PLANT REGENERATION FROM MICROSPORE CULTURES OF *BRASSICA NAPUS* L. GROWN IN GREENHOUSE CONDITIONS IN ANTALYA

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Almost all of the commercial rapeseed (*Brassica napus* L.) (*Brassicaceae*) varieties are hybrids. In hybrid rapeseed breeding, hybrids are generated from the crosses between cytoplasmic male sterile (CMS) and restorer lines, while maintainer lines are used to produce CMS lines. However, especially winter rapeseed breeding is quite difficult, laborious and time-consuming due to infertility and/or self-incompatibility, vernalization requirement and bud pollination. The only way to shorten this period by also increasing the breeding efficiency is doubled haploidy (DH) technology. Isolated microspore culture is the most suitable DH technique applied in the rapeseed. The purpose of this study is to reveal the producibility of DH restorer lines through microspore culture for a winter hybrid rapeseed breeding study initiated in greenhouse conditions in Antalya. Five genotypes were used as donor plants and their proper microspore developmental stages were determined by DAPI staining. Microspores were isolated in B5 medium supplemented with 13% (w/v) sucrose (B5-13) and cultured in NLN-13 medium. The cultures at the density of 40 000 microspores/ml were exposed to the pre-heat shock treatment at 32°C. The resulting cotyledonary embryos were transferred onto hormone-free B5-1 medium, then some of *in vitro* regenerants were cloned. The ploidy levels of acclimatized plants were determined by flow cytometer. Our results have shown that DH restorer lines can be successfully produced through microspore culture from the rapeseed plants grown in greenhouse conditions in Antalya.

Keywords: *Brassica napus*, Breeding, Embryogenesis, Haploid, Microspore culture, Rapeseed

(21300) *ANNONA CHERIMOLA*: APPLICATION OF THE *IN VIVO* AND *IN VITRO* CULTURE TO OPTIMIZE THE GERMINATION RATE

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Among the promising tropical fruit for Morocco, cherimolier or cherimoya, commonly known as "anonier" it was introduced in Morocco in 1930. Although its economic and nutritional characteristics are very interesting, it has not yet experienced all its growth in Morocco. Although hermaphrodites, the flowers of the Anonier are not autofertile because of the dichogamie (protogynie). So the manual cross-pollination is a necessity for obtaining a good yield. The cherimoya grows 4 to 5 years after planting seedling trees and after 3 to 4 years for grafted plants. The harvest is manual; the fruit is fragile; its shelf life is limited to 5 days. However, it happens to extend this preservation up to 6 weeks at 4.4 °C.

The objective of this study, is to conduct tests for optimization of the germination stage under *in vivo* and *in vitro* condition. The results obtained revealed difficulties in germination under *in vitro* culture condition. Soaking the seeds in a solution of GA3 at 1mg/l, we obtained a rate of 60 % seeding in the conditions of *in vivo* culture, compared to the control group which reached only 15%.

Keywords: *Annona cherimola*, Germination, GA3

**(18192) *IN VITRO* TUBERIZATION FOR POTATO IMPROVEMENT AFTER
GAMMA IRRADIATION**

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Potato (*Solanum tuberosum* L.) is an important vegetable and staple food worldwide and ranks fourth after maize, rice and wheat. In Morocco, it is staple food for most of the population therefore the cultivation is extensively throughout the year. However, the cultivated varieties have poor yield due to Potato virus Y and drought. *In vitro* culture of vegetatively propagated crops in combination with radiation induced mutation has proven to be a valuable method to broaden genetic variability. Mutation breeding aims to improve these traits in favoured the most cultivated variety “Kondor”.

Prior to mutation breeding, radio-sensitivity tests need to be performed to determine the optimal dose treatment for mutation induction. Since potato is a vegetatively propagated crop, and a tuber producer crop, the micro-tuberization strategies were adopted: 1) irradiation of *in vitro* cutting and immediate tuberization; and 2) tuberization of *in vitro* cuttings and irradiation of micro-tubers.

Radio-sensitivity tests showed varied responses in two treatments with respect to GR50 and LD50 (doses required for mutation induction). The micro-tubers were more resistant to gamma irradiation compared to the cutting tuberization. In addition, the efficiency of the two strategies is being assessed on mutant population level in field conditions.

Keywords: Radio-sensitivity test, Optimal dose, Gamma irradiation, Micro-tubers, Mutation induction

(18736) GLUCOSE OXYDASE OF *ASPERGILLUS NIGER*

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Biotechnology, which consists of exploiting the potential of microorganisms, animal and plant cells and the subcellular fractions derived from them, has revolutionized entire economic sectors. This work consists of a preliminary study for the production of glucose oxydase from a local *Aspergillus niger* isolated at the Microbiology laboratory of the University of Constantine. At first, we studied the production and localization of glucose oxydase, at this level the fermentations are carried out in test tubes of 2.5 cm diameter and the growth times fixed at 2,3,4 and 5 days. Subsequently, we moved to Erlenmeyer cultures to study the influence of agitation, aeration and the middle on extracellular glucose oxydase activity. The results of the glucose oxydase activity obtained made it possible to deduce that the strain used is a glucose oxydase producing strain with, however, an extracellular activity which seems more important. These results showed a certain relation between the production of the enzyme and the morphology of *Aspergillus niger*. The extracellular glucose oxydase activity increases with the stirring speed. This influence is limited by the fragility of the mycelium. It is concluded that the production of extracellular glucose oxydase increases with increasing aeration and agitation, with however a limit. For industrial purposes, it is important to decrease the time of culture by increasing the stirring speed.

Keywords: Glucose oxydase, *Aspergillus niger*, Aeration, Agitation.

(18777) THE DIFFERENT NUTRITIONAL CHARACTERISTICS OF ARGANIA SPINOSA EMBRYO AND ENDOSPERM OIL

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The argan tree (*Argania spinosa* L. Skeels) is endemic to Morocco and Algeria. The natural argan forest is exploited by local people for many uses, including the production of oil, which is extracted from the seeds. The argan 'kernel' is always processed as a whole. Using flow cytometry, we have shown that the seed of the argan tree consists of two well-developed tissues, the endosperm and the embryo. Because these latter are of apparent equal contribution to the seed mass, the separate determination of their lipid composition is of crucial importance to understand their respective contribution to argan oil characteristics. The two tissues were analyzed. Their respective mass, oil content, fatty acid, sterol, triterpene alcohol and tocopherol composition. Our study shows that the embryo and the endosperm contribute equally to seed oil yield. Considerable differences in fatty acid composition were observed between the two tissues. In particular, the endosperm 18:2 percentages were two-fold higher than that of the embryo. The tocopherol content of the endosperm was also markedly higher than that of the embryo. In contrast, both tissues had similar sterol and triterpene alcohol contents and compositions. One practical application of this result could be the production of argan endosperm oil, which would be richer in tocopherols than the oil extracted from whole kernels.

Keywords: Argan, Embryo, Endosperm, Tocopherol, 18:2

(18804) CHICKPEA CALLUS HISTOLOGY INOCULATED WITH *ASCOCHYTA RABIEI* BLIGHT CAUSAL AGENT SPORES

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This research aim is to study the interaction between *Ascochyta rabiei* as a pathogen and its host, established through *in vitro* tissue culture using as a pathosystem chickpea *Cicer arietinum* callus inoculated with *Ascochyta rabiei* spores. A resistant chickpea genotype INRA 199 and a local cultivar: "Zouaoui", were used.

Murashige and Skoog, (1962) medium supplemented with 0.5 mg/l of Naphthalene Acetic Acid (NAA) and 1 mg/l of Benzyl Amino Purine (BAP) was used for the production of calluses taken as host. Samples were collected after 12 h, 7 and 14 days. The histological study of calli inoculated with *Ascochyta rabiei* spore suspension compared to the control showed two different reactions. In INRA199, the pathogen proliferation was slow and limited by the formation of an area where the cells accumulate phenolic compounds whereas in the cultivar Zouaoui the pathogen rapidly colonized the calli intercellular space and the number of formed pycnidia were high.

Keywords: *Cicer arietinum*, Pathosystem, *In vitro* culture, Chickpea blight

(18805) SUPERCRITICAL CO₂ AND SUB-CRITICAL WATER EXTRACTS OF ALGERIAN *INULA VISCOSA* LEAVES: CHEMICAL COMPOSITION

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Inula Viscosa has been used from ancient times as a remedy in traditional medicine, since this plant is a rich source of bioactive agent responsible to treat many illnesses. In this work, we have attempted to employ two high pressures technologies to collect the oily extracts from the Algerian *Inula Viscosa* leaves: The supercritical CO₂ extraction and the subcritical water extraction. The use of supercritical fluid extraction with carbon dioxide as solvent has gained much attention since it is an environmentally-friendly process and its effectiveness to obtain high final quality in short time. The subcritical water (hot pressurized liquid water) can be favored due to its selectivity for a variety of polar or non-polar organic compounds from many different matrices. The corresponding extracts were analyzed using GC-MS Method. Analysis showed some important differences in the quantitative and qualitative composition. The supercritical CO₂ Algerian *Inula Viscosa* leaves extract is dominated by high level of Tomentosin which is an important agent having a high bioactivity. Indeed, the efficiency of SCCO₂ extraction in Tomentosin was significantly higher than this of SBCW extraction.

Keywords: SC-CO₂ extraction, SBCW extraction, *Inula Viscosa*

(18820) BIOCHEMICAL RESPONSES OF TREE VIGNA SPECIES TO SALT STRESS *IN VITRO*

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Salinity is a major abiotic factor limiting plant development and crop production. The effect of salinity on biochemical profile of three *Vigna* species (*Vigna radiata*, *Vigna mungo* and *Vigna unguiculata*) *in vitro* was studied. The hypocotyl explants measuring 0.5 cm in length are taken from three day germinated seeds on MG medium (MS medium supplemented with 3 mg/l BAP) then cultured on M3 medium (MS medium supplemented with 0.5 mg/l ANA and 2.5 mg/l BAP). The callus aged one month was transferred to the medium M3 supplemented with different concentrations of NaCl (0, 50, 100 et 200 mM/l). After one month of culture, several assays are realized (assay of polyphenols, flavonoids, total soluble proteins, total soluble sugars and proline).

The polyphenols, flavonoids, proteins, sugars and proline content is influenced by the concentration of NaCl added in the culture medium. The increase in NaCl concentration induces an increase in the production of polyphenols, flavonoids and proline in three *Vigna* species. The protein and sugar content produced from the callus varies according to the concentration of NaCl added to the culture medium in three species tested.

Keywords: *Vigna radiata*, *Vigna mungo*, *Vigna unguiculata*, Hypocotyl, Callus, NaCl

(18833) CHEMICAL COMPOSITION OF FRESH LEAVES ESSENTIAL OILS FROM ALGERIAN MELISSA OFFICINALIS L. EXTRACTED BY MICROWAVE ASSISTED HYDRODISTILLATION AND HYDRODISTILLATION

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Microwave assisted hydrodistillation (MWHD) and hydrodistillation (HD) were carried out for the analysis of volatile components in fresh leaves of *Melissa officinalis* L. In Algeria, this plant is known locally by the names touroudjan, trandjan or bararendjabouya. It is considered as an important medicinal plant largely used in traditional medicine, for the treatment of headaches, indigestion, colic, nervousness, cardiac failure and depression. Fresh leaves were distilled using a microwave oven modified to fit a “Dry dist” apparatus and hydrodistillation using a modified Clevenger type apparatus. All the essential oils were analyzed by GC-FID and GC/MS. A total of 62 compounds, constituting 92.17% of the oil were identified in the oil obtained by HD, whereas 54 compounds representing 94.76% of the oil were characterized in the MWHD oil. MWHD-distilled oil is richer in lightly oxygenated monoterpenes (83.14%) than HD oil (69.81%). Whereas, the HD oil has a higher amount of hydrocarbon sesquiterpenes (11.70%) than MWHD (4.03%).

Keywords: Essential oil composition, GC, GC/MS, *Lamiaceae*, *Melissa officinalis*

(18840) STUDY OF THERMAL STRESS IN *ENTEROCOCCUS*

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Enterococci have important implications in the dairy industry. They play an acknowledged role in the development of sensory characteristics during ripening of many cheeses and have been also used as components of cheese starter cultures. The technological application of enterocins, shown to be produced during cheese manufacture, led to propose enterococci as adjunct starter or protective cultures in cheeses. These strains should resist to adverse conditions encountered in industrial processes, for example during starter handling and storage (freeze-drying, freezing); to which they respond by activating adaptive mechanisms which in turn affect their survival and technological performances.

We studied the effect of thermal stress on the viability of ten strains of *Enterococcus* isolated from different sources and identified with the VITEK system, the viability of the strains is affected differently by this stress and the CFU number is lower when the intensity of stress was increase.

We have found that the two strains LF4 and CHM17 isolated from breast milk and camel milk respectively are the most resistant to extreme thermal stress (-20°C and 65°C), while the rest of the strains show a very high mortality (90% mortality) at these temperatures. The mortality rate is variable according to the strains for the temperatures of 10°C to 45°C. The results obtained allow us to note that the lethality was determined at 75° C for the majority of strains.

The analysis of intracellular proteins by SDS-PAGE electrophoresis, whose profiles are processed by Image J® software, reveal the appearance of proteins involved in the mechanism of fight against this stress, and also causes the disappearance of other proteins under intense stress conditions.

Keywords: Thermal stress, Viability, CFU, *Enterococcus*, SDS PAGE, Image J®

(18858) PRODUCTION AND VALORIZATION OF A BIOPOLYMER WITH A SEED COATING NATURE

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Exopolysaccharides (EPS) produced by lactic acid bacteria (LAB) have gained increasing attention as valuable compounds because of their potential applications as viscosifying, stabilizing, emulsifying, sweetening, gelling and water-binding agent in the food as well as in the non-food industries, increasing the possibility to replace or reduce the use of external hydrocolloids. For this purpose, the use of a ruthenium red medium revealed the production of exopolysaccharides by *Leuconostoc*'s strains, which were first identified by using genus-specific primers and amplifying a DNA fragment of 1200 bp. 16S rDNA gene sequencing was used to identify species level of these strains. A total of 3 strains were identified as *Leuconostoc citreum* and *Leuconostoc mesenteroides*. In addition, for EPS production and preparation, a selective sucrose medium has been used and shows a highly viscous growth. Other work, including precipitation, EPS hydrolysis, and total sugar determination by the phenol sulfuric acid method were determined. The results showed that the production of EPS varied from 666,1 mg/l to 1254 mg/l for the highest production for *Leuconostoc mesenteroides* LGM-L14 strain and the apparent viscosity ranged from 201 to 347 centipoise (cP). Moreover, Componential analysis of hydrolyzed EPS by thin layer chromatography indicated that it is a dextran, consisting of glucose monomer. Investigations carried out on the structural characterization of these polymers by FTIR, and NMR (H1 and C13) analysis confirmed that it is α (1, 6) dextran with a low percentage of α branching (1, 3). The isolated strains of *Leuconostoc* sp. are a potent producer of dextran, which find its applications in various areas; including food, pharmaceutical, agricultural industries such as coating seeds and medicine.

Keywords: Biopolymer, DNA, *Leuconostoc*, Rheological, Dextran

(18861) MILK PROTEIN HYDROLYSIS BY PROTEOLYTIC *LACTOBACILLUS* STRAINS

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Milk is an excellent source of highly valuable proteins (caseins and whey proteins). The hydrolysis of milk proteins during fermentation by lactic acid bacteria contributes to the properties of the fermented products. Indeed, proteolytic activity is very important characteristic of lactic bacteria, allow them to liberate essential growth amino acids from the protein substrates such as milk and can lead to the generation of techno functional peptides acting on the organoleptic qualities of the product and / or biological active peptides.

In the study, we examined proteolytic activity of two selected lactobacilli strains grown in reconstituted skim milk (RSM). These strains were able to grow in non-enriched skim milk by weakly acidifying milk (from pH 6,8 to pH 5,2) at 37°C during 48h to 72h and showed ability to hydrolyze the milk proteins. The results demonstrated the correlation between the growth of the strains in the milk and the proteolysis and the proteolytic activity varied among the strains. Both strains produce proteases in the growth medium. The hydrolysis of milk proteins by extracellular proteases was followed using electrophoresis SDS-PAGE method. The proteolysis profile revealed that proteases are mainly active on caseins than whey proteins. Caseins are hydrolyzed at 30°C after 24 h, the β lactoglobuline is weakly hydrolyzed while proteases are inactive on α lactalbumine.

The obtained results suggested that the *Lactobacilli* strains studied have selection criteria for technological applications and can lead to produce bioactive compounds during milk fermentation.

Keywords: *Lactobacillus*, Proteolytic activity, Extracellular proteases, Milk proteins

(18931) IDENTIFICATION AND EVALUATION OF GENETIC RESOURCES OF THE *PISUM* GENUS BY BIOCHEMICAL MARKERS

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In this work we sought to study the identification and the evaluation of genetic resources in a legume, which is peas foraging.

The genetic diversity of plant species has been generated over time under the combined pressure of nature and man since the beginning of domestication. The conservation of genetic diversity inevitably involves its evaluation and the search for tools that can translate it as faithfully as possible. This study evaluated the genetic diversity of some varieties of cultivated pea (*Pisum sativum*).

It is the diversity of proteins and isoenzymes as well as the use of these genetic markers in varietal identification that are sought after. The mono-dimensional electrophoresis on polyacrylamide gel in the presence of Sodium Dodecyl Sulfate (SDS-PAGE), gives a good resolution of the total, alcohol-soluble and soluble proteins.

The gels obtained show a large polymorphism in the samples studied, and these results can be used as a genetic fingerprint to better clarify and deepen further research.

The study of the enzymatic polymorphism (Glutamate Oxaloacetate Transaminase "GOT system" and Esterase) has shown the existence of a very interesting intra and interspecific variability.

This variability expressed also at the individual level is probably of genetic origin. The resemblance indices, calculated from the dichotomous tables, and the dendrograms made it possible to estimate the degree of kinship of the varieties. They have more or less low values, which indicates a great dissimilarity between the proteins of the varieties studied. The polymorphism of these proteins and isoenzymes is used as a genetic fingerprint to evaluate the diversity of this collection.

This work made it possible to evaluate the genetic diversity of the pea. Recall that it is the diversity of proteins and isoenzymes and the use of these genetic markers in varietal identification that are sought. The use of the SDS-PAGE technique gives a good resolution of the total proteins, soluble and alcohol-soluble.

All the proteins had a rather large polymorphism, we detected bands of different mobilities.

Further studies on other enzyme systems and other varieties of the genus *Pisum* could better assess and evaluate genetic variability. Molecular biology techniques such as micro-satellites, RFLP's and SNP's are additional and advantageous ways to study the genetic characteristics of populations and the evolution of species.

Keywords: Legumes, *Pisum*, Varieties, Genetic fingerprint, Proteins, Electrophoresis

(19013) ANTI-INFLAMMATORY AND ANTI-MICROBIAL ACTIVITY OF FATTY OILS OF PUMPKIN SEEDS (*CUCURBITA MOSCHATA*) HARVESTED IN BOUIRA (ALGERIA)

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This work focuses on the extraction the physic-chemical characterization chromatographic analysis and study of biological activities antimicrobial and anti inflammatory pumpkin seeds *Cucurbita moschata* Family cucurbitaceae harvested area Lakhdaria in Bouira. The extraction of fatty substance by two methods with cold maceration and soxhlet it gives the best yield (41.61%), the study of physic- chemical parameters has a refractive index (1.48%) acid value (0.56%) and iodine (180.6g /100g). And chromatographic analysis revealed that oil rich of linoleic acid (44.1%) oleic acid (36.6%) palmitic acid (12.3%) and stearic acid (5.3%). The latter shows no reduction of edema, however, the reference shows the maximum reduction of edema. The results show an increase in the weight of the left paws relative to the right paws in all the batches tested, which means the presence of inflammation, the signs of the latter clearly appearing in the left paw of the control compared to the result obtained after treatment. by fatty oil (HG). The results showed the biological activities oil from pumpkin seeds has advantage anti-inflammatory activity, and the activities of these seeds have little antimicrobial activity and antifungal activity. It would be interesting to continue extend and deepen the study of the effectiveness of extracts of *Cucurbita moschata* on the different organs of the plant to determine the compound which are at the origin of the biological activities.

Keywords: Seed squash, *Cucurbita moschata*, Fatty substance, Anti-inflammatory and antimicrobial

(19017) EVALUATION OF THE ANTIRADICAL POTENTIAL OF GARLIC BY THREE DIFFERENT ANTIOXIDANT MECHANISMS

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The suitability of three different methods such as: RP (Power Reduction), DPPH free radical scavenging method, and cationic scavenging method. ABTS • + was assessed to determine the antioxidant activities of various garlic samples. Allium plants were chosen because of their high antioxidant potential.

Furthermore, the water/methanol ratio of (50/50) and the pure methanol showed significant antiradical activities for the three tests used with the lowest inhibitory concentration (IC50) values. In addition, the activities of these extracts were found to be superior where the limit closes to those of the reference antioxidants such as vitamin C or trolox.

Also, it has been found that the values of DPPH IC50 and ABTS IC50 are strongly correlated with flavonoids content relative to total polyphenols in particular, for the DPPH test. In addition, a low correlation was observed between RP0.5 and the phenol content. The evaluation of these three variables and their correlations can serve as an index to effectively measure the antioxidant activity of Allium extracts.

Keywords: Garlic, Phenolic compounds, Antioxidant activity, Mecanisme

(19020) EFFECT OF THE ESSENTIAL OIL OF *MENTHA PIPERITA* AND *THYMUS NUMIDICUS* ON THE GROWTH OF *FUSARIUM* SP.

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The polluting substances are of industrial or agricultural origin, at the level of the different ecosystems. These are the effects of synthetic products on the fauna and flora we are interested in. So our use of biopesticides based on plant extracts, namely essential oils as a natural insecticide is our concern. These bioactive substances or molecules are of great ecological interest because they are very harmful to the ecosystem.

The objective of this study is the use of the essential oil of *Mentha peperita* harvested from the area of Larabaa (Blida) and *Thymus nomidicus* recovered from the area of Bouira as biofungicides with respect to a fungal strain isolated and identified from the leaves of the zucchini crop in Boudouaou -El Bahri. The isolated species belongs to the genus *Fusarium*. The extraction method is the hydraudistillation which allowed us to have yields of essential oil of 2.02% for *M. peperita* and 1.2% for *T. numidicus*.

The study of the antifungal activity of these two oils tested was carried out by the direct contact method.

The evaluation of the antifungal effect of these two extracts shows that the essential oil of *T. numidicus* has an inhibitory capacity on mycelial growth with an inhibition rate between 40 and 50%. While the oil of *M. piperita* is not active on the *Fusarium* sp with a level of inhibition between 20 and 25%.

Fusarium sp also shows an allergy to *T. numidicus* oil, while this plant pathogen is resistant to *M. piperita* oil.

Keywords: *Thymus numidicus*, *Mentha piperita*, *Fusarium* sp, Extracts essential oil

**(19023) INFLUENCE ON GERMINATION AND GROWTH OF TOMATO
(*LYCOPERSICON ESCULENTUM*) PLANTS BY INOCULATION WITH
STREPTOMYCES SP.: POSSIBLE ROLE OF PLANT GROWTH PROMOTION**

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Many rhizospheric bacteria can stimulate plant growth and can thus be used as biofertilizers. Biofertilizers bacteria can stimulate plant growth via different direct and indirect mechanisms. Several plants growth-promoting rhizobacteria (PGPR) have been used worldwide for many years as biofertilizers, contributing to increasing crop yields and soil fertility and hence having the potential to contribute to more sustainable agriculture and forestry. In this study, we have been interested at the first time to the ability of nine strains of the genus *Streptomyces* isolated from rhizospheric soils of Laghouat region localized in the Sahara of Algeria to produce metabolites of agricultural benefit (phosphate solubilization, production of AIA, HCN, NH₃ and antifungal substances). Secondly the beneficial effect of inoculating plants with these strains by an *in vivo* assay on a variety of tomato (*Lycopersicon esculentum*) seeds.

All the strains studied showed a significant metabolic diversity as PGPR. All strains solubilize the phosphate on the solid medium NPRIP containing Ca₃(PO₄)₂ as the sole source of phosphate. The S10 and S15 strains are the most efficient solubilizing, with 12.5 and 11 cm diameter halos respectively. They are also capable of producing the AIA with a maximum of 13µg/ml, observed with the strain S2. 100% of *Streptomyces* synthesize NH₃. 44.44% have a cyanogen activity while the antifungal activity *in vitro* was negative for all strains. The PGP *Streptomyces* effect on tomato seeds was marked by a significant stimulation of germination and growth of tomato seedling. Strains S1, S2, S11 showed the highest degree of growth promotion (root part 11, 8.5 and 8 cm) respectively compared to the control (4 cm). The combination of these strains *in vivo* causes a strong protection of tomato seeds against the four plant pathogenic fungi *Fusarium*, *Alternaria*, *Aspergillus niger*, *Aspergillus flavus*.

Keywords: *Streptomyces*, PGPR, Phosphate solubilization, Indole acetic acid, Cyanhydric acid, Ammonia, Antifungal

(19024) BIOACTIVE MOLECULES SECRETED BY NEW *STREPTOMYCES* SP. STRAIN ISOLATED FROM SALT LAKE EZZEMOUL (ALGERIA)

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Since the introduction of antimicrobials in the therapeutic arsenal of infectious diseases, microorganisms developed means of defense which confers them resistance to antibacterial. The antibiotic resistances at therapeutic doses appear more or less rapidly according to the chemical complexity of the antibiotics and genetic patrimony of the bacteria. Currently whatever the antibiotic used, there are strains of several bacterial species resistant to them. In front of such emerging of antimicrobial resistance, the discovery of new compounds is therefore a necessity. Analysis of fermentation products of new bacterial or fungal species isolated of few or no explored ecosystems is a path that can fill that need. Many organisms are able to develop molecules with antimicrobial activity can be exploited among which we mention: microorganisms, plants, lichens and insects ... This work fits into these lines and regards the production of bioactive compounds by an actinomycete isolated from soil of the Ezemoul Sebkhia of Ain M'lila and belonging to a rare genus *Streptomyces*. This strain is a new species in the light of the morphological, physiological, chemotaxonomic characteristics and molecular (16S rDNA sequencing). The production of antibiotic substances was investigated using six culture media. The best antibiotic production was obtained on Bennett medium. Chloroform and isoamyl acetate were found to be the best solvents for the extraction of bioactive molecules produced by the strain. The largest zone of inhibition was obtained with the test-bacteria *Staphylococcus aureus* Mu 50 by discs impregnated with the chloroformic extract. The UV-Visible spectrum shows no peaks characteristic of polyenes, suggested a non-polyenic nature of the active molecules produced by the strain. The chromatographic profile (HPLC) corresponding to an injection of 25 µl gives for the active extract of the strain SS4 three peaks, revealed that the crude extract contained five actives compounds.

Keywords: Antibiotics, Actinomycetes, *Streptomyces*

(19033) STUDY OF SOME BENEFICIAL BACTERIAL ISOLATES: THEIR POTENTIAL AS ANTAGONISTS AND BIOCONTROL AGENTS

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The biological control of phytopathogenic diseases and other pests, by the introduction of microorganisms beneficial of the rhizosphere has been proposed as an alternative to chemical control.

The objective of our work is to determine the elements on which this interaction between antagonistic bacteria and bioaggressors of cultures such as secondary metabolites, is based. The present work involves the identification of a collection of strains belonging to the *Bacillus* genus with the demonstration of the synthesis of secondary metabolites such as enzymes with hydrolytic effect and the characterization of their bioactive molecules as well as the study of their effect antagonist against *Verticillium dahliae* agent of the verticilliose and insecticidal effect against *Galleria mellonella*. These isolats are from the rhizosphere soil of three cultivated plants (Nèfle, Barley and potato) in the region of Boumerdes (North Algeria).

The macroscopic and microscopic identification tests allowed us to select strains with characteristics identical to those of *Bacillus* sp. The identification was confirmed by molecular study by sequencing of the 16S RNA.

The study of the different enzymes (amylase, cellulase, chitinase, caseinase) show for the majority of strains a good production, which explains their efficiency against *Verticillium dahliae*. In fact, the biological control tests carried out in vitro by these bacterial strains have shown that it is possible to limit the incidence of *V. dahliae* and that the use of this biological treatment makes it possible to maintain the disease at an acceptable threshold. These strains can therefore have a role in antagonism and plant biostimulation.

Concerning the insecticidal effect of bacteria on the larvae of the wax moth *Galleria mellonella*, very significant results are achieved with 100% mortality recorded 4 days after treatment at the high dose (1.107 ufc/ml).

It appears that these isolates could find their place in biotechnological applications aimed at improving yields and preserving the environment for sustainable development.

Keywords: Antagonism, *Bacillus* sp., Bioactive molecule, *Galleria mellonella*, Rhizosphere, *Verticillium*

(19034) EVALUATION OF THE EFFECT OF THE HYDRIC STRESS ON SOME BIOCHEMICAL PARAMETERS OF TWO VARIETIES OF PEA (*PISUM SATIVUM* L.)

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The aim of the present study was to evaluate the effect of the hydric stress and the variability of the answer of two varieties of pea (*Pisum sativum* L.): Onward and Utrillo. The work is based on the analysis of some biochemical parameters (content in chlorophyll a, b, a+b and carotenoid, dosage of soluble sugars and proline) under two levels of irrigation: with hydric deficit (put under stress) and without hydric deficit.

The results show that the behavior of both varieties tested against the stress is different. The variety Onward tends to fight against the hydric insufficiency by decreasing its concentration in chlorophyll a and by increasing its chlorophyll total a+b. The variety Utrillo adopts an inverse strategy as regards to the chlorophyll a and no significant effect is exercised concerning the content in carotenoids for both varieties.

Besides, the biochemical answer of both varieties is also estimated through the process of accumulation of some osmoticums inside their cells among which the proline and the sugars. The obtained results show that the diversity of behavior of both varieties concerning the accumulation of soluble sugars, where the content raised by this organic compound is only recorded at the variety Utrillo. Concerning to the synthesis and the accumulation of the proline, both studied varieties used the same strategy of tolerance in the hydric stress with a remarkable varietal difference between the not put under stress control.

This experience allowed to demonstrate that both varieties use the same strategy to tolerate the hydric stress but the answer to this issue depends on the factor variety.

Keywords: Hydric stress, *Pisum sativum* L., Variety, Biochemical parameters.

**(19174) *IN VITRO* TUBERIZATION FOR POTATO IMPROVEMENT AFTER
GAMMA IRRADIATION**

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Potato (*Solanum tuberosum* L.) is an important vegetable and staple food worldwide and ranks fourth after maize, rice and wheat. In Morocco, it is staple food for most of the population therefore the cultivation is extensively throughout the year. However, the cultivated varieties have poor yield due to Potato virus Y and drought. *In vitro* culture of vegetatively propagated crops in combination with radiation induced mutation has proven to be a valuable method to broaden genetic variability. Mutation breeding aims to improve these traits in favoured the most cultivated variety “Kondor”.

Prior to mutation breeding, radio-sensitivity tests need to be performed to determine the optimal dose treatment for mutation induction. Since potato is a vegetatively propagated crop, and a tuber producer crop, the micro-tuberization strategies were adopted: 1) irradiation of *in vitro* cutting and immediate tuberization; and 2) tuberization of *in vitro* cuttings and irradiation of micro-tubers.

Radio-sensitivity tests showed varied responses in two treatments with respect to GR50 and LD50 (doses required for mutation induction). The micro-tubers were more resistant to gamma irradiation compared to the cutting tuberization. In addition, the efficiency of the two strategies is being assessed on mutant population level in field conditions.

Keywords: Radio-sensitivity test, Optimal dose, Gamma irradiation, Micro-tubers, Mutation induction

(19191) MOLECULAR APPROACHES TO DROUGHT TOLERANCE IN WHEAT

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Drought stress has been witnessed in many parts of the world. In many irrigated regions also, shortage of water supply allows only limited irrigation. These conditions have an adverse effect on the productivity of many crops including cereals such as wheat. It is known that most of the traits associated with improved performance under water-limited environments are complex and polygenic in nature. Fortunately, significant genetic variation for traits associated with drought tolerance seems to be available in wheat germplasm. Therefore, it will be useful to deploy marker-assisted selection (MAS) involving the available QTLs for drought-related traits for the development of pre-bred wheat material with improved tolerance to drought stress.

A number of studies involving QTL interval mapping and genome wide association studies (GWAS) have already been conducted in wheat. As a result, a large number of QTLs have already been reported for several traits related to drought tolerance. These traits include coleoptile length, CID or $\Delta^{13}C$, water-soluble carbohydrates (WSC), root system, grain yield, and related traits recorded under water stress. Some QTLs for each of these individual traits contribute as much as >20% phenotypic variation. A number of these QTLs are also now being deployed for developing drought-tolerant wheat cultivars. However, there are also some restraints, for example, there is a challenge for QTL detection, e.g. interaction between genotype and environment, inconsistent repeatability, numerous genes that regulate yield, and use of wrong populations for mapping.

In this brief review, an effort has been made to review the literature on advances and limitation factors of QTL mapping for drought tolerance in wheat.

Keywords: Molecular, Improvement, Wheat, Drought, Resistance

(19593) EVALUATION OF IN VITRO ANTIOXIDANT CAPACITIES OF AQUEOUS AND HYDRO-ORGANIC EXTRACTS FROM ORIGANUM MAJORANA

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Origanum majorana is one such herb which has been used in traditional medicine for its therapeutic biological properties. In the present study, antioxidants properties of *Origanum majorana* were explored. Acetone, ethanol (70%) and water were used to extract bioactive compounds from aerial part of *Origanum majorana* by maceration and decoction, respectively. The antioxidant properties of the Aerial part extracts were evaluated using 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical-scavenging and β -carotene/linoleic acid model systems. Total polyphenol contents were determined using Folin-Ciocalteu's reagent. Total flavonoid contents were estimated using 2% alumine chloride. The hydro-ethanolic extract of *Origanum majorana* showed the highest yield of extraction (18.01%). The results showed that the hydro-acetonic extract contains high amount of total polyphenols and flavonoids (335.218 \pm 0.867 μ g gallic acid equivalent/g dry extract; 27.6 \pm 0.56 μ g quercetin equivalent/g dry extract) respectively. The hydro-ethanolic and aqueous extracts possess an important DPPH effect with an IC50 value of 24.55 \pm 0.0008 μ g/ml, 26.06 \pm 0.0006 μ g/ml respectively. Using the β -carotene/linoleic acid bleaching assay, the aqueous extract had the highest antioxidant activity with 61.478 \pm 1.415 % inhibition. These results indicate that aerial part of *Origanum majorana* has potent antioxidant activities, and may prove to be of potential health benefit in several diseases where antioxidant activity is suitable.

Keywords: *Origanum majorana*, Extracts, Antioxidant activity, Polyphenols, DPPH, Lipid peroxidation

(19903) EFFECT OF QUINOA PLANT ON METASTASIS AND ION CHANNELS OF RAT BRAIN CANCER GLIOMA CELL LINES

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In this study, the effects of the quinoa plant on the rat brain cancer glioma cell line were examined.

Rat C6 glioma cell lines were propagated in Dulbecco's Minimum Essential Medium (DMEM) supplemented with HAMS F 12 (1:1) and 2% FBS. After cell proliferation, Quinoa plant was added into the cells and incubated at 37°C for 24 and 48 h in 5% CO₂. The viability of the cells was determined by using MTT method (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide). IC₅₀ concentration was determined using the statistic software SPSS (Probit analysis). The effect of the quinoa plant on the invasiveness of the C6 cells was analyzed by the wound test and the changes in the ion concentrations in the cells were determined with ICP-MS.

As a result of MTT test, the IC₅₀ value of the quinoa plant was determined as 50 ppb. Wound test showed that use of quinoa plant (50 ppb) inhibited metastasis in the glioma cells while the cell proliferation in the control group was continued. Furthermore, calcium, sodium and potassium ions, which are regulators of cell cycle, were found in higher concentrations in that the untreated control cells than quinoa treated cells.

As a result of this study, ICP-MS analysis showed that higher levels of calcium, sodium, and potassium ions were found in the untreated cells, whereas the application of the quinoa plant decreased these values. This change in ion channels was thought to be associated with the invasion of glioma cells, and it was determined that quinoa had significant anticancer effects.

Keywords: Quinoa, Cancer, Invasion, Glioma, Ion channels

(19965) VIP3 PROTEINS WITH HIGH INSECTICIDAL EFFETCS

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Vegetative insecticidal proteins (Vip) are produced during the vegetative growth stage of *Bacillus thuringiensis* (Bt). To characterize *vip3* gene of two local *B. thuringiensis kurstaki* isolates we performed the screening by PCR, the cloning and the characterization of *vip3* genes of local Bt isolates (BnBt, MnD) which isolated and characterized in previous studies. The insecticidal activity of partly purified Vip3 proteins of BnBt and MnD isolates against the *Spodoptera littoralis* larvae was determined. As a result of the PCR analysis and the cloning, Vip3 genes in MnD and BnBt isolates were determined. Vip3 proteins of BnBt and MnD isolates by obtained from culture supernatants by ion exchange chromatography were subjected to SDS-PAGE analysis and a 90 kDa band of proteins were determined. The obtained proteins were used against the larvae of *S. littoralis* and according to results, the insecticidal activity of the Vip3 proteins of both BnBt and MnD was observed 86.66% and 83.33%, respectively. Lethal concentrations (LC50) of BnBt and MnD were determined as 41.860 ng and 55.154 ng, respectively. These results suggest Vip3 gene may be effective for preventing resistance in various insect-pest species. This protein may be used to develop a biopesticide.

Keywords: *Bacillus thuringiensis kurstaki*, Insecticidal activity, *Spodoptera littoralis*, Vip3 gene

(19981) "STATISTICAL OPTIMIZATION OF THERMOSTABLE KERATINASE PRODUCTION FROM BACILLUS ATROPHAEUS STRAIN BN2"

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Bacillus atrophaeus produces Keratinase with potential application in the leather industry, since this enzyme does not damage bovine collagen. “keratinases” have an advantage over normal proteases and have replaced them in many industrial applications, such as nitrogenous fertilizer production from keratinous waste, animal feed, leather industry and detergent additive application. The use of chicken feathers as fermentation substrate is very interesting since this low cost waste material serves dual purposes: to reduce the fermentation cost for enzyme production as well as reducing the environmental waste load.

In this study, fifteen keratinolytic strains were isolated and selected from chicken feathers and poultry soil (Kabylia region) on solid feather meal medium, the test of keratinolytic activity on liquid medium allowed to select the isolate BN2 which is the most producing of keratinases (100 U/ml) after 48 hours of fermentation. The 16S rDNA sequence results suggest that this isolate may be assigned as *Bacillus atrophaeus* strain BN2. The better production of keratinases was obtained when the strain grown at an optimum temperature of 40 °C, an optimum pH of 8 and an optimal concentration of NaCl of 2%.

The keratinase activity remained thermostable at 50°C for 15 h and have an optimum temperature of 50°C, these enzymes have a potential application in biotechnological processes, like horn degradation, which require thermostability at 50 °C for long periods, the keratinase showed a high specificity towards feathers’s keratin (117 U/ml) compared to azure keratin (48 U/ml).

Statistical screening of medium constituents and the physical factors affecting keratinase yield of the isolate was optimized by RSM using central composite design, namely 15 experimental runs with 4 independent variables: concentration of feather chicken meal, pH, inoculum rate and temperature of the keratinase production. The central composite design showed 1.5 fold increased keratinase production compared to “one factor at a time approach”. The thermostable keratinase showed a thermostable property with potentially applicable nature at industrial scale. This statistical approach established a contribution in enzyme production from the isolate by optimizing independent factors and represents a first reference on the enhanced production of thermostable keratinase from *Bacillus atrophaeus*.

Keywords: *Bacillus atrophaeus* BN2, Statistical optimization, Response surface methodology, Keratinase production

(20076) CHARACTERIZATION OF A NEW ISOLATE OF MALACOSOMA NEUSTRIA NUCLEOPOLYHEDROVIRUS (MANENPV) FROM TURKEY AND ITS VIRULENCE ON DIFFERENT HOST

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The lackey moth, *Malacosoma neustria* (Linnaeus, 1758), a worldwide pest, causes extensive economic losses on especially hazelnut, prunus, quercus, populus and salix trees. In this study, a local nucleopolyhedrovirus (NPV) was isolated from the larvae of *M. neustria* in north-east of Turkey. It was named as ManeNPV-T4. Its morphological characteristics were determined by electron microscopy, and it was shown that polyhedra contained several virions with multiple nucleocapsids packaged within a single viral envelop. Partial *lef-8* sequence of viral DNA was amplified by PCR and sequenced. The phylogenetic analysis of the *lef-8* sequence of ManeNPV-T4 showed its relation to the other NPVs from *Malacosoma* species. A bioassay was conducted against 3th instar *M. neustria* larvae with virus concentrations ranging from 10³ to 10⁷ PIB /ml. Mortality values ranged between 48 and 100% according to the PIB concentration. Based on bioassays, LC50 value of new isolate were calculated as 0.78 × 10³ OBs/ml. Additionally, virus mortality was determined against *Spodoptera exigua*, *Lymantria dispar*, *Hyphantria cunea* and *Helicoverpa armigera* insects. LC50 values, obtained with these hosts, varied between 5.2 × 10⁹ OBs /ml and 1.2 × 10⁸ OBs/ml Consequently, ManeNPV appears to be a promising microbial control agent for biocontrol of *M. neustria*.

Keywords: *Malacosoma neustria*, Nucleopolyhedrovirus, Characterization, Different hosts

(20077) BIODEGREDATION OF BLACK LIQOUR WITH LACCASE AND FERULOYL ESTERASE

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The paper and pulp industry is one of the world's most polluting industries. By-products that are released during paper production are highly toxic and pose a threat to the environment. These BOD and COD high wastes prevent pollution in the aquatic environment and prevent sun rays from reaching the aquatic life.

In recent years, the biodegradation studies using enzymes obtained from microorganisms have gained importance in order to reduce the harmful effects of these wastes on the environment. When the literature is examined, among these enzymes, especially the laccase enzyme is striking. However, in order for this enzyme to be used effectively, mediators are needed which must be added to the medium. The hydroxycinnamic acids present in the plant cell wall is one of these mediator systems and released by the ferulic acid esterase enzyme to separate it from the polysaccharides it is bound to. In this study, both ferulic acid esterase and laccase enzymes (in combination) were used and detoxification and decolorization capacities for black liquor were determined. Ferulic acid esterase-laccase combination reduced COD by 22.9%. According to these results, it has been determined that products obtained with the ferulic acid esterase enzyme can be used effectively as natural laccase mediator. Thus, the cost from synthetic intermediates can be reduced.

Keywords: Biodegradation, Ferulic acid esterase, Laccase

(20079) PAPER PULP WASTEWATER BIODEGRADATION WITH *BACILLUS MEGATERIUM*

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Paper pulp is chemically fairly processed and optimized for long-term minimal waste. Black liquor is one of the examples of these waste materials. Black liquor contains lignin, byproducts which are the result of degradation of organic acids and polysaccharides and it affects aquatic flora and fauna negatively.

Microorganisms (bacteria and fungi) are nature's original recyclers. They convert toxic organic compounds into harmless products. In addition, intensive studies have been undertaken to explore microbial diversity, particularly by investigating organisms capable of degrading large-scale pollutants in highly contaminated contaminant fields. White rot fungi have been found to have good ligninolytic activity because they produce enzymes such as lignin peroxidase, manganese peroxidase and laccase. However, the use of fungal systems for wastewater treatment has been problematic because they have a narrow pH range (pH 4-5) to grow and produce enzymes. Generally, the high pH (pH 7-9) values in the paper and pulp industry must be reduced prior to fungal application. This adds additional cost to processing. Unlike fungi, bacteria can grow in neutral and alkaline pH environments and can be used in the decolorization of paper and pulp wastewater without any pH adjustment. Bacterial laccases are highly active and more stable at high temperature and pH values.

In this study, the capacity of *Bacillus megaterium* bacteria, which has laccase activity, to detoxify and decolorize black liquor has been determined. *Bacillus megaterium* reduced COD value by 55.19%. So, in the light of obtained data, it was observed that this bacterium could be of sufficient capacity for industrial use.

Keywords: *Bacillus megaterium*, COD, Waste water

(20149) MICROPROPAGATION OF *ANGELONIA ANGUSTIFOLIA* FROM STEM EXPLANTS

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The results of this study have established a micropropagation system for *Angelonia angustifolia* that will provide plant material of high-quality *Angelonia* plants for the commercial market.

A study has been made of the possibility of introducing *Angelonia angustifolia* in culture by stem cuttings.

Different variants of sterilization have been tested. The most successful was Var.2 /HgCl₂ 0.1% -5 min/. The highest % sterile explants were reported - 84.7% and the highest % of live plants was 65.8%

Nodal explants of *Angelonia angustifolia* were cultured on MS basal medium and induced to form shoots when supplemented with different concentrations BAP (0.1mg/l, 0.3mg/l and 0.5mg/l). MS medium supplemented with BAP (0.5mg/l) was the most effective, providing high multiplication factor (1.40) associated with a high number of shoots per explant (3,0±0,3 shoots/explant).

Plants were rooted on MS medium without plant growth regulators or in combination with different concentrations of IBA (0.1mg/l, 0.3mg/l and 0.5mg/l). The highest % (90 %) rooted plants were obtained when using IBA-0.1mg/l.

All plantlets survived acclimatization producing healthy plants in the greenhouse.

Keywords: Micropropagation, *Angelonia angustifolia*, Stem explants

(20177) EFFECT OF REPLACING PORK BACK FAT AND MEAT WITH BEEF FAT, OLIVE OIL AND BEEF MEAT ON THE CHEMICAL AND SENSORIAL QUALITY OF THE CHORIZO

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Chorizo is a traditional Spanish sausage made from pork chopped and spiced. It is a variety of sausages famous for its fruity taste and spicy, as well as for its rusty color. In order to introduce this type of merchandise market in the Islamic countries, this work aims to substitute the meat and pork back fat by components acceptable by the Islamic community in other words, `HALAL` components which are the meat of beef and their fats or olive oil as a substitute for pork fat.

This work is a contribution to the evaluation of compositional parameters such as moisture, fat, mineral, carbohydrate and protein, pH, content calorific value, TBA value and sensory analysis. The moisture and mineral content of fat sausages substituted by olive oil show an increase over control ($P < 0.05$), while their fat content and their calorific content show a significant decrease ($P < 0.05$).

On the other side, the substituted sausages by the beef fat revealing percentages close to those of the control, an increase of the pH and the value of TBA are revealed for the two types of sausages by comparing with the control. Sensory analyzes show that the flavor and texture of the two substitute's sausages are almost identical to those of control.

Keywords: Back fat pork, Beef meat, Chorizo, Olive oil, Pork meat

(20288) MARGOTIA GUMMIFERA ESSENTIAL OIL: VOLATILE COMPOUNDS AND ITS ANTIMICROBIAL ACTIVITY

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To highlight the different virtues of medicinal and aromatic plants, the essential oil (EO) of one species belonging to the Apiaceae family was chosen to evaluate its antimicrobial activity. The EO of *Margotia gummifera* (*M. gummifera*) aerial parts was obtained using a Clevenger type apparatus. The *in vitro* antimicrobial activity was realized against 5 bacterial strains (*Escherichia coli* ATCC25922, *Pseudomonas aeruginosa* ATCC27853, *Salmonella typhimurium* ATCC19430, *Staphylococcus aureus* ATCC25923 and *Bacillus subtilis* ATCC6633) and 3 fungi (*Candida albicans* ATCC1024, *Aspergillus flavus* NRRL391 and *Aspergillus niger* 2CA936) by the agar diffusion method at various dilutions of the oil. The gentamicin, Nystatin and divident were used as positive control for bacteria and fungi, respectively. The yield of *M. gummifera* EO was 1.76%. The antimicrobial effect of the EO varied depending on the germs and the dilutions used but generally, it was moderately effective on the bacteria tested. *E. coli* and *S. typhimurium* strains were gave an inhibition diameter equal to 9 and 10.5±0.5mm, respectively at 1/2 dilution, however the other bacteria were resistant. Also, the oil of *M. gummifera* had a good activity against all fungi tested at 48 hours, 15 and 16mm. In conclusion, *M. gummifera* EO have an antimicrobial activity which was reported for the first time in this study.

Keywords: Medicinal plants, *Margotia gummifera*, *Apiaceae*, Essential oil, Antimicrobial activity

**(20884) CHEMICAL COMPOSITION OF POLYPHENOLIC EXTRACT FROM
THYMUS FONTANESII AND ITS INFLUENCE ON EXOPOLYSACCHARIDES
PRODUCTION OF LACTIC ACID BACTERIA**

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Exopolysaccharides (EPS) of generally recognized as safe (GRAS) lactic acid bacteria (LAB) have received great interests as food-grade ingredients. The purpose of our work is to find treatment that can improve the metabolic activity-exopolysaccharides production of lactic acid bacteria. The polyphenolic content of *Thymus fontanesii* was used, it was extracted in water by sonication, with a yield of 41.5% and 156 mg equivalent of gallic acid/g. Gallic, caffeic, syringic, vullinic and carboxylic acids, catechin, rutin and epicatechin were the important phenolic molecules identified in the extract. Then, two dairy industrial strains *Streptococcus thermophilus* and *Lactobacillus bulgaricus* were treated with the extract at different concentrations (50, 100, 200 and 250 µl/ml) to improve exopolysaccharides production under the optimal fermentation conditions previously determined. Polyphenolic extract of *Thymus fontanesii* had optimal concentration (100 µg/ml) effect on *S. thermophilus* ($p \leq 0.05$). It yielded 826 mg/l compared to control 219 mg/l. Besides, polyphenols, which improve the *Lactobacillus bulgaricus* growth, had no significant effect on its yield exopolysaccharides production. In this respect, these molecules, which have gained attention not only for their technological properties but also have thought to have prebiotic potentials, can be used as an alternative or additive agents to improve the probiotic bacteria activity (proliferation and colonization).

Keywords: Exopolysaccharides, Polyphenols, *Lactobacillus bulgaricus*, *S. thermophilus*, *Thymus fontanesii*

(20989) DETERMINATION OF THE PHYSIOLOGICAL EFFECT AND BIOACTIVITY OF ENDOPHYTIC BACTERIA ISOLATED FROM ROOT TISSUES OF ZEA MAYS

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Endophytic bacteria are microorganisms that live in host plants, but do not cause diseases to the hosts (Duan et al. 2013).

The aim of the study is to determine the phytohormonal effect of five endophytic bacterial strains, which belong to the genera of *Bacillus* and were isolated from the root of *Zea mays*.

These bacterial strains are known to synthesize biologically active substances (BAS) like phytohormones, which support plant growth and development; increase the productivity of photosynthesis; enhance enzymatic processes in plants and improve water regime; increase the activity of other microorganisms in soil; act as antagonists of phytopathogenic microorganisms and increase the protective ability of plants.

For the purpose of the study, a chromatographic analysis was performed and the endophytic bacterial strains *Bacillus megaterium* and *Bacillus amyloliquefaciens* were used in a hypocotyl test with *Lettuce Batavia* var. *Noisette*. High Performance Liquid Chromatography tandem mass spectrometry was used for the chromatographic analysis.

From the results it can be concluded that *Bacillus megaterium* strains produce secondary metabolites as plant cytokinin trans-zeatin (938.932 ng/ml), Gibberellin A3 (60.065 ng/ml). Other endophytic bacterial strains *Bacillus amyloliquefaciens*, also produce plant hormones trans-zeatin (520.422 ng/ml), but does not synthesize the hormone Gibberellin A3 as it synthesizes Flurprimidol, which is synthetic inhibitor of Gibberellic acid. The high concentration of phytohormones indicates the potential of the studied strains to help germination, increase plant leaf area, stem height and influence the overall development of plants.

The experiment with *Lettuce batavia* confirms that the treatment has a certain effect on the development of the test plants, which is specific for the individual strain and concentration.

Keywords: Physiological effect, Endophytic bacteria, Phytohormones, Secondary metabolites

(21085) MALDI TOF MS TECHNIQUE IN THE IDENTIFICATION OF MICROORGANISMS

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The great diversity of microorganisms and successful discoveries in many disciplines (physics, biochemistry, microbiology, medicine) have led to the development and advancement of methods specific to microorganization. Phenotypic characterization of microorganisms is originally performed using macroscopic/microscopy methods, culture-based methods and physiological / biochemical methods. Even if some of these methods are still used today due to economic or regulatory reasons, nowadays new methods of identification are based on cellular, immunological and molecular techniques. Among these, tools based on nucleic acid analysis (eg, G/C ratio, enzyme restriction use, PCR-based techniques, hybridization-based techniques, isothermal amplification, sequence based techniques) are widely used in the World.

Traditionally used phenotypic identification requires a long time. When identification is made using automated systems, determinations such as gram positive / negative must be made in advance. Because genotypic identification is limited to certain microorganisms, and because of its disadvantages such as being expensive. Because of having a wider identification scale instead of these methods, shorter analysis time and lower cost (matrix assisted laser desorption /ionisation) MALDI (time flight) TOF (mass spectrometry) MS other conventional methods for microorganism identification have begun to take place. By the MALDI-TOF MS method, it is based on the principle of extracting protein profiles by ionizing the protein structures of microorganisms and then passing them electrically. The obtained protein profiles are identified by comparing the data in the library of the system. The microorganism proteins based on the identification are mainly composed of ribosomal proteins that are less affected by environmental conditions.

It also becomes a preferred method because MALDI TOF MS is able to successfully identify species, genus and even subspecies of microorganism isolates. With this technology, various microorganisms obtained from various sources have been successfully identified.

Keywords: Identification, MALDI TOF MS, Protein profile

(21216) EXPRESSION PATTERN OF PHCAMTA1 GENE UNDER DROUGHT STRESS IN COMMON BEAN GENOTYPES

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Drought stress causes a significant reduction in crop performance in terms of plant survival, economic yield or crop quality in many regions of the world. Like other environmental stresses, drought stress *activates various* physiological, biochemical and molecular responses in plants. These responses depend on the plant genotype, severity and duration of stress, age and development stage. Calmodulin-binding transcription activators (*CAMTAs*) belong to a conserved transcription factor (TF) family that possesses multiple functional domains and play an important role in response to the various biotic and abiotic stresses in plants. In the present study, expression pattern of the *PhCAMTA* gene in the drought tolerant and sensitive genotypes were investigated under water deficit. For this, the genotypes were subjected to different irrigation regimes (control: irrigated every 7 days, moderate drought stress: irrigated every 10 days, and severe stress: irrigated every 14 days), Total RNA was extracted and gene expression was evaluated using quantitative real-time PCR technique. Relative gene expression values were calculated using the $2^{-\Delta\Delta C_t}$ method. The results indicated that moderate drought stress strongly induced expression of *phCAMTA1* by over 30 fold in tolerant bean genotype (line 8) compared to control condition. Under severe water stress, the level of this gene decreased by 0.08 fold. The expression of *phCAMTA1* gene in sensitive genotype (Cos16) had the same pattern of line 8, but the maximum expression of this gene was observed under the moderate water deficit by a 3-fold increase. Under severe stress, only 2 fold increases were observed for *phCAMTA1* expression in sensitive plants. In the other hands, drought stress differential expression of *phCAMTA1* were observed in the sensitive and tolerant genotypes and greater accumulations of *phCAMTA1* in tolerant bean plant were observed which not correlate to drought stress levels. These results indicated that *phCAMTA1* increases at moderate water deficit to overcome the effect of stressed condition. However, the investigated genotypes showed reduction in *phCAMTA1* levels under severe stress conditions, perhaps due to the loss of protein synthesis or degradation of proteins. This result revealed that *phCAMTA1* plays a positive role in plant resistance to drought stress.

Keywords: Calmodulin-binding transcription activators, Drought stress, *Phaseolus vulgaris*, quantitative RT-PCR

(21218) DEVELOPMENT OF ASSISTED REPRODUCTION TECHNOLOGIES FOR THE ENDANGERED ALBANIAN WATER FROG (*PELOPHYLAX SHQIPERICUS*): FROM GAMETE RELEASE TO FROGLETS

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Pelophylax shqipericus, the Albanian water frog is a species of true frog (family *Ranidae*) and is native to Albania and Montenegro. The Albanian water frog is an endangered species and its populations are currently in decline. Significant threats to its habitat are presented by pollution and by drainage of wetlands, and a more direct threat is the aggressive collection of the species for commercial purposes. Assisted Reproductive Technologies (ART) encompasses a range of techniques that manipulate reproductive endocrinology, gametes, and embryos, for the purpose of enhancing reproductive success. The purpose of this study is the stabilization of the protocol to be used in the *in-vitro* fertilization technique in Albanian water frog and the recognition of some of the factors that play a crucial role in the success of this technique. This study investigates the activation and *in-vitro* fertilization of eggs of *Pelophylax shqipericus* obtained by hormonally induced ovulation. Also, here we show that the egg jelly structure is one of the major factors in the achievement of fertilization in the water frog *P. shqipericus*. Definition of morphology, sperm concentration of Albanian water frog by hormone induction and fertilization of eggs through the technique of direct spray with the extract of macerated testicles increases significantly the success of the technique. Finally, applied *in vitro* fertilization protocol showed a 27% success rate. By using the *in-vitro* fertilization technique (IVF), we can give a contribution to the protection and conservation of the critically endangered Albanian water frog. The transfer of this technology and production of endangered amphibians is a conservation milestone that can be applied to other captive breeding programs.

Keywords: *Pelophylax shqipericus*, *in vitro* fertilization, Assisted reproductive technologies, Conservation

**(21233) RESEARCH ON THE TESTING OF AN ASSORTMENT OF
BIOSTIMULATING PRODUCTS FOR THE TREATMENT OF RAPE SEEDS**

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In the context of the continuous increase of the planet's population and energy requirements, amid the increase in pollution, the attention of specialists turned to less polluting technologies, and one of the solutions is the use of biofuels. Thus, rapeseed has gained increasing importance through the potential it has. In Romania, the area planted with rapeseed has increased from 100ha in 1962 to 527,000 ha in 2010, and worldwide it has grown from about 6mil ha in 1962 to over 36mil ha in 2014. Worldwide Romania is ranked 10th as a surface planted with rape after Canada, China, India, Australia. In these circumstances, it is more and prominent problem of increasing production levels in order to ensure adequate food, according to the application of modern agriculture, high performance, it is considered mandatory treatment of seeds with fungicides, insecticides or mixtures fungicides by all farmers, this measure having a decisive role in the system of prevention and control of numerous pathogens and pests that settle in crops with their establishment. Starting from the biostimulatory effect of chelates with microelements and amino acids, they were formulated and tested in laboratory experiments based on: hydrolyzed keratin from wool with chelates of Zn, Mn, Cu, Mg and Mo. To test the impact of biostimulator treatments on rape seeds, a bifactorial experience was performed where Factor A tested the product with 5 graduations, and Factor B seed immersion time in products tested with 4 graduations. Research has shown that all tested products have influenced favorable germination parameters that have been monitored by increasing the germination rate, germination rate, increasing the average number of germinated seeds per day, reducing the average germination time, and biometric parameters plant growth, average length of roots and shoots, average daily length of plantlets and roots. The products tested did not show phytotoxic effects on rapeseed plants.

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Keywords: Rape seed, Biostimulators, Seed treatment, Biometrical parameter, Phytotoxicity

(21245) COMPARING OF SUBMERGED (SMF) AND SOLID-SUBSTRATE FERMENTATION (SSF) FOR PRODUCTION OF EXTRACELLULAR LIPASE BY SOME MICROFUNGI

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In this study, the ability of extracellular lipase production of ten microfungi species (*Aspergillus flavus*, *Cladosporium cladosporioides*, *Gibberella fujikuroi*, *Fusarium poae*, *Penicillium aurantiogriseum*, *P. citrinum*, *P. solitum*, *Rhizopus arrhizus*, *Scopulariopsis sp.* And *Trichoderma sp.*) belonging to 8 genus in the collection of Trakya University Arda Vocational School was investigated. The aim of the study is to compare extracellular lipase production of microfungus strains in these two methods using solid state fermentation (SSF) and submerged state fermentation (SmF) methods. Maximum lipase activity was obtained from SSF culture medium containing *Rhizopus arrhizus* strain at 0.924 U / ml. This was followed by *Penicillium citrinum*, *Fusarium poae*, *P. aurantiogriseum*, *P. solitum*, *Trichoderma sp.*, *Aspergillus flavus* and *Cladosporium cladosporioides*. Enzyme production from two microfungi species has not been achieved. The lipase activity of the *A. flavus* strain, which has high activity in the SmF medium, was found to be 64 times less than that of the same strain in the SSF medium. It was observed that SSF method for microfungi screened in this study is a more successful method for lipase production than SMF.

Keywords: Fungal lipase, Solid state fermentation (SSF), Submerged state fermentation (SmF)

(21262) CALLUS STIMULATION FROM MATURE EMBRYOS OF *BELLEVALIA EDIRNENSIS*

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Critically endangered *Bellevalia edirnenensis* is an endemic plant of Balkans that spreads European Turkey and NE Greece. Serious threats (over grazing, agricultural operations, water and soil contamination) exist in the habitat of *B. edirnenensis* that spreads in a limited area and has low individual number. The purpose of this research is to obtain callus cultures using the embryos of the matured seeds of *B. edirnenensis*. In this context the seeds are collected in June 2017 and kept in a cool and dry conditions. The seeds are shaken in 30% commercial bleach for 20 minutes and then soaked in 70% ethanol for 5 minutes. After that the seeds that taken to sterile dH₂O to swell are kept in water for 72 hours. Embryos are isolated and transferred to Murashige and Skoog (MS) nutrition medium including 2,4-D and/or NAA in different concentration. 30 g/l sucrose and 7 g/l agar added to these medium. The petries are foiled and subjected to 4°C for one week, and then incubated in 12/12 h light/dark photoperiod in 25±2°C. After the 6th month the best callus formation is observed (40%) in the embryos that transferred to MS medium including 1 mg/l NAA. Callus are transferred into the accretion environment (1mg/L NAA+4mg/l BA), and large number of callus cultures obtained from the growing calluses. The obtained calluses are thought to be useful in propagation, determining secondary metabolite content and in vitro conservation by creating continuous callus cultures.

Keywords: Endemic, Critically endangered, *in vitro*, Conservation

**(21296) LARGE SCALE PRODUCTION OF RECOMBINANT MICROBIAL
TRANSGLUTAMINASE IN *PICHIA PASTORIS***

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Microbial transglutaminase (MTGase) is composed of 331 aminoacids with a molecular weight of 37.842 kDa. It is a monomeric simple protein and has three potential glycosylation sites (-Thr-Xxx-Asn). MTGase catalyze the formation of γ -glutamyl-lysine crosslinks among proteins or peptides, which could improve the gel strength of dairy products such as cheese and yoghurt. In this study, to produce large scale recombinant MTGase; *Streptomyces mobaraensis* transglutaminase gene was cloned into the pGAPZ α A vector and pGAPZ α -proMTG expression vector was obtained. Single copy expression cassette containing clone was selected according to southern blot analysis result. Fermentation of this clone was performed in a 5l bioreactor for 79 hours and samples were taken throughout the fermentation process. The samples were analyzed by SDS-PAGE and MTGase enzyme activity measurement by spectrophotometrically. In a bioreactor, the production of MTGase enzyme was achieved and the enzyme activity was found as 37640 U/l at pH 7 and temperature 20 °C. These results indicate that *P. pastoris* expression system is very suitable for recombinant MTGase production. As a conclusion, the clone was constructed to produce huge amount of recombinant MTGase for commercial purposes.

Acknowledgements: This project was funded Akdeniz University Scientific Research Projects Coordination Unit (Project number FBA-2017-2474)

Keywords: Recombinant protein expression, *Pichia pastoris*, MTGase, Bioreactor

(17974) GENOME WIDE ASSOCIATION MAPPING FOR DROUGHT TOLERANCE IN HEXAPLOID WHEAT GERMLASM AT PRE-ANTHESIS STAGE

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Genome-wide association studies (GWAS) were undertaken to detect SNP markers related with physiological, biochemical and yield traits in 92 genotypes from Pakistani historical set and synthetic hexaploid wheat collections. The field experiment was conducted during 2013 2015 seasons under controlled and drought conditions. Genotyping was done using high-density Illumina iSelect 15K SNP (single nucleotide polymorphism) array, and finally 7739 high quality SNPs were used in mapping. Population structure analysis identified two subpopulations (K=2) that were representative of synthetic hexaploids and local cultivars of Pakistan. LD decay was observed at 11cM genetic distance for whole genome collection using 700 unlinked markers. In total, there were 1174 MTAs recorded for biochemical parameters at P<0.001 in stressed conditions using MLM approach, among them, 647 MTAs were flanked for more then one trait. Genome A, B and D contributed 431, 553 and 190 MTAs respectively. Highest number of MTAs was found on chromosome 2B. For yield components, out of 1035 markers, 274 were confined to a single trait. Highest number of MTAs were located on genome B (534), followed by genome A (406) and D (95). Trait wise number of MTAs were for PH (84), TGW(138), SL(106), GPS(147), DH(118), DPM(97), GL(143), PUB(89), Habit(52) and LR(61). Based upon this research, future breeding strategies can be conceived to start marker assisted breeding for manipulating favorable alleles of SNPs associated with drought related attributes to increase grain yield in stressed environments.

Keywords: Drought, Bread Wheat, Single nucleotide polymorphism, Linkage disequilibrium

(19326) PRODUCTION AND CHARACTERIZATION OF BIODIESEL FROM SCENEDESMUS QUADRICAUDA (TURPIN) ISOLATED FROM KANYE WATER RESERVOIR IN KANO STATE, NIGERIA.

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In this study, *Snedesmus quadricauda* was isolated from Kanye water reservoir in Kano State, Nigeria, and cultivated in the laboratory for the extraction and characterization of biodiesel. The algal culture was scaled up in a photobioreactor which was designed to provide optimum light intensity and aeration. The scale up yielded up to 1000ml of the alga. The oil obtained from the harvested biomass was subjected to esterification and purification processes. Characterization of the oil using FT-IR revealed the presence of ester, alkane and aliphatic functional groups. The oil was further subjected to ASTM standard test and was found to have essential energy properties which fall within set limits: Saponification value (193mh KOH/gm), Acid value (0.6mg KOH/gm), free fatty acid (0.3%), Molecular weight (168), Refractive index (1.5%), pH (7.2) and Iodine value (83mg KOH/gm). The findings of this investigation indicate that *S. quadricauda* biomass is a good feed stock for biodiesel production which has the potential to provide a better alternative to fossil fuels when produced on a large scale.

Keywords: *S. quadricauda*, Biodiesel, Kanye water reservoir

**(19394) A STUDY OF NATURAL WOODY PLANTS OF FOREST IN ŞANLIURFA –
DETERMINATION OF DETECTION AND LANDSCAPE VALUES OF PARKS AND
GARDEN PLANTS**

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This research material are ornament plants used by Şanlıurfa Metropolitan Municipality Directorate of Park and Gardens and by County Municipalities in park and medians; and woody plants grown naturally in Şanlıurfa forests. Within the context of the study, majority of the epitomic gardens and parks located in Şanlıurfa provincial border are visited and in these gardens and parks 83 species and 103 taxons belonged to 38 families are determined. These determined species are examined in four groups called broad-leafed plants, shrubs and bushes, coniferous trees and climbing plants. Besides, 19 species and 24 taxons belonged to 13 families grown naturally in Şanlıurfa forests are determined. Consequently, the biggest urban green areas (parks and medians), natural forest lands and their present and botanical states are examined. The most important park-garden plants found and widely used; *Parthenocissus quinquefolia* (L.) Planch. (Amerikan Sarmaşığı), *Washingtonia filifera* H. Wendl. (Palmiye), *Laurus nobilis* L. (Defne), *Melia azedarach* L. (Tespah Ağacı), *Salix alba* L. (Ak Söğüt), *Albizia julibrissin* Durazz. (Gülibrişim Akasya), *Elaeagnus angustifolia* L. (İğde), *Cercis siliquastrum* L. (Erguvan), *Salix babylonica* L. (Salkım Söğüt), *Sophora japonica* L. (Sofora), *Populus alba* L. (Ak Kavak), *Pyracantha coccinea* M. Roem. (Ateş Dikeni), *Prunus cerasifera* Ehrh. 'Pissardii' (Süs Eriği). The most common of the natural woody plants are; *Pistacia khinjuk* Stocks (Bittim), *Pistacia terebinthus* L. subsp. *palaestina* (Boiss.) Engler (Yabani Fıstık, Menengiç), *Rhus coriaria* L. (Sumak), *Quercus brantii* Lindley (İran Palamut Meşesi), *Ficus carica* L. subsp. *carica* (All.) Schinz & Thell. (İncir), *Punica granatum* L. (Nar), *Amygdalus communis* L. (Badem), *Rosa canina* L. (Kuşburnu) ve *Cerasus mahaleb* (Mahlep).

Keywords: Şanlıurfa, Park, Gardens, Landscape, Forests

(19470) AN ETNO-BOTANIC RESEARCH ON MEDICAL AND AROMATIC PLANTS SOLD IN HERBALISTS IN CEYLANPINAR (ŞANLIURFA)

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In this study was carried out at the An Etno-Botanic Research on Medical And Aromatic plants sold in Herbalists In Ceylanpınar town, depending on the Sanliurfa province, Situated in Turkey's Southeast Anatolia. This investigation was carried out between the years 2014 and 2015 to determine the ethnobotany of Ceylanpınar town. Local and scientific names of plants sold in herbalists has been determined. Moreover, provides information about the usage patterns of these plants. The research material consists of plant samples found in Aktars, who sell herbal plants in the Ceylanpınar town, province of Şanlıurfa. The data has been recorded both verbally and in writing. As a result of this study, about 50 plant species with medical and aromatic character and common use among the population have been identified. Some plant species that are widely used in the district include: *Nigella sativa*, *Laurus nobilis*, *Cerasus mahaleb*, *Coriandrum sativum*, *Foeniculum vulgare*, *Rosmarinus officinalis* and *Thymbra spicata*.

Keywords: Aktar, Ceylanpınar, Ethnobotanical, Medical and aromatic Plants, Şanlıurfa,

(19889) HYDROPRIMING: MELATONIN ON COMBINED STRESS DEFENSE

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Mock-up experimental designs are more realistic to study real effects of stresses simultaneously occur in nature rather than single stress types given the climate change and shifting seasonal cycles which makes the desired quality and quantity of agricultural production a challenging scenario. In this study, salt and heat stress the two most widespread environmental stresses in the world were simultaneously applied and the hypothesis that whether melatonin (N acetyl 5 methoxy tryptamine) hormone could be used to alleviate the combined stress damage via hydropriming were investigated in plants. Melatonin (mel) appeared to be important in reducing the negative effects of the combination of these two stresses by campaigning the stability of leaf photochemistry demonstrated by higher photochemical efficiency of photosystem II and entirety of photosynthetic pigments along with lesser cell membrane oxidation in maize seedlings at early vegetative stage. Mel hydropriming resulted in more efficient protective effects on oxidative damage induced by combined stress in maize seedlings than that of each individual stress.

Keywords: Simultaneous, Salt and heat stress, Melatonin, Hydropriming

**(19954) SCREENING OUT OF ANATOMICAL INVESTIGATIONS MADE ON
CUCURBITACEAE FAMILY**

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The family *Cucurbitaceae* is originated from tropics within many cultivated species consists of pumpkin and related vegetables. In the different parts of plants anatomy, the basic anatomical tissues are epidermis/peridermis, cortex, collenchyma, sclerenchyma, chlorenchyma, and vascular bundles. The latter mostly bicollateral and arranged in two circles. In stem anatomy, primary fibro-vascular are arranged in the outer and the inner. Each bundle is with well-developed xylem. Xylem and phloem often become dissected by the formation of secondary rays produced by the fascicular cambium. The number of vascular bundles varies from four to ten in tendril anatomy. Leaves are usually dorsiventral and more rarely isobilateral. Cystoliths are commonly present at the basis of the leaf hairs in numerous genera and species of the family. Along with this study, anatomical studies of root, stem, tendril, petiole, leaf and fruit stalk are screened and the knowledge about the anatomical properties of the family are settled up.

Keywords: *Cucurbitaceae*, Anatomy, Fibro-vascular bundles

(20080) MOLECULAR PHYLOGENETICS COUPLED WITH MORPHOLOGICAL ASSESSMENT OF SOME MUSHROOM FORMING FUNGI OF THE TEMPERATE HABITATS OF SWAT VALLEY, PAKISTAN

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Swat valley is the floristically rich mountain ecosystem of the eastern Hindu Kush series of Pakistan that is sometimes referred to as Swat Himalayas. The valley provides enormous opportunities for socioeconomic development through multiple uses of the biodiversity. The ecosystem services provided are also significant. District Swat lies adjacent to the intersection of the world-famous mountain ranges viz. Himalaya, Hindu Kush and Karakoram, which support diverse forest types. We report the first comprehensive account of basidiomycota of the area, particularly the mushroom forming fungi. These were studied morphologically and molecularly. Many interesting taxa are reported by applying; 1) Phylogenetic analyses based on nrDNA ITS sequences, 2) Scanning Electron Microscopy (SEM), and 3) morphological assessment. Phylogenetic reconstruction resolved the taxonomic placement of many questionable taxa. SEM provided a more in-depth insight into the form and extent of spore ornamentation. Ectomycorrhizal fungi such as those in the Russulaceae (*Russula sichuanensis*), Inocybaceae (*Inocybe rimosa*), Amanitaceae (*Amanita flavipes*) and Hymenogastraceae (*Hebeloma theobrominum*) are described in this study.

Keywords: Swat, Mushrooms, Molecular Phylogenetics, SEM

**(20873) DETERMINATION OF PHYTOTOXIC RESPONSES IN TOBACCO
(*NICOTIANA TABACUM* L.) EXPOSED TO HERBICIDE AND INSECTICIDE
STRESSES**

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Plants are exposed to various stress factors in their natural environment that causes physiological and biochemical damage on the product quality. Pesticide stress is one of the most experienced abiotic stress factors. In this study the effect of herbicide and insecticide stress were tested simultaneously and in a separate manner on the tobacco plant. With this aim different doses of herbicide and insecticide were applied on the tobacco plants and collected leaves were tested for their total chlorophyll, carotenoid and malondialdehyde content as well as antioxidant enzyme activity. According to the findings stress applied groups has shown that chlorophyll content has decreased, malondialdehyde content has increased where antioxidant enzyme activity changes. These changes were more remarkable for the herbicide and herbicide+insecticide group.

Keywords: Herbicide, Insecticide, *Nicotiana tabacum*, Antioxidant

**(21037) SUAEDATA-SALSOLETUM-PETROSIMONIOSUM FORMATION AT THE
DESERT VEGETATION OF MIL STEPPE OF AZERBAIJAN**

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In our days environmental protection, as well as rational usage of phytocenoses or plant cover at natural winter pastures has a great importance.

Characteristic formations found at desert and semidesert vegetation types of Mil steppe of Azerbaijan are differ from each other on phytocenological structure, species content, productivity, fodder capacity.

Herbariums which collected from plant cover were systematized and identified based on new taxons on “Flora of Azerbaijan”, species names were given on S.K. Cherepanov, V.C. Hajiyev and T.E. Gasimova.

At desert type vegetation of researched area *Suaedaeta-Salsoletum-Petrosimoniosum*, *Salsoleta-Artemisietum-Petrosimoniosum*, *Salicornietum-Petrosimoniosum*, *Tamarixeta-Artemisietum-Petrosimoniosum* and *Salsoleta-Petrosimonietum-Aeluropusosum* formations are found at saline and alkaline meadow-grey soils. At the same time *Artemisietum-Salsoletum* formation is found at grey-meadow soils at semidesert vegetation.

At the species content of *Suaedata-Salsoletum-Petrosimoniosum* formation 19 kinds of higher flowering plants were found; on biomorphological and life forms of species 2 species (10,5%) are shrubs, 1 species (5,3%) is subshrub, 5 species (26,3%) are perennial herbs, 1 species (5,3%) is biennial herb, 4 species (21,0%) annual herbs and 6 species (31,6%) are ephemers. These species were analysed on ecological classification and it was defined that 6 species (31,6%) are xerophytes, 9 species (47,4%) are halophytes, 2 species (10,5%) are mesophytes and 2 species (10,5%) are mesoxerophytes.

Dominant of the formation is *Petrosimonia brachiata* (Pall.) Bunge, abundance is 3-4 pounds, subdominant is *Salsola dendroides* (C.A. Meyer) Moq., abundance is 2-3 pounds and *Suaeda dendroides* (C.A. Mey) Moq. abundance is 2 pounds. Total plant cover changes between 50-70%.

Because of anthropogenic and technogenic influences, as well as extremely grazing of desert and semidesert vegetation by cattle, the plant cover of winter pastures was become salted and digression was occurred. For prevention of such negative effects it is recommended rational use and implementation of improving measures for Mil steppe phytocenosis.

Keywords: Formation, Dominant, Subdominant, Desert, Phytocenosis

(21162) ANATOMICAL AND MORPHOLOGICAL ASPECTS OF THE TAXA BELONGING TO ARACEAE JUSS. FAMILY, WHICH SHOWS NATURAL DISTRIBUTION IN ŞANLIURFA REGION

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In this study, Araceae Juss, which shows natural distribution in Şanlıurfa, the morphological and anatomical characteristics of the species are investigated belonging to the family. Three genus and 8 species were detected in the floristic study in Şanlıurfa. As a result of the field studies carried out in the province of Şanlıurfa, 3 genera and 8 taxa were determined. The genus is identified as *Arum*, *Biarum* and *Eminium* and 8 species. They are *Arum rupicola*, *A. dioscoridis*, *Biarum aleppicum*, *B. carduchorum*, *B. bovei*, *Eminium intortum*, *E. rauwolfii* and *E. spiculatum*. Species are collected distributed in Şanlıurfa with certain periods. The collected species were dried according to herbarium standards and it were made morphological measurements. These measurements are compared with 'Resimli Türkiye Florası 'and' Flora of Turkey'. For the anatomical investigations, the taxa were collected from the field kept in 70% alcohol. The root, skapa and leaf anatomies were examined of the collected taxa. The roots, skapa and leaves of *Arum* and *Biarum* species studied in this study and the anatomy of leaves and leaves of *Eminium* were studied for the first time. In all species the radial transmission band is radial type at the root. The xylem arm is polyark. 6-7 in *A. dioscoridis*, 7-8 arms in *A. rupicola*, 7-8 in *B. bovei*, 8-9 in *B. carduchorum*, 5-6 arms in *B. aleppicum*, 8 in *E. spiculatum*, 7-8 in *E. rauwolfii*, 7 in *E. intortum*. *A. rupicola*, *A. dioscoridis*, *B. bovei*, *E. spiculatum*, and *E. intortum* were observed collenchymatic cell clusters arranged periodically under the epidermis, but no collenchymal cell clusters were observed in *B. aleppicum*, *B. carduchorum* and *E. rauwolfii* in the skapa. The stoma cells are mesomorphic in the leaf epidermis. There are on both the lower and upper surface stomata of the lamina. There are parasitic and anomasitic stoma types on the leaf surface. Rafite crystals were found in all leaf species.

Keywords: *Araceae*, *Biarum*, *Eminium*, *Arum*, Anatomy, Morphology, Şanlıurfa

(21180) THE INTERACTION OF BIOCHAR AND NITRIC OXIDE: A NEW REMEDIATION TOOL

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Biochar is a remediation tool that widely used to reduces the bioavailability of heavy metals in contaminated soils, which become a global concern due its adverse effects on ecosystem health. The objective of our study is to investigate the interaction of nitric oxide (NO) as plant hormone and garden waste biochar (GB) as a promising remediation material to remediate the heavy metal toxicity in spanish growth and development in contaminated soil. Our results proved that additions NO significantly induced chlorophyll content, antioxidant activities and proline, which resulted in higher number of fresh and dry weight, and leaves number of spinach. On the other hand, the interaction between NO and GB significantly was higher than the use of NO and GB alone. Intersensingly, the accumulation of heavy metals mainly Pb and Cd was reduced under such interaction, which mainly attribite to the role of biochar to absorbe these contaminations preventing them from uptake by plant. On the other hand, it seems that NO plays a less effecitive role in this regard. Moreover, the soils amended biochars had pH values significantly higher than the untreated one. The availability of Pb, Cd, Zn, and Cu was significantly lower in the biochar-amended soils than in the control soil. A significant reduction in Pb, Cd, Zn, and Cu accumulation in the shoot and root of the plants grown in amended soils. In conclusion, the heavy metal bioavailability affected by biochar and NO additions and these results suggest that the use of both of them can alleivate heavy metal disorders on both plant and soils. To our knowledge, this is the first study on the effect of interaction of garden waste biochar and the efficiency use of NO it as remediation tool.

Keywords: Spanish, Heavy metals, Nitric oxide, Biochar, Garden waste

(21253) THE ORCHIDS OF YILDIZ MOUNTAINS (STRANDJA) IN TURKEY

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The Orchids diversity survey for the ‘Yıldız Mountains (Strandja)’ was conducted between April - October 2017. The Orchids were the focus of the field survey. A classic (standardised) methodology was carried out to identify the orchid’s specimens and photographed. Surveys were confined to sites of potential significance for orchids and 34 taxa belong to Orchidaceae family were collected and identified.

The study generated a total of 162 records of 27 orchids taxa in 60 locations during the 18 days of field work. A thorough review of the literature and available herbarium records (EDTU and ISTE) indicate that a total of 34 plant species have been reliably recorded from the Project area, based on the results of this survey and previous studies. A total of 34 taxa have been recorded in the Study area belong to 14 genera, 31 species, 14 subspecies and 1 subspecies, 1 variety and two hybrids. Two hybrids (*Anacamptis coriophora* x *Anacamptis palustris* subsp. *elaegans* and *Anacamptis papilionacea* subsp. *papilionacea* x *Anacamptis morio* subsp. *caucasica*) and one species (*Epipogium aphyllum*) are new records for flora of European Turkey and Study area. The number of taxa and belonging to genus: *Anacamptis* L.C.M. Richard (9), *Cephalanthera* L.C.M. Richard (3), *Dactylorhiza* Neck. ex Nevski (2), *Epipactis* Ziin. (3), *Epipogium* R. Brown (1), *Himantoglossum* W.D. Koch (1), *Limodorum* Böhmer (1), *Neotinea* Reichb. fil. (1), *Neottia* Guettard (2), *Ophrys* L. (5), *Orchis* L. (2), *Platanthera* L.C.M. Richard (2), *Serapias* L. (1) and *Spiranthes* L.C.M. Richard (1). In this study, it has been aimed to show to distribution of Orchids species in Yıldız Mountains (Strandja) in Turkey. The taxonomic status of Orchidaceae taxa have also been reviewed according to recent monograph of orchids.

Keywords: Yildiz Mountains (Strandja), Turkey, Orchid, Distribution

(21266) DISTYLY IN *LINUM* L. (*LINACEAE*): A CASE STUDY ON ITS RELATION ON THE POLLEN MORPHOLOGY OF THE TAXA FROM TURKEY

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Distyly, a type of heteromorphic self-incompatibility, is present in plants of the same species which produce two types of flower. Relative position of anthers and stigma is the most prominent difference between floral morphs. Dimorphic condition is common in the most of the *Linum* taxa from Turkey. In this study, as a consequence of distyly, the differences in the pollen morphology of both short-styled and long-styled morphs are presented. Measurements and observations on general pollen morphology were carried out with light microscope on preparations made according to Wodehouse method. Detailed exine ornamentation microstructure was investigated with scanning electron microscope. Distyly is predominantly present in sections *Dasylinum* (Planch.) Juz. And *Syllinum* Griseb.; in *Linum* (= *Eulinum* Griseb.) and *Linastrum* (Planch.) Winkl. rarely occurs. All the studied distylous taxa have dimorphic pollen grains. In short-styled floral morphs the exine has monomorphic processes, which at the top have a ring of marginal papillae, central papilla prominent or not. In long-styled floral morphs the exine is dimorphic and has two types of processes: smaller in diameter, ending in a central spinule and larger in diameter with a central spinule surrounded by radiating buttresses or a marginal ring of spinules. Pollen grains are trizonocolpate, additionally, in short-styled morphs hexacolpate grains are present in very few amounts. In the studied distylous species the pollen of short-styled flowers is larger than that of long-styled.

Keywords: Distyly, *Linum*, Pollen morphology, Turkey

(18800) TRADITIONAL USES, PHYTOCHEMICAL STUDY AND MORPHOLOGICAL CHARACTERIZATION OF *PISTACIA LENTISCUS* L. FRUITS FROM THREE AREAS OF NORTHERN ALGERIA

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Medicinal plants, already known as a natural source of a range of bioactive compounds. Therefore, the researchers today are emphasizing on evaluation and characterization of various plants and plant constituents against a number of diseases based on their traditional claims. The present study aimed to the valorization of *Pistacia lentiscus* L.; an evergreen shrub producing bright red globose berries of the Anacardiaceae family that is ubiquitous in Mediterranean areas. Hence, an ethnobotanical investigation, phytochemical screening and morphological study of fruits from three areas of northern Algeria were carried out.

Ethnobotanical data were recorded from herbalists, pharmacists and individuals living in contact with the medicinal plants of the three study areas (Boumerdes, Tizi-Ouzou and Bouira), using a questionnaire in order to collect as much information about the virtues and traditional uses of lentisk. The screening was performed for various biochemicals. The color intensity or the precipitate formation was used as analytical responses to these tests. Biometric measurements and weight of 1000 seeds of fruits from three provenances were realized and compared.

According to the data collected, over 90% of the surveys in the three regions have knowledge of lentisk; the consensus value for a part of the plant (CPP) revealed that the fruit of lentisk represented by the fixed oil, is most used in the region of Bouira (0.38). However, leaves represent the highest utilization values in the other regions. A number of diseases treated with *pistacia lentiscus* L. were identified; these are mainly respiratory and digestive disorders (22% to 55%) and (24% to 50%), respectively. lentisk was also indicated for the treatment of disorders of the circulatory system and *allergic skin condition*, with varying percentages depending on the region. Phytochemical screening of of this plant showed that fruits from different areas were rich in anthocyanins, condensed tannins, gallic tannins, and flavonoids with variable intensity. While they were devoid of saponoside and alcaloids. A significant difference of the weight of 1000 seeds and diameters were obtained between the fruits of the three areas that may be due to climatic factors.

The results obtained constitute a valuable source of information, which should be the subject of additional pharmacological studies to validate their popular use and to isolate bioactive compounds.

Keywords: Ethnobotany, *Pistacia lentiscus* L., Phytochemical screening, Morphological study.

(18882) FLORISTIC AND ETHNOBOTANICAL STUDIES OF MEDICINAL PLANTS IN THE BORDJ BOU ARRERIDJ CITY (ALGERIA)

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This study is conducted to inventory and identify the therapeutic virtues of medicinal plants in the Bordj Bou Arreridj (BBA) city. Ethnobotanical surveys were carried out from March 2017 to January 2018 among 61 informants randomly and a total of 329 survey cards completed. The study identified 80 plant species divided into 70 genera and 37 families with significant representativeness of the following families: Lamiaceae (12 species), Apiaceae (9 species), Asteraceae (7 species) and Fabaceae (6 species). The morphological and biological spectra show a predominance of herbaceous and therophytes. The results of this study showed that the foliage constitutes the most used part and the majority of the remedies is prepared in the form of a decoction. Also, the study revealed various diseases such as gastric disorders, indigestion, scarring, headaches, rheumatic disorders, diarrhea, and menstrual problems. The results obtained are a very valuable source of information and could be an amendment for the Algerian pharmacopoeia and this ethnobotanical information must be validated by clinical trials.

Keywords: Ethnobotany, Medicinal plants, Investigations, Bordj Bou Arreridj, Algeria

**(18945) CHANGES OF CHEMICAL CONTENT AND CYTOLOGY OF
COTYLEDON EXPLANTS IN ORNAMENTAL SUNFLOWER**

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Ornamental sunflowers (*Helianthus annuus* L.) are widely grown for decorative purposes as cut flowers, potted plants or in the garden. The application of biotechnology methods for improving the sunflower traits is limited due to the difficulty of regenerating plants in a high efficient way. Sunflower regeneration is highly variable and depends upon genotype, specific media components, the nature of the explant, etc. The objective of this study was to investigate chemical and cytological changes in cotyledon explants during in vitro culture. Cotyledons with the adaxial side at 0, 1, and 7 day-old were cultured on MS media supplemented with 1 mg/l BA for 21 days and then were subjected to chemical and cytological analyses. The results showed that cell area and cotyledon thickness were increased in cultured cotyledon explants, while cell number was decreased. For chemical content, it was found that total fat content was the main storage reserve in sunflower seed and its level was strongly reduced in cotyledon explants cultured in vitro. Protein content was the second most storage reserve and its level decreased during germination, but increased in cultured cotyledon explants. Total sugar and sucrose content decreased upon in vitro culture. Furthermore, the shoot regeneration was positively correlated with cell area and total protein.

Keywords: Sunflower, Cotyledon, Protein, Total fat, Cell number

(19192) ECO-BIOLOGICAL CHARACTERISTICS OF FLORA IN PROTECTION ZONE "YAZOVIR KONUSH" VILLAGE KONUSH (BULGARIA)

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The present study examines the flora in the protected zone (PZ) "Yazovir Konush", Konush village in the region of Plovdiv. Eco-biological characteristic of the vascular plants is made, and the species are categorized by biological groups, by life forms and by floral elements. The plants are classified by ecological groups according their regard towards the water, the light and the heat as a factor. Conclusions for the presence by percentage of medicinal flora in the protected zone are made. The diversity of vascular plants in PZ "Yazovir Konush" is studied by systematic observations and collecting of material during the vegetative seasons of 2012-2014. The periodicity of the visits is conformed to the climatic conditions in the region and the determined by their phyto-rhythmic. The earliest aggregates are form the beginning of February 2012, and the latest – from the end of September 2014. The results of research of the vascular plants in protected zone "Yazovir Konush" shows that there are 172 species plants from 133 genera and 50 families. Among these plants the majority are the perennial herbaceous species, the hemicryptophytes, the species with European and Mediterranean origin, the thermophytes, the mezophytes and the heliophytes.

Keywords: Protected zone "Yazovir Konush", NATURE 2000, flora, vascular plants

**(19226) PLANTS USED AS FOLK MEDICINE FOR PREVENTION OF SOME
CANCER DISEASES**

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In the literature, it is shown that some plants have a positive effect on prevention and treatment of some cancer types. In the right amount, with the right plant and at the right time, using some medicinal folk plants prevented of some types of cancer. The aim of study to give some information of eight medicinal plants using for the treatment of some cancer types. When studies and articles on the subject were reviewed over the last 10 years, 25 of the plants on which most cancer researches were carried out were determined. Among these plants, photographs of plants which are used extensively among the public are given, and the therapeutic effects are given by comparing them with each other. According to the results of the literature research; in the context of cancer and plant relationship, the regular use of *Matricaria chamomilla*, *Capsicum annum*, *Brassica oleracea*, *Morus alba*, *Allium sativum*, *Malva sylvestris* and *Olea europaea* has been shown to inhibit the formation of many cancer types and prevent cancer. *Aloe vera*, *Olea europaea* and *Morus alba* has been found to be effective in the treatment of the wounds caused by chemotherapy. It is concluded that *Capsicum annum* prevented prostate, pancreas and uterine cancer, *Brassica oleracea* prevented food borne, stomach, intestinal and breast cancers, *Morus alba* prevented lung and prostate cancers, *Allium sativum* prevented breast, esophagus, stomach, colon and rectum cancers and *Olea europaea* prevented especially pancreas, liver, stomach and breast cancers

Keywords: Cancer, Folk medicine

(19693) CONTRIBUTION TO THE ETHNOBOTANIC AND ANATOMICAL STUDY OF A MEDICINAL PLANT IN THE ALGERIAN NORTHEAST

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Algeria by its geographical position and its bioclimatic floors possesses a very diversified flora with a rate of endemism about 12.6 %. This very rich flora counts many medicinal and aromatic plants in therapeutic use which represent a natural wealth of a priceless value and are likened to real inexhaustible ores of molecules and bioactive principles. The popular knowledge of the virtues of the medicinal and aromatic plants and their use in the traditional medicine represents a very precious national heritage. This inheritance is the key necessary for the valuation and the good exploitation of the medicinal and aromatic plants.

In our work we led an ethnobotanic investigation on *Rubus ulmifolius* Schott (the bramble), a thorny shrub growing spontaneously in Algeria, to estimate the knowledge of the population of the region of Annaba and El Tarf (Algerian Northeast) on the traditional therapeutic use of the plant and to probe the place of herbal medicine in society. Furthermore, we realized histological sections of the leaf and the stem of the plant to better understand its anatomy and distinguish the different tissues that constitute it. The ethnobotanic information was collected by means of a questionnaire from 220 people of both sexes, between 20 and 82 years old, according to a simple random sampling in twelve municipalities of the wilaya of Annaba and El Tarf (Algerian Northeast). The investigated were approached by direct questions in a simple and understandable language. The parameters taken into account were the following ones: age, sex, region, family situation, school level, job, knowledge of the plant, vernacular name, used part, source of supply, the handled diseases, shape of administration and posology. The results were reported in an Excel table for the processing of statistical analyzes.

The histological sections of the leaves and stems of *Rubus ulmifolius* Schott were first prepared by the double staining method (Congo Red, Methyl Green) which is based on the staining of the cell walls in such a way that the cellulosic walls (living cells) are stained pink and the lignified walls (dead cells) are colored green. After staining, the histological sections were mounted on slides for microscopic observation of the different tissues with several magnifications (Gx4, Gx10, Gx40). The results obtained from the survey show that 100 % of the respondents know *Rubus ulmifolius* and specially under the vernacular name of "Alligie". Unlike young people, the elderly knows the virtues of the plant and its use in the traditional medicine of the region. According to the respondents, *Rubus ulmifolius* is essentially used for the care of the dermatological problems and is very effective in treating the most serious burns and injuries.

Microscopic observation of the histological sections showed an anatomy of dicotyledonous plants with a pentagonous stem with hair-bearing fibers, an epidermis, a supporting tissue, a cortical parenchyma, a conductive bundle, and a marrow. The leaf has leafy hairs, some multicellular secretory hairs, an epidermis, a supporting tissue, a conductive bundle, a palisadic and lacunous parenchyma.

Keywords: Medicinal and aromatic plants, Traditional medicine, *Rubus ulmifolius* Schott, Ethnobotanical survey, Histological section, Anatomy

**(19813) ANATOMICAL CHARACTERISTICS OF TURKISH ENDEMIC PLANT,
SCROPHULARIA LEPIDOTA (SCROPHULARIACEAE)**

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In this study, anatomical characteristics of root, stem and leaf of *Scrophularia lepidota* (Scrophulariaceae), an endemic plant species of Turkey, were examined. In the cross-section, root is in the secondary structure, there are 5–8 cell layered periderm in outside and under periderm tissue, there are 6–10 cell layered pericycle. Cambium layer consists of 3–4 cell layers and cells are flattened and irregular shaped. The stem is in primary structure, covered by uniseriate epidermis and stellate epidermal trichomes. Under the epidermis there is cortex tissue which consists of 6–8 cell layers. The leaves are equifacial according to the mesophyll layer, and amphistomatic according to the presence of stoma. The midrib is oval–circular in shape, and is surrounded by a single cell layered parenchymatous bundle sheath. There are idioblastic cells in leaf cross section. The determined anatomical features of *S. lepidota* were compared with previous anatomical studies on other species of the genus *Scrophularia* and the results were discussed. In this study, the anatomical features of *S. lepidota* were determined, herewith contributing to the general anatomical characteristics and taxonomy of the genus *Scrophularia*.

Keywords: Anatomy, Endemic, *Scrophularia lepidota*, Turkey

(19831) DETOXIFICATION AND STRUCTURAL ANALYSIS OF AFLATOXIN B1 AND B2 THROUGH AJOWAN (*TRACHYSPERMUM AMMI*) AND VASAKA (*ADHATODA VASICA*) MEDICINAL PLANT EXTRACT IN STORED FOOD AND ITS PRODUCTS

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Aflatoxin meant for *Aspergillus flavus* plus toxin, are a group of mycotoxin produced by *Aspergillus flavus* and *Aspergillus parasiticus*. Aflatoxin B1, B2, G1 and G2 found in large concentrations and most toxic compound causing rapid death and hepatocellular carcinoma in developing countries including Pakistan and developed countries. The risk of life is less in developed countries as compared to developing countries because they have effective preventive measures against aflatoxins. Effective control of aflatoxin is not yet reported from Pakistan. Biological management is most effective, therefore, in this study two medicinal plants viz; Ajowan (*Trachyspermum ammi*) and Vasaka (*Adhatoda vasica*) extract was used for aflatoxin inhibition. Morphological characterization was also being carried out to confirm the aflatoxin producing pathogens. Pathogenicity testing was conducted on maize cobs to confirm the Koch's postulates. Histopathology of the diseased maize cob tissues was done. It is very important to develop biological control for aflatoxin. Protein extraction using S.D.S page will be carried out for the extraction of protein to check which protein is responsible for antagonistic effect against aflatoxins producing fungi. HPLC (High Performance Liquid Chromatography) was done for qualitative analysis of residual toxin. The data was analyzed statistically using SAS software.

Keywords: Aflatoxin, Ajowan, Vasaka, High Performance Liquid Chromatography

**(19869) THE STUDY OF PLANT SPECIES BELONGING TO THE
CAMPANULACEAE JUSS. FAMILY SPREAD IN THE FLORA OF NAKHCHIVAN
AUTONOMOUS REPUBLIC**

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The article encompasses the research history of the Bellflower family, the taxonomic composition of the Campanulaceae Juss. family spread in Nakhchivan Autonomous Republic, their role in plant communities and the distribution patterns on vertical zones. For the first time, as a result of the investigations, the species diversity of Bellflower family was studied in the flora of Nakhchivan Autonomous Republic, 20 species and 6 varieties belonging to three genera belonging to the family were discovered and the modern taxonomic spectrum of the family was compiled and the reasons for the last changes of taxa were analyzed. In the article there have been expressed the results of the research on nomenclature changes and their synonyms occurring in the systematic of variations and species belonging to the Campanulaceae Juss. family according to the work of Conspect of Caucasian flora. During the research, there have been discovered the new formations and association groups of 4 species [*Campanula latifolia* L., *C. rapunculoides* L., *C. tridentata* Scherb., *C. stevenii* Bieb.] for the flora biodiversity of Nakhchivan AR. There have been found out that 5 species [*Campanula glomerata* L., *Campanula bononiensis* L., *Asyneuma campanuloides* (Bieb. ex Sims) Bornm., *A. pulchellum* (Fisch. et C.A. Mey.) Bornm., *A. amplexicaule* (Willd.) Hand. -Mazz.] of family take the edificator role in the meadow plant communities. *Michauxia laevigata* Vent. species has been found in mountain-xerophytic plant communities. 9 representatives [*Campanula karakuschensis* Grossh., *Campanula daralaghezica* (Grossh.) Kolak et Serdjukova, *Campanula bayerniana* Rupr., *Campanula coriacea* P.H. Davis, *Campanula massalskyi* Fomin, *Campanula saxifraga* Bieb., *Campanula sclerotricha* Boiss., *Campanula propinqua* Fisch. et C.A. Mey., *Campanula zangezura* (Lipsky) Kolak. et Serdjukova] of the family have been found as single or small microgroups form in lithophytic plant communities. The study of the distribution patterns on vertical zones has been determined that, one species [*Campanula massalskyi* Fomin] in the low mountainous zone, one species [*C. karakuschensis* Grossh.] in the middle mountainous zone and six species [*Campanula sclerotricha* Boiss., *C. daralaghezica* (Grossh.) Kolak. et Serdjukova, *C. zangezura* (Lipsky) Kolak. et. Serdyuk., *C. saxifraga* Bieb., *C. tridentata* Scherb., *A. amplexicaule* (Willd.) Hand. – Mazz.] in the high mountainous zone. 10 species [*C. glomerata* L., *C. latifolia* L., *C. rapunculoides* L., *C. bononiensis* L., *C. bayerniana* Rupr., *C. coriacea* P.H. Davis, *C. stevenii* Bieb., *A. campanuloides* (Bieb. ex Sims) Bornm., *A. rigidum* (Willd.), *A. pulchellum* (Fisch. et C.A. Mey.)] of family representatives have spread from the middle mountainous zone to the subalpine zone. *Michauxia laevigata* Vent. species has found from the foothill zones to the subalpine zone, *Campanula propinqua* Fisch. et C. A. Mey. species have found in the low and middle mountainous zones.

Keywords: Bellflower, *Campanula*, Family, Genus, Species, Variation, Spread area, Rock plants, Taxonomic spectrum, Species composition, Bioecological features

(20088) CYTOEMBRYOLOGICAL STUDIES ON ANTHER WALL AND THE MALE GAMETOPHYTE DEVELOPMENT OF *GLADIOLUS ITALICUS* MILLER (IRIDACEAE)

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In this study, anther wall and the male gametophyte development of *Gladiolus italicus* Miller, a wild and perennial geophyte with corm (hard onion), were investigated by light microscopy. *G. italicus* is naturally distributed in Edirne, Kocaeli, Bolu, İstanbul, Kastamonu, Burdur, Bursa, Çorum, Çanakkale, Diyarbakır, İçel, Malatya, Manisa, Muğla, Samsun, Sivas, Tekirdağ, Şanlıurfa, İzmir and Karaman. The plants were collected from their natural habitats in Üyükütatar village in Edirne and then cultivated in the greenhouse of the Botany Department of Trakya University. Buds and flowers of different stages of the cultivated specimens were fixed in Carnoy's fluid. After fixation, the samples were dehydrated in alcohol series and embedded in Historesin kit (Leica). The sections (3 µm) were cut with a rotary microtome (Leica) equipped with a tungsten carbide knife and stained with 0.5% Toluidine blue. According to the light microscopy investigations, the anthers of *G. italicus* are *tetrasporangiate* and young anther walls consist of five wall layers; an epidermis, two endothecium, a middle layer and a secretory tapetum. The middle layer disappears in the vacuolated microspore stage while the tapetum gradually starts to degenerate in the pollen mitosis. The mature anther wall comprises a single layer of epidermis and two layers fibrous endothecium. During microspore development, meiocytes undergo meiosis and successive cytokinesis leading to the formation of isobilateral and decussate tetrads. Meiotic division is almost regular and pollen fertility is very high (98%). The pollen grains are shed from anther at 2-cells stage (vegetative cell and generative cell). *G. italicus* pollen shape is subprolate, structure tectate-columellate, sculpture spinulate-perforate and aperture monosulcate. Morphological, anatomical and karyological studies about *G. italicus*, which has attractive flowers, are very few and the literature review shows that there is no study on the embryology of the species.

Keywords: *Gladiolus italicus*, Iridaceae, Anther wall, Male gametophyte development, Pollen

(20154) ANATOMICAL STUDY OF GARDEN NASTURTIUM (*TROPAEOLUM MAJUS* L.)

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Tropaeolum majus L (garden nasturtium) is a fast growing climbing annual plant which is known for its medicinal, ornamental and culinary utility. In fact, it is used in traditional medicine to treat several diseases including scurvy. However, little data is available on its anatomical structure.

The aim of this work is to study the anatomy of the garden nasturtium growing under the climatic conditions of Annaba (eastern Algeria).

Garden nasturtium stem, petiole, leaf and root were harvested during the month of November (2016). Fresh samples of these parts of the plant were fixed in 70% alcohol in order to carry out anatomical studies according to the double staining method followed by an observation under photonic microscope (x10 and x40).

Microscopic observation of the different organs of garden nasturtium revealed that the anatomy of this plant contains much more hydrophilic cellulosic tissues (parenchyma and collenchymas) than hydrophobic lignified tissues. We can deduce that garden nasturtium requires a high humidity which explains the great growth of this species under the climatic conditions of the region of Annaba, characterized by Mediterranean climate (high rainfall and high atmospheric humidity and mild temperature).

Keywords: *Tropaeolum majus* L., Anatomy, Region of Annaba

(20973) RESPONSE OF WHEAT GENOTYPES HAVING DIFFERENT STATURE TO EARLY DROUGHT PERIOD IN WHEAT

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Drought is a polygenic strain and is counted as one of the major factor limiting the crop yields around the world. The shortage of the water on any stage of growth can be damaging for plant growth, physiological aspects and yield. To study the impacts of early drought on wheat genotypes having different stature an experiment was directed at Agronomy area of research, University of Agriculture Faisalabad through in the growing season 2017-2018. The experiment was laid out in Randomized Complete Block Design with split plot arrangement. The early drought treatment such as I0 (Control with all irrigations), I1 (first irrigation 30 days after sowing), I2 (first irrigation 45 days after sowing) and I3 (first irrigation 60 days after sowing) were in the main plot while wheat cultivars having different stature i.e. Faisalabad-2008 (standard height and low tillering), Td-1(low height and low tillering) and Galaxy-2013 (standard height and high tillering) were in sub plots. The plot size was 6 m × 1.8 m, row to row distance 0.225 m and seed rate will be 100 kg/hac. All other crop management practices were kept constant during whole crop period. Data in respect of germination, growth, physiology and parameters related to yield was recorded on the basis of standard procedures and methods. Data was analyzed using split plot design under RCBD, and treatments means were compared using Dunnett's test and was contrasts at 5% level of significance. Drought stress among cultivars regarding to plant height showed maximum effect on TD-1 (71.10 cm), where as minimum effects were seen in Galaxy 2013 (83.42 cm). Likewise, length of spike was also maximum in Galaxy-2013 (8.11 cm) and minimum in TD-1 (7.79 cm). Produced grain yield in controlled condition was maximum and effect of drought could be seen clearly in the treated plots. Grain yield was maximum in Galaxy-2013 in all treatments where as FSD-2008 and TD-1 was almost same in yield. Yield and parameters of yield were affected significantly by various drought levels. Productive tillers, No. of grains per spike, biological yield and grain yield were significantly affected by drought. Different levels of drought affected cultivars differently, difference in 1000 grain weight showed that clearly.

Keywords: Drought, Wheat, Cultivars

**(21256) DETERMINATION OF MOLECULAR PHYLOGENETIC PROPERTIES OF
ORCHIS LAXIFLORA AND *ORCHIS PUNCTULATA* (ORCHIDACEAE) TAXA
USING THE TECHNIQUE OF DNA SEQUENCING**

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In this study systematic and phylogenetic properties of the taxons of *Orchis laxiflora* and *Orchis punctulata* from the Orchidaceae family were determined by sequencing 18S rDNA and ITS2 regions of their genomic DNA. Genomic DNA's were isolated from basal leaf cells of plant samples which were dessicated by silica-gel method. The 18S rDNA an ITS1 regions were amplified by previously prepared primers. The classification of these orchid species at the molecular level was accomplished for the first time, by applying bioinfomation and phylogenesis programs on the data obtained from the DNA sequences of these amplified regions. CLUSTALW2 program was used to determine the leveling of the species in question, with the other Orchidaceae species. Their phylogenetic trees were built by using the Neighbour-Joining (Saitou and Nei, 1987) method of MEGA 4,0 (STABLE) program. The data obtained from the matrix-join table and phylogenetic trees were compared with the classical taxonomical data. In conclusion, *O. laxiflora* and *O. palustris* were grouped together with *A. coriophora*, *A. morio*, *A. champagneuxii* and *A. pyramidalis*, in the same group, whereas *O. punctulata* was grouped with *O. italica*, *O. mascula*, *O. militaris*, and *O. purpurea*. Therefore, it was proposed to keep *O. punctulata* to belong to the genera *Orchis*, but *O. laxiflora* and *O. palustris* to be transferred to the genus *Anacamptis*.

Keywords: *Orchis laxiflora*, *Orchis punctulata*, RAPD PCR, ITS, Molecular phylogeny, Taxonomy

(17973) VALORISATION OF NATURAL RESOURCES: POLYMERIZATION OF β -PINENE BY NATURAL MONTMORILLONITE CLAY

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Environmental friendly catalytic processes of biomass valorization to produce chemicals with high added value, are an important field which are continuously attract more attentions in chemical engineering.

Biomass derived β -pinene issued from pin trees is an essential compound for fine chemical industry. It is the precursor of non toxic and inert poly(β -pinene) used as additive for rubbers, food packaging, casting industries and in the production of chewing gums. In this paper, we report an efficient and environmentally method to produce poly(β -pinene). We have used an algerian Montmorillonite clay as a heterogeneous non toxic catalyst to induce the polymerization of (β -pinene). Spectroscopic methods such as FT-IR, ¹H NMR, GPC chromatography and viscosimetry were used to confirm the structure of the obtained polymer. Effects of Maghnite/monomer weight-ratio, temperature and solvent on the yield of the polymerization and on the average molecular weight M_v of the resulting polymers were studied. The thermal properties (DSC) of the resulted poly(β -pinene) were also studied.

Keywords: β -pinene, Poly(β -pinene), Non-toxic catalyst, Cationic polymerization, Montmorillonite

(18175) EFFECT OF GREEN SYNTHESIZED COPPER NANOPARTICLES IN COMPARISON WITH COPPER SALT ON THE DYEABILITY OF COTTON FABRIC TOWARDS SULPHUR DYE

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Improvement in color strength and washing fastness of the sulphur dyed fabrics is a challenge. This is generally caused by improper color dissolution, color precipitation, poor solubility of the dyes, poor and insufficient washing. This limits their use on materials where good wash fastness is required. To achieve the goal of good fastness properties and color strength different procedures were employed to fix the impregnation of dye on the fabric. Due to this scientist diverted their focus to modify the fabric surface and act as cross linking agents due to penetration in the dye molecules. The emerging nano technology plays an important role because of their small particle size and ultimately improves serviceability of the material. Therefore, the present study was focused on assessing the effect of Copper salt as a mordant in combination with green synthesized copper nano particles using *Conocarpus Erectus* leaves on the dyeability, color strength and fastness properties of the cotton fabrics using single shade of Diresul Indiblue RDT sulphur dye. Dyeing was carried out by continuous method. Among the fabric samples, few were treated first with copper acetate mordant of two different concentrations 10% and 20% and dyed and few were treated with green synthesized copper nanoparticles and dyed and few were dyed with copper nanoparticles. Copper acetate and copper nano particles were applied using pad-dry-cure method. All the samples were subjected to various laboratory tests to evaluate the effect of treatments on tensile strength, color strength and color fastness properties using the standard ISO procedures. SEM analysis was carried out to identify the size of copper nanoparticles. SEM analysis of untreated and copper nanoparticle treated samples was done to visualize their effect on the fiber's surface. SEM analysis of copper nanoparticles indicated that they were in dispersed cluster form with a size range of 30-70 nm. SEM analysis of fabric had shown even distribution of copper nanoparticles on fabric surface. Prescribed treatment have shown improvement of sulphur dyed fabric in terms of Fabric Strength, Color strength (K/S), and Fastness; washing, light and rubbing. Higher concentration of copper acetate mordant has shown better results. The samples treated with copper nanoparticles and dyed later have shown good color strength (K/S) and improved color fastness properties than their counterparts. These results were helpful in implementing where textiles are dyed with sulphur dyes.

Keywords: Dyeing, Sulphur dye, Nanoparticles, Spectrophotometer, SEM, X-Ray diffraction

(18179) THE USE OF GREEN SYNTHESIZED SILVER NANOPARTICLES ON LEATHER

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The present work shows the determination of total phenolic compounds in plant leaves extract of *Azadirachta indica*, *Conocarpus erectus* and *Nerium indicum* and then Silver nanoparticles (Ag NPs) were prepared by using plant leaf extract as reductant and their application on leather. Ag NPs were characterized by SEM (Scanning Electron Microscope) and XRD (X-Ray Diffractometer) methods. The size of Ag NPs size was assessed in the limit of 30-80 nm. UV-Visible spectroscopy and SEM was used to confirm that Ag NPs were set down on the collagen fibers surface and inner side of the skin collagen matrix of fibers (leather). The antibacterial and antifungal effect of Ag NPs was assessed by general microbiological test for seven days. The result shown power full strength of silver nano particles against bacterial or fungal attack for long duration of time. This permits us to deliberate the assimilation of these Nano particles into leather as a feasible substitute of other than commercially available expensive products in order to gain leather with enhanced antimicrobial properties.

Keywords: *Conocarpus erectus*, *Azadirachta indica*, *Nerium indicum*, Silver Nanoparticles, Silver treated leather

(19898) STUDY OF COMPLEXATION OF DOPAMINE ANALOGS WITH BIOACTIVE METALS BY CYCLIC VOLTAMMETRY

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Dopamine analogs are reported to have remarkable biological activities. Levodopa (LD) and carbidopa (CD) are active ingredient of drugs used for the treatment of Parkinson and Alzheimer diseases. Methyldopa (MD) is another molecule belonging to same class of compounds and is used as hypertensive drug. Concurrent ingestion of the metal ions can causes marked changes in the bioavailability of these drug molecules. In this present study, interaction of dopamine analogs with the bioessential metals like iron, copper and aluminum is investigated by cyclic voltammetry. These bioessential metals have significant role in normal functioning of the brain and nerves. The work is aimed to establish a convenient, simple and fast method through which the complexation of dopamine analogs with different bioactive metals can be explored. For this purpose, cyclic voltammetric probe is used and electrochemical parameters (peak currents and peak potentials) of electroactive drug, in the presence and absence of metal ion, are served as an analytical tool. It was found that drug molecule undergoes coupled chemical reaction with the metal ions and this interaction is pH dependent. Electrochemical behavior of the drug molecule was found to be changed in the presence of the metal ion.

Keywords: Dopamine analogs, Bioactive metals, Cyclic voltammetry

(18768) PHYTOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITY OF METHANOLIC EXTRACT OF ARGAN LEAVES (*ARGANIA SPINOSA*) FROM NORTH ALGERIA

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The argan tree, geographically distributed in southwestern Algerian Sahara (north of Tindouf), was recently observed in the Algerian west coast (Mostaganem). This study aimed to assess the phytochemical composition and the antioxidant effect of the methanolic extract of argan leaves (*Argania spinosa*) growing on the west coast of Mostaganem. The methanolic extract was obtained according to the Soxhlet method. A phytochemical screening and an evaluation of the antioxidant activity (DPPH, TBARS) were carried out. Qualitative phytochemical tests show the presence of polyphenols (flavonoids and tannins), triterpenes and reducing sugars. The polyphenols, flavonoid and tannins assay revealed that the methanolic extract contained 168.5 ± 0.002 mg Eq gallic acid/g extract, 47.86 ± 2.37 mg Eq quercetin/g extract and 97.33 mg Eq catechin/ g extract, respectively. Antioxidant activity, evaluated by the DPPH free radical reduction method, reveals an IC₅₀ of up to 0.838 mg / ml. The extract at the concentrations tested, seems to have a non-negligible ($p < 0.05$) effect on the lipid oxidation of the meat kept at 4°C. In fact, the TBA values recorded after five days of storage reached 1.99 mg equivalent MDA/kg for the untreated meat against 0.369 and 0.243 mg equivalent MDA/kg in the meat treated with the concentrations 0.1 and 0.2 mg/ml, respectively.

The methanolic extract of the Argan tree leaves growing in the west coast of Algeria has an interesting antioxidant potential to be exploited.

Keywords: *Argania spinosa*, Methanolic extract, Antioxidant activity, North Algeria, Polyphenols

(18881) QUANTIFICATION OF TYLOSIN ANTIBIOTICS AND ANTIBIOTIC RESISTANCE GENES IN CATTLE WASTE

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Each year 2 million people suffer from the infections caused by bacteria which are resistant to antibiotics, 23,000 people die because of antibiotic resistance every year. New drugs are coming into the market almost every day but are at the threat of developing resistance. One of the reasons for the development of antibiotic resistance is the overuse of antibiotics in the animal feed. This research is focused on developing a solid phase extraction (SPE) procedure and an LC-MS/MS method for quantifying tylosin in waste samples from the cattle treated with tylosin. Tylosin is a macrolide antibiotic found naturally as a fermentation product of *Streptomyces fradiae* and is mainly used in promoting growth and treating infections in animals. Tylosin acts by inhibiting the protein synthesis in bacteria. In cattle, tylosin is used for treating the bovine respiratory complex, foot-rot and calf diphtheria while in swine it is used to treat swine arthritis, swine pneumonia swine erysipelas. The products from livestock, treated with antibiotics such as milk, meat (Chicken, pork, cattle beef), excreta and manure possess residual antibiotics and resistance genes(ARG's) which are consequently passed to humans. Further, the tylosin resistance genes in the cattle waste samples are also being studied.

Keywords: Tylosin, Antibiotic resistance, Antibiotic resistant genes, LC-MS/MS, PCR

**(18997) ISOLATION AND CHARACTERIZATION OF ISOFLAVONOIDS FROM
RETAMA SP**

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Retama genus commonly called R'tem, belongs to the family Fabaceae, endemic of the Mediterranean regions, represented in Algeria by three species: Retama monosperma growing on the coast and coastal dunes stabilized, she protect beaches from erosion, Retama raetam and Retama sphaerocarpa that span arid and Saharan areas where they plays an important ecological role in the fight against desertification by stabilized sand dunes. Phytochemical studies have shown that these species are very rich in flavonoids, triterpenoides, saponins, alkaloids, phytosterols, cellulose, hemicellulose and lignin. In the present study we have investigated a species from Retama genus. This plant was collected in M'sila, on june 2016 and identified by Dr K. Rebbas (Departement of Biologie university of M'sila). Air dried and powdered plant material was extracted with MeOH. This residue was suspended in H₂O and successively partitioned with chloroform, ethyl acetate and *n*-butanol at room condition, filtered and evaporated under vacuum. The chloroform extract were subjected to column chromatography. After purification processes three isoflavonoids, which their structures were: 7-hydroxy-6'-methoxy-3',4'-methylenedioxyisoflavone, Isoprunitin and genistein were elucidated using 1-HNMR, ¹³C, HSQC and HMBC spectroscopic techniques.

Keywords: *Retama* genus, Structure elucidation, NMR spectroscopy, Isoflavonoids

**(19105) EXTRACTION AND CHEMICAL STUDY OF THE ESSENTIAL OIL OF
ORIGANUM VULGARE L. OF THE REGION OF GUELMA-ALGÉRIE**

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Plant present in many Mediterranean countries, Oregano (*Origanum* kind) is widely used as a traditional to treat various conditions as antispasmodic, antimicrobial, against whooping cough, cough, digestive disorders and menstrual problems.

In this work, we are interested in the study of the chemical composition of the essential oil extracted from the leaves of *Origanum vulgare* L. for the valuation of this aromatic plant. Leaves of *O. vulgare* were collected at the stage of flowering in mid-June 2014 in Nechmaya, Guelma. The essential oil was extracted by the method of hydro distillation during 3 hours using a device of type Clevenger, and qualitative analysis of the essential oil was performed using a gas chromatograph coupled with a mass spectrometer of Hewlett Packard Agilent 6890N type. The essential oil obtained by hydro distillation has a yellow color with a strongly pungent flavor and a characteristic strong smell of aromatic plants. It has been preserved at low temperature in airtight bottles. The yield was 1.15%.

The spectrophotometric analysis showed fifty - five (55) constituents representing 98.7% of the total. The major component was the thymol (32, 58%). Other components have been identified as γ -terpinene (18.76%), phenol (17.92%), 1, 2, 3, 4-tetramethylfulvene (11.40%), isodiprene (2.79%), β -thujene (1.94%), caryophyllene (1.80%), β -sesquiphellandrene (1.43%) and linalool (1.22%).

The *O. vulgare* EO of the region of Guelma is characterized by the presence of phenols (50.81%), hydrocarbon monoterpenes (38.55%), oxygenated monoterpenes (3.38%), hydrocarbon sesquiterpenes (4.74%) oxygenated sesquiterpenes (0.39%) and acids (0.17%).

Keywords: *Origanum vulgare* L., Guelma, CPG-SM, Thymol

(19127) HPLC-TOF/MS ANALYSIS OF PHENOLIC ACIDS AND FLAVONOIDS IN GENISTA FEROX LEAVES EXTRACTS

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The Fabaceae family contains approximately 700 genera, in Algeria there are about 53 genera and 337 species. *Genista* genus has about 150 species in Europe and the Mediterranean region. A literature survey shows that this genus is a good source of phenolic compounds, in particular flavonoids and isoflavonoids, which are known for their diverse biological activities.

Algeria, a North African country with a large variety of soils (littoral, steppe, mountains and desert) and climates, possesses a rich flora (more than 3.000 species), and many of them are used in as medicinal plants.

In the present study, the qualitative and quantitative analysis, the identification and quantification of phenolic acids and flavonoids in chloroform, ethyl acetate, *n*-butanol and methanol extracts of leaves part of *Genista ferox* using HPLC-TOF/MS were reported. Three extracts were subjected to DPPH radical scavenging activity assay to evaluate the antioxidant activity.

Results show the presence of seventeen phenolic acids and twenty-seven flavonoids. Ethyl acetate extract exhibited the highest antioxidant activity with an IC₅₀ (14.2 ± 0.02) µg/ml in comparison with ascorbic acid as a standard.

Keywords: Fabaceae, *Genista ferox*, Phenolic content, HPLC-TOF/MS, DPPH

(19132) PHYTOCHEMICAL SCREENING, POLYPHENOL CONTENT AND ANTIOXIDANT ACTIVITY OF ALGERIAN GENISTA

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This work makes part of our research program on the Algerian plants of the Fabaceae family. *Genista* (Fabaceae) is a large genus with about 100 species predominately distributed in the Mediterranean area; this genus is presented in Algeria with 25 species and sub-species from which 11 species are endemic. Many species of this genus showed important biological activities and a remarkable wealth of bioactive secondary metabolites in particular isoflavonoids and flavonoids. For this cause our research was interested by the phytochemical screening, the quantification study of the total polyphenols and total flavonoids of chloroform, ethyl acetate and *n*-butanol extracts from *Genista vepres* using colometric methods. The antioxidant activity of these extracts was spectrophotometrically evaluated by measuring their ability to scavenge a stable DPPH free radical and by β -Carotene/linoleic acid bleaching assay. The phytochemical screening shows the presence of many interesting chemical groups. A high phenolic and flavonoid contents in ethyl acetate extract. The ethyl acetate extract exhibited the highest antioxidant activity in comparison with ascorbic acid as a standard.

Keywords: *Genista*, Fabaceae, Antioxidant activity

**(19146) PHYTOCHEMISTRY STUDY, ANTIOXIDANT, ANTIBACTERIAL
ACTIVITIES OF THREE EXTRACTS OF *CLEOME AMLYOCARPA*
(CLEOMACEAE)**

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In the pharmaceutical field, plants and their extracts are extremely important, and this, not only because of their efficiency in the treatment of various diseases but also because of their great tolerance towards the body too. Naturel compounds are a large group of structurally related because of their biological and physiological importance. In this context, we are interested about *Cleome amplyocarpa* (Cleomaceae), known by its richness of secondry metabolites and its potential therapeutic significance, as an antibacterial for the treatment of bronchitis and for stomach infections. The plant is native to the southeast of Algeria, Tunisia, Saoudi Arabia. Our work focused on the study of *Cleome amplyocarpa* (Cleomaceae). The dried aerial parts of cleome amplyocarpa powdered and was macerated successively with chloroform100%, chloroform/methanol (9/1) and methanol 100%, both of three extracts were pounted on TLC eluents with BAW and chloroform/ methanol (95/5) .3g of chloroform extract was cromatographed on silica gel colonne using the graduat system chloroform/ methanol to obtained 100 lots and regrouped with TLC to 22 fractions, between the fractions worked onF2, F3 and F4. The anti-bacterial and anti-oxidant activity was evaluated on crude extracts. All the compounds were identified by elucidation 1D and 2D NMR.

Keywords: Phytochemistry, *Cleome amplyocarpa*, Cleomacea, NMR 1D and 2D, Antibacterial activity, Anti-oxidant activity

(19435) DEGRADATION OF PENCONAZOLE IN APPLE AND ESTIMATION OF RESIDUE LEVELS USING LC-MS/MS

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Penconazole belongs to the class of triazole, which is one of the largest and the most important pesticide group of fungicides to control powdery mildew, pome fruit scab and other fungal pathogens on fruit and vegetables. The aim of the study was to estimate the trend of residue levels of penconazole in apple fruit after its application. The residues of penconazole were investigated in two apple cultivars Starking and Gold Delicious, which were treated with maximum (0.05%) and minimum (0.025%) levels of recommended doses of penconazole by application of commercial formulation PEN10. The apple fruit samples were collected randomly in the interval of 1, 7 and 19 days after application and were prepared for further analysis. The samples were extracted using QuEChERS method and the clean-up was achieved using the primary secondary amine (PSA) and magnesium sulphate. The qualitative and quantitative analyses of penconazole residues in apple fruit were performed using liquid chromatography coupled with mass spectrometry (LC-MS/MS) technique.

The obtained results showed that the level of penconazole residues in all analyzed samples decreased with the time after application. Thus, the level of penconazole residues vary from 0.173mg/kg to 0.037mg/kg and from 0.306mg/kg to 0.045mg/kg in Gold Delicious with the minimum and maximum applied doses at 1st and 19th day after application, respectively. Also, in the Starking cultivar the level of penconazole residues vary from 0.239mg/kg to 0.01mg/kg and from 0.493mg/kg to 0.045 with the minimum and maximum applied doses at 1st and 19th day after application, respectively. Therefore, the level of penconazole residues on first day after the application were in general, above the Maximum Residues Limit (MRL) of 0.2mg/kg for apple fruit, except the treated samples with the minimum recommended dose in Gold Delicious cultivar. Whereas, the penconazole residues in all analyzed apple fruit samples were below MRL on the 19th day after application, showing that the application of penconazole as fungicide to control fungal pathogens in apple fruit is suitable and guarantees the food quality and security for the consumers.

Keywords: Penconazole, Apple, QuEChERS, Pesticide residue, LC-MS/MS technique

(19642) CHEMICAL COMPOSITION AND ANTIBACTERIAL ACTIVITY *CEDRUS ATLANTICA* MANETTI ESSENTIAL OILS FROM MEGRESS AND BOUTALEB MOUNTAINS

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The natural area of the Cedrus gender distribution is North Africa (*Cedrus atlantica* in Morocco and in Algeria). Along this study, we were interested in the valorization of *C. atlantica* needle, by the chemical characterization of essential oils extracted by steam distillation, from two sites (Megress and Boutaleb mountains) and their antibacterial activity. Also the results of chromatographic analysis by GC/FID and GC/MS revealed that the needle essential oil is rich in α -pinene (38.08 - 50.93%), β -myrcene (37.49% - 30.3 to), Dl-limonene (10.03 – 6.4%) and trans-caryophyllene (4.8% - 1.9%) respectively for Boutaleb and Megress essential oils. The results of the antibacterial evaluations by diffusion method agar showed weak to moderate activity against the analyzed strains. The oils of each population have very different diameters of inhibition. For the population of Megress, the antibacterial activity of the oil is very important especially vis-à-vis *Staphylococcus aureus*. While the oil of the population of Boutaleb is almost inactive against the studied strains.

Keywords: *Cedrus atlantica*, Chemical composition, Antibacterial activity

(19648) FLAVONOIDS FROM THE AERIAL PARTS OF *CLADANTHUS MIXTUS* (L.) OBERPR. & VOGT.

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The genus *Cladanthus*, belonging to the Asteraceae family, is closely related to the genus *Anthemis*, *Chamaemelum* and *Ormenis*. It comprises about five species, mainly distributed in south-west Europe and the Mediterranean region. *Cladanthus* species are used in traditional medicine as anti-icteric, antifeedant and likewise as ornamental plants. Previous phytochemical investigations on the *Cladanthus* genus indicated the presence of essential oils, sesquiterpenoid lactones, coumarins and flavonoids (artemetin). According to literature survey, the essential oil of *Cladanthus* have exhibited various biological properties, such as antioxidant, antimicrobial and insecticidal activities. The present study reports the isolation and structural identification of a 17 known flavonoids from the *n*-butanol extract of the aerial parts of *Cladanthus mixtus* (L.) Oberpr. & Vogt., for the first time., The structures were established either by comparison with authentic substances or by UV, 1D and 2D NMR spectroscopic methods, including 1H and 13C NMR, COSY, ROESY, HSQC and HMBC experiments and ESI-MS.

Keywords: *Cladanthus mixtus*, Asteraceae, Flavonoids

(19650) FLAVONOIDS AND ANTIOXIDANT ACTIVITY OF *THAPSIA GARGANICA* FROM ALGERIA

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In continuation of our investigation of flavonol glycoside distribution in Algerian medicinal plants, we report here our study on the aerial parts of *Thapsia garganica* L. (Apiaceae). This is the first time that flavonoids are isolated from this species from which the roots are traditionally used to treat rheumatism.

The aerial parts of *Thapsia garganica* L. (Apiaceae) were collected during the flowering period in May (2010) at Constantine, Algeria. A voucher specimen was deposited at the Herbarium of the Laboratory under the code number LOST.Tg.05.05.

Air dried aerial parts of *Thapsia garganica* (2000 g) were macerated three times with 70% MeOH solution. The hydroalcoholic solution was concentrated under reduced pressure to dryness, and the residue was dissolved in hot water (1000 mL) and kept in the cold overnight. After filtration, the aqueous solution was successively extracted with EtOAc once and with *n*-BuOH for three times; then the EtOAc and *n*-BuOH extracts were evaporated to dryness.

The butanolic extract (20 g) was subjected to column chromatography on polyamide SC6 with a gradient of toluene–MeOH of increasing polarity. Preparative TLC on Polyamide DC6 using the system toluene–MeOH–methyl ethyl ketone (4:3:3) and Whatman PC N°3MM, followed by flash column chromatographies on Sephadex LH20, eluted with MeOH, led to ten compounds (**1–10**).

Compounds **1–10** were identified by the use of spectroscopic techniques (NMR, UV, mass spectrometry) and acid hydrolysis; they were divided into five flavonol 3-*O*-glucosides (**1–5**), three flavone 7-*O*-glucosides (**6–8**), and two diglycosides (**9–10**).

The DPPH radical-scavenging activity of the methanolic extract of the flowers (FMETG) and that of the leaves (LMETG) of *Thapsia garganica* was assayed by a slightly modified method of Blois. After 30 min, the absorbance of the solution was measured at 660 nm and the antioxidant activity calculated using the following equation: DPPH radical-scavenging activity % = [(Absorbance of the control – Absorbance of the sample)/Absorbance of the control] × 100.

Keywords: *Thapsia garganica*, Apiaceae, Flavonoids, Antioxidant

(19661) NEMATICIDAL ACTIVITY OF THE DERIVATIVES OF OLEANOLIC ACID

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3 β -hydroxy olean-12-ene-28-oic acid (Oleanolic acid) is sound known pentacyclic triterpenoid isolated from various plants. Oleanolic acid possesses many biological activities such as cytotoxic, anti-inflammatory, diuretic, insecticidal, antibacterial and antifungal. Numerous studies have been designed to modify the structure of oleanolic acid with the hope of improving its physical proper for better bioavailability to enhance its bioactivity. Furthermore, it is clearly demonstrated that the chemical structure of oleanolic acid has three “active” sites, the C3 hydroxy, the C12 to C13 double bond and the C28 carboxylic acid which may be chemically modified and thus change its physical and pharmacological effects.

Ester derivatives of oleanolic acid have been synthesized and evaluated for their nematicidal activity. Their structures were predicted with the help of IR, UV, EI-MS and ¹H-NMR spectroscopic techniques. Solvent-solvent extraction, column chromatography and preparative thin layer chromatography were used for the purification of the compounds.

Key words: Oleanolic acid, Pentacyclic triterpenoid, Ester derivatives, Nematicidal activity

(19691) ANTI-HERPES SIMPLEX VIRUS AND CYTOTOXIC ACTIVITIES OF THE SUCCULENT PLANT *GRAPTOPETALUM PARAGUAYENSE* E. WALTHER

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About 90% of infectious diseases have viral etiology. Herpes simplex virus types 1 and 2 (HSV-1 and HSV-2) are the most common human pathogens, infecting about 90% of the world population. Unlike antimicrobial drugs against bacteria and fungi, only a few effective antiviral drugs are available. The toxic side effects and the emergence of virus strains that are resistant to the drugs, enhance the need for new effective compounds against viral infectious diseases. Medicinal plants are known to be a source of abundant of chemical compounds and traditionally used in healthcare in many countries.

The aim of our study is to evaluate *in vitro* anti-herpes simplex virus effect and cytotoxicity of *Graptopetalum paraguayense* E. Walther (*Crassulaceae*) extracts using colorimetric assay. To evaluate the main organic groups, which had the aqueous leaf extract of the tested ethno plant GC/MS analysis was performed. Next three main fractions were obtained - A (lipids), B (amino and organic acids, carbohydrates) and C (phenolic acids) and the composition of each were determined by GC/MS analysis. The first important step of antiviral experiment is determining of cell proliferation and viability. Both maximal nontoxic concentration (MNC) and cytotoxic concentration for inhibiting 50% (CC50) values were evaluated simultaneously by morphological (microscopically) and by cell survival criteria (MTT-test). To determine the capacity of the whole extract, as well as the three main fractions to inhibit the lytic activity of HSV-1, strain Victoria and HSV-2, strain Bja we use MTT colorimetric assay. The results are expressed as concentrations, which have 50% inhibitory effect on the viruses (IC50) and are possible to calculate selectivity indexes (SIs).

The aqueous extract of *Graptopetalum paraguayense* E. Walther has not cytotoxic effect on RD 64 and Lep cells. It effectively inhibits HSV replication in dose-dependent manner. Furthermore, the aqueous extract was effective inhibitor of HSV-1 replication (97%), whereas its effect to HSV-2 was significantly lower *in vitro*. IC50 values are not so significantly lower than that of ACV. Fraction C has not CPE on human cell lines and inhibits HSV replication in dose-dependent manner. A and B fractions showed no antiviral effect. The mechanism of the action of fraction C is not yet completely identified. Further studies are needed in order to verify which compounds could be responsible for this activity.

Keywords: Anti-herpes simplex virus activity, *Graptopetalum paraguayense* E. Walther, cytotoxicity, MTT assay, GC/MS

(19760) TEMPLATE SYNTHESIS OF NOVEL OXO-VANADIUM (IV) COMPLEXES WITH PHENANTHROLINE

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Phenanthroline-derived ligands and their complexes are known to exhibit many biological activities such as anticancer, antibacterial, antiviral and anti-parasitic effects. In particular, their vanadium complexes have been shown to present antidiabetic properties to similar that of insulin. For this reason, phenanthroline-derived vanadium complexes have begun to attract the attention of scientists.

The vanadium complex was synthesized by the template method as a result of the reaction of 1,4-diaminobutane with 1,10-phenanthroline-2-carboxyaldehyde in the presence of VOSO₄.H₂O salt. Two more similar complexes were synthesized by the same method. At first, the diamine 1,4-diaminobutane was replaced by 1,6-diaminohexane in the reaction. Then, the root followed by replacing 1,4-diaminobutane with 1,8-diaminohexane to obtain the third complex. The structures of the complexes are characterized by their Fourier Transform Infrared Spectra and Energy Dispersive X-ray (EDX) spectra. Also, the conductivity and magnetic moment measurements in addition to thermogravimetric methods were employed to determine the properties of the complexes.

Keywords: VO (IV), Schiff base, Template, Phenanthroline

(19762) SYNTHESIS OF VO (IV) COMPLEXES OF NEW SYMMETRICAL N₂O₂ TETRA-DENTATE LIGANDS

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The coordination chemistry of oxo-vanadium (IV) complexes have aroused significant interest due to the attempts of designing long-acting drugs in human metabolism in addition to its utility in several biological processes such as antimicrobial, antioxidant, antitumor effects.

A Schiff base condensation reaction of 1,6-diaminohexane with 2-furan-carboxyaldehyde resulted in a novel symmetrical ligand. The other similar ligand was synthesized using 1,8-diaminoquine instead of 1,6-diaminohexane in the latter reaction. The ligands were then treated with the VOSO₄H₂O salt to obtain oxo-vanadium (IV) complexes. The ligands were characterized by FT-IR, ¹³C-NMR, ¹H-NMR, LC ESI/MS. The oxo-vanadium (IV) complexes were revealed by FT-IR, energy dispersive x-ray spectrum (EDX), thermogravimetric (TG) methods and conductivity and magnetic susceptibility measurements.

The Broth Micro dilution method was used to determine antibacterial efficiency of the ligands and the complexes on a spesific bacteria family. It has been observed that the complexes, probably due to their Oxo-vanadium ion, were more active than their parent ligands, and these activities can be classified moderate when they are compared with the antibiotic tests on the bacteria.

Keywords: Schiff base, VO (IV), Furan

(2022) SYNTHESIS AND CHARACTERIZATION OF NOVEL AZO-COMPOUNDS

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Azo dyes are organic compounds, which contain the colouring azo function (N=N-). The azo function is often bound to an aromatic ring, and the dye can then be broken down to an aromatic amine, arylamine. This can take place either chemically, through 'reductive cleavage', or through the body's own enzyme system. Some azo dyes can also be broken down to arylamines during storage due to light and high temperature. Some arylamines have been judged to be carcinogenic. The best known one is aniline. It is important to remember that not all azo dyes are based on arylamines. Azo compounds, which were developed in the mid 1800s, are one of the most common dye materials and are useful synthetic intermediates. They have been widely utilized as dyes and analytic reagents; they are also used in substrates such as textile fibres, leather, plastics, papers, hair, mineral oils, waxes, foodstuffs and cosmetics and considered as the most important class of synthetic dyes and pigments, representing 60 - 80% of all organic colorants. Hence azo colorants are part of our everyday life, they are all around us and we could not do without them. They contain the basic structure of Ar-N=N-Ar'. Their color is due to the high level of conjugation that extends through N-N double bond to the aryl unit. Azo dyes are prepared in a two steps reaction, the first being the synthesis of an aromatic diazonium ion from an aniline derivative. The next step is coupling of the diazonium salt with an aromatic compound. The colours of azo dyes include different shades of yellow, red, orange, brown, and blue.

Keywords: Azo-dyes, Diazotation, Copulation, Chromophores, X-ray diffraction

**(20268) DETERMINATION OF SOME MICRO AND MACRO ELEMENT LEVELS
IN PACKAGED MILKS CONSUMED IN EDİRNE**

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Milk, which contains proteins, vitamins, enzymes, mineral substances in its structure is among the most consumed staple food products around the world. In terms of macro elements such as sodium (Na), calcium (Ca), phosphorus (P), potassium (K) and magnesium (Mg), milk is a good mineral source. In addition, it contains micro elements such as cadmium (Cd), aluminum (Al), zinc (Zn), mercury (Hg) and lead (Pb). However, the increase of some elements in the milk may cause toxic effects.

In this study, it was aimed to determine some micro and macro element levels of packaged milk samples belonging to 10 different brands which were presented for consumption in Edirne province. Element levels of Ca, Na, Mg, K, Al, Zn, Fe, Co, As, Cd and Pb of the samples were determined as ppm ($\mu\text{g/ml}$) using inductively coupled plasma mass spectrometry (ICP-MS). These elements contents found in packaged milk samples were compared with the limit values stated in the Turkish Food Codex. Low levels of Na, K, Mg, Ca were determined in 20%, 30%, 40%, 90% of the samples respectively. High levels of Na, K, Zn, Mg, Pb were determined in %10, %60, %20, %10, %10 of the samples respectively. It was observed that the amounts of iron, cadmium and aluminum elements did not exceed the limit values. As a result, it was determined that the amount of the elements in the packaged milks differ according to the brands. Determination of micro and macro element levels in packaged milks may be an indicator of whether the milk is adequate in terms of mineral nutrients or whether exposure to heavy metal contaminants such as machinery, equipment and packaging materials used during their production. Since heavy metals are an important issue for community health, care should be paid to inspections of packaged milks and the work done in this direction should be increased.

Keywords: Milk, Heavy Metal, Macro Element, Micro Element, ICP-MS

(20797) ION EXTRACTION CAPABILITY STUDIES OF NEW BENZO-15-CROWN-5 COMPOUNDS WITH ALKALI AND TRANSITION METAL IONS

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The selectivity is very important for the separation of species of a similar chemical nature. The selective metal cation separations based on molecular recognition processes are related to supramolecular chemistry. The key to an efficient separation process is the development of an extractant macrocyclic ligands, called crown ethers that bind metal ions such as sodium, potassium, lithium, cesium, strontium and barium. An appropriate macrocyclic ligand exhibits good extraction selectivity for desired metal ion species.

In this work, we studied the extraction capabilities of synthesized new crown ether ligands with alkali and transition metal cations (Li⁺, Na⁺, K⁺, Mn²⁺, Zn²⁺, Cu²⁺, Ni²⁺, Pb²⁺ and Cr³⁺) by the UV-Vis. spectrophotometric method. The percentage of extraction (E%) was determined based on the absorbance of pikrat ion in the aqueous solution. The extractibility of alkali and transition metal picrates into the organic layer was calculated.

Keywords: Crown ethers, Solvent extraction, Metal picrates, Extraction capability

(20935) ANALYSIS OF THE VOLATILE ORGANIC COMPOUNDS FROM LEAVES AND NECTAR OF AUSTRALIAN GROWN *LEONURUS SIBIRICUS*

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Leonurus sibiricus which known as a Motherwort, it is a member of the family Lamiaceae and native to India and central and Southwest Asia, including China, Mongolia, and Russia. Moreover, now it is naturalized in many other parts of the world including South, North and Central Americas. Headspace solid-phase microextraction HS-SPME /GC-MS was optimized to identify the volatile bioactive compounds in the leaves and for the first time, the flower nectar of Australian grown *Leonurus sibiricus*. The alcohol 1-Octen-3-ol (octenol) was identified as the most abundant constituents of the flower with nectar and the leaves from *Leonurus sibiricus* grown in Australia. It made up more than 50% of the total volatile compounds in both sample types. It is the most common volatile compounds in straw mushrooms and has also been found in blue cheeses, and in some fruit sources, such as orange juice oil, raspberries and elder flowers as well as in Australian prawns and sand-lobsters. It is also known to attract biting insects such as mosquitoes and indeed, it has been used in mosquito traps. Australian grown *L. sibiricus* should be highly considered in the production of octenol for using as flavouring agent.

Keywords: *Leonurus sibiricus*, 1-Octen-3-ol, HS-SPME, Volatile Organic Compounds., Nectar, GC-MS

(21181) PROPERTIES AND TRANSFORMATION PHASES OF ZNO–BI₂O₃ BINARY SYSTEM VARISTORS BASED ON NANOMETRIC POWDERS

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The aim of this work is the production of zinc oxide (ZnO) doped with bismuth varistors from powders of nanometric size and the study of the effects of sintering temperature transformation α , β and δ phases at (650 ° C, 730 ° C, 800 ° C, 900 ° C, 1000 ° C). The synthesis technique used is the Sol-gel method. In order to do this, we have studied by DRX the structural properties of the obtained varistors, by FTIR (Infrared Spectroscopy with Fourier Transform) the optical properties, by UV-Visible spectrophotometry for the evaluation of the optical gap and by AFM, SEM and TEM microscopy for the determination of the Morphology of the surfaces and the Bi intergranular phases of the varistors. An IR characterization was also carried out in order to confirm the appearance of Bi-linked phases. Ultimately, all this was completed by determining the eclectic characteristics J (E), which is considered the most important because it allows us to determine the varistor effect, characteristic on which the manufacture of varistors is based.

Keywords: ZnO, Zn-1% Bi-O, Sol-Gel, Sintering, α , β and δ -Bi₂O₃ phases, Varistor, J (E)

(20379) BIO-OIL AS AN ALTERNATIVE SOLVENT FOR BIOMASS LIQUEFACTION: INFLUENCE OF SOLVENT RATIO

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The biomass conversion by solvolytic liquefaction to produce bio-based polyols is a promising method of producing foam. Phenol and polyhydric alcohols are the most widely used solvents concerning solvolytic liquefaction of biomass. In this study, the usability of pyrolysis oil as solvent in the liquefaction reaction was examined. Spruce tree sawdust (STS) was liquefied by using phenol and bio-oil mixture as the liquefaction solvent with two different biomass: solvent ratios of 1:3 and 1:5. The amount of surfactant was increased by 25% compared to the conventional method, so that more complex and dense bio-oil as compared to phenol was used in the liquefaction process. The effects of conditions on the properties of carbon foams were investigated via elemental analysis, x-ray diffraction, nitrogen sorption isotherms, scanning electron microscopy techniques, bulk density and compressive strength tests.

Keywords: Carbon foam, Pyrolysis, Spruce tree sawdust, Solvolytic liquefaction

(20382) BIO-FUEL OIL CHARACTERISTIC OF DATE STONE PYROLYSIS

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Pyrolysis of food waste is an essential method to support the utilization of biomass energy. This methodology provides a novel, cost-effective and environmentally compliant technique of evaluating recovery potential of valuable products. Pyrolysis experiment of date stone (DS) as biomass was carried out at 520°C with 100 cm³/min sweeping gas (N₂) velocity and heating rate 100°C/min. The pyrolysis experiment yielded bio-fuel oil (24%) with high calorific value (27 MJ/kg), char (31%) and non-condensable gas (19%). The pyrolysis characteristic of DS and its bio-fuel oil were analyzed using elemental analysis, Fourier-transform infrared spectroscopy (FT-IR) analysis, gas chromatography/mass spectrometry (GC-MS) and proton nuclear magnetic resonance (1H-NMR). Thermogravimetric analysis (TG) was also used for DS and the results showed that pyrolysis temperature of DS fall in the range of 220°C–450°C. Besides, GC-MS analysis indicated that the main pyrolysis products of DS were between C₄-C₃₂. The FT-IR and 1H-NMR analysis were also applied to investigate the characteristics of bio-fuel oil. Based on the results above, it was confirmed that DS can be utilized as a potential bio-resource to obtain especially phenolic component enriched bio-fuel oil. Thus, the obtained bio-fuel oil can also be useful material for industrial production.

Keywords: Bio-fuel oil, Characterization, Date stone, Pyrolysis

**(18860) IMPROVEMENT OF SOME MECHANICAL PROPERTIES OF FABRICS
USING *EUPHORBIA* EXTRACT**

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Textile products are the product group that is mostly related to the human body after foodstuffs. Dye residues and chemicals on our clothes penetrate into our body through sweating and respiration and affect our health. In the study, it was aimed to improve the various mechanical properties of fabrics by using the *Euphorbia* extract and to find natural alternatives to chemicals.

In the study, firstly the *Euphorbia* was collected from nature, and its species was identified. The plant was dried in an appropriate environment, and whether the plant burned easily due to its oxygen scavenging property was tested. The extract was obtained from the dried samples by the boiling method. The sample fabric was obtained by investigating to which fabrics the extract could be applied, and AR-GE controls were made. The extract was used with various fabrics, and the most suitable fabric was selected. The rubbing fastness, touching, flammability, crease resistance, and abrasion (abrasion resistance) tests were performed in the sample produced and standard fabrics, and then the results were evaluated.

As a result of the study, it was determined that the sample fabric produced using *Euphorbia* extract gave better results than the standard fabric in the wet and dry rubbing fastness, crease resistance and mechanical friction resistance tests and gave the desired amount of toughness, density, and smoothness to the fabric in the touching test. In the flammability test, it was observed that it started to catch on fire in about 13-14 seconds and that the result was positive since 10 seconds is taken as criteria in these tests performed in advanced laboratories. It is remarkable that the chemicals used for these properties in the studies carried out are largely carcinogenic. It is thought that the data obtained in the study can be further developed by experts in their fields and that fabrics can be produced using natural substances instead of chemicals harmful to health.

Keywords: *Euphorbia*, Natural fabric, Dye pouring, Friction resistance, Fire resistance

(19944) MODIFICATION OF AROMATIC POLYAMIDE THIN FILM COMPOSITE REVERSE OSMOSIS MEMBRANES BY ATMOSPHERIC PLASMA TREATMENT

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There is an increasing interest in use of reverse osmosis (RO) process for juice concentration, showing satisfactory results regarding the preservation of the final product quality. One of obstacles limiting widespread use of RO membranes is their proneness to surface fouling. The semi-hydrophilic nature and rough surface morphology of the polyamide (PA) thin film composite (TFC) membranes increases their affinity with organic foulants. It has been demonstrated that increasing surface hydrophilicity of the polymeric membranes can limit their affinity with organic foulants. This study aimed to modify surface characteristics of commercial polyamide TFC RO membranes to improve hydrophilicity by using atmospheric plasma systems. Three different gas precursors (nitrogen, argon, and oxygen), various table speeds (1.5-2.5 mm.min⁻¹) and passage times (2-6) under the plasma jet have been systematically evaluated to assess the effect of plasma on surface characteristics of the membranes. Surface hydrophilicity of the plasma-modified PA TFC membranes were examined by the static contact angle analysis and respective surface free energy (SFE) components. It was observed that argon treatment had no pronouncable effect on surface hydrophilicity, where ~5 fold increase was observed in polarity of membranes following oxygen and nitrogen plasma treatments. The most effective plasma parameters selected by evaluating the alterations in the SFE components of the resulting membrane surfaces and the membranes treated under selected parameters were further characterized by SEM and FTIR/ATR analyzes.

Keywords: Atmospheric plasma, Reverse osmosis, Fouling, Polyamide membrane

**(20103) INVESTIGATION OF TOXIC METAL POLLUTION FOR THE LAKE TUZ
BRINE**

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The shallow brine of the Lake Tuz (main Lake-Turkey) evaporates to a large extent during the summer months of the year, leaving a salt crust (mainly halite) that can be economically exploited. Analyzed toxic metal concentrations of the brine samples were compared to the WHO-Drinking Water Quality Standards to evaluate whether there is a possible pollution hazardous to health. The concentrations of the As and B elements in the samples remain well above the maximum allowable concentration values of the WHO, while the Cd, Cr, Pb and Se concentrations are in the limits but the Ba, Cu and Ni concentrations are below than the WHO standard values. It is therefore possible that some toxic metals in the brine might be transferred into the salt crust during the precipitation from itself. As a consequence, we suggest that the salts produced from the Lake Tuz should not be used in our foods without the necessary treatment is done, as it may be risky for human health.

Keywords: Brine, Health risk, Lake Tuz, Salt crust, Toxic metals

**(20697) THE FINDING OF SUITABLE BIOCOMFORT AREA MAPPING FOR
KARABUK CITY CENTER**

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People experience nominal temperature, precipitation, and humidity, and in certain ranges of environmental conditions, such as wind, they feel healthy and dynamic. In the appropriate range for the people of these values, it is called biocomfort. When biocomfort will be in the range of fair value, people in the area would become bothered and want to get away from the area. Hence, biocomfort areas used for tourism are important.

In this study, biocomfort is examined by mapping the Karabuk, and thus, this study aims to build pad similar studies in urban or forest areas with similar structures. To this end, the climatic data of Karabuk are obtained; based on the equivalent temperature from the physiological index, biocomfort maps are prepared. To determine the structure of the biocomfort field, climatic data are collected from meteorological stations. The obtained data are evaluated using the RayMan 1.2 program, and geographic information system is used to produce a thermal perception map with the help of a software. As a result, the most appropriate time and area for outdoor recreation activities are identified by thermal perception maps.

Keywords: Landscape plan, Forest, Karabuk, Biocomfort

(20699) THE ASSESSMENT OF ACCESSIBILITY OF URBAN GREEN AREA FOR KARABUK

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An urban green space distribution of active and functional and aesthetic qualities of size and systematic planning will be possible with the development of an urban design concept. The adequacy of the standard value of green space is usually specified in the relevant legislation and comparing it with the amount of green space available per city are defined. Size and decreasing rates per person evaluated. Even distribution of distance and accessibility of green space throughout the city is closely related to the need to provide entertainment. Different sizes of green space, recreational activities and accessibility standards unit varies depending on the city they serve. In this research, Karabuk green field distribution and distribution of the amount of green space in the neighborhood, as well as scale are analyzed. According to the digitization of parks composed of polygons in the ArcGIS attribute table for calculation, parks in the study area consist of 30 different parcels, 12 of which are 10000 m² or less in area. Most small parklands were 1.296 m²; the largest urban park is at the southern entrance of the city, with an area of 5.624 m². Parks in the study area cover a total area of 8.358 m².

Keywords: GIS, Karabuk, Green space, Urban city, Dustainable

(21219) QUATERNARY LAKE PLAYAS IN IRAN; SIGNIFICANT SOURCE OF WINDBLOWN DUST

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During the late Quaternary with the end of Pleistocene epoch and climatic fluctuations in Holocene, a coarse face of arid environments created in many parts of Iran. Playas are the remnants coast of Quaternary lakes with geomorphic facies including Sabkha, Chott, Clay-pan, and Kavir (Salty pan). The studies indicated a strong bond between civilization development in the margin of playas in Iran. The dust cycle in arid zones is known by a windblown dust transfer from playas to piedmonts. Today many permanent lake playas are drying due to anthropogenic activities mainly overexploitation and mismanagement of water resources. Although the drying process of Urmia lake, as the widest endemic lake of Iran and international habitat, is bolded, unfortunately, all of the lake playas of Iran are drying or dried approximately such as Hurolazim in the south-west, Hamoon in the east, Parishan, Gavkhoni, Bakhtegan, and Maharloo in central Iran. The aim of this article is studying the significant role of these lakes for windblown dust emission in recent years. Since many of these lakes involved sabkha and salty pans, emission of salt components with windblown dust is a hazard for human health. In this paper has been studied the role of dried lake playas as the degradation-aggregation zone for windblown dust emission in the recent decade. Based on the recent windblown dust in Khozestan and Hurolazim lake playa alterations, a conceptual analysis has been done. The finding shows that Khozestan plain receives windblown dust from nearby Hurolazim Lake playa with decreasing water table and land use change in this area. The close relationship between the lake playa and dust nature of Khozestan suggests that eolian transport can arise from lake playa. These results have important implications for combating desertification and windblown dust problems.

Keywords: Windblown dust, Quaternary lake playa, Urmia, Khozestan, Hurolazim

(21242) FREQUENCY ANALYSIS OF MAXIMUM TEMPERATURES IN THRACE REGION

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One of the most studied meteorological parameters is temperature due to climate change on recent times. With this research, it is aimed to determine provinces where maximum temperatures can be encountered in Thrace. Frequency analysis in hydrology mostly apply to rainfall and discharge parameters. Working frequency analysis on temperature parameters are not common. In this study, frequency analysis was performed by applying the Kolmogorov-Smirnov (K-S) test on maximum temperature data representing three provinces of Thrace. Given the comparisons of the maximum temperatures in all recurring years, the order of the stations from the heat to the cold is Edirne, Kirklareli and Tekirdag respectively. According to the K-S test, the frequency of encountering bigger maximum temperatures in Edirne is bigger than Tekirdag. When we look at the statistics of past data, it is only Edirne where the highest temperature values in Thrace can be seen in the future If other factors such as climate change and greenhouse gas emissions are ignored. In terms of agricultural production in Thrace, it is suggested that the cultivation of plants with high temperature demands and the keeping of livestock that will not be harmed at high temperatures in Edirne.

Keywords: Frequency Analysis, Kolmogorov-Smirnov test, Thrace Region, Temperature

(18659) IMPACT OF THE DISCHARGE OF WASTEWATER IN THE SOUMMAM WATERSHED ON THE ENVIRONMENT AND PUBLIC HEALTH (CASE OF THE DAIRY DANONE DJURDJURA ALGERIA)

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Oued Soummam, which meanders through several villages in the Wilaya of Bejaia and is used by some communes as a "septic tank", experiences multiple daily aggressions caused by industrialization, agriculture and urbanization. The dairy DANONE Djurdjura Algeria, like all the agro-food industries uses a lot of water for the manufacture of its products as well as for cleaning and disinfection, it generates 1481m³ of wastewater per day. The purpose of treating or purifying wastewater is to reduce the pollutant load that it contains in order to allow better protection of the ecosystem. As part of the realization of our work, we aimed to identify and quantify possible pollutants by performing physicochemical analyzes of the effluents of Danone Djurdjura Algeria, as well as the evaluation of the effectiveness treatment of its water treatment plant. the objective of this study is the evaluation of the pollutant load of dairy wastewater Danone Djurdjura Algeria treated by a physicochemical wastewater treatment plant and their impacts on the receiving environment and on public health, pre- and post-treatment samples were systematically collected and analyzed with a view to measure physico-chemical parameters: chemical oxygen demand, demand biological oxygen content over 5 days, suspended solids, nitrogen compounds and heavy metals. The results revealed that the pollution caused by Danone Djurdjura is essentially organic expressed by a COD (1882 mg/l), BOD5 (752 mg/l), a COD / BOD5 (2) and Solid Suspended solids (4427 mg/l), but also inorganic expressed by nickel contents (3.95 mg/l) and copper (3.97 mg/l), this results showed very high far exceeding Algerian standards, and this is due to the variability in flow rates, concentrations and of the nature of these effluents and various products used in process and treatment.

Keywords: Wastewat pollution effluents, Chemical oxygen demand, Biological oxygen demand, Suspended solids, Heavy metals, Organic pollution

(18812) PULP AND PAPER WASTEWATER TREATMENT THROUGH BIOLOGICAL PROCESS AND ITS EFFECTS ON SEED GERMINATION, VIGOR AND SEEDLING GROWTH OF BRASSICA CAMPESTRIS

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Pulp and paper industry consumes large quantities of fresh water during pulp processing resulting into large amount of highly contaminated wastewater with high biological and chemical oxygen demand. Different treatment processes like physicochemical, biological and integrated ones have been employed with each having advantages and disadvantages. None of study has documented comparative efficacy of individual and/or sequential biological wastewater treatment and its subsequent effects on seed germination and seedling growth. Pulp and paper wastewater were treated with three biological treatments *viz.* aerobic, anaerobic and sequential (i.e. anaerobic and aerobic) and at the end treated water was used as irrigation to determine its phytotoxic effects on seed germination, vigor and seedling growth of mustard (*Brassica campestris*). Electric air diffuser and minimal salts medium in sealed plastic bottles at control temperature were used for aerobic and anaerobic treatments, respectively. The significant reduction in chemical oxygen demand (COD) (81%), total suspended (TSS) (65%), dissolved solids (TDS) (60%) and turbidity (68%) was recorded during sequential treatment. TSS removal efficiency of aerobic treatment was found to be higher than anaerobic treatment while COD, TDS, and turbidity were effectively removed by anaerobic process. Sequential treatment greatly reduced phytotoxicity of wastewater and showed the highest germination percentage (90%) compared to aerobic (60%) and anaerobic (70%) alone and from untreated wastewater which showed only 30% germination. Regression analysis also endorsed these findings ($R^2=0.95$ between seed germination, seedling growth and vigor). Based on these findings, we conclude that the sequential treatment could be a more effective strategy for treatment of pulp and paper industrial wastewater with efficiency to be used for irrigation of mustard crop without toxic effects.

Keywords: Chemical Oxygen Demand, Industrial Wastewater, Mustard, Phytotoxicity, Total dissolve solids, Turbidity, Total soluble salts

**(18835) ECOPHYSIOLOGICAL STRATEGY FOR SOIL SALINITY MITIGATION
BY USING HALOPHYTIC PLANT TO AGRICULTURAL DEVELOPMENT**

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In the arid countries, the soil salinization process takes more and more the momentum in these last years, factor of degradation of the biotope, the loss of the plant biodiversity and the reduction of the agricultural area. Salinity is characterized by the process of accumulation of salts in the soil especially at the root level causing harmful effects on plants and soil. Among the possible strategies to rehabilitate and enhance these areas in the perspective of agricultural development, the ecophysiological approach remains possible through the introduction and intensification of salinity tolerant species. The choice of the halophytic species responds to aim because they have the capacity to accumulate Na^+ and exclude it which reflects a biological mechanism of phytoremediation of soils contaminated by salts. These species have many interests, ecological in the protection and fixation of degraded soils, that food because of their high protein. The introduction of halophytic species requires knowledge of certain mechanisms involved such as cationic mineral management at the plant level under salinity constraints.

The proposed work is based on an analysis of the cationic responses of juvenile plants of two atriplex species, *Atriplex halimus* L. and *Atriplex canescens* Pursh Nutt, subjected to a salt regime with NaCl at 100 and 600 mM.l-1 of Hoagland solution to determine the salinity tolerance threshold for each species.

To target potential Na^+ , K^+ and Ca^{++} accumulation sites of both species, we propose results of the cationic variations of Na^+ , K^+ and Ca^{++} foliar and root plants of both species, the evaluation of the relative salt susceptibility index (ISRS), the evaluation of the ratio K^+/Na^+ foliar and root for the determination of the selective transport of K^+ over Na^+ between foliar and root.

According to the analysis of these parameters, the results show a variability of the cationic status of the two species related to the salt regime, the measured parameters and the species.

Keywords: Halophytic plants, Phytoremediation, Cations, *Atriplex* species

(18898) EVALUATION OF COMPOSTING VEGETABLE WASTE AND PHYSIC-CHEMICAL PROPERTIES FOR COMPOST MATURITY

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Vegetable waste market is a special solid organic waste that has high moisture content and high organic substrate. General disposal of vegetable waste from market is through dumped it in opened landfill with improper practices management. As the vegetable waste has high content and readily biodegradation, it is causing major environmental problems due to improper waste management practices in Libya. Thus, the composting could be a best alternative practices to disposal of these organic waste as well as produce high quality compost use as organic fertilizer. Therefore, the aim of this study was to evaluate quality of compost produced from windrow vegetable waste.

Four Windrow piles were conducted by adding sheep manure to vegetable waste based on four ratios. During 100 days of composting the piles were irrigated to keep water content at field capacity. The piles were 5 times turned during the high temperature phase above 65°C after 7, 15, 30, 60, and 90 days. Samples were taken during composting to measure physico-chemical properties, including the moisture content (% w w-1), bulk density, total carbon and nitrogen were measured. The EC and pH of samples were measured.

The changes during composting period in selected physico-chemical properties was observed. A maximum of temperature was observed after 21 days of composting due to higher organic matter decomposition. Initially, the temperature in the pile was about 18°C and after the first week it increased to reach 45°C. The pH was recorded between 7.1 and 7.8 in all treatments, while the EC was decreased with composting. However, the EC was then observed to increase gradually after 42 days of composting before decreasing again after 75 days of composting. The moisture content remained 60 to 70% during composting. However, after 100 days of composting the moisture content was recorded less than 60% in all treatment. Initial C: N ratio was 15 due to the high nitrogen content in vegetable waste, however, gradually decreased to be between 9 and 5 after 14 days, the final C: N ratio of matured compost was between 7 and 5.

Keywords: Composting, Windrow, Vegetable waste

(18935) THERMOSOLUTAL NATURAL CONVECTION IN PARTIALLY POROUS CAVITIES

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The study of thermosolutal convection in saturated porous media takes place more and more important due to the considerable challenge that it represents in new problems related to competition effects of heat and mass. The importance of porous media in the industrial and technological phenomena and processes is now well established. However, despite the rise of ways to study, gaps still exist in terms of basic knowledge, especially understanding the phenomena of heat transfer and mass transfer in systems include porous media.

Therefore, studies of the double diffusive convection in the presence of a porous medium are currently the subject of an ever increasing interest. This interest is due to many practical applications relating thereto, in various applications industrial and natural medium such as the diffusion of pollutants in soil, drying of agricultural products and pharmaceuticals, diffusion of the radioactive substances in the underground deposits reserved for nuclear waste, diffusion of the chemical elements in reactive porous beds (coal gasification), environment, storage of agricultural products, chemical processes.

In this investigation we focus on the heat and mass transfer generated in a composite fluid-porous layer. porous layer is considered homogeneous, isotropic and saturated aqueous solution. The domain right and left vertical walls are considered at uniform different temperature and concentration. The influence of the main parameters of double diffusive convection is investigated, Raleigh number, Lewis number and Buoyancy ratio on the flow structure and heat and mass transfer. The numerical results are presented and analyzed in terms of streamlines, isotherms, isoconcentrations lines and for the average Nusselt and Sherwood numbers.

Keywords: Thermosolutal convection, Porous medium, Bi-layer, Two-dimensional

(19108) GLOBALIZATION AND ITS INFLUENCE ON THE ECONOMY AND OTHER SYSTEMS OF THE PUBLIC RELATIONS

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The purpose of this article is to make the research of globalization and its influence on the economy and other systems of the public relations. Analysis of the problems of the globalization and its peculiarities was investigated by various scientists, representing the most different areas of scientific knowledge. In most cases, globalization is associated with participation and inclusion of the majority of the states and societies in the mutual relations that causes complication of the public relations in financial and economic, political, social and legal aspects that is also closely connected with expansion of information space and development of modern technologies. The term “globalization” is the main term used for designation of the specified processes though in the doctrine exist also other concepts, such as “internationalization”, “universalization” and many others. The driving force of self-control of system of the public relations causes development of the society in the course of globalization directed on preservation and a survival of society through formation of global society with a global law and order on the basis of justice (orderliness, efficiency and a compromise of interests). The global law and order is the social form and manifestation of self-control of the public relations which is expressed in a certain system of regulation and management of the public relations for ensuring qualities of orderliness, efficiency and a compromise of interests in society. These provisions are the main conclusions of this part of research, and are made on the basis of the analysis of applicable scientific-theoretical provisions and necessary information.

Keywords: Globalization, Self-control of system, Public relations, Global society, Global law, Global order, Efficiency, Compromise of interests, Designation

(19130) EFFECT OF HEAVY METALS (ZINC, CADMIUM AND LEAD) ON THE RATES OF POLYPHENOLS AND FLAVONOIDS OF THE *ATRIPLEX CANESCENS* (PURSH) NUTT

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The pollution of the environment and soils by heavy metals is one of the major problems of our time. Our study is to study the accumulator effect of heavy metals (zinc, cadmium and lead) by the *Atriplex canescens* (Pursh) Nutt stressed after 60 days of sowing. Five different doses were applied to the plant *Atriplex canescens* (Pursh) Nutt for two weeks for: zinc, cadmium, lead (0, 2500, 5000, 7500 and 10000 ppm). The results showed an increase in the total polyphenols content and flavonoids, depending on the increasing concentration of heavy metals at the leaf and root levels. The leaves have total polyphenols and flavonoids higher than those of the roots. The highest levels of total polyphenols and flavonoids in the leaves (3.47 mg/g dry weight of total polyphenols and 3.70 mg/g dry weight of flavonoids) are obtained at a dose of 10000 ppm (cadmium, lead), respectively. On the other hand, the highest levels of total polyphenols and flavonoids in the roots are obtained at the metallic dose of 10000 ppm for cadmium respectively (3.38 mg/g dry weight of total polyphenols and 0.61 mg/g dry weight of flavonoids). These results also underline the important role of secondary metabolites (total polyphenols and flavonoids) in the defense against oxidative stress caused by metallic stress.

Keywords: Heavy metals, *Atriplex canescens* (Pursh) Nutt, Total polyphenols, Flavonoids

(19462) PHENOTYPIC CHARACTERIZATION OF NATIVE RHIZOBIA ASSOCIATED WITH ASTRAGALUS MARIOTICUS OF ALGERIA ARID REGION

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Rhizobia plays an important role in agriculture by including nitrogen fixing nodules on the roots of legume plants. The present study describes the characterization of Rhizobia strain isolated from root nodules of medicinal legume *Astragalus maritoticus* growing in Biskra regions. The isolate's phenotypic, physiological and biochemical properties were characterized, to ascertain their taxonomic position. The isolates were rod, Gram negative, they utilized a many of carbohydrates as sole carbone source, and they produced nitrate reductase, urease, cellulytic and pectinolytic enzymes. The studied isolates exhibited a different resistance to antibiotics and heavy metals. The magority of isolates tolerated temperature up to 40°C and they could grow from pH 4.5 to 9. They tolerate a high NaCl concentration 5% (w/v).

Keywords: *Astragalus maritoticus*, Rhizobia, Phenotyic character, Symbiosis

**(19473) EFFECTS OF SOME SOFT INSECTICIDES ON THE EGG PARASITOID
TRICHOGRAMMA CACOECIAE MARCHAL (HYM. TRICHOGRAMMATIDAE)**

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Parasitoids of the genus *Trichogramma* occur naturally worldwide and play an important role as natural enemies of lepidopterous pests on a wide range of agricultural crops. Results of augmentative releases of *Trichogramma* can be affected by the use of broad-spectrum insecticides in or near release and consequently affects populations of these beneficial and the biodiversity of the agricultural fields. The search for selective insecticides to be used with *Trichogramma* releases is of great importance. The recent laboratory studies were carried out to investigate the side effects on *Trichogramma cacoeciae* of two formulated products of each of two botanical insecticides: Azadirachtine (Neemazal T/S Blank and Celaflor®) and Quassin (alcoholic or water extracts) to study their possible use with *Trichogramma* releases, since these insecticides are from plant origin and are believed also to have the advantage of having the least impact on the environment.

Two formulations of the botanical active ingredient, azadirachtine (Neemazal T/s Blank and Celaflor) as well as two extracts of Quassin (Alcoholic and Water extracts) were included in the tests. The field recommended concentrations were prepared for the tests. The study included Exposing adults (susceptible life stage) of *Trichogramma* to sprayed glass plates. In another experiments adult of *Trichogramma* were Exposed to sprayed host eggs. The study also included spraying of parasitized host eggs at different interval after parasitisation ranging from 1 – 8 days. The results showed that by exposing adults *T. cacoeciae* to residues of Neemazal formulations on glass plates, the preparations were either harmful (Neemazal-Blank) or moderately harmful (Celaflor). The two Quassin formulations tested were harmless. In another set of experiments, where treated host eggs were offered to adults *T. cacoeciae*, all tested chemicals were almost harmless. By exposing adults to treated host eggs both Quassin formulations were harmless. Celaflor was slightly toxic for adults, both when freshly or 6-day old sprayed host eggs were offered to adults of *T. cacoeciae*. Neemazal-Blank formulation was only slightly toxic when 6 day old sprayed host eggs were offered to the adults.

Keywords: Side effects, *Trichogramma*, Botanical insecticides, Neemazal, Quassin

(19474) EFFECT OF POWDER PREPARATION OF CLOVE, GINGER, GARAD AND GALANGAL ON THE INFESTATION OF CHICK-PEA GRAINS CAUSED BY COW PEA WEEVIL *CALLOSOBRUCHUS MACULATUS* ADULTS

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Chick-pea, *Cicer arietinum* L.(Fabaceae) is the most important legumes crop in Sudan. Cow pea weevil, *Callosobruchus maculatus* (Coleoptera: bruchidae) is the major store pest of chick-pea grains. This study was conducted to investigate the efficacy of flower buds powder of clove, *Syzygium aromaticum* Cl, rhizomes powder of ginger, *Zingiber officinale* Rose, galangal, *Alpinia officinarum* Hance, and fruits powder of garad, *Acacia nilotica*, on the level of infestation of cowpea weevil adult. The experiments were carried out in the laboratory to rear cowpea weevil adults on chick-pea grains treated with powder of the above natural products. Ten cowpea weevil adults were introduced to each treatment. Chick-pea grains were treated with powder of clove, ginger, galangal, garad, and untreated chick-pea grains as control, replicated five times and arranged in a completely randomized design. Parameters studied were weight loss, adult mortality, seed damage and seed germination; weight loss and adult mortality were determined weekly, seed damage and seed germination were assessed at the end of the experiment. The results indicated that these natural products significantly ($p < 0.05$) reduced the percentage of damage of cowpea weevil adult on chick-pea grains which were 8.40%, 19.60%, 32.00%, 33.20% and 66.00% recorded in clove, ginger, galangal, garad, and the control, respectively, percentages of weight loss were 1.81%, 3.31%, 4.03%, 4.35% and 5.31% recorded in clove, ginger, galangal, garad, and the control respectively. Percentages of adult mortality were 93.33%, 61.99%, 54.66%, 41.40%, and 30.06% recorded in clove, ginger, galangal, garad and the control respectively. Percentages of seed germination were 83.20%, 74.00%, 68.00%, 64.40% and 41.60% recorded in clove, ginger, galangal, garad, and the control respectively. Apparently clove powder was the most effective one followed by ginger, galangal and garad compared to the control. It is concluded that clove powder is the most effective in reducing cow pea weevil adult infestation on chick-pea grains, and there for recommended for chick-pea grains protection against cowpea weevil in grain stores

Keywords: Chick pea, Cow pea weevil, Sudan, Botanicals

(19547) APPLICATION OF THE CASE STUDIES FOR THE FORMATION OF ECOLOGICAL CULTURE IN PROSPECTIVE BIOLOGY TEACHERS

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Pure air is essential for a healthy life. Poor air quality is one of the leading causes of premature death in the European Union. In recent decades, great progress has been made in reducing air pollution in Europe. The economic costs of air pollution amount to over 20 billion euros per year.

It is necessary to reduce air pollution to levels that do not pose a risk to human health and the environment. Coping with air pollution is a systematic challenge. It implies concerted action between public actors, economic sectors and education.

In support of these actions the methodology for application of environmental cases in the process of training students - future teachers of biology are developed. Case solving in the learning process is based on the consideration of cases taken from practice or very close to practice that are problematic and/or difficult to solve.

The article presents a system of case studies that includes primarily eco-innovation, services and models, new solutions such as advanced household heating technologies, strategic urban mobility plans, or innovative ways to reduce air pollution from energy use, transport and agriculture, funding for eco-innovative solutions. The methods used in this study are theoretical analysis and synthesis, focus groups.

The cases developed are two main types: cases where the problem situation is described, no decision has been made and decision-making possibility is discussed and case studies that describe the problem situation, a decision or series of decisions have been made, and the correctness of the approach and the decision has been discussed.

Students' opinion on the application of the elaborated case system is that they develop skills to: identify problems and rank them in importance; assess possible solutions and choose a solution based on rational arguments; take a decision in a limited time.

Keywords: Ecological culture, Case studies, Prospective biology teachers

(19635) EXTRACTION AND APPLICATION OF NEW BIOMATERIALS BASED ON OPUNTIA FICUS INDICA (CACTUS) IN WATER TREATMENT AND WASTEWATER TREATMENT PLANT SLUDGE CONDITIONING

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This present study deals with the preparation and application of a new biodegradable, non-polluting and economical bioflocculants based on available natural cactus cladodes (*Opuntia Ficus Indica*) namely (cactus gel and cactus juice OFIJ) for water clarification and wastewater treatment plant sludge conditioning. The main objective of this work is to replace conventional commercial products such as chemical coagulants (FeCl_3 , $\text{Al}_2(\text{SO}_4)_3$), synthetic organic polymers proving inadequate, unsuccessful or expensive to apply and to be able to meet increasingly stringent standards. The use of this new generation of biomaterials should reduce the cost of water treatment in a health, environmental and sustainable development context.

The results showed overall and clearly that the maximum reduction in the turbidity of synthetic water and surface water is obtained for a very low volumetric ratio 0,08ml/l (gelled flocculant/water sample). Throughout all the pH range studied (2-12), very high reduction rates were obtained with a residual turbidity meeting the standards (0,67 NTU) and without affecting the pH and conductivity of treated samples.

The application on sludge conditioning gave interesting results. The optimum dosage of OFIJ is found to be 0,8 g/kg of dried matter, for which the residual turbidity, the dryness of filtration cake, and the specific resistance of filtration are found to be 2,2 NTU, 24% and 0,17 1012 m/kg, respectively. The results obtained with OFIJ are compared with those of commercial polyelectrolytes such as *Chimfloc C4346*, a cationic polymer, *Sedipur NF 400*, a non-ionic polymer, and *Sedipur AF 102*, an anionic polymer, and inorganic conditioners such as FeCl_3 and $\text{Al}_2(\text{SO}_4)_3$. OFIJ is proven to be as effective as the cationic polymer *chimfloc C4346* for the same dose. According to the obtained results, the cactus gel and juice are good flocculating agents when compared to conventional commercial products and to other bioflocculants. This Ecofriendly biomaterial can be attributed as an alternative solution to problems associated with the environmental performance of chemical coagulants.

Keywords: Bioflocculant, Cactus, Clarification, Coagulation-flocculation, Filtration, Sludge, Conditioning

(19912) WASTEWATER AND BIOSOLID REUSE MANAGEMENT: VIRTUES AND VICES

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Millions of wastewater cubic meters and tons of biosolids are being produced daily around the world needing effective and productive management for the benefit of the human society. Reuse of wastewater and of biosolid is indeed an attractive option which under high qualitative characteristics of these outputs of the wastewater processing plants, can lead to their multidimensional exploitation.

The aim of the reuse is indeed multifarious targeting at taking advantage of the virtues of these inputs, i.e. at supplying the plants with irrigation water, and plant nutrients, improving soil fertility and productivity by supplying organic matter to soil, contributing to the possibility of effectively managing these inputs by protecting the environment (soil and surface waters) and therefore by relieving the environment from the great pressure and freeing the state officials from the environmental stress which is created by these two inputs.

However, apart from the virtues, the wastewater and the biosolids also have some basic vices such as they contain heavy metals pharmaceutical compounds, xenobiotics, agricultural chemicals, and microplastics. All these substances can accumulate in the soil and via plant uptake can easily enter into the food cycle affecting adversely human health thereby constituting serious health risk.

Due to this risk involved, it is considered a must, that the scientific community is necessary to work towards alleviating this highly negative and toxic aspect of the reuse of both of these soil inputs and accomplish a real “safe reuse”. Unfortunately, for the time being in most of the cases this is a dream, which it is hoped to be materialized in the near future. Consequently, it is a “*sinus non quam*” condition that the scientific community must reconsider and re-examine the guidelines for reuse applied currently, producing new ones, based on the advanced up-to-date research results. It must be underlined that it has been reported that in spite of the application according to the official guidelines of the biosolids, there have been victims among the users of this input and among the people living around the areas where the biosolid was applied. These people were suffering from serious deceases and even some of them died due to their exposure to the amended soils with biosolids.

It is therefore underlined that the scientific society must work very hard to offer some real solution to this serious problem so as to accomplish a “scientifically based and safe reuse”. In our School of Science and Technology of HOU, Greece we work on the following aspects of the wastewater and biosolid management, aiming at removing the barriers involved in the effective and “safe reuse”, i.e. we conduct research on the following aspects of reuse: a-Control of heavy metals, b- evaluation of the soil pollution with heavy metals by means of pollution indices, c- control of microplastics, d- survey of pharmaceuticals in the wastewaters and biosolids.

Our intention is to exploit the wastewater and biosolid as a raw material for the production of biodegradable plastics with the view to replace the currently used difficultly degradable pvc plastics, production of biogas from biosolids, manufacturing of safe organic fertilizers and organic amendments, reuse of biosolid in cement industry in cooperation with cement companies, in brick production and contributing to the production of other, possible products aiming at the effective exploitation of the wastewater and biosolid. We believe that our research aims must be oriented towards achieving “Safe-reuse” for the welfare of the society and for the sustainable protection of the environment.

Keywords: Wastewater, Biosolid, Management, Reuse

(19929) BIO-ECOLOGY AND IMPORTANCE OF INVASIVE *Aedes* (DIPTERA: CULICIDAE) SPECIES

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More than 3500 species of mosquitoes, the most important arthropod group in medical terms, have been identified so far around the world. Among the genera, the genus *Aedes* is an important group in the vectorial sense because it is the carrier of viruses leading to many important diseases. The flexibility of their ecological aspirations and their affinities to human increase the risks. Invasive *Aedes* species which are important for public health; *Aedes albopictus*, *Aedes aegypti*, *Aedes japonicus japonicus*, *Aedes koreicus*. Among the species mentioned above, *Ae. albopictus* is the highest invasive ability. The species has invaded Europe and its neighbours. It has been reported that *Ae. albopictus* has an ability to deliver at least 32 viruses; but its role in nature for many factors is not fully understood. Some well-known viruses that are reported to be transmitted by *Ae. albopictus*; DENV (Dengue virus), CHIKV (Chikungunya virus), WNV (West Nile virus), ZIKV (Zika virus), YFV (Yellow fever virus), JEV (*Japanese encephalitis* virus), EEEV (eastern equine encephalitis virus), VEEV (venezuelan equine encephalitis virus), WEEV (Western equine encephalitis virus), SLEV (St. Louis encephalitis virus), Rosse River virus, SINV (Sindbis virus), mayaro virus, Getah virus, Potasi virus, Cache Valley virus, Tensaw virus, Keystone virus, San Angelo virus, LACV (La Crossa virus), Trivittatus virus, Oropauche virus, RVFV (Rift Valley fever virus), Orungo virus and Nodamura virus. The species is also capable of vectoring helminthic parasites of *Dirofilaria immitis*, *Dirofilaria repens* and *Setaria labiatopapillosa* in humans and in dogs. Although some of the important diseases they infect have vaccines, some do not have vaccines, some others are on the trial. The struggle of the established and widespread invasive *Aedes* has many difficulties both economically and ecologically. For these reasons, field studies of invasive *Aedes* species should be carried out periodically and a comprehensive and organized program of combat should be conducted.

Keywords: *Aedes albopictus*, Public health, Invasive, Mosquito

(19943) THE NAME OF HAZARD INCREASINGLY IMPORTANT IN FOOD HYGIENE IS MODIFIED MYCOTOXINS

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Mycotoxins are toxic secondary compounds synthesized by certain fungal species that can grow in a variety of foods under specific conditions. In addition to animal products such as meat, milk and eggs, mycotoxins enter the food chain via cereal-based foods, which can accumulate in different organs or tissues. In particular, the main chemical structure of mycotoxins that undergo various metabolic changes in originated foods varies considerably. Mycotoxin derivatives, which cannot be detected by conventional analytical techniques as the structure changes in the plant, are described as "modified mycotoxin". Although the natural formation of modified mycotoxins has been shown in food and animal feed for a long time, there are not enough directives, regulations and recommendations for food and feed considering these modified species. In addition, little is known about the toxicity of these modified mycotoxins. In fact, the lack of analytical standards and reference materials has complicated their definition and partly limits the progress of research in this area. All of these effects can cause the modified mycotoxin components in food and feed to be taken into account. Given all these factors, the monitoring of the presence of these potentially dangerous metabolites is seen as an important activity in terms of food safety and provision of human/animal health. In this study, the definition of modified mycotoxins, their presence in food, possible damages and methods of protection and control have been examined in the light of current literature information.

Keywords: Mycotoxin, Hazard, Modified, Food safety

(19958) INVESTIGATION OF ANTIMICROBIAL ACTIVITY OF *PHYSALIS ALKEKENGI* L. FRUIT EXTRACTS COLLECTED FROM CORUH VALLEY

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Physalis alkekengi L. is a plant that can be used for complementary and alternative medicine in Europe and China. Previous studies have reported that *Physalis alkekengi* L. has antifungal, anti-inflammatory, analgesic and anti-cough effects. During the studies, different parts of the plant such as crown and leaf were examined for antimicrobial activity. In this study, it was aimed to investigate the antimicrobial activity of the methanolic extract of *Physalis alkekengi* L. plant fruits collected from Coruh valley (Artvin / Turkey). The effect of the extract of *Physalis alkekengi* L. fruits was investigated by disk diffusion and liquid microdilution methods against reference strains containing 5 Gram negative, 6 Gram positive bacteria and *Candida albicans*. As a result of the study, it was determined that the methanolic extract of plant fruit had no effect against *Candida albicans* (MIC=4096 mg/ml). while it showed a high level of action against *Bacillus subtilis* and *Staphylococcus epidermidis* (MIC=128 mg/ml). In the disk diffusion method, the highest zone diameter was determined against *Staphylococcus epidermidis* and *Staphylococcus aureus* at concentrations of 40 and 50 µl. As a result of the study, it was determined that the extract of *Physalis alkekengi* L. fruit was not effective even at the highest concentration on *Candida albicans*, whereas it was found to have a partial effect on *Pseudomonas aeruginosa*, known to harbor multiple intrinsic and acquired resistance genes, and a high level of activity against Gram positive bacteria.

Keywords: *Physalis alkekengi*, Extract, Antimicrobial activity

(20118) DETERMINATION OF THE HERBICIDES ATRAZINE, METOLACHLOR AND TERBUTHYLAZINE IN GROUNDWATER OF NORTHERN GREECE

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The presence of pesticide residues in groundwater is considered to be risky for human and environment. Many studies in Europe showed frequent detection of pesticide residues in groundwater samples. European Union had set the maximum permissible limit of pesticide in potable water at 0.1 µg/l in each sample. A pesticide monitoring study of groundwater samples was conducted in Northern Greece. The target compounds were the herbicides metolachlor, terbuthylazine, atrazine and its metabolites DIA, DEA and HA. Previous studies had demonstrated the presence of these compounds in surface and groundwater samples of corn-cultivated area. The properties of soil in the studied area facilitate pesticide leaching and preferential flow. Five drinking water, two irrigation wells and four experimental boreholes located 10-20 km from the Greece/Turkey borders were monitored. The overall amount of samples was fifty-four. Pesticides were extracted by solid-phase extraction. The chromatographic analysis was conducted by a HPLC/DAD. For all compound the LODs were ranged from 0.001 to 0.005 µg/l and LOQs from 0.01 to 0.05 µg/l. The recoveries were higher than 76% for all compounds. The six-month monitoring study in river Ardas basin, North Evros, showed pesticide residues in groundwater of this region. Although atrazine had been banned 15 years ago, it was detected frequently during our monitoring campaign and their concentrations in some cases were over the maximum permissible limit.

Keywords: Herbicides, Metabolites groundwater, Contamination

**(20323) EVALUATION OF MICROBIOLOGICAL COASTAL WATERS QUALITY
IN BOU-ISMAIL BAY (ALGERIA)**

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This work was undertaken to evaluate the microbiological water quality of bathing sites along Bou-Ismaïl Bay. Over a period of seven months, from June to December, seawater samples were collected from 5 stations in Bou-ismail Bay. These stations were identified based on the accessibility of bathing areas and the possible pollution sources from land. Seawater samples were analysed for total coliforms, faecal coliforms; faecal streptococci, *Escherichia coli* and *Salmonella*.

The results of the bacteriological analyzes (total coliforms, faecal coliforms and enterococci) showed that the S2 and S5 stations are the most contaminated stations, the number of faecal enterococci is higher than the standard of safety at these stations.

These stations should be monitored more frequently. Moreover, the origins of marine pollution must be investigated to avoid coastal ecosystem degradation.

Keywords: Fecal coliforms, Seawater, Quality, Pollution

**(20327) ENVIRONMENTAL IMPACTS OF EFFLUENTS FROM ALGERIA
DESALINATION PLANT ON THE MEDITERRANEAN SEA**

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This work focuses on Environmental impacts associated with concentrated brine rejection arising from seawater desalination plants in Algeria. We present a case study on the environmental impacts of Palm Beach seawater desalination plant. These impacts are mostly due to the highly saline brine that is discharged into the sea, which may be increased by temperature, contain residual chemicals from the pretreatment process, heavy metals from corrosion or intermittently used cleaning agents. We performed in this study the measurement of physico-chemical and bacteriological quality of receiving water, and the phytoplankton density at different discharge distance. Global results show no effect while there is a local impact due to the relatively small size of the resort of plant.

Keywords: Environmental impacts, Desalination plant, Water column, Phytoplankton

(20384) COLISTIN RESISTANT *ESCHERICHIA COLI* AND PLASMID-BORNE MCR GENE

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The problem of antimicrobial resistance, which maintains its importance throughout the world, has once again attracted attention with its resistance to *Escherichia coli* isolates isolated from humans and animals. Colistin is the most effective antibiotic against carbapenem resistant Gram negative bacteria. While the use of colistin was limited for veterinary treatment, colistin resistant Gram negative bacteria were found at high rates in animal isolates. In humans, the use of colistin has been limited due to the impairment of renal function, which is now frequently used in the treatment of infections caused by multiple antibiotic resistant Gram negative bacteria. The development of plasmid-mediated resistance provided by the mobilized colistin resistance (*mcr-1*) gene has further increased the importance of colistin, while the resistance of the colistin is thought to cause only long-term chromosomal mutations. Since the introduction of the *mcr-1* gene in China in 2015, this gene has been identified in a variety of bacterial strains isolated from animals, animal food products, humans, and environmental samples. In this review, up-to-date information on the resistance of the colistine will be given.

Keywords: *E.coli*, Mcr, Colistin, Antimicrobial resistance

**(20698) THE ASSESSMENT OF ECOTOURISM POTENTIAL FOR THE CASE
STUDY OF KARABUK AREAS**

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Karabuk has an important historical value and great potential because of its outstanding natural and cultural heritage. It is an area that can make an important contribution to the entire region. But in order to do so, making long-term plans for the area and its surroundings, creating the necessary infrastructure, and promoting it locally and internationally are required. This study deals with the ecotourism resources of Karabuk that include its historical, cultural, and natural landscape to determine its potential classification in terms of values that can be a source of tourism activity and are intended to be mapped. For this purpose, the value of the tourism resources that constitute Karabuk's values such as maps, photos, and surveys were evaluated in light of data collected as a result of work done in the area and of existing and potential ecotourism activities. Then the appropriate fields for the specified activities creating a digital base were determined. During the evaluation and processing of data, they were used to map the ArcGIS program. In conclusion, Karabuk's ecotourism resources including its historical, cultural, and ecological values were identified and mapped.

Keywords: Forest, Karabuk, Ecotourism, ArcGIS

(21149) USE OF FACTOR ANALYSIS TO EVALUATE THE WATER QUALITY OF DAM LAKES LOCATED IN ERGENE RIVER BASIN (THRACE REGION, TURKEY)

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Altınyazı, Karaidemir, Kayalıköy, Kırklareli, Sultanköy and Süloğlu Dam Lakes are located in Ergene River Basin in the Thrace part of Marmara Region, where has very large agricultural lands because of contained rich soil and much freshwater resources. They were constructed by DSİ (State Water Works) in order to provide irrigation and drinking water and flood protection. The aim of this study was to evaluate the water quality of these reservoirs by a statistical approach by using Pearson Correlation Index (PCI) and Factor Analysis (FA). For this purpose, total of 16 limnologic parameters (temperature, dissolved oxygen, oxygen saturation, pH, electrical conductivity, total dissolved solids, salinity, turbidity, nitrate, nitrite, phosphate, sulfate, fluorine, biological oxygen demand, chemical oxygen demand, fecal coliform) were measured in selected total of 15 stations in spring season of 2018. According to the results of PCI, significant relations were recorded between the investigated parameters at the 0.01 and 0.05 significance levels. According to the results of FA, 3 factors explained 85% of the total variance.

Keywords: Dam Lakes, Ergene River Basin, Factor Analysis

(21167) CYTOGENETIC AND APOPTOTIC EFFECTS OF NiSO₄ ON ROOT GERMINATION OF *ALLIUM CEPA*

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Today, heavy metal pollution is one of the most important environmental problem. Increased metal pollution due to increased industrialization has a toxic effect on living organisms. Although Nickel is a metal in the class of microelements and a necessary element in seed germination for plants, its high doses are toxic on living organisms. The aim of this study is to determine the cytotoxic effect and apoptotic effect of NiSO₄ by using *Allium cepa* test assay. Different concentrations of NiSO₄ (1.75, 3.5, 7, 14 ppm) were exposed on root germination of *Allium cepa* for 48 and 72 for to observe mitotic abnormalities and cytotoxic effect and 5-day treatment for to observe apoptotic effect by using ethidium bromide/acridine orange fluorescence staining method on root tips. The results showed that, amorphous nuclei, vacuoles and c-mitosis were mostly observed abnormalities as the concentration and exposure period increase for C-mitosis and amorphous nuclei and vacuolization at 14 ppm concentration exposure. Mitotic index was found to decrease significantly at all the tested concentrations for both exposure periods and negative correlation was found between mitotic index decrease and concentration increase after 72-hour exposure period. Apoptosis rates were determined by imageJ program by using ethidium bromide and acridine orange fluorescence staining method. The results showed that high concentrations of NiSO₄ caused significant cell death at root tips compared to the control group leading to growth inhibition at plant root tips. As a result, cell division might be inhibited due to NiSO₄ toxic effect by causing nuclear and cytological abnormalities and the cytogenetic abnormalities and apoptosis were increased with the increase of concentration and exposure period.

Keywords: Nickel, *Allium cepa*, Apoptosis, Nuclear abnormalities, Etidium bromide, Acridine orange

**(21213) USE OF PRINCIPLE COMPONENT ANALYSIS TO EVALUATE THE
GROUNDWATER QUALITY OF VILLAGES LOCATED IN ERGENE RIVER
BASIN**

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Ergene River is located on the Thrace part of Marmara Region and it is known as one of the most contaminated aquatic habitats of Turkey. This study was carried out to evaluate the groundwater quality of settlement areas located in the Ergene River Basin by using some statistical methods. Water samples were collected from 30 villages in summer season of 2018. Some physical and chemical water quality parameters including dissolved oxygen, oxygen saturation, pH, electrical conductivity (EC), total dissolved solids (TDS), salinity, turbidity, nitrite (NO₂), nitrate (NO₃), phosphate (PO₄), sulphate (SO₄) and chemical oxygen demand (COD) were determined and the results were evaluated by using Pearson Correlation Index (PCI) and Principle Component Analysis (PCA). According to the results of PCI, significant relations were recorded between the investigated parameters at the 0.01 and 0.05 significance levels. According to the results of PCA, 2 factors named as "Ionic Factor" and "Agricultural Factor" explained 77.7% of the total variance.

Keywords: Ergene River Basin, Groundwater quality, Principle Component Analysis

(21214) TREATMENT OF POLLUTION FROM TEXTILE DYES WITH OZONE METHOD

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The textile industry uses a large number of different colors and pigments. More than 50% of the dyes used in the textile industry are azo dyestuffs. These dyes usually contain at least one and at most four azo groups bound to two radicals, at least one or both of which are aromatic groups. The increased use of cotton also causes significant increases in the use of reactive dyes. However, since reactive azo dyes are separated by carcinogenic aromatic amines, they are potentially harmful to the environment and are of high importance.

In this study, COD and color removal were investigated by ozonation (2 g O₃/saat) method of selected dyestuff species (Reactive Setazol Yellow Ng and Acid Dye Nyloset Red E-BI) used in the textile industry. A two hour reaction period was carried out with ozone. As a result, ozonation method has not provided a significant elimination of COD removal and color removal from these dyestuffs.

Keywords: Ozone, Advanced treatment, Dyestuff, Chemical oxygen demand, Color removal

**(18427) TOXICITY OF ZINC OXIDE NANOPARTICLES TO *GAMUSIA AFFINIS*:
HISTOLOGICAL STUDY OF HEPATOPANCREAS**

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The biological impact of engineered nanomaterials released into the aquatic environment is a major concern. Research has demonstrated that metallic nanoparticles produce toxicity in aquatic organisms that is due largely to effects of particulates as opposed to release of dissolved ions.

This study focuses on the assessment of the impact of Zinc oxide nanoparticles (ZnO) on bioindicator organism pollution which actively participating in biological control against mosquitoes, freshwater fish, *Gambusia affinis*. Due to their unique properties and diverse nanostructures, ZnO nanoparticles (nano-ZnO) are widely applied in optoelectronics, cosmetics, catalysts, ceramics, pigments, etc. In this study, we investigated the possible toxic effects of ZnO nanoparticles on biometric parameters and histological structure of the hepatopancreas of *G. affinis*.

The results show a toxicity manifesting on a first plane by a growth delay that resulted in a weight and linear decrease of individuals treated by ZnO nanoparticles a dose dependent manner and time as well as the condition index that reflects a delay in sexual maturity of individuals. The histological study shows that NPs ZnO cause a number of hepatocyte parenchymal damage, cell debris and necrosis. Leukocyte infiltration and enlargement of nuclear volume were observed on hepatopancreas at the higher concentrations and longer exposure period to NPs ZnO.

Keywords: Nanotoxicity, ZnO, Histology, Mosquitofish, Hepatopancreas

**(18709) TOXICITY OF TITANIUM DIOXIDE NANOPARTICLES TO HONEY BEES
(*APIS MELLIFERA INTERMISSA*): OXYDATIF STRESS AND HISTOLOGICAL
STUDY OF MIDGUT**

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There are a lot of studies conducted on the toxicity of nanoparticles in recent years. Once focused on the aquatic environments, while others are now being initiated and conducted on terrestrial environment and organisms. The production and widespread use of TiO₂-NPs increases the risk of environmental contamination. Titanium dioxide accounts for 70% of the total volume of world pigment production. It is mainly present in 3 tetragonal forms of different parameters: Rutile, Anatase and Brookite. The appearance of nanotechnology products and their inevitable release into the environment can also result in adverse effects on honey bees which play an important ecological and economical role as pollinators of crops and produce honey that can be harvested for consumption. Therefore, there is a crucial need for investigating the potential toxic effects of NPs on honey bees. The aim of this study was to evaluate the eventual toxicity of TiO₂ by measuring the activities of a stress-related enzyme glutathione S-transferase (GST) and to assess morphological changes in the midgut epithelium of the local honey bees in Algeria: *Apis mellifera intermissa* (Hymenoptera: Apidae) exposed to TiO₂.

Keywords: *Apis mellifera intermissa*, Nanotechnology, Titanium dioxide, Glutathione-S-transferase, Histology, Midgut

(18734) COPPER SORPTION ON CHITIN AND ACID-WASHED SHRIMP SHELLS FROM *PALINURUS ELEPHAS*: ISOTHERM AND KINETIC STUDIES

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This paper investigates the ability to remove copper (II) from aqueous solution by low-cost adsorbents chitinous materials such as acid-washed shrimp shells (AWSS) and chitin prepared from Algerian shrimp shell wastes. Elementary analyses show that demineralization and deproteinization, of raw materials, are responsible of an increase of nitrogen content in the biomaterial. The influence of demineralization and deproteinization on crude shrimp shells and the interactions between Cu(II) and chitin biopolymer have been investigated. A high content of nitrogen may be responsible of an efficient copper fixation due to strong interaction between transition metal ions and amino or N-acetylamino groups of the biomaterial. Langmuir and Freundlich analyses suggest a homogeneous distribution of Cu(II) onto the substrate. Maximum adsorption capacity at pH 4 was found to be 16 mg/g for AWSS and 24 mg/g for chitin. Kinetic modelling has shown that the pseudo-second order model is the most suitable for Cu(II) sorption.

Keywords: Shrimp-shell, Adsorption, Copper

(18762) COPPER ADSORPTION ONTO BIOSORBENTS OF PECTIN AND CHITOSANE: COMPARATIVE STUDY

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Biosorbents are eco-friendly compounds with intrinsic properties that give them an adsorption capacity. This work involves the development of new forms of biosorbents based on two biopolymers namely pectic substances that are plant polysaccharides and chitosan which is a polysaccharide of animal origin and enhance them in the elimination of copper ions Cu(II) from aqueous solutions by adsorption. Biosorbents were prepared in membrane form by gelation method. The membranes formulated are a continuous polymer films characterized by smooth surfaces. All biosorption experiments were carried out at room temperature. The kinetics of biosorption was discussed in terms of influence of various parameters which are: biosorbent content, pH, concentration of the metal solution and nature of biosorbent. The concentration of Cu²⁺ ions remaining in each solution was determined using a UV-visible spectrophotometry. The results obtained show that membranes of chitosan are the best with a maximum adsorption capacity of 254.3 mg/g against an adsorption capacity of 183.3 mg/g recorded for those of pectin.

Keywords: Pectin, Chitosan, Membrane, Biosorption, Copper

(18910) THE STRATEGIES USED BY *RETAMA MONOSPERMA* (L.) BOISS FOR ADAPTATION TO XEROPHYTISM CONDITIONS

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In nature, the Plant face adverse conditions such as drought, salinity, which are abiotic stress, develop different strategies to cope with such stress.

Plants are able to set up a series of answers physiological allowing them to act on their own water status in order to adapt to environmental conditions, to limit the effects of stress on their metabolism, and simply to ensure their survival and reproduction.

Exemple of These plants is *Retama monosperma* (Boiss), it is a Fabaceae that grows on coastal dunes of Algeria. It is an excellent plant fixing the atmospheric nitrogen

Retama monosperma pushing in the Algerian coast has characteristics that allow them to adapt to the conditions xerophytism such as the sharp decline in leaf area, the presence of stomata in crypts surrounded by hairs contributing in reducing evaporation and root system developed to draw water they need to survive and contribute to the stabilization of sand.

Keywords: *Retama monosperma*, Adaptation, Stress, Xerophytism

(18925) ASSESSMENT OF HYDROCARBON CONTAMINATION OF COASTAL WATERS OF SKIKDA BY THE USE OF *ULVA COMPRESSA* LINNAEUS AND *DERBESIA TENUISSIMA* CASE OF LIONS RAVINE BEACH (LA CARRIÈRE)

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The region of Skikda is considered industrial because of the presence of the oil giant SONATRACH and the harbor infrastructure, However, this renown brings with it a major impact on the environment, the treated and untreated waste of these beds are considered very harmful to the fauna, flora and the quality of the environments. The study that was carried out from March to May 2017 on RAVIN DES LION beach was intended to assess the degree of water pollution in this area of the Skikda town's shoreline, in this case the post 6. The choice of the study area was based on the presence of several urban discharges threaten the cleanliness of this beach. The study in question was carried out by analyzing and measuring a set of physicochemical parameters, namely: pH, temperature, conductivity, dissolved oxygen, biological oxygen demand, chemical demand in oxygen, the complete alkalimetric title, the nitrates, the nitrite and the sulphates but also by the determination of the total hydrocarbons the waters and the algae taken by the absorption in the infrared (IR) which reflects well the chemical structure of the molecules, and the absorption characteristics of the IR molecules are indicated by the chemical structure of the substance. Therefore, the absorption at different wavelengths in the infrared range is measured. The position of the intensity of the absorption bands allows us to make a quantitative and qualitative analysis of the substances. The values recorded for this study station vary, the highest concentration of total hydrocarbons in water is recorded in March (13.3 mg/l) and the lowest (12.1 mg/l) is recorded in May the values are in accordance with the limit value required by the Algerian law which is 20 mg/l; For algae there is significant increase during the last two months of studies.

Keywords: Algae, Hydrocarbons, Pollution, Skikda

(18938) FIRST DATA ON THE DETECTION OF HEAVY METALS BY *CICONIA CICONIA* L.1758 (AVES, CICONIDAE) IN EASTERN ALGERIA

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This study was carried out in the region of Tébessa at two stations: urban (El Merdja), rural Ain Zaroug during the breeding period and rearing young storks.

A total of nine heavy metals were detected in the Tébessa region; these are Nickel, Lead, Cadmium, Copper, Chromium, Iron, Manganese, Selenium and Zinc.

The concentration of these metals is studied according to the position of the feather on the body of the bird and to the location of storks colonies studied.

Results obtained showed that the most detected metals at El Merdja station are: Lead (Pb) and Cadmium (Cd) with different concentrations. The highest average concentration in Pb is found in the small feather (34ppm), while that of Cd in the small feather and in the large feather (the rector) with 10ppm. Other metals are weakly concentrated. In down of this bird, Pb is more concentrated (20ppm) than Cd (9.00ppm). At Ain Zaroug the nine metals are found with different concentrations. With an average of 15.3 ppm, Cd is the most concentrated metal in the secondary remiges, followed by Pb with 12.5 ppm in the same feather. Other metals are very weakly detected.

At the down, Pb is the most concentrated metal (25.16 ppm), followed by Mn. Cadmium is not detected at all.

Keywords: *Ciconia ciconia*, Heavy metals, Eastern Algeria

(18939) IMPACT OF PHOSPHATE POLLUTION ON THE DISTRIBUTION OF THE ENTOMOLOGICAL FAUNA AT BIR EL ATER REGION (TEBESSA, ALGERIA).

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Pollution of air, water and soil by harmful substances affects the health of humans, the quality of life and the natural functioning of ecosystems. Animals are generally exposed to several forms of contaminants with different source types.

Tebessa region is rich in mineral resources, and the phosphate complex located at Jebel Onk 7 km from Bir El Ater city (wilaya Tebessa) represents a real threat to the environment in this region.

The results obtained made it possible to note the presence of a fauna constituted of 05 different classes: Arachnids, Crustaceans, Gastropods, Insects and Myriapods.

Insects class is the most represented, it includes 38 families, belonging to eight different orders, the most important are: Coleoptera, Dermaptera, Diptera, Heteroptera, Hymenoptera, Lepidoptera, Odonoptera and Orthoptera.

With the exception of the Dermaptera (absent in the polluted station) the other orders are present in both stations. 35 families are present in station 1 (non polluted station), 23 families in station 2 (polluted station).

The similarity index calculated for diversity in the two stations showed that they are different since the percentage obtained is low.

Formicidae family is very abundant in station 2 and just abundant in station 1, whereas Tenebrionidae is abundant in station 1 and less in Station 2. All other families are rare or accidental.

In station 1, Tenebrionidae is the most dominant family accounting for 23.82%, followed by Dermestidae 10.66% and Acrididae 10.11% whereas in station 2 it is Formicidae which is the most dominant representing 33.44%, followed by Tenebrionidae with 13.37%. The remaining families are poorly found in both stations.

The families Acrididae, Calliphoridae, Formicidae and Tenebrionidae are constant in both stations, while Dermestidae, Pyrohocoridae and Sphecidae are constant in the station 1 and Apoidae, Pieridae, Scarabidae, Syrphidae in station 2.

Keywords: Phosphate pollution, Entomological fauna, Algeria

**(18944) DIET OF *DELICHON URBICA* AND *HIRUNDO RUSTICA* BREEDERS AT
TEBESSA IN EASTERN SEMI ARID REGION OF ALGERIA**

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Window swallows (*Delichon urbica*) and barn swallow (*Hirundo rustica*) are strictly insectivorous. The studies carried out on swallow diet were based on the droppings analysis. The droppings collections carried out under the installed nests on the houses walls of Mouldi Achouri colony of Tebessa city, from March to September 2016. In total 56 droppings have been picked up and recovered randomly. The prey's identification was realized from sclerotized pieces, present in the feces. *Delichon urbica* diet analysis showed that insect's class includes eight orders of different importance: Coleoptera, Hymenoptera, Diptera, Dermaptera, Homoptera, Orthoptera and finally Heteroptera and Lepidoptera. Indeed, the Coleoptera are numerically the most important followed by the Hymenoptera. *Hirundo rustica* diet analysis showed that the insect's class includes nine orders of different importance: Coleoptera is numerically the most important followed by Hymenoptera, Dermaptera and Diptera while Heteroptera, Orthoptera, Homoptera, Odonatoptera, and Lepidoptera have the lowest percentage.

Keywords: Diet, *Delichon urbica*, *Hirundo rustica*, Semi arid, Insectivorous

(18946) NON-DARCIAN EFFECTS ON HYDROMAGNETIC NATURAL CONVECTION IN AN INCLINED SQUARE POROUS ENCLOSURE FILLED WITH A BINARY FLUID

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This paper presents a numerical study of a double diffusive convection in an inclined square porous cavity filled with an electrically conducting binary mixture. The upper and bottom walls are maintained at a constant temperatures and concentrations whereas the left and right walls are assumed to be adiabatic and impermeable. A uniform and tilted magnetic field is applied at an angle, about the horizontal, it is obvious that this is related to the orientation of the magnetic force that can help or oppose the buoyant force. The Dupuit-Darcy flow model, which includes effects of the inertial parameter, with the Boussinesq approximation, energy and species transport equations are solved numerically using the classical finite difference method. Governing parameters of the problem under study are the thermal Rayleigh number, Hartmann number, Lewis number, the buoyancy ratio, inclination angle, inclination angle of the magnetic field and normalized porosity. The numerical results are reported on the contours of streamline, temperature, and concentration and for the average Nusselt and Sherwood numbers for various parametric conditions.

Keywords: Double diffusive convection, Porous media, Inertia effect, Magnetic field, Heat and mass transfer.

(19018) SALT EFFECT ON BIOCHEMICAL BEHAVIOR FODDER HALOPHYTES

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Atriplex halimus L., endemic to the Mediterranean region and *Atriplex canescens* (Pursh) Nutt. endemic to the American regions introduced in Algeria are two halophytes of semi-arid to arid regions. Salinity tolerance to NaCl (100, 300 and 600 mM/l) of Oran population of *halimus* L. and El Bayadh population of *canescens* (Pursh) Nutt. is analyzed. The parameters studied are Na⁺⁺, K⁺, Ca⁺⁺, Mg⁺⁺ and Cl⁻. These are studied using two t methods (flame spectrophotometry and microanalysis EDX). In response to NaCl stress, the contents of Ca⁺⁺ and K⁺ decrease. However, at low salt concentrations, Ca⁺⁺ accumulates in the stems and leaves of *halimus* L. and only in the plant roots of *canescens* (Pursh) Nutt. However, the leaves become less and less rich in K⁺, Mg⁺⁺ under all salinity treatments in all organs of both species. Na⁺ accumulates in large amounts in the leaves. However, this accumulation slows down under the effect of salt beyond 300 mM.l-1 in *canescens* (Pursh) Nutt. while the load in this cation increases in the stems and roots. Therefore, *halimus* L. is one halophyte of "includer" type whereas *canescens* (Pursh) Nutt. is "includer" one at concentrations low or equal to 300 mM/l. But at 600 mM/l, the plant changes to become an "excluder" halophyte. This change in the type can be a way to avoid the harmful effects of stress resulting from ionic salt stress in this species. On the other hand, microanalysis (EDX) shows that the Ca⁺⁺ and Na⁺ are two essential elements of *halimus* L. roots and that only Ca⁺⁺ is for *canescens* (Pursh) Nutt. At the level of leaves, Na⁺ and Cl⁻ essentially characterize *halimus* L. However, for plants of *canescens* (Pursh) Nutt., K⁺ and Cl⁻ are dominant. Na⁺ then represents the specific component of the roots and leaves of *halimus* L. and K⁺ represents the specific element of *canescens* (Pursh) Nutt. leaves.

Keywords: *Atriplex*, Halophytes, Cation, NaCl stress

(19096) EFFICACE TREATEMENT BY WHEATGRASS (*TRITICUM DURUM*) FOR DETOXIFICATION OF LEAD METAL IN WISTAR RATS MALES

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This study is mainly focused on the search for an effective treatment for eliminating the toxicity of lead. We have tried to evaluate a phytotherapy by using a much known plant: the wheat grass. The rats were divided into 3 groups. They were exposed, either to a diet containing 600 mg Pb acetate/Kg diet, or combined with wheat grass (7g/100g diet) for a period of 6 weeks (Pb+Bl).

The results of haematological parameters show a very significant increase in white blood cells and lymphocytes with the group treated with the lead single. By contrast there was no difference was recorded between the treated group by Pb + Bl and the control. A very significant decrease in the red blood cells, the haemoglobin and haematocrit was recorded from the group treated with Pb alone. No difference was registered in the group treated with Pb+Bl, which explains that this plant has a great power to eliminate the harmful effect of lead to purify and renew the blood.

The study of the fertility parameters indicates a highly significant decrease in the concentration, the mobility of sperm counts among the treated group by Pb alone. The administration of the wheat grass has increased.

Keywords: Wheat grass (Bl), Lead acetate (Pb), Hematological and fertility parameter

(19124) HORMONAL AND REPRODUCTIVE RISK FACTORS OF THYROID DISEASE

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The incidence of thyroid disease has increased all around the world and its prevalence has been increasing those last years, particularly since the incident of Chernobyl in 1986; which led many researchers to explore the different risk factors that may influence this small and sensitive gland. Female hormones and reproductive factors have been suggested to be one of the important risks in the development of thyroid disease since women are exposed to different hormonal changes through their lives from puberty, menstrual cycle, contraception use, pregnancy, miscarriage, menopause, etc.

Our work is a prospective epidemiological study conducted from 2013-2015 in the North-East of Algeria through a survey submitted to 301 women presenting thyroid disease. Our objective is to examine the association between contraceptive use, number of pregnancy, breastfeeding and thyroid disease.

The results have shown that for 301 women, there was no dependent association with contraceptive use and thyroid diseases ($p=0.46$). In contrast, there was a dependent association with number of pregnancy ($p=0.026$), breastfeeding ($p=0.03$) and thyroid pathologies. For this reason, a thyroid assessment of women of childbearing age is of great interest.

Keywords: Thyroid, Diseases, Reproduction

(19135) STUDY OF THE HYPORHEIC FAUNA DYNAMICS IN A SEMI-ARIDE STREAM (ALGERIA) DURING LOW WATER

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The study of hyporheic fauna dynamics was conducted on a gravel bar at upstream of Tafna wadi, which is located in northwestern Algeria, during the low water period of two years (2014 and 2015).

The superficial and hyporheic biotope were considered in this study and two sites were selected at our gravel bar. "P1" represents a downwelling zone and "P2" site represents an upwelling. The hyporheic fauna was collected from 30 cm depth. The purpose of this study is to evaluate the impact of low-water period on the dynamics of the benthic and hyporheic community.

Whatever is the superficial or interstitial biotope, the density of insects was more important in the first day of low water and decrease on the last day of sampling. This suggests that Insects have searched for other refuges than 30cm of depth.

When low water level has progressed, we have observed an increase in the density of Oligochaeta in hyporheic environment in the downwellings zones at 30 cm of depth whereas they have almost disappeared in superficial environment. Due to the flexible body of Oligochaeta, this taxon is able to penetrate the fine sediment and cross the interstices to avoid the period of low flow. At the same time, Crustaceans, particularly Cyclopoidae, permanent residents of the hyporheic zone, experienced an increase in their density during the last days of low water levels in the upwellings areas.

No decrease in the number of taxa was noticed in hyporheic zone between the first and last days of low water. However, the number of taxa in the superficial environment has heavily decreased from 23 taxa during the first days to 14 taxa in the last days of low water. This confirms that the hyporheic zone is a potential refuge for certain species of aquatic invertebrate.

Keywords: Dynamic, Hyporheic fauna, Benthic fauna, Low water

(19136) EVALUATION OF WATER QUALITY IN THE WATERSHED TAFNA BY USING *TRICHOPTERA* AS BIOINDICATORS

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The study of the Trichoptera communities in Oued Tafna and its two tributaries upstream, during the period 2013 and 2014, yielded 8285 individuals distributed over 16 taxa and 17 species identified from larvae and mature male nymphs. The appreciation of the macro distribution revealed variability in the distribution of taxa along the 10 stations surveyed. Taxonomic wealth is more important in Chouly than in Tafna. It varies from 25 to 5 on Oued Chouly and from 5 to 2 on Oued Tafna. Oued El khemis presented 8 taxa. Biodiversity indicators showed low diversity at the sites located on Chouly wadi and El khémis wadi and poor diversity for sites located on Oued Tafna. The analysis of the micro-distribution made it possible to observe a faunistic space organized according to the speed of current, the nature of the substrate, the aquatic vegetation as well as the exposure. The waters of the stations upstream of Oued Chouly and Oued Khémis harbored pollo-sensitive taxa as well as those tolerant of organic pollution, whereas those of Oued Tafna harbored only the taxa tolerant to organic pollution. The physicochemical analysis revealed clear waters, well oxygenated, fresh, very little concentrated in Nitrites and nitrates, devoid of salinity for the stations of Chouly and Khemis and waters presenting a certain level of Nitrates, Nitrites salinity and Turbidity for the Tafna stations.

Keywords: Oued, Macro distribution, Micro distribution, Pollo-sensitive, tolerant

(19173) AN INVESTIGATION ON THE TOXIC EFFECTS OF CATIONIC AND ANIONIC SURFACTANTS ON *TRITICUM AESTIVUM* L. CV. ALDANE

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Surfactants are compounds that lower the surface tension of a liquid, the interfacial tension between two liquids, or between a liquid and a solid. A range of industries use complex organic chemicals. These include pesticides, pharmaceuticals, paints and dyes, detergents. Wastewaters can be contaminated by feedstock materials, by-products, product material in soluble or particulate form, washing and cleaning agents, solvents. Detergents, wetting agents, emulsifiers and solvents are in the group of surfactants. The surfactants in wastewater were accumulated in the soil and made pollution. Because of that, the aim of this study was to determine the toxic effects of different concentrations of cationic, anionic surfactants on the germination of wheat (*Triticum aestivum* L. cv. Aldane). In this study, the effects of cationic surfactant (CTAB) cetyltrimethylammonium bromide, an anionic surfactant (SDS) sodium dodecyl sulphate with 1%, 0.5% and 0.25% (w/v) concentration rates at 16 ± 0.5 °C laboratory conditions on germination rates of (*Triticum aestivum* L. cv. Aldane) were determined. According to previous studies with *Hordeum vulgare* L. it was determined that cationic surfactants were more toxic than the anionic surfactants on root lengths and leaf morphology of barley. In this study, toxic effects of cationic and anionic surfactants were seen especially in the 1% dose on germination of wheat. The results were in agree with the previous results.

Keywords: Anionic surfactant, Cationic surfactant, Toxic effect, Wheat

**(19176) CONTRIBUTION TO THE STUDY OF TROPHIC RELATION OF
MACROINVERTEBRATES IN HYPORHEIC ZONE**

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Our work aims to classify macroinvertebrates collected at the hyporheic zone in trophic groups; this classification is based on the eating habits of these organisms. This hyporheic zone is occupied by a great diversity of aquatic invertebrates, called “hyporheos”. The sampling of fauna was carried out at Tafna Wadi upstream, which is the main course of Tafna catchment, is located at the North-West of the Algerian territory, between 1°00' and 1°45' longitude Western and 32°40' and 35° 20' Northern latitude. It extends on totality from the wilaya from Tlemcen and overflows on the kingdom of Morocco, with a drainage surface of 7245 km². The collection collected during 2 sampling field work composed of 23 taxa, dominated by Annelids, where Oligochaetes are most dominant. This study also showed a predominance of two trophic groups: collectors and filterers. The study of the trophic groups in hyporheic fauna appears necessary and allow us to determine the role of the hyporheic zone for the flow of matter and energy while integrating the surface compartment, and finally this study led us to better understanding how a wadi ecosystem perform.

Keywords: Macroinvertebrates, Hyporheic, Trophic groups, Tafna Wadi

(19348) LEAD REMOVAL FROM INDUSTRIAL WASTEWATER BY THE MEAN OF PLANTED FILTER OF PAPHYRUS

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In recent years, heavy metal pollution has become a main public concern. Human activities such as mining, industry, traffic, agriculture, and military activities promote heavy metals release into the environment, leading to toxicity. Heavy metals pose serious health risks not only to wildlife, but also to human health. Because they are non-degradable, persistent and difficult to eliminate once they incorporate the environment. Phyto-purification, the use of plants and their associated microbes for environmental cleanup, is a noninvasive, a cost-effective and an efficient technology for a variety of organic and inorganic pollutants. Among inorganic pollutants that can be phyto-remediated, Lead which is a nonessential element. This heavy metal exists naturally in the environment but exposure to high doses has toxic effects. Macrophytes commonly show great plasticity of structures, morphology, and behavior in aquatic systems; and for this reason, they are used to remediate the polluted aquatic environment. It is in this perspective that the objective of our study, which is to highlight the potential of aquatic plant (*Papyrus*) to purify industrial wastewater and particularly to eliminate the Lead present in this water. The experiment concerns a filling of planted filters with an industrial wastewater, then a collecting of the water from the filter after 5 days. The water samples are analyzed by Atomic Absorption Spectrophotometry. The results obtained revealed a good removal efficiency of heavy metal present in the raw water. The planted filters of *Papyrus* show Lead removal efficiency for a residence time of 5 days of 75,68%. So this research confirms the importance and feasibility of using planted filters with macrophytes in the treatment of wastewater.

Keywords: Phyto-remediation, Planted filter, Papyrus, Residence time, Lead, Industrial wastewater.

(19446) TEST OF CONTAMINATION OF A LICHEN SPECIES "XANTHORIA PARIETINA" AND A MUSCICOLE SPECIES "HYLOCOMIUM SPLENDENS" BY LEAD/EFFECTS ON SOME PHYSIOLOGICAL PARAMETERS.

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Air pollution, especially that caused by lead has constantly evolved over time, due to the considerable increase in the number of vehicles on the market. Lead, which is one of the first used metals by mankind, represents a major risk to human health but also to the ecosystem. Living beings are a reflection of the environment in which they evolve and their observations at various levels of the biological organization can provide guidance on the quality and characteristics of this environment.

The use of lichens and mosses can provide very precise indications and show as early as possible the natural or the induced changes. That's why, our work is essentially based on the characterization of the accumulating power as well as the impact of the different concentrations of lead on two species, a lichenic species "*Xanthoria parietina*" and muscicole species "*Hylocomium splendens*" collected in the region of Bir El Djir "Oran" Algéria.

In order to determine the ability of these plants to accumulate lead and its impact on some physiological parameters (ph, chlorophyll and proline), a contamination in vitro by different concentrations of Pb (NO₃) was carried out during a period of 45 days.

The obtained results show the presence of lead in the thalli of both species, at levels increasing in parallel with the concentrations to which they were exposed, as well as a disturbance of the cellular metabolism which is interpreted by an increase in ph. Also we have noticed variations of measured physiological parameters; Chlorophyll and proline content that can result from stress, degradation of the fresh material, and disturbance of the photosynthetic process.

It is obvious to mention that the two studied species are proven good bio accumulators of lead which makes them excellent bio-indicators for the estimation of pollution especially by metals.

Keywords: Lichens, Mosses, Lead, Bioaccumulation, Bio-indication, Physiological parameters

(19694) DISCOLORATION OF ORANGE METHYL BY ELECTROFLOTATION

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The objective of this work is to determine the optimal conditions for the discoloration of an azo dye (orange methyl) in aqueous solution by an electrochemical process (electro-flotation). Electroflotation (EF) is the flotation using electrolytically generated bubbles of hydrogen and oxygen for separating suspended substances from aqueous phases. Experimental design and analysis of the results were realized using a central composite face-centered design (CCF). Optimization of the operating conditions was obtained using the response surface methodology. The experimental data obtained were adapted to a second order polynomial equation using multiple regressions and were also analyzed by analysis of variance (ANOVA). The correlation coefficient R^2 obtained was found to be equal to 0.997 indicating that the experimental data fit very well with the predicted data by applying the quadratic models. Optimal parameters are pH = 7.94, a current density of 37.48 mA/cm² and a reaction time of 29.98 min. Under optimal conditions, the discoloration rate is 96.26%.

Keywords: Methyl orange, Discoloration, Electro-flotation, Optimization, Response Surface Methodology

(19858) MASS TRANSFER PROCESSES IN THE ADSORPTION OF (CBB) IN AQUEOUS SOLUTION BY APRICOT STONE ACTIVATED CARBON

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The preparation of an activated carbon from apricot stone (ASAC) with H₃PO₄ activation and its ability to remove the Coomassie Blue (CB) from aqueous solutions are reported in this study. The spectroscopy method is used to get information on interactions between the functional groups of the adsorbent and the CB. A series of contact-time experiments were undertaken in stirred batch adsorber to assess the effect of the system variables. A comparison of the two kinetics models showed that the kinetics of adsorption was best described by the pseudo-second order kinetic. The adsorption isotherms are determined and correlated with the Langmuir and Freundlich models. The smaller RMSE values obtained in Freundlich models indicate the better curve fitting and the monolayer adsorption capacity of CBB is found to be 10.09 mg/g at 22.5°C and 98.022 mg/g at 50 oC and pH 2. The determination of the thermodynamic parameters indicates the spontaneous and exothermic nature of the adsorption process in the studied range of temperatures. The value of activation energy was found to be 66.161 kJ/mol, which indicates that chemical adsorption was the predominant mechanism in the sorption process.

Keywords: Apricot stone, Coomassie Blue G-250, Kinetic, Isotherm, Thermodynamic

(19888) STUDY OF CHROMIUM CONTAMINATION OF SLUDGE FROM WASTEWATER TREATMENT PLANTS IN EASTERN ALGERIA

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Chromium can be found in small amounts in its natural state in all types of rocks and soils. The main sources of anthropogenic chromium are the industry using chromium, such as tanneries, sewage sludge landspreading, atmospheric deposition, fertilizer use and animal manure.

This study aims to quantify the concentration of chromium in the sludge of the main purification plants in eastern Algeria. It also aims to determine the origin of the contamination when the concentration of chromium in the sludge exceeds the standard of 1000 mg/kg.

The estimation of chromium concentration in sewage sludge was carried out by Panalytical Epsilon 3 energy dispersive X-ray fluorescence spectrometer (EDXRF). The sample is placed under a helium atmosphere during the analysis. The system is computerized and fully controlled by the OMNIAN analysis software. It allows selecting optimal excitation conditions. The intensity and energy of the X-rays produced by the tube are judiciously adjusted to amplify the peaks of a particular region of the X-ray fluorescence spectrum. The spectrum was recorded with an aluminum filter with a thickness of 50 µm, a ddp of 12.00 kV and a current of 500 µA to amplify the peaks of chromium.

The results obtained for the following stations: Jijel, El Eulma, Ain El Beida, Ibn Ziad, Bordj Bou Arreridj, Setif, Sidi Merouane, Batna, El Eutmania, Souk Ahras, Annaba, Guelma, Khenchela, El Milia and Ferdjioua are respectively: 4540 mg/kg, 1980 mg/kg, 1720 mg/kg, 240 mg/kg, 230 mg/kg, 330 mg/kg, 310 mg/kg, 230 mg/kg, 180 mg/kg, 280 mg/kg, 230 mg/kg, 180 mg/kg, 160 mg/kg, 350 mg/kg and 1980 mg/kg.

The chromium concentrations are all below the norm except for the wastewater treatment plants of Jijel, El Eulma and Ain El Beida. The result concerning the station of the city of Jijel confirms previous studies on the pollution of the city by chromium. The mollusks of the littoral of the city contain a high concentration in chromium. This contamination was attributed to the tannery of the city.

Keywords: Chromium contamination, Wastewater treatment plant, Sludge

(19925) A PRELIMINARY STUDY ON THE ASSESSMENT OF THE CYTOTOXIC EFFECT ON MOUSE EMBRYONIC FIBROBLASTS (MEF) OF ERGENE RIVER

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The development of modern and intensive agricultural practices has introduced chemical fertilizers and pesticides into the urban environment. Also, the low capacity of sewage treatment has resulted in industrial and residential waste being discharged directly into the Ergene River Basin.

In this study, it was aimed to investigate cytotoxic effects in Mouse Embryonic Fibroblasts (MEF) exposed to water samples taken from the Ergene River. For the purpose of this research, MEF cell lines cultured in DMEM, HAMS F 12 (1: 1) and 5% FBS with conditioned medium and incubated 24 and 48 hours at 37°C, 5% CO₂. The viability of cells was assessed spectrophotometrically via the in situ reduction of 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT). The magnitudes of the cytotoxic effects of water samples were found to be time and concentration dependent. Cytotoxicity assessment in cells impacted by the Ergene River presence of heavy metals was visualized (Live-Dead-Apoptosis Assay) by fluorescence microscopy.

In addition, some element and pesticide analysis were carried out to evaluate the chemical structure of the water sample. The obtained data was compared with Surface Water Quality Regulation. The indicative limit values were exceeded for Pb, Sb, Cd, Se, Zn, Cu, Ni, Co, Fe, Cr, V and Al. The results were revealed the presence of pesticides in investigated sample. But their concentrations did not exceed its tolerance level. For this reason, it is thought that toxicity may be related to heavy metal.

Keywords: Ergene River, Mouse embryonic fibroblast, Cytotoxicity, Heavy metal, Pesticide

(19931) ACCUMULATION OF HEAVY METAL IN HEALTHY FIBROBLAST CELL LINES: AN EXAMPLE FROM THE ERGENE RIVER

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Water quality assessment in the inland waters based on the physicochemical and ecotoxicological investigations. The results indicate that sites located close to the most urbanized and industrialized areas are severely impaired. Industrial and domestic waste waters, besides other pollutants also contain high concentration of heavy metals. They accumulate in living organism through the biological chain.

This research was conducted for the effects of toxic heavy metal accumulation rates in Mouse Embryonic Fibroblasts (MEF) cell lines were investigated after exposure of Ergene River.

Healthy Mouse Embryonic Fibroblast Cells were incubated with Dulbecco's Minimum Essential Medium, HAM'S F 12 (1: 1) and 5% FBS at 37°C for 24 and 48 hours. The viability of the cells was determined by the MTT method (3- (4,5-dimethylthiazol-2-yl) -2,5-diphenyltetrazolium bromide). As there was a very high death toll in 48 hours, the work was decided to continue for 48 hours. MTT test results LD50 values were determined by PROBIT analysis of SPSS 18 statistical program and applied to MEF cell lines. The heavy metal accumulations of the cells were analyzed by ICP-MS.

As a result of ICP-MS analysis showed that higher levels of Mn, Cu, Al, Ba, Se and Sr than the control group. This accumulation suggests that death in healthy cells is due to heavy metals. Following this, presumably future research will find out molecular and genetic studies.

Keywords: Accumulation, Heavy metal, Ecotoxicology, Mouse embryonic fibroblast, ICP-MS.

(19941) AN ARTIFICIAL NEURAL NETWORKS MODELL FOR PREDICTING BOD OF ISHEM RIVERS

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Water quality depends on the determination of the many parameters determined by chemical methods. These methods are often tedious and time consuming. Artificial Neural Networks (ANNs) are suitable models for many purposes. Recently, ANNs have been widely used in modeling, control, pattern recognition, signal processing, prediction purposes and so on.

Many of the physical and chemical water quality variables (pH, turbidity, TDS, temperature, electrical conductivity, dissolved oxygen, chemical oxygen demand, hardness, chloride, sulphate, phosphate, calcium, magnesium, nitrate, nitrite and ammonium) that affect biochemical oxygen demand (BOD) concentrations were collected at 7 sampling sites in the Ishem River Basin during 2010–2017.

In this study, we use a three-layer feed-forward model with back-propagation multi-layer perception (MLP) to model the relationship between the water qualities parameters used to predict the BOD.

The available data set was partitioned in three subsets: a training set, a validation set and a test set according to station. In order to reach an optimum amount of hidden layer nodes, nodes 2, 3, 5, 7, 9, 10 were tested. Within this range, the ANN architecture having 10 inputs and 1 hidden layer with 5 nodes gives the best choice. The ANN was successfully trained and validated with 80% and 10% of the data sets respectively.

Comparison of results shows that the ANN model gives reasonable estimates for the BOD prediction. Performance of the models was evaluated by average error (AE) and mean square error (MSE). The correlation coefficient of ANN models for prediction of BOD was 0.925. Sensitivity analysis was also carried out to identify the most significant input-output relationship. Hence, the ANNs were able to show remarkable prediction performance to predicting the BOD in Ishem River.

Keywords: Artificial Neural Network model, Multi-layer perceptron, Prediction, Ishem River, BOD, Water quality parameters

(20038) PHYTOCHEMICAL DIVERSITY AND ANTIOXIDANT ACTIVITY OF BOTH MAIN TUNISIAN OLIVE CULTIVARS UNDER DIFFERENT CLIMATIC CONDITIONS

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Mediterranean countries especially the southern ones seem to be the most seriously concerned by the climate change, which have many impacts on agricultural productivity and food safety and quality. The olive culture is a characteristic of the Mediterranean region where it takes economic, social and environmental places. Chemlali and Chetoui are the main Tunisian variety of olive tree. To adapt to different climatic conditions characterizing the North, the Center and the South of the country, these varieties synthesis many interesting compounds which were screened and compared. Indeed, the chemical compositions of their foliar methanolic extracts were analyzed quantitatively for their content in antioxidant compounds. The antioxidant activities of these extracts were tested against both radicals, DPPH and ABTS. While, antioxidants were identified using chromatographically analyses by GC-FID and GC-MS. Tested at a concentration of 1mg/ml against DPPH, the methanolic extracts of both Chemlali and Chetoui exhibited an interesting antioxidant activity reaching 90%. However, Chemlali activity was more important in the Center (80%) and the South (70%), while, Chetoui's was in the North and the South. These activities were lower against ABTS but steeled more important in the South comparatively to the other areas. Total phenols of Chemlali showed an increase in its content in the South, it tripled comparatively to the North's. Additionally, flavonoids, diphenols, saponin and carotenoids increased significantly in this area differently to those of Chetoui, which showed a decrease in a lot of them. Benzyl alcool, Ionene, Pyrazole, Benzaldehyde, 4-vinyl methoxyphenol, known for their antioxidant activity were identified in these varieties.

Keywords: Olive tree, Chemlali, Chetoui, Antioxidants, Climatic conditions

(20056) TRACE AND TOXIC ELEMENT BIOACCUMULATIONS IN MUSCLE, GILL AND LIVER TISSUES OF FISHES LIVING IN MERIÇ RIVER DELTA, TURKEY

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Meriç River Delta, which is located on the Thrace Region of Turkey, is one of the worldwide important wetlands. Gala and Sığircı Lakes are known as very significant lakes in Turkey in terms of especially biodiversity and they are located in the Meriç River Delta. The aim of this study was to evaluate the trace and toxic element bioaccumulation levels in fishes of Gala and Sığircı Lakes by investigating a total of 25 macro and micro element concentrations. One Way Anova Test (OWAT) was applied to detected data in order to determine the statistical differences of element bioaccumulations among the fish species and Cluster Analysis (CA) was also applied to detected data in order to classify the investigated elements in terms of concentration levels in fish tissues. According to the results of OWAT, although statistical differences were not recorded among the fish species in terms of essential element levels, significant statistical differences were recorded in terms of toxic element levels ($P < 0.05$). According to the results of CA, 5 statistically significant clusters were formed, which were named as "Most intense elements", "Second most intense elements", "Moderate intense elements", "Second rarest elements" and "Rarest elements". It was also determined that toxic element bioaccumulation rates in fishes of Gala Lake were significantly higher than detected in fishes of Sığircı Lake ($P < 0.05$).

Keywords: Meriç River Delta, Fishes, Macro and micro elements

(20057) USE OF FACTOR ANALYSIS TO EVALUATE THE TOXIC ELEMENT BIOACCUMULATION LEVELS OF FISHES LIVING IN GALA AND SİĞİRCİ LAKES (THRACE REGION, TURKEY)

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Meriç River Delta, which has an international importance, is located on the Edirne Province of Turkey. Gala and Sığircı Lakes are located in the Meriç River Delta and they are the main aquatic factors of the system. The aim of this study was to evaluate the toxic element bioaccumulations in fishes of Gala and Sığircı Lakes from a statistical perspective by using Factor Analysis (FA). For this purpose, sodium (Na), magnesium (Mg), aluminum (Al), calcium (Ca), manganese (Mn), iron (Fe), cobalt (Co), nickel (Ni), copper (Cu), selenium (Se), cadmium (Cd) and lead (Pb) concentration levels in muscle, gill and liver tissues of *Carassius gibelio* (Bloch, 1782), *Carassius carassius* (Linnaeus, 1758), *Scardinius erythrophthalmus* (Linnaeus, 1758), *Cyprinus carpio* Linnaeus, 1758, *Sander lucioperca* (Linnaeus, 1758), *Perca fluviatilis* Linnaeus, 1758 living in these lakes were investigated and detected data were evaluated by using FA in order to determine the associated contaminants and effective factors on the biotic components of the basin. According to the results of FA, 3 factors, which were named as “Nutrient Factor “, “Agricultural Factor” and “Industrial Factor”, explained 79% of the total variance.

Keywords: Gala and Sığircı Lakes, Toxic elements, Factor Analysis

**(20059) CHARACTERIZATION OF THE SLUDGE OF THE EL EULMA STATION
WITH A VIEW TO ITS VALORIZATION**

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The wastewater treatment plant in the city of El Eulma is a station with a treatment capacity of 230,000 population equivalents. It can produce up to nine thousand two hundred tons of sludge a year. Sewage sludge consists of complex organic materials, inorganic materials and microorganisms. Its agricultural valorization seems to be the cleanest and most profitable solution. However, sludge contains disease causative agent and dangerous chemical compounds. The valorization of sludge in agriculture becomes prohibited when the concentration of certain chemical elements is reached. Sludge characterization of wastewater treatment plants is essential before its use.

The aim of this study is the quantification of the metallic pollution contained in the sludge of the El Eulma wastewater treatment plant. The sludge samples were taken after thickening in the treatment plant during the month of March 2017. They were used after drying for 24 hours at 60 ° C and grinding. The determination of the metallic elements was carried out by a Panalytical Epsilon 3 spectrophotometer with a power of 9 watts. The determination of carbonate content was carried out after etching with an excess of acid. The determination of nitrate ion concentration, chemical oxygen demand and pH was made after extraction in aqueous solution. X-ray fluorescence spectroscopy analysis identified the following elements in this sludge: Na, Mg, Al, Si, P, S, Cl, K, Ca, Ti, V, Cr, Mn, Fe, Ni, Cu, Zn, Ga, As, Br, Rb, Sr, Zr, In, Ba and Pb. These elements represent 63.80% of the total sludge mass. The carbonate content is 102 mg/g. The elements present in the sludge of the El Eulma station and whose content is regulated are chromium, copper, nickel, lead and zinc. They are present in the sludge with respectively the following concentrations: 1.98 mg/g, 1.01 mg/g, 0.05 mg/g, 0.45 mg/g and 3.31 mg/g. Chromium is the only element whose content exceeds the norm.

The chemical oxygen demand measured after extraction in aqueous solution is 2.470 mg/g. The concentration of dissolved nitrate ions is 0.303 mg/g. The pH of the sludge is 7.20.

Keywords: El Eulma wastewater treatment plant, Sludge, Sewage sludge valorization

(20210) DETERMINATION OF THE SEA WATERS AND SEDIMENT QUALITY OF BOU-ISMAIL GULF IN ALGERIA

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The objective of this study was to evaluate the quality of the environment and fishery products in the gulf of Bou-Ismaïl (ouest Algeria), by studying several quality indicators in the three compartments that make up the marine ecosystem: Water, sediment and biota (fish).

The study of the physicochemical quality of sea water in the different sampling stations showed a moderate variation of the temperature and salinity except for the stations which are approximate of industrial and urban wastewater discharged directly in sea.

The physical and chemical parameters of sea water (temperature, OD, pH, salinity, etc.) measured in situ are good and reflect the real conditions in the Mediterranean coastal waters at the time of the sumpling. Nutrient analyzes, on the other hand, reflect some degree of ammonia NH₄⁺ contamination. These results are related to seasonal variations in the circulation of nutrients in sea, and also to anthropogenic activity in the study area.

The analysis of the three traces metals Pb, Cd and Zn in the sediment samples showed the presence of these metallic elements in the majority of the studied stations.

From these different results, it can be said that at present, the marine environment of Bou-Ismaïl gulf is influenced by a moderate anthropogenic activity that requires a continious monitoring and protection plan of the marine ecosystem.

Keywords: Pollution, Littoral, Sediment, Sea water, Heavy metals, Physicochemical and chemical quality

(20231) QUANTIFICATION OF MASS CONCENTRATIONS AEROSOLS PM_{2.5} IN PRIMARY SCHOOLS OF TIARET CITY (ALGERIA)

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In the atmosphere, aerosols are one of the main routes of pollutant transfer. Particles with a characteristic size of less than few microns make up the majority of the atmospheric aerosol and are therefore the most likely long-distance transfer route. The problems of air pollution in Algeria accumulated over decades are just like in all big cities with industrial development, automobile traffic and household waste which suffocate their environment.

The objective of this work is to quantify particulate pollution by aerosols PM_{2.5} in educational establishments in Tiaret city (Algeria) using a Dekati® PM₁₀ impactor two-stage. The dispersion of these particles is illustrate by a detailed map.

As sampling sites, 23 primary schools have been selected in Tiaret city, and the collection of PM_{2.5} was performed in the morning, afternoon and evening, in the presence and absence of the pupils. The results found have shown a gradient of concentrations of PM_{2.5} by site typology; low and average concentrations are recorded in the areas close to forests and the high concentrations are observed in the sites exposed to road traffic in winter. However, concentrations recorded in the urban sites are lower in the summer.

We also noticed that the dominance of PM_{2.5} has been observed in the vicinity of the major axes of movement.

The maps present information obtained by hierarchical classification, they aim to answer a need for spatialized knowledge of the problem of particulate pollution in urban areas in the city of Tiaret.

Keywords: Air pollution, PM_{2.5} aerosols, Mass concentrations, Cartography, Tiaret, Algeria.

(20296) BIOLOGICAL DEGRADATION BY BIOSTIMULATION OF ORANGE II DYE

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Biological treatment is widely used especially in treatment plants because of its low cost and high degradation performance, however this treatment is used for biodegradable molecules only, through this work we wanted to degrade a recalcitrant molecule, at high concentration with biological treatment by biostimulation which concerns the addition of an organic material beside the activated sludge. According to the published literature, mixtures containing multiple organic matter sources may support a wider consortium of interdependent organisms and may, thus, show higher bacterial activities than those corresponding to single sources. To incite the development of biomass in the mixture, capable of degrading biorefractory compounds like azo dye, Pedicels of dates cut into small pieces, were used in this work, as support for bacteria and as external carbonaceous substrate source for the biological treatment of synthetic dye solution. To carry out this study we applied our process to the anionic and azo dye orange II, and we tried to optimize the following parameters: the type of the biostimulant, the mass of the microorganisms, the mass of the biostimulant, the pH, the temperature as well as the initial concentration of the solution.

The results revealed a very good performance that exceeds 70%.

Keywords: Biodegradation, Activated sludge, Biostimulation, Bacterial activity

(20303) COMPARISON OF ORGANIC POLLUTION BETWEEN TWO MAIN BRANCHES OF DRIN RIVER

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The objective of this paper is to compare data on pollution from organochlorinated pesticides and polychlorinated biphenyls (PCB) in waters of the two most important branches of Drin River, one passing through Kosovo and the other originating from Ohrid Lake and passing through north-eastern Albania. The organochlorinated pesticides and polychlorinated biphenyls are the widest class of organic compounds and the most problematic in environment.

The method applied to detect pesticides was sampling water in 10-25 cm of depth in two specific locations, one at the end of each of the branches of the river before their conjunction. Samples of surface waters were taken during 2012 – 2015. The liquid – liquid (L/L) water extraction and gas chromatography (GC) with micro electron-capture detector (μ ECD) were applied for pesticide residue analyse. The quantified pesticides were α -HCH, β -HCH, HCB, Lindan, Heptachlor, 2,4-DDE, 4,4-DDE, DDT, DDD representing organochlorinated pesticides and PCB 28, PCB 101, PCB 118, PCB 153, PCB 138 for polychlorinated biphenyls.

The most polluted branch resulted to be Black Drin.

Keywords: Drin River, Organochlorinated pesticides, Polychlorinated biphenyls

(20325) INVESTIGATION OF A CONTINUOUS SOIL WASHING PROCESS USING SURFACTANT

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The contamination of soils and groundwater by toxic and/or hazardous organic pollutants is a widespread environmental problem and the removal of these hydrophobic organic compounds from contaminated soils is becoming a major concern. Up to now, various remediation techniques have been developed; among them, the washing processes with surfactants and biosurfactants are the most used. These processes are based on the decrease of the interfacial tension at the soil/organic phase and water/organic phase interfaces. Where, the organic molecules are removed from soil by mean of mobilization and/ or solubilization processes at a concentration greater than the critical micelle concentration (CMC). According to several studies, the solubility of hydrocarbons depends on many factors: the type and quantity of surfactant, and the age of contamination. Recently, many types of surfactants have been studied. Widely used in the world, the diesel fuel is a mixture of saturated hydrocarbons and aromatics, which represents a permanent source of soil and water pollution.

In this work, the washing process of a soil column by an anionic surfactant (Sodium dodecyl sulfate) was investigated. Water flow rate and the contamination duration (age) have been studied. The performance of water in the removal of diesel fuel was found to be non-negligible, while water contributed by 7% in the global elimination of diesel fuel. The effect of SDS is significant beyond the CMC, where 30% of the diesel fuel was removed from soil at a rate 3.2 ml/min with 8 mM SDS solution. Furthermore, the process was shown to be governed by the first-order kinetics. The partitioning of the diesel fuel between the liquid and solid phases was studied by the breakthrough curves.

Keywords: Surfactant, Soil remediation, Diesel fuel, Hydrocarbon removal

**(20860) BIODIVERSITY OF MAYFLIES OF ABDI WADI (ALGERIA):
TAXONOMY, ECOLOGY AND BIOGEOGRAPHY**

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To contribute to the study of systematic biogeography and ecology of mayflies in the Algerian lotic waters, a faunal analysis of one of the most important wadis in the Saharan Atlas, Abdi wadi, was performed from January 2008 to December 2009 on 5 sites distributed in the wilayas of Batna and Biskra.

The surveys carried out allowed us to develop a systematic repertory of 10 species of mayflies. 4 families were identified: these are the Leptophlebiidae and Caenidae belonging to the suborder of Rectracheata and respectively to the infra-orders Lanceolata and Pannota; the Hepatgeniidae relate to suborder of Setisura and the Baetidae return to the suborder of Pisciforma. The Baetidae are the most abundant and the most diversified family with 6 species including one, *Baetis sinespinosus*, is an Algerian endemic and signaled for the first time in our study area. The Caenidae family is represented by two species of which, *Caenis cf macrura*, is not met in Algeria since 1928. The Leptophlebiidae and Hepatgeniidae are rarely represented with a single species for each. Each species shows ecological preferences for such type of environment for another. The species *Baetis pavidus* adorned the more eurytope and more eurythermal. Moreover, the most species appear thermophilic such as: *Ecdyonurus rothschildi*, *Caenis luctuosa*, *Choroterpes (Ch) atlas*, *Procloeon stagnicola* etc. The *Baetis gr. rhodani* prefer the fresh waters of the sites situated in high altitude.

Keywords: Mayflies, Endemic, Systematic, Ecology, Biogeography, Abdi Wadi

**(20952) MONITORING OF THE DISTRIBUTION OF MARINE MOLLUSCS IN
HARD SUBSTRATE FOR THE ESTABLISHMENT OF AN ECOLOGICAL
DIAGNOSIS OF THE ORAN COAST**

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The malacofauna of the Algerian coast has been the subject of little research, especially in the study of the natural environment, few scientific studies that have focused on the ecology of this phylum and interest as a biological indicator of the health of the environment condition.

This study aims to evaluate the water quality of the Oran coast, this by using ecological indices, based on the presence and abundance of gastropods and mollusks polyplacophores, living on natural bedrock of the mediolittoral stage. We conducted an inventory of mollusk species that inhabit the coast of Oran to establish an ecological analysis using biodiversity indices in order to show the ecological health of the Oran coast.

The results obtained show that the richness varies between 7 and 12 with species abundances ranging from 218-897 individuals. Spatial variations in the abundance of shellfish indicate a disparity between the 11 stations surveyed. This in conjunction with the environmental conditions in particular human disturbance.

However, diversity indices, such as: Shannon Wiener index (H), evenness index Pielou (J), Simpson index, Hill index and index of Sorensen,

Tend to describe an Oranian coastline disturbed by an ever-increasing human activity, beyond urbanization, we have noted a detrimental effect of fishing for cane, which contributes to the destruction of some species of mollusc.

The principal component analysis (PCA) showed that species with a significant correlation between them are species that cohabit together under the same conditions and that diversity indices were significantly correlated with each other except Hill index (HI) that is negatively correlated with all indices.

Keywords: Biomonitoring, Malacofauna, Oran coast, Abundance, Diversity indices

(21150) STATISTICAL APPROACHES TO EVALUATE THE DRINKING WATER QUALITY OF VILLAGES LOCATED IN EDIRNE (THRACE REGION, TURKEY)

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This study was carried out to evaluate the drinking water quality of İpsala, Keşan, Uzunköprü and Meriç Districts, which are located in the Meriç River Basin in Edirne Province of Turkey, by a statistical approach by using Pearson Correlation Index (PCI) and Factor Analysis (FA). For this purpose, water samples were collected from 51 villages in autumn season of 2017 and some physical and chemical water quality parameters including dissolved oxygen, oxygen saturation, pH, electrical conductivity (EC), total dissolved solids (TDS), salinity, turbidity, nitrite (NO₂), nitrate (NO₃), phosphate (PO₄) and cyanide (CN) were determined. Pearson Correlation Index (PCI) and Principle Component Analysis (PCA) were applied to detected data in order to determine the significant relations among the investigated parameters and effective factors on groundwater quality of the region. According to the results of PCI, significant relations were recorded between the investigated parameters at the 0.01 and 0.05 significance levels. According to the results of PCA, 4 factors explained 75% of the total variance.

Keywords: Edirne villages, Drinking water quality, Principle Component Analysis

(21173) SUB-CHRONIC EXPOSURE TO FIPRONIL INDUCED OXIDATIVE STRESS, BIOCHEMICAL AND HISTOPATHOLOGICAL CHANGES IN THE LIVER AND GILLS KIDNEY OF OF NILE TILAPIA, OREOCHROMIS NILOTICUS

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Fipronil is a relatively new chiral, phenylpyrazole insecticide that exhibits neuro-toxic activity by blocking the GABA-regulated chloride channels of neurons. Fipronil is commonly used to control both agricultural and household invertebrate pests, but little is known about its toxic effects on non-target organisms such as fish. The purpose of this study was to evaluate biochemical and histological responses induced by fipronil in the liver and gills of Nile tilapia (*Oreochromis niloticus*) exposed for NOEC (no-observed-effective-concentration, 0.05 mg L⁻¹) and ½ LC₅₀ (0.077 mg L⁻¹) using semi-static technique for 21 days exposure. The acute, 96-hour toxicity of fipronil to fish was 0.152 mg L⁻¹. Behavioral characteristics are obviously sensitive indicators of toxicant effect. The most behavioral alterations happened by exposure to fipronil were observed during the acute- toxicity test at high concentrations (0.25, 0.30 mg L⁻¹) included opercular movement increasing, loss of equilibrium, fast swimming and swimming with head shaking. Changes in the activities of enzymatic antioxidants, such as superoxide dismutase, catalase (SOD), glutathione peroxidase (GSHPx), glutathione S-transferase (GST) and malondialdehyde (MDA) levels in liver tissues from fish exposed to the selected sublethal concentrations of fipronil were evaluated after 21 days of exposure. Our data showed that exposure to fipronil significantly decreased SOD activity at the lower concentration (0.05 mg L⁻¹) while increased it at the higher concentration (0.08 mg L⁻¹) compared to that of the control. The activities GSHPx, GST, and CAT were significantly increased after 21 days of exposure to fipronil. Similarly, the levels of lipid peroxidation (malondialdehyde, MDA) were significantly increased in response to fipronil exposure at both selected concentrations. Moreover, the activity of serum alanine aminotransferase (ALT) was significantly increased after 21 days of exposure to fipronil, at both selected sublethal concentrations, whereas the activity of aspartate aminotransferase (AST) was significantly decreased compared to that of the control. The levels of serum creatinine and urea were also significantly increased in response to exposure to fipronil for 21 days at both sublethal concentrations compared to those of the control. The liver and gill tissues of the fish exposed to fipronil for 21 days showed several histopathological changes. The severity of lesions accreted depending on increased pesticide concentration. The liver damage included necrosis in the pancreatic cells in the portal area with fatty change in the hepatocytes, dilatation of sinusoids, rupture of hepatocyte membrane and hypertrophy of hepatocytes. Also, the gill tissues of the fish exposed to fipronil showed several histopathological changes. The gills also exhibited some necrotic cells, edema, lifting of filaments and lamellar epithelium, and vascular disorders, such as extreme vasodilatation, proliferation of filament epithelium, and massive numbers of inflammatory cells, infiltration and degeneration in the covering epithelium of the rakers. A correlation between the biochemical and histological changes of the liver and gill tissues could be established, attributing the tissue and cell damages to the accumulation of fipronil or its metabolites. These results revealed that the biochemical and histopathological parameters can work as good indicators of the stress of a toxicant on fish.

Keywords: Nile tilapia, Fipronil, Sub-chronic, Oxidative stress, Biochemical parameters, Histopathological lesions

**(21179) CO-PRECIPIATED MAGNETITE PROPERTIES IN WASTE WATERS
PHOSPHATE ADSORPTION AND MICROBIAL CHARGE REDUCTION**

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In this paper are presented experimental results of synthetic magnetite adsorption capacity study for phosphorus and microbial removal from wastewaters. The magnetite used is produced by co-precipitation synthesis. First, the optimal precipitation conditions, such as NaOH addition rate, the presence of inert media, and the drying temperature are identified. After that, adsorption characteristics in synthetic and real wastewaters are evaluated. It is concluded that magnetite manifest better characteristics if it is produced in an inert media by fast addition of NaOH in the Fe(II)/Fe(III) mixture and dried at 60°C. Phosphorus adsorption in synthetic waters takes place after Langmuir isotherm. The situation differs in real wastewaters where, considering the competing ions, the adsorption takes place after Freundlich isotherm with equation constants $k=13.12$ and $1/n=2.9037$. The presence of competing ions also seems to lead to weaker capacities of magnetite to adsorb phosphorous. It is also shown a microbial reduction in the presence of magnetite, especially coliform bacteria, but also yeasts and moulds colonies.

Keywords: Magnetite, Co-precipitation synthesis, Adsorption capacity, Orthophosphate removal, Microbial reduction

(21195) COMPARATIVE EFFECTIVENESS OF ORGANIC AND INORGANIC AMENDMENTS ON CHEMICAL PROPERTIES OF SALINE-SODIC SOIL

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Soil salinity along the sodicity is one of the major problems in optimizing of maximum yield in arid and semiarid regions. In Pakistan, major causes of soil salinity and sodicity include weathering of salty parent material and brackish nature of underground water. The saline sodic soil causes low seedlings vigor, poor germination rate, poor stand establishment and osmotic inhibition. So present study was planned for reclamation of saline sodic soil by using different organic and inorganic amendments as compared with traditional reclamation gypsum. Eight treatments viz T1: Control, T2: Gypsum@100% SGR, T3: Gypsum @ 50% SGR, T4: Polyvinyle alcohol (1%w/w), T5: Compost (5 g kg⁻¹), T6: Biochar (5 g kg⁻¹), T7: Humic Acid (0.18g kg⁻¹), T8: Acetic Acid (3.64g kg⁻¹) with their replicates was designed. six kg soil was taken in each lysimeter and sorghum was grown. The results showed that maximum % decrease in soil SAR was recorded where gypsum @100% SGR was applied. The percentage decreasing order of SAR was T2 (65.44%) > T4 (59.98%) > T7 (43.34%) > T5 (42.26%) > T3 (41.51%) > T6 (27.00%) > T8 (16.97%) over control. Similarly, percent decrease in pH and EC (5.72%, 37.03%) and percent increase in O.M and CEC (143.05%, 58.70%) respectively was evaluated in T2 where gypsum @100% SGR was applied as compared to control. So the above results showed that gypsum @100% SGR perform best for decreasing sodium adsorption ratio, pH and electrical conductivity as compared to other amendments.

Keywords: Salinity, Low plant growth, Chemical imbalance, EC, pH, SAR, CEC, Amendments, Gypsum, Compost, Biochar, Organic acids, 100% soil gypsum requirement

(21247) REMOVAL OF METHYLENE BLUE FROM AQUEOUS SOLUTIONS BY ADSORPTION ON MONTMORILLONITE CLAY OF MAGHNIA CITY (WESTERN ALGERIA): CHARACTERIZATION AND ADSORPTION

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This research paper is articulated on the physicochemical characterization of AMN natural clay sampled from the region of Maghnia city (Western Algeria). Several techniques were used: The DRX, MEB, FTIR and UV-vis, in addition to the determination of some physicochemical properties as CEC and PZC. This enabled us to establish a series of data with these different properties of our materials: AMN, AMN Intercaled, AMN_{Ca2+} saturated and Intercaled. In the second stage, the adsorption of the organic contaminant was studied, which is the Methylene Blue (MB) by raw clay Montmorillonite (AMN) and modified (saturated and intercalated), after that we studied its application in the environment.

Keywords: Montmorillonite, Methylene Blue, Adsorption, Intercalation, DRX, FTIR, PZC

**(21251) VALORIZATION OF HOUSEHOLD WASTE VIA BIOGAS PRODUCTION
IN ALGERIA SINCE 1938: INVENTORY AND PERSPECTIVES**

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Energy is an important factor in Algerian's economy, the recent Algerian's economy crisis is due to the fall of the oil incomes of 70% in less than two years, which made the country lose half of its external receipts and causing an important deficit of its trade balance. The fossil fuel reserves will not last eternally (some 40 to 50 years) and the human activity causes a significant change of the climate, which has actually important repercussions. The need to find an alternative and renewable source of energy is becoming increasingly important for the sustainable development. However, Algeria is a country rich in solar and biomass layer; according to the National Waste Agency, more than 28,219 tons of municipal solid waste are generated per day. Energetic valorization of municipal solid waste (MSW) seems to be an alternative solution for sustainable development of Algeria, which the biogas constitutes a considerable source of renewable energy. This paper presents an overview for the status of this technology in Algeria including the increasing of the interest in methanization since 1938. Also in this study, is referred the first experience of Tamanrasset (southern of Algeria) in the field of biogas production.

Keywords: Biogas, Municipal solid waste, Renewable energies, Methanization, valorization

**(21265) NICKEL ACCUMULATION AND ANTIOXIDANT ACTIVITY OF
COMMON REED (*PHRAGMITES AUSTRALIS*) IN THE ALBANIAN PART OF
LAKE OHRID**

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The presence of some mines that produced nickel, chromium, iron and coal which now most are not functional is one of the main factors of metal contamination in the Albanian part of Lake Ohrid. In addition to this factor agriculture, chemical and metallurgical industry, serpentine soils endanger the lake. The purpose of our research was to evaluate the accumulation of nickel from the aquatic plant of the lake Common reed and to estimate the antioxidant activity of the leaves in the spring season.

Concentration of heavy metals was determined with Atomic Absorption Spectrophotometry (AAS) method whereas the total antioxidative activity with DPPH (2,2-diphenyl-1-picrylhydrazyl) radical elimination method.

The results showed that the largest accumulation of nickel was at the point of the former Fe-Ni mine 6.98 ± 0.5468 mg/kg and the difference was significant in comparison with entry of Pogradec ($p < 0.05$) and Lin village ($p < 0.01$). As far as antioxidant activity was concerned, it was highest at the point of the former Fe-Ni mine 431.88 ± 28.298 mg Trolox/g dry tissue weight but the difference was not significant compared to other points.

Keywords: Ohrid, Ni, Antioxidant, Pollution, Mine, Reed

(21269) OXIDATIVE STRESS IN COMMON REED (*PHRAGMITES AUSTRALIS*) IN THE ALBANIAN PART OF LAKE OHRID

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Aquatic plants are constantly exposed to various environmental factors that cause reactive oxygen species (ROS) production. One of these factors that endanger the Ohrid Lake's plants is the accumulation of heavy metals by plants. Various metals like nickel, chromium increase ROS production and with it the malondialdehyde (MDA) values in the plants.

The purpose of this research was to evaluate oxidative stress in common reed by measuring the values of MDA and to see the possibility of using of MDA as a bioindicator for the assessment of pollution in the Lake Ohrid.

Plant samples were analyzed by Health Packer spectofotometric method.

The research conducted on three points at the entrance of Pogradec, at the former factory of ferro nickel and at the village Lin. Although not significant the greater values of MDA (4.8300 ± 0.5742 micromol/g wet tissue) in stem of common reed had in the factory point. Our results showed that a further study on MDA as a bioindicator on various parts of the plant and even in various aquatic plants should be continued.

Keywords: Ohrid, MDA, plant oxidative stress

(21273) TREATMENT OF OIL MILL WASTEWATERS BY INFILTRATION-PERCOLATION

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In Morocco, the olive oil extraction industry generates high amount of olive mill solid waste and olive mill wastewater. These effluents are heavily loaded with organic matter. Their discharges without any treatment affect the quality of water and soil and cause immense environmental damages. The objective of this study is the treatment of oil mill wastewaters from two different regions of Morocco (Sefrou, Marrakech) by infiltration-percolation.

The physicochemical characterization of the olive mill wastewater has shown that these acid effluents are too much loaded with organic matter, suspended matter and polyphenols.

The treatment of oil mill wastewaters by both F1 (sand - soil - sand) and F2 (sand - fly ash - soil) filters has allowed an increase in the pH which becomes basic, a significant removal of COD, BOD5, total polyphenols, MES, respectively in F1 and F2.

For the oil mill wastewaters from the city of Marrakech treated by the five filters, the best rates of abatement and the high attenuation of the microbial load are obtained with filters combining fly ash and agricultural soils.

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Keywords: Oil mill wastewaters, Infiltration-percolation, Soil, Fly ash

**(18010) NUTRITION, MALNUTRITION ANALYSIS IN THARPARKAR DISTRICT,
SINDH PROVINCE PAKISTAN**

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The goal of reducing child malnutrition is far from being fulfilled in most developing countries. Over the past 20 years there has been little change in the prevalence of malnutrition in the population despite more food availability and an overall increase in caloric intake per capita. The purchasing power of people is decreasing day by day. The Tharparkar has faced the drought due to low level monsoon rains, lack of measures to ensure the food security, lack of fodder and disease among the livestock resulted in loss of large number of animals. The situation analysis revealed the poor health and nutrition status of the women and children. The study was implemented in union councils of two talukas Mithi and Diplo of district Tharparkar. Total 50274 children under 5 years of age were screened for malnutrition through MUAC (Mid-Upper Arm Circumference) measurement. The malnourished children identified were 9570 (19%). This is slightly higher than the overall Sindh data of malnourished children as revealed by the National Nutritional Survey (NNS 2011). Among these malnourished children 52.5 percent were girls. The severely acute malnourished children were 3018 (6% of the total children) and moderately acute malnourished children were 6552 (13% of the total children). The pregnant and lactating women were also screened for malnutrition through the MUAC measurement. Total 26360 women were screened including 13627 pregnant women and 12733 lactating women. The malnourished women were 5037 (19.1%), that is also slightly higher than the percentage of women (17.5%) revealed by the NNS 2011 for Sindh.

Keywords: Malnutrition, Nutrition, Tharparkar

(18158) BIOCHEMICAL CHARACTERIZATION OF CELL WALL POLYMERS OF FRUIT OF *CHAMAEROPS HUMILIS* L.

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Detailed analyses of the cell wall polymers are essential for the understanding of plant development and for our use of plant biomass in the food, agriculture, biofuel and biocomposite industries. The chemical composition of macromolecular components of *Chamaerops humilis* L. fruits have been evaluated. We present analytical techniques to define the chemical composition of individual cell wall polymers. The procedure covers the preparation of cell walls, together with Thin layer chromatography (TLC) methods, for the analysis of monosaccharides. The extraction of the parietal polysaccharides was carried out by alkaline solutions of 24% KOH and 17.5% NaOH (Huwyler et al., 1979) to solubilize the hemicelluloses. The pectins are first solubilized by boiling water, then with 0.5% ammonium oxalate. Lignins were studied by used Klason method using H₂SO₄. (Dence, 1992) The result of this determination is expressed in g/100 g of dry fruit content of pectins, hemicelluloses (KOH, NaOH extracts) (H%), cellulose (C%), and lignins (L%). The insoluble cell wall residues (cellulose) obtained after removing liposoluble constituents yielded 25.8% of the initial fruit powder. The cellulose fraction was the largest, followed by pectin extract 8.7%. The hemicelluloses fraction yielded lower amount 5.6%. The thin-layer chromatography analysis of the parietal polysaccharides showed that the pectins contained rhamnose, arabinose and xylose. In The hemicelluloses arabinose, xylose and galactose have been revealed. The lignins Klason content was 15%.

Keywords: *Chamaerops humilis* L., Cell wall polysaccharides, Lignins, TLC

(18493) ENTEROHEMORRAGIC *ESCHERICHIA COLI* O157:H7 ISOLATED FROM IMPORTED BOVINE MEAT IN WEST ALGERIA «TLEMCEEN»

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Actually, there are no official regulations stipulating the procedures for sampling and research of STEC in food in Algeria.

In this study, we were interested in search of *E. coli* O157: H7 Shiga-toxin producing (STEC) in 750 samples of bovine meat imported from different countries. After enrichment and use of selective agents in the Sorbitol MacConkey (SMAC) medium that are intended to curb the growth of the annex flora, we have isolated 5 strains from meat.

These strains presented the main characteristics of *E. coli* O157: H7, non sorbitol fermenting and negative β -Dglucuronidase, we have colorless colonies (the other species of *E. coli* fermenting sorbitol form pink colonies on SMAC medium).

Genetic characterization revealed the presence of genes and toxicity *stx1 stx2*, are the major virulence factors of these strains, they are responsible for pathogenicity of these bacteria by the production of toxins as well as the specific hemolysin (*ehxA*) and intimin (*eae* genes) for *E. coli* O157: H7.

The study of the resistance of the strains to antibiotics disclosed they are sensitive to all antibiotics (ampicillin, chloramphenicol, gentamycin, colistin, flumequin, enrofloxacin, nitrofurantoin, cephalotin, sulfamethoxazole-trimethoprim and tetracycline) tested.

Keywords: *E. coli* O157: H7, Imported bovine meat, Stx1, Stx2, Antibiotics

(18740) THE EMERGENCE OF THE ACTIONS MICROBIAL PLURI-RESISTANT TO ANTIBIOTICS STRONGLY LIMITS THE OUTPUTS OF THE LEVEL DAIRY PRODUCTION IN WILAYA OF BOUIRA

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The insufficiency of the production dairy in Algeria is ascribable at the various origins among which, sterility, the failure of a rigorous policy of the genetic selection, a bad medical condition of the milk draft, environmental factors, mode of the breeding control and economic factors (Chehad2002). In order to determine best the risks which are related to the consumption of the raw cow milk to wilaya Bouira, of the contaminated milk samples were take in 20 dairy exploitations in order to analyze and to encircle the causal bacteriological flora, it is noted that 85% of case from staphylococci mastitis and 95% of case streptococci mastitis and that on the 22 taking away were analyzed, 17 exploitations present a positive culture is a rate of 77.27% therapeutic failures including 35.29% by *Staphylococcus Aureus* resistant to the tetracycline's, 35.28% for the enterobacteries and 5.88% for the *streptococci*. In the dairy production, the principal use of antibiotics is recommended for the mastitis treatments. According to the Ecoantibio2017 forecasts, the combat against antibiotic-resistance became a world major challenge and of public health and loss of effectiveness of antibiotic impact of the people, health animal health and that of the ecosystems (ALIMAGRI, 2018). This significant risk of antibiotic resistance and the possible residues of the milk antibiotics which are thus inhibitors a danger (CPC) in the dairy recommends us to install the security and the traceability of the curative mastitis treatments containing antibiotic is a cause which constitutes an essential challenge for the economy of the breeding, the public health and the interest of milk near the consumers.

Keywords: Raw milk, Mastitis, Good practices of hygiene, Antibioresistance, CPC

(18894) TOTAL PHENOLIC, FLAVONOID CONTENT AND ANTIOXIDANT CAPACITY OF METHANOLIC EXTRACT OF GALANGAL (*ALPINIA GALANGA*) POWDER

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Alpinia galanga is a wellknown plant in Asia whose rhizoma is frequently used as a medicinal herb in China. It is a member of the ginger family (Zingiberaceae) and its rhizome resemble ginger in shape. Due to an increasing demand for new ethnic foods, galangal has emerged as one of the popular ingredients. The aim of this research was to evaluate the antioxidant activity of methanolic extract of galangal power by different methods. (1, 1-diphenyl-2-picrylhydrazyl) free radical scavenging activity assay (DPPH), [2,2'-azinobis (3-ethylbenzothiazoline-6-sulphonic acid)] free radical scavenging activity assay (ABTS) and Ferric ion Reducing Antioxidant Power assay (FRAP) for determination of antioxidant activity were compared. Total phenolic, flavonoid contents also determined. Galangal rhizomes were purchased from a local market in Afyonkarahisar. Total phenolic and flavonoid content of the galangal powder were found 17729.17, 13384.38 mg catechin equivalent/kg powder respectively. DPPH, FRAP and ABTS results were found 2.75, 830.3, 9191.8 mg Trolox/kg powder respectively.

Keywords: Antioxidant, Galangal, ABTS, DPPH, FRAP

(18912) ANTIOXIDANT ACTIVITY OF TRADITIONAL OTTOMAN TAMARIND SHERBET

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Turkish cuisine is one of the few cuisines in terms of wealth in the world. One of the varieties that contribute to this richness is the traditional Ottoman sherbet. Especially the tamarind sherbet, which is called demirhindi sherbet, is one of the most popular among the Ottoman sherbets. Although there are two hours of boiling in the process, many phytochemicals will drink a lot because of the many spices used. However, there is no study to determine the antioxidative properties of demirhindi sherbet. For this reason, we aimed to determine the amount of total phenolic content and flavonoids and antioxidant potency of demirhindi sherbet in our study. In preparing the sherbet, tamarind, ginger, turmeric, cinnamon, clove, clover, nutmeg, cardamom, rose water, anise and fennel were used. Antioxidant percentages, DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging capacity, FRAP (iron ion reductive antioxidant power), total phenolic content, flavonoid, acidity, pH, color, sensory and total dry matter analyzes were performed. The results of the analyzes made on the demirhindi sherbet are as follows: the amount of total phenolic content is 1504.25 mg catechin equivalent/l, flavonoid content is 305.95 mg catechin equivalent/l, the dry matter content is 10.92%, pH 3.18, color L is 17.90, a is 4.69, b is 9.94, acidity 1,728 g/100 ml (in citric acid), DPPH 145.72 mg trolox equivalent/l and FRAP 16.625 mg Fe²⁺/l. In the sensory analysis using the five-point likert scale, the average score of the panelists was 3.6 for the color, 4.0 for the appearance, 4.8 for the smell, 4.0 for the taste and 4.4 for the consistency.

Keywords: Functional food, Antioxidant, Phenolic, Flavonoid, Tamarind

**(19025) APPLICATION OF CHITOSAN AT PRE AND POST HARVEST STAGE
ENHANCES QUALITY OF TABLE GRAPES**

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Grapes a nutrient rich fruit production is increasing in Pakistan during the recent years. Due to minimum shelf life it has significant postharvest losses. There is a need to apply latest post harvest techniques on grapes to increase its shelf life.

The present study was designed to find out new techniques for improving the quality and preservation of grapes. The study was also focused on overcoming the post-harvest losses of grapes so that valuable functional ingredients are not wasted.

The use of GRAS chemicals at pre and post harvest stage is an innovative technique to curtail the post harvest losses of fruits. Different concentrations of chitosan (0.5% and 1%) were prepared with surfactant Tween-80 @ 0.05% at pre and post harvest stage of grapes. On complete maturity, grapes were harvested and stored at ambient temperature (30-35°C) for 15 days. During storage physiochemical analysis for antioxidants, flavonoids, phenolic content, total soluble solids, titratable acidity and decay incidence was carried out at an interval of 5 days.

Results of study revealed that chitosan coatings were highly successful in reducing the loss of valued functional ingredients. 1% Chitosan solution particularly improved the quality of table grapes. After 15 days of storage, the decline in antioxidant was recorded at 3.4% and 14.1% respectively in pre-harvest sprayed samples as compared to 9.4% and 23.1% in control. Flavonoid content of treated grapes was 168.12 mg/l in contrast to 93.1 mg/l in control. A two time greater reduction in acidity loss and slight increase of solid solids was achieved by Chitosan showing a slower deterioration in quality. Similarly, chitosan increased the overall storage life by maintaining the decay incidence to as low as 5.45% after 2 weeks of storage at ambient temperature.

Hence, pre-harvest application of 1% Chitosan solution proves to be a successful strategy in preserving the quality and nutrients in grapes. It can serve as a tool to ensure greater availability of fruits by reducing the post-harvest losses.

Keywords: Grapes, GRAS chemicals, Chitosan, Pre-harvest, Post -harvest

(19026) FOOD DEFICIENCY CHALLENGES IN PAKISTAN: PRESENT STATUS AND FUTURE PROSPECTS

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A lot of information exists, on availability of food and devastating health, physical and psychological concerns of malnutrition in Pakistan but a little study has been conducted on its economic consequences, human development and future projection. In the present study food grain deficiency was assessed and correlated with relative growth rates of population in relation to food grain area and production along with future forecasting. The data from different sources regarding food grain production, availability of different nutrients and malnutrition was collected from the years 1959 to 2014. It is noted that the extent of malnutrition is worsening over the period of time instead of improving in Pakistan. An insight into the data exhibited a continuous increment in gap between availability of food grains and increase in population. The ADF test, Log-lin model and Autoregressive Moving Average (ARMA) model was used for forecasting of food grain production of 2030. The results revealed that food grain production of Pakistan will increased from 39345 in 2015-16 to 65130 thousand metric tons in 2030. The average growth rate will be 3.38% per annum during forecasted period. The pace of growth of food grains was not enough to cope with the increasing population of the country. The policy maker and planners have to plan accordingly to overcome this serious issue.

Keywords: Food grains, Malnutrition, ARMA model, Population, Projections

(19103) INFLUENCE OF FACEBOOK ON BODY IMAGE AND DISORDERED EATING IN KAZAKHSTAN AND USA

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Women in the United States of America (USA) are ranked fourth heaviest in the world, while women in Kazakhstan are generally thin. This difference in average female weight leads to interesting questions regarding perceptions of beauty. Is there less negative body image in Kazakhstan given that, on average, Kazakh women are slimmer compared to American women? The “thin ideal” is pervasive in all genres of mass media and has been linked to negative body image, which in turn is a risk factor for eating disorders, and a significant predictor of low self-esteem, depression, and obesity. Young women spend an increasing amount of time with social media both in Kazakhstan and the USA, but the relationship between this growing exposure and body image is not fully understood. This study uses objectification to examine the relationship between time spent on Facebook and body image among Kazakh and American college women.

Time on Facebook predicted BSQ and EAT-26 scores in Kazakhstan but did not in the USA, suggesting Facebook may have a subtler effect in the USA. Time on Facebook predicted attention to appearance and negative feelings in both countries. Practical and theoretical implications are detailed.

Keywords: Facebook, Health of women, Healthy lifestyle, Health of nation, Negative influence of hypodynamia, Unrealistic media images, Obesity rate, Female weight, Anorexia, Disorders’ etiology

(19676) MICROBIOLOGICAL QUALITY OF KUNEFE CHEESE USED IN THE PRODUCTION OF KUNEFE, A TRADITIONAL CHEESE DESSERT IN HATAY

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Kunefe, a traditional cheese dessert, is one of the most important elements in the cuisine of Hatay which was determined as a world gastronomic city. Kunefe cheese used in kunefe manufacture is fresh and salt-free cheese and produced from raw cow or goat milk. The aim of this study is to determine the microbiological quality of kunefe cheeses used in the manufacture of kunefe dessert that has not been researched enough. For this purpose, 25 cheese samples provided from twenty-five enterprises which are manufacturing kunefe in Hatay were analysed in terms of total aerobic mesophilic bacteria, yeast-mold, coliform, staphylococcus-micrococcus, lactobacilli, *Salmonella* spp. and *Listeria monocytogenes*. Total aerobic mesophilic bacteria, yeast-mold, coliform, staphylococcus- micrococcus and lactobacilli were detected by classical microbiological cultivation methods, *Salmonella* spp. by VIDAS Salmonella (SLM) (bioMerieux, France) and *hlyA* gene for *L. monocytogenes* by PCR. The results of the analyzes revealed that the average counts of total aerobic mesophilic bacteria, yeast-mold, coliform, staphylococcus / micrococcus and lactobacilli were 1.2x10⁸ cfu/g, 9.0x10⁴ cfu/g, 4.8x10⁵ cfu/g, 1.5x10⁵ cfu/g and 8.4x10⁶ cfu/g, respectively. *Salmonella* spp. and *Listeria monocytogenes* were not detected in 25 g of the cheese samples.

As a result, it was determined that the microbiological quality of kunefe cheeses produced by non-standard methods in local small enterprises is low. Though it is not thought to be a microbial risk because künefe cheese is consumed as cooked, there is always a risk of cross contamination due to environment and staff. Although *Salmonella* spp. and *L. monocytogenes* were not detected in the cheese samples, high microbial contamination can pose a risk for food safety and public health.

Keywords: Kunefe cheese, Traditional cheese dessert, Microbiological quality

(19821) INFLUENCE OF DIFFERENT PRESERVATIVES ON PHYSICO-CHEMICAL AND SENSORIAL QUALITY OF TOMATO PULP DURING STORAGE

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This study was conducted to investigate the “Influence of different preservatives on physicochemical and sensorial quality of tomato pulp during storage temperatures” during the year 2016-17. Results show that Dry matter, Vitamin C, and Serum loss, was increased at room temperature with SB Whereas Titratable acidity, Total soluble solids (Brix°), Moisture content, ash content and pH value were decreased during the storage period. The results indicated all parameters including pH value, moisture, dry matter, vitamin C, titratable acidity, total soluble solid, ash and serum loss were significantly higher in refrigerated temperature (7±2°C). Whereas, the results of tomato pulp at room temperature contained lowest pH value 3.07, moisture content 94.01, Vitamin C 12.56, titratable acidity 2.40, total soluble solids 2.92, ash content 0.11 and serum loss 5.23, and highest dry matter 3.90 content respectively. Sensory analysis showed the highest score for color, taste, texture, aroma and flavor and overall acceptability respectively was observed in tomato pulp contained potassium Meta bisulphate at refrigerated temperatures (7±2°C) compared to the tomato pulp contained sodium benzoate. Furthermore, result indicated that the tomato pulp contained Potassium Meta bisulphite highest ascorbic acid 70.22±38, (mg/100g); 51.22±10 Lycopene content (mg/100g) 47.29±99 Total phenolic content (mg/100g) at refrigerated temperatures (7±2°C) as compared to the tomato pulp contained sodium benzoate ascorbic acid 66.02±64, (mg/100g); 46.07±22 Lycopene content (mg/100g) 37.40±34 Total phenolic content (mg/100g) respectively. Potassium Meta bisulphite extended the shelf life and improved tomato pulp to 2-3 weeks, respectively, at refrigerated temperatures (7±2°C) might be a better way for long term preservation of tomato pulp and its chemical constituents showed minimal changes over the period of study. Microbial contamination was only found in room temperature (30±2°C) storage.

Keywords: Storage, Tomato, Preservatives

(19853) BIO-PRESERVATION OF CHEESE: A TOOL TO AVOID CHEMICALS

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Cheese is a nutritious and ready to eat food very much liked by the consumers due to its different flavors, taste and texture. It is consumed almost in the whole world and suitable for all age groups. Taste, texture and flavor are produced by using different types of bacterial cultures used for milk inoculation. Besides the beneficial bacteria cheese is also contaminated by pathogens during processing and storage, like *Escherichia coli*, *Listeria monocytogenes*, *Salmonella*, *Salmonella enterica* and *Staphylococcus aureus* due to suitable conditions for growth of microorganisms under eutrophic conditions. Cheese experiences different types of disparities due to high contents of moisture and fat like attack of microorganisms, lipid oxidation, activation of enzymes, presence of transition metal ions, exposure to heat, oxygen and light. These quality changes eventually cause degradation of the product. Preservation of the food item like cheese is not a new trend but over the past few years, it has been an increasing interest in using natural preservatives like antimicrobials, essential oils, antioxidants, Spices and herbs, bacteriocins, change of gases concentration to avoid chemicals due to the general consumer rejection of synthetic additives such as sulfites, benzoic acid or its derived salts. Essential oils are secondary metabolites produced by different aromatic plants and have persuasive antimicrobial effect against several spoilage and pathogenic microorganisms. The main active compound in essential oils is carvacrol which is considered to have strong antifungal capacity. Mandarin fiber has prebiotic properties used as functional food additive, it contains soluble fiber in the form of pectin having good water holding capacity used in formation of nano-emulsion based edible coatings. It also protects the product from chemical reactions by acting as moisture barriers, gaseous exchange, oxidative reactions and mechanical damage. Oregano essential oil is a natural product with antioxidant activity. Herbs and spices like clove, cinnamon and thyme known for its distinctive aroma and flavor providing property to food are commonly used have antimicrobial property and considered as safe. Application of natural antimicrobials mainly bacteriocins to the cheese is vital for reducing *Listeria monocytogenes* contamination. Nisin which is produced by *Lactococcus lactis* ssp. *lactis*, is generally regarded as safe for use as antimicrobial. Bacterial activity can be retarded in different cheeses like Manchego, Cheddar, Vidiago, Camembert and cottage cheeses by using nisin. Bioactivity of nisin is reduced when directly used in cheese due to its binding to different components, such as fat and protein. To overcome this problem encapsulation technology is introduced. Food biopolymers are used for encapsulation, delivery and release of bacteriocins at the spot. Poly-g-glutamic acid and Chitosan are two main biopolymers used for cheese. Lipid oxidation can be stopped/slow down by the use of antioxidants. Many essential oils are considered having antioxidant properties like essential oils of rosemary, oregano and laurel. Packaging is also a tool to increase shelf life without chemicals. By changing the concentration of gases in packaging material activity of microorganisms is controlled. Gas mixtures containing CO₂ alone or in combination with nitrogen are commonly used to increase shelf life. Carbon dioxide concentration increased from 50 to 95% can retard the development of *Pseudomonas* spp. Lysozyme is a natural compound this lactic enzyme limits the microbial spoilage. In cheese the lysozyme antibacterial activity can be improved when it is used in combination with other substances, such as ethylene-diamine-tetraacetic disodium salt. MicroGARD1400 is a natural compound used for the fermentation metabolites of starter cultures. MicroGARD1400 retard the growth of Gram-negative bacteria, Gram-positive and yeasts and moulds.

Keywords: Bacteriocins, Nisin, Cheddar, Antibacterial

(19870) INFLUENCE OF MILLING PH ON PHYSICOCHEMICAL COMPOSITION, MINERAL AND FATTY ACID PROFILE OF BUFFALO MOZZARELLA CHEESE “A PASTA FILATA CHEESE”

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Fatty acid composition of bovine milk cheese varied with many factors. These may be breed of animal, animal health condition like mastitis and stage of lactation. It also differs with feed and dietary fat intake and seasons. Many studies demonstrated physicochemical, textural and sensory characteristics of Mozzarella cheese with variation in technological process but no literature found about the fatty acids profile and potential influence of milling pH on the fatty acid composition of buffalo Mozzarella cheese.

Cheeses were manufactured at 5.2, 5.1, 5.0, 4.9 and 4.8 milling pH, vacuum packaged and stored at 4 °C and analyzed for chemical composition mineral composition and fatty acid profile on days 1, 45, and 90. Results were analyzed by ANOVA according to complete randomized design.

This study evaluated the effect of milling pH on chemical composition and fatty acid profile of buffalo Mozzarella cheese. Experimentally induced milling pH differences persisted and significantly affected chemical composition during first day of manufacturing but have no effect on fatty acid profile of cheese. However, storage effects significantly on chemical composition and fatty acid profile of cheese. Decreasing milling pH from 5.2- 4.9 resulted in decrease in moisture content of cheese. As a result of the changes of the milling pH, all the cheeses experienced a significant loss in protein content. In contrast to protein content, fat content of cheese increases with decreasing milling pH. Ash contents of cheese decreased with decreasing milling pH. The level of calcium decreases from 77.82 mg/g to 69.1mg/g with decreasing milling pH while there is no clear trend observed for potassium and sodium during change in milling pH. Saturated fatty acids presented higher concentrations reaching values of about 71.38 g/100g throughout storage while monounsaturated fatty acids decrease with storage from 26.72 to 22.06 g/100 g. On the other hand, total polyunsaturated fatty acids exhibited lower concentrations than total monounsaturated fatty acids reaching values of 3.2 g/100 g and its value also decreased with ripening and reached to 1.6 g/100g.

In modern era Mozzarella cheese is major source of dietary fatty acids. The study demonstrated that Mozzarella cheese is rich source of saturated fatty acids that has detrimental effect on health but it is also observed that it is also a major source of essential fatty acids that has beneficial impact on health. It is also concluded that cheese may get oxidized if it is packed in inappropriate packaging material that have reduced light are air barrier resistance. Moreover, cheese storage under light may also cause oxidized cheese which is detrimental for health.

Keywords: Mozzarella, Milling pH, Fatty acid profile, Calcium, Potassium

**(19960) DETERMINATION OF FATTY ACID COMPOSITION OF SESAME
(*SESAMUM INDICUM* L.) GROWN IN ÇUKUROVA**

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Sesame (*Sesamum indicum* L.) owing to its oil content and quality is one of the oldest and the most important oil plant cultured in the world. The most important feature of sesame oil is resistance to oxidative deterioration. In this study, fatty acid compositions of some local sesame seeds cultivated in Çukurova were determined. As a result of this study, it was determined that the composition of fatty acids is made up of palmitic acid (9.21-9.78%), stearic acid (4.64-5.08%), oleic acid (37.50-40.13%), linoleic acid (42.64-44.56%) arachidic acid (0.56-0.60%) and linolenic acid (0.34-0.40%). Palmitic acid content in saturated fatty acid was the highest in the Cumhuriyet 99 (9.78%) while the oleic acid value of the unsaturated fatty acid was found to be the highest in Muganlı 57 (40.13%). The location affected the rates of palmitic acid, stearic acid and arachidic acid, while planting condition affected linoleic acid and palmitic acid. However, from the results of this study, it can be concluded that the fatty acid profile of the sesame oil was significantly influenced by genotypes.

Keywords: Sesame, Sesame oil, Fatty acid composition, Palmitic acid, Oleic acid, Çukurova

(19998) SKIN COLOR AND BIOCHEMICAL PROPRIETIES OF SOME LOCAL CLONES AND FOREIGN VARIETIES OF FIG (*FICUS CARICA* L.) IN MOROCCO

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Fig is an emblematic food of the Mediterranean diet. This highly nutritional fruit is mainly cultivated in the mountains in northern Morocco which hosts an important level of genetic variability. In this study, biochemical variability was explored based on some important bioactive compounds of fresh fig within 140 local genotypes and foreign varieties put in collection of the regional center of agricultural research (INRA) of Meknes. Analysis concerned fruit skin color, titratable acidity, total phenolics, flavonoids, anthocyanins, proanthocyanidins, total soluble sugars, soluble solids, and radical scavenging capacity using ABTS Decolorization, DPPH and β -carotenes assays. Results showed that colorimetric coordinates of the genotypes fruit skin were found to be highly significantly different ($p < 0.05$) and clustered in three main groups based essentially on L^* , c^* and h° coordinates indicating the clarity of the skin color. The total soluble solids (TSS), total soluble sugars, titratable acidity and antioxidant compounds have shown a significant difference ($p < 0.05$) among genotypes. Especially, an important range of variation was shown for total phenols and total flavonoids where the concentrations respectively varied from 25 to 322 mg/100g GAE of dried weight and from 14 to 103 mg of catechin equivalent per 100 g of dried weight. Radical scavenging activity determined by the three methods expressed the highest values in the local fig genotypes compared to foreign varieties. Skin color coordinates L^* , c^* and h° were significantly correlated to total anthocyanins, total phenols, total flavonoids and free radical scavenging activity (DPPH). These correlations varied generally from $r = 0.3$ to $r = 0.5$. The important antioxidant activity and polyphenols concentrations were found in figs having a dark skin color. In addition, the total anthocyanins have shown to be the most important phenolic compounds that would be significantly implicated in the antioxidant activity. The principal component analysis based on all descriptors has revealed three means contrasted groups with a total inertia of 34.5%. Based on above results, the collection of figs analysed present an important diversity in terms of biochemical quality indices and offers a basis to select performant genotypes for a diversified valorization issues.

Keywords: Morocco, *Ficus carica* L., Bioactive compounds, Scavenging activity

(20078) LISTERIA PREVENTATION AND CONTROL IN CHILLED FOOD INDUSTRY

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While there are numerous pathogens that affect the food manufacturing industry, one of the most dangerous food-borne pathogens that exists today is *Listeria* – a bacterium that when present in foods, yields no difference in taste, smell or appearance. *Listeria* is the cause of the illness listeriosis. Nearly everyone infected with listeriosis is hospitalized, while one in five people or 20 percent will die from the disease. *L. monocytogenes* is widespread in the environment and can contaminate a wide range of foods. It is most commonly associated with chilled ready-to-eat foods such as cooked sliced meats, smoked fish, cooked shellfish, soft mould-ripened cheeses, pate and pre-prepared sandwiches, that do not require further cooking or reheating. To help lower the risk for an outbreak, it is important to know that *Listeria* is a bacterium that can also grow at refrigeration temperatures. This means that if *Listeria* migrates onto food, it may continue to grow even if the food is held at refrigeration temperatures during shipping, storage, and display, thus increasing the potential for illness. A listeriosis outbreak is devastating, not only to the individuals that became ill but to the food processor that made that food, if the illness can be traced to their facility.

Depending on the size of a facility and the size of the outbreak, a food processing plant could be forced to throw out all of their products that may be contaminated with *Listeria*. The processor may also have to issue a recall of contaminated or potentially contaminated food. The processor will also have to take steps to ensure that the *Listeria* is eliminated from the processing environment. This may require the processing facility to be shut down for hours or days while the facility is cleaned and processing equipment is disassembled as needed and deep cleaned. Plant closings can cost thousands to millions of dollars in lost time, decreased productivity and reputation damage. In addition to those losses there may be fines and litigation costs that can be even larger. Improved control measures starting in the 1990s have greatly reduced the prevalence of *L. monocytogenes* in many food categories, particularly in meats and meat products. However, the rate of Listeriosis has remained constant during the last decade and the more severe, systematic (invasive) form of listeriosis is now recognised as occurring more frequently in small outbreaks than previously recognised.

Keywords: *Listeria*, Food industry

(20120) ANTIMICROBIAL, PHYSICOCHEMICAL AND MECHANICAL PROPERTIES OF GELATIN/PECTIN EDIBLE FILMS INCORPORATED WITH MENTHA PULEGIUM AND LAVANDULA ANGUSTIFOLIA ESSENTIAL OILS AS A BIOACTIVE PACKAGING FOR FOOD

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Biocomposite edible films were fabricated from gelatin combined with pectin by casting method. Different concentrations (0.5 % and 1.5 %) of *mentha pulegium* essential oil (MEO) and *Lavandula angustifolia* essential oil (LEO) were added to the mixture. Sorbitol was used as a plastifiant and tween 80 was used as an emulsifier. The antibacterial activity of the fabricated films was evaluated against four common foodborne bacteria (*E. coli*, Enterococcus faecalis, *P. aeruginosa*, *L. monocytogenes*), as well as mechanical properties (film thickness, tensile strength and elongation at break) and physicochemical properties (moisture content, swelling index and water solubility). Films containing essential oils (EOs) showed a significant ($p < 0.05$) antibacterial activity against the examined strains compared to the control (film without essential oil), *P. aeruginosa* was the most resistant to the films containing MEO and LEO while Enterococcus faecalis was the most sensitive. In addition, the inhibition magnitude was EOs concentration dependent. The incorporation of MEO or LEO in the film composition did not change the thickness of the films significantly ($p > 0.05$). The moisture content increased significantly ($p < 0.05$) by incorporation of EOs while the swelling index and water solubility of the edible films decreased. Tensile strength and elongation at break decreased with increasing MEO and LEO concentration. Also, edible films with LEO showed higher flexibility and lower strength than those incorporated with MEO. According to these results, the biocomposite gelatin-pectin based edible films incorporated with appropriate concentrations of *mentha pulegium* or *Lavandula angustifolia* essential oils can be considered as an alternative for the development of antimicrobial and eco-friendly packaging to reduce foodborne pathogenic contaminants in food.

Keywords: Active packaging, Edible film, Essential oil, Film characterization, Antimicrobial activity

(20138) A STUDY ON THE PREVALENCE OF *SALMONELLA* BY IMS-PCR AND CONVENTIONAL CULTURE METHODS IN BEEF MEATS SOLD IN ERZURUM, TURKEY

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In this study, the presence of *Salmonella* spp. and specific microbiological parameters and were investigated in 30 beef meat samples collected from markets and butcher shops. The specific microbiological parameters were determined using a conventional cultural method and the presence of *Salmonella* spp. in beef meat samples was determined using conventional and immunomagnetic separation (IMS)-polymerase chain reaction (PCR) methods. In addition, antimicrobial susceptibility of the isolates was revealed using the Kirby–Bauer disc diffusion method. The results indicated that 1 of the 30 samples were positive for *Salmonella* spp. by the conventional method, and 8 of the 30 were positive by the IMS-PCR method. These results indicate a high prevalence of *Salmonella* spp. in beef meat samples from Erzurum city, Turkey, and the general microbiological properties should be considered for public health. The results also show that the IMS-PCR technique was superior to the conventional method for detecting *Salmonella* in beef meat.

Keywords: *Salmonella*, IMS-PCR, Beef meat, Microbiological

(20141) COMPARISON OF THE CHEMICAL COMPOSITION AND STEVIOL GLYCOSIDE PROFILES OF *STEVIA REBAUDIANA* (BERTONI) VARIETIES CULTIVATED IN SOUTH OF TURKEY

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The dried leaves from two varieties (Morita II and Criolla) of *Stevia rebaudiana* (Bertoni) cultivated in Adana-Turkey were analyzed for chemical properties, steviol glycoside contents and dietary fiber composition.

Morita II and Criolla were harvested 70-80 days and 110-120 days after planting in soil as seedlings, respectively. The plant height of Morita II was 65-75 cm whereas the height of Criolla was 95-110 cm. Morita II yielded 450-500 kg dry leaf/da while Criolla variety gave a yield of 550-630 kg dry leaf/da.

Dried leaves of stevia varieties were found to contain significant amounts of carbohydrates (62%-71%) because it contained carbohydrates in its steviol glycosides and fibers (7%-12%). Total dietary fiber content of Morita II was 30.60 g/100g, while Criolla had total dietary fiber content of 31.50 g/100g. It was also determined that dry stevia leaves contain 11-14% protein. The total steviol glycoside (TSG) content of Morita II dry leaves was found to be 16.92-17.58%. Stevioside and Rebaudioside A (Reb A) contents in dry leaves were 2.25-3.10% and 12.42-13.37%, respectively. Total steviol glycoside, Stevioside and Rebaudioside A contents of Criolla were however determined as 12.15-12.41%, 5.62-6.74% and 3.65-4.90, respectively. This study showed that Morita II contains higher amounts of TSG and Reb A than Criolla.

Keywords: *Stevia*, Criolla, Rebaudioside, Steviol, Stevioside

(20237) BEROUIL FUNCTIONAL FERMENTED FOOD OF TERROIR IN ALGERIA

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Since the dawn of time, people have resorted to fermentation to preserve food. It was not until later that the nutritional virtues of fermented foods were discovered. Fermentation increases the nutrient content of foods and their digestibility, making them real health foods. The Berouil also called Hammoum, is a traditional couscous of terroir prepared from wheat semolina or fermented barley or the mixture between the two, these elements are agglomerated by adding water and will submit physical treatments such as the cooking and drying. It is highly appreciated in the Algerian gastronomy. It is characterized by its black color, its slightly acidic fresh taste and its characteristic aroma. These characteristics are influenced by the activity of the epiphytic (wild) flora such as lactic acid bacteria and yeasts on the raw material during an uncontrolled spontaneous fermentation. The mesophilic and thermophilic lactic acid bacteria are isolated and identified by the biochemical tests defined as *Lactobacillus plantarum*, *Lactococcus lactis*, *Leuconostoc dextranicum*, *Enterococcus faecalis* and *faecium*, *Pediococcus* sp., *Streptococcus bovis*. They are endowed with a high probiotic potential (anti-bacterial activity against Gram +, Gram - and *Candida albicans* bacteria, survival at acid pH and bile salts, assimilation of cholesterol). New questions arise and constitute the challenges of tomorrow for the design of safe, healthy and functional ferments for that a characterization of the plasmids was studied according to (Tamanai-Shacoori.z et al., 1992 which reveals a pure plasmid with a molecular weight of 1800 PB and a quantity which varies between 0.02-0.08 µg/ml. Berouil is a functional food that is highly recommended in the population and has important nutritional, sensory and healing properties.

Keywords: Berouil, Lactic acid bacterium, Probiotic, Plasmid

(20400) THE EFFECT OF DIFFERENT DRYING METHODS ON TOTAL PHENOLIC CONTENTS OF KABAAŞI APRICOT VARIETY

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The origin of Kabaası apricot variety is Malatya. It is evaluated as table and dried. Amount of dry matter soluble in water varies between 24-26, the fruit meat hardness is hard texture. Malatya apricots are known to be an important source of phenolic compounds. Phenolic compounds are important in terms of food composition, their effects on the taste-odor formation, their participation in the mechanism of color formation and change, their antioxidant and antimicrobial properties. Phenolic compounds not only prevent the oxidation of foods but also protect the human body from harmful oxidative effects. This study is important to determine the specificity of identification of the phenolic compound compositions of Malatya apricots and to reveal differences among varieties. Kabaası apricot sample suitable for drying was applied to sun drying (SD) and sulfur drying (SuD) and oven drying (OD) methods. Changes in the amount of total phenolic contents (TPC) were determined after drying with drying methods. The amount of TPC was determined spectrophotometrically by modifying the Folin-Ciocalteu method. The TPC values of the samples were calculated as the sum of the amounts of water-soluble and methanol-soluble substances as gallic acid equivalents. The amount of TPC in the Kabaası apricot sample was determined as 187.22 mg GAE/100g DM, whereas the quantities of 135.91, 229.46 and 154.06 mg GAE/100g DM TPC were determined in SD, SuD and OD methods, respectively. It was determined that the amount of TPC was increased due to sulfur application and quantity in the SuD method.

Keywords: Malatya apricots, Total phenolic content, Gallic acid

(20433) AROMA CHARACTERIZATION OF KIRKLARELİ RIPENED WHITE CHEESE

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Ripened Kırklareli White Cheese (KRWC) is a white pickled cheese ripened in tinfoil containers for at least 6 mo. A mixture of milk from cow, goat and sheep is used to make KRWC. These small ruminants and cows feed on only pastures in Kırklareli city and also sheep called as “kıvırcık” is a domestic pure breed belongs to Kırklareli. The aim of this research was firstly exhibiting to the aroma characterization of KRWC belonging to Kırklareli. For this purpose, KRWC samples were obtained from different manufacturers (15 pieces) which are traditionally produced and the aroma-active components in these samples were determined by Gas Chromatography. In the research, more than 30 aroma compounds have been identified which contain 10 alcohols, 16 volatile acids, 3 ketones, 3 hydrocarbons, 1 aldehyde and 3 other compounds have been determined. It is evident that KRWC has rich compositions for aroma components. Alcohols found in KRWC can be listed as ethyl alcohol, 2-butanol, 2-pentanol, 1-butanol-3-methyl, 2-heptanol, 2-ethyl-1-hexanol, 2,3-butanediol. Some of these such as 2,3-butanediol, which is an alcohol with 4 carbons, is one of the important aroma compounds that can be found in low concentrations in fermented dairy products via citrate metabolism. The most important aldehyde detected in KRWC is 2-butanone-3-Hydroxy. Some aldehydes have lower sensory perception thresholds increase their importance for cheese flavor. KRWC is also rich content for methyl ketones, such as 2-pentanone, 2-heptanone and 2-nonanone.

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Keywords: Aroma, White cheese, Kırklareli

(20434) AROMA CHARACTERIZATION AND FATTY ACID COMPOSITION OF KIRKLARELI OLD KASHAR CHEESE

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The aim of this research was firstly exhibiting to the aroma characterization and fatty acid composition of KOCC belonging to Kırklareli. For this purpose, KOCC samples were obtained from different manufacturers (15 pieces) which are traditionally produced and the aroma-active components and fatty acid compositions in these samples were determined by Gas Chromatography. In the research, more than 40 aroma compounds and 27 fatty acids have been identified. According to the literatures, butanoic acid has the highest percent in old kashar cheeses and it responsible for the ransit taste formation. However, butanoic acid has the second highest percent in aroma components for KOCC. According to our research, hexanoic acid has the highest percent for KOCC which gives a fruity aroma. On the other hand, there is some similarity with other old kashar cheeses belong to different regions. For example, acetic acid content has high percent in aroma components for all old chashar cheeses and also they have significant amounts of octanoic acid and decanoic acid.

Fatty acid compositions of KOCC samples were also determined. There are some factors effects to the old kashar cheese quality, such as milk type, milk quality, thermal processing, starter culture or/and yeast, lipase enzyme derived from raw milk and cheese yeast etc. Fatty acid profile has high importance on flavor of KOCC. Some researchers accepted short and medium chained fatty acids, which have low sensory perception thresholds, as an index for classifying old kashars. In general, the proportions of butyric acid (C4:0), which has a significant role in the taste of cheese and the formation of rusty taste, ranged between 1.63%, 2.46% and 2.19% on average for KOCC. Among the fatty acids (C10-C14), which are described as middle-chain, myristic acid (C14:0) has a significant percent in kashar cheeses. In the total fatty acids of KOCC, myristic acid had average values of 9.54%, 9.55% and 9.90%, respectively. Besides, palmitic acid (C16:0) appears to have the largest share in the total fatty acids when the long chain fatty acids (C16-C20). Palmitic acid was determined in about 26-29% of all KOCC samples. Other fatty acids with the highest ratio after palmitic acid was determined as oleic acid (C18:1 cis-9,12) followed by stearic acid (C18:0).

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Keywords: Aroma, Fatty acid, Kashar cheese, Kirklareli

(20612) SPROUTING AN EFFECTIVE TOOL TO ENHANCE WHEAT BIOACTIVE COMPOUNDS: ROLE OF SPROUTING TEMPERATURE

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Sprouting is an old green food engineering tool to improve edible seeds nutritional value, through a catabolism of macromolecules (ie. proteins and starch) and an accumulation of bioactive compounds such as vitamins and polyphenols either through transformation of existing ones or through a new synthesis. These changes are strongly related to sprouting conditions used: temperature, light, duration... The aim of this research was to assess the effect of sprouting temperature on durum wheat sprouts bioactive molecules.

The effect of temperatures on durum wheat (*Triticum durum*) sprouts biocompounds was assessed through carotenoids, vitamin C, α -tocopherol, α -tocotrienol, β -tocopherol, β -tocotrienol, total phenol content and DPPH radical scavenging activity measurements for control unsprouted seeds and seeds sprouted at 18 and 25°C.

Sprouting increased significantly ($p < 0.05$) sprouts carotenoids content, as well as levels of α -tocopherol, α -tocotrienol, β -tocopherol, when compared to raw seeds. The highest average was obtained at 25°C. Although vitamin C was not detected in raw seeds, its level increased significantly after sprouting, according to the increase in temperature. However, amount of β -tocotrienol decreased after sprouting, and rising temperature enhanced this decrease. Interestingly a sprouting temperature of 25°C led to a significant increase in sprouts total phenol content whereas a temperature around 18°C had no effect. Moreover, the increase in bioactive compounds led to an improvement of antioxidant properties. The highest increase was also observed at 25°C.

Durum wheat sprouting improved bioactive molecules amounts and antioxidant properties. Their evolution was dependant on sprouting temperature used. Highest antioxidant activity was obtained at 25°C.

Keywords: Durum wheat, Sprouting, Temperature, Vitamins, Phenols, DPPH radical scavenging activity

(20944) EFFECT OF *ROSMARINUS OFFICINALIS* AND *OCIMUM BASILICUM* EXTRACT ON PEROXIDE VALUE, CARBONYL COMPOUND, AND FREE FATTY ACIDS OF FISH OIL

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One of the newest attended techniques is ultrasound-assisted extraction. This method is more efficient and economic than solvent and ultrasound apart from. The purpose of the present work was evaluated and compare *Rosmarinus officinalis* and *Ocimum basilicum* extraction on the quality of fish oil in similar conditions. Results of chemical tests (peroxide value, carbonyl compound, and free fatty acids) showed that both of extracts could increase the storage period of *Hypophthalmichthys molitrix* fish oil. They delayed production of undesirable metabolites in samples and *Rosmarinus officinalis* extract was better than *Ocimum basilicum* one. In agreement, higher concentrations of both extracts were better than lower ones. There were significant differences between control and treated samples. This technique could be replaced for extraction from different sources.

Keywords: *Ocimum basilicum* extract, Fish oil, *Rosmarinus officinalis* extract, Shelf life, Ultrasound-assisted solvent

(21203) LIPIDOMIC ANALYSIS IN SARI ULAK OLIVE CULTIVARS AND CLONES BY USING OPLS-DA

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The purpose of this study is to compare the fatty acid compositions of seven Sarı Ulak clones, which were selected in terms of high yield and quality properties, and four registered Sarı Ulak varieties with the OPLS-DA Multivariate Statistical Analysis methods.

Seven clone samples and four control samples were obtained from genetic resources and adaptation parcel of Alata Horticultural Research Institute (Mersin, Turkey). The samples were analyzed repeatedly. Fat extractions were carried out using an automatic soxhlet extractor (Gerhard, SOX412, and Germany). Fatty acid composition was determined by Gas Chromatography- flame ion detector (GC-FID) (Shimadzu, GC-2010 plus ATF, Japan) according to FAME method. Pattern of fatty acids in each sample from control and clones groups were analyzed by SIMCA- V14.0 software (Umetrics AB, Umea, Sweden). Differences in fatty acids between two groups were identified according to S-plot, descriptive analysis, VIP plot and loading column plot.

Fatty acid profiling by GC-FID showed that fourteen types of fatty acids were found in both clone and control groups. The score plots of OPLS-DA model after pareto scaling showed that there was clear discrimination between two groups ($R^2X=0.909$, $R^2Y=0.849$, $Q^2Y=0.508$). Oleic acid (C18:1) were statistically less in control groups than clones ($p=0.003$). It also gave the highest VIP value, which gives contribution of one component to the classification of groups. Palmitic Acid (C16:0) and Palmitoleic Acid (C16:1) were statistically higher in control groups ($p=0.01$ and $p=0.004$). Heptadecanoic Acid (C17:0), Cis-11 Eicosenoic Acid (C20:1n-9) were statistically higher in clones ($p=0.005$ and $p=0.047$).

Keywords: Lipidomic, Sarı Ulak, OPLS-DA, Fatty acid

(21260) DETERMINATION OF MICROFUNGI OF UNPACKED SOLD NUTS AND DRIED FRUITS

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Moldy foods are one of problems that threaten human health. Molds with food contaminants produce mycotoxins which are their secondary metabolites under favorable conditions and cause to health problems in humans consuming these foods. Nuts and dried fruits of great importance to nutrition are risky foods for mold contamination. If they are not produced or stored under appropriate conditions, molds may grow in these foods and cause mycotoxin formation. This study was carried out to determine the levels of total yeast and mold in nuts (hazelnut, almond, pistachio, walnut, peanut, kaju, inner pumpkin seed, inner sunflower seed) and dried fruit (apricot, fig, grape, date, plum, mulberry, cherry, goji berry and cranberry) sold unpacked. For this purpose, was used dilution method in petri dishes containing Potato Dekstrose Agar medium and isolated filamentous fungi were identified by cultural methods. Total yeast and mold values determined in 14% of the samples were found above the maximum allowed total yeast and mold values in the Turkish Food Codex. *Aspergillus* (mostly *A. niger*) and *Penicillium* were the most isolated microfungi genus in food samples.

Keywords: Nuts, Dried fruits, Microfungi, Mycotoxins

(21261) DETERMINATION OF OCHRATOXIN A IN SUN AND MICROWAVE DRIED PLUMS

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Drying is a food preservation method in which water is removed from the material. By reducing the value of water activity by the drying process, it provides suitable conditions to prevent especially microbiological activities in food products. With the drying process, storage conditions are easier and are generally preferred due to economic gain. The environmental condition during ripening, harvesting drying and storage of plum seem favourable for mold growth and mycotoxin production in fruits. Ochratoxin A (OTA) is a toxic secondary metabolite, naturally produced by species mold. As far as humans concerned, the International Agency for Research on Cancer classified OTA as a possible carcinogen to humans. In this study, plum samples which were dried by using 2 different drying methods and were stored at room temperature for two years. Samples were dried in the sun and two different microwave power and analyzed in terms of their OTA content by HPLC-FLD after pre-separation using immunoaffinity columns in 2 replicates in 2 parallels. The HPLC system was an Agilent 1260 Infinity system with an autosampler using a fluorescence detector. The wavelengths for excitation and emission were 333 nm and 460 nm, respectively. The chromatographic column was 5 µm ODS C18, 250 x 4.6 mm column. The mobile phase used for OTA analysis was a mixture of water, acetonitrile, and acetic acid (49.5:49.5:1 %; v/v/v). The flow rate was 0.8 ml/min, and the column temperature was maintained at 25° C. The injection volume was 100 µl. As a result, OTA was not detected in both sun and microwave dried plums. It is believed that careful selection of raw materials during the drying and fulfilling recommended production and storage requirements may prevent the emergence of OTA.

Keywords: OTA, Plum, Drying

(21267) DETERMINATION OF ANTIOXIDANT ACTIVITY AND TOTAL ANTHOCYANIN CONTENT OF FROZEN AND THAWED OF STRAWBERRIES UNDER DIFFERENT CONDITIONS

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Strawberries are among the most consumed summer fruits due to their potential benefits for human health coming from their high content of bioactive compounds with antioxidant, anticancer, anti-inflammatory and anti-neurodegenerative properties. Even though strawberries are very attractive fruits for the consumers, due to their active metabolism and easy deterioration, they are available mainly in the processed form as an ingredient to food products or as a frozen product. Freezing is one of the techniques often used for preservation of fruits. During freezing, an expansion occurs with the formation of ice crystals causing cell wall rupture. Therefore, the texture of frozen fruits and vegetables is usually softer after thawing when compared to the unfrozen product. Slow freezing rates produced considerable softening due to extracellular ice formation. In addition, the freezing process and thawing conditions may influence the stability of phenolic compounds, anthocyanins and antioxidant activity.

In this study, fresh strawberries were frozen at different temperatures; -18 °C, -86 °C, and individually quick frozen (IQF) as freezing methods. Frozen strawberries were thawed at 24 °C at room condition, +4 °C in the refrigerator and microwave oven with thawing mode. Total phenolic compounds, total flavonoid and total anthocyanins content, and total antioxidant activity were performed to examine the effect of freezing and thawing on biocompatibility. According to the results, the total phenolic compounds in the range of 0.232-2.756 mg gallic acid equivalent/g, flavonoid content 0.320-0.905 mg catechin equivalent/g, total anthocyanin content 0.021-0.163 mg/g and total antioxidant capacity 42.868-55.645% were found in strawberries. According to these results, it was determined that the loss of bioactive components was minimized by frozen with IQF and thawing in the microwave oven. In addition, the shortness of the thawing time in this process provides an extra advantage.

Keywords: Freezing, Thawing, Strawberry, DPPH

**(18159) PRELIMINARY ASSESSMENT OF NUTRITIONAL VALUE OF
*CHAMAEROPS HUMILIS L.***

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Palms are an economically important family of Monocot comprising 188 genera and 2600 species (Dransfield et al. 2008; Baker et al. 2009).

The aim of this investigation was to study chemical composition variation in leaflets, rachis and fruits (pericarp) of dwarf palm (*Chamaerops humilis*L.) The proximate moisture, ash, total soluble solids, crude fiber, protein and lipids analysis, and mineral composition, were performed using standards analytical methods. Inductively coupled plasma-mass spectrometry (ICP-MS) was used to determine the concentrations of constituent elements in the leaflets, rachis and fruits of *Chamaerops humilis* L. collected from Ouest coastal region of Algeria. The protein value ranged from 22.04±1.6-30.27±1.6%, fat was 0.53±0.20-2.13±0.49%, crude fiber was 18±0.89-71±1.56 %, ash was 3±0.44-5.1±0.2%, TSS was 2.4±0.001-4±0.00 and moisture was 17.37± 0.12-51.68± 0.16%. The concentration of the minerals ranged from 7322.23±0.69-1092549.1±2.50 µg/kg for potassium, 74759.77±1.06-111343.1±0.90 µg/kg for Magnesium, 7309.2±1.22-62328.4±1.89 µg/kg for calcium and 14168.7 ± 2.01-18456.35 ± 1.01 µg/kg for zinc. The plant samples would serve as good sources of K, Mg, Ca, Zn and Sr but moderate sources of Fe, Cu and Na while Hg was not detected. According to these results, we concluded that all *C. humilis* parts have good nutritive while fruits have higher value than leaflets and rachis.

Keywords: *Chamaerops humilis* L., Proximate composition, Trace element, Nutritive values

(18721) DATE CAROTENOIDS COMPOSITION DURING MATURATION

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The aim of this study was to investigate the carotenoid composition and the provitamin A value of three palm date (*Phoenix dactylifera*) varieties (Deglet-Nour, Hamraya and Tantebouchte) from Algeria at three different ripening stages (khallal, rutab and tamr).

Chromatographic analysis showed that the major carotenoid pigment present in dates is lutein followed by b-carotene, with an evident carotenoid disappearance during ripening from the khallal to the tamr stage. The different date fruits present a total carotenoid content in the range of 61.7–167, 32.6–672, and 37.3–773 lg/100 g fresh weight (FW) in Deglet-nour, Tantebouchte and Hamraya varieties, respectively. The rutab stage of Tantebouchte showed the lowest carotenoid content of 32.6 lg/100 g FW, whereas the khallal stage of Hamraya presented the highest value, 773 lg/100 g FW, followed by Tantebouchte with 672 lg/100 g FW. Provitamin A value (due exclusively to b-carotene) increased from 0.4 to 0.5 RE/100 g in Deglet-Nour fruits, but decreased from 11.7 to 1.6 RE/100 g and from 3.9 to 0.5 RE/100 g in Tantebouchte and Hamraya fruits, respectively, during ripening. The lowest value was found at the tamr stage of the Deglet-Nour variety (0.5 RE/100 g) whereas the highest provitamin A content was found at the khallal stage of the Tantebouchte variety (11.7 RE/100 g).

Keywords: *Phoenix dactylifera*, Carotenoid profile, Provitamin A value, Fruit ripening, Algeria date fruit

(18753) EVALUATION OF THE HYGIENIC QUALITY OF RAW MILK AT DIFFERENT LEVELS OF THE DAIRY CHAIN

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Variations in the hygienic quality of raw milk collected at different levels of the dairy chain from the farm, tanks, at the end of collection and at delivery in the north-central region of Algeria were studied over a period of one year. The average loads of all the germs of contamination increased gradually ($p < 0.001$). The average values of these respective evolutions of the farm, at the end of collection and delivery, expressed in Log₁₀ cfu/ml of raw milk for total aerobic mesophilic flora (TAMF), total and fecal coliforms (TC), (FC) values are (5.11, 6.42 and 7.5), (3.1, 4.6 and 5.31), (1.61, 3.29 and 4.29). Yeasts and molds are present with high levels of contamination in the samples analyzed, the average per milliliter expressed in Log₁₀ cfu at each collection site are respectively (2.84, 4.58 and 5.34), (1.24, 3.23 and 3.88). The pathogenic flora also has increasing presence rates at each level of the dairy chain. Milks from farms that were already contaminated with *Clostridium*, *Listeria monocytogenes*, and *Staphylococcus aureus* (15.27, 1.39 and 4.86%), respectively, arrived at the different dairies with exponential mean presence (50, 28.33 and 56.66%). However, it should be noted that the danger is all the more important as the presence rate and the microbial load are higher in raw milks. The strong growth of the micro-organisms studied once again demonstrates the variability of practices from one sampling site to another. This is the result of poor hygienic conditions during milking, they also provide information on the degree of handling of milk, including the observed transvasions

Keywords: Hygienic quality, Raw milk, Farm, Collection, Delivery.

(19430) WINE APPELLATIONS

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An *appellation* is a legally defined and protected geographical indication used to identify where the grapes for a wine were grown; other types of food often have *appellations* as well. An appellation is the best way to control and to obtain the origin and the quality of traditional foods. Although appellation has been carried out especially for wines all over the world for centuries, in Türkiye this case is brand new that has just 10 years past. The earliest attempt to classify wines was in France occurred in the 14th century in south-west France. French wine classification entered a new era when in 1855 Bordeaux on the west coast of France produced a classification which divided the best vineyards into five levels of quality with the highest level going to five famous vineyards in the communes of Pauillac, Margaux, and Pessac. The AOC system, that sets strict rules, was introduced in 1935. These rules covered the permitted grape types, the communes in which the grapes can be grown, the maximum permitted yields, the pruning type and the permitted harvesting techniques in some appellations. Today, there are over 360 AOCs in France mostly in 11 primary growing regions. First American Viticultural Area (AVA) was granted in 1980 and today there are nearly 200 AVAs, half of them in California. Oregon has 16, Washington 10, and New York and Texas eight each. Rioja was the first Spanish region to be awarded DOC status in 1991 and today Spain has many DOs. It has 2 “qualified” DOs (DOC Rioja and DOQ Priorat), which means regions whose quality standards are a bit higher than the rest. Italians had the first attempts to make laws to legally promote the production of quality wines in Italy at the beginning of 1900 but the first real quality system that set rules to guarantee the quality of wines and their place of origin, was introduced in 1963 that is still alive today as DOC/DOCG classification system and most of the traditional high-quality Italian wines are produced in limited DOC or DOCG areas, according to strict regulations.

Keywords: Wine, Appellation, Quality, Origin

(19505) ANTIBACTERIAL ACTIVITY OF *ENTEROCOCCUS* STRAINS ISOLATED FROM ALGERIAN RAW MILK

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Foods constitute adequate habitat for various microorganisms. The raw milk is an example of ecological niche containing a complex and diverse microbial population. This population contains microorganisms presenting a particular interest in dairy technology such as the lactic acid bacteria and the pathogenic bacteria or spoilage microorganisms such as *Staphylococcus*, *Pseudomonas*, as well as several enterobacteria. After *Lactococcus* and *Lactobacillus* of the heterogeneous group of the lactic bacteria, the genus *Enterococcus* knows an increasing interest. Thanks to the importance of their technological and antimicrobial properties, *Enterococcus* was the object of several studies these last years. Many foods in particular the raw milk contains naturally a variable number of *Enterococcus* strains, in particular both species *E. faecalis* and *E. faecium*. Their antibacterial activity allows extending the shelf life of this food.

Twenty two bacterial strains were isolated from the raw milk. The phenotypic identification shows that the raw milk contains among its micro flora strains of *Enterococcus* among which two species were identified as *E. durans* and *E. faecium*. To study their antibacterial activity potential we used the method of Fleming *et al.* (1975) which revealed that these strains inhibited Gram positive and Gram negative bacteria. Two strains of *E. faecium* revealed, by the method of Spelhaug and Harlander (1989), their bacteriocinogenic potential towards strains of *E. faecium* and two Gram negative bacteria *Pseudomonas sp* and *Proteus mirabilis*.

Keywords: Raw milk, *Enterococcus faecium*, Antibacterial activity, Bacteriocinogenic potential

**(19517) FORAGE QUALITY AND MILK PRODUCTION: ANALYSIS USING
ARTIFICIAL NEURAL NETWORKS**

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Milk production is a function of several factors. Next to the breed and the age of the rumen, the fodder -constituent most determining. Outside the pasture, nutritionists agree that a good forage quality is one that ensures high intake and maintenance of good rumen health and therefore good milk production. The quality of it is also a function of a set of parameters. The basic criterion in choosing forage is its digestion and absorption. However, the sugar and protein levels decrease with the maturation of the vegetation. The ripening stage is therefore a determining factor in the quality of the fodder. As the plant matures, the digestible content decreases and the cell walls increase and become indigestible. This leads to a decrease in its consumption in quantity which reduces the quantity of nutrients available and therefore the production of milk. Other factors may influence the nutritional quality and health status of the cow. Condition factors of rearing comfort can influence production.

The system is very complex to analyze using conventional mathematical methods. In this study, we propose a system of artificial neural networks in data processing. Artificial neural networks are highly connected networks linking the two input and output spaces. These networks have the capacity to contain a large number of interconnected data; their application in this area is adequate. From real data of race, age of the rumen, forage species, stage of maturation and rearing conditions, the input space is constituted. The output space represents the milk production rate. The built-in system adjusts the input parameters for optimal milk production and also predicts the production rate from the data set at the system inlet.

Keywords: Milk production, Forage quality, Cell content, ANN

**(19555) AFLATOXINOUS FIGS (*FICUS CARICA* L.) SEPERATION PROCESS
USING ULTRAVIOLET (UV) LIGHT**

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Fig fruits have high aflatoxin-forming capacity due to its high water activity and sugar content from the phase of harvest to the phase of drying. During aflatoxin formation, mycotoxigenic molds produce kojic acid as a metabolic residue. In the presence of kojic acid, aflatoxin-containing products emit greenish yellow and blue color while viewed under long-wave (365nm) UV (Ultraviolet) light. Scanning under UV light is a unique method commonly used for physically separating the aflatoxin-containing fruits from dried figs. With this study, the processes of aflatoxin-containing figs separation were analyzed in one fig enterpris operating at Aydın province. At each stage of screening, starting from raw to final product, a total of 35 samples as BGYF (+) and BGYF (-), were subjected to some quality criteria and aflatoxin analyzes. Aflatoxin was analyzed from 5 raw fig samples and the highest total aflatoxin value was found to be 29.03µg/kg. From the 15 samples viewed BGYF (+) and seperated as possible aflatoxin-containing figs in enterpris, wholly aflatoxin was detected, 15 of which were above the total aflatoxin limit value of 10 ppb and a maximum value of 402.10µg/kg was analyzed. Aflatoxin was not detected in any of the final product figs separated as BGYF (-).

Keywords: Dried fig, Aflatoxin, Kojic acide

(19573) THE INFLUENCE OF PROTEIN CONTENT ON BEER QUALITY AND COLLOIDAL STABILITY

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Protein content and beer composition depend on the raw materials and enzymatic reactions used in brewery technology. In order to improve the colloidal stability of beer, it is necessary to remove both protein and polyphenolic complexes or prevent their formation. This study aims to determine the protein content in all production stages and to evaluate its influence on beer quality and colloidal stability.

Analyzes of total protein content were performed by Kjeldahl and spectrophotometric methods. Statistically, a significant change was observed in the protein content of the final product, which was less than that in wort ($\alpha < 0.05$). Turbidity, colour, extract, alcohol, bitterness, foam and pH were also measured.

Haze forcing tests (incubation at 200°C, 400°C and 600°C) were conducted to evaluate the colloidal stability of the final product. Results of tests showed that highest level of product stability was ensured after treatment of beer with both silica gel and polyvinylpyrrolidone (PVPP).

Keywords: Beer quality, Colloidal stability, Protein content

(19641) EFFECT OF DIFFERENT DRYING TECHNIQUES ON SOME FUNCTIONAL PROPERTIES OF DRIED FIG

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Fig as one of the major export products of our country, deteriorates very quickly due to its perishable nature. For this reason it is utilized as dried fruit. Drying of figs in traditional method is made by spreading the intermediate moisture figs under the sun after losing their water on tree and being fallen to ground. In this method sometimes adversities seen arising from climate, particularly in the drying season, there are quality losses due to the effects of rainfall. With this study fresh figs were dried by using different immersion solutions both under the sun and in the cabinet type dryer. Potasa and alkaline ethyl oleate dipping solutions were used for shorten the drying time. Additionally, ¼ cut fruits was dried in both methods without using solutions. Cabinet type dryer reduced the drying time compared to drying under sun. The immersion solutions were effective in reducing the drying time of the figs whereas the shortest drying time was detected in ¼ cut fruits. In the ¼-cut fruits the total phenolic content and antioxidant activity identified as 356.16 (mgGA/100 gDM) and 261.00 (µM trolox /100 gDM), respectively, and this application gives better results compared to others.

Keywords: Fig, Drying methods, Total phenolic content

(19800) DEGRADATION OF GLUCOSINOLATES BY INTESTINAL MICROFLORA

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Various plants contain goitrogenic substances, able to provoke the disturbance of the synthesis of thyroid hormones. For a long time it was believed that these foods lose their antithyroid action during the cooking, following the inhibition of the enzyme involved in the process of degradation of goitrogenic factors. However; the antithyroid effect of food treated by heat is so intense that the goitrogenic effect is not destroyed.

The hypothesis to explain the persistence of anti thyroid effect despite cooking is based on the existence of specific enzymes in the intestinal flora capable of catalyzing the hydrolysis of glucosinolates by releasing antithyroid factors.

The purpose of this study is to test glucosinolates degradation by non strict anaerobic human intestinal flora.

We approached the study:

- Extraction of glucosinolates from cabbage (*Brassica oleracea*);
- Isolation and identification of intestinal flora in the various age individuals;
- Incubation of different floras with the extracts of glucosinolates at different pH for each stage of the digestive tract and the estimated level of decomposition.

At acid pH (corresponding to that of the stomach), we have not observed production of thiocyanate by all the flora studied.

All bacterial flora degrades glucosinolates to pH 7 corresponding to that of the intestine. The total flora is most active at this pH. The glucosinolate hydrolysis varies between individuals. Overall, the level is the highest in adult subjects.

Keywords: Goitrogenic factors, Glucosinolates, Intestinal flora, Thiocyanate ion

(19835) STUDIES ON FLOWABILITY, COMPRESSIBILITY AND *IN-VITRO* RELEASE OF MIXED FRUIT POWDER TABLETS

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The present study aimed to elaborate matrix tablets from powder mixture (2:1 ratio) of Algerian date (*Phoenix dactylifera* L.) fruit and lyophilized berries (*Arbutus unedo* L.) (LB), using the direct compression technique. In a first part, the physicochemical properties, including the X-ray diffraction, of individual powders and their mixture were determined. In the second step, the swelling, erosion and in vitro release rate characteristics of tablets were studied. The dissolution study of tablets is evaluated throughout the electric conductivity (EC) of surrounding medium (distilled water). Among the four tested models, namely zero-order, first-order, Higuchi and Korsmeyer-Peppas, the latter seems to be the most appropriate ($R^2 = 0.972-0.989$) to describe kinetics of the ionic transfer whatever the applied temperature. Further, the activation energy (17.272 kJ/mol) related to the transfer mechanism is obtained from the Arrhenius plot with a correlation coefficient greater than 0.899. Globally, the physicochemical parameters of obtained tablets were found to be in compliance with the pharmacopoeial standards

Keywords: *Arbutus* berries, Tablet, Dissolution, Swelling, erosion

(19844) PRODUCTION OF CONCENTRATED WHEY BEVERAGE BY OSMOTIC MEMBRANE DISTILLATION: ANALYSIS OF FLUX PROFILE

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The objective of this study is to produce concentrated whey beverage having high protein content from ideal whey by osmotic membrane distillation. Recently, whey has not been regarded as a waste in the food industry, but rather as a raw material in the production of different high-added value dairy products. In the literature, it has been seen that there are intensive studies on manufacturing of whey beverages with different characteristics. In these studies, acid or sweet whey, which are produced after cheese manufacturing, are generally used as raw material. Passage of rennet enzyme and the other additives used in cheese manufacturing to whey, and acidic character of whey negatively affect sensory properties of the final products. Therefore, ideal whey, which is separated from milk before cheese making, was used as a raw material in this study. It was concentrated by osmotic membrane distillation, which is an alternative technique to thermal methods such as evaporation in recent years. It was expected that minimum protein denaturation can be achieved in the final product. The effects of the composition of ideal whey on the performance of osmotic membrane distillation was evaluated based on flux profile. Conversion of whey into an alternative product that is more easily marketable and high-added value is expected to provide an economic benefit for dairy industry in Turkey and especially in Thrace region. Moreover, the use of ideal whey instead of acid or sweet whey as a raw material will allow the cheese industry to produce more varieties of cheese and expand its product range.

Keywords: Beverage, Cheese, Whey, Waste

(19845) TRANSGALACTOSYLATION ACTIVITY OF B-GALACTOSIDASE FROM ASPERGILLUS ORYZAE: KINETIC PARAMETER ESTIMATION

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Galactooligosaccharides (GOS) are enzymatically synthesized from lactose in a kinetically controlled transgalactosylation reaction catalyzed by β -galactosidase. The mechanism of GOS synthesis is very complex because hydrolysis and transgalactosylation reactions occur simultaneously. Modeling such a system is useful to understand its reaction pathway. The reaction mechanism modelling will provide estimation of the reaction rate constants for the proposed mechanism and thus it will make possible to predict the GOS yield at any point in time during the reaction. Therefore, the aim of this study is to estimate the transgalactosylation kinetics of *Aspergillus oryzae* for the proposed model in a batch reactor. Kinetic model was adapted from literature and modified by adding galactose and glucose inhibition to the model. The thirteen apparent rate constants were obtained by employing optimization methods of random search and particle swarm of COPASI 4.22 sequentially using experimental data of six replicates. The experimental conditions for GOS synthesis were temperature of 45 °C, lactose concentration of 182.5 g/L and enzyme concentration of 0.098 mg/mL lactose solution. It was found that proposed model explained well not only the lactose hydrolysis but also the GOS synthesis by the *Aspergillus oryzae* β -galactosidase at various concentrations of substrate. The experimental data were in good agreement with the predictions of the derived reaction rate equations.

Keywords: Galactooligosaccharide, Transgalactosylation, Kinetic parameter estimation, *Aspergillus oryzae*

**(19848) A COMPARATIVE STUDY THE ANTIOXIDANT PROPERTIES OF
DIFFERENT CITRUS JUICES**

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Citrus fruits are important sources of beneficial phytochemicals, such as vitamins A, C and E, mineral elements, flavonoids, coumarins, limonoids, carotenoids. Epidemiological studies have shown that citrus species possess significant biological functions on human health, including antioxidative, anticarcinogenic, antiatherosclerotic, antimutagenic and angiogenesis inhibitory activities. In this study, total phenolic, total flavonoid, total carotenoid and vitamin C contents of the juices of seven citrus varieties which are grown in Antalya, Turkey were determined. Additionally, antioxidant activities were also investigated using DPPH method. Total phenolic contents of the citrus juices varied from 18.21 to 52.44 mg gallic acid equivalent/100 ml and flavonoid contents varied from 2.77 to 10.64 mg catechin equivalent/100 ml. Total carotenoid contents varied between 1.27 and 1.86 mg/ml and vitamin C contents were from 46.06 to 86.01 mg/100ml. IC₅₀ values of the citrus juices ranged between 52.88 and 122.84 µl. Statistically significant differences were observed between citrus varieties for investigated parameters.

Keywords: Citrus, Antioxidant activity, Phenolic, Flavonoid

(19863) DETERMINATION OF CHANGES IN TOTAL PHENOLIC AND FLAVONOID CONTENTS, ANTHOCYANIN AND ANTIOXIDANT CAPACITY OF RED GRAPE JUICES DURING STORAGE

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In the current study, changes in total phenolic and flavonoid contents, anthocyanin and antioxidant capacity of red grape juices were monitored in different storage conditions (4, 24 and 37°C) during 4 months. In addition; the pH, acidity and total soluble solids alterations in the samples were also observed. The acidity values decreased between 10.93 and 32.91 percent in the end of the 4th month, but the similar reductions were no monitored in the total soluble solid and pH values. Total monomeric anthocyanin amounts reduced starting from the second week according to initial amount as dramatically. The decreasing of anthocyanin values for 4, 24 and 37°C storage conditions reached 27.27, 65.42 and 91.21 percent in the end of the storage time respectively. Alterations in the total phenolic and flavonoid contents were more stable compared to anthocyanin changes. Antioxidant capacity of the red grape juices reduced between 19.46 and 23.71 percent. This changing was more at 4°C storage conditions. As a result; It was revealed that some quality parameters such especially anthocyanin and antioxidant capacity values of red grape juices changed considerably during storage.

Keywords: Grape juice, Quality, Anthocyanin, Antioxidant, Storage

(19894) EFFECT OF BROILER GENETIC STRAIN ON ECONOMIC PROFITABILITY AND MEAT QUALITY CHARACTERISTICS

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The present work aims to evaluate the effect of broiler genetic type on economic profitability, meat quality and sensory acceptability.

Two commercial broiler strains were studied: a fast-growing strain (Cobb and Arbor) and the slow-growing poultry strain (JV), that has been genetically selected to improve production traits of broilers and maximize the profitability of chicken meat production.

A post-mortem inspection showed that the general trauma rate was higher in both Arbor and Cobb strains compared to the JV strain ($p < 0.05$). Economic profitability study showed that Cobb strain is the most profitable.

Physicochemical parameters evaluation showed a significant difference between the studied poultry strains ($p < 0.05$). Statistical analysis revealed that pH was positively correlated with cooking loss and the color parameter a^* but it was negatively correlated with water loss, exudate and color parameter b^* . Moreover, the textural analysis showed that the broiler from Cobb strain was significantly difficult to chew.

In addition, no differences ($p > 0.05$) existed among breast meat from the different strains with respect to consumer acceptability of appearance and overall acceptability. Breast meat from Arbor strain was slightly preferred ($p < 0.05$) with respect to color, aroma and juiciness.

Keywords: Broiler genetic type, Fast-growing strain, Slow-growing strain, Meat quality, Economic profitability

(19945) A NONTHERMAL APPROACH FOR PRODUCTION OF CONCENTRATED SOUR POMEGRANATE SAUCE: OSMOTIC DISTILLATION

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Concentrated sour pomegranate sauce is a popular traditional product in Turkey, which is commonly used as dressing for several salads and appetizers. Traditionally, the sour sauce is produced simply by boiling, without the addition of further sugar or any other additives. Industrial processing includes several steps such as extraction, filtration, clarification and evaporation as well as addition of glucose, citric acid, antioxidant agents, coloring agents, and some preservatives. The industrial evaporation is usually performed by thermal evaporators, in which much more drastic temperature and time regimes than pasteurization process can be used. However, thermal evaporation process has many heat induced drawbacks including high energy consumption, alteration of sensory attributes, reduction of nutritional value and formation of unfavorable compounds (HMF and furan). There is a real need to minimize the degradation of the functional molecules during the conventional thermal evaporation in order to secure an optimal sensorial and nutritional quality. In recent years, concentration using membrane processes have come to the fore as an alternative to traditional methods. In this aspect, osmotic distillation (OD), providing concentration up to 60-65 °Briks or higher levels at ambient temperature, have been emphasized. OD process differs from other pressure driven membrane processes, such as reverse osmosis, in terms of obtaining a high quality product and also maintaining flux stability at high concentration levels.

The aim of the present study was to evaluate the potential use of OD process for production of concentrated sour pomegranate sauce under very mild conditions. The OD yielded a concentration of the raw sour pomegranate juice (with an initial TSS of 15°Brix) up to 67°Brix. The concentrated sour pomegranate sauce retained the original color. No significant differences observed in the total antioxidant content of sour pomegranate juice and no HMF formation was observed following OD. On the basis of the experimental results, OD can be proposed as an alternative for production of concentrated sour pomegranate sauce under very mild processing conditions in order to ensure the safety of the product as well as to preserve the natural quality of the product.

Keywords: Membrane distillation, Concentrate, Traditional, Membrane separation

(19946) RECOVERY OF PHENOLIC COMPOUNDS FROM POMEGRANATE HUSK: EFFECT OF MEMBRANE FOULING ON ULTRAFILTRATION PERFORMANCE

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Pomegranate husks are large part of processing waste in fruit juice industry and they are rich in bioactive compounds having beneficial effects on human health. Therefore, assessment of phenolic compounds by recovering from pomegranate husks is important both in terms of environment and economy. The effects of membrane fouling on the ultrafiltration (UF) performance based on the flux and the recovery yield were investigated in this study. In the experiments, a super hydrophilic Hydrosart® UF membrane (stabilized cellulose based membrane) with an effective membrane area of 200 cm² and a nominal molecular weight cut off (MWCO) of 2 kDa was used. The experiments were performed according to the total recycle mode during 135 min. The UF system was operated at a temperature of 40 °C, at a feed flow rate of 9,35 l/h, at a feed total phenolic content of 880 mg GA/l extract and at different trans membrane pressure (TMP) values in a range of 0,5-1,5 bar. The fouling mechanisms of the membrane were evaluated by the resistance-in-series model. Membrane fouling mechanism which can support rejection of phenolic compounds in a UF process generally consists of cake filtration mechanism, concentration polarization and pore blocking mechanisms. The contribution of cake layer resistance (R_c) to total resistance (R_t) were found 1%, 2% and 4% while the TMP values were 0,5-1-1,5 bar. Nevertheless, the reversible fouling decreased with increasing TMP. The results also showed that the irreversible fouling was unimportant for all TMP values.

Keywords: Fouling, Bioactive compounds, Recovery, Waste management

(19973) QUALITY ASSURANCE AND PREVENTIVE MEASURES, A PRE-CONDITION FOR FOOD SAFETY GUARANTY

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Globalization of the food supply has led to the rapid and widespread international distribution of foods. Throughout the world the incidence of foodborne diseases is increasing and international food trade is disrupted by frequent disputes over food safety and quality requirements. An estimated 600 million - almost 1 in 10 people in the world fall ill after eating contaminated food and 420 000 die every year. Safe food supplies support national economies, trade and tourism, contributes to food and nutrition security, and underpins sustainable development. It is also important to note that addressing the risk of foodborne disease goes beyond the public health worker. Ultimately it requires the implementation of a well functioning and integrated food control system which needs collaboration among all the components of a food control system, including food law and regulations, food control management, inspection services, epidemiological and food monitoring (laboratory services) and education of and communication with the consumer.

Food quality assurance, on the other side, imposes for food manufacturing to comply standards on their products. Dietary changes in global society, restriction on importing several foods from other countries, lack of consumer knowledge, allergies from various food ingredients, economic crisis, etc., do effect the food consumption and food industries. Food production companies may try to reduce production costs by adding in low quality materials, which may damage peoples' health.

Given to private sector the possibility to increase profits at all costs, food safety protection must be guided by strong government regulations. Actually, those regulations and governmental policy, influenced by industry, do create favorable rules that decrease the cost of business by putting consumers at risk. Regulators act more in reactive manner than preventive one, using voluntary product recalls to respond to major food safety scandals rather than addressing the underlying problems. It is up to each actor in the food production and distribution chain to take all steps to make sure that products placed on the market are free of all risks to consumers' health.

The aim of this paper is to discuss factors affecting food safety, the implementation of food quality standards and highlight significant findings on quality assurance and preventive measures in food industry, for better more effective intervention strategies against food related diseases and the benefits of consumers globally.

Keywords: Food Safety, Quality assurance, Food-borne diseases, Food chain

**(20001) ANTIOXIDANT COMPOUNDS DISTRIBUTION AND RADICAL
SCAVENGING CAPACITY IN SKIN, PULP AND FRUIT EXTRACTS OF FIG
CULTIVARS (*FICUS CARICA* L.)**

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Total phenolic, total flavonoid distribution and antioxidant activity in skin, pulp and fruit extract of 10 fig cultivars belonging to INRA Morocco collection were investigated. Antioxidant activity were performed based on DPPH and ABTS essays. The results showed significant differences ($p < 0.05$) in the radical scavenging capacity and in the levels of total phenolic and flavonoid compounds among genotypes and depending on the fruit compartments (skin, pulp and the whole fruit). The total phenolic, flavonoids content and antioxidant capacity were high in dark fruit (low values of L^*) than clear ones (high values of L^*). For both, these compounds were essentially concentrated in fig skin. Total flavonoids and antioxidant activity were shown to be strongly and positively correlated to coordinates skin color, particularly (L^* and the hue angle). The results confirmed that figs having a dark color hold a high amount of phenolic compounds that are highly concentrated in the fruit skin.

Keywords: *Ficus carica* L., Skin fruit, Antioxidant compounds, Radical scavenging

(20046) IMPACT OF VINIFICATION TECHNIQUES ON THE CONTENT OF POLYPHENOLIC COMPOUNDS OF WHITE WINE FROM CV. PULËZ DURING TWO DIFFERENT VINTAGES

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Wine production techniques and agronomic practices influence the flavors and bouquet of white wines. Various studies have shown that these factors influence the content of phenolic compounds that are essentially responsible for the taste and aroma of wine. The purpose of this study is to investigate the influence of vinification techniques in dynamic changes of phenolic compounds in white wines produced in two different vintages. For this study, was taken a autochthonous white grape, Pulëz, cultivated in Berat area. For the production of wines were followed two different vinification schemes (fermentation with and without skins). Prior to fermentation, the must was macerated at 5°C for 24 hours. *Saccharomyces Bayanus* BC commercial yeast was used for both fermentations. Every three days the phenolic compounds of wines were analyzed by spectrophotometric methods, such as the index of polyphenols, flavonoids and color parameters. The obtained data were subject to ANOVA statistical analysis. The obtained results show that vinification techniques show the higher values in the index of polyphenols, flavonoids and color parameters with a significant difference with $P \leq 0.05$ Test Tukey. While different vintages have not significant differences in polyphenolic components. Based on the results of this study, we conclude that the application of two vinification techniques influences the increase of these constituents especially when vinification is carried out in the presence of the skin.

Keywords: White wine, Fermentation, Polyphenols, Flavonoids

(20050) DEVELOPMENT OF A MULTIPLEX REAL-TIME QUANTATIVE PCR ASSAY (Q-PCR) FOR DETECTION OF EQUINE MEAT IN PROCESSED MEAT PRODUCTS

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The identification of equine (horse and donkey) meat in bovine meat in commercially processed meats is one of the most crucial issues in the food industry because of religious, food ethics, medical purposes, and intentional adulteration. In this study, we aimed to develop a method for the detection of horse and donkey meat in the processed meat products.

A method has been developed allowing both species identification and quantitative analysis by using Real-Time Polymerase Chain Reaction (RT-PCR) method employing specific primers for horse and donkey mitochondrial cytochrome b (cytb) gene. As a reference, triple meat mixtures containing horse and donkey meat were prepared in known quantities in cattle meat. Single, double and triple reactions were prepared with horse and donkey primers in which genomic DNA dilution series were used as a template. The results show that the calibration curves between 0.05% and 50% with high linear correlation values and reaction efficiency were obtained. Furthermore, forty processed food samples which already tested positive for horse and donkey meat by a validated method were analyzed by the quantification method developed. Fifteen out of forty samples were negative for horse and donkey meat. The quantitative method was able to determine the horse and donkey meat at the level of 1- 50% in a processed food.

Keywords: Equine, Horse meat, Donkey meat, Species identification, Quantitative RT-PCR, Adulteration

(20147) IMPROVEMENT OF NUTRITIONAL PROPERTIES OF A MILKY DESSERT BY INCORPORATION OF *LUPINUS ALBUS* AND *STEVIA REBAUDIANA* EXTRACTS

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The aim of the present study is to evaluate physicochemical, microbiological and sensorial properties of cream dessert, made with mixtures of partly skimmed reconstituted milk and lupine milk at different concentrations. To reduce the amount of sugar, from 11% in the conventional protocol to 7.15%, 3.85% of *Stevia rebaudiana* extract was used. Compared to the reference product, eighteen elaborated trial protocols had high protein content ranging from 8.36 to 16.25 g/100g. Furthermore, some mixtures had high amounts of fat, ash and calcium. Microbiological analysis revealed complete absence of pathogenic organism in the eighteen tests, which proved their safety for consumption. In this study, we developed a good mixture protocol to prepare cream dessert which is highly rich in protein (14.646 g/100 g) and calcium (97.796 mg/100 g), with an estimated acceptability of 3.424.

Keywords: Cream dessert, *Lupinus albus*, *Stevia rebaudiana*, Pectin

**(20153) PHYTOCHEMICAL PROFILE AND ANTIOXIDANT POTENTIAL OF
ANVILLEA RADIATA COSS. & DUR. VAR. *GENUINA* M.**

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The present study aimed to evaluate the potential of *Anvillea radiata* Coss. and Dur. var. *genuina* M. (Asteraceae) as a source of antioxidant compounds. The preliminary evaluation of the phytochemical composition of the different organs highlighted the presence of some chemical groups. This was confirmed by quantitative analysis based on the measurement of total phenolics, flavonoids, flavonols and condensed tannins content. We have shown that aqueous methanol is the best extractor of flavonoids, while acetone has the ability to extract more of tannins. Considering organs, flowers of *A. radiata* have the highest levels of these compounds. Thus, in order to obtain an extract enriched with metabolites of interest - flavonoids, we opted for a liquid-liquid extraction using different solvents with increasing polarity. The quantitative determination of total flavonoids by the aluminium trichloride method revealed that butanol and ethyl acetate fractions were the richest with respective holders of (55.910 +/- 1.022 mg CE/g DW) and (47.394 +/- 1.497 mg CE/g DW) for *A. radiata* flowers. These fractions showed also remarkably strong antioxidant activities on 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging, ABTS radical scavenging and reducing power, which were almost comparable to capacities of the positive controls (Vit E and BHT). Conversely, a very high inhibition of lipid oxidation was obtained in the hexane fraction of *A. radiata* flowers (IC₅₀ < 0.094 mg/ml), yet very low concentrated on polyphenols. This is probably due to the presence of other substances which may act independently or synergistically. HPLC analysis of the most active fraction revealed the presence of eleven compounds, including procatechuic acid (3.21%), caffeic acid (3.83%), naringenin-7-O-glucoside (1.46%), morin (27.09%) and coumarin (1.64%), some of them not previously reported in *A. radiata*. In conclusion, these results indicate that *Anvillea radiata* organic extracts can be considered as a promising source of phenolic acids and flavonoid compounds, with remarkable antioxidant properties.

Keywords: *Anvillea radiata*, Antioxidant, Flavoids, HPLC

**(20162) DRYING OF KIWI FRUIT SLICES BY APPLYING VACUUM
IMPEGRATION**

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Kiwifruit quite rich in vitamins, minerals, antioxidants, phytochemicals and fiber content which are native to north-central and eastern China and has been cultivated in Turkey for about 30 years. The kiwifruit plantation area in Turkey is showing a rapid increase and parallel to this, production is increasing significantly. Therefore, kiwifruit produced in Turkey is becoming an important industrial product with minimal loss of quality. In this project, *Actinidia deliciosa* cv. Hayward was used as material was obtained from Atatürk Horticultural Central Research Institute experiment orchard. Kiwifruits were sliced to a thickness of 9 mm and dried in a hot air dryer at 65°C. Vacuum impregnation and osmotic dehydration technique which saves energy in drying technology were used and also 30%, 40% and 60% brix sucrose concentrations used as pre-treatments. The drying process continued until the water activities (aw) of the products were 0.60-0.65. As a control, the fruits were dried without any treatment in the hot air dryer. In this study, effect of vacuum impregnation method of kiwifruit on osmotic dehydration mechanism and the effects of different osmotic solution concentrations on the dried quality qualities of this mechanism have been examined. For this purpose, total dry matter, aw (water activity), L*a*b*- chroma- hue color values and sensory evaluation were performed and the best solution concentration was recommended according to these analyses. 30% brix concentration sensually recommended since samples with a solution concentration of 30 brix was best preserved in terms of colour that provides the best sour sweet balance.

Keywords: Kiwifruit (*Actinidia deliciosa*), Dried fruit, Quality analyses, Vacuum impegation.

(20168) TESTING OF POTENTIAL PROBIOTIC LACTIC ACID BACTERIA AND THEIR EFFECT ON PATHOGENIC BACTERIA INVOLVED IN THE DIGESTIVE PATHOLOGY *IN VITRO*

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Among the very many functional foods available commercially, those containing live bacteria and able to provide a beneficial health effect deserve a special mention, these are currently traded under the label of probiotic, and their efficacy depends mainly on the ability of said probiotic strain to survive throughout the whole food processing chain, and to compete with metabolically active microorganisms either along the food chain or during passage through the gastrointestinal tract.

One of the important properties of probiotics is their ability to survive in the intestine. Few studies have been conducted on the probiotic property of lactococcus the fact that they are not considered formally as natural inhabitants of the intestine. To evaluate lactococcus as probiotic bacteria, a collection of 30 Lactic acid bacteria obtained from Moroccan traditional dairy products (Iben, Jben, lemon and olives) and goat fecal microbiota was studied for their ability to survive during gastric transit by *in vitro* tests.

Several strains could be considered promising probiotic candidates since they showed a good growth capacity and survival under simulated gastrointestinal environment, such as a low pH (1.5-3) and the presence of bile (0-4% with increments of 1%), auto-aggregation of selected strains, as well as co-aggregation with *Listeria innocua*, *Escherichia coli*.

In addition, selected strains with potential traits were tested for their hemolytic activity, antibiotic resistance and antimicrobial activity production.

Isolates of presumptive *Lactococcus* and enterococci were assigned to the genus or species level by PCR, with the use of specific primers *Lactococcus lactis*, *Leuconostoc spp*, *Lactococcus raffinolactis*, *L. lactis subsp*, *L. lactis subsp cremoris*, *Enterococcus spp*.

On the basis of results obtained, selected strains with potential traits and the survival capacity demonstrated by some of the analyzed, strains are encouraging to further study their potential as probiotics.

Keywords: *Lactococcus*, Survival, Gastrointestinal tract, Probiotics

(20170) FREE FATTY ACID COMPOSITION OF REGIONALLY-PRODUCED MOROCCAN GOAT CHEESE AND RELATIONSHIP WITH SENSORY CHARACTERISTICS

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Due to their specific composition, organoleptic characteristics and healthy attributes, the production of goat's milk and goat cheese has attracted growing interest over recent years. Goat's milk fat and protein are more easily digestible than those of cow's milk and it contains higher levels of vitamin A, thiamine and niacin. In addition, the lower aller-genic capacity compared to cow's milk makes goat's milk an alternative for people who cannot tolerate cow's milk. Cheese made from goat's milk is greatly appreciated because of its particular organoleptic characteristics. Lipolysis plays an essential role in the sensory properties of cheese; some free fatty acids (FFAs) have been shown to contribute directly to the aroma characteristics of many types of cheese, or indirectly as precursors of aroma components.

This present work was undertaken with the main objective to evaluate the free fatty acid profile of regionally-produced Moroccan goat cheeses and its relationship with sensory characteristics. FFAs were extracted from cheese and determined by gas-chromatography according to the method described by Poveda and Cabezas (2006). The odour and taste attributes of the test cheeses were analysed using a panel of 10 tasters previously trained in the sensory analysis of cheese.

The most abundant FFAs were oleic (C18:1) (mean values of 696–778 mg/kg), stearic (C18) (688–697 mg/kg), palmitic (C16) (499–568 mg/kg), myristic (C14) (355–478 mg/kg), and capric acid(C10) (367–440 mg/kg). Butyric acid was the main short-chain FFA present (mean: 4.7% of total FFAs) and capric acid was the chief medium-chain FFA (7.5% of total FFAs). Long-chain free fatty acids and the sensory attributes bitterness, brine odour and goat milk odour were the variables that most contributed to sample differentiation.

Keywords: Goat milk cheese, Lipolysis, FFAs

(20171) A NATURAL NUTRITIONAL SOURCE: HUNNAP

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Hunnap is a plant of about 40 species and distributed in warm temperate zones and subtropical regions throughout the world. This plant is a member of Rhamnaceae family with a small thorny bush. Hunnap is peculiar to Chinese culture and up to now more than 700 kinds of hunnap have been found in China. Having a history of more than 3,000 years, hunnap is still a popular fruit in our daily lives for the benefits of our health. Hunnap has been used as food and food additive for thousands of years because of its high nutritional value. Hunnap can be consumed as fresh, dried, canned and confectionary. Hunnap fruit is a source of essential fatty acids because it is rich in unsaturated fatty acids (68.54-72.44% of total fat). The predominant fatty acids in hunnap are oleic, linoleic, palmitic and palmitoleic acids. Fresh and dried hunnap is especially rich in fiber, trace minerals, proteins, sugars, organic acids and volatile compounds which provide a pleasant characteristic flavor. Previous studies have shown that hunnap contains flavonoids, cerebrosides, aminocytes, phenolic acids, mineral constituents and polysaccharides, including triterpenic acids. Glucose, fructose, sucrose, rhamnose and sorbitol are the main sugars of the hunnap fruit. In addition, different organic acids such as citric, succinic and malic acids have been described in hunnap fruit. Hunnap is rich in vitamin C and is a source of many vitamins such as thiamine, riboflavin, niacin, vitamin A and vitamin B-6. General information about hunnap has been given in this study.

Keywords: Hunnap, Natural, Nutritional, Fatty acid

(20179) SOME YELLOW KIWIFRUIT VARIETY CANDIDATES DRYING HEAT PUMP DRYER

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Kiwi fruit production and increase day by day to show these fruits are interested in turkey and assessment increases. In our country, Hayward variety is cultivated with fruit variety. In addition, the availability and evaluation of variety candidates that are outstanding in breeding studies on new varieties in kiwi fruit are important. Therefore, the aim of this study is to evaluate dried gold kiwifruit, which is very important in terms of nutrition, for the newly cultivated variety candidates (HO8, J284, H140) in Yalova, Turkey. In the study, the skin of kiwi fruit was peeled and sliced to a thickness of 9 mm. Heat-pump dryers, which are more advantageous in terms of energy saving than other drying systems, have been used for drying the fruit. The water-pumped dryer was dried at 45 degrees to a water activity (aw) of 0.55 and a moisture content of 15%. Before and after drying the fruit, the changes after drying were determined by analyzing vitamin C, Antioxidant Activity, total phenol and total sugar. Relatively new varieties of food will be advised for eating.

Keywords: Yellow kiwifruit, Dried fruit, Quality analyses, Heat Pump Dryer

(20180) TRADITIONAL CHEESES "JBEN" AND FERMENTED MILK "LBEN" IN THE TANGIER, NORTH REGION OF MOROCCO AS A SOURCE OF POTENTIAL PROBIOTIC STRAINS

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The present study's goal is to characterize a collection of LAB isolated from traditional cheese and fermented milk of Tangier Morocco. Furthermore, the development of starter cultures and new biotechnological processes for improving the organoleptic quality, the safety aspects and avoiding important economic losses.

A collection of 19 *Lactobacillus* (11 *Lactobacillus plantarum*, 4 *Lactobacillus paracasei*, 2 *Lactobacillus Rhamnosus*, 2 *Lactobacillus curvatus*) were selected on the basis of their potential technological, safety aspects, and antibacterial activity. The survival under different gastric conditions, aggregation and coaggregation properties were also tested.

Under gastric conditions, all *Lactobacillus* strains were able to survive in the presence of 4% of bile salts. Whilst different viability rates were shown for the capacity to survive at low pH (1.5) at t₀, the maximum survival rate was observed for *Lactobacillus plantarum* (104.57 logUFC/ml), followed by (102.83±4.24 logUFC/ml) and (102.70 logUFC/ml) for *Lactobacillus paracasei* and *Lactobacillus rhamnosus* respectively. Concerning the capacity to survive at pH (2), also the maximum survival rate was observed for *Lactobacillus plantarum* (104.57 logUFC/ml), followed by *Lactobacillus paracasei* (100.92 logUFC/ml) and *Lactobacillus rhamnosus* (100.00 logUFC/ml). Auto-aggregation of *Lactobacilli* belonging to the same strain is an important feature especially in the human gut, our results showed that *Lactobacillus* strains exhibited different auto-aggregation abilities ranging from high *Lactobacillus casei* (41.19 %), *Lactobacillus plantarum* (41.21 %). Co-aggregation of *lactobacillus* with pathogenic bacteria was significantly variable. High co-aggregation capacity (41 –100%) of tree *lactobacillus plantarum* was detected with *E. coli*, while two *lactobacillus paracasei*, one *lactobacillus plantarum*, and one *lactobacillus rhamnosus* had highly co-aggregated with *Listeria innocua* (41 - 50%).

The isolated strains of *Lactobacillus* could be considered as probiotic candidates, since they showed their efficiency not only in the gastro-intestinal tract but also in food matrices

Keywords: Probiotic, *Lactobacillus*, Gastric conditions, Human gut

(20197) THE EFFECT OF BRINE ACIDITY ON COLOUR OF BRINED VINE LEAF PRODUCTION

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Vine is one the most cultivated plants in the world. Mainly it is cultivated for different varieties of grape. Also grape can be processed to different types of productions, such as table grape, raisin, wine etc. In Turkey many of traditional vine products are existed and one of them is brined vine leaf. In this study the effect of brine acidity on color of vine leaves is aimed. For this purpose, leaves of Sultani Çekirdeksiz variety are fermented in brine solution which is prepared at 12.5 °Brix and acidified to five different levels, from % 0.01 to % 1 acidity. In the fermentation period almost 2 months, total soluble solid (TSS), pH and titratable acidity (TA) of brine is monitored per week. On the other hand, color values of brined leaves are measured as L^* , a^* , b^* , Chroma and Hue angle per week. So that it can be determined obviously the effect of acidity on color of leaves and also the change of color, TSS, pH and TA during fermentation period. The color of leaves is very important for consumers. It is believed that suitable acidity level will be specified for the acceptable color of brined vine leaves for production.

Keywords: Brined vine leaf, Acidity, Color, Fermentation

(20245) QUALITY PARAMETERS AND SUITABILITY OF AUTUMN ROYAL GRAPE VARIETY ON JAM PRODUCTION

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Nowadays, there is a great interest in high antioxidant capacity, anthocyanin-rich fruits and products, which have great importance in terms of human health. Grape has an important place among these fruits in terms of phenolic substances and antioxidant content. In this study, the use of Autumn Royal grape variety in the production of jam was investigated. For this purpose, physical and biochemical analyses such as pH, Total Soluble Solid (TSS), titrable acidity (TA), total phenolic content (TPC) and total monomeric anthocyanin (TMA) analyses were performed. Also, Hydroxymethylfurfural (HMF) analyses were determined by HPLC method. The pH value of Autumn Royal grape variety was 4.83, whereas pH value of jam sample were 3.95. TSS value of Autumn Royal grape variety was 22.2°Brix, whereas TSS value of jam sample was 69.2 °Brix. TA value of grape was 2.53 g/l, whereas TA value of jam sample was 3.35 g/L. TPC and TMA value 2344 mg GAE/kg and 490 mg malvidin-3-glucoside for Autumn Royal grape variety, respectively. Besides, TPC and TMA values 2235 mg GAE/kg and 329 mg malvidin-3-glucoside for jam sample, respectively. As noted in the literature, jam processing does not cause a significant change in the total phenolic content of the fruit. HMF was not detected in Autumn Royal grape jam samples. Sensory evaluations of grape jam samples were also carried out and the general taste score of Autumn Royal grape jam was determined to be quite high.

Keywords: Grape jam, Autumn Royal, Phenolic substances, Quality parameters

(20257) DETERMINATION OF POLYPHENOL AND SENSORY PROPERTIES OF CARBONATED GRAPE JUICE BEVERAGE INCLUDING MESIR AROMA EXTRACT

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Mesir is a sweet paste which specific to Manisa province, inherited daily from the Ottoman Empire and is continuously produced today. It is known that 41 kinds of spices in its ingredients have beneficial effects on human health. Mesir also has a specific aroma with this multi-spice mixture.

Grape is a valuable product in terms of its nutritional qualities. It is agriculture and trade are carried out at considerable levels in Turkey and is evaluated in different forms. One of these evaluation forms is grape juice.

In this study, a grape juice drink containing 2%, 5% and 10% Mesir flavor extract and carbonated with CO₂ gas was produced. Total phenolic content (TPC), Antioxidant activity (AA) and Sensory analysis of the samples were performed. TPC and AA values were changed between 187-263 mg GAE/kg and 347-474 µM TE, respectively. Grape juice beverage including 10% Mesir extract had the highest score in terms of sensory quality.

Keywords: Mesir, Grape juice, Beverage, Spice, Polyphenol

(20259) USE OF GRAPE SEED AND PEEL IN PESTIL PRODUCTION

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Pestil is a traditional food that obtained from fruits such as grape, mulberry, apricot, plum and produced in Turkey. Pestil which to give the desired consumed in all seasons and in a good way comprises health beneficial nutritional components from the fruit content.

Grape is one of the raw material sources of Pestil and contains significant quantities of phenolic compounds, organic acids and sugars. Particularly grape seeds and peel are rich with regard to phenolic compounds.

Pestil is made from must and grape seed and peel are obtained as a by-product. In this study, after the remaining seed and peel in the pestil production were dried, separated and powdered and used in the production of pestil at the determined ratios. The peel powder ratios used were 1%, 3%, 5%; the seed powder ratios were 1% and 2%.

According to the results of the analysis, the content of phenolic substance increased as the addition ratio increased. Also, according to sensory evaluation was found to be acceptable with 1% seed powder added pestil and 3% peel powder added pestil.

Keywords: Pestil, Fruit leather, Grape, Seed, Peel, Phenolic substance

(20318) FOOD ADDITIVES INCORPORATED IN CANNED FOODS OF ANIMAL AND VEGETABLE ORIGIN PLACED ON THE ALGERIAN MARKET (ANNABA CITY)

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Food additives are the indispensable and necessary tools of the agro-food industries to ensure sufficient production in quality and quantity. In the same way our food cannot do without the technological support of the food additives as we are looking for new products, new flavors, so much we need to preserve and ensure an impeccable hygiene of our food, they allow therefore meeting our food needs. However, these food additives are not without risk for consumer's health. It seems that many of them are directly correlated to cases of allergy or intolerance with digestive or migraine disorders, others suspected of causing genetic mutations and thus promote the formation of cancers. Based on this observation, our objective is to identify additives incorporated in food products and to evaluate their risk to public health.

For this, a survey of food products intended for human consumption is carried out at Annaba city. The survey was conducted from January to April, and concern a total of 56 local and imported canned foods of animal and vegetable origin placed on the Algerian market. Our survey results show that in canned foods of animal origin, SIN129 (highly toxic), SIN250 (highly toxic) and SIN316 are the most incorporates additives in local products, and SIN 129, SIN160c (moderately toxic), SIN334 in the imported ones. However, vegetable canned foods contain SIN479 (toxic) in local products and SIN223 (toxic) and SIN 385 (toxic) in imported ones. To deal with this plague of toxicity, we advise consumers to become aware when buying food by checking the labels of these products. Thus we encourage manufacturers to respect daily doses in products and we encourage the agri-food industries to reserve sufficient space for the list of ingredients on the packaging. This so that it is readable and easily identified by buyers.

Keywords: Food additives, Survey, Canned foods, Health risk, Consumers

(20320) EVALUATION OF THE IMPACT OF COMMERCIAL GREEN TABLE OLIVE PROCESSING TECHNOLOGY ON THE PHENOLIC PROFILE

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Table olive is an important element of the Mediterranean diet, containing a nutritional value and a therapeutic interest costs which are contributed to its composition in different bioactive compounds. This study aims to investigate the effect of Spanish style green olive processing on the phenolic profile of *Olea europaea* L. of some local and introduced foreign varieties. The strategy adopted in our study is to define the main characteristics of the phenolic profile of olives before and after their processing according to the Spanish style by the method of assay and HPLC. It is clear from this study that the phenolic content is strongly influenced by the preparation technology which leads to losses for which the most important are estimated at 96% (total polyphenols), 98.11% (ortho-diphenols) and 93.44% (flavonoids) noted for the variety of Azzeradj Seddouk. The analyses of phenolic composition by HPLC showed that all extracts present the same phenolic composition profile with high amount of oleuropeine and verbascoside. Nevertheless, this profile was significantly modified after processing. Spanish style green olive processing results in total losses of oleuropeine, verbascoside, ligstroside and the quercetine 3-galactoside following to their alkaline hydrolysis, as well as the generation of the benzoic acid and the derivatives of the cinnamic acid known by their high antioxidant and antimicrobial activities.

Keywords: Table olive, *Olea europaea* L., Spanish style, HPLC, Polyphenol

(20347) FORMULA OPTIMIZATION OF LOW-FAT BUTTER USING RESPONSE SURFACE METHODOLOGY: EFFECT ON PHYSICOCHEMICAL PROPERTIES, AND CONSUMERS' ACCEPTANCE

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According to WHO, high fat diets are linked to obesity and overweight, both increase the risk of diabetes. Therefore, food industry has to review the product formulas. The objective of this study was how to develop fat-reduced butter.

In order to manufacture a product with beneficial properties, the formulation consists on using a surface methodology based on 3 different factors such as percentages of emulsifier additive E471 (glyceryl monostearate, glyceryl distearate), xanthan gum (E415, thickening agent, stabiliser and emulsifier) and water, and 2 levels (-1+1). For optimizing this combination, four responses were used: percentages of fat, water, pH and hardness. Optimum formulas were validated by sensory hedonic tests. In the second part of this study, physicochemical and sensory properties of butter were assessed before and during storage at 6°C for 20 days. Preliminary optimized formula of reduced-fat butter was obtained by using emulsifier additive E471, xanthan gum E415 and water contents of 3, 0.1 and 40%, respectively. However, this fat reduction of 63% led to a weak sensory acceptance score. Additional formulation with butter aroma and coloring agent (E160a) has significantly improved consumers' acceptance of the product. Fat reduction in butter formula has also significantly induced an increase in water activity, pH, acid, peroxide and iodine indexes, and a decrease in hardness, when compared to control butter (ie. unreduced). Moreover, storage of low fat butter at 6°C during 20 days induced a significant decrease in pH, and iodine index, whereas acid and peroxide indexes increased significantly and in a higher extend, when compared to control butter. Moreover, microbial load increased after 16 days of storage. These variations due to higher water content led to a decrease in low-fat butter shelf life at 6°C. Our results showed that the production of low-fat butter can be industrially applicable and recommended to people who are interested in consumption of reduced- fat foods.

Keywords: Butter, Response surface methodology, Emulsifier, Texture, Quality, Storage

(20435) INVESTIGATION OF THE TOTAL PHENOLIC COMPOUNDS OF DANDELION (*TARAXACUM OFFICINALE*) EXTRACTED BY DIFFERENT METHOD AND SOLUTIONS

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In this study, dandelion (*Taraxacum officinale*) plant was used for extraction material, which produced of different aims, such as herbal tea, spices, pharmacy etc. The total phenolic content (TPC) was determined by two different methods and two different solutions. Dried dandelion plant was homogenized to 5 mm particles and screened. Firstly, moisture and ash content of dried material were analyzed. Then, ethyl alcohol and methanol were used for extraction. According to the first method, dried sample and solution were mixed and kept at room temperature for 24 hours. The mixture was filtered through Whatman 4 filter paper in a Buchner funnel. According to the second method, dried sample and solution mixed and centrifuged for two times. After the extraction methods, the filtered solutions were evaporated under reduced pressure (Rotavapor, T<40°C) and the extract was further dried in a desiccator, under vacuum, to constant weight. The extract was then weighed, dissolved in methanol and transferred to the last volume in flask. The solution was stored -18°C until TPC analysis. Also, each extraction method was applied with both methanol and ethanol solutions. The amount of total phenolics was determined by using Folin–Ciocalteu method. The results obtained with two different solutions and two different extraction methods were compared with each other.

Keywords: Dandelion, Extraction, Phenolic, *Taraxacum officinale*

(20463) EVALUATION OF THE STABILITY OF PHYSICOCHEMICAL AND MICROBIOLOGICAL QUALITIES OF A SOFT CHEESE, TYPE: CAMEMBERT, AFTER STORAGE FOR THREE WEEKS AT DIFFERENT TEMPERATURES

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Cheese has always been a safe source for human nutrition. Stabilizing cheese technology, used for the acidification and maturation of thermophilic starters. Stability of the products during storage and/or marketing is controversial subject. Study aimed to assess the physicochemical and microbiological characteristics stability of a Camembert cheese collected in the North- East of Algeria (Provinces: Setif and Bordj Bou Arreridj).

Fifty two samples, collected during February, March and April 2018: half (26 samples) were kept at temperature 04 °C the rest were stored at 23 °C for three weeks.

Analyzes were carried out either at the end of each week and after opening the packaging and exposure of their contents to the ambient air for two hours at the end of the 3rd week.

Physico- chemical tests, after storage life, at 04 ° C and 23 ° C gave the average values: pH: (5.54- 5.62), Titratable acidity: (16.72D- 18.18D °), Conductivity (4.41ms/cm-4.53ms/cm), Total Dry Extract (53.66%-55.6%), Relative Humidity (46.4%-44.46%) respectively.

Results of the tests carried out, after the direct opening of packaging at the end of the 3rd week, were respectively: pH: (5.68- 5.57), Titratable acidity: (16.72- 20.24°D), Conductivity: (4.48 ms/cm- 4.69 ms/cm), total dry extract: (57.8%- 61%), relative humidity: (42.2%- 39%).

Microbiological analyzes, by counting floras revealed stability and compliance of the product with national standards, during the first and second week at 4°C and 23°C. However, an increase in total mesophilic flora (FTAM) estimated at 02×10⁴ CFU/g for both temperature storage (04°C and 23°C) at the end of the third week.

All the samples had a stability of the physicochemical parameters. High numbers in mesophilic aerobic flora were recorded at the end of the third week of storage at 04°C and 23°C. The study deserves to be deepened by a more representative sampling plan and by more physicochemical and bacteriological analysis.

Keywords: Camembert cheese, Stability, Storage, Physicochemical tests, Microbiological analysis

(21084) CONSERVATION TEST OF A STIRRED YOGURT WITH MYRTLE ESSENTIAL OIL

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The objective of this work is to study the effects of the incorporation of *Myrtus communis* L. essential oil on the quality of stirred yogurt prepared and fermented by freeze-dried lactic ferments in the laboratory. The essential oil was incorporated at concentrations of 2.5%, 5% and 10% in the yogurt during the stirring process. These effects were evaluated by monitoring the evolution of the physico-chemical and microbiological parameters during 21 days of storage at + 4 ° C. The presence of the essential oil at the concentrations of 2.5%, 5% and 10% in the stirred yogurt led to an increase of *St. thermophilus* viability in the order of 33.7x10⁶, 31x10⁶ and 53.2x10⁶ UFC/ml from the first week of storage and then a significant decrease with the highest doses of 5% and 10% in the order of 11 × 10⁶ and 19 × 10⁶ CFU/ml, respectively, at the end of storage. On the other hand, the addition of the essential oil at a low dose of 2.5% showed a slight decrease of 1.3x10⁷ CFU/ml at the end of storage comparable to that of the control (1.2x10⁷ CFU/ml). As for the acidity, the results obtained showed a decrease in pH (from 4.6 to 3.9 for 10%, from 4.6 to 4.2 for 5% and from 4.6 to 4.35 for 2,5% of EO) and an acidity increase of 85 to 135 ° D for 10% and 84 to 112 ° D for 5% with exception for 2.5% (81 to 94 ° D) compared to the control (83 to 125 ° D). Thus, the addition of this dose made it possible to stabilize the microbiological quality of the stirred yogurt while extending its shelf life. Sensorially, natural yogurts (sugar-free and with sugar) were the favorites among all samples and aromatization with myrtle EO at a dose of 5% seems to be the least appreciated or even unacceptable because of its strong aroma, pronounced odor and accentuated taste.

Keywords: Essential oil, *Myrtus communis* L., Yoghurt, *St. thermophilus*, *Lb. bulgaricus*, acidity

(21117) CRUDE FAT ANALYSIS FROM SOME MEAT PRODUCTS BY DIFFERENTIAL SCANNING CALORIMETRY

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This paper presents the thermal analysis of crude fat from salami samples which were reformulated by their lipid profile differentiation using the differential scanning calorimetry (DSC) method. Salami samples were manufactured by partial substitution of the back fat with vegetable oils and walnuts. Thermal curves profile of the crude fat was correlated with the lipids profile determined by gas-chromatography/mass spectrometry (GC/MS) method. The addition of lipids from vegetable sources determined a decrease of the ratio of saturated/unsaturated fatty acids from 0.639 (control) to 0.283 (salami with oil) and 0.218 (salami with oil and walnuts). The thermal curves obtained were different between the samples. For each sample, the crystallization profile showed an exothermic event for the reformulated samples and two events for the control sample, for different onset temperatures: 15.410C (control sample), 1.730C (salami with oil) and -5.120C (salami with oil and walnuts). The same profile was observed for two different heat flow rates: 100C/min and 200C/min, respectively. The melting profile showed three endothermic events for the reformulated samples and two events for the control sample. The samples were different regarding the onset temperature of the last endothermic event which was 11.820C for the control sample, 18.730C for salami with oil and 15.150C for salami with oil and walnuts, respectively, for both heat flow rates. DSC showed the physical properties and thermal behaviour for each chemical composition of the fat. DSC is a promising and rapid method for assessing the thermal fingerprint of a meat product by analyzing the crude fat.

Keywords: DSC, Lipids, Meat products, Thermal profile

(21152) CHEMICAL CHANGES IN THE STORAGE PROCESS OF EDIRNE STYLE WHITE CHEESE

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Turkey, the need of using commercial starter cultures, both naturally occurring in the milk or the environment produced by the fermentation of microorganisms involved in the contamination of milk with various ways has a very rich variety of cheese. Despite the fact that the production of feta in almost every region of Turkey, Edirne or more pickled or tin known as feta-type cheese. Especially Thrace, Marmara, Aegean and Central Anatolian regions are produced intensively.

These cheeses are caused by the geographical conditions of the region, prevailing vegetation cover, dense breed animal breeds and applied production technology in order to create unique taste, odor and textures. There are 10-12 types of cheese which are commonly produced in our country. Among these, white cheese (Edirne or single cheese) comes first. Because of the low heat treatment (pasteurization (65-67 °C ± 10-15 min), a 3 month maturation period for the inhibition of pathogenic microorganisms can be consumed afterwards. Three main components are required for the production of pickled white cheese. These are Milk, yeast and salt. Traditionally yeast is used to clot milk proteins (renin enzyme).

In this study Edirne type white cheese produced from cow milk was subjected to 6 months storage period and pH, titration acidity, SH, dry matter (%), protein (%), nitrogen (%), fat (%), ash (%) and salt (%) were calculated. Due to the activity of lactic acid bacteria during storage, the pH is decreased by pH (5.25-4.72), the titration is increased by acidity and SH up to 150 th day, the amount of protein, nitrogen and dry matter decrease due to the activities of microorganisms. It was observed. While there was no significant change in the fat ratio, an increase in the ash ratio, a decrease in the salt ratio after a certain period of time, was observed.

Keywords: Feta cheese, Maturation

(21153) NATURAL FOOD COLORANT PRODUCTION FROM PETALS OF SAFFLOWER (*CARTHAMUS TINCTORIUS* L.)

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Interest in safe and healthy natural products have been increasing due to high awareness of consumer in recent years. It has started to be used natural dyes which have antioxidant and antimicrobial activities instead of synthetic dyes used to increase the attractiveness of food because of the adverse effects on human health. Traditionally used with the purpose of food and medicine in Asian countries, it was aimed to produce two different (red and yellow) food dyes, from the petals of the safflower (*Carthamus tinctorius* L.).

In this study, the red and yellow pigments from safflower were extracted at alkali and acid conditions, respectively. Extracted solution containing either red or yellow pigment was encapsulated with maltodextrin by using spray dryer. After spray dryer procedure, SEM micrographs of the microencapsulated powders was obtained. The quality attributes of encapsulated and un-encapsulated samples were examined with respect to total phenolic content (TPC), antioxidant capacity and also color values (*L*, *a* and *b*). Antioxidant capacity was analyzed based on DPPH radical scavenging activity. As for TPC was determined by the Folin–Cioceltea's method. The total phenolic contents of Safflower with 12.04% moisture content were found 11.28±0.16 g GAE/L and 11.67±0.13 g GAE/L for yellow and red ones, respectively. Microencapsulated powders were also added to the food material for coloring and *L*, *a*, *b* values of mixture were measured to evaluate their color.

Keywords: Natural colorants, Safflower, Encapsulation, Spray dryer

(21186) COMBINED PLACKETT-BURMAN AND BOX-BEHNKEN DESIGNS FOR OBTAINING ANTHOCYANINS-RICH EXTRACTS FROM DARK FIGS

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Nowadays, anthocyanins are among the most attractive natural molecules for both researchers and industrials. They are responsible for pigmentation of several fruits and vegetables, especially, red and dark colored parts. The class of anthocyanins belongs to the large family of flavonoids. To date, more than 500 different anthocyanins are reported. These compounds are used as natural water-soluble colorants that change hue depending on the pH of the medium. Therefore, increasing number of studies is reported on the several applications of anthocyanins as natural antioxidant molecules that play a role in disease prevention (cardiovascular diseases, neuronal dysfunction, cancer, diabetes, etc.). The commercial source of anthocyanins is grape peels (*Vitis vinifera*), but different other sources are reported, such as purple corn (*Zea mays*), dark carrots (*Daucus carota*), red cabbage (*Brassica oleracea*) and several berries. In the present work, it is shown that dark figs (*Ficus carica*) could also be a potential source of anthocyanins. Two complementary designs of experiments were used for the optimization of anthocyanins extraction from dark figs. At first, Plackett-Burman design is used for the screening of the most influent factors among 8 different factors (solid-to-solvent ratio, solvent concentration, acid type, acid concentration, acid-to-solvent fraction, extraction time, extraction temperature and sonication power). Considering the total anthocyanins yield as response, the obtained significant model ($R^2 = 0.9892$; $F = 68.8089$, $p < 0.0001$) extracted three influencing factors: solid-to-solvent ratio, solvent concentration and acid-to-solvent fraction. Next, the three selected factors were used in response surface methodology using Box-Behnken design for the determination of optimum extraction conditions that maximize the response. The obtained quadratic model ($R^2 = 0.955$; $F = 40.23$, $p = 0.0004$) was significant and allowed us to set the optimum extraction conditions as follows: solid-to-solvent ration equal to 0.1054g/20ml, solvent concentration 100% and acid-to-solvent fraction of 9.98: 90.02. The optimum conditions give a response of 429.7mg of anthocyanins per 100g DM.

Keywords: Anthocyanins, Dark figs, Optimization, Plackett-Burman design, Box-Behnken design, Extraction

(21205) METHODS ASSESSMENT FOR A SUSTAINABLE PREPARATION OF THE ANIMAL FAT SAMPLES FROM DAIRY MATRIX FOR ¹H-NMR ANALYSIS USED TO CHECK DAIRY PRODUCTS CONFORMITY

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In the context of globalization and the free movement of foodstuffs, conformity assessment has become a condition for detecting fraud affecting their quality. There is need to develop quick analysis methods and NMR can provide a fatty acid profile that characterize the apolar matrix. Sample preparation is a very important step that influence the final investigation. Any used method should have none to minimum impact in the final NMR profile.

The study was carried out to examine the influence of fat sample preparation in NMR analyses. We assessed four methods to obtain necessary fat. We included the referential ISO 17189:2003 in this investigation in order to have a base in comparison of the results. This standard is used to calculate total fat content from butter and it is quite complex in terms of sample preparation. We took from it only the interested part about fat separation and extraction. The other variants where a simple centrifugation, direct extraction via phases destabilizing and fat drying by high temperature. Butter was produced in pilot plant by churning commercial 30% fat cream. H-NMR spectra was obtain by a Bruker 400 MHz spectrometer.

Sustainability, economical approach and environmental factors where the most important criteria followed to choose the right method. Big differences in the fatty acids profile of the butter fat extract were not observed in NMR spectra, however this conclusion gives us the base of using phase destabilisation as a preparation method for this analyse.

Keywords: Food quality, Dairy products conformity, NMR analyse, NMR sample preparation

**(21250) BIOCHEMICAL CHARACTERIZATION OF THE POMEGRANATE
(*PUNICA GRANATUM* L.) JUICE GROWN IN MOROCCO**

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Pomegranate (*Punica granatum* L.) is one of the oldest cultivated fruit species in Morocco, with considerable adaptive potential for several regions of the country. Its fruit has a high nutritional and dietary value due to its richness in antioxidants, anthocyanins, tannins, flavonoids, polyphenols in addition to soluble sugars and organic acids. These interests ask to conduct research for the development of this crop, especially in terms of enlargement of variety profile in cultivation.

In this context, a study was carried out to characterize biochemical quality of pomegranate juice of a collection of 18 varieties (including 10 local and eight foreign) in the experimental field of INRA in Ain Taoujdate. Parameters analyzed included antioxidant activity, total polyphenols, total flavonoids, total anthocyanins, Brix degree, pH and titratable acidity. The results showed that the values of antioxidants trapping potential varied from 4.3% to 31.4% for local cultivars and 16.7% to 42.3% for foreign varieties. The total polyphenol content ranged from 1.14 g/l to 1.41 g/l. Total anthocyanin content ranged from 24.9 mg/l to 169.6 mg/l for local cultivars and 14.5 mg/l to 120.6 mg/l for foreign cultivars.

The Brix degree ranged between 14.8% and 19.4%, while the titratable acidity between 0.9 and 1.34 g/100 ml. The variability noted in terms of the biochemical composition studied is important, indicating a large genetic diversity in the collection. This work constitutes a great contribution to promote this crop in Morocco.

Keywords: *Punica granatum*, Pomegranate juice, Biochemical characterization, Genetic diversity

(18051) BODY SIZE AND FECUNDITY IN LEPIDOPTERA: A PATTERN EXPRESSED IN TWO INTRAGENERIC MEDITERRANEAN FOREST DEFOLIATORS

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Body size of *Thaumetopoea* species correlates with several factors such as reproductive fitness, environmental changes and the quality and quantity of food during critical development stages. For reproductive efficiency considerations, sexual size dimorphism (SSD), which happens to be widespread among animal taxa, defines often different optimal body size for males and females. For the Palearctic pine moths of the genus *Thaumetopoea* in Algeria, larvae of *T. pityocampa* feed during winter while larvae of its congeneric *T. bonjeani* develop during summer although they both feed upon Atlas cedar *Cedrus atlantica*. This discrepancy in ecological behavior leads to different reproductive strategies based on parameters related to egg batch length, number of eggs per batch, eggs protection mechanisms and female body size. According to Darwin's fecundity advantage hypothesis (1871), large-sized female body influences positively the reproductive fitness as their fecundity is supposedly higher. The universal allometry scaling phenomenon rule proposed by Rensch (1950) states that degree of SSD tends to decrease with increasing of body size in female-biased taxa. Here, we propose two morphometrical parameters; scale surface and body surface estimated from basic measurements. We also perform bio-morphometrical comparisons involving two sympatric forest pests to evaluate the degree of intra-specific SSD and its effectiveness in the reproductive strategy. We also discuss Darwin's hypothesis through investigation of correlations between body size and fecundity parameters. Rensch's rule is checked for consistency in the *Thaumetopoea* genus. Results highlight a female-biased SSD in both species. The cryptic relationships between female body size and fecundity shown in this study provide a weak support to Darwin's hypothesis. Intrageneric test allowed saying that Rensch's rule does not hold in our species. Finally, will one of the two species have advantage over the other if the ecological behavior of one of them is changed in the context of global climate change?

Keywords: *Thaumetopoea*, *Cedrus atlantica*, Sexual size dimorphism, Darwin's hypothesis, Rensch's rule

(18837) ESTIMATION OF BIOMASS AND CARBON STOCK OF FOREST OF PUNJAB THROUGH ALLOMETRIC EQUATIONS: A CONTRIBUTION TOWARDS THE REDD+ PROJECT

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This study reports methods and allometric equations developed for estimation of biomass and carbon stock in different pools of Chichawatni Irrigated Plantation in district Sahiwal, Punjab, Pakistan. Eastern part of Chichawatni Irrigated Plantation was selected for estimation of above and below ground live biomass of trees, shrubs and herbs as well as dead biomass of litter and soil. Five percent sampling was carried out for tree species while one percent for non-tree woody biomass vegetation. Above ground biomass of all tree species was calculated by developing different allometric equations. Below ground biomass was calculated by ratio method as determined by the Intergovernmental Panel on Climate Change (IPCC) in Reduction Emission from deforestation & degradation of forests (REDD) methodological module. Biomass of non woody species was assessed by harvesting method. The results revealed that the carbon stock in shrub / herbs was 6.219 t/ha and 0.537 t/ha respectively. The carbon allocation in litter, assessed by quadrat method was found to be 2.461 t/ha. Soil carbon from 0 - 30 cm depth was calculated by Walkley-Black Method, and was found to be 23.46 t/ha. This is the first study of its kind in Pakistan where destructive sampling has been used to statistically build allometric relationships between the physical tree parameter of DBH (Diameter at Breast Height) and above-ground biomass.

Keywords: Carbon dioxide (CO₂), Carbon sequestration (CS), Biomass, Chichawatni Irrigated Plantation (CIP), Regression model, Soil organic Carbon (SOC)

(19193) POPULARIZATION OF MELIA DUBIA BASED AGROFORESTRY SYSTEMS IN KARNATAKA

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Melia dubia locally known as Kadu bevu, hebbevu in Kannada and ghora-nim, mahanim in Hindi languages. The tree is fairly large, deciduous fast growing indigenous species attaining a girth of 1.2-1.5 m and height of about 20 m with spreading and a cylindrical, straight bole of about 9.0 m and being a local timber better suited for industrial use than exotic / foreign species. Majority of the farmers in dry locations of Karnataka are small land holders engaged mainly in subsistence farming. They cultivate local varieties of jowar, pearl millet (bajra), foxtail millet (navane), amaranthus and upland varieties of rice. Even today, many open pollinated vegetables are cultivated by rural women leading to conservation of local varieties. Cultivation of short rotation tree species like *Melia dubia*, *Eucalyptus*, and *Grevillia robusta* has helped supply of timber, fodder and fuelwood. Cultivation of short rotation trees has helped to mitigate financial crisis leading to economic upliftment of farmers. As a result, *Melia dubia* cultivation as an agroforestry option as plantations and on wastelands has become popular in Karnataka and surrounding areas because of a variety of benefits like timber, fuelwood and fodder for goats, sheep and cattle. A study need to document the successful cultivation of *Melia dubia*, to the fullest advantage of the farmer, industries and the environment. Growing of *Meliaspecies* can increase the forest cover rapidly, which at present is a national policy. The large scale availability of plantation timber will save our national forest and bio-diversity which need to be protected. This will improve rural economy and livelihood security of farming community. The seeds of *Melia* can be used for extraction of bio-pesticides which is an industry by itself.

Production potential of *Melia dubia*

In addition, the Kernel which contains 25 – 30% of oil can be used for industrial purpose and/or production of bio-fuel is the need of the hour. Further, the leaves can also be used as a top feed for animals and small ruminants. In a short period, rotation of 10-12 years the tree can yield 14-15 cft of timber with 20 per cent top for chip wood and for fuel. The *Melia dubia* under intensive planting @ Rs 3,500 tree-1 will provide a total returns of Rs.15,40,000 ha-1 in short rotation period of 10-12 years and approximately Rs.12,800 monthly income. Similarly, if *Melia dubia* is cultivated under agroforestry system with 200 trees ha-1 with a short rotation, it provides total income of Rs.7,00,000 and monthly income of Rs 5,800 ha-1. Moreover, there is a lot of demand for plywood in Karnataka due to growing demand in housing sector. And there is shortage of raw material for the plywood industries. *Melia* being a fast growing tree and yield good quality industrial timber within a period of 10-12 years short rotation and hence, this tree could be considered as a best candidate tree to meet the growing demand in plywood industries. Considering its multiple uses and suitability for the prevailing agro-climatic conditions in Karnataka, the *Melia dubia* is need to study on collection and evaluation of plus trees, production of good quality saplings, developing *Melia* based agroforestry models in different agroecological situation and finally disseminate the transfer of agroforestry technology, training and demonstration

Keywords: *Melia dubia*, Additional farm income, Fodder potential, Environmental security

(21231) NUTRIENT POOLS (P, K, CA, MG, MN, ZN, FE, CU) OF DIFFERENT ECOSYSTEM COMPARTMENTS IN COPPICE ORIGINATED OAK FORESTS AT NORTHWESTERN TURKEY

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In this study, different nutrients' (P, K, Ca, Mg, Mn, Zn, Fe, Cu) amounts in per unit area for various tree components (stem wood without bark, bark, branch and leaves) and ecosystem compartments (ground cover, forest floor and soil) at oak (*Quercus* sp) forests with different ages and stand types in Northwestern Turkey (Demirköy) were evaluated. Total 48 sample plots with 2 replications were selected to study. Both ground cover and forest floor samples were sampled with five replications. Forest floor samples were separated as leaf + fermentation and humus layers. Soil samples were taken from different soil depths such as 0-5 cm, 5-15 cm, 15-30 cm, 30-50 cm, 50-70 cm and 70-100 cm. Dry weights of tree components in sample plots were estimated by using regression equations and biomass values were calculated for per hectare area. P, K, Ca, Mg, Mn, Zn, Fe and Cu were determined in ICP-OES analyzer. Nutrient stocks were calculated according to nutrient concentrations and dry weights of tree components, ground cover, forest floor and soils.

In conclusion, it was presented that soil was the most important pool for all investigated nutrients. Soil was followed by live biomass and forest floor. Nutrient concentrations of stem wood are lower and leaves, branches and bark have higher nutrient concentrations in live biomass. Nutrient stocks of stands at oldest development stage (mean diameter=20-36) are higher in biomass and forest floor in comparison with stand types.

Acknowledgement: This work was supported by Scientific Research Projects Coordination Unit of Istanbul University, Project numbers: 3900

Keywords: Tree components, Soil, Nutrient, Oak, Demirköy, Ecosystem, Nutrient cycle

**(21240) BIOMASS ESTIMATIONS OF MARITIME PINE (*PINUS PINASTER*)
AFFORESTATION IN İSTANBUL-DURUSU (TERKOS) SAND DUNE**

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In Turkey, coastal dunes cover quite a large area. Wind-driven dunes can threaten settlements, agricultural areas and wetlands in their surroundings. Approximately 60 years ago, afforestation efforts for the restoration of such dune areas has initiated in Turkey. One of these afforested areas are on the coastal dunes between Durusu (Terkos) Lake and Black Sea, which is the most important drinking water basin of Istanbul. During the plantations started in the 1960s, (mostly) maritime pine (*Pinus pinaster*) and stone pine (*Pinus pinea*) species were used. With these afforestations, the dunes were stopped together with the prevention of the sand fill in Durusu Lake and a provided biomass production with significant amounts. Biomass production in forests is important in reducing carbon dioxide in the atmosphere by providing carbon accumulation in trees. In this sense, 60 sample areas of different diameter classes were selected from the maritime pine afforestation stands. From these sample areas, 75 trees were selected for biomass calculations in their above- and underground-components. Equations have been developed that can be used to predict the biomass of various tree components (foliage, branch, stem wood over bark, aboveground and belowground biomass and total biomass) by using independent variables such as diameter at ground level (D0m) diameter at breast height (D1.3m) and tree height (H). The significance level of the D²H indices which are used together with D1,3m and H in the equations are observed to be quite high. Then, using these equations, the total amount of biomass in the unit area was estimated. As a result, total biomass was determined as 21.7 t/ha in stands with small diameter (D1,3m < 8 cm), 120.0 t/ha in stands with medium diameter (D1,3m=8-20 cm), 225.8 t/ha in stands with large diameter (D1,3m= 20-36 cm) and 363.7 t/ha in stands with upper large diameter (D1,3m> 36 cm).

Acknowledgements: This work was supported by The Scientific and Technological Research Council of Turkey (TUBITAK), Project Number: TOVAG-1140797.

Keywords: Sand dune, Biomass equations, *Pinus pinaster*, Biomass stocks

(18813) MOLECULAR CHARACTERIZATION OF CYP1B1 GENE IN PAKISTANI PRIMARY CONGENITAL GLAUCOMA PATIENTS: IDENTIFICATION OF FIVE KNOWN AND A NOVEL POINT MUTATION AT 3' SPLICE ACCEPTOR SITE OF INTRON 2

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Primary congenital glaucoma (PCG) causes blindness in early age. It has an autosomal recessive pattern of inheritance, hence is more prevalent in populations with frequent consanguineous marriages like Pakistani population. To date, mutations in *CYP1B1* gene are frequently associated with PCG. Present study was aimed to identify genetic mutations in *CYP1B1* gene in PCG cases belonging to 38 families from Pakistani population.

We identified 38 Pakistani families having at least one child affected with PCG. DNA was extracted using blood samples of all enrolled patients, their available unaffected family members and controls. Direct sequencing of *CYP1B1* gene was performed. Novel 3' splice acceptor site mutation of intron 2 was also analyzed in unaffected family members and 93 ethnically matched controls. All identified mutations were validated by computational programs i.e., SIFT, PolyPhen-2 and MutationTaster. Pathogenicity of novel splice site mutation identified in this study was analyzed by using Human Splicing Finder.

The sequence analysis results revealed a novel 3' splice acceptor site mutation and five already reported mutations including p. G61E, p. E229K, p.R355X, p.R368H and p.R390H in *CYP1B1* gene. Novel mutation was segregating with PCG phenotype in a large consanguineous family having four PCG patients and was not detected in controls.

Eleven out of thirty eight families with PCG had disease due to *CYP1B1* mutations suggesting that *CYP1B1* is a major gene contributing to PCG in Pakistani patients. Identification of a novel 3' splice acceptor site mutation in intron 2 is first report for *CYP1B1* gene which indicates genetic heterogeneity of disease.

Keywords: Splice site mutation, *CYP1B1*, Primary congenital glaucoma, Consanguinity, Autosomal recessive

**(19104) WOMEN'S AND CHILDREN'S RIGHTS IN THE REPUBLIC OF
KAZAKHSTAN: THEORY AND PRACTICE**

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At the beginning of the third millennium, the special attention was made to the issue of children's and women's rights. Especially, the democratization of the society, political and economic changes in the countries of Central Asia created both opportunities and obstacles to achieving gender equality. This paper discusses the available legislation and real life problems with respect to the legal rights of woman and children. In conclusion, the national legislation is to enabled and enforced for the development of women's and children's rights. In the modern conditions the special attention is paid to the problem of women's and children's rights. From the point of view of jurisprudence, the feminist movement is the special movement in the theory of gender equality. We would like to note, that in the late seventies of the XX century the feminist movements have gained mass character. The feminism inspired by the socialist ideals, proclaims the main objective fight against all forms of operation, including the exploitation of women.

Keywords: Feminism movement, Children's and women's rights, Gender equality, Central Asia, Kazakhstan, Women's non-governmental organizations, Gender statistics, Strategy of gender equality, Institutionalization of gender policy, Realization of children's rights

(21092) ETHNOGENETIC PROFILE OF THE PEOPLE OF NORTHERN PAKISTAN

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The people residing in Khyber Pakhtunkhwa Province located in northwestern Pakistan exhibit a vast variety of cultural and biological diversity, yet they remain largely unknown with respect to biological affinities. We conducted a decade long research endeavor to analyze dental anthropology and ethnogenetics for establishing phenotypic and genetic affinities among members of the ethnic groups of the area. For assessment of phenotypic affinities, non-metrical variation in permanent tooth crown features were analyzed both in the mandible and maxilla. Whereas for genotypic analyses, mitochondrial DNA and Y-Chromosomal STRs/SNPs were considered for elaboration of the maternal and paternal lineages, respectively. Phenotypical variants of the permanent tooth crown were analyzed in accordance with the Arizona State University Dental Anthropology System. The mitochondrial DNA, Y-STRs and Y-SNPs were used to establish genetic affinities among the ethnic groups, other people of the region and ancient residents of the area also. We found vast genetic differences, sometimes, even among the closely related ethnic groups residing and sharing the same ecology for hundreds of years. Interestingly some of the ethnic groups placed distantly geographically showed a very close genetic descent. Results obtained from frequencies of non-metric dental crown traits shows marked differences between members of highland ethnic groups of northern Khyber Pakhtunkhwa, coupled with lesser differences among ethnic groups occupying the western and eastern lowlands of central Khyber Pakhtunkhwa.

Keywords: Pakistan, Khyber Pakhtunkhwa Province, Peopling, Dental anthropology, Molecular genetics

**IN VITRO ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITIES
VALORISATION OF METHANOL EXTRACT OF ORCHIS MACULATA L. SUBSP
BABORICA M. AND OPHRYS SUBFUSCA (RCHB.) BATT.**

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Abstract

Orchidaceae is regarded as the largest family of plant kingdom comprising a many species with therapeutic values. *Orchis maculata* L. subsp *aborica* M. W and *Ophrys subfusca* (Rchb.) Batt., are two orchids growth in Setif – Algeria tested for their antioxidant and antiinflammatory capacities. The antioxidant investigation has been carried out by radical scavenging activity (DPPH) and anti-inflammatory activity with the Human Red Blood Cell (HRBC) membrane stabilization method. Result showed an excellent antioxdant and anti-inflammatory capacities for *Ophrys subfusca* (Rchb.) Batt and an important value for *Orchis maculata* L. subsp *aborica* M. and W.

Key words: Extract, *Orchis*, *Ophrys*, Antioxidant, Anti-inflammatory

SORGHUM CROP, AN ALTERNATIVE FOR DOBROGEA FARMERS IN THE CONTEXT OF CLIMATE CHANGES

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Abstract

Dobrogea is the most drought area of Romania (average 1961-2016: 464 mm rainfall precipitation). Climate change in recent years has accentuated this phenomenon. For farmers from this area sorghum crop is a solution. At Sport Agra in Amzacea, in the last few years there have been experimented new sorghum crop technologies designed to face the current climate changes. These technologies include the following elements: changing the sowing epoch with one month before the usual period recommended by classical technologies; (– beginning of April in order to benefit from the soil's humidity la 4-5 cm depth boosting the germination process); choosing early hybrids in order to avoid the drought season which starts in June; applying adequate crop protection treatments, with pre-emergent and post-emergent herbicides and last generation insecticides. The agricultural crops in this area are not irrigated, so the farmer proposed a new technology, with the sowing of the crops earlier. This way the plants will benefit from the moisture from the soil accumulated in the winter. The obtained production from sorghum crop was over 10t/ha for most of the varieties tested.

Key Words: Sorghums, Climate changes, Technologies

RECENT DEVELOPMENTS IN TURKISH SEED SECTOR

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Abstract

The seed is the most important technological input in increasing the yield and production in agricultural system. However, with the increase in the world population, the seed has been regarded as a strategic product even more than commercial in many countries. The ability of seed to be used in agriculture, which is extremely important in agricultural production and food supply, depends on the structural and legal arrangements and investments required for the development of the seed sector, the public sector and in particular the private sector. In 1925, seed breeding stations were established in different ecological regions. In 1950, State Production Farms were commissioned with seed production. In 1961, the first private seed company was established. With the enactment of the Seed Law No. 308 in 1963, a public-oriented system of production and procurement was introduced and continued until 1980. Since 1983, seed policies have been adopted aiming to integrate with the world in the free market economic conditions, where the private sector also takes place. The Turkish seed sector has gained significant momentum and has begun to be restructured with the adoption of the "Protection of breeders' rights of new plant varieties" in 2004 and the adoption of "Seed" laws in 2006. Depending on these developments, seed production capacity, R & D activities, certified seed production and use in our country have increased over the years. Certified seed production was 110 thousand tons in 1996, 369 thousand tons in 2006 and 1049 thousand tons in 2017. In 2017 Turkey exported 136 million \$ seed and imported 185 million \$ seed, and ratio of export coverage import increased to 73% in 2017. Private seed sector has been developing faster and its share in certified wheat seed production increased from 4% in 1996 to 20% in 2006 and it reached to 69% in 2017. Private sector has shown remarkable increase on cotton seed production, its share in cotton seed production increased from 2% in 1996 and in 87% in 2006 to 100% in 2017. Besides that, private sector has dominated as 100% percent of the seed production of soybean, corn, sunflower and potatoes since 1996 to 2017. However, certified seed use rates in self-pollinated crops are not adequate. The use of certified seed should be further expanded and new support methods for certified seed should be developed. R & D work should be supported and the competitiveness of the sector should be increased both domestically and abroad.

Key words: Turkey, seed production, seed sector, certified seed.

**LEPTIN GENE (E2JW, E2FB) AND TYROGLOBULIN GENE (C422T)
POLYMORPHISMS IN TURKISH HOLSTEIN CATTLE**

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Abstract

It is an important problem that beef does not have enough quality that consumers want. This situation is related to genotype of animal and environment conditions. Marbling of meat and tenderness of meat are the most important features that signify the quality of meat. Genetics researches were performed on the beef cattle about the subject and linear correlation was revealed on meat quality with single nucleotide polymorphism (SNP). It is known that Leptin (LEP) gene and Tyroglobulin (TG) gene have a connection with meat quality, meat yield, back fat thickness, meat texture and marbling. LEP and TG genes of cattle were investigated in 100 head of Turkish Black & White Holstein in the beef feedlots of Edirne. Two SNP markers (E2JW and E2FB) in exon 2 of the leptin gene and one SNP marker (TG5) in 5' promoter region of TG gene were investigated with restriction fragment length polymorphism (PCR-RFLP) method. The SNP alleles with regard to marbling and tenderness of the meat were determined with these three markers which are effective on detecting quality of the meat. Three different genotypes in LEP E2JW and 2 different genotypes in LEP E2FB were found Turkish Holstein cattle. TG C422T was found monoforphic. Genetic characterization of 3 SNPs in LEP and TG gene of Turkish Holstein cattle were determined. The frequencies of AA, AT and TT genotyped cattle in LEP E2JW were observed respectively as 0.56, 0.38 and 0.06. The frequencies of CT and TT genotyped cattle were determined in LEP E2FB as 0.94 and 0.06. The frequencies of CC genotyped cattle were found in TG C422T as 1. It has been determined that the Turkish Holstein cattle carried the T allele variant, which is a positive effect on beef tenderness and marbling. It was located in E2JW and E2FB SNPs in the LEP gene.

Keywords: LEP gene, TG gene, SNP, Meat quality

THE PERFORMANCE OF SOME HYBRID RICE CULTIVARS IN EDIRNE CONDITIONS

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Abstract

This study was carried out to test performance of some hybrid rice cultivars at Edirne conditions in 2015. Six japonica type rice cultivars and three self pollinated check were used as a material. To obtain seedlings, seeds were planted at 3.05.2015. Seedlings were transplanted at 4th of June and 7th of June to field in Edirne and Uzunköprü respectively. 4-5 seedlings were transplanted at 16.7 cm within rows and 30 cm between rows. Experiment was conducted with three replications at Randomized Complete Block Design (RCB). 180 kg/ha N and 80 kg/ha P₂O₅ fertilizer were applied. Line TL2015-02 had the lowest days to flowering and days to maturity at the both locations, followed by check varieties Edirne and Osmancık-97 respectively. Lia0 8/ you 5 had highest plant hight and longest panicle length. TL2015-2 and TL2105-3 had the heighest fertile panicle per suquare. In Edirne location Liao/you62 rice cultivar had the heighest pady yield with 10 102 kg/ha and followed by TL2015-3 with 9985 kg/ha. All hybrid rice cultivars had better yield than check cultivars except. TL2105-2. In Uzunköprü location TL2105-3 rice lines had 9772 kg/ ha and it was followed by Liao 8/ you 5 with 9390 kg/ ha. In Uzunköprü location all hybrid rice cultivars had better yield than that of check cultivars.

Key words: Hybrid rice, Edirne, Production. Seed yield, Yield traits

**DNA FINGERPRINTING OF REGISTERED TURKISH RICE (*Oryza sativa* L)
CULTIVARS**

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Abstract

This study was carried out to make barcoding of registered rice cultivars in Turkey, in 2017. In this study 60 rice cultivars (42 registered, 5 production permitted and rest of other different cultivars) were used as a material. 50 SSR markers recommended for diversity analysis of rice by “Gramene” database is used for molecular characterization. DNA isolation was done from one single polished rice kernel, or 20 days seedling leaf. Amplified PCR products by each SSR markers were analyzed by AATI fragment analyzer system. 45 SSR markers from tested 50 SSR markers were detected as polymorphic and 10 of these 45 SSR markers were used to make fingerprinting of registered rice cultivars. These fingerprintings can be used distinguish of rice cultivars from each other.

Key words: Rice, Characterization, Fingerprinting, DNA Barcoding, Yield traits

SOME MORPHOLOGICAL AND AGRONOMIC CHARACTERISTICS OF RICE CULTIVARS COLLECTED FROM TURKEY

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Abstract

This study was carried out to study morphological and agronomic characteristics of local rice cultivars obtained from USDA gene banks, in 2017. 20-day old seedling were transplanted at 2017. 180 kg/ha N and 80 kg/ha P₂O₅ were applied. 129 rice accession were obtained from USDA gene banks and 120 of them used for morphological and agronomic characterization because of germination and days to maturity problem. UPOV characteristics for DUS tests were used for characterization of rice cultivars. Distribution of 120 genotypes for some characteristics studied were found that; for intensity of leaf green color % 28 of them light green, % 47 them green and % 26 of them dark green, for leaf antocyanin coloration.

Key words: Rice, Characterization, UPOV, Yield traits

**INVESTIGATION OF PROPERTIES OF CUTTING TOOLS AFTER PHYSICAL
VAPOR DEPOSITION**

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Abstract

One of the method used to increase the cutting life of HSS cutting tools exposed to long-term cutting is surface coating. The aim of the work is to investigate and observe tool life and tool wear after surface coating. Although cutting tools are obtained from different materials, there are high costs that are not preferred for use. Therefore, HSS tools are now used in high-speed machining applications. In this study, the surface coating method involves examining the behavior of HSS cutting tools under load during cutting. In addition, the way in which the coating method used influences the operation of the cutting tool has been investigated in experimental comparisons.

Key Words: Coating, PVD, Surface, Metal Cutting, HSS

**OBSERVATION OF THE EFFECT OF GLASS FIBER REINFORCEMENTS ON
POLYPROPYLENE COMPOSITES**

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Abstract

Strength and hardness of the materials can be increased by using reinforcing material. Obtained from various materials the strength properties vary depending on the reinforcing material. This study presents the effects of injected glass fiber reinforcements on composite materials. Mechanical tests were performed on the produced composite materials and the results were obtained. Tensile tests were carried out on the samples. Glass fiber reinforcement contributed to the increase in tensile strength of the composites. Also in the study, experiments were carried out on the welding ability of the composites. Various parameters were tested in the experiments. It was tried to understand whether the composite materials could successfully welded or not with experiments.

Key Words: Reinforced thermoplastic, Composites, Polypropylene, Glass Fiber, Tensile Strength

THE RELATIONSHIP BETWEEN EMOTIONAL INTELLIGENCE AND SOCIAL MEDIA ATTITUDES OF UNIVERSITY STUDENTS

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Abstract

High emotional intelligence is related with academic success, and good skills in interpersonal communication. In our study, emotional intelligence (EI) levels of university students, the factors affecting EI and the relationship of emotional intelligence with social media attitudes were evaluated. Our study was performed with Trakya University undergraduate students between the ages of 18-25. This study included 208 students between April 2017-August 2018. Our study was planned as a prospective study. Age, gender, demographic characteristics, school, socioeconomic status, parental education, and the longest place of residence of the volunteers were recorded to evaluate students. Emotional Intelligence was evaluated with Bar-On Emotional Quotient inventory (Bar-On EQ-I). To evaluate social media attitudes of the university students Social Media Attitudes Scale (SMAS) was used. This study included university students from Trakya University. SMAS scores and Bar-On EQ-i scores were significantly higher in participants who were using social media for a longer period of time than new users. SMAS scores were significantly higher in participants who used social media more frequently. Also, Bar-On EQ-i scores tended to be higher with increasing frequency of social media use. Appropriate use of social media by young people has positive effects in terms of communication with the environment, socio-cultural development, sharing feelings and thoughts in a clear and understandable way, communication and mental relaxation; its inappropriate use may cause losing too much time, decreasing efficiency and performance at work, distracting attention, and adverse effects on socialization. Social media may be helpful to support learning, but caution should be exercised to avoid its negative consequences.

Education programs should be established to improve younger generations' emotional intelligence in order to improve their abilities to cope with social problems and catching up with their times. Sociodemographic features that affect emotional intelligence should be identified, its relationship with social media use to which young people spend a great deal of time should be determined, and both should be included in education programs to contribute to young people's personal development.

Keywords: Social media, nursing student, university student, emotional intelligence

FLUID APPLICATIONS CAN IMPROVE EFFECTIVENESS OF PHOSPHORUS FERTILIZERS IN CALCAREOUS SOILS

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Abstract

Increasing total yields and economic, social, and environmental sustainability of plant production systems are main aims in today's agriculture. One of the most important factors which decrease economically sustainable plant production, is deficiency of nutrient(s). According to the results of estimating studies, 30-50% of increase in food production since 1950's was attributed to fertilizer consumption. Among nutrients, constituents of fertilizer materials, the phosphorus (P) has the second important effect following nitrogen (N) when compared with other essential nutrients in agricultural ecosystems as well as in natural. In many regions of the world, P is one of the most important nutrients limiting plant production. This special importance of P, when compared with other essential nutrients, might be attributed to its low mobility and availability in diversified soil conditions. Because of reasons mentioned above, increasing the efficiency of phosphorus containing fertilizers dependent to limited raw material sources is very important for effective use of sources as well as minimizing possible environmental risk. That's why; effects of MAP fertilizer phosphorus in different forms (liquid and granule) and soil amendment containing humic and fulvic acid (HA+FA) mixture applications on growth and phosphorus uptake of bread wheat selected as model plant and vertical movement of phosphorus in soil were investigated. Opposite of previous researches, in present study no effect of HA+FA application on neither phosphorus uptake nor plant development was found and this opposite effect might be attributed to low soil organic level. However, to prove this hypothesis, more detailed basic research activities are needed. Although application of soil amendment had no effect on biomass yield, its increasing effect even for phosphorus applied as granule on vertical movement was determined. In general, phosphorus applied in liquid form so far that applied in granular form increased phosphorus movement in soil as well as enhanced the phosphorus nutritional status of model plant, bread wheat. Results of present research paper in supportive manner to formerly obtained limited results, show that application of phosphorus containing liquid fertilizer in comparison to granular P fertilizers, may increase the efficiency of phosphorus and so that enhance plant yield, as well.

Keywords : Calcareous Soils, Fluid fertilizers, Phosphorus, Use Efficiency

EVALUATION OF ANTIOXIDANT CAPACITIES OF DECOCTION AND HYDROMETHANOLIC EXTRACTS FROM ROOTS OF PITURANTHOS SCOPARIUS (COSS. & DUR.)

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Abstract

Pituranthos scoparius is one such herb which has been used in traditional medicine for its therapeutic properties. The current study was undertaken to evaluate the total phenolic contents and the antioxidant activity of *Pituranthos scoparius* root extracts. Methanol (85%) and water were used to extract bioactive compounds from root part of *P. scoparius* by maceration and decoction, respectively. Total polyphenol contents were determined using Folin Ciocalteu's reagent, flavonoids were quantified employing the AlCl₃ and method tannins using haemoglobin precipitation test. The antioxidant capacity of the root extracts was evaluated by two complementary techniques, the scavenging activity against 1,1'-diphenyl 2-picrylhydrazyl (DPPH) and β -carotene/linoleic acid model system. The results showed that aqueous extract contains higher amounts of total polyphenols; tannins and flavonoids than the hydromethanolic extract (50.04 ± 0.73 μ g gallic acid equivalents /mg dry extract; 40.64 ± 0.04 μ g tannic acid equivalent/mg dry extract and 1.31 ± 0.01 μ g quercetin equivalent/mg dry extract) respectively. The hydromethanolic extract had the highest antioxidant activity in both DPPH assay and β -carotene/linoleic acid bleaching assay with ($IC_{50} = 0.271 \pm 0.006$ mg/ml; $76.73\% \pm 0.64\%$) respectively. These results indicate that *Pituranthos scoparius* roots have potent antioxidant activity, and may prove to be of potential health benefit in several diseases where antioxidant activity is suitable.

Keywords: Medicinal plant, antioxidant activity, extracts, polyphenols, DPPH, β -carotene

ION CHELATING, LIPID PEROXIDATION AND ANTI-HEMOLYTIC ACTIVITIES OF HALOGETON SATIVUS LEAVES

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Abstract

The present study was undertaken to evaluate the antioxidant effects of different extracts prepared from *Halogeton sativus* leaves. The polyphenols contents of the extracts revealed the richness of the Ethyl acetate extract (EAE) and decoction extract (DEC) followed by crude extract (CrE) with 257.58 ± 0.52 , 229.83 ± 0.94 and 193.75 ± 0.25 μg EAG/mg dry extract, respectively. Also, EAE was the richest in flavonoids ¶ contents followed by CrE and aqueous extract (AQE) with 149.55 ± 1.67 , 78 ± 0.66 and 76.22 ± 1.01 μg EQ/mg dry extract, respectively. Ferrous ion chelating capacity assay showed that EAE was the most active ($\text{IC}_{50}=0.28 \pm 0.15\text{mg/ml}$). All extracts (EAE, CrE, DEC, ChE and AQE) inhibited considerably β -carotene oxidation with significantly percentages: 108.67 ± 0.47 , 91.37 ± 0.22 , 91.23 ± 0.28 , 89.35 ± 0.40 and 79.65 ± 0.17 , respectively. The effect of the extracts was tested on murine red blood cells (RBCs) and found that they did not show any harmful effect. All extracts exhibited satisfactory inhibitory properties against hemolysis at different concentration where CrE was the most active ($\text{HT}_{50} = 147.03 \pm 1.98$ mg/ml). In Conclusion, *Halogeton sativus* leaves extracts demonstrated significant ferrous ion chelating activity, a considerable inhibition of lipid peroxidation and satisfactory protection red blood cells. Also, might be used as a potential source of natural remedies, where scavenging radicals or protecting of lipid peroxidation are warranted. Also, these results support the use of this plant in traditional medicine as anti-inflammatory.

Keywords: Ion chelating, lipid peroxidation, anti-hemolytic, *Halogeton sativus*.

PHYTOCHEMICAL SCREENING AND ANTIOXIDANT EFFECTS OF ALGERIAN ASH EXTRACTS MEASURED BY SPECTROPHOTOMETRIC AND CYCLIC VOLTAMMETRY METHODS

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Abstract

This study aims to investigate the antioxidant and antibacterial activities of Algerian *Fraxinus excelsior* extracts. Antioxidant activity was evaluated by spectrophotometric and electrochemical techniques. The phytochemical screening revealed the presence of alkaloids, tannins, polyphenols, flavonoids, sterols/triterpenes, and coumarins. The total polyphenols contents were in the order EAE > MetE > BolE > ChE > AqE > PEE, while flavonoids contents were in the order ethyl acetate (EAE) > chloroform (ChE) > methanol (MetE) > butanol (BolE) > aqueous (AqE) > petroleum ether (PEE) extracts. In The DPPH test EAE (IC₅₀ = 23.1 µg/mL) exhibited the maximum activity followed by ChE (IC₅₀ = 101.86 µg/mL) or MetE (IC₅₀ = 106.06 µg/mL), BolE (IC₅₀ = 125.15 µg/mL), AqE (IC₅₀ = 363.41 µg/mL) and PEE (IC₅₀ = 3722.5 µg/mL) fractions. β-carotene-linoleate and metal chelate tests showed closely the same order: EAE (AA% = 91.19), ChE (AA% = 72.6), MetE (AA% = 70.39), BotE (AA% = 68.52), AqE (AA% = 57.26) then PEE (AA% = 38.15). Antioxidant activity measured by cyclic voltammetry method presents an important activity, in the order: EAE (80.49 mg Ascorbic acid equivalent/ g of extract), ChE (21.50 mg AAEq/g), MetE (16.16 mg AAEq/g), BotE (16.67 mg AAEq/g), then AqE and PEE without any activity. In conclusion, *Fraxinus excelsior* extracts contain active compounds which have antioxidant and antibacterial effects and can be useful in the treatment of pathologies where these activities are needed.

Keywords: Phytochemical screening, *Fraxinus excelsior* L., β-carotene, Antioxidant Capacity, Cyclic Voltammetry

IMMUNOMODULATORY EFFECT OF THE AQUEOUS EXTRACT OF ALOE VERA IN A MOUSE MODEL

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Abstract

The objective of the present study was to evaluate the immunomodulatory activity of aqueous extract of Aloe vera leaves (AVLE). The assessment of immunomodulatory activity was carried out by the humoral Haemagglutination antibody test (HA) and cell mediated immunity (Delayed type hypersensitivity reaction test) using aqueous extract of AVLE, at 100, 200 and 400 mg/kg/day, in healthy albino mice. AVLE showed a significant ($p < 0.05$) increase in both the primary and secondary HA titer values and an increase in serum immunoglobulin levels when compared with control, which indicates its stimulatory effect on humoral immunity. On an other hand, the response produced by oral administration of extract caused a significant ($p < 0.05$) increase in a dose-related manner in Delayed type hypersensitivity reaction (DTH) responses, with a maximum increase observed at 400 mg/kg-body wt, probably by its triggering effect on cell mediated immunity. In addition, it was observed that AVLE was safe at dose of 5000 mg/kg. The active constituents like flavonoids were found to be present in aqueous extract of AVLE and it also has good stimulatory effect on both humoral and cell mediated immunity. This study supports the use of *Aloe vera* in traditional medicine.

Keywords: *Aloe vera* leaves, Immunomodulation, HA titre, DTH response

**PHYTOCHEMICAL ANALYSIS AND ANTIOXIDANT PROPERTIES OF
ALGERIAN *CRATAEGUS AZAROLUS* L. FRUIT EXTRACTS**

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The objective of this study is to estimate the phenolic contents and the antioxidant activity of *Crataegus Azarolus* L. fruit extracts. Total polyphenols of ethanolic extracts were 28.09 ± 1.93 mg Equivalent Gallic acid/gram of extract (mg EqGA/g). For the quantification of flavonoids, tannins and sugar results showed that Ethanol Extract contained 1.54 ± 0.12 mg Equivalent quercetin/gram of extract (Eq Q/g); 99.06 ± 1.04 mg ETA/g; 458.4 ± 90.45 mg Eq.D-glucose/g, respectively. The antioxidant activity was estimated using the scavenger effect of DPPH and ABTS, reducing power and β -carotene/linoleic acid tests. The ethanolic extract has antiradicalar activity using DPPH and ABTS with $IC_{50} = 0.23 \pm 0.02$ mg/ml and 0.02 ± 0.08 mg/ml, respectively. With respect to the reducing capacity, the EC_{50} value of the extract was 0.30 ± 0.02 mg/ml. In addition, the extract did not show any inhibition of beta carotene/linoleic acid bleaching. In conclusion, this fruit can be a good source of antioxidants used in food and pharmaceutical industries.

Keywords: Polyphenols, flavonoids, antioxidants, *Crataegus azarolus*

IN VITRO CYTOTOXIC EFFECTS AND QUALITY CONTROL STUDIES OF BLACK CUMIN OILS AND SOFT CAPSULES IN THE TURKEY MARKET

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Abstract

Nowadays, natural products are frequently used in the preparation of food additives, cosmetics and drug preparations. Therefore many medically effective plant species have had a significant share of steadily increasing trends in the world market. Black cumin (*Nigella sativa*) has been used for many years in the Middle East, Asia and Africa, and in recent years in Europe, it has been used for the purpose of preventing diseases from being treated, promoting healthy life and increasing the quality of life. *Nigella sativa* (NS) is a member of the Ranunculaceae family and is also called black seed, black caraway or fertility grain. Considering the potential medicinal properties of thymoquinone, one of the most important components of black seed oil, it has been chosen as a traditional healing resource. In this study, the Turkey market, by providing the black seed oils and soft capsules with different formulations which are marketed by several manufacturers quality control tested and thus are intended to be compared in terms of efficacy and safety. In this context; GC analysis and HPLC analysis were performed to determine the amount of fatty acids components and ratios in the content of black cumin oil, and to determine the amount of thymoquinone, which is a major component of black cumin oil. In addition, MTT test was performed by applying the capsules and oils forms obtained from the market to the MCF-7 breast cancer cell line in order to examine the in vitro cytotoxic effect of the black cumin. The composition of fatty acid methyl esters of soft capsule forms and oils in the market of *Nigella sativa* preparations is shown by GC analysis. The most common unsaturated fatty acids in fat and soft capsule preparations are linoleic acid (~ 56.55%) and oleic acid (~ 25.30%). The most saturated fatty acid is palmitic acid (~ 11.5%). The soft capsules are compared among themselves; the YK1 soft capsule has lower proportions than the YK2 and YK3 preparations in terms of both saturated and unsaturated fatty acids. *Nigella sativa* soft capsules and oils obtained from the market were also investigated by HPLC method with methanol extract prepared or not containing thymoquinone. The highest amount of thymoquinone was found in Y2 oil (2.9728 mg/ml), while the group with the least amount of thymoquinone was YK1 soft capsule group (0.8917 mg/ml). Cell viability was assessed by MTT assay compared to negative control. There was no statistically significant difference in IC50 between two groups (capsule-oil) ($p > 0.05$) (0,123). 0.5% DMSO was used as a negative control and 10 μ M thymoquinone was used as a positive control. As a result of the MTT analysis, it was observed that the Y2 test group had the highest cytotoxic effect at 90.21% compared to the IC50 values calculated from the absorbance values obtained at 48 hours from each test group. The least cytotoxic group was YK1 with 94.98%. These ratios are in parallel with our HPLC analysis. The result of HPLC analysis and MTT analysis support each other. As a result, in the light of previous studies, our thinking about the cytotoxic effect of *N. sativa* in the MCF-7 cell culture medium has become more grown. As supported by many studies, the cytotoxic effect of black cumin may suggest a particularly promising new treatment method and the development of a drug against cancer. In addition, our study is an in vitro cell-based study and should be supported by in vivo studies.

Keywords: Black cumin, Cytotoxic effects, Cell culture, Quality control

CHEMICAL COMPOSITION AND ANTIBACTERIAL ACTIVITY OF THE ESSENTIAL OIL OF *CITRUS AURANTIUM* L.

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Abstract

Introduction:

Citrus aurantium (Bitter Orange) is a Rutaceae known for its extremely bitter and sour taste. Its leaves are rich in essential oil. The purpose of our study is to extract this oil, analyze it and evaluate its antibacterial activity against 10 bacterial strains (05 *Escherichia coli*, 03 *Staphylococcus aureus* and 02 *Klebsiella sp.*).

Materials and methods

Bacterial strains: *Escherichia coli* (ATCC22, S45, S55, S145, S102)

Klebsiella oxytoca S 113

Klebsiella pneumoniae +2815

Staphylococcus aureus S 47

Staphylococcus aureus 93

Staphylococcus aureus ATCC 23

Extraction of the oil: It was carried out on fresh leaves harvested in Annaba (eastern Algeria) in February 2013 by the steam training method using a Clevenger type device for 60 min, relatively short duration because the secretory structures are superficial (Schizolysigenic secretory pockets).

The analysis of the essential oil was performed by GPC / MS Shimadzu and it was tested on 10 bacterial strains by the dilution method in agar medium.

Results and discussion

The Analysis of the essential oil shows that the 2 major components are beta linalool at 44.52% and bergamole at 27.52% and that these two constituents present 72.04% of the total composition.

Among the ten strains tested, eight were sensitive to this essential oil with inhibition diameters ranging from 12.1 mm to 21.45 mm and MICs between 0.1 and 1%; however, both *Klebsiella pneumoniae* and *Escherichia coli* ATCC strains were resistant.

The antibacterial activity of Bitter Orange Eo seems to be largely due to the two major components: linalool and bergamol.

Key words: *Citrus aurantium* L- Essential oil - GC / MS - Antibacterial activity.

NEW GENETIC CHARACTERISATION OF ALGERIAN SHEEP BREEDS

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Abstract

Exposition of variations between breeds is very important for genetic diversity. Determination of this variation is needed to reveal population structure and relationship between populations and planning national breeding and conservation programmes. This study was carried out in 296 animals from 12 different local sheep breeds (Barbarine, Ouled Djellal, Ifilene, Srandi, Daraa, Rembi, Berbere, Ta[^]admit, Hamra, Sidaou, Tazegzawt and D'men) reared in different regions of Algeria. Fifteen microsatellite markers were used to determine between breed genetic diversity. The population of 12 sheep breeds studied from Algeria exhibited a high number of alleles (24.67) and polymorphic information content (0.90). Observed heterozygosity values were lower than expected for all molecular markers except INRA0123 locus. Obtained GST value from the present study indicated that 1.9% of total genetic variation resulted from the differences between the breeds. The present study supplied important information to understand between breed genetic differences. Moreover, it has provided the opportunity to discuss with previously reported results. In light of these findings, it can be said that studied microsatellite markers can be successfully used to determine genetic diversity and population structure in Algerian sheep breeds.

Keywords: Genetic diversity, Structure, Sheep, Native sheep breeds

(20075) WHOLE GENOME SEQUENCE AND ORGANIZATION OF A *LYMANTRIA DISPAR* NUCLEOPOLYHEDROVIRUS (LDMNPV) STRAIN FROM TURKEY

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The gypsy moth *Lymantria dispar* (Lepidoptera: Lymantridae) is a worldwide pest of forest, and fruit trees. Gypsy moth caterpillars cause extensive defoliation, leading to reduced growth or even mortality of the host tree. Also, urticacious hairs on larvae and egg masses cause allergies in some people. The *Lymantria dispar* nuclear polyhedrosis virus (LdNPV), a member of the *Baculoviridae*, is known to be highly specific towards *L. dispar* and the most important biological agent for controlling gypsy moth worldwide. In this report we describe the complete genome sequence of a nucleopolyhedrovirus strain (LdMNPV-T3) from Turkey. The LdMNPV-T3 genome is a circular double-stranded DNA molecule of 162,614 bp in size with a nucleotide distribution of 57.5% G+C and predicted to contain 160 putative open reading frames (ORFs) \geq 150 nucleotides. Comparison between the reference (LdMNPV-AF081810) and LdMNPV-T3 genome revealed some differences on the basis of ORFs. Four ORFs (ORF10, ORF13, ORF31 and ORF154) are missing in LdMNPV-T3 genome. Musin-like protein gene (ORF4) is separated into two parts and designated as ORF4a and ORF4b. ORF61 in LdMNPV-T3 genome contains both ORF63a and *lef-9* genes of reference genome tandemly without stop codon in between. The same content is existing for ORF71 including both *bro-e* and *bro-f* genes tandemly. This study expands our knowledge about genetic variation among LdMNPV isolates and provides novel information on the distinct groups in which these NPVs occur.

Keywords : *Nucleopolyhedrovirus*, *Lymantria dispar*, Complete genome sequence

(21350) SOIL PHOSPHATASE ACTIVITY IN DIFFERENT BUFFER PH AND STOCK CULTURE

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The aim of this study is to determine the phosphatase enzyme activities in different buffer pH, sterile and non-sterile soils and to compare phosphatase enzyme activities in different stock culture methods. Two Ohio soils (Wooster and New Mexico), varying in organic matter content and pH were selected for the study. Each soil was maintained at field moisture condition and the remainder was left on the laboratory bench for 48 h at laboratory temperature (25–28 oC) to air-dry and passed through a 2 mm screen. Soil samples were stored in glass jars at 4 oC for subsequent phosphatase enzyme activity measurements. Added 4.5 ml extraction solution to 0.5 g soil, shaken 30 minute, waited 1h. 0.5 ml top solution was taken, and put in 1 lt LB Medium. Solutions were shaken at 37 oC until turbidity reached A600 of 0.8. 30 ml cells culture or 10 mg cells (freeze dry) were harvested with centrifugation and added 4 ml MUB Buffer pH=6 (AcdP: acid phosphatase) or pH=11 (AlkP: alkaline phosphatase), 0.2 ml Toluene, 1 ml, 0.025 M p-nitrophenol phosphate solution. Samples were incubated 1 h at 37 oC, and then added 1 ml 0.5 M CaCl₂ and 4 ml 0.5 M NaOH, read 405 nm wave length with spectrophotometer and calculated p-nitrophenol content from calibration curve standards. This study focused on the changes of phosphatase enzyme activity of sterile (with toluene) and non-sterile (without toluene) soil at different buffer pH application rates of MUB (pH 4, 5, 6, 7, 8, 9, 10, 11 and 12) and at different stock culture (bacteria culture and freeze dry culture) methods. According to the results; AcdP enzyme activity increased with increasing buffer pH up to pH 7 in sterile and non-sterile acidic Wooster (pH:6.45), but decreased over buffer pH 7. AlkP enzyme activity increased with increasing buffer pH up to pH 11 in sterile and non-sterile alkaline New Mexico soils (pH:7.80), but decreased over buffer pH 11. The enzyme activity values of AcdP (at buffer pH=6) and AlkP (at buffer pH=11) of bacterial cultures obtained by different isolation methods from acidic and alkaline soil were in parallel with values obtained from sterile and non-sterile soil. The investigation show that soil AcdP and AlkP enzyme activities have not been affected with sterile and non-sterile soil condition and these enzyme activity values were in parallel with different stock culture isolation methods.

Keywords : Soil phosphatase activity, buffer pH, stock culture methods

(21354) EFFECTS OF SOIL TILLAGE ON SOIL PROPERTIES

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Improved soil quality is related to agricultural enhancement and sustainability. Soil quality has been affected by management practices Non-tillage (NT) and conventional tillage (CT). To evaluate the effects of management practices on some soil properties, composite soils from 48 conventionally-tilled (CT) and non-tilled (NT) farmer's fields under sugar beet (*Beta vulgaris*) were sampled, processed, and analyzed for microbial populations, basal respiration (BR), enzyme activity, and some chemical properties. Averaged across fields, NT had observed less bacterial and total microbial populations, but 2 times more fungal populations than CT. The NT had less BR than CT. Moreover, NT had higher acid phosphatase, more alkaline phosphatase, and greater dehydrogenase activity than CT. Urease activity was lower in NT over CT. NT had higher TC, TOC, TN, and AP than CT. Among the SQ indices, soil biological quality (SBQ) was higher and chemical quality (SCQ) was higher in NT over CT. Likewise, the overall SQ was higher in NT than in CT. The SBQ significantly accounted for of the variability in the overall SQ. Significantly higher values of biological and chemical properties and soil quality in NT than in CT are due to the surface placement of crop residues, dominance of energy efficient fungal food webs, and cooler, moist, undisturbed soil environment.

Keywords : Bacterial population, fungal population, basal respiration, soil enzyme activity

(19597) ECOLOGICAL STABILITY OF QUANTITATIVE SIGNS IN WHITE LUPIN VARIETIES

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Ecological stability of quantitative signs in white lupine varieties was studied in field trial in the Institute of Forage Crops, Pleven, Bulgaria. Seven varieties of white lupine were used. Dispersion analysis showed a well-proven influence of genotype and environment factors and the interaction between them in terms of plant height, number of pods, number of seeds and seeds weight. For plant height, number of seeds and seeds weight, the influence of the environment was stronger than that of the other two factors. The seeds weight strongly correlated with the Anicchiarico W_i indices ($r = 0.87$), b_i ($r = 0.634$), a_i ($r = 0.633$) and T ($r = 0.559$) and negative correlated with the Lin and Binns ($r = -0.977$) parameter. Ecological stability parameters for plant height showed the most stable and high-growing PI533704 variety; for the number of pods, number of seeds and seeds weight Zuter variety, respectively. Zuter variety was found close to the ideal type combining high productivity with ecological stability. Lucky801, for most signs, was environmentally unstable but highly productive and is therefore suitable as a parent component in breeding programs for obtaining high yield varieties.

Keywords : adaptation, *Lupinus albus*, genotype, environment

(19596) ASSESSMENT OF INITIAL MATERIAL OF VETCHES IN PRODUCTIVE AND ADAPTIVE ABILITY

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Eight winter vetch varieties (BGE004222, BGE001847, BGE000637, BGE001076, BGE000639, BGE000643, BGE001383 and Asko 1) were assessed by plant height, fresh leaf weight, fresh stem weight and nodule number per plant in field trial in the Institute of Forage Crops, Pleven, Bulgaria. The varieties are characterised by low general adaptive ability and average specific adaptive ability on the investigated signs. With the highest general adaptive ability by fresh leaf weight is distinguished BGE000643, by number of nodules per plant BGE004222 and BGE001383, and by plant height - BGE001847 and BGE000637, respectively. By the complex indicator selection value of the genotype, taking into account the general adaptive ability and stability, the signs fresh leaf weight and fresh stem weight the best was found BGE001383 variety. According to the number of nodules per plant and the indicators of adaptability and stability, the interest represents the variety BGE004222. Based on the aggregate assessment of the varieties, which is based on the average height of the plant and the parameters of adaptability, the most valuable were the varieties BGE001847 and BGE001076. A positive correlation was established between fresh leaf weight and: the specific adaptive ability ($r = 0.568$), the general adaptive ability ($r = 0.099$) and the indicator of the stability level of the variety ($r = 0.544$); and between the number of nodules with the coefficient of linear regression ($r = 0.115$) and with homeostaticity ($r = 0.116$).

Keywords : Genotype, selection value, stability, vetch

EFFECT OF DIFFERENT EXTRACTS OF *LAVANDULA STOECHAS* L. AREAL PARTS ON GASTROINTESTINAL MOTILITY IN MICE.

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Introduction: *Lavandula* species (Lameacea family) are widely distributed in the Mediterranean region and *Lavandula stoechas* L. is a plant that has been used in the local traditional pharmacopeia.

Aims: The aim of this study was to investigate the effect of *Lavandula stoechas* on gastric emptying of red phenol meal and intestinal transit in mice.

Materials and methods: Plant powder of *Lavandula stoechas* aerial part was extracted using different solvents to get methanol (ME), chloroform (CHE) and ethyl acetate (EE) fractions. The effect of methanol extract and the solvent fractions on the gastrointestinal tract motility was evaluated using red phenol meal model in mice. The rate of intestinal transit was expressed as the ratio between the distance travelled by the test meal and the total length of the small intestine.

Results: The CHE fraction significantly and dose dependently lowered the transit of phenol red through the small intestine compared to the vehicle (37.26%), whereas, the ME and the EE fractions delayed the intestinal transit only at the highest dose (47.52 and 45.02%, respectively). Furthermore, all the extracts exerted a dose dependent reduction in the emptied quantity of the test meal compared to the vehicle (80.6%). However, this effect was only significant ($P \leq 0.0001$) at the highest dose of the EE fraction

Discussion: The chloroform extract of *L. stoechas* exhibits higher antimotility than the other plant fractions. This effect could be due to its polyphenol contents.

Conclusion: *L. stoechas* may help in the remedy of gastrointestinal disorders, which may justify its use in Algerian traditional medicine in gastrointestinal ailments.

Key words: *L. stoechas*, extracts, gastric emptying, intestinal transit, red phenol

**PROTECTIVE EFFECT OF ESSENTIAL OIL FROM *LAVANDULA STOECHAS* L.
AGAINST ETHANOL-INDUCED GASTRIC ULCER IN RATS**

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Introduction: Gastric ulcers affect many people around the world and their development result from an imbalance between aggressive and protective factors in the gastric mucosa.

Aims: The effect of *Lavandula stoechas* L. essential on ethanol-induced ulcers in rats was investigated.

Materials & Methods: The extraction of essential oil from *L. stoechas* L. areal parts was conducted by hydro distillation. Gastric ulcers were induced in rats with a single dose of ethanol (70%). The effect of pre-treatment with *L. stoechas* L. essential oil (50, 250 and 500 mg/kg) was assessed in comparison with ranitidine as the reference standard. The length (mm) of lesions in the glandular region was measured and the percentage of protection was calculated.

Results: Acute oral exposure of rats to ethanol caused mucosal oedema and congestion along the stomach. This damage is attenuated by the administration of *L. Stoechas* L. essential oil at different degrees: The plant essential oil dose dependently ameliorated injuries caused by ethanol compared with the ranitidine treated animals. The highest dose showed almost complete protection (98.08%). Compared with the vehicle treated animals, the essential oil dose dependently and significantly increased the gastric mucus; these values were even higher than the positive control.

Discussion: The protective effect of the plant essential oil could be attributed to antioxidant compounds present in the plant such as polyphenols.

Conclusion: It may be concluded that *L. stoechas* L. essential oil exerts a significant protection against ethanol induced gastric damage by increasing at least in part the mucus layer.

Key words: *L. stoechas*, essential oil, gastric ulcer, ethanol, mucus layer.

THE EFFECTS OF LONG TERM SEED STORAGE ON SOME TRAITS OF DURUM WHEAT VARIETIES

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This study was conducted at the research laboratory and greenhouse conditions to determine the effect of long-term stored seed (7 years) and non-stored seed (control) on germination, emergency values, coleoptile length, root and shoot traits of nine durum wheat varieties. Three replicates of 20 seeds were germinated between double layered rolled germination papers in the petri plates. Seeds were allowed to germinate at $20\pm 1^{\circ}\text{C}$ in the dark for 8 days. The seeds were counted on the 8th day as per ISTA rules and calculated in percent to determine germination rate. Seedling emergency values were determined by testing 20 seeds placed into a mixture of soil and the sands with three replications of pots. Plants were counted on the 7th day and 12th day to determined seedling emergency rate and capacity, respectively. For coleoptile length, root and shoot traits, three seeds per variety were line up the middle of paper towel. The boxes with paper towel and wax paper were fully watered and kept for 14 days in a constant darkness at 20°C under laboratory condition. According to results, there are significant differences among the varieties in terms of plant height, root length coleoptile length, root mass, total plant mass, germination rate, seedling emergency rate and capacity of long-term stored and non-stored seeds. In the study, there are significant differences between stored conditions of seeds in terms of germination rate, seedling emergency rate and capacity. Mean of germination rate was 97.8% in non-stored seeds whereas it was lowered up to 84.6% in long-term stored seeds. Mean of seedling emergency rate and capacity declined from 79.3% and 84.6 in non-stored seeds to 50.4% and 57.2% in long-term stored seeds, respectively. The results also indicated that coleoptile length, seedling height, root length, primary root number, root mass and total mass were significantly reduced through long-term stored seeds. The total plant mass, root mass and coleoptile length were declined from 0.29 g, 0.109 g and 5,1 cm in non-stored seeds to 0.24 g, 0.075 g and 4.4 cm in long-term stored seeds, respectively. Finally, responses of characters investigated in this study to long-term storage varied significantly among durum wheat varieties.

Key words: Durum wheat, germination, emergence, root and shoot traits, long-term storage

THE EFFECT OF DOCETAXEL AND CURCUMIN ON DU 145 PROSTATE CANCER CELL LINE ANGIOGENESIS

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The aim of this study is to evaluate whether curcumin can be used in combination with docetaxel for apoptotic and antiangiogenic effect in DU145 prostate cancer cells. The effect on cell proliferation and IC50 value of, both individually and combination treatment of Docetaxel and Curcumin were determined by MTT assay, apoptosis and necrosis were investigated by TALI image based cytometer with Annexin V:PI staining, invasion assay were performed with wound healing assay, gene and protein expressions were detected qRT-PCR in DU145 cells. The IC50 values of docetaxel and curcumin was 23.31 nM and 11.03 µM, respectively. In combination treatment, the dose dependent death occurred in DU 145 cell line. The result of TALI analysis showed that 35 and 70 nM doses of Docetaxel in the DU145 cell line resulted in both apoptotic and necrotic deaths. Both individual and combination application with curcumin significantly induced apoptotic signals in DU 145 cell lines. The combination of 70 nM Docetaxel+50 µM Curcumin applications inhibited angiogenesis by decreasing VEGF, VEGFR, FAK, SMAD3 and COX-2 gene expression levels. In the wound healing assay 35 nM Docetaxel+50 µM Curcumin and 70 nM Docetaxel+50 µM Curcumin combinations inhibited cell migration. But gene expression levels of angiogenesis members PAI-1 (10.95 fold), MMP3 (3.97-fold), PI3K (3.17-fold), ACT (7.27-fold) significantly increased. For this reason, it may be thought that, the angiogenesis inhibited by another signalling mechanism in DU 145 cell lines. In conclusion, it is thought that Docetaxel and Curcumin combination is effective agent in inhibiting angiogenesis of prostate cancer and Curcumin may be a candidate molecule for combination chemotherapy regimens. However, further in-vivo studies are needed to support our results.

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Keywords: Prostate Cancer, Du145 cell line, Curcumin, Docetaxel, Angiogenesis

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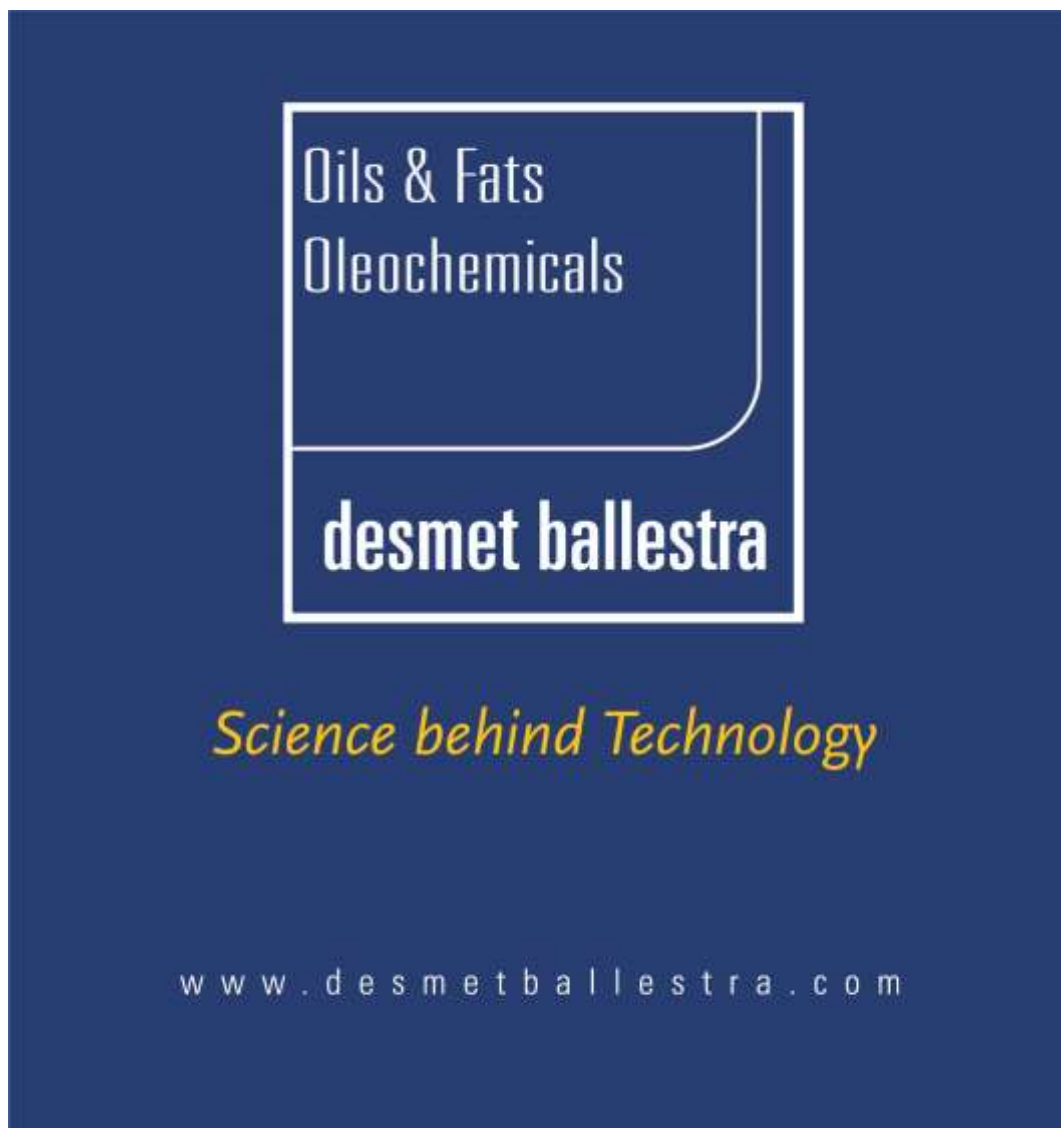
The advertisement features a central image of a family (mother, father, daughter, and son) smiling and posing around a large bottle of Meizan Sunflower Oil. The background is a vibrant sunflower field under a blue sky. The Meizan logo is prominently displayed in red and white. Below the logo, Burmese text reads: "မိသားစုတိုင်း ကျန်းမာပျော်ရွှင်ဖို့ မေရင်နေကြာဇီ ကိုရွေးချယ်ဖို့" (For every family to be healthy and happy, choose Meiranzi). To the right, a list of nutrients is provided: "• Linoleic acid 68% သက်သာပျက်စီးမှုကို ကာကွယ်ပေးသည်။" (Linoleic acid 68% helps prevent spoilage) and "• Vitamin-E စွဲတတ်ရာ ပါဝင်သည်။" (Contains Vitamin-E, which is easy to absorb). A small icon of a heart with a checkmark is also present. In the bottom right corner, there are smaller images of Meizan products including a bag of flour and two more bottles of oil. In the bottom left corner, there is a QR code and the text "Meizan Myanmar".



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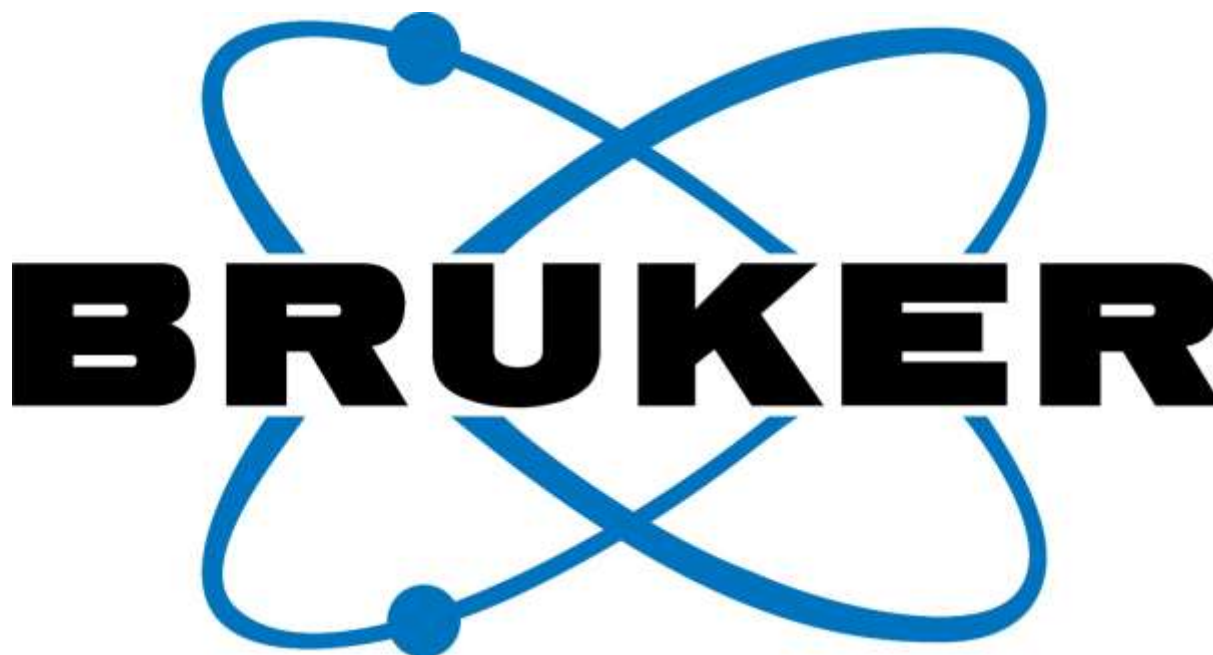
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