MESMAP-3

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April 13-16, 2017
MERIT PARK HOTEL
Girne - Turkish Republic of Northern Cyprus

Abstract Book

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The Third International Mediterranean Symposium on Medicinal and Aromatic Plants

MESMAP - 3

ABSTRACT BOOK

April 13th – 16th, 2017

Girne-Turkish Republic of Northern Cyprus

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Dear colleagues,

Having respected scientific board and organizing committee members from all over the world, MESMAP Symposium series started in 2013. The first Mediterranean Symposium on Medicinal and Aromatic Plants (MESMAP-2013) was held on April 17-20, 2013 in Gazimagosa (Famagusta), Turkish Republic of Northern Cyprus (TRNC), which was organized by Faculty of Pharmacy, Eastern Mediterranean University (EMU) joint with AMAPMED (Association of Medicinal and Aromatic Plants of the Mediterranean).

MESMAP-2 Symposium was held on April 22-25, 2015 in Antalya – TURKEY, which was organized by academicians from Gazi University (TURKEY), Gaziantep University (TURKEY), Kilis 7 Aralik University (TURKEY), Yüzüncü Yil University (TURKEY), Association of Pharmaceutical Teachers of India (APTI – INDIA) joint with AMAPMED (Association of Medicinal and Aromatic Plants of the Mediterranean).

MESMAP-3 Symposium which was held on April 13-16, 2017 in Girne (Kryneia) – Turkish Republic of Northern Cyprus (TRNC), was the third event of MESMAP symposium series on Medicinal and Aromatic Plants. MESMAP Symposiums provide a platform for herbal medicines, botany, plant biotechnology, ethnobotany, phytopharmacology, pharmacognosy, food, agriculture and forestry, plant biology, phytochemistry and aromatherapy.

You can find abstracts of all the scientific works presented in MESMAP-3 in this ABSTRACT BOOK. We are proud to announce that INDUSTRIAL CROPS AND PRODUCTS JOURNAL with high impact factor from ELSEVIER group published a special issue covering some of the full papers selected after scientific evaluation. We are happy to invite MESMAP-3 participants to submit their full papers which were presented at the symposium to Indian Journal of Pharmaceutical Education and Research (IJPER) published by APTI and indexed with THOMSON REUTERS. Selected full papers after scientific evaluation will be published in this journal.

We would like to thank for their sincere supports of Turkish Ministry of Forestry and Water Affairs, General Directorate of Forestry, TURKISH AIRLINES, Turkish Ministry of Food, Agriculture and Livestock, Kilis 7 Aralik University, Ordu University and all the other supporters. Moreover, organizing committee members would like to thank you all the participants their valuable scientific participation.

Organizing Committee hope that MESMAP-3 Symposium participants would have an amazing experience and unforgettable memories to take back their homes, and would like to thanks for all MESMAP-3 participants for their valuable contributions. We would like to remind you that MESMAP Symposium series will be organized every two year. Hope to meet you in the fourth meeting series of MESMAP in 2019 spring.

Best regards,

Symposium Chairman,

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"IJPER is an official proceeding journal of MESMAP-3." Selected full papers will be published in this SCI-Expanded Journal after the symposium.

MESMAP – 3 ORAL PROGRAM

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KEYNOTE LECTURE - I

BIOACTIVE MOLECULES FROM TROPICAL FORESTS TO THE OCEANS: A PERSONAL ACCOUNT THROUGH TIME AND CONTINENTS

Anake Kijjoa

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Historically, natural products from plants were the source of virtually all medicinal preparations and, more recently, natural products have continued to enter clinical trials or to provide leads for compounds that have entered clinical trials, particularly as anticancer and antimicrobial agents. Over the past decades, scientists have pursued a variety of phytochemical and pharmacological approaches to investigating the pharmaceutical potential of tropical organisms due the rich biodiversity of tropical forests. On the other hand, marine organisms have evolved biochemical and physiological mechanisms that include the production of bioactive compounds for reproduction, communication, and protection against predation, infection and competition which makes the marine environment an exceptional reservoir of bioactive natural products, many of which exhibit structural/chemical features not found in terrestrial natural products. Since marine natural products are found to exhibit biological and pharmacological activities in higher rate than their terrestrial counterparts, researchers have recently paid their attention to marine organisms such as marine sponges, corals and other invertebrates. However, this approach also has a serious drawback due to supply problems. Recently, scientists have proved that many bioactive compounds isolated from plants and marine organisms are *de facto* produced by symbiotic microorganisms. This fact has led many researchers to pay much attention to microorganisms associated with plants and marine organisms. One of many advantages of microbial bioactive compounds is that their production can be scaled up to overcome the supply problem encountered when working with plants and marine organisms. In this lecture, the author's account of his attempt to search for bioactive natural products from medicinal and wild plants from the tropical forests to the exploration of the marine environment and finally to the microbial world will be presented.

Keywords: medicinal plants, natural products, marine organisms, terrestrial fungi, marine-derived fungi

References:

[1] Kijjoa, A., & Sawangwong, P. (2004). Drugs and cosmetics from the sea. *Mar Drugs*, *2*(2), 73-38.
[2] Harvey, A. L. (2008). Natural Products in drug discovery. *Drugs Discovery Today*, *13*(19/20), 894-901.

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KEYNOTE LECTURE - II

NUTRACEUTICALS FOR HEALTHY LIFE

Raman Dang

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The lifestyle has improved with economic development of the people. Side by side the major challenge are `lifestyle diseases' that are due to food habits. Consumption of junk food has increased manifold, which has led to a number of diseases related to nutritional deficiencies. Hence they are shifting from synthetic ingredients towards organic foods and ingredients, which are obtained from natural sources. Of late, Nutraceuticals can play an important role in controlling them and also fulfill all the health requirements. They are incredible dietary supplements that help in prevention or treatment of disease, which is made from raw herbals. This is a rapidly growing industry with more than 100 million people using these natural products but as like drugs, there should be strict regulatory control for nutraceuticals. With extensive anecdotal data on exciting health results, nutraceutical promise significant contributions to disease prevention and allow humans to maintain an overall good health. Nearly two thirds of the world's 6.1 billion people rely on the healing power of plant based materials for many reasons-availability, affordability, safety or their belief in traditional cures. Hence the demand is irreversibly increasing. According to a new market research, global nutraceuticals market was valued at US$165.62 billion in 2014 and is expected to reach US$278.96 billion by 2021, growing at a compound annual growth rate (CAGR) of 7.3% from 2015 to 2021. Indian markets growing at the rate of 21% per year and among that Amay, Dabur and Pfizer are well recognized. This indicates the people are accepting Nutraceuticals as medicine to make life healthy.

KEYNOTE LECTURE - III

AN UPDATE ON BIOACTIVE MOLECULES EXPLORED THROUGH OUR *IN VITRO* AND *IN SILICO* RESEARCH

Ilkay Erdogan Orhan, Fatma Sezer Senol

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Objective / Purpose: Natural products have been always targeted in drug discovery studies as they are perfect models for novel drug candidates. Enzyme inhibitors are commonly used in treatment of many diseases and therefore, researchers are focused on a rich number of enzymes to discover new inhibitors of natural and synthetic origins.

Material and Methods: In our ongoing studies since the year of 2000, we have been screening *in vitro* over 500 plant species and 100 pure compounds against a wide range of enzymes such as cholinesterases, tyrosinase, elastase, collagenase, lipoxygenase, xanthine oxidase, urease, phosphodiesterase, etc using ELISA microtiter assays. The active molecules have been proceeded to *in silico* experiments using molecular docking techniques.

Results: Our long-lasting efforts to find new natural compounds with significant enzyme inhibitory activities afforded many promising inhibitors of plant origin. Among them, diterpene derivatives (tanshinones), phenolics (methyl rosmarinate, rosmarinic acid, ascorbic acid, etc), coumarins (imperatorin, hyuganin C, pteryxin, etc), xanthones (macluraxanthone), flavonoids (pomiferin, osajin, quercetin, etc) have been reported by us as the strong enzyme inhibitors. After *in vitro* assays, molecular interactions have been confirmed with most of them *via* docking experiments.

Conclusion / Discussion: Our extensive studies indicated that natural molecules seem to be good candidates to discover new enzyme inhibitors. Our further work is in progress.

Keywords: Natural molecules, plant, enzyme inhibition, *in vitro* assay, molecular docking

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INVITED LECTURE - I

NATURAL SUBSTANCES OF JUNIPER BERRIES AND THE QUALITY OF BOROVIČKA – SLOVAK ALCOHOLIC BEVERAGE

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"Borovička" as a major alcoholic beverage is produced in several private companies in Slovak Republic. The objective of this work was to study the influence of juniper berries (*Fructus juniperi*) as a raw-material for the quality of the Slovak "Borovička" – alcoholic beverage [1]. In the production of "Borovička" – alcoholic beverage the essential components are: alcohol, juniper berries and water. Producers of the popular alcoholic beverage shall be kept to the original recipe coming from the second half of the 18th century. Production technology of "Borovička" consists of harvesting of juniper berries, their drying, cleaning, grinding and the subsequent fermentation. Very important part of the production technology is distillation. During the distillation of a juniper mash a by-product – juniper oil is produced, which is necessary to be separated from the juniper distillate. The next step is a rectification, which means practically, the re-distillation. The resulting product of this process is purified juniper distillate with an alcohol concentration of about 73 ± 0.1 %, as the 3rd distillate with the following qualitative characteristics: aldehydes = 0.01 $g.la^{-1}$ * , esters = 0.00 $g.la^{-1}$, Σ higher alcohols = 0.30 $g.la^{-1}$ and Σ pinanes = 0.70 $g.la^{-1}$ (*la – calculation for the absolute ethanol /100 %/) . It is added to the alcohol in a certain proportion to give a "Borovička" that is sold commercially.

To know chemical composition of the raw material of juniper berries is very important for industrial production of the "Borovička" – alcoholic beverage. In regard to the final quality of this Slovakian national liquor, distiller companies need to prefer the juniper fruits with the high pinane contents, as donors of aroma, odor, and lower essential oil quantity.

Keywords: alcoholic beverage, berries, distillate, composition, *Juniperus communis* L.,

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INVITED LECTURE - II

LC/MS AND NMR DEREPLICATION STRATEGIES FOR THE DISCOVERY OF NEW BIOACTIVE NATURAL PRODUCTS

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Objective / Purpose: Development of new strategies for the dereplication of natural product extracts using LC-UV-MS and NMR approaches as a tool to speed-up the discovery of novel bioactive molecules.

Material and Methods: Different chromatographic and spectroscopic platforms, including LC-UV-LRMS, LC-UV-HRMS, NMR equipped with low volume cryoprobe (1.7 mm) and LC-SPE-NMR, in combination with internal databases of reference spectra or commercial and public databases (Chapman & Hall Dictionary of Natural Products, ChemSpider, and PubChem).

Results: Strategies employed at Fundación MEDINA for the dereplication and early identification of known molecules in bioactive natural product extracts will be described. The combination of the different platforms described above has proved to be essential in the identification of different types of structures and a description of the rational employed in each of these strategies and individual examples summarizing the success in their use will be given.

Conclusion / Discussion: Drug discovery from natural products has experienced a revival since the beggining of this century due to the failure of alternative approaches such as combinatorial chemistry. To be succesful in this field, the implementation of rapid dereplication approaches, using state of the art analytical instrumentation and suitable databases is a fundamental requirement. The combination of dereplication platforms employed by the natural product chemistry group at fundación MEDINA described in this communication guarantees the early and fast identification of extracts containing known molecules. This allows concentrating efforts in the most promising hits bioactive in the different drug discovery programs, containing potentially novel compounds.

Keywords: natural products, dereplication, databases, LC-UV-MS, NMR.

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INVITED LECTURE - III

A NATURAL RECIPE FOR CHEMOPREVENTION

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Objective / Purpose: Indigenous vegetables were investigated for the presence of isothiocyanates and chemopreventive potential.

Material and Methods: Biomarkers were identified by HPLC and LC/MS-MS. The anticancer action was conducted in HCT116 colon cancer cells based on antiproliferation and apoptosis induction effect. Apoptosis was determined based on nuclei morphological change, DNA fragmentation, caspases activity, changes of mitochondria membrane potential (MMP) and level of proteins relate to apoptosis.

Results: Among vegetables studied, an edible *Raphanus sativus* L. var. *caudatus* Alef (RS) was highly contained sulforaphane (SF) and sulforaphene (SN)[1]. The extract from pod and stem greatly inhibited HCT116 cell proliferation with the respective IC_{50} values of 35.69±0.12 and 128.32±5.36 µg/ml. After fractionation of the pod crude extract, lesser antiproliferation was observed. The extracts from pod and stem were, therefore, investigated for apoptosis inducing effect compared to SF and SN. The pod and stem extracts caused nuclei morphological changes, DNA laddering; and increased %apoptotic cells, caspases 3, 8 and 9 activities, and MMP. Significant increment of intrinsic apoptotic proteins (Bax/Bcl 2 ratio) compared to untreated cell was evident in cells treated with pod and stem extracts, SF and SN. But only high Fas protein level—indicating the extrinsic pathway—was significantly observed in cell treated with the stem extract. Non-significant change of Bid level suggests no cross talk between these two pathways**.**

Conclusion / Discussion: Multi-constituents in each part of the RS extracts were contributed to apoptotic cancer cell death. RS is proved to be a good source for chemopreventive compounds.

Keywords: apoptosis, chemoprevention, colon cancer, Thai rat-tailed radish, intrinsic pathway, and extrinsic pathway.

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INVITED LECTURE - IV

INDIAN SPICES AND THEIR MEDICINAL VALUES

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Spices form an important part of virtually all recipes in all cultures, not only for their flavor and seasoning of foods but also for their numerous medicinal values. Spices tend to come from *tropical* regions. Throughout history, the most powerful country of its time has dominated world (spice) trade. Spices were much sought out products and used in preservatives, beverages, medicines, and even exchange for money. Spices were among the first objects of commerce between East and West. Columbus's famous voyage was inspired by the idea of finding a shorter route to India, the home of many spices.

India produces a wide variety of spices including cardamoms, chilies, black pepper, mustard, coriander. Indian cuisine is also known for its rich taste which it derives from numerous spices. The demand of Indian spices is high in the global market due to their rich aroma, texture, and taste. India has the largest domestic market for spices in the world. The major importers of Indian spices are the US, Germany, China, the UAE and Malaysia. The primary spices imported from India are pepper, chili, turmeric, coriander, cumin, and fennel. Use of medicinal plants developed from informal experimentation and based on a general familiarity with medicinal plants. This knowledge was amassed via experimentation over many generations and was handed down orally from person to person – often woman to woman in traditional cultures.

Many spices come from reproductive plant parts (e.g. flowers, fruits, seeds), some also come from bark, roots. The major phytochemical components of the spices are: Essential Oils – Often are complex mixtures of terpenes, and other terpenoid compounds; Esters – "fruity" aromas, often associated with ripening; Amides - Nitrogen containing compounds, e.g. capsaicin; Vitamins - Typically vitamins A, B-complex, and C. Spices are generally used as important food adjuncts help to avoid monotony, disguise unpleasant odor, Aid digestion, Increase rate of perspiration, resulting in lowering body temperature, carminative and antiseptic, antioxidants, anti-inflammatory, perfumes, soaps, incenses, dyes etc.

INVITED LECTURE - V

FROM THE LAND AND THE SEA: A LIBRARY OF XANTHONE NATURAL MIMICS LOOKING FOR BIOLOGICAL DIVERSITY

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During the past few decades the main goal of our research group has been focusing on the synthesis and molecular modification of nature-mimetic compounds, namely xanthones, flavones and chalcones.

A large number of naturally occurring compounds based on the xanthonic scaffold wherein a large variety of substituents is placed at key points to interact with a large number of biotargets, are found to exhibit a wide range of bioactivities, thus placing them as *privileged structures*. Although Nature, in the evolutionary process, has prepared these molecules to interact with target proteins in an optimal way, the type and position of the chemical groups in the xanthonic scaffold are conditioned by the biosynthetic pathways. Consequently, Medicinal Chemistry has provided a valuable contribution in the enlargement of the chemical space of xanthones through design strategies to obtain new molecules with a broad spectrum of biological and pharmacological activities.

The work carried out by our research group, based on natural xanthonic scaffolds as models as well on the ways used by Nature for developing molecular modifications, is presented to give an insight into the diversity of strategies applied to the hit-to-lead optimization process, leading to a variety of biological activities.
The research currently developed for the discovery of marine natural products/nature-mimics having as a main target to prevent and/or to treat cancer and infectious diseases as well as to overcome multidrug-resistance is also highlighted.

Keywords: Xanthones, natural strategies, antitumor, antimicrobial

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INVITED LECTURE - VI

IRANIAN MEDICINAL AND AROMATIC PLANTS USED IN TRADITIONAL MEDICINE

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Herbal medicinal is known to more than 80% of world population. Traditional medicine consists of health cares and has been common before using formal and scientific medicine. Today, remarkable advances in modern medicine, we are confronted with an increasing tendency towards herbal remedies among those seeking for traditional therapies. Herbal therapy in Iran also dates back to a long time ago and a number of writings regarding this issue are left by great physicians e.g. Avicenna and Rhazes. Iranian botanists have lead to recognition of around 150 spontaneous families of Angiosperms containing 124 Dicotyledonous and 22 Monocotyledonous and 4 Gymnosperms families. And also totally containing about 1450 genera and 8000 species which nearby 2000 species are endemic of Iran. Beside there are around 36 cultivated families growing in Iran have not been mentioned in Flora Iranica. Therefore Ethno-pharmacological field work, examining patients consuming herbal remedies and identifying the disease for which an herbal remedy is used. In Iranian traditional medicine had cited pharmaceutical dosage forms, e.g. powders, syrups, ointment, extracts, powders, mucilage's, nectars, etc.

Treatment with natural drugs in the traditional Medicine in Iran is based on the knowledge of the temperament of drugs as well as the knowledge concerning types of effects of drugs on the body. Iran, as a country located between China and Europe, played a key role in connecting various cultures and civilizations that existed along the Silk Road. In this presentation am going to present, the Photo-chemical screening of some medicinal and aromatic plants, and traditionally patients consuming herbal remedies as *Rosa damascena*, *Hypericum* spp and *Punica granatum*, are reviewed.

INVITED LECTURE - VII

HERBAL COSMETICS AND NOVEL DRUG DELIVERY SYSTEMS

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Herbal cosmetics are defined as the products which prepared by or included plants and /or herbal components that are mainly; plants, plant extracts, volatile oils, distillates, aromatic waters, juices, aqueous extracts, tinctures, resins, gums and congenerous, herbal oils-lipids, waxes, mucilages, plant carbohydrates or purified plant components. Critical parameters that affect the final quality and stability of herbal cosmetics are the specifications of herbal inputs, structure of formulation and manufacturing process. In this context the critical analyses of quality control of herbal raw materials are performed in addition to in-process and the post-analyses of the cosmetics. In addition to produce according to the good manufacturing practices of cosmetics (ISO 22716) in case of being natural or organic cosmetic it needs to meet the related international standard for technical definitions and criteria of natural and organic cosmetic ingredients and products (ISO 16128). As they are used in new generation advanced cosmetics, novel drug delivery systems are also use for herbal cosmetics. Among the novel delivery systems vesicular delivery systems (liposomes, nanosomes, phytosomes, herbosomes, marinosomes, oleosomes etc.), solid lipid nanoparticles, nanostructured lipid carriers and nanoemulsions etc are most preferable systems. Advantages of such systems for herbal cosmetics can be listed as; improved stability, decrease allergic potensial of some herbal substances. Liposomes are using in personal care products due to their benefits, such as controlled release, reduced toxicity, increased stability, and increased bioavailability. They are especially used in many antiaging products to encapsulate vitamins, antioxidants, and natural botanical extract. Niosomes had been developed as alternative controlled drug delivery systems to liposomes in order to overcome the problems associated with sterilization, large scale production and stability. The first niosome report came from a cosmetic company and then other cosmetic and drug industries started to use. Regarding nanoparticle efficiency there are many studies in cosmetic field. The main aim is to control the release and target cosmetic active agent. Nylon nanoparticles are also used in make-up and skin care products to absorb oil and sunless tanning of the skin. Most of the nanocapsules are investigated for delivery of antioxidants and sunscreen agents. However, nanoparticle use in cosmetics is limited due to possible toxicity of the by-products. Lipid nanoparticles such as solid lipid nanoparticles and nanostructured lipid carriers have gained attention for dermal application of cosmetic active substances to achieve targeting and sustained release of active

substances to the different layers of the skin providing avoidance of systemic uptake of active substances. As a conclusion, in case of developing new herbal cosmetics selecting an appropriate drug delivery system is able to provide increased efficacy, stability and enhanced safety of the final product.

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ORAL PRESENTATIONS (1 – 106)

ORAL PRESENTATION - 1

APPLICATION OF NANOTECHNOLOGY TO IMPROVE PHARMACOKINETICS OF THAI HERBAL EXTRACTS

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Objective: This presentation aimed to demonstrate the application of nanotechnology to increase the pharmacokinetic aspects of herbal extracts including enhancement of solubility, absorption and bioavailability.

Material and Methods: Three common uses of Thai plant extracts were formulated in nano-dosage forms, including *Phyllanthus emblica* extract in nanoemulsion; *Curcuma comosa* extract in nanoemulsion; and *Kaempferia parviflora* extract in self-microemulsifying drug delivery system (SMEDDS) and cyclodextrin complexes. Then their pharmacokinetic parameters were determined.

Results: All obtained formulations have high % entrapment efficiency with better absorption and higher bioavailability than the initial plant extracts. Nanoemulsion containing 0.15% *P. emblica* extract was further formulated as a skin whitening gel that showed skin lightening effect in normal volunteers. Nanoemulsion of *C. comosa* extract showed more than 10 times increased *in situ* intestinal absorption of diarylheptanoids than that of the extract in oil. Both SMEDDS and cyclodextrin complex formulations of *K. parviflora* extract improved the dissolution rate, drug permeability in Caco-2 cells and oral bioavailability of methoxyflavones in rats.

Conclusion / Discussion: Nanotechnology can be used to improve the pharmacokinetics and to obtain the novel drug delivery system for plant extracts that may support the clinical utilization of herbal medicine with better efficacy.

Keywords: nanoemulsion, self-microemulsifying drug delivery system, cyclodextrin complex, *Phyllanthus emblica*, *Curcuma comosa*, *Kaempferia parviflora*

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ORAL PRESENTATION - 2

MORPHOGENETIC, ONTOGENETIC AND DIURNAL VARIABILITY IN ANTIMICROBIAL ACTIVITY OF BITTER FENNEL ESSENTIAL OIL

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Objective / Purpose: This research was carried out to determine morphogenetic, ontogenetic and diurnal variability in antimicrobial activity of bitter fennel essential oil in a two-year study.

Material and Methods: To specify morphogenetic variability; leaf and root-bulb-stalk samples were taken at three stages (pre-, full and post-flowering), flower samples were picked up at full flowering and seed samples were gathered at two seed growth stages. To clarify ontogenetic and diurnal (9:00 am, 1:00 pm and 5:00 pm) variability, whole plant samples were taken at pre-, full and post-flowering stages. A total of 10 microorganisms, including 7 bacteria, 1 fungus and 2 yeast species, have been studied to determine antimicrobial activity of essential oils using disc-diffusion and minimal inhibition concentration methods.

Results: The highest inhibitory effect of leaf essential oil was observed from post-flowering samples, but essential oil of root-bulb-stalk samples of pre-flowering produced the highest antimicrobial activity. Whole plant essential oils of post-flowering samples generally produced higher antimicrobial activity than those of pre- and full flowering samples. In general, inhibitory effect of seed essential oil extracted at the beginning of seed formation was higher than that of seed maturity. There were no significant differences among antimicrobial activities of essential oils extracted from whole plant samples taken at three times a day. None of the essential oil extracted from different plant parts at different growth stages and three sampling hours showed antimicrobial activity against *Saccharomyces cerevisiae* and *Aspergillus niger*.

Conclusion / Discussion: The present study reveal that antimicrobial activity of bitter fennel essential oil significantly vary based on plant parts, growth stages and sampling hours.
Keywords: disc-diffusion, *foeniculum vulgare*, minimal inhibition concentration, volatile oil

ORAL PRESENTATION - 3

AGRONOMICAL AND PHYTOCHEMICAL EVALUATION OF *STEVIA REBAUDIANA* GENOTYPES IN SWITZERLAND

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Objective / Purpose: The Paraguayan and Brazilian shrub *Stevia rebaudiana* (Bertoni) Bertoni contains large amounts of calorie-free sweeteners that are up to 400 times sweeter than sucrose (mainly stevioside and rebaudioside A). Stevioside gives a marked bitterness of licorice-like aftertaste that some manufacturers would like to avoid. The present study assesses the agronomic potential and the phytochemical variability of 21 genotypes in Switzerland over three years (2013-15) in order to identify the most interesting ones for local cultivation.

Material and Methods: Between 2013 and 2015, 21 genotypes were planted in Conthey/Switzerland (480 masl, continental climate) and in Bruson/Switzerland (1050 masl, kettle moraine) with a density of 10 plants per m^2. Dry matter yields were measured over 1 to 3 harvests. Steviol glycoside content (stevioside and rebaudioside A) was estimated by UPLC based on the Waters Application Notes WA60128 and WA60129, with a detection at UV 200 nm. ANOVA and Tukey-Test were performed with XLSTAT.

Results: Over a period of three years, annual yields in dry leaves varied between 10 and 183 g/m^2. The UPLC analyses showed a notable variability in the phytochemical composition of steviol glycosides, with a content of stevioside ranging from 0.3 to 7.9 % and of rebaudioside A ranging from 0.3 to 6.5 %. The ANOVA of mass of glycosides (% of glycosides x weight of dried leaves) shows statistically significant differences among the genotypes, ranging from 277.6 to 0.0. After three years of trials, the genotype F (vegetative propagation) from EUSTAS (European Stevia Association) is recommended for its high sweetness and low bitterness, eg suitable for herbal tea manufacturers, while the genotypes GAWI (EUSTAS, vegetative propagation) and Pharmasaat (seed supplier in Germany, generative propagation) are also recommended for their high yields and sweetening power, while having an aftertaste of licorice.

Conclusion / Discussion: The cultivation of *Stevia rebaudiana* is possible in Switzerland, but as an annual plant, while it is a perennial plant in its place of origin. Compared to significantly higher yields of perennial crops in temperate regions (> 700 g/m^2), cultivation in Switzerland must imperatively generate added value by emphasizing organic farming.

Keywords: stevioside, rebaudioside A, sweetener plant, Switzerland

ORAL PRESENTATION - 4

THREAT ANALYSIS AND PROPOSED SOLUTIONS FOR ELEKDAG WILDLIFE DEVELOPMENT AREA

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Objective / Purpose: Wildlife Development Area is a protection status declared in accordance with the Land Hunting Act No. 4915. According to this law, Wildlife Development Area are defined as "Fields in which hunting and wildlife are protected, developed, game animals are placed, measures are taken to improve the living environment, and hunting can be carried out within the framework of special hunting plan if necessary". Within this scope, there are 80 Wildlife Development Areas in our country. The subject of this research is the threats observed in the Elekdag wildlife development area and proposed solutions for the area.

Material and Methods: Elekdag Wildlife Development Area is located in Kastamonu province, within the boundaries of Taşköprü county. The administrative responsibility of Elekdag Wildlife Development Area belongs to the General Directorate of National Parks and Nature Conservation, which is affiliated to the Ministry of Environment and Forestry, Kastamonu Provincial Environment and Forestry Directorate.

Results: As a result of the study, it was found that wildlife habitats for deer populations (target species) and water resources in the area at risk. Proposed solutions have been presented for the elimination of these risks.

Conclusion/Discussion: The identification of the risks on habitats and biological resources and proposed solutions have great importance on ecosystem integrity of the protected area. The most important factor is the arranging on-site management to ensure sustainable protection-use balance.

Keywords: Threat Analysis, Wildlife Development Area, Elekdag, Kastamonu.

ORAL PRESENTATION - 5

EVALUATION OF THE *IN VITRO* ANTI-INFLAMMATORY ACTIVITY OF *NERIUM OLEANDER* L. FLOWERS AND ACTIVITY-GUIDED ISOLATION OF THE ACTIVE CONSTITUENTS

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Objective / Purpose: *Nerium oleander* L. flowers are used against rheumatoid diseases in traditional Turkish medicine [1]. This study aims to investigate the *in vitro* anti-inflammatory activity of the flowers and isolation of the active components.

Material and Methods: The fresh flowers were extracted with ethanol and partitioned to obtain *n*-hexane, dichloromethane, ethylacetate (EtOAC) and remaining water subextracts. The effects on viability and NO productions of the LPS induced Raw 264.7 macrophages were evaluated by WST-1 and Griess assays. The effects on the protein levels (iNOS, COX-2, MAPK's; ERK, JNK, p-38) were investigated by Western Blot. The structure elucidations were achieved by NMR/MS.

Results: The EtOAc subextract exerted the highest NO inhibitory activity. When it was applied at 50, 100 and 200 µg/ml concentrations, NO productions were inhibited up to 62.56±1.91% and iNOS protein levels were reduced up to 67.50%. However COX-2 levels were not affected. L-NIL (10 µM) provided 86.94±1.75% inhibition. The phosphorylation levels of MAPK's (JNK, p38) were slightly reduced and ERK phosphorylation was inhibited by 20.53% at 200 µg/ml concentrations. The EtOAc subextract was fractionated by polyamide column chromatography into four fractions: Fr. A-D. All of the fractions significantly inhibited NO productions except Fr A. Activity guided isolation yielded kaempferol-3-*O*-β-D-glucoside, chlorogenic acid and kaempferol from Fr B, Fr. C and Fr. D, respectively.

Conclusion / Discussion: The EtOAc subextract exerted significant *in vitro* anti-inflammatory activity and active components were determined. The results of this study support the traditional use of *N. oleander* flowers.

Keywords: *Nerium oleander*, iNOS, MAPK, flavonoids

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ORAL PRESENTATION - 6

PHARMACEUTICAL DEVELOPMENT OF BIOTECHNOLOGICAL FRAGRANT PRODUCTS

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To date, fragrant product biotechnologies based on microbial synthesis are unique. Modern companies (Switzerland, Germany, and Austria), which use biotechnological methods in their production, focus on individual compound synthesis. However, essential oils, which are more expensive than their separate components, are natural mixtures of numerous volatile substances: aliphatic, monocyclic, and bicyclic monoterpenes, sesquiterpenes, and aromatic alcohols.

We analyzed component composition of our new fragrant products via gas–liquid chromatography and mass spectrometry. To reveal their antimicrobial properties, we used disk diffusion and serial dilution methods. Test cultures were *Escherichia coli, Hafnia alvei, Pseudomonas aeruginosa, Proteus mirabilis, Enterococcus faecalis, Acinetobacter baumanii, Staphylococcus aureus, Myxococcus sp., Bacillus subtilis, B. antracoides, B. thuringiensis, B. megatherium, Streptomyces violascens, Candida albicans, Cladosporium sp., Fusarium sp., Aspergillus terreus, Penicillum rubrum, Rhisopus sp.* We evaluated toxicity of *Eremothecium* oil and *Chlorella* resinoid using in vitro biotesting. We patented fourteen producer strains and production procedures for the fragrant products and developed three manufacturing instructions. The development of essential oil biotechnology can open up new opportunities for microbiological and biochemical production.

Keywords: volatile-oil-bearing plants, microbial synthesis, biotechnological raw material, fragrant products.

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ORAL PRESENTATION - 7

INVESTIGATION OF PHENOLIC COMPONENTS OF STRAWBERRY TREE (*Arbutus unedo* L.)

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Objective / Purpose: The aim of this study is to investigate phenolic components of strawberry tree (*Arbutus unedo* L.) fruits grown in Bartin province of Blacksea Region in Turkey.

Material and Methods: In this study, Strawberry tree fruit samples which naturally grown in Alioba district of Bartın province were used. The phenolic compounds of strawberry tree were determined by HPLC method. Total phenol content determination has been detected with Folin-Ciocalteu Reagent (FCR).

Results: Vitamin C (58.849 %), gallic acid (3.484 %), katechin (2.511 %), shiringaldehyde (1.367 %), quercetin (0.760 %), p-Hydroxybenzoic acid (0.663 %), trans-Ferrulic acid (0.435 %), benzoic acid (0.045 %) and rosmarinic acid (0,03 %) were determined as phenolic compounds. Total phenolic compound quantity was found 274,372 m GAE/g.

Conclusion / Discussion: In the studies on Vitamin C inside the fresh fruit was found 124-243 mg/100 ml by [2] and 150-280 mg/100 g by [1]. According to the amount of dry matter obtained in this study, 635,64 mg/100 g Vitamin C is a close value to the result obtained by [2] and [1]. Furthermore, [1] reported that gallic acid (10.7 mg/g), gentisic (1,9 mg/g), protocatechuic acid (0.6 mg/g), p-hydroxybenzoic acid (0.3 mg/g), vanillic acid (0.12 mg/g) and M-anisic (0.05 mg/g) were found in their works. When phenolic components of the Strawberry tree are considered, that is a valuable nutrient which its commercial breeding should be done. Due to the containing phenolic components, it is a species that should be used in fields such as medicine and pharmacy.
This work was supported by the Scientific Research Projects Unit of Bartin University with the project number 2014-FEN-C-007.

Keywords: Strawberry tree, *Arbutus unedo* L., phenolic compounds, total phenolic.

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ORAL PRESENTATION - 8

ANTIDIABETIC EFFECTS OF *FERULA SPP L.* EXTRACT IN STREPTOZOTOCIN INDUCED DIABETIC RATS: HISTOPATHOLOGICAL, IMMUNOHISTOCHEMICAL AND BIOCHEMICAL INVESTIGATIONS

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Objective: The ameliorative potential and antioxidant capacity of *Ferula spp* extract (FE) was investigated using histopathological, immunohistochemical and biochemical changes in pancreas, liver and kidney tissues of streptozotocin (STZ)-induced diabetic rats**.**

Material and Methods: A total of forty healthy adult Wistar albino male rats were divided randomly into five groups as Control; Diabetes mellitus (DM); DM+Akarboz 50 mg/kg; and FE. Experimental diabetes was established by a single-dose [50 mg/kg, intra-peritoneal DM+FE (i.p)] STZ injection. Rats in control, DM and DM+Akarboz groups were fed on with standard pellet. The DM+FE and FE groups received in addition 30 ml *Ferula spp* extract/kg diet for 28d. Blood glucose levels were recorded throughout the all experiment period.

Results: Hepatorenal and pancreatic protection by FE extracts was further supported by the almost normal histology in DM+FE extract-treated group as compared to the degenerative changes such as inflammatory cell infiltration, hydropic degeneration and necrosis in the STZ-treated rats.

As a result of immunohistochemical investigation Glutathione peroxidase 1 (GPx1) immunoreactivity was lower in the tissues of diabetic rats (DM group) compared to the other groups. Insulin immunoreactivity in beta-cells of pancreas decreased in the DM group, whereas administration of supplementary FE extract helped restore the degenerative effects of STZ in the DM+FE group.

Decreased levels of blood glucose AST, ALT, ALP, LDH, Creatinin were detected in plant extract supplemented diabetic group. Additionally, a considerable increase in the malondialdehyde (MDA) and fluctuated antioxidant defence system constituents (ADSCs) levels were restored in FE-extract supplemented diabetic groups.

Conclusion: In conclusion, FE extract has a protective effect on tissue damage probably due to its antioxidant activity and possess the ability to regenerate β-cell in STZ-induced diabetic rats.

Keywords: Diabetes mellitus, *Ferula spp* extract, Histopathology, Immunohistochemistry, Biochemical, Rat.

References:

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ORAL PRESENTATION - 9

SOME PHYSICO-CHEMICAL CHARACTERISTICS OF WILD GROWN MYRTLE (*Myrtus communis* L.) FRUITSIN THE WEST MEDITERRANEAN REGION OF TURKEY

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Objective / Purpose: To determine and compare the chemical, nutritional and physical properties of black and white myrtle (*Myrtus communis* L.), fruits collectedfrom the wild in the Mediterranean basin of Antalya, Turkey.

Material and Methods: Myrtle berries used in this studywere obtainedfrom thevillage forestof Gazipasa, nearAntalya, Turkey in November. Experimental fruits were taken from wild myrtle shrubs at commercial maturity level. Three subsamples of 30 fruits were used for measurements of horticultural attributes such as fruit weight, fruit length, shape index (Fd/Fl) and stalk length. Total soluble solid contents (TSS) were determined using a digital refractometer and expressed as Brix.The chromatographic separation was performed on a solvent delivery system coupled with an auto sampler and refractive detector for determination of sugar composition. Identification of peaks in every sample chromatogram was accomplished with peaking of external sugar standards. The absorbance of the final solution was recorded with a spectrophotometer at 760 nm wavelength with respect to blank solution for determination of Total Phenolic Content (TPC). The results were expressed as Gallic Acid Equivalent (mg GAE /100 g fw). Concentrations of K, Ca, Mg, Fe, Zn, Mn and Cu were determined by using atomic absorption spectrophotometer. Phosphorus and total nitrogen contents were analyzed according to the procedures of Kacar and Kovanci (1992); Kacar and Inal (2008).

Results: The results demonstrated that the physical properties of black myrtle fruits were higher than those from white myrtle fruits. Sugar content of the fruits varied significantly according to the myrtle genotype. In the black myrtle fruits,

fructose and glucose were 6.48 g/100g, 6.93 g/100g, while in white myrtle fruits the contents of fructose and glucose were 5.59 g/100g, 5.96 g/100g, respectively. Total phenolic concentration for black myrtle was 14406.67 mg GAE/100g fw and in white myrtle 6498.33 mg GAE/100 g fw. Potassium was the dominant macro element in both myrtle genotypes, while iron was the major microelement.

Conclusion / Discussion: Both wild myrtle genotypes varied in respect to their physical and chemical features. In black myrtle genotype, the fruit weight, fruit diameter, fruit length and fruit shape index values were higher than in white myrtle genotype. The amount of total soluble solid contents and total phenolic concentration in black myrtle fruits were higher than in white myrtle fruits. The twocommon sugars, glucose and fructose, but not sucrosewere identified in both myrtle genotypes.

Keywords: Myrtle, fruit, physico-chemical properties

ORAL PRESENTATION – 10

DETERMINATION OF ANTIMICROBIAL ACTIVITY AND CHEMICAL COMPOSITION OF PIMENTO & GINGER ESSENTIAL OILS

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Objective / Purpose: The objectives in this study were to determine the chemical composition and antimicrobial activity of the essential oils from *Pimenta racemosa* (Pimento) and *Zingiber officinale* (Ginger).

Material and Methods: *Pimenta racemosa and Zingiber officinale* obtained from Özşen Lokman Hekim Company located in GIMAT-Ankara, TURKEY. For the identification of chemical components, each sample was analysed by GC-MS QP 2010 Ultra (Shimadzu) equipped with Rtx-5MS capillary column. The antimicrobial activities of these plant oils were tested against 18 different microorganisms by MIC (minimums inhibitory concentration) method.

Results: The GC-MS analyses revealed that the main components of oils obtained from Pimento 19.40% α-thujene, 14.47% terpinen-4-ol, 8.54% δ-3-Carene, 6.11% α-Fenchene, 5.78% Sylvestrene and 4.91% γ-terpinene. The essential oil from Ginger was characterized by the presence of 77.73% thymol and 11.73% p-cymene. From GC-MS results, Pimento oil included high amount of α-thujene (19.40%) and Ginger oil included high amount of thymol (77.73%). The Pimento oil showed strong antimicrobial activity against tested 17 microorganisms. However, Ginger oil showed moderate antimicrobial activity against tested 7 microorganisms.

Conclusion / Discussion: The antimicrobial activity results suggested that the Pimento essential oils can be used as a natural antimicrobial agent against different microorganisms.

Keywords: *Pimenta racemosa*, *Zingiber officinale*, essential oil, GC-MS, antibacterial activity

ORAL PRESENTATION - 11

BLACK RICE BRAN EXTRACTS: THE ANTI-SKIN AGING EFFECTS ON COLLAGEN SYNTHESIS AND DEGRADATION

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Objective / Purpose: Rice bran is a source of biofunctional compounds which with wide range of applications could be expected including cosmeceutical effects. Therefore, this study aimed to investigate the cosmeceutical properties of fermented black rice bran extract (FRB) and 50% ethanolic extract thereof (50% RB).

Material and Methods: FRB and 50% RB were prepared and investigated for their phytochemical compositions. Cosmeceutical effects were investigated based on (1) MMP-2 and MMP-9 activity by gelatin zymography, (2) collagenesis by Sircol® test kit; and (3) genes expression of COL1A1, COL3A1, MMP-1 and MMP-3 in NHDF fibroblast by RT-PCR.

Results: The different TLC patterns of 50%RB and FRB were manifested. Higher content of phenolics and anthocyanins as well as antioxidation were significantly shown in 50% RB. However, both FRB and 50% RB gave similar stimulating effects on collagenesis involving up-regulation on COL1A1 and COL3A1 and down-regulation on MMP-1 and MMP-3 expression. Interestingly, the 50% RB significantly showed higher potency than vitamin C. In contrast, the FRB showed higher effects than 50% RB on stimulation of NHDF proliferation and inhibition of MMP-2 and MMP-9 enzymes.

Conclusion / Discussion: Anti-skin aging effects of black rice bran extracts—50%RB and FRB—were evidenced with different degrees of actions. These differences may be due to different extract preparation methods that led to different patterns of chemical compositions and biological effects.

Keywords: black rice bran, fermentation, anti-skin aging, collagen, metalloproteinase

ORAL PRESENTATION - 12

WILD-COLLECTION OF THE MEDICINAL AND EDIBLE PLANTS IN LEFKE REGION OF NORTH CYPRUS

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Medicinal and edible wild plants provide a range of benefits (e.g. food, cash income and traditional knowledge) for human wellbeing. Unfortunately, habitats of these plants have particularly been threatened due to the impacts of urbanization, land use change, and the absence of a national strategy for the conservation and sustainable use of the target plants, as seen in Lefke Region of North Cyprus. Accordingly, the purpose of this study is to record medicinal and edible plants and associated traditional knowledge in five villages of Lefke Region. The data on the target plants and relevant traditional knowledge were obtained from 135 respondents by semi-structured and structured interviews during 2013 and 2014. Consequently, 47 species (8 medicinal, 21 edible-medicinal and 18 edible) belonging to 26 families were recorded. The collected plant species are used for various reasons such as traditional food (47 %), spice (16 %), herbal tea (11 %), medicine (2 %), and ornament (2 %). The major plant parts used are such as young stems (36 %), leaves (33 %), fruits (14 %), flowers (5 %), young shoots (4 %), and roots (1 %). Finally, several responses (e.g. support for small-scale cultivation in home gardens) for the maintenance and transmission of traditional knowledge with the target plants were suggested. It is expected that the results of this study can draw attention to the neglect of conservation and sustainable use of the target plants as well as maintenance of associated traditional knowledge in Lefke Region and all over North Cyprus.

Keywords: Medicinal plants, edible wild plants, traditional knowledge, Lefke Region, North Cyprus

References:

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ORAL PRESENTATION - 13

ANTIMICROBIAL ACTIVITY AND CHEMICAL COMPOSITION OF *CORIANDER* & *GALANGAL* ESSENTIAL OIL

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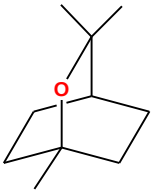
Objective / Purpose: The different effects of plant-based essential oils have been revealed by researches, which are increasing day by day. For this purpose, the objectives in this study were to determine the chemical composition and antimicrobial activity of the essential oils from coriander (*Coriandrum sativum)* and galangal (*Alpinia officinarum)* [1].

Material and Methods: *C. sativum* and *A. officinarum*. obtained from Özşen Lokman Hekim Company located in GIMAT-Ankara, TURKEY. For the identification of chemical components, each sample was analysed by GC-MS QP 2010 Ultra (Shimadzu) equipped with Rtx-5MS capillary column. Antimicrobial activities of obtained oils were investigated by using minimum inhibitory concentration (MIC) test by against 18 different species microorganisms.

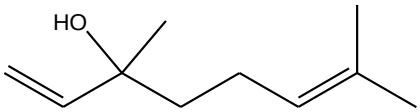
Results: The GC-MS analyses revealed that the most abundant of oils obtained from *A. officinarum was* 28.4% Eucalyptol. The most abundant components of *C. sativum* essential oil was linalool with 69.4% Figure 1. The *C. sativum* showed s strong antimicrobial activites against the 7 tested microorganism and *A. officinarum* oils showed strong antimicrobial activity against the 14 tested microorganism.

Conclusion / Discussion: As a result, it can be easily said that *C. sativum* and *A. officinarum* has strong anti-microbial activities against to almost tested microorganism. So the essential oils of *C. sativum* and *A. officinarum* can be usable as anti-microbial protector in cosmetic and medicine industry.



1,3,3-trimethyl-2-oxa-bicyclo[2.2.2]octane

Eucalyptol



3,7-dimethylocta-1,6-dien-3-ol

Linalool

Figure 1. The chemical structures of the Eucalyptol and Linalool

Keywords: *C. sativum, A. officinarum,* essential oil, GC-MS, antimicrobial activity

References:

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ORAL PRESENTATION - 14

EFFECT OF DIFFERENT HERBS AND PACKAGING CONDITIONS ON THE ANTIOXIDANT AND PROTEOLYTIC ACTIVITIES OF PROBIOTIC LOR CHEESE

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Objective / Purpose: The objective of this study was to evaluate the influence of oregano (*Origanum anites*) and rosemary (*Rosmarinus officinalis*) enrichment and two packaging conditions (modified atmosphere as 80% CO_2 and 20% N_2 and vacuum) on some characteristics of probiotic lor cheese containing *Lactobacillus acidophilus* and *Bifidobacterium lactis*.

Material and Methods: Oregano and rosemary were added at a ratio of 2% whereas control samples had no any herb supplement. Total phenolic content, radical scavenging and proteolytic activities of the samples were determined during 28 days.

Results: Total phenolic contents of herb enriched probiotic lor cheeses were found higher than those of control samples throughout the storage. Vacuum packaged samples enriched with rosemary had higher phenolic content when compared to vacuum packaged samples supplemented with oregano. Significant decreases were generally observed in the phenolic values of all herb added samples on 28th day.
On the other hand, cheeses enriched with rosemary had higher DPPH (2,2,-diphenyl-1-picrylhydrazyl) scavenging activity than samples with oregano for both packaging conditions. Both modified atmosphere and vacuum packaged control cheeses showed as high DPPH scavenging activity as rosemary enriched cheese samples especially on 14th and 28th days.
The highest proteolytic activity was determined in rosemary enriched lor cheese which was packaged under modified atmosphere. The activity reached the highest values on 14th day and then decreased on 28th day in all experimental cheeses.

Conclusion / Discussion: Rosemary addition improved the antioxidant activity of probiotic lor cheese especially at modified atmosphere packaged probably due to its high phenolic content and proteolytic activity in comparison to oregano addition.

Keywords: oregano, rosemary, lor cheese, antioxidant activity, proteolytic activity

References:

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ORAL PRESENTATION - 15

DETERMINATION OF SOME FLAVONOIDS AND ANTIMICROBIAL BEHAVIOUR OF SOME PLANTS EXTRACTS

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Objective/Purpose: Antimicrobial activity against 15 disease pathogens was studied in ethanol water extract of *Cannabis sativa, Cichorium intybus, Lavandula stoechas, Valeriana officinalis* and *Glycyrrhiza glabra* and was investigated the presence of some flavonoids by HPLC.

Material and Methods: *C. sativa, C. intybus, L. stoechas, V. officinalis and G. glabra* was used in this study. The plant was extracted with solvent prepared by mixing 65% ethanol and 35% distilled water. The extracts was investigated in terms of their antimicrobial activities against 15 microorganisms, namely, *Bacillus subtilis DSMZ 1971, Candida albicans DSMZ 1386, Enterobacter aerogenes ATCC 13048, Enterococcus faecalis ATCC 29212, Enterococcus faecium, Escherichia coli ATCC 25922, Klebsiella pneumoniae, Pseudomonas aeruginosa DSMZ 50071, Pseudomonas fluorescens P1, Salmonella enteritidis ATCC 13075, Salmonella infantis, Salmonella Kentucky, Salmonella typhimurium SL 1344, Staphylococcus aureus ATCC 25923 and Staphylococcus epidermidis DSMZ 20044* by using the disk diffusion method and techniques of MIC (Minimum Inhibitory Concentration), MBC (Minimum Bactericidal Concentration) and MFC (Minimal Fungicidal Concentration). Furthermore, the presence of eight flavonoids were analyzed by using HPLC.

Results: Every extract inhibited the development of microorganisms at different rates: *C. sativa: Salmonella enteritidis, Candida albicans, Enterococcus faecalis and Salmonella typhimurium, C. intybus: Candida albicans and Enterococcus faecalis, L. stoechas: Salmonella enteritidis, V. officinalis: Salmonella enteritidis and G. glabra*: *Enterococcus faecalis.*

Conclusion / Discussion: The extracts of *C. sativa, C. intybus, L. stoechas, V. officinalis* and *G. glabra* showed antibacterial activity against tested microorganisms at different levels. The flavonoids were determined at different amounts in extracts.

Keywords: *Cannabis sativa, Cichorium intybus, Lavandula stoechas, Valeriana officinalis, Glycyrrhiza glabra*, Antimicrobial activity, flavonoid

ORAL PRESENTATION - 16

MINERAL COMPOSITION OF ACORN COFFE

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Background: Wild plant nuts have been important food resources, mainly staple substitute in food crisis periods, during the human history. Acorns which are fruits of *Quercus* trees growing in Mediterranean climate are also important wild food and feed source with high nutritive value. Besides its folkloric food uses for human diets and important feed source especially in poultry, processed acorns have been used as herbal coffee in some regions. Nutritional values and mineral compositions of wild edible plants have been studied and many publications were released up to now.

Objective / Purpose: Herbal coffees (Terebinth, Black cumin, Carob, Date and Gundelia coffees) have been produced different plant parts of some species. Having rich mineral compositions and lower health risks herbal coffees have been substituted by true coffee produced from *Coffea arabica*. As novel products and functional foods, herbal coffees have recently been analyzed their chemical compositions and biological activities [1,2,3]. There is limited information about acorn coffee chemical properties and no information has been found about its mineral composition. Therefore, mineral composition of acorn coffees produces in two different way and raw fruits were evaluated for their mineral compositions.

Material and Methods: Acorns used in the present study were harvested from wild *Quercus coccifera* L. tree and shrubs in Kilis, located in Eastern Mediterranean Region in November 2016. Acorns were dried, peeled and prepared for laboratory analysis. Acorn coffees were processed by two ways; boiled-roasted-grouns and roasted-ground. In raw peeled acorns and acorn coffees preapred by two different process were analyzed their mineral compositions by ICP-AES. Al, B, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Ni, P, Pb, S and Zn were determined in the samples.

Results and Discussion: According to analysis results, raw peeled acorns and acorn coffees prepared by different ways had different mineral compositions. Processing affect mineral composition, difference among the processing changed by minerals. Compared by other herbal coffees and thier raw materials, raw peeled acorn and two accorn coffee product had lower mineral composition (Şekeroğlu, 2012). Heavy metal consantrations in analyzed acorn and acorn coffee samples were much lower than that the acceptable limits for herbs and spices by WHO [4].

Conclusion: As a traditional and staple food source in Mediterranean, acorn have recently been rediscovered as a novel herbal product and functional food. Although acorn coffee is traditional hot drink in rural areas by substitution true coffee, it has a great potential as industrial product soon. Determining its useful and hazardous minerals for human health was the first step of its usefulness in food industry. Further studies are needed to prove biological activity, safety, toxicity and nutritive values of acorn coffee.

Keywords: Acorn coffee, functional food, herbal coffee, mineral composition, Quercus *coccifera* L.

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ORAL PRESENTATION - 17

SEPARARION AND IDENTIFICATION THE SPECIATION OF THE PHENOLIC COMPOUNDS IN FRUITS AND LEAVES OF SOME MEDICINAL PLANTS (*Juniperus phoenicea AND Quercus coccifera*) GROWING AT AL –GABAL AL –AKHDER REGION (LIBYA)

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Objective: This study aimed to separation and determination the phnolic compound in two medicinal plants (*Juniperus phoenicea* and *Quercus coccifera*) collected from al –gabal al –akder region(Libya).

Material and Methods: Different types of solvents were used in this study ,then the phenolic compounds were identified by using GC –Mass instrument

Results: The contents of the phenolic compounds can be summarizing as following :Juniperus phoenicea leaves :4,5-Dicaffeoly guinic acid (0.003047 mg/g), Cinnamic acid (0.00000696 mg/g), Galic acid (0.0161mg/g) Geraniol (0.000644 mg/g), Phloridzin (0.00000297 mg/g), Quercetin (0.02033 mg/g) and Catecin (0.0424 mg/g). On the other side in *Juniperus phoenicea* fruits :3,4-Dicaffeoly guinic acid (0.00115 mg/g), Galic acid (0.0000975 mg/g and Catecin (0.0424 mg/g). While in *Quercus coccifera* plan : The concentrations were fluctuated as following: *Quercus coccifera* leaves: Chlorogeneic acid (0.0115 mg/g), 3,4-Dicaffeoly guinic acid (0.129 mg/g), 3,5-Dicaffeoly guinic acid (0.309 mg/g), 4,5-Dicaffeoly guinic acid (0.0161 mg/g), 2,5-dihydroxy Benzoic acid (0. 0000589mg/g), and Galic acid (0.166mg/g). While in *Quercus coccifera* fruits the contents were recorded as following : (0.0197 mg/g), (0.102 mg/g), (0.132 mg/g), (0.205 mg/g), and cinnamic acid (0.000698mg/g).

Keywords: Phenolic compounds, Medicinal plants, growing, Libya

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ORAL PRESENTATION - 18

INVESTIGATION OF GENETIC DIVERSITY IN DIFFERENT FERN SPECIES BY SRAP MARKERS

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Objective / Purpose: Ferns, which were known to be exist since ancient periods, were first observed on earth approximately 300 million years ago at the Devonian Era. Considering that no other species were living on earth at that Era, existence of ferns and the diversification of their form becomes a phenomenal subject. Ferns also described as the source of the worlds' coal beds. With all these facts, to determine the endemic species and the taxa locations become essential both for the agricultural and many other disciplines. In this study, genetic diversity of different fern species growing in certain regions of Turkey was investigated using sequence related amplified polymorphism (SRAP) markers.

Material and Methods: Different fern species were collected from different part of Turkey. DNA isolations of plant materials were performed using CTAB method. DNA was successfully amplified by 20 SRAP combinations.

Results: Among 364 bands generated by the SRAP primers, 364 were polymorphic. The percentage of polymorphism was 100% based on SRAP data. All data were scored as discrete characters and unweighted pair group method with arithmetic mean (UPGMA) dendrogram and principle coordinate analysis (PCoA) scatter plot were constructed.

Conclusion / Discussion: Based on the results, fern genotypes showed high genetic diversity and we showed that SRAP markers are powerful tool to discriminate Turkish fern genotypes. The high genetic diversity existing in the Turkish germplasm suggests that it would be beneficial to utilize this pool in fern breeding programs and germplasm management activities.

Keywords: DNA, fern, SRAP, molecular characterization, PCR

ORAL PRESENTATION - 19

GENETIC DIVERSITY AND POPULATION STRUCTURE OF LOCAL ENDEMIC *TEUCRIUM LEUCOPHYLLUM* IN ERZINCAN REGION OF TURKEY

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Objective / Purpose: Medicinally, *Teucrium* (Lamiaceae) species have a long history of use as diuretic, diaphoretic, tonic, antipyretic, antidiabetic, antispasmodic, and cholagogic purposes [1]. *Teucrium leucophyllum* Montbret & Aucher ex Bentham is a rare and endemic plant species that shows narrow distribution around Erzincan (Turkey). According to the IUCN criteria, this species was evaluated as EX (Extinction) for many years. However, it has been rediscovered from its original localities [2]. The aims of the present study were determine genetic diversity levels and population structure of *T. leucophyllum* in order to obtain data for its conservation.

Materials and Methods: A total of 81 plants were sampled from 4 populations for DNA extraction. CTAB method was employed to isolate total genomic DNA. DNA quantifications were performed by using Nanodrop® ND-1000 spectrophotometer (OD260/OD280). PCR amplifications were performed in a 25 µL reaction mixture using ABI gradient thermocycler. PCR products were run on 1.4% agarose gel and photographed with the UVIpro Gel Documentation System. A binary matrix was produced by scoring each amplified fragment as present (1) or absent (0) from each individual. The matrix was used to produce an input file and analyzed using the software programs; POPGENE 1.32, GenAlex, MEGA and STRUCTURE.

Results: A total of 434 clear and reproducible bands was amplified, of which 431 were polymorphic (99.31%). The genetic diversity was high at the species level; the effective number of alleles (*Ne*) was 1.4046, the observed number of alleles (*Na*) was 1.9931 and the Nei's genetic diversity (*H*) was 0.2633, and the Shannon's information index (*I*) was 0.4183. A high level of gene flow (*Nm*: 2.2087), in line with low genetic differentiation (G_{ST}: 0.1846) were also observed. Analysis of molecular variance showed that 11% of the total genetic diversity resided among populations, while 89% within the populations.

Conclusions/Discussion: Compared to genetic diversity levels found in other endemic species, *T. leucophyllum* maintains high levels of genetic diversity.

Taking this into consideration along with small number of populations, it is necessary to protect all existing natural populations in order to maintain genetic diversity. However, in the long term, the most suitable strategy for the conservation of this species is the protection of its habitat.

Keywords: Genetic diversity, ISSR, Endemic, *Teucrium leucophyllum*

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ORAL PRESENTATION - 20

CAN IT BE PREVENTED TESTICULAR DAMAGE CAUSED BY METHOTREXATE BY USING *URTICA DIOICA* SEED EXTRACT: AN INVESTIGATION ON HISTOPATHOLOGICAL, IMMUNOHISTOCHEMICAL, BIOCHEMICAL AND SPERMATOLOGICAL

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Objective: The ameliorative potential and antioxidant capacity of an extract of *Urtica dioica* seeds (UDS) was investigated using histopathological, immunohistochemical, biochemical and spermological changes in testicles tissues of rats exposed to Methotrexate (MTX).

Material and Methods: A total of 32 rats were divided randomly into 4 groups: control, UDS extract-treated, MTX-treated and MTX+UDS extract-treated. Rats in control and UDS extract-treated groups were fed on with standard pellet. MTX group rats were fed on with standard pellet and received 20 mg/kg dose of MTX (IP) in first and fifth days. MTX+UDS group rats were fed on with pellets included 30 ml/kg UDS extract and received 20 mg/kg MTX (I.P.) in first and fifth days. After six week trial period, blood and samples of testicles tissue were taken for biochemical, histopathological, immunohistochemical analysis after the necropsy. In addition, semen were taken via a puncture of epididymis for sperm examination.

Results: Testicles protection by UDS extracts was further supported by the almost normal histology in MTX +UDS extract-treated group as compared to the degenerative changes in the MTX-treated rats. Immunohistochemically, Glutathione peroxidase 1 (GPx1) immunoreactivity was detected more intense in the MTX + UDS group than in the MTX group.

Administration of supplementary UDS extract helped restore the MTX-induced increase in MDA and reduced the antioxidant system towards normality in the testicles. Spermatologic examination revealed significant differences in density, motility, dead-live sperm ratio and abnormal sperm rate in group MTX compared to MTX + UDS group.

Conclusion: It was concluded that UDS extract has a protective testisles effect in rats affected by MTX.

Keywords: Methotrexate toxicity, *Urtica dioica* seed extract, Pathology, Rat

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ORAL PRESENTATION - 21

CHEMICAL CHARACTERIZATION OF DIFFERENT TYPES OF GABA TEA (*Camellia sinensis* (L.) Kuntze) BY A MULTI-METHODOLOGICAL APPROACH

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Objective / Purpose: Tea (*Camellia sinensis*) is the second most popular beverage consumed worldwide for its sensorial properties and health-promoting effects, ascribed to the high content of polyphenols and many other bioactive compounds (i.e. xanthines, and proteic and non-proteic amino acids). In the late 1980s, in Japan a new type of tea, naturally rich in γ-amino butyric acid (GABA), which accumulates within tea leaves during the manufacturing process, was discovered. Even though the growing demand for GABA tea registered over the last decade because of its beneficial properties, little is known about its composition. This triggered us to investigate the metabolic profiling of select teas differing from production process and origin country.

Material and Methods: a multi-methodological approach, including RP-HPLC-PDA-ESI-MS^n, RP- HPLC coupled with fluorimetric detector (FD), and NMR spectroscopy, combined with a multivariate data analysis, was used to determine tea phytochemical composition.

Results: green and GABA green teas had similar caffeine and polyphenol composition, both qualitatively and quantitatively. Differently, GABA content is higher in GABA green teas than green tea samples. On the contrary, GABA oolong tea samples resulted to be different in polyphenol, caffeine, and amino acid composition, showing a lower content of flavan-3-ols, caffeine, and glutamic acid, and a higher content of GABA in comparison with oolong teas.

Conclusion / Discussion: our results suggest that the healthy properties of GABA teas have to be considered on the basis not only of the content of a single component (especially GABA), but taking into account the comprehensive metabolic profiling.

Keywords: Green tea, Oolong tea, GABA tea, NMR, HPLC-PAD-ESI-MS^n

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ORAL PRESENTATION - 22

ONTOGENETIC VARIATIONS OF ESSENTIAL OIL CONTENT AND COMPONENTS OF BAY LAUREL (*Laurus nobilis* L.) GENOTYPES AND LEAF ASPECTS FOR SPICE QUALITY

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Objective / Purpose: This study was carried out to determine the ontogenetic variability of bay laurel essential oil contents and components and to examine the leaf characteristics of selected 12 bay laurel plants in flora of Hatay-Turkey.

Material and Methods: The leaves of 12 bay laurel plant genotypes were gathered every month throughout the year and the essential oil contents and components were identified. In order to determine the spice quality of the leaves, bay laurel plants were examined in terms of phenological, morphological and some spice characteristics in three different physiological periods (March-spring flowering period, June-after flowering period, December- beginning of the winter dormancy period) during the year. All trials were conducted with three replications for two years. Leaves were dried and hydro distilled for 3 hours with Clevenger apparatus, and then analysed with GC-MS (Thermo Scientific ISQ).

Results: The leaves essential oil content of bay laurel genotypes ranged between 1.35-7.20% in different harvest times. In general, the essential oil content reached high level from June through November. Eucalyptol (1,8 cineole) were determined as the main component of the essential oil and eucalyptol contents of genotypes valued between 31.85-53.95% as regards to harvest time. The percentage of dry leaf weight (35.22-60.45%), leaf area (3.75-10.95 cm²), leaf thickness (322.3-747.7 µm), chlorophyll SPAD values (36.70-54.70), total ash content (0.21-1.19%) and crude cellulose content (17.20-28.10%) were also determined.

Conclusion / Discussion: As a result the genotypes E1 and HB8 were identified as candidate essential oil cultivars for registration.

Keywords: Bay laurel, *Laurus nobilis* L., ontogenetic variability, essential oil, chlorophyll values.

ORAL PRESENTATION - 23

ECONOMIC ANALYSIS OF POST-FIRE CULTIVATION OF SOME MEDICINAL AND AROMATIC PLANTS WITH MODEL FOREST NETWORK APPROACH

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Objective / Purpose: This research was aimed to adaptation and production of lavender, medical sage and rosemary plants according to management of model forest network approach after fire openings at new planted pine forest of ecology.

Material and Methods: Lavender, medical sage and rosemary were used as material and benefit cost ratio [1], net present value [1], and internal rate of return are used as methods [1] .

Results: The rosemary, sage and lavender plants were adopted locally and grown under natural conditions without any cultural processing. According to evaluated data, for lavender production; benefits expense ratio was 2.19, internal profitability was 35% and net present value was calculates as 1699.50 ₺, for sage production; benefits expense ratio was 1.6, internal profitability was 28% and net present value was calculates as 1775.50 ₺ and for rosemary production; benefits expense ratio was 1.8, internal profitability was 35% and net present value was calculates as 2586.13 ₺.

Conclusion / Discussion: According to economic analysis of cultivation of rosemary, medical sage and lavender plants with model forest, network approach at post-fire forest area benefit cost ratio was greater than 1and their internal profitability is more than the current interest rates of the country so that this model of production is recommended.

Keywords: medical and aromatic plant, utility cost, net present value, internal profitability

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ORAL PRESENTATION - 24

A PRELIMINARY MACROFUNGAL LIST OF TURKISH REPUBLIC OF NORTHERN CYPRUS (TRNC)

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A survey was done to reveal macrofungal distribution of Turkish Republic of Northern Cyprus during 2015-2016 years. In the field and laboratory studies, 84 macrofungal species belonging to 2 divisions and 40 families were identified. Among them, 5 families, 8 genera and 9 species are in Ascomycota, 35 families, 58 genera and 75 species in Basidiomycota. Moreover, 59 species were found for the first time in the Northern Cyprus mycobiota. A distribution and some special features of the species are given in the study.

Keywords: Macrofungi, diversity, new record, Cyprus.

* This study is supported by the protocol of the TRNC TAGEP-Cukurova University.

ORAL PRESENTATION - 25

SYNTHESIS AND CHARACTERIZATION OF SILK FIBROIN MICROPARTICLES CONTAINING LINSEED OIL

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Objective / Purpose: The aim of this study was to synthesize and characterize silk fibroin micro particles containing linseed oil for biomedical and pharmaceutical applications.

Material and Methods: Silk fibroin has been purified from *Bomboxy Mori* silk cocoons obtained from North Cyprus villages. Ionic gelation method was used by using 0.1 M ($Na_2O_{10}P_3$) sodium triphosphate pentabasic solution (pH = 9). All other chemicals were purchased from Sigma-Aldrich.

Results: Silk fibroin coated linseed oil micro particles have been successfully synthesized. The influence of pH on swelling and solubility properties of silk fibroin – linseed oil (SF-LO) micro particles have been studied. Micro particles were insoluble in basic (pH = 9) and acidic (pH = 1) solutions. They were soluble in ultrapure water (pH = 7). Morphology studies have been carried out by using inverted microscope. Micro particles with a uniform spherical shape 4.300-5.500 µm in diameter and 10-20 µm in shell thickness were successfully prepared by using ionic gelation method. As time passed, electrostatic attractions caused micro particles to agglomerated and sphere shape occurred. The morphology analysis of the sphere shape material has been analysed by stereomicroscope.

Conclusion / Discussion: The results indicated, silk fibroin coated linseed oil micro particles have been successfully synthesized and that electrostatic attractions played important role in the sphere shape formation. Solubility studies concluded that, silk fibroin coated linseed oil micro particles have potential applications both in biomedical and pharmaceutical disciplines.

Keywords: silk fibroin, linseed oil, micro particles, solubility

ORAL PRESENTATION - 26

CHEMICAL COMPOSITION, ANTIMICROBIAL AND ANTIOXIDANT ACTIVITIES OF THE ESSENTIAL OIL OF *BURSERA GRAVEOLENS* (*BURSERACEAE*) FROM PERU

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Objective / Purpose: Palo santo (holy branch) oil is an important component of the traditional Peruvian medicine and is known to have antibacterial properties. This essential oil is extracted from fallen branches of the tree *Bursera graveolens*. To validate some of its properties, the antimicrobial and antioxidant activities of palo santo oil obtained from northern Peru were first examined.

Material and Methods: Based on the measurements of the diameter of growth inhibition (Disc Agar Diffusion method), antimicrobial activities ranging from moderate to high were revealed against *Staphilococcus aureus, Bacillus cereus, Listeria monocytogenes, Clostridium perfringens, Escherichia coli, Salmonella choleraesuis* and *Candida albicans*. This study confirms that the essential oil of B. graveolens demonstrates significant antimicrobial properties. An antioxidant activity of IC_{50} = 545.25 µg/mL was determined using the 1,1-diphenyl-1-picrylhydrazil(DPPH), radical discoloration test. The phenol content was found to be 5.71 mg phenols/100 g using the Folin – Ciocalteu method.

Results: To learn more about the composition of this essential oil, it was submitted to hydrodistillation and analysis by gas chromatography. Twenty-six compounds were identified, representing 67.1 % of the total oil. The most abundant compounds were α –Terpinene (31.57%), isocaryophillene (6.61%), pyperitone (5.61 %), β-trans-ocimene (4.93%), 6-allyl-o-cresol (4.63 %), 1-tetradecen 3.27%), durenol (2.36 %), linalol (1.53%), 3-octanol (1.1%) germacren (0.92 %). Thus, different types of monoterpenes were the predominant constituents of the essential oil.

Keywords: *Bursera graveolens*, antimicrobial activity, antioxidant activity.

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ORAL PRESENTATION - 27

HARVEST NUMBER AND GROWING SEASON EFFECTS ON QUALITY AND HEALTH RELATED COMPOUNDS IN PARSLEY

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Objective / Purpose: Parsley *(Petroselinum crispum* L.) belong to the Umbelliferae family and are mostly grown outdoors and harvested seasonally. It's popular fresh herbs in the world for aromatic and valuable biochemical compounds [1]. Biologically active compounds are known to influence human health, these affect different activities at the physiological or cellular level therefore investigations in this case are very important and useful [2].

Material and Methods: The effects of harvest numbers for two growing seasons, namely summer and winter, both of which are widely preferred in temperate climates, have been investigated on quality and health promoting compounds of parsley such as dry matter, color values, chlorophylls, vitamin C, antioxidant activity and total phenol content. The experiment was conducted during 2014 and 2015 in the experimental fields of Ödemiş Vocational School at Ege University, Izmir, Turkey. Seed material of parsley obtained from regional farmers. The trials were set up in randomised complete block design, with three replications.

Results: Statistically significant differences were identified for color values, chlorophylls and total phenol between harvest numbers for both growing seasons. On the other hand, Vitamin C and antioxidant activity were not affected significantly by harvest numbers for both growing seasons. Dry matter content increased with increasing harvest numbers for only summer growing season. Darkest leaves were obtained from fourth harvest for summer growing season; from second harvest for winter growing season. First harvest had the highest chlorophyll a and b with 36.98 and 15.90 mg/100 mg, respectively; harvest numbers analyzed declined in the following order: first harvest > fourth harvest > third harvest > second harvest for summer growing season. Total phenol content decreased with increasing harvest numbers, with losses between 9 and 22% for summer growing season. Contrarily to the summer growing season, total phenol content increased slightly with increasing harvest numbers by 5% for winter growing season.

Conclusion / Discussion: It can be concluded that depending on harvest numbers either an increase, a decrease or no effect in quality and health related compounds of parsley seemed to occur. Summer growing season may be taken more seriously,

since it creates a better environment for the expression of different quality traits as compared to winter season production.

Keywords: *Petroselinum crispum* L., harvest number, antioxidant activity, total phenol.

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ORAL PRESENTATION - 28

PROTECTIVE EFFECTS OF RHEUM RIBES AND URTICA DIOICA ON CARBON TETRACHLORIDE TOXICITY IN MALE RATS

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Objective / Purpose: Exposure to carbon tetrachloride (CCl_4), a well-known toxicant, causes tissue damage by inducing oxidative stress via formation of free radicals. In this study, we evaluated the protective capacity of Rheum ribes (Rr) and Urtica dioica (Ud) against CCl_4-induced liver damage in cirrhotic rats.

Material and Methods: Rats were divided into ten groups each containing seven rats as follows: Control group, CCl_4 group, Rr (200 mg/kg) group, Rr (400 mg/kg) group, Ud (200 mg/kg) group, Ud (400 mg/kg), CCl_4+Rr (200 mg/kg) group, CCl_4+Rr (400 mg/kg) group,. CCl_4+Ud (200 mg/kg) group and CCl_4+Ud (400 mg/kg) group. The activity analysis of liver enzymes (aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyltransferase (GGT)) was performed using serum, and the activity of antioxidant enzymes as superoxide dismutase (SOD) and glutathione peroxidase (GPx) was established in the liver. The tissue samples were processed by routine histological and immünohistochemical procedures. Sections were stained with Hematoxylin-eosin, cysteine-dependent aspartate-directed proteases 3 (Caspase-3) and 8-hydroxydeoxyguanosine (8-OhdG) methods.

Results: The liver sections of control groups showed normal histological characteristics. The lobular architecture of liver tissue was deformed in liver sections of rats exposed to CCl_4 alone. The findings were reduced in the treatments groups.

Conclusion / Discussion: We suggest that plants such as Rr and Ud can markedly have positive effects in the treatment of liver diseases characterized by especially edema, inflammation, and fibrosis.

Keywords: Rheum ribes, Urtica dioica, liver, cirrhosis, Oxidative stress.

ORAL PRESENTATION - 29

PROTECTIVE EFFECTS OF *BRYONIA MULTIFLORA* EXTRACT ON PANCREATIC BETA CELLS, LIVER AND KIDNEY OF STREPTOZOTOCIN-INDUCED DIABETIC RATS: HISTOPATHOLOGICAL AND IMMUNOHISTOCHEMICAL INVESTIGATIONS

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Objective: In this study, the ameliorative potential and antioxidant capacity of treated with different doses of *Bryonia multiflora* extract (BE) was investigated using histopathological and immunohistochemical changes in pancreatic beta cells, liver and kidney tissues of streptozotocin (STZ)-induced diabetic rats**.**

Material and Methods: A total of forty-two healthy adult Wistar albino male rats were divided randomly into six groups as Control (C); Diabetes mellitus (DM); DM+Akarboz 20 mg/kg; DM+100 mg/kg BE extract (BE1); DM+200 mg/kg BE extract (BE2); DM+400 mg/kg BE extract (BE3). Experimental diabetes was established by a single-dose [45 mg/kg, intra-peritoneal (i.p)] STZ injection. Essential dosages of BE extracts and Akarboz were applied with gastric gavage for 21 day. Blood glucose levels were recorded throughout the all experiment period.

Results: Histopathological studies showed that hepatorenal and pancreatic protection by depending on the dose level of BE extracts was further supported by the almost normal histology in DM+ BE extract-treated group as compared to the degenerative changes such as disorder of architectural structure, inflammatory cell infiltration, hydropic degeneration and necrosis in pancreas, liver and kidney tissues of STZ-treated rats.Immunohistochemical investigation revealed that STZ-induced degenerative changes in beta-cells in the pancreas of the diabetic rats has reduced insulin immunoreactivity. On the other hand, insulin immunoreactivity in the β cells of pancreas of BE –treated diabetic rats has significantly increased.

Additionally, Glutathione peroxidase 1 (GPx1) immunoreactivity was lower in the tissues of diabetic rats (DM group) compared to the other groups.

Conclusion: In conclusion, BE extract has a protective effect on tissue damage probably due to its antioxidant activity and possess the ability to regenerate β-cell in STZ-induced diabetic rats.

Keywords: Diabetes mellitus, *Bryonia multiflora* extract, Histopathology, Immunohistochemistry, Rat.

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ORAL PRESENTATION - 30

AUTOBIOGRAPHY AND ANTIFUSARIC ACTIVITY OF TWO VEGETAL TARS OF SOUTH WEST ALGERIA

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This work is interested in the study of the antifusaric activity of the tarry and oily parts of two shrubs (*Juniperus oxycedrus* and *Olea europeae sylvestris*). The activity is tested against four fungal strains (*Fusarium oxysporum f.sp albedinis* (S1, S2, S7), *Fusarium graminearum* (S6) at different concentrations. The autobiography revealed the existence of 3 anti-FOA molecules.

The results of antifungal activity showed that the samples of tars and oils (T1, T2, O1, O2) completely inhibit the growth of fungal strains tested. For T1 inhibition was observed with an MIC of 0.171 mg / ml for FOA (S2) and *Fusarium graminearum* (S6) and 0.429 mg / ml for FOA (S7) and FOA (S1). Concerning T2 the MIC is on the order of 0.163 mg / ml for FOA (S2), 0.408 mg / ml for *Fusarium graminearum* (S6) and FOA (S7) and a MIC 0.817 mg / ml for FOA (S1).

While O1 inhibits growth with MIC of 0.162 mg / ml for FOA (S1) and FOA (S2) and for *Fusarium graminearum* (S6) and FOA (S7) the MIC is on the order of 0.012 mg / ml, and 0.014 mg / ml respectively. O2 shows an MIC of the order 0.014 mg / ml for FOA (S7) and a MIC of 0.159 mg / ml for FOA (S1), FOA (S2) and *Fusarium graminearum* (S6).

Analysis of tar samples from both shrubs by thin layer chromatography (TLC) showed 192 spots in the three mobile phases. The valorization of the TLC plates using an autobiography technique based on Iodo-nirtro tetrazolium as developer showed the presence of 3 spots of anti-FOA activity.

Keywords: Tar - Oil - Juniperus oxycedrus - Olea europeae sylvestris - Antifungal activity - TLC chromatography, autobiography, Fusarium oxysporum sp albedinis

ORAL PRESENTATION - 31

APPLICATION OF BIOAPIFIT® ANTI-INFLAMMATORY OINTMENT FOR THE TREATMENT OF ATOPIC DERMATITIS IN CHILDREN

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Objective / Purpose: The purpose of this work was development and testing of new herbal ointment for the treatment of atopic dermatitis in children.

Material and Methods: 50 patients (4 to 56 months old) were treated 8 weeks (every four hours) with the ointment containing the following ingredients*: Avena sativa, Nigella sativa, Argania spinosa, Prunus amygdalus, Daucus carota, Helichrysum italicum, Calendula officinalis, Matricaria chamomilla, Bellis perennis, Lavandula officinalis, Achillea millefolium,Thymus serpyllum, Salvia officinalis, Symphytum officinale, Plantago major, Olea europaea, Melaleuca alternifolia, Cera alba*, honey, and glycerol. The severity of the disease prior and after the therapy was assessed by SCORAD index.

Results: The total score before the therapy ranged from 23.1 to 99.4 (66.50±23.43). Among the tested patients 76%, 20% and 4% had severe, moderate and mild symptoms, respectively. In the end of the therapy the total score decreased more than 20 times compared to the initial value and ranged from 0 to 14 (13.18±4.29). The intensity parameters (swelling, oozing/crusting and scratch marks) as well as subjective parameters (itch and sleeplessness) disappeared completely.

Conclusion / Discussion: Two months of the topical treatment with Bioapifit® ointment resulted in complete remission of the symptoms in 56% of the patients while in another 44% of them only mild symptoms are recorded that could be ascribed to the ointment's formulation containing emollients, strong anti-inflammatory, immunomodulating, wound healing and antimicrobial agents that simultaneously targeted the multiple mechanisms involved in AD pathogenesis. This ointment could be used as alternative therapy to topical corticosteroids and immunomodulants.

Keywords: atopic dermatitis, children, Bioapifit® herbal ointment, SCORAD index

ORAL PRESENTATION - 32

THE INVOLVEMENT OF NO–CGMP–ATP SENSITIVE K+CHANNELS PATHWAY IN PROTOCATECHUIC ACID PERIPHERAL ANALGESIA

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Objective: Protocatechuic acid (PCA) is a type of widely distributed natural bioactive phenolic acid. The various pharmacological activities such as antioxidant, antidiabetic and anti-inflammatory activities have been identified[1]. However, the studies focused on the analgesic effect of PCA are limited and the action mechanisms of PCA still remain unclear. The present study was conducted to evaluate the peripheral analgesic effect of *p.o.* administration of protocatechuic acid (PCA), and investigate the involvement of NO–cGMP–ATP sensitive K^+ channels pathway in analgesic effect in acetic acid induced writhing test in mice.

Material and Methods: The NO-cGMP-ATP-sensitive K^+ channels pathway is an additional mechanism for the action of some peripheral analgesics and this events' sequence would be considered as an antagonistic mechanism to the hyperalgesic state that occurs in inflamed tissues[2]. Previously, we found that PCA has a peripheral analgesic effect in writhing test at the doses of 75, 150 and 300 mg/kg (p.o.)[3].

Results: In this study it was also demonstrated that pre-treatment with glibenclamide (10 mg/kg, *i.p.*), an ATP-sensitive K^+channel blocker, and methylene blue (20 mg/kg, i.p.), a guanylate cyclase (GC) inhibitor, did not notably change antinociception produced by 300 mg/kg PCA, however administration of nitro-L-arginine methyl ester (L-NAME) (10 mg/kg, *i.p.*), a nitric oxide synthase (NOS) inhibitor, significantly reversed PCA antinociception.

Conclusion: The present results indicate that the peripheral antinociceptive action of PCA involved another NO related pain pathway, not NO–cGMP–ATP sensitive K^+channels pathway. The other possible NO related pain pathway involvement in PCA antinociception is still under investigation.

Keywords: Protocatechuic acid, writhing test, NO–cGMP–ATP sensitive K+channels pathway

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ORAL PRESENTATION - 33

PHENOLIC CHARACTERIZATION OF EXTRACTS FROM *VINCA* SPECIES AND THEIR'S CYTOTOXIC EFFECTS ON MULTIPLE MYELOMA

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Objective / Purpose: The objectives of this study, to compare the phenolic content of leaf extracts from *Vinca* species (*V. herbaceae* and *V. soneri*) and to determine cytotoxic effects on multiple myeloma cells.

Material and Methods: For this aim *Vinca* species were collected from their localities. The plants were extracted with metanol by using Soxhlet apparatus. After extraction, extract was evaporated and prepared for HPLC analyses. 17 phenolic standards were used to determine phenolic contents of the extracts. For cytotoxicity analyses ARH-77 cells were grown under the conditions of 5% CO_2 at 37°C. WST-1 assay was performed to determine cytotoxicity of plant extracts and cell proliferation.

Results: HPLC analysis results were shown the differences between the extracts. Especially at *V. herbaceae* extract's rutin trihidrat amount is more than *V. soneri* extract. WST-1 results were shown that at 0,1- 0,01% dose range *V.herbaceae* extract is more effective than *V.soneri*. IC_{50} dose approximately 0,02% for *V.herbaceae* and 0,04% for *V.soneri.*

Conclusion: These results encourage further studies of the extracts from *Vinca* species. Molecular investigation is planned to determine the mechanism of growth suppression of tumor cell lines and to determine the cell death via apoptosis or necrosis.

Keywords: ARH-77, WST-1, multiple myeloma, Turkey.

ORAL PRESENTATION - 34

A HISTOPATHOLOGICAL AND IMMUNOHISTOCHEMICAL STUDY OF ANTIDIABETIC EFFECTS OF *HERACLEUM PERSICUM* EXTRACT IN EXPERIMENTALLY DIABETIC RATS

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Objective: In this study, the histological and immunohistochemical changes to pancreatic beta-cells liver and kidney in STZ-induced diabetes were evaluated in rats treated with different doses of *Heracleum persicum* (HP).

Material and Methods: Forty-two Wistar albino male rats were divided into six groups including Control (C); Diabetes mellitus (DM); DM+Akarboz 20 mg/kg; DM+100 mg/kg HP extract (HP1); DM+200 mg/kg HP extract (HP2) and DM+400 mg/kg HP extract (HP3). Experimental diabetes was established by a single-dose [45 mg/kg, intra-peritoneal (i.p)] STZ injection. Essential dosages of HP extracts and Akarboz were applied with gastric gavage for 21 day Blood glucose levels were recorded throughout the all experiment period.

Results: In histopathological evaluation of the stained liver and kidney sections of diabetic rats showed degeneration and necrosis of hepatocytes, inflammatory cell infiltration and hydropic degeneration and necrosis in tubulus epithelial cells, disorder of glomerular structure and lymphocyte infiltration. These histopathological changes were ameliorated in the HP-treated rats depending on the dose level. STZ-induced degenerative changes in beta-cells caused decreases in the number of functioning beta-cells and insulin immunoreactivity in the pancreas of the diabetic rats. The pancreas of HP-treated rats were improved and the number of immunoreactive β cells were significantly increased.

Conclusion: In conclusion, our data suggests that the STZ-induced immunohistochemical and histopathological alterations could be prevented by HP extract probably due to possess the ability to regenerate β-cells.

Keywords: *Heracleum persicum,* Histopathology, Immunohistochemistry, Diabetes, Rat.

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ORAL PRESENTATION - 35

ANTI-INFLAMMATORY EFFECTS OF ESSENTIAL OILS FROM *Rosmarinus officinalis* AND *Populus alba* ON EXPERIMENTAL MODELS OF ACUTE AND CHRONIC INFLAMMATION IN RATS

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Objective / Purpose: Essential oils (EOs) distelled form aromatic plants have a wide range of uses because of their rich pharmacological activities including, antiinflammatory, antitumor, antimicrobial, antioxidant, antidiabetic and hepatoprotective. The present research aimed to investigate in-vivo anti-inflammatory effects of EOs from *Rosmarinus officinalis* and *Populus alba* as biomarker levels in well-defined acute and chronic inflammation models.

Material and Methods: The anti-inflammatory activity of EOs of *R. officinalis* and *P. alba* was carried out using two model, one of them is acute inflammation that induction by dextran 1% at the rat paw[1] and another is chronic inflammation that induction by monoiodoacetic solution[2]. To evaluate the anti-inflammatory properties of essential oils, a measure of paw thickness was carried out with the calculation of percent inhibition. Thus, monitoring of some biomarkers will be paramount.

Results / Discussion: The results indicate the absence of severe clinical signs or dead in rats during the observation period. Therefore, the essential oils of *R. officinalis* and *P. alba* are devoid of acute toxicity in rats. For treatment with the essential oil of *Rosmarinus officinalis*, *Populus alba* and Diclofenac®, the results showed a significant reduction for responses induced by dextran. Treatments produced reductions in inflammation ranging from 2.19 to 15.15%. Treatment with essential oils showed a recovery of values of biochemical markers during the experimental period. Consequently, the EOs of *R. officinalis* and *P. alba* demonstrate anti-inflammatory activity on both acute and chronic inflammation models.

Conclusion: It can be concluded that the EOs of *R. officinalis* and *P. alba* possess pharmacological potentials as anti-inflammatory agents.

Keywords: Anti-inflammatory, Essential oils, Experimental model, *Rosmarinus officinalis*, *Populus alba.*

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ORAL PRESENTATION - 36

VOLATILE COMPOUNDS FROM *CORALLINA OFFICINALIS* OBTAINED BY SUPERCRITICAL FLUID EXTRACTION

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Objective / Purpose: *Corallina officinalis* is a calcareous algae growing in circalittoral zone under dim light conditions. The objective was to analyze the volatile compounds present in algae which do not withstand high levels of irradiance.

Material and Methods: The red algae *Corallina officinalis* was collected in August, 2017 at south-eastern Adriatic coast, Montenegro. Grinded plant material was extracted with CO_2 in a lab-made supercritical fluid extraction system at the pressure of 30 MPa, temperature of 40ºC and with a CO_2 mass flow rate of 2.0 kg/h. The characterization and quantification of compounds present in the extract was performed by analytical GC (FID) and GC-MS apparatus.

Results: The volatile compounds present in *Corallina officinalis* CO_2 extract were: hydrocarbons, alcohols, aldehydes, organobromine compounds and terpenes. Phytol was present in a form of isomers. Most abundant compounds were: docasane, octadecane, 1-bromo-triacontane, glaucyl alcohol, phytol isomer, 1-octadecene, 2-bromo-octadecanal and squalene.

Conclusion / Discussion: Sophisticated method can be modelled to reveal and determine the volatile compounds present in algae.

Keywords: *Corallina officinalis*, volatile compounds, supercritical fluid extraction

ORAL PRESENTATION - 37

IN VITRO STUDIES TO EVALUATE THE WOUND HEALING PROPERTIES OF *QUERCUS COCCIFERA* EXTRACTS

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Objective / Purpose: A disruption in structural and physiological continuity of the skin and underlying tissues as a result of injury by physical, chemical, thermal, microbial, or immunological factors is called a wound. This disruption creates a potentially dangerous and possibly life-threatening situation. Proper healing of wounds is essential for improve patient quality of life. The basic principle of optimal wound healing is to minimize tissue damage and provide adequate tissue perfusion and oxygenation, proper nutrition and moist wound healing environment to restore the anatomical continuity and function of the affected part. Besides of the conventional remedies, phytomedicines turned out to be an interesting alternative or addendum to beneficially influence the different stages of wound healing. In this context, extracts from *Quercus coccifera* L. (Fagaceae) have gained more and more interest for investigation of their therapeutic potential in wound healing. We wanted to elucidate the underlying molecular mechanisms of wound healing properties of *Q. coccifera* stems extracts (QE).

Material and Methods: The effect of two different extracts from *Q. coccifera* stems (aqueous and methanolic) on the proliferative phase of wound healing was studied in mouse dermal fibroblasts. MTT tests were performed. The effect of QE on the new tissue formation phase of wound healing were evaluated by studying the migratory properties of these extracts in mouse dermal fibroblasts using the scratch assay. Finally, antimicrobial and antioxidant activities of QE relating to wound treatment were assessed by broth microdilution technique and DPPH/ folin-ciocalteu assays, respectively.

Results: The methanolic and aqueous extracts from Q. *coccifera* at 25-400 µg/ml concentration influenced the proliferative phase increasing the cell viability in a dose-dependent manner. Both extracts at 200 µg/ml affected the new tissue formation phase by activating (33.5 % and 71.88 %, respectively) the migration of fibroblast. The aqueous and methanolic extracts exhibited strong antimicrobial activity (MIC≤4) against to *Staphylococcus epidermidis, Bacillus subtilis, B. cereus* and *Proteus mirabilis*, otherwise these extracts exerted weak antimicrobial activity (MIC≥64) against to *S. aureus* and *Escherichia coli*. Both methanolic extract with IC50 58.70 and aqueous extract with IC50 76.38 showed strong antioxidant effect.

Conclusion / Discussion: Our results contribute to a better understanding of the wound healing properties of the traditional medicinal plant Q. *coccifera.*

Keywords: Wound healing, *Quercus coccifera*, scrath assay, MTT assay, antioxidant, antimicrobial

ORAL PRESENTATION - 38

EPICUTICULAR WAX OF ARISTOLOCHIA (ARISTOLOCHIACEAE)

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Objective / Purpose: Eepicuticular waxes showed variation in chemistry and structure in different plant groups. *Aristolochia* (Aristolchiaceae) with over 500 species in the world has 3 species in Iran as *A. olivieri, A. hyrcana and A. bottae* from which two first are endemics. These are perennial herbs with medicinal importance. Mahfoud 2009 pointed to the epicuticular waxes of Mediterranean elements of *Aristolochia*. He identified some distinct groups based on wax shape. Epicuticular wax of leaf dorsal epidermis has been considered here to find diagnostic features for species distinction. It is the first study of *Aristolochia* species in Iran.

Material and Methods: leaf dorsal epidermis segments of *Aristolochia* species, three native and two exotic species, were studied by Scanning electron microscopy. Characters were coded in binary or multistate and statistical analyses were done by use of SPSS ver. 20 and PAST ver. 2.17 softwares.
Barthlott et al (1998) terminology was used.

Results: Two main wax types were observed in native species. These were platelets of Convullaria type and rodlets of Aristolochia type. Orientation, density and margin shape of epicuticular wax showed differences in studied species. Wax features of *A. macrophylla* from east America and *A. gigantean* native to Brazil was compared with native ones.

Conclusion / Discussion: wax types were rodlets, which is the common feature in primitive woody angiosperms, and platelets which is common in Liliiflorous. Our findings are in concordance with Mahfoud (2009) and Barthlott et al. (1994). Wax findings are of diagnostic importance. Two morphologically similar species, *A. bottae* and *A. olivieri* showed different wax shape. Species relationships are discussed based on wax results.

Keywords: *Aristolochia*, Iran, Epicuticular Wax.

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ORAL PRESENTATION - 39

THE EFFECT OF FERTILIZATION AND MYCORRHIZA INOCULATION ON YIELD VARIABLES AND ESSENTIAL OIL CHARACTERISTICS OF COMMON SAGE (*Salvia officinalis* L.) GROWING IN THE GREENHOUSE AND FIELD

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Objective/Purpose: The present study was conducted both in the greenhouse (University of Massachusetts, Stockbridge Agriculture, CNS), and in the field (Agricultural Learning Center, UMass, Amherst, MA) in order to investigate the effect of mycorrhiza and various fertilization doses to the biomass, and essential oil characteristics of common sage (*Salvia officinalis* L.).

Material and Methods: Nitrogen, phosphorus and potassium and their combinations (Control, N, P, K, NP, NK, PK and NPK) were applied both mycorrhiza infected and non-infected samples. N:P2O5:K2O was applied with 1:0.43:0.56 dosses to the pots. The field trials were established as a randomized block design with three replicates. Following observations were taken, one from the Greenhouse (May 2nd, 2014) and two from field experiments (July 31st and October 8th, 2014), in total, from three harvests as; plant height (cm), number of shoot, canopy width (cm), 90° canopy width (cm), fresh herb (g), dry herb (g), and leaf area index (cm^2). Essential oils were extracted by steam distillation apparatus in the laboratory of Medicinal and Aromatic Plants Program, UMass, Amherst. Essential oils were characterized by GC-MS in the Medicinal and Aromatic Plants Laboratory of Bati Akdeniz Agricultural Research Institute.

Results: The greenhouse experiment revealed that myco inoculated pots were recorded high fresh, dry herb and a high leaf area index regarding to non myco inoculated plants. The mean fresh herb, dry herb yield, fresh leaf, dry leaf and leaf area indexes were recorded at non-mycorrhiza infected (-M) and mycorrhiza infected (+M) plants as; 258.41g and 342.66g; 56.18 g and 76.25 g; 200.60g and 255.80g; 44.71g and 59.37g; 3754.36 cm^2 and 4963.31 cm^2 per plant, respectively. The common point of all cuttings revealed that myco application gave positive interaction with fertilizer doses. Especially with Nitrogen and its combinations. Nitrogen fertilization enhanced the essential oil yield in both treatments and among their applications. The highest essential oil yield was obtained with 1.60% from –M NP combination and 1.60% from +M N combination. The mean essential oil yield was found to be 1.38% (-M) and 1.39%

(+M). Although no significant differences found between the treatments –M and +M, effect of fertilizer applications was significant at the 5% level.

Conclusion/Discussion: In the present study, the highest quantities of camphor was recorded at P (-M) and PK (+M) combinations as 31.64% and 33.54% respectively. These amounts were extremely high considered previous studies isolated from essential oil (Bernotiene et al., 2007). The reason why the camphor ratio was found to be so high might be due to the first year of the plantation. According to Croteau et al. (1981), the camphor content of sage leaves increases when the leaves enlarge.

Keywords: common sage (*Salvia officinalis* L.), fertilization, mycorrhiza *spp*., biomass, essential oil yield, camphor, α-thujone.

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ORAL PRESENTATION - 40

THE PHENOLIC COMPOUNDS ANALYSIS of *Cratoneuron filicinum* and *Campyliadelphus elodes* SPREAD IN ZONGULDAK

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Objective / Purpose: According to our knowledge, phenolic compounds of *Cratoneuron filicinum* and *Campyliadelphus elodes* (Amblystegiaceae family) have not been investigated so far. Therefore, our study aimed to find out both the qualitative and quantitative amounts of these bryophytes.

Material and Methods: The samples of the plants were picked from nature within Zonguldak provincial border. HPLC is used to detect the phenolic compounds and their quantitative amounts.

Results: Twelve different phenolic compounds were found. According to HPLC results, the largest amount of the phenolic compound obtained from *Cratoneuron filicinum* was biochanin A: 0,00126 mg/g (dry weight) and the highest amount of phenolic compounds obtained from *Campyliadelphus elodes* were gallic acid: 0,0040637 mg/g (dry weight) and biochanin A: 0,0044 mg/g (dry weight).

Conclusion/Discussion: The presence of phenolic compounds in bryophytes is economically crucial and has important chemical and pharmacological aspects.

Keywords: *Cratoneuron filicinum*, *Campyliadelphus elodes*, biochanin A, gallic acid.

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ORAL PRESENTATION - 41

SUPRAMOLECULAR ALLEVIATION OF HEPATOTOXICITY OF ARECOLINE (ARECA ALKALOID) BY A SYNTHETIC RECEPTOR

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Objective / Purpose: Areca nut has been recognised as the fourth most addictive self-administered psychoactive substance. Arecoline, the major active phytochemical in Areca nut that has been well studied for its beneficial role in various diseases including neurological disorders and cardiovascular diseases, has shown profound links with serious hepatotoxicity. This study was aimed to develop a supramolecular formulation of arecoline with reduced liver toxicity.

Material and Methods: ^{1}H NMR titration was conducted to investigate binding sites between cucurbit[7]uril (CB[7]) and arecoline in aqueous solution. ITC experiments were employed to determine the binding ratio, binding constant, as well as the thermodynamic parameters during the arecoline-CB[7] complexation process. Molecular modeling and ESI-MS were also employed to confirm encapsulations of arecoline inside CB[7]. The hepatotoxicity of arecoline in the absence and in the presence of CB[7] was evaluated using MTT assay with L02, a healthy human liver cell line.

Results: our results showed that CB[7] formed 1:1 host-guest inclusion complexes with arecoline, driven by both enthalpy and entropy, with a binding constant of ~ 10^4. The hepatotoxicity of arecoline was significantly alleviated *in vitro*, upon its encapsulation by CB[7], as evaluated by MTT assay of a healthy human liver cell line L02.

Conclusion / Discussion: Our results not only provide a novel supramolecular arecoline formulation for alleviated toxicity and improved safety, but also bring CB[7] further to potential application as a novel pharmaceutical excipient.

Keywords: Arecoline, Cucurbituril, Toxicity, Formulation, Host-guest Chemistry

ORAL PRESENTATION - 42

EFFECTS OF SILYMARIN ON METHOTREXATE-INDUCED TESTICULAR DAMAGE IN RATS

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Objective: Methotrexate (MTX) is an anti-metabolite widely used in the treatment of various malignancies, but its use has been limited due to its toxicity. Silymarin (SLY), a polyphenolic flavonoid derived from milk thistle (Silybum marianum), has been reported to have antioxidant effect. This study aimed to investigate the protective effects of SLY on MTX-induced damages in the testis tissue.

Material and Methods: Thirty two rats were divided into four groups (n=8) including: control (C), MTX-treated (MTX, 20 mg/kg, i.p. first and fifth days), SLY-treated (200 ml/kg, Orally) and MTX + SMN-treated animals. After six week trial period, blood and samples of testicles tissue were taken for histopathological and immunohistochemical analysis after the necropsy. In addition, semen were taken via a puncture of epididymis for sperm examination.

Results: Testicles protection by SLY was further supported by the almost normal histology in MTX+SLY treated group as compared to the degenerative changes in the MTX-treated rats. Immunohistochemically, Glutathione peroxidase 1 (GPx1) and manganese superoxide dismutase (SOD2) immunoreactivity was detected more intense in the MTX+SLY group than in the MTX group. Spermatologic examination revealed significant differences in density, motility, dead-live sperm ratio and abnormal sperm rate in group MTX compared to MTX+SLY group.

Conclusion: Our results indicate that SLY has protective effects against MTX-induced testis damage.

Key Words: Methotrexate, Silymarin, GPx1, SOD2, Testis, Pathology

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ORAL PRESENTATION - 43

THE RESEARCH OF PHYTOCHEMİCAL CONTAINS AND ANTIMICROBIAL ACTIVITIES OF *MALUS FLORIBUNDA'* SIEBOLD EX: VAN HOUTTE

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Objective /Purpose: *Malus floribunda* 'siebold ex. Van is an ornamental and landscape plant in our country and small fruits are consumed as food[1]. In this study, antimicrobial activities and phytochemicel contains of extracts *Malus floribunda'* siebold ex. Van Houtte which were researched.

Material and Methods *Malus floribunda* 'siebold ex. Van were collected from different localities in the province of Elazig. The flavonoid, lipid peroxidation, DPPH, resveratrol and sugar contents levels of fatty acid, vitamin values, protein, element and glutathione amounts of *Malus floribunda* 'siebold ex. Van were determined. The antimicrobial activity studies, on thirteen bacteria, three yeast and two dermatophyte were examined[2].

Results: Flavonoids such as rutin, morin, quercetin, naringin and Phytosterol such as ergosterol, stigmasterol, β-sitosterol and retinol were determined in fruits. *In vitro* medium, it is determined that in FeCl group, LPO amounts increases in a large ration with respect to the control group and LPO levels in groups which includes plant extracts and FeCl2, decreases in certain amounts. It was determined that the radical scavenging activity of the fruits increased due to the doz .Four different fatty acids were identified in the fruit. Fruits were found to different levels of sugar. Vitamin E in the examples were determined high rate. Protein found up to 1,686 mg/g. Ca was the highest detected element which was found in the samples. Extracts inhibited the development of microorganisms at different rates.

Conclusion / Discussion: Although studies on this type were limited, similarities and differences were seen in the results compared to other studies.

Keywords: *Malus floribunda,* phytochemical containts, DPPH, Element, antimicrobial

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ORAL PRESENTATION - 44

GREEK CROCUS AND ITS BIOLOGICAL IMPACT ON LEARNING MEMORY

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Objective: The main aim of the present study was to characterize and asses the antioxidant and biological activities of hydrophilic and lipophilic extracts from *Crocus sativus*.

Material and Methods: The plant material was represented by Crocus stigma purchased in Greece in the summer of 2015. The bioactive compounds were analysed using high performance liquid chromatography. Total phenolic content was also determined. The antioxidant activity of hydrophilic and lipophilic extracts of *Crocus sativus* of different origins was investigated. *In vitro* antioxidant activity used the ABTS cation radical scavenging assay. We investigated if the obtained extracts have an impact on the memory in an AD rat model induced by intracerebroventricular injection of amyloid Aβ-(1-42) and Aβ- (25-35).

Results: The identified compounds were safranal and picrocrocin. Regarding HPLC determination, the most important identified compounds were: safranal, picrocrocin, catechin, luteolin, caffeic acid and gallic acid. The richest extract in safranal and picrocrocin was the lipophilic extract. Moreover, the hydrophilic extract of Greek origin showed a good antioxidant activity compared to the other type of extract. On the other hand, all the doses (5 mg and 10 mg) had a significant positive impact on short memory and anxiety.

Conclusion: The impact of Greek sample of *Crocus sativus* on memory in an Alzheimer's disease rat model was studied, showing promising results in restoring memory impairment and alleviating the anxiety and depression induced by administration of beta amyloid peptide.

Keywords: *Crocus sativus*, antioxidant, antioxidant, memory

ORAL PRESENTATION - 45

EFFECTS OF THE ALTERNATIVE POSTHARVEST TREATMENTS ON 'HİCAZNAR' POMEGRANATE FRUIT ORGANIC ACID AND SUGAR CONTENT

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Objective / Purpose: Natural alternative postharvest treatments increase demand that the application which have positive effects on prevent fungal, physiological and biochemical deterioration of pomegranate fruit. These include in particular the external alternative eco-friendly postharvest treatments are gaining importance in the use of applications. The main objective of this study was to investigate postharvest treatment of GABA and oxalic acids on sugar and organic acid content of 'Hicaznar' pomegranate fruit. Compared to exogenous GABA to oxalic acids applications, GABA treatment kept fruits organic acid and sugar content of pomegranate during 20 days at 4°C cold storage.

Material and Methods: Pomegranate 'Hicaznar' fruits were harvested commercially optimal stage. After harvest fruits were transferred laboratory and fruits were immersed external three different concentrations of oxalic acids and GABA postharvest treatment. 'Hicaznar' fruits were evaluated sucrose, glucose, fructose, sorbitol, succunic, fumaric and L-ascorbic acid content in present study.

Results: Compared the effects of postharvest oxalic acid and GABA treatments on organic acids and sugar content results showed that GABA treatments has slighly better effects on especially some organic acid content.

Conclusion / Discussion: The pomegranate fruits have rich in natural source and high nutritional value, organic acids, sugars which is benefit for human health (Opara et al., 2015). GABA treatment possitively effected fruit biyochemical quality compared to oxalic acid treatment during 20 days 4°C storage period.

Keywords: pomegranate, GABA, oxalic acid, sugar, organic acids, storage

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ORAL PRESENTATION - 46

POTENTIAL ANTITHROMBOTIC EFFECT OF CRATAEGUS SPECIES

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Hawthorn (Crataegus) is one of the most important medicinal and aromatic plants and it has been used for many years in the treatment of various diseases. In folk medicine, hawthorn has been used for treatment of asthma, hyperlipidemia, heart failure, pain etc. Cardiovascular diseases (CVDs), as angina, hypertension, arrhythmias, and congestive heart failure, are among the most important areas of usage of hawthorn extract. Crataegus constituents are flavonoids, proanthocyanidins, organic acids and some amines. Thrombus is one of the most common causes of many CVDs. Based on our previous studies, the purpose of this review is to evaluate the antithrombotic effect of various hawthorn species and their some constituents. We have investigated antithrombotic effects of ethanol extracts of *Crataegus orientalis*, *C. monogyna* and *C. davisii* and apigenin, vitexin, quercetin and hyperoside are flavonoids found within the Crataegus species at the carrageenan-induced tail thrombosis model [1,2,3]. Our results showed that the extracts and the flavonoids of the Crataegus species have potentials against thrombosis therefore they can be regarded as good candidates for the development of new antithrombotic agents and use in complementary medicine as well.

Keywords: Crataegus, antithrombotic effect, carrageenan-induced tail thrombosis

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ORAL PRESENTATION - 47

Raphanus sativus var. *caudatus* ALEF POD EXTRACT INDUCES APOPTOTIC CELL DEATH VIA ROS GENERATION

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Objective / Purpose: *Raphanus sativus* var. *caudatus* Alef (RS) is a vegetable in Brassicaceae family similar to broccoli. RS was determined for its potential as functional food by the investigation of the apoptosis inducing effect against three cancer cell lines.

Material and Methods: RS was homogenized with water, fitered, and partitioned with dichrolomethane. The dichrolomethane layer was dried yielding the crude extract. The cytotoxicity of the pod RS extract was tested against cervical carcinoma (Hela), colorectal carcinoma (HCT116), and leukemic (Jurkat) cell lines by neutral red assay. The ROS level was determined based on the DHE and DCFH assays for superoxide anion and hydrogen peroxide, respectively. The DNA damage was determined by gel electrophoresis.

Results: HCT116 was the most sensitive cell line to the RS pod extract (IC_{50}=35.69 µg/ml) followed by Hela (IC_{50}= 402.63 µg/ml), and Jurkat cell (>500 µg/ml). The RS pod extract increased both superoxide anion and hydrogen peroxide levels. The DNA ladder was detected in HCT116 cells indicating DNA fragmentation at the late stage of apoptosis.

Conclusion / Discussion: The RS pod extract caused apoptosis cell death. The initial step of cell death may be contributed to the superoxide anion and hydrogen peroxide generation. Sulforaphane and sulforaphene were previously detected in the RS pod extract [1], both act as the pro-oxidant in several cancer cell lines [2]. Hence the anticancer activity of the RS pod extract was initiated by pro-oxidant effect leading to apoptosis cell death via the intrinsic pathway.

Keywords: apoptosis, DNA damage, isothiocyanates, oxidative stress, *Raphanus sativus* var. *caudatus* Alef, Thai rat-tailed radish

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ORAL PRESENTATION - 48

MICROBIOLOGICAL and SENSORY CHARACTERISTICS OF PROBIOTIC ICE CREAM FORTIFIED WITH DIETARY FIBRES

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Objective / Purpose: The aim of this study was to evaluate the influence of five dietary fibres (wheat, oat, apple, orange and bamboo) on the probiotic culture survival and sensory properties of probiotic ice cream containing *Lactobacillus acidophilus* and *Bifidobacterium lactis*.

Material and Methods: The probiotic ice creams containing 6% milk fat, 12% milk solids non fat, 16% saccharose, 0.6% stabilizer-emulsifier mixture, and 2% dietary fiber were manufactured in the pilot plant of Dairy Technology Department. The experimental ice cream samples manufactured with five different dietary fiber and the control sample containing no fiber were stored at -18°C for six months. *L. acidophilus* and *B. lactis* counts of the samples were enumerated by using MRS-Sorbitol and MRS-NNLP agar, respectively. Sensory evaluation was also carried out in terms of flavor, texture and appearance.

Results: The viable counts of *L. acidophilus* in all ice cream samples were ranged from 6.60 to 7.58 log cfu/g, while the viable counts of *B. lactis* were changed between 5.15 and 7.10 log cfu/g during the storage. In general, control ice cream samples had the highest *L. acidophilus* and *B. lactis* counts during the storage while the experimental ice creams generally contained lower counts of probiotics, especially for *B. lactis*, than those of control sample ($p<0.05$).The ice cream fortified with wheat fiber had the highest viable *B. lactis* counts at 120. day of storage. The ice cream samples fortified with apple and wheat fiber and also control sample had the highest viable counts of *L. acidophilus* at the storage days of 1, 60, 90, and 180. In terms of sensory characteristics, the best scores of flavor, texture and appearance were obtained in the probiotic ice creams fortified with wheat, oat, bamboo as well as control samples throughout the storage ($p<0.05$).

Conclusion / Discussion: As a conclusion, different dietary fibers can be used as dietetic alternative ingredients in the production of functional ice cream. Wheat fiber can be proposed among others examined in this study for the production of probiotic ice cream in terms of microbiological and sensory properties.

Keywords: dietary fiber, ice cream, probiotic.

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ORAL PRESENTATION - 49

THE EFFECTS OF CAPSAICINE IN THE RED PEPPERS ON OXIDANTS AND DNA PROTECTIVE ACTIVITY

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Objective : *Kapsaisin Capsicum annuum* L. type belongs to *dicotyledonae* class', *Tubiflorae (Solanales)* team's, *Solaneceae* family, and is a trans-8-methyl-N-vanil-6-nonamid. Capsaicin is one of the most important secondary metobilits and is known to have anticarcinogenic and antimutagenic potential. Homeland of the red pepper is South America, and it is produced in South Asian countries, and especially the South Eastern Anatolian Region of our country for 7000 years, and is a very common plant in Gaziantep both in terms of production and consumption. For this purpose, we investigated the effects of capsaicin antiradicalic that we purified from the both hot and sweet peppers that are grown in Gaziantep on oxidant status and DNA protective activity.

Material and Method : For this purpose, pure capsaicin was obtained with a 72-hour process in methanol and dichloromethane from the red hot and sweet pepper samples that were harvested, dried and milled. Rel Assay Diagnostics kits (TAS,TOS) and DPPH method was used for antioxidant activity from the purified capsaicin. pBR322 plasmid DNA and UV-C method was used for DNA protective activity.

Results and Discussion : It was determined that different extracts show different antioxidant activities, and methanol extracts were found to be highly active in both methods. The highest antiradical activity was determined in red sweet pepper methanol extract. In terms of DNA protective activity, extracts in dichloromethane and methanol of the red sweet pepper showed the most protective activity and extracts in methanol of the red hot pepper showed the lowest concentration DNA protective activity.

Keywords : pBR322, DPPH, TAS, TOS, UV-C

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ORAL PRESENTATION - 50

VOLATILE COMPOUNDS FORMED DURING THE STEEPING PROCESS OF HERBAL TEAS

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Herbal teas are widely used for the treatment of various diseases, in addition to its consumption as a food product. The main principle behind using herbal teas for treatment lies on the effects of its volatile content. However, there is limited information about aromatic component and volatile fraction of herbal teas. Moreover, there is not sufficient data on the transformation of volatile compounds of herbal teas during both preparation and steeping processes. Liquid-liquid extraction, hydro-distillation, solid-phase micro-extraction, solvent assisted flavor evaporation and similar methods are utilized for the isolation of volatile compounds in steeped teas. The extractions gained through these methods are analyzed by GC-FID and GC-MS techniques, and volatile compounds are identified. The profiles of these volatile compounds that are classified according to their chemical fractions (terpenes, hydrocarbons, alcohols, aldehydes, ketones, acids, esters) differ from the profiles of the original essential oils. This compilation focuses on the volatile compounds in the steeped herbal teas of rosemary (*Rosmarinus officinalis*), fennel (*Foeniculum vulgare* subsp. *vulgare*), lavender (*Lavandula angustifolia*), thyme (*Thymus vulgrais*) and daisy (*Matricaria recutita*).

Keywords: Herbal teas, steeping process, volatile compounds

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ORAL PRESENTATION - 51

GENETIC DIVERSITY OF *Dorystoechas hastata* Boiss. & Heldr. ex Bentham (*Lamiaceae*), A RELICT ENDEMIC MEDICINAL AND AROMATIC PLANT FROM ANTALYA, TURKEY

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Objective / Purpose: *Dorystoechas hastata* Boiss. & Heldr. ex Bentham (Lamiaceae) is a relict endemic Mediterranean element naturally grown in Antalya (Hedge, 1982). It has economic value due to its intense volatile and aromatic oil content (Valant-Vetschera et al., 2003). The objective of the present study was to determine variation in genetic structue of *D. hastata* within and among populations where species grown naturally in Antalya.

Material and Methods: The 56 genotypes representing 16 populations from the species' distribution area were used in the study. Field studies were carried out between March and July 2016. Genetic diversity among populations was determined by SRAP (Sequence Related Amplified Polymorphism) and iPBS (interprimer binding sites) molecular marker systems. The degree of variation in terms of genetic structure was determined by Principle Component and Cluster Analysis.

Results: In this study, 13 SRAP and 11 iPBS primers were selected and used to determine genetic diversity between and among 15 populations of *D. hastata*. The 24 primers produced 346 polymorphic bands across 56 genotypes. The average numbers of polymorphic bands per primer was 14.4 respectively. Genotypes were divided into 8 main groups according to the phylogenetic dendrogram obtained from the principle component analyses. The cluster analysis yielded similar results.

Conclusion / Discussion: A high genetic diversity exists within the *D. hastata* species, and genetic data should be taken into consideration for any future conservation studies.

Keywords: Population structure, Mediterranean, SRAP, iPBS, Molekular markers

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ORAL PRESENTATION - 52

EFFECTS OF PUERARIN ON DEPRESSIVE-LIKE BEHAVIORS IN OVARIECTOMIZED MICE AND PUTATIVE MECHANISMS UNDERLYING ITS ACTIONS

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Objective / Purpose: To clarify the effects of puerarin on depressive-like behaviors in ovariectomized (OVX) mice and its potential mechanisms.

Material and Methods: One week after ovariectomy or sham operation, mice were given a 6-week treatment of vehicle or 17β-estradiol (1 ug/kg/day p.o.) or puerarin (10 or 100 mg/kg/day, p.o). Depressive-like behaviors were determined using tail suspension test and forced swimming test. Serum and brain tissues of mice were used for neurochemical and immunohistochemical studies.

Results: Puerarin treatment attenuated depression in OVX mice. OVX caused an elevation of serum corticosterone level, an index of hyper-activation of the hypothalamic-pituitary-adrenal (HPA) axis, in a manner attenuated by puerarin and 17β-estradiol treatment. The estrogen receptor (ER)-alpha, ER-beta and BDNF mRNA expression in hippocampal significantly decreased in OVX mice when compare with sham group. Puerarin and E2 treatment significantly enhanced ER-alpha, ER-beta and BDNF mRNA expression. Moreover, doublecortin-positive cells in the dentate gyrus region were reduced in OVX mice. Puerarin administration reversed these OVX-induced neurochemical and histological abnormalities.

Conclusion / Discussion: These results suggest that puerarin can ameliorate OVX-induced depression-like symptoms and that the effects of puerarin are mediated by its estrogenic activity, restoring dysfunctions of the HPA axis and synaptic plasticity-related signaling systems and neurogenesis.

Keywords: Puerarin, Ovariectomized, Depression-like behaviors, Neurogenesis.

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ORAL PRESENTATION - 53

COMPARISON OF PHENOLIC COMPOUND CONTENTS IN VIVO AND IN VITRO GROWN LEAVES OF PISTACIA *lentiscus* L.

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Purpose: The purpose of this study was to compare of phenolic compound contents in vivo and ın vitro grown leaves of Pistacia *lentiscus* L.

Material and Methods: In vivo materials used in the study were taken from the trees in İzmir Çeşme Çiftlikköy. The mature seeds were cultured in solid Murashige and & Skoog (M&S) medium containing 1 mg L^{-1} indole butiric acid (IBA). The germinated plants transferred to the MS medium supplemented with 1 mgL^{-1} BAP and 0.5 mg L^{-1} GA_3. The ethanol extracts of samples were analyzed by LC-MS/MS in terms of 37 phytochemicals.

Results: The highest amount of protocatechuic acid (739. 67 µg/g extract), rutin (508. 75 µg/g extract), quercetin (38.78 µg/g extract), quercitrin (1041. 59 µg/g extract), apigenin (67.81 µg/g extract), isoquercitrin(537.67 µg/g extract), cosmosiin (176.71 µg/g extract) and myricetin (330.8 µg/g extract) were found in the samples taken from female samples; the highest amount of hesperidine (13.28 µg/g extract), gallic acid (9488.81 µg/g extract), quinic acid (40467.44 µg/g extract), and nicotiflorin (128.79 µg/g extract) were obtained from the male samples; The contents of p-coumaric acid (13.38 µg/g extract), caffeic acid, rosmarinic acid (47.07 µg/g extract), fumaric acid (2286.59 µg/g extract) and malic acid (9393.4 µg/g extract) were found in leaf explants from in vitro shoots.

Conclusion: It is determined that the main components of all plant samples were gallic acid, quinicacid, protocatechuic acid, fumaric acid, and malic acid. Flavonoids were generally found lower amounts in the all samples.

Acknowledgement: This research has been supported by a grant from TUBITAK-The Scientific and Technological Research Council of Turkey (Project No:**114Z842**)

Keywords: Phenolic compound, P. lentiscus L., in vitro, LC-MS/MS

ORAL PRESENTATION - 54

EFFECT OF HEAT PROCESSING ON SYNEPHRINE AND ASCORBIC ACID CONTENT IN SEVILLE (SOUR) ORANGE JUICE

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Objective / Purpose: Synephrine is well known with its adrenergic and thermogenic effect. The aim of this study was to understand the change of synephrine and also ascorbic acid content after evaporation process of the Seville (sour) orange juice.

Material and Methods: Sour orange juice was extracted by pressing after peeling of fruits. Fruit juice was pasteurized at 80ºC for 1 min. in order to inactivate pectin methyl esterase. After pasteurization, juice was clarified by using pectinase and bentonite and filtrated by filter paper. Evaporation was carried out by using rotary evaporator at 70ºC. Synephrine analysis were carried out according to Dragull et al. [1]. Ascorbic acid contents were analysed according to Ozkan et al. [2]. Both analyses were performed with Shimadzu HPLC system consisting of a PDA detector.

Results: The results were calculated as dried and wet basis. Synephrine contents of clarified juice and concentrated juices on wet basis were 1.29g/L and 7.82g/L, respectively. However, these were 16.08g/L 14.49g/L on dried basis, respectively. Ascorbic acid contents of juice and concentrated juices on wet basis were 0.61g/L and 3.10g/L, respectively. But these were 6.89g/L and 6.58g/L as dried basis, respectively.

Conclusion / Discussion: According to dried basis results, concentrated sour orange juice involved almost 10% less synephrine and 5% less ascorbic acid in comparison with clarified juice. However, on wet basis, concentrated sour orange juice contained almost 6 times more synephrine and 5 times more ascorbic acid content considering clarified juice.

Keywords: Sevilla (Sour) Orange, Ascorbic Acid, Synephrine, Heat Processing

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ORAL PRESENTATION - 55

ANTIMICROBIAL ACTIVITY AND CHEMICAL COMPOSITION SCREENING OF *Epilobium montanum* ROOTS

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Objective / Purpose: In several places of the world, there are increasing researches for determination of the unknown activity of medicinal plants. In consequence of the expressly enhancement in infections at developing countries, new explorations for newantimicrobial agents is required. Although extracts of several Epilobium species have been investigated as potential antimicrobial, antifungal and antiviral agents, as far as the current literature is concerned*Epilobiummontanum*related antimicrobial research doesn't exist, therefore roots of this medical plant was applied against 17 bacteria and 1 fungi by using disk diffusion method.

Material and Methods:A wide range of Gram positive andGram negative bacteria and yeast were selected to test the antimicrobial effect of *E. montanum*.These microbial species *Bacillus subtilis*ATCC 6633, *Candida albicans* ATCC10231, *Enterobacteraerogenes* ATCC13048, *Enterococcusdurans*, *Enterococcus faecalis* ATCC 29212, *Enterococcus faecium*, *Escherichia coli* ATCC 25922, *Escherichia coli*CFAI, *Klebsiellapneumoniae*, *Listeria monocytogenes*ATCC 7644, *Salmonella enteritidis* ATCC 13075,*Salmonella infantis*, *Salmonella kentucky*, *Salmonella typhimurium* SL 1344, *Staphylococcus aureus* ATCC 25923,*Staphylococcus carnosus* MC1.B, *Staphylococcus epidermidis* DSMZ 20044 and *Streptococcus agalactiae*DSMZ 6784. Twelve of them are standard species and they are important for exact determination of antimicrobial potential. 2.75 and9.17 mg samples were prepared by using ethanol extraction method. Besides, chemical composition of this sample was determined by Gas Chromatography-Mass Spectroscopy and National Institute of Standards and Technology (NIST) library was used for mass spectra analysis.

Results: The results were presented that *E. montanum* has antimicrobial activity against all tested microbial species except *E. coli*. Six of them are high susceptible (15-25 mm); five of them moderate susceptible (14-10 mm) and six of them are low susceptible (9-7 mm). Several active metabolites were identified, but some composition of this sample is not matched with the library.

Conclusion / Discussion: Our study clearly presents that *E.montanum*roots should have a possible medicinal uses. However, further researches are needed in order to analyse the active substances and their activity mechanisms in details. *E. montanum*contains unknown molecules and this molecules should be analyzed by NMR spectra for their 3D structure determination and identification.

Keywords: Epilobiummontanum, medicinal plant, antimicrobial activity, disk diffusion method, ethanol extract.

ORAL PRESENTATION - 56

INVESTIGATION OF THE EFFECTS OF *Calendula Officinalis* ON CUTANEOUS WOUND HEALING AND EPITHELIALISATION IN RATS: A HISTOPATHOLOGICAL, IMMUNOHISTOCHEMICAL AND BIOCHEMICAL EVALUATIONS

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Objective: Wound therapy has been a leading subject of research since the beginning of medical science. The aim of this study is to investigate of histopathological and biochemical effects of *Calendula officinalis* on the wound healing in the rats skin.

Material and Methods: In this study, 24 experimental rats were divided to three groups, control, *Calendula officinalis* and madecassol. In order to make wound model rats were carried out under xylazine -ketamine anesthesia after which a wound by punch device 1cm in diameter at least 2 cm spaced 2 parallel cutaneous tapes from the interscapular region. *Calendula officinalis* and madecassol ointment have been administered to study groups per day and serum physiologic solution has been administered to control group locally as placebo. In order to evaulate by histopathological and immunohistochemical and biochemical on 7th and 15th days by taking the blood and skin tissue.

Results: Compared with the control group, the topical application of *Calendula officinalis* has antiinflamatory effect by reducing inflamation and edema. Moreover, it has positive effects on epithelialisation, proliferative effects on fibroblasts and enlarging effect on collagenisation. As a result of immunohistochemical investigation Glutathione peroxidase 1 (GPx1) immunoreactivity was higher in the skin tissues of *Calendula officinalis* group compared to the Control group. Biochemical examination of skin and blood tissue revealed that fluctuated malondialdehyde and antioxidant defence system constituents levels were restored in *Calendula officinalis* supplemented group.

Conclusion: Consequently, application of *Calendula officinalis* accelerated wound healing by reducing the time required for complete epithelialization and the proliferation of connective tissue.

Key Words: *Calendula officinalis*, Epithelialization, Wound healing, Rat.

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ORAL PRESENTATION - 57

ALTERNATIVE STATISTICAL DESIGN AND ANALYSIS FOR MICROPROPAGATION OF ORCHIDS

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Orchids are one of the most diverse flowering plant families with more than 800 genera and 30 000 species. Orchids flowers are long lasting with various size, shape and color. Although orchids are used primarily as ornamentals, some are utilized in herbal medicine from ancient times for their medicinal properties. Orchids are rich in alkaloids and were reported to show anti-inflammatory, anti-microbial, anti-cancerogenic, anti-aging properties. Some orchid genera and species were used by different cultures throughout the history to treat tuberculosis, gastritis, diabetes, skin infections, epilepsy etc.

Orchids are outbreeders, therefore seed propagation leads to heterozygous plants. Micropropagation provides year-round mass scale production of true to name uniform plants free of viruses and diseases. However, micropropagation of orchids is still limited due to unoptimized tissue culture medium conditions.

Tissue culture optimization studies are generally conducted using factorial design which requires very high number of treatments when many factors are tested at the same time. Computer generated optimal designs are good alternative for biological reseach, because allow decreasing treatment combinations tremendously. Traditional statistical analyses like ANOVA and linear regression don't allow detecting complex non-linear relationships between factors and responses. Therefore, advanced statistical methods like data mining could be suggested for analyzing micropropagation data.

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ORAL PRESENTATION - 58

IN VITRO REGENERATION OF ENDEMIC MEDICINAL PLANT *ISATIS CONSTRICTA* DAVIS FOR CONSERVATION ALONG WITH PRODUCTION OF INDUSTRIAL MATERIALS GLUCOBRASSICIN AND INDOLE GLUCOSINOLATES

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Objective / Purpose: *Isatis* species a medicinal herb in Europe and in Traditional Chinese Medicine (TCM) contain antibacterial, antiviral, antimicrobial, antitumoral, anticarcinogenic and antimutagenic biologically active environment friendly glucobrassicin and indole glucosinolates (GLs). There is need to improve their culture both through traditional *ex vitro* agronomic techniques and *in vitro* biotechnological approaches for conservation and increased production of their secondary metabolites.

Material and Methods: Soon after, sterilization, theseeds of *Isatis constricta* were germinated on MS medium. Therafter, 5-7 d the 3-4 cm long seedlings were used to obtain leaf and petiole explants under aseptic conditions and cultured on MS basal medium containing diffrent concentarations of BA and NAA supplemented with 0.65 % agar and 3.0 % sucrose. All cultures were incubated under 16 h light photoperiod. Well developed shoots were rooted on MS medium containing 0.5mg l^{-1} IBA.

Results: Maximum shoot proliferation on petiole (13.33 shoots per explant) and leaf (12.75 shoots per explant) was noted on MS medium containing 1mg l^{-1} BA + 1 mg l^{-1} NAA. These were rooted on MS medium containing 0.5 mg l^{-1} IBA and the plants were acclimatised in peat moss and sand (1:1).

Conclusion / Discussion: Besides, helping in developing protocols for conservation of the plant, the study will help in the mechanisms for understanding of physiological, biochemical approaches for increased production of industrial materials glucobrassicin and indole glucosinolates.

Keywords: dye plant; micropropagation; mass proliferation

ORAL PRESENTATION - 59

ESSENTIAL OIL COMPOSITION OF *Sideritis syriaca* Subsp. *nusairiensis*

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Objective / Purpose: The genus Sideritis is known as a herbal tea as "Dağçayı or Adaçayı" in Turkey and *Sideritis syriaca* subsp. *nusairiensis* (Post) Hub-Mor is one of the endemics species listed in the LC categories as an IUCN lists. It is also known it has antimicrobial, antioxidant and analgesic effects.

Material and Methods: In this study, fresh aerial parts of *Sideritis syriaca* subsp. *nusairiensis* were collected from Mt. Gökçedağ (Osmaniye, East Mediterranean part of Turkey) in July 2015. Essential oil constituents of *S. syriaca* subsp. *nusairiensis* were analyzed by GC/MS. As a result of GC/MS analysis, a total of 11 components were determined in the essential oil.

Results: Identified main chemical groups consisted of monoterpene hydrocarbons, sesquiterpene hydrocarbons, oxygenated sesquiterpenes and other groups. The predominants components were mainly α-pinene, β-caryophyllene, 9-octadecenoic acid, D-limonene and sabinene in the essential oil of *S. syriaca* subsp. *nusairiensis.*

Conclusion / Discussion: It could be concluded that *S. syriaca* subsp. *nusairiensis* in Mt. Gökçedağ had mainly rich in monoterpenic hydrocarbons.

Keywords: *Sideritis syriaca* subsp. *nusairiensis*, essential oil, α-pinene, caryophyllene

ORAL PRESENTATION - 60

VITAMIN C LEVELS IN TYPE 2 DIABETIC PATIENTS PRESCRIBED METFORMIN

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Objective / Purpose: Metformin has been in use as an antidiabetic drug and it originates from the French lilac or goat's rue (*Galega officinalis*). The main objective of this study was to investigate vitamin C levels of type 2 diabetes mellitus (T2DM) patients who were prescribed Metformin for a 6 months follow up period.

Material and Methods: A total of five T2DM patients (mean age 58) were recruited to our study. Blood samples were first taken when the patient was first diagnosed with T2DM. Diabetic patients started to make diet and were prescribed Metformin after the diagnose. After 90 days, and after 180 days of the first diagnose, the patients were called to the hospital two more times and their blood samples were taken to measure both routine biochemical parameters, lipid peroxidation levels and Vitamin C levels.

Results: We could not find any significant changes in the liver enzymes (ALT, AST), lipid profiles (HDL, LDL, cholesterol, triglycerides). However, the levels of glucose were significantly different between glu0 and glu90 as well as glu90 and glu180 ($p<0.05$) as expected. After 90 days of metformin usage there was not much difference in Vitamin C levels of these patients. However, after 180 days of Metformin usage we detected a significant increase ($p<0.05$) in Vitamin C levels of our patients.

Conclusion/Discussion: Our data suggests that while Metformin regulates blood glucose, it also enhances Vitamin C levels of T2DM patients within 6 months period.

Keywords: metformin, type 2 diabetes mellitus, vitamin C.

ORAL PRESENTATION - 61

BIOCHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITIES OF OIL EXTRACT OBTAINED FROM HAMSTERS

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In Struga and surrounding one interesting medicine from animal origin nowadays exist for healing an ear pains. This traditional medicine probably was prescribed by the physician Vladimir Kavaev (born in 1885) who studied military medical academy in Russia. Doctor Kavaev and his wife Elena (also physician) were personal acquaintances and collaborators of Lenin [1]. To this day this medicine is prepared in some areas in Republic of Macedonia as a very efficient and irreplaceable remedy for ear pain. No, literature data exist about preparing and usage of this remedy prepared with just borne hamsters, in our country and other countries in the world [2]. Because of that with our contemporarily investigations on the biochemical composition and antimicrobial activities of this oil extract we have tried to find an explanation of its usage for healing ear pains. The biochemical composition of the oil extract obtained from hamsters determined by the Eclia (Electrochemiluminescence assay) showed more than 1750 nmol/l of Cortisol and more than 70.0 nmol/l 25-hydroxycholecalciferol. Mineral composition assay determined by electrothermal atomic absorption spectrometry after microwave digestion showed presence of 13.2 mg/kg Fe. The results for antimicrobial activities show inhibition of bacterial growth for *Escherichia coli* and *Pseudomonas fluorescens*, and low antimicrobial action on Gram positive bacteria i.e. *Staphylococcus aureus*. Discovered biochemical composition and antimicrobial activity of oil extract obtained from hamsters justify it's usage to date

Keywords: oil extract, antimicrobial activity, hamsters, biochemical composition, traditional medicine

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ORAL PRESENTATION - 62

THE EFFECT OF *ALLIUM SATIVUM* AND *ALLIUM CEPA* EXTRACTS ON DIFFERENT CANCER CELLS

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Objective / Purpose: Allium vegetables have been widely employed to treat various diseases such as cancer and microbial infections for hundreds of years. This work aims to evaluate the antioxidant activity, protective properties and anti-proliferative capacity of *Allium cepa* (Onion) and *Allium sativum* (Garlic) extracts.

Material and Methods: The antitumor activity of garlic and onion extracts were tested under *in vitro* conditions on different cancer types including HepG2 (human liver cancer cell line), SKBR (human breast cancer cell line) and T98G (cell line derived from a human glioblastoma multiforme tumor). The cytotoxicity of the studied extracts was also evaluated on L929 mouse fibroblast cells. Cell viability was monitored using thiazolyl blue tetrazolium bromide (MTT) reduction assay. The antioxidant activity of extracts was evaluated by DPPH (1,1 diphenyl-2-picryl hydrazyl) radical scavenging method.

Results: The results showed that onion and garlic extracts have different cellular responses to cancer types. Garlic extracts showed higher anti-proliferative effect on HEPG2 and T98G; however, onion extract has the similar effects on SKBR cells. The anti-proliferative effects of extracts also varied in a dose- and time-dependent manner. At the concentrations below 500 µg/mL, both garlic and onion extracts did not produce significant inhibitory effects on cell proliferation. The dose above 500 µg/mL for both two type of extracts induced toxicity on L929 cells.

Conclusion / Discussion: The consumption of garlic and onion extracts may provide protection against different cancer types; however, the extracts may lead to toxicity at the same time for healthy cells depending on the dose.

Keywords: *Allium sativum, Allium cepa,* cancer treatment, cell proliferation, MTT

ORAL PRESENTATION - 63

THE EFFECTS OF CULTIVATION AREA AND ALTITUDE VARIATION ON COMPOSITION OF FATTY ACIDS OF *LAURUS NOBILIS* L. BERRIES GROWN IN EASTERN, WESTERN AND CENTRAL KARADENIZ REGION AND ABKHAZIA

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Objective / Purpose: The aim of the investigation was determined and compared fatty acid contents of laurel berries (*Laurus nobilis* L.) grown in Trabzon, Bartın, Samsun and Abkhazia. Fleshy parts of laurel berries and seeds were analyzed separately to reveal yields of fixed oils. The study has a unique characteristic because there is no such a study on the fruits of laurel grown in Eastern Karadeniz Region and Abkhazia.

Material and Methods: A device called ''Foss Soxtec 2050'' was used for getting fixed oil and then fixed oil was turned into fatty acid methyl esters. Fatty acid methyl esters were analyzed by GC –FID.

Results: The fixed oil yield of fleshy parts of berries range between 28.37% and 42.08%. The highest amount of fixed oil yield in mesocarps was obtained in Bartın (0-100 m). The fixed oil yield of seeds range between 16.26% and 22.81%. The highest amount of fixed oil yield in seeds was obtained in Bartın (100-300 m). According to GC-FID results, oleic acid (27.06 % - 48.93%) was the most abundant fatty acid, lauric acid (0.49% -1.35 %) was the least fatty acid in the fleshy parts of bay fruits. In seeds, lauric acid was the most common fatty acid (32.37%-44.49%) and arachidic acid (0.87%-1.17%) was the least fatty acid.

Conclusion / Discussion: Present study confirmed cultivation area and altitude variation affects of chemical composition of fatty acids of laurel berries.

Keywords:*laurel berry,* seed, mesocarp, fatty acid

ORAL PRESENTATION - 64

USE OF MEDICINAL AND AROMATIC PLANTS IN THERAPEUTIC GARDENS

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Objective / Purpose: Today there is an accumulation of literature providing evidence for long and short term beneficial effects of living close to nature on various different health conditions ranging from psychological to physical disorders including depression, heart problems and diabetes (see the seminal articles by Ulrich (1979) and Kaplan (1973)). The results of these researches have given rise to the promotion of therapeutic gardens in outdoor spaces of healthcare establishments such as children's hospitals, assisted-living houses, rehabilitation centers, and hospices. Therapeutic gardens are outdoor garden spaces that meet the needs of the users mainly for their psychological well-being and healing. Our focus in this study is the use and maintenance of MAPs in therapeutic gardens. Use of MAPs in therapeutic garden design is a fertile research realm. Our objectives are to review the literature on this topic, categorize the role of MAPs as a design element, and provide MAP design guidelines for therapeutic gardens.

Material and Methods: Entire literature on the topic are reviewed. A sense-system will be used to categorize MAPs for therapeutic gardens with respect to the purpose of garden use (visual stimulation; stimulation of scent and memory; touch therapy). Design guidelines will be created to aid the planning of MAPs in therapeutic gardens.

Results: The literature on the topic is scarce and the existent literature does not fully address the theory and application of MAPs in landscaping the therapeutic gardens. Our guidelines are applicable to all therapeutic gardens.

Conclusion: Aromatic plants is a good attempt to improve the healing environment of therapeutic gardens from an aesthetic as well as medical standpoint. Our design guidelines provide the landscape designer with essential ingredients to efficiently incorporate MAPs in designing therapeutic gardens.

Keywords: healing garden, health facilities, stress, assisted-living house.

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ORAL PRESENTATION - 65

THE EFFECTS OF SOILS WITH DIFFERENT LEVELS OF LIME CONTENT ON YIELD, QUALITY, AND MINERAL NUTRIENT UPTAKE IN İSTANBUL OREGANO (*Origanum vulgare* subsp. *hirtum* L.)

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Oregano is one of the Turkey's most imported medicinal aromatic plants. İstanbul oregano (*Origanum vulgare* subsp. *hirtum* L.) have an important role of culinary spice and volatile oil industry and is commonly provide from nature in Turkey. The cultivated plants were required to improve quality of desirable featured plants and to reduce dependence of nature. It is important to know soil features of the plant in the order of taking to the cultivation.

This study has been conducted in order to determine the effects of soils which have different lime content features on plant development in İstanbul oregano. With this aim, the plants have been grown in pots which contain % 0, 15, 30, 45 and 60 lime. The experiment was laid out randomized parcel design with four replications. In the study, it has been tried to determine the effect of different lime contents on fresh and dry leaf yield, plant height, number of plant branch, rate of total essential oil, and absorption of nutritional elements by plants.

According to the results obtained from the study, the highest yield values were obtained on 15% calcareous soils followed by 30% calcareous soils. The highest amounts of essential oils were obtained from oregano grown on 15% soils in the first cut and on 30% soils in the last cut. With the increase of calcareous content, the amount of calcium in the plants increased while the iron content decreased.

Keywords: İstanbul oregano, soil, lime

ORAL PRESENTATION - 66

EFFECTS OF DIFFERENT IRRIGATION REGIMES ON QUALITY PARAMETERS OF *STEVIA REBAUDIANA* BERTONI

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Stevia rebaudiana Bertoni is a herbaceous perennial belong to Asteraceae family and its originating in the Rio Monday valley, an area in north-eastern Paraguay. The plant is one of the important source of natural sweetening agents with non-calorie that can be used as an alternative to artificial sweeteners. Stevioside and reb A concentration in stevia leaves is known to vary widely, depending on the growing conditions and agricultural practices. İt is aimed to determine plant quality parameters in irrigation management of stevia grown under different irrigation regime. In this scope, plants were subjected to control (I100) and 5 different irrigation applications (I120, I80, I60, I40, I20) during 2015 - 2016 and the changes in the stevioside, reb-A, stevioside + reb-A and reb-A/stevioside ratios in the plants were examined. Irrigation schedule was based on A-Class evaporation pan and soil moisture level. The crops were harvested once each year. Quality analysis were performed with post-harvest dried leaves. In both years, the quality parameters varied according to irrigation regimes. In addition, the obtained results showed differences between two years. The results showed that the amounts of reb-A, stevioside and reb-A+stevioside in the second year of plants were maximum in I80 application, minimum in I20 application.

Keywords: Stevia rebaudiana, irrigation regime, stevioside, rebaudioside-A

ORAL PRESENTATION - 67

EXTRACTION OF PHENOLIC COMPOUNDS FROM OVEN AND MICROWAVE DRIED MUSHROOMS (*Agaricus bisporus* AND *Pleurotus ostreatus*) BY USING METHANOL, ETHANOL AND ACETON AS SOLVENTS

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Objective / Purpose: The aim of this study was (i) to recover total phenolic using different solvents like methanol, ethanol and acetone from two types of mushroom (*A. bisporus* and *P.ostreatus*) which were dried either in conventional or microwave oven, (ii) to choose the best extraction solvent, (iii) to express antioxidant capacities of extracts with respect to both DPPH and FRAP methods, (iv) to determine the effects of drying procedures on total phenolic and antioxidant levels of extracts.

Material and Methods: *Agaricus bisporus* ve *Pleurotus ostreatus* were produced by using composts in Mushroom House of Osmaniye Korkut Ata University. Samples were dried at 60, 70 and 80°C in oven and 180, 360 and 600 W in microwave oven. 1 gram dried and pulverized samples were extracted with 80% methanol, 80% ethanol and 80% aceton seperately. Total phenolics and antioxidant acitivities of extracts were determined "Folin-Ciocalteu method" and "DPPH and FRAP methods" respectively.

Results: Rising in drying temperature/power had an increasing effect in total phenolic content and antioxidant capacity of all samples except microwave dried *P. ostreatus*. The maximum recovery of phenolic substances was observed in methanolic extracts. In conventional drying, *A. bisporus* showed lower antioxidant behavior than *P. ostreatus*, however in microwave drying, *A. bisporus* depicted its maximum in methanol. Ethanol and acetone were the second and third effective solvents in extraction respectively.

Conclusion / Discussion: Conventional (oven) drying and methanolic extraction gave the best results for recovering phenolic and antioxidant compounds.

Keywords: *P. ostreatus*, *A. bisporus*, drying, extraction, phenolics

ORAL PRESENTATION - 68

APOPTOTIC EFFECT OF *CORCHORUS OLITORIUS* LEAF EXTRACT IN COLON ADENOCARCINOMA CELL LINES

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Objective: The objective of the study was to determine antiapoptotic activities of *Corchorus olitorius* L. (*Co*) leaf extract on Colo-320 primer and Colo-741 metastatic colon adenocarcinoma cell lines.

Material and Methods: Dry, powdered *Co* leaves (100 g) that were collected in July 2016 were extracted with ethanol then filtered and concentrated to 200 ml. H_2O phase was evaporated and lyophilized to yield 14,8 g of crude extract. Different concentrations of *Co* extract were incubated for 24 and 48 h on Colo-320 and Colo-741 cells. Cell growth and cytotoxicity were measured with MTT assays. Antiapoptotic activities of *Co* were investigated by immunocytochemistry using antibodies directed against to caspase-3, cytochrome-c and Fas ligand (FasL). TUNEL assay was used to detect DNA fragmentation in both cell lines.

Results: While the number of TUNEL positive cells were similar in both cell lines after incubation with extract, caspase-3 expression was higher in Colo-320 cells than Colo-741 cells after 24 h incubation. On the other hand, immunoreactivity of cytochrome-c and FasL were higher in Colo-741 cells. Caspase-3 expression was lower in both Colo-320 and Colo-741 cells when compared with cytochrome-c and FasL expression.

Discussion/Conclusion: H_2O phase extract of *Co* leaf had triggered apoptotic pathway in both cell types, but, Colo-741 cells were affected more than Colo-320 cells. This result suggested that, initiation of apoptotic pathway starts after 24 h and could not be terminated in 24 h. Therefore, longer incubation of *Co* extract in colon adenocarcinoma cell line might be more effective for treatment.

ORAL PRESENTATION - 69

DETERMINATION OF ADAPTATIONS AND SOME YIELD COMPONENTS OF FENNEL (*Foeniculum vulgare*) IN BOLU ECOLOGICAL CONDITIONS

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Objective: Fennel (*Foeniculum vulgare*) is an important spice plant from Apiaceae (Umbelliferae) family and is typical of Mediterranean area. It is an industrial medicinal plant and used for pharmaceutical and food applications as well as catarrh of the upper respiratory tract. This study was carried out with the aims of determining some morphological characteristics of 33 diverse genotypes of fennel obtained from United States Department of Agriculture (USDA) and 4 (Kırsehir, Denizli, Eskisehir and Erzurum) local populations

Material and Methods: In this study, a comparison study of 33 diverse genotypes of fennel obtained from USDA and 4 local populations were carried out on the basis of morphological and agronomic characteristics. The field trials were arranged in Augmented Experimental Desing consisting of 2 blocks of which first block had 17 lines with 4 control populations (Kırsehir, Denizli, Eskisehir and Erzurum) and second block had 16 lines with 4 control populations. Seeds of these genotypes were sown in 20 april in trial area of Mudurnu Sureyya Astarci vocational school.

Results: Following findings were determined during the research; first germination and first flowering day was seen 12th day and 79th day after from sowing, respectively. First germination times changed between 12-18 days and first flowering time was observed between 79-111 days. Plant heights changed between 52.5-136.0 cm. The hightest plant height was observed from Kırsehir population. Number of branches in per plant were observed between 1.9-7.0 number/plant. The most number of branche was obtained from Turkey, Urfa population. While the most umbel number was obtained with 30.3 number/plant (Spain, Madrid population), the lowest umber number found 3.0 number (Ethiopia population).

Conclusion: According to obtained results; it was determined that there was a large amount of variation among genotypes regarding all characters investigated.

Keywords: adaptation, ecological conditions, fennel, morphology

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ORAL PRESENTATION - 70

AN IMPORTANT AND STATUS OF RESEARCH DEVELOPMENT STUDIES OF AN AROMATIC PLANT, SANDALWOOD (*SANTALUM ALBUM*) IN INDONESIA

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Objective / Purpose: Sandalwood *(Santalum album)* is a woody plant has a distinctive smell and known as a native plant of Nusa Tenggara Timur, Indonesia. It has a very high economic value but its contribution was going down because of reckless exploitation. Overexploitation causes population decline led to reduce genetic diversity that may causes some extinctions and threatened rare. The purpose of this paper is to know the importance of sandalwood at present and can be used to evaluate for preparing development research in the future.

Material and Methods: This was descriptive research using study literature method. All of information were investigated from published papers.

Results: Some articles about botany, ecology, cultivation, *in situ* and *ex-situ* concervation were examined. However, the results of those researches had not been optimal, especially in plant breeding research. There were not many research of plant breeding that had been reported, especially about tissue culture. Advanced plant breeding researchs are needed to support cultivation and development of this commodity.

Conclusion / Discussion: Those conditions are opening large opportunities to develop the advanced researches that can be conducted to obtain the new information or technology. Information and technologies can support to enhance and value the development of the commodity especially at industry.

Keywords: *Santalum album*, aromatic, native, rare.

ORAL PRESENTATION - 71

THE EFFECTS OF *Cyclamen graecum* and *Prospero autumnale* ON GROWTH PERFORMANCE OF EUROPEAN SEA BASS, *Dicentrarchus labrax*

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Objective: Natural dietary additives recently become important instead of synthetic dietary antibiotic, antioxidant and colouring agent. These materials enhance growth performance, health parameters and flesh quality of fish. Geophytes are natural additives and there are less information about usage in aquaculture industry. In this study, it is aimed that determining effects of dietary *Cyclamen graecum* and *Prospero autumnale* extracts on growth performance of European sea bass, *Dicentrarchus labrax*.

Material and Methods: Seven experimental diets were prepared including control (C), and with 0.05% (C0.05), 0.1 (C0.1) and 0.2% (C0.2) *Cyclamen graecum* and 0.05% (P0.05), 0.1 (P0.1) and 0.2% (P0.2) *Prospero autumnale* extract. The experiment was carried out in 400 L rectangular fiberglass tanks which are conducted to a recirculating marine water system. The study was realized in Mediterranean Fisheries Research Production and Training Institute, Antalya, Turkey. Sea bass were randomly distributed amongst the 21 tanks with three replicates for each dietary treatment. The diet was formulated for nutritional requirement of European sea bass. Water temperature held at 18.36±0.38 and pH was 7.82. The one-way ANOVA was used for statistical analysis.

Results: Final mean weight of fish fed with C was significantly greater than all other groups, except P0.05 and P0.1 ($P<0.05$). The lowest growth performance was found in C0.2 group ($P<0.05$). The highest condition factor and the lowest viscerosomatic, hepatosomatic and mesenteric fat indexes have been observed in C0.05 group ($P<0.05$).

Conclusion / Discussion: The growth performance of sea bass fed control and *Prospera* groups were similar and good results while growth of fish fed *Cyclamen* groups were found to be lower. In conclusion, further studies are required to assess the effect of these geophytes on the health parameters, and resistance to diseases.

Keywords: Geophytes, Growth performance, European sea bass, *Dicentrarchus labrax*.

ORAL PRESENTATION - 72

EFFECT OF ZAHTER (*THYMBRA SPICATA* L. VAR. *SPICATA*) ESSENTIAL OILS ON MEAT QUALITY IN JAPANESE QUAILS FED IN VARIOUS STOCKING DENSITIES

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Purpose: This study was conducted to determine the effect of the Zahter (Thymbra spicata L. var. spicata) essential oil (ZEO) on the meat quality of Japanese Quail fed in various stocking densities.

Material and Methods: In the study, A total of 300 Japanese quail (Coturnix coturnix japonica) chicks were used at the age of 7 days, which were selected for live weight and the trial was lasted at 28 days. Experimental groups were designed as the group was received basal diet at optimal stocking density (160 cm2/chicks, OSD-CONT), the group was received basal diet at high stocking density (90 cm2/chicks, HSD-CONT), the group was received basal diet plus at 10mg/kg Avilamycine at high stocking density (HSD-ANT), the group was received basal diet plus at 200 (HSD-T1),400 (HSD-T2)and 600mg/kg zahter (Thymbra spicata L. var. Spicata) essential oil (HSD-T3) at high stocking density, respectively. Each group consisted of 5 replicas and 50 chicks.

Results: Effect of ZEO on meat quality parameters such as color, ether extract and dry matter was significantly important ($P<0.01$). On the other hand, meat protein, pH, crude ash, cooking loss, and water retention capacity were not affected by ZEO treatment.

Conclusion / Discussion: Addition of ZEO into the Quil diet where fed in various stocking densities improved meat quality parameters in different levels. It can be concluded that 400mg/kg ZEO can be used in reducing advers effect of high stocking density.

Keywords: Japanese quail, stocking density, thyme essential oil, meat quality.

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ORAL PRESENTATION - 73

DIFFERENTIAL INFLUENCE OF SEABUCKTHORN ON THE *IN VIVO* AND *IN VITRO* CELL-MEDIATED IMMUNE RESPONSES IN CHICKENS WITH GUMBORO DISEASE

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Objective / Purpose: The study intended to clarify the effects of an alcoholic seabuckthorn extract on the *in vivo* and *in vitro* cell-mediated immunity in chickens in different stages of Gumboro disease, caused by an immunesuppresive virus.

Material and Methods: A graft rejection test was performed *in vivo* on healthy, Gumboro virus infected and convalescent chickens, by injecting 0.1 ml of a sheep lymphocyte suspension ($5x10^6$ cells/ml) mixed 1:1 with either saline or an alcoholic seabuckthorn extract. Wattle thickness was measured before and 24, 48 and 72 hours post injection and rejection indices were calculated as a percentages of the measurements.
An *in vitro* blast transformation test was carried out on heparinized blood samples from the three groups of chickens. Blast transformation indices were calculated after 48 h at 37ºC, for PHA M and the seabuckthorn treated cultures versus untreated controls, by glucose concentration measurements (orto-toluidin method). The statistical significance of the differences between the groups was interpreted by Student's t-test.

Results: The wattle thickness decreased from 24 to 72 h in all categories, while seabuckthorn increased the wattle response the most in healthy (40 ± 0.43mm) and the least (19.03 ± 0.11) in diseased chickens ($p<0.01$-0.001). The strongest inhibitory activity during blast transformation was observed in diseased chickens (-1.5 ±2.7%).

Conclusion / Discussion: The *in vivo* cell-mediated immune response response, probably targeting *in situ* a broader cell-population, seemed more fit than the *in vitro* test to evaluate the immunological role of an alcoholic seabuckthorn extract.

Keywords: chicken, Gumboro disease, adaptive cell-mediated immunity, sea buckthorn

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ORAL PRESENTATION - 74

ESSENTIAL OIL OF OREGANO AND SATUREJA; CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY

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Objective / Purpose: The objectives in this study were to determine the chemical composition and antimicrobial activity of the essential oils from *Origanum vulgare* subsp. *hirtum* and *Satureja thymbra.*

Material and Methods: Oregano and Satureja obtained from Özşen Lokman Hekim Company located in GIMAT-Ankara, TURKEY. For the identification of chemical components, each sample was analysed by GC-MS QP 2010 Ultra (Shimadzu) equipped with Rtx-5MS capillary column. The antimicrobial activities of these plant oils were tested against 18 different microorganisms by MIC (minimums inhibitory concentration) method.

Results: The GC-MS analyses revealed that the main components of oils obtained from Oregano 18.90% 7-epi-Sesquithujene, 9.83% β-Sesquiphellandrene and 9.25% α-Farnesene. The essential oil from Satureja was characterized by the presence of 36.08% α-Terpinyl acetate and 29.75% 1,8-Cineole. The Oregano and Satureja oil showed strong antimicrobial activity against tested 18 microorganisms.

Conclusion / Discussion: The antimicrobial activity results suggested that the Oregano *and* Satureja essential oils can be used as a natural antimicrobial agent against different microorganisms.

Keywords: *Origanum vulgare* subsp. *hirtum*, *Satureja thymbra*, essential oil, GC-MS, antimicrobial

ORAL PRESENTATION - 75

ANTIMICROBIAL ACTIVITY OF SEVERAL LESS-KNOWN FOREST FRUITS IN TURKEY

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Objective: Chloroform and acetone extracts of the fruits of three less-known plants, *Pistacia terebinthus* L. subsp. palaestina (Boiss) Engler, *Jasminum fruticans* and *Pterocarya fraxinifolia*, grown in Turkish forests, were screened for their antibacterial and antifungal activities.

Material and Methods: The fruits of *Pistacia terebinthus* L. subsp. palaestina (Boiss) Engler (Anacardiaceae), *Jasminum fruticans* (Oleaceae) and Pterocarya fraxinifolia (Juglandaceae) were collected from Derekoy village in Kahramanmaras province-Turkey in September 2001. Voucher specimen numbers are KASO 326, 327, 328 for *P. terebinthus*, *J. Fruticans* and *P. fraxinifolia*, respectively. Air-dried fruits of the plants were first pounded in a mortar by hand and then were extracted in the presence of chloroform and acetone by using soxhlet equipment for 3 h. The antimicrobial activities of all the extracts described above were determined using the agar-disc diffusion method described elsewhere [1]. Eleven bacteria (e.g Bacillus megaterium DSM 32, Bacillus brevis NRS, Bacillus cereus EU, Escherichia coli DM, Mycobacterium smegmatis CCM 2067, Pseudomonas aeruginosa ATCC 27853, Staphylococcus aureus Cowan 1, Klebsiella pneumoniae FMC 5, Enterococcus faecalis ATCC 15753, Corynebacterium xerosis UC 9165, Micrococcus luteus LA 2971) and three yeast (e.g Kluyveromyces fragilis, Rhodotorula rubra, Saccharomyces cerevisiae) were used in this study for antimicrobial test.

Results: *P. fraxinifolia* did not show any activities against *Kluyveromyces fragilis*, *Rhodotorula rubra* and *Saccharomyces cerevisiae yeasts*. Chloroform extracts from *P. terebinthus, Jasminum fruticans and Pterocarya fraxinifolia* had an average inhibition zones of about 15 mm, 11 mm, 12 mm, respectively, for all the microorganisms used. On the other hand, acetone extracts from *P. terebinthus*, *J.fruticans* and *P. fraxinifolia* showed an average inhibition zone of about 12 mm, 10 mm, 10 mm, respectively. The highest inhibition zone of 21 mm was found for the chloroform extract of *P. terebinthus against Klebsiella pneumoniae FMC 5*. No any microbial activities against *Kluyveromyces fragilis*, *Rhodotorula rubra* and

Saccharomyces cerevisiae were found for the whole extracts from *Pterocarya fraxinifolia.*

Conclusion / Discussion: The inhibition zone data showed that the chloroform extracts had generally the higher inhibition zone in comparison to the acetone extracts for all the species, resulting in almost the greatest antimicrobial activity. Moreover, the whole extracts of *P. terebinthus* had antimicrobial activities among the other extracts studied here. The fruits extracts were of higher microbial acitivities against bacteria compared with fungi.

Keywords: Antimicrobial activity; *P. terebinthus*, *J. fruticans* and *P. fraxinifolia*, Turkey.

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ORAL PRESENTATION - 76

ANTIMICROBIAL PROPERTIES OF ESSENTIAL OILS AND THEIR POTENTIAL APPLICATIONS IN MILK AND DAIRY PRODUCTS

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Essential oils are aromatic liquids obtained from different parts of plant material like flowers, buds, seeds, leaves, bark, fruits and roots. They can be obtained by different methods such as enfleurage, expressed oils, solvent extraction, fractional distillation and percolation or CO_2 extraction, but generally steam distillation method is used. In recent years, using some essential oils as antibacterial additives for making food safe is a popular alternative. Essential oils can be used in milk and dairy products for their preservative or aromatic properties. They are suitable substances for using in dairy products for preventing food from spoilage or deterioration by their antimicrobial and antioxidant capacity. Essential oils are complex mixtures that have individual components more than sixty. These components constitute up 85% of essential oils, whereas minor components are present only as a trace. It is thought there is a synergistic effect between major and minor components, and it plays an important role for antibacterial activity. Generally the essential oils contain phenolic substances like carvacrol, eugenol, thymol which have strong antimicrobial effect against pathogens. The minimum inhibitory concentration (MIC) is most frequently used as a measure of antibacterial performance of essential oils. Some methods are used for calculating the MIC of essential oils against food borne pathogens like *Escherichia coli*, *Listeria monoyctogenes*, *Stahpylococcus aureus* etc. Antibacterial effects of essential oils or their components can be change in food matrix according to in vitro assays. It has generally been found a greater concentration is needed to ensure the same effect in food. For example, the ratio has been found twofold in semi-skimmed milk. Both intrinsic properties (fat, protein, salt, pH), and extrinsic determinants (temperature, packaging, characteristics of microorganisms) can effect the MIC of essential oil against pathogens. Whereas the low pH of yoghurt is susceptibility to support the effectiveness of essential oils, high protein content can be a limiting factor for antibacterial activity.

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ORAL PRESENTATION - 77

ACTIVITY OF *Alternanthera sessilis* ON IMPROVEMENT OF ANXIETY-LIKE BEHAVIOR INDUCED BY OVARIECTOMIZED MICE MODEL

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Objective / Purpose: Ovariectomy (OVX) causes estrogen deprivation and oxidative stress leads to the hippocampus cell death and affected on mood disorders such as anxiety. *Alternanthera sessilis* is a medicinal herb. The present study aims to evaluate the action and mechanism of *A. sessilis* extract on anti-anxiety activity in OVX mice model.

Materials and Methods: Mice were ovariectomized to induce estrogen deprivation similar to menopause condition which involved mood disorder of anxiety. The *A. sessilis* extract (250 and 500 mg/kg/day) were orally administered to OVX mice. 17β-Estradiol (E_2, 1µg/kg/day) was used as a positive control. Six weeks after treatment, anxiety-like behavior was evaluated by the light/dark exploration test (LD), mirror chamber test (MC) and elevated plus maze test (EPM). To confirm the mechanism, uterine weight and serum estrogen level were investigated. The expression of *CREB* and *BDNF* mRNA in hippocampus that related to anxiety were evaluated by using RT-PCR. Antioxidant assay of crude extract and lipid peroxidation of brain were determined for the oxidative stress mechanism.

Results: OVX mice significantly increased the time spent in dark compartment in LD and MC test and reduced the proportion of time spent in open arms of EPM test. Long term treatment of E_2 and *A. sessilis* (250 and 500 mg/kg/day) significantly improved the anxiety behaviors, increased uterine weight and serum estrogen level, and also increased *BDNF* and *CREB* mRNA expression similar to those treated with 17β-estradiol.

Conclusion / Discussion: *A. sessilis* can manifest anti-anxiety in mice via estrogenic activity, neurogenesis process in hippocampus and oxidative stress mice in brain.

Keywords: *Alternanthera sessilis*, ovariectomy, anxiety

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ORAL PRESENTATION - 78

CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITY IN COLD PRESS OIL OF FENNEL, ANISE, WHITE AND BLACK MUSTARD SEEDS

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Objective / Purpose: The use of non-wood forest products as medicinal aromatic plants has become widespread with the development of alternative medicine as complementary to modern medicine. In this study, the cold press oil components and antimicrobial activities of fennel (*Foeniculum vulgare*) and anise (*Pimpinella anisum*) and white mustard (*Sinapis alba*) and black mustard seed (*Brassica nigra*) species seeds, which are widely used by the people for alternative medicine, were determined.

Material and Methods: *F. vulgare*, *P. anisum*, *S. alba* and *B. nigra* species seeds were obtained from cultuvated areas in central Anatolia in TURKEY. The Oil was extracted by using a screw press (MP-001 Cold Press, Turkey), and the volatile oil components and fatty acid components in these oils were analysed by GCMS. Antimicrobial activities of obtained oils were investigated by using minimum inhibitory concentration (MIC) test by against 18 different species microorganisms.

Results: When characterized by GCMS, *F. vulgare* and *P. anisum* oils were found to be the most abundant components which were Anethole (89.74%, 88.95 % respectively according to volatile oil component test) and Methyl elaidate (60.44%, 66.44% respectively according to fatty acid component test). The most abundant components of *S. alba* oils were Cyclopropanenonanoic acid (48.70% according to volatile oil component test) and Methyl linolate (68.19% according to fatty acid component test). DI-(9-Octadecenoyl)-Glycerol (42.16% according to volatile oil component test) and Methyl erucate (38.23% according to fatty acid component test) were founded the most abundant components of *B. nigra*. According to results, the plants oils didn't show any anti-microbial activities against tested microorganisms.

Conclusion / Discussion: As a result, it can be easily said that *F. vulgare* and *P. anisum* has big potential for raw material to obtain high quality anethole for medicine industry, but these species cold press oils needs protective chemicals for the long shelf life for using alternative medicine.

Keywords: *F. vulgare*, *P. anisum*, *S. alba*, *B. nigra*, oil components, anti-microbial activities.

ORAL PRESENTATION - 79

ANTIMICROBIAL ACTIVITY OF *HELICHRYSUM CHIONOPHILUM* FROM GUMUSHANE, TURKEY

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Objective / Purpose: Determine the antimicrobial activity of various extracts of local endemic plant, *Helichrysum chionophilum*

Material and Methods: Four solvents (ethanole, methanole, ethyl acetate and hexane) and aerial part of the plant were used for extraction. The four extracts were investigated interms of antimicrobial activity by using Kirby- Bauer disk diffusion method. 6 Gram (+) microorganisms (*E. faecalis, S. epidermidis, S. aereus, E. faecium, MRSA, E. hirae*) and 6 Gram (–) microorganisms (*P. aeruginosa, E. coli, Y. enterocolitica, V. parahaemolyticus, S. typhimurium, K. pneumonie*) were tested for activity.

Results: All extracts exhibited significant antimicrobial activity agains at least six test organisms. Especialy ethyl acetate and hexane extracts showed significant inhibition activity to *P. aeruginosa* (28 mm) and MRSA (28 mm), respectively.

Conclusion / Discussion: As a results, it has been found that *Helichrysum chionophilum* various extracts have strong antimicrobial activity on both 6 Gram (+) and Gram (–) microorganisms. Therefore, this plant could be potential source of ne antimicrobial agents.

Keywords: local endemic, aerial parts, extract, antimicrobial activity

ORAL PRESENTATION - 80

ANTIOXIDANT ACTIVITY OF ETHANOLIC AND METHANOLIC EXTRACTS OF *HELICHRYSUM CHIONOPHILIUM*

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Objective / Purpose: Find out in vitro antioxidant activity of the extracts of *Helichrysum chionophilum* aerial parts collected from Turkey, Gümüşhane area.

Material and Methods: For the extraction of plants; methanol and ethanol were used as solvent. To determine the antioxidant activity, extracts were evaluated by UV-spectrophotometer. DPPH (2,2-diphenyl-1-picrylhydrazyl) and ABTS (2,29-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid)) were used for methods.

Results: Plants extracts have shown that highly antioxidant properties. For instance, DPPH results are for methanol extracts: 34.71 µg/ml and for ethanol extracts: 34.13 µg/ml.

Conclusion / Discussion: The study gives an idea that *Helichrysum chionophilum* from Turkey, Gümüşhane might be used by food industry and natural antioxidants rather than chemical ones. The phenolic content in the extract of this plant was responsible for the large antioxidant activities.

Keywords: *Helichrysum chionophilum*, aerial parts, ethanol-methanol extracts, antioxidant property

ORAL PRESENTATION - 81

EFFECTS ON THE GERMINATIONS OF BASIL (*Ocimum basilicum*) AND QINOA (*Chenopodium quinoa)* SEEDS OF DIFFERENT HYDROSOL DOSES OF BASIL

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Objective: Medicinal and aromatic plants (MAPs) have some allelopathic effects on seed germination, root lenght and shoot lenght due to including chemicals in their extracts or essential oils. In this study, changes of germination rate**,** shoot and root lenght of basil (*Ocimum basilicum*) and qinoa (*Chenopodium quinoa*) seeds exposing to the different concentrations of basil hydrosol have been investigated.

Material and Methods: The treatments included control (distilled water), tap water and different concentrations (0.5, 1, 1.5, 2 ml) of basil hydrosol. The study was conducted with randomized complete block design with 3 replications and 20 seeds of each species were placed on a filter paper in Petri dishes. 2 milliliters from each test solution (distilled water or tap water or hydrosols) separately were applied to each replicate for each treatment. All experiments were carried out at 29±1ºC, dark photoperiod in drying oven in laboratory conditions.

Results: According to the study results, germination rate and power of basil seeds and quiona seeds completed within 3-7 days. Treatments showed that root lenght changed between 0.04-1.53 cm, shoot lenght changed between 0,09-2.31 cm in the basil, root lenght changed between 0.19-4.71 cm, shoot lenght changed between 0,08-2.37 cm in the quiona.

Conclusion: According to obtained results; increasing applied dosage of the hydrosols of basil significantly decreased seed germination rate, shoot lenght and root length, certain 2 ml hydrosol dose prevented seed germination more than 50% in basil.

Keywords: hydrosol, essential oil, quinoa, basil

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ORAL PRESENTATION - 82

INVESTIGATION ON ANTIOXIDANT ACTIVITY OF THYME (THYMUS VULGARIS L) AFFECTED BY MICRO NUTRIENTS

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Substantial evidence indicates that foods containing antioxidants and possibly in particular the antioxidant nutrients may be of major importance in disease prevention. In the last few years, there has been a growing interest in providing natural antioxidants. The plants of the Lamiaceae family possess appreciable antioxidant activity. Thyme (*Thymus vulgaris* L.) essential oil has been reported to be among the top 10 essential oils. The aim of the trial was to study the effects of micro nutrients (Fe, Mn, Zn and B) on antioxidant activity of Thyme. The study was conducted at the Experimental Fields and laboratory of the Agronomy Department, Faculty of Agriculture, Urmia University, West Azerbaijan, Iran, during 2015-2016, used randomized complete block design in three replications. Control (not application), Fe (3 per 1000), Zn (2 per 1000), B (4 per 1000) and Mn (3 per 1000) were used as fertilizer treatments. Total phenolic content, total flavonoid content, DPPH radical scavenging activity, nitric oxide radical scavenging activity and Chain-breaking activity were determined. The results showed that the highest phenol content (39.37 g Gallic acid/100 g Thyme powder) and lowest (28.9 g Gallic acid/100 g Thyme powder) related to Mn and control respectively. The maximum flavonoid (1 g quercetin/ 100 g Thyme powder) and the minimum (0.509 g quercetin/ 100 g Thyme powder) were obtained from B and Fe. The best DPPH radical scavenging activity recorded from control (91.7 %, mg/mL) as well as Fe and Mn treatments, and the lowest was related to the Zn (68.4%, mg/mL). In the top three traits the difference among treatments was significant in first harvest. The highest nitric oxide radical scavenging activity (201.78 %) and the lowest (128.64 %) related to Mn and Fe respectively in first harvest whereas in second harvest B had maximum (124 %), and Fe had minimum (113.86 %). In terms of chain-breaking activity Mn showed the highest (65.41 -Abs-3 /min/mg extract) and Fe and Zn lowest. In conclusion, Mn and B have positive effect on lifting antioxidant activity of the plant than other treatments.

Keywords: Foliar Application, Micronutrients, Antioxidant Activity, Thyme.

ORAL PRESENTATION - 83

ESSENTIAL OILS FOREIGN TRADE OF TURKEY

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Objective / Purpose: This research was aimed to present essential oil export and import status of Turkey.

Material and Methods: Foreign trade report of Turkey Statistical Institution was material and descriptive statistics was method of this study.

Results: The essential oil exports of Turkey, which was around 15 million in 2005, increased by 177.2% to $ 41.3 million in 2016. Rose and thyme essential oils have an important share in the export of essential oils. Turkey's imports of essential oils were around $ 27.4 million which 12.1% rose, 11.1% mint, 10.2% orange, 6.7% lemon and 4.7% other citrus oils in 2016. The share of the countries imported by Turkey into essential oils varies from year to year. In 2016, import value of essential oils was made from 16.5% India and 15.1% Germany.

Conclusion / Discussion: The essential oil sector of Turkey gives more foreign trade. However, it is necessary determined standard and sustainable production model according quality characteristics desires of foreign market in order to be leader in the world essential oil market.

Keywords: Turkey, essential oil, foreign trade, export, import

ORAL PRESENTATION - 84

THE POTENTIAL ROLE OF ANTIGEN PRIMING IN INCREASING THE OVERALL ANTIMICROBIAL RESISTANCE IN CAPTIVE SILVER FOXES

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Objective / Purpose: We hypothesized that antigenic priming should stimulate the humoral and cell-mediated adaptive immune response, further improved by vegetal extracts while alleviating the immune suppression induced by captivity stress in silver foxes.

Material and Methods: One of two groups of adult silver foxes was s.c. primed and boosted 7 days later with a 5% SRBC suspension. One week after the booster, serum antibody titers (hemagglutination test) and circulating immune complexes levels (CIC)(4.2% polyethylene glycol precipitation test) were quantified and ln of the antibody titers were calculated. Similarly, an *in vitro* blast transformation test was carried out on heparinized blood samples using alcoholic vegetal extracts (*Calendula officinalis, Arnica Montana, Symphytum officinale, Echinaceea spp.*) and immune stimulating compounds (thymus extract, selenium salts, bovine tuberculin). Blast transformation indices were based on a glucose consumption test (orto-toluidin method). The statistical significance of the differences versus unprimed control group was interpreted by Student's t-test.

Results: A more intense cell growth was seen in primed foxes versus the unprimed individuals (68.8±9.88 and 17.49±22.9). The primed animals reacted significantly ($p< 0.001$-$p< 0.01$) better to vegetal extracts (*C. officinalis, E. angustifolia*) and to thymus extract, selenium salts and bovine tuberculin (51.43±25.28 and 35.41±19.76 %, respectively) than the unprimed group. Anti-SRBC antibodies were highly variable (0.69 - 5.54).

Conclusion / Discussion: SRBC as a thymus dependent antigen exerted a positive effect on both humoral and cell-mediated immune responses in adult silver foxes, supporting the enhancement of antimicrobial defensive capacities by booster vaccination and immune stimulating therapy.

Keywords: silver foxes, antigenic stimulation, adaptive immunity, vegetal extracts

ORAL PRESENTATION - 85

INVESTIGATION OF INVENTORY OF A COMPANY TRADES MEDICAL AND AROMATIC PLANTS IN THE MARMARA REGION

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Objective / Purpose: The number of medicinal and aromatic plants is expressed in thousands. However, it is not known exactly how many of these are widely used in the production of herbal tea in Turkey. At the same time it is almost impossible to get product inventory information from the enterprises. Thus this study aimed to provide information about the product design used in the production of herbal tea by examination of a herbal tea business.

Material and Methods: The data of the study were obtained by full-scale method from a large-scale herbal tea company operating in the Marmara Region.

Results: Inventory of processed or unprocessed products were determined. According to results, about 350 different quality and size products have been reported. Each type of product is distinguished by its quality and usage characteristics such as fs, cons, ns, dust, whole (according to particle diameters).

Conclusion / Discussion: Few plants at foreign origin have been identified and unexpectedly plants also found outside of tea uses. Regular warehouse record keeping is recommended to herbal tea producer.

Keywords: medical aromatic plant, inventory record, business, product variety

ORAL PRESENTATION - 86

EFFECT OF EDIBLE MUSHROOM POWDER ON ANTIOXIDANT ACTIVITY OF TARHANA

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Objective/Purpose: In recent years, the interest in foods that are rich in natural antioxidants for human consumption has increased dramatically because of positive effects to human health. Also, there are several studies about adding other cereals, legumes, wheat germ, or wheat bran to increase the nutritional and antioxidant properties of tarhana. In present study, two edible mushroom powders having antioxidant activity (*Morchella conica* and *Ramaria flava*) were used to raise the biological value of tarhana.

Material and Methods: Tarhana was supplemented with two edible mushroom species *Morchella conica* and *Ramaria flava* powder at different concentrations to improve its nutritional value and functional properties. Tarhana samples (*w/w*, flour base: a) 100% flour (the control tarhana), b) tarhana supplemented with 100%Morchella, c) 100% Ramaria, d) 50% Morchella+50% Ramaria and e) 25% Morchella+25% Ramaria+50% flour) were analysed for their antioxidant activities in different methods using 2,2-diphenyl-1-picrylhydrazyl (DPPH) scavenging activity, reducing power (RP), ferric ion reducing antioxidant power (FRAP) and nitric oxide (NO) scavenging activity. Total phenolic (TPC) and flavonoid contents (TFC) were also determined in both control and treatment groups.

Results: The total phenolic (GAE mg/kg) and total flavonoid (CE mg/kg) contents of the tarhana samples were ranged from 202,2-1168,1 and 3,5-281,3 respectively. 50%Morchella+50%Ramaria had the highest DPPH scavenging activity (794,2 µM Trolox), FRAP (2,94 mM Fe^{+2}) and RP (1010,0 µM Trolox) values. Tarhana supplemented with 100% Morchella had the highest NO scavenging activity (268,7 µM Trolox).

Conclusion/Discussion: Tarhana supplemented with mushroom powders had high total phenolic, total flavonoid contents as well as antioxidant activities ($p<0.05$). The results indicated that high positive correlations were found between the antioxidant activities and the polyphenol contents of the tarhana supplemented with mushroom samples ($p<0.01$). The results of the sensory analyses of the tarhana supplemented with edible mushroom indicated that the use of less concentrations of the edible mushroom suggested to which reduce deteriorative effect on sensory properties of tarhana.

Keywords: Tarhana, Antioxidant activity, Phenolic content, Flavonoid content, FRAP

ORAL PRESENTATION - 87

PROFILE OF HEAVY METAL AND NUTRIENT ELEMENTS IN SOME SIDERITIS SPECIES

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In recent years, there has been a growing worldwide interest in monitoring heavy metals and macro and micronutrients in medicinal and aromatic plants. In this study, heavy metal and selected nutrient elements (Al, Cd, Co, Cr, Ni, P, K, Ca, S, Fe, Cu, Zn, Mn, B and Na) of three *Sideritis* species (*Sideritis germanicopolitana* BORNM, *Sideritis galatica* BORNM and *Sideritis hispida* P.H. DAVIS) endemic to Turkey were determined using standard analytical methods. The heavy metal and nutrient element concentrations in the *Sideritis* species were found at different levels. Among the three species, *Sideritis germanicopolitana* showed considerable variation in nutrient concentration and it was especially rich in iron (365 mg kg^{-1}) and potassium (2.05 %). The heavy metal concentrations of all *Sideritis* species were found to be lower than the permissible limit set aside for human consumption with no health risk in medicinal plants.

Keywords: Herbal tea, folk medicine, medicinal plants, trace elements

ORAL PRESENTATION - 88

THE EFFECTS OF FREEZE DRYER AND CONVENTIONAL OVEN APPLICATIONS ON C-PHYCOCYANIN IN LARGE SCALE OF MICROALGAE PRODUCTION

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Objective: Phycocyanin is a natural dye and has pharmaceutical effects via its pigment-protein complex. It has been recommended by oncologists due to its pharmaceutic effects. Also, it can help to synthesis important enzymes needed for inhibition of cancer cell growth and promote cell regeneration in human metabolism [1]. In this trial, it is aimed to compare content of C-phycocyanin extracted from *Spirulina* powder produced in large scale with freeze drying and oven drying techniques.

Material and Methods: *Spirulina platensis* was cultured in 2500 L race-way algae ponds during 16 days in summer period at Greenhouse of Algae Culture, University of Yalova, Turkey. At the end of cultivation, *Spirulina* biomass was filtered from 45 µ of plankton cloth. In the first method, biomass was dried during 24 hours at +40°C in the industrial type oven. In the second method, the biomass was dried for 24 hours at -60°C by freeze drier. After each drying, samples were grinded and *Spirulina* powder was obtained. Phycocyanin analyses were done on *Spirulina* powder obtained from two different drying techniques.

Results: Phycocyanin yield was found 41.3 mg/g at the freeze dried samples and 37.7 mg/g at the oven dried samples. The purity ratio of phycocyanin (*A*620/*A*280) was achieved in samples of freeze dried and oven dried as 2.7 and 2.5 at reagent grade, respectively.

Conclusion / Discussion: In the pharmaceutical industry, the degree of purity of phycocyanin is required to be 4 or more. In the food industry, the degree of purity of phycocyanin that is expected to be higher than 0.7 and 2 purity is widely accepted [2]. In this study, obtained purity degree of oven drying technique is acceptable. However, freeze drying is recommended to achieve higher amount and purity ratio of phycocyanin.

Keywords: *Spirulina platensis*, phycocyanin, heat treatment.

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ORAL PRESENTATION - 89

CORRELATION OF PREDICTOR VARIABLES TO SQUALENE CONTENT IN OLIVE FRUITS USING MULTIVARIATE STATISTICAL ANALYSIS

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Objective / Purpose: The present study was designed to examine the correlation of some predictor variables including pH, organic matter (OM), lime (L), phosphorus (P), potassium (K) and total salt (TS) content of soils of olive orchards to squalene content of olive fruits. Multiple linear regression analysis was used to model the relationship between explanatory variables (pH, OM, L, P, K and TS) and responses variable (squalene content) by fitting a linear equation to observed data.

Material and Methods: The olive fruits (Kilis Yaglik cv.) were sampled from ten-different locations. The soil characteristics of the sampling sites were determined. Oil extraction was carried out in similar industrial extraction conditions using an oleodosor system.

Results: All of the variables are non-significant by the t-tests. Accordingly, pH (p=0,596), OM (p=0,359), L (p=0,490), P (p=0,127), K (p=0,265) and TS (p=0,572) were not individually statistical significant but their interaction was significant (p=0,006). The predictor equation concerned was:
Squalene content (%)=
(1,554)+(-0,106x**pH**)+(-0,003x**L**)+
(1,821x**TS**)+(0,027x**P**)+(0,001x**K**)+(0,024x**OM**)

Conclusion / Discussion: Standardizing the olive oil quality is not easy at all due to complex and variable environmental conditions. Along with the results herein, the factors themselves were not significant but their complex interaction was significant.

Keywords: Squalene, olive oil, soil characteristics

ORAL PRESENTATION - 90

ANNOTATION OF BUSH TEA (*Athrixia Phylicoides* DC.) USING ^{1}H-NMR AND LC-QTOF-MS TO ASSESS QUALITY IN RESPONSE TO DIFFERENT PRUNING LEVELS

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Objective / Purpose: The objectives of the study was to profile metabolites for assessment of quality of bush tea (*Athrixia phylicoides* DC.) subjected to different pruning levels.

Material and Methods: Treatment consisted of no pruning or control, top-branch pruning, middle pruning and basal pruning arranged in randomized complete block design with single trees used as replicates. The bush tea plant samples were prepared for analysis using ^{1}H NMR spectrometer and LC-QTOF-MS and the multivariate data analysis were performed using SIMCA-P and MetaboAnalyst.

Results: Orthogonal partial least square (OPLS-DA) from ^{1}H NMR and LC-QTOF-MS revealed a separation between the basal, middle, top pruning and the unpruned bush tea plants. Further analyses were done to reveal the variants which contributed to the separations observed. About, 60 compounds were annotated from LC-QTOF-MS, and they include both primary and secondary metabolites. The pruned (top) and unpruned, exhibited higher levels of metabolites than the basal pruned.

Conclusion / Discussion: Although pruning is one of the most important cultural practices, that enhances composition of tea leaves (Tockclai, 2008), there is still lack of literature on the influence of pruning on accumulation of primary and secondary metabolites teas. This study revealed that control (unpruned) plants exhibited more secondary metabolites than the other treatments. Thus, top pruning can be highly recommended on bush tea plant as it resulted in better secondary metabolites accumulation which indicates improved tea quality.

Keywords: *Athrixia phylicoides*, metabolites, quality, pruning

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ORAL PRESENTATION - 91

MICROSCOBICAL INVESTIGATIONS ON A WELL KNOWN SPICE: OREGANO

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Objective / Purpose: The genus *Origanum* L. (Labiatae) is represented by 62 natural taxa in the world, 30 of them occurs in Turkey, all are known as oregano, used as folk remedies and spice [1-2]. Powder products are used in the spice trade, which makes it difficult to diagnose the Herba Origani drugs. The study was carried out in order to contribute to the identification of taxa that can not be diagnosed morphologically because it contains missing diagnostic character.

Material and Methods: Aerial parts of *Origanum* specimens are collected from nature in Turkey and made into herbarium material. They are grinded as powdered drugs and examined by a light microscope, the structures are drawn and photographed.

Results: As a result of examining all the taxa some common characters have been identified. Generally, the lower epidermal cells are larger than the upper ones and have sinuous to wavy walls. There are 2 types of glandular trichomes, covering trichomes are simple. The leaves are amphistomatic and the lower surface is thicker and bigger. Diacytic stomata are present. Pollen grains are usually hexacolpate.

Conclusion / Discussion: Excluding hybrids, 25 *Origanum* taxa naturally grown in Turkey. Except one of these (not collected since 1910-holotype) are evaluated for organoleptic and microscopic characters that could be observed in the powder preparation. Even though the microscopic characters alone are not sufficient to distinguish the species of oregano powder, they can be used to a significant extent when used with other internal and external morphological characters.

Keywords: Anatomy, Herba Origani, Labiatae, oregano, *Origanum*, Turkey

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ORAL PRESENTATION - 92

ACTIVITY OF *CERATONIA SILIQUA* AGAINST BIOFILM FORMATION AND BIOFILM EMBEDDED PATHOGENS

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Objective / Purpose: Biofilms make treatment of biofilm-related infection hard and recurrent. Antibiofilm alternative substances such as natural compounds are needed to discover, instead antibiotics of which usage can rise multidrug resistant isolates to several antibiotics **[1]**. *Ceratonia siliqua* (*C. siliqua*) contains polyphenols such as tannins, phenolic acids, flavonoids that have antibacterial activity **[2]**. This study was performed to investigate the effects of *C. siliqua* against biofilm formation and biofilm embedded pathogens.

Material and Methods: *C. siliqua* pods were extracted with distilled water (400mg/mL) by heating at 50^{o}C for 4 hours in benmari. Extract was double fold diluted (1/2) to gain doses extended from 400-3.125 mg/mL. Biofilm production of Methicillin resistant *Staphylococcus aureus*, Methicillin sensitive *Staphylococcus aureus*, Methicillin resistant *Staphylococcus epidermidis*, *Escherichia coli*, *Klebsiella pneumonia*, *Pseudomonas aeroginosa*, and *Proteus mirabilis* were determined by tube method, congo red agar method, and microtiter plate assay (MtP). The activity of *C. siliqua* extract against biofilm formation and biofilm embedded pathogens were examined by using MtP.

Results: Biofilm productions of pathogens were decreased ranging 0.040-0.070 nm at the concentrations of 400 mg/mL of *C. siliqua*. Biofilms produced by biofilm embedded bacteria were not distrupted by *C. siliqua*. Planktonic bacteria that were detached from matured biofilm were eliminated ranging 0.16-3.58 log cycle by *C. siliqua* of which concentration was 400 mg/mL.

Conclusion / Discussion: *C. siliqua* extract can be improved as pharmaceutical and nutraceutical due to its antibiofilm activity to prevent or treat biofilm-related infections.

Keywords: *Ceratonia siliqua*, Antibiofilm, Biofilm formation, Biofilm embedded bacteria, Biofilm producer bacteria, Antimicrobial resistance.

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ORAL PRESENTATION - 93

ANTIOXIDANT ACTIVITY, CYTOTOXICTY, TOTAL PHENOLIC AND FLAVONOID CONTENTS OF *Alkanna tinctoria* (L.) Tausch ROOT EXTRACTS

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Objective: To screen the antioxidant activity, cytotoxicity, total phenolic and flavonoid contents of *Alkanna tinctoria* root extracts.

Material and Methods: *A.tinctoria* roots collected from Mus, eastern part of Turkey in 2016 were dried and powdered by porcelain mortar. These powdered samples were extracted separately by methanol (MA), ethanol (EA), acetonitrile (AA) and distilled water (DA) (10%). After concentrated, samples were suspended by methanol at final concentration 20 mg/mL. The possible antioxidant activities of extracts were screened by free radical scavenging activity method. The total phenolic and flavonoid contents of the extracts were detected according to the Folin-Ciocalteu spectrophotometric analysis and the method given by Sharma and Vig (2013). Cytotoxicitiy of the extracts (6.25, 12.5, 25, 50 and 100 µg/ml for 24-48 h**)** was evaluated on canine mammary tumor cell line CMT-U27 by MTT assays.

Results: The total phenolic contents of alkanet root extracts (MA, EA, AA and DA) were 0.415, 1.183, 1.003 and 0.041 mg GAE/g. The flavonoid contents of these extracts were calculated as 0.228, 0.115, 0.3 and 0.066 mg RE/g, respectively. % inhibiton in DPPH of extracts was found to be 62, 3, -34 and 18%. On treating CMT-U27 cells with extracts for 48 h, 25, 50 and 100 µg/ml asetonitrile extracts exhibited maximum anti-proliferative effect with ~40, 60 and 80% inhibition of viability, respectively.

Conclusion/Discussion: *A. tinctoria* root extracts especially acetonirile could be evaluated as potential substances for anticancer drug therapys. But at first, identification and isolation of biologically active compounds in extracts are needed.

Keywords: *Alkanna tinctoria*, cytotoxicity, antioxidant, phenolics, flavonoid

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ORAL PRESENTATION - 94

ANTIMICROBIAL AND PHENOLIC COMPOSITION OF GOOSEBERRY

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Gooseberry, one of the fruits with functional properties, have increasingly economical prescriptions in national and international markets. Gooseberry (Physalis peruviana L.) grown in Trabzon province was used in fruit study. In this study, gooseberry was separated into four groups (fruit, leaf road, seed and branch) and was determined antimicrobial activity and phenolic composition. Thirteen standards of phenolic compounds were analyzed using HPLC-UV (Elite Lachrom Hitachi, Japan) using a C18 column of LiChroCART ® 250- 4 RP (10 µm) 280 nm, were used to detect phenolic substances. Thirteen referance standarts, including gallic, protocatechuic acid, p-OH benzoic acid, catechin, vanillic acid, caffeic acid, epicatechin, p-coumaric acid, ferulic acid, rutin, t-cinnamic acid and luteolin were used to determine and quantify amounts of phenolics. Gallic acid and were detected in all samples while *p*-OH benzoic acid and luteolin were absent from all samples. The antimicrobial activity of gooseberry sample was studied using ten bacteria (four gram-positive: *Staphylococcus aureus*, *Bacillus cereus*, *Listeria monocytogenes*, *Clostridium perfringens*, and six gram negative: *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Shigella sonne*, *Yersina enterocolitica*, *Salmonella typhimurium*) and two yeasts (*Candida albicans*, *Aspergillus niger*). It was found that all parts of the fruit had an effect against both gram positive and gram negative. Seed part showed the highest activity compared to other parts. As a result, it was determined that the gooseberry has antimicrobial activity and that the phenolic content was found to be rich.

Keywords: *Physalis peruviana* L., Antimicrobial activity, Phenolic substances

ORAL PRESENTATION - 95

INVESTIGATION OF SOME CHEMICAL CHARACTERISTICS OF WILD EDIBLE *CEPHALARIA SCHRADER* EX ROEMER & SCHULTES G.C. SETOSA BOISS &HOHEN GROWING IN EAST ANATOLIA

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This study was conducted to determine the mineral contents and some nutritional properties of *Cephalaria Schrader* ex Roemer & schultes G.C. setosa Boiss &hohen growing in Van lake around and are consumed as food and medicinal purposes inhabitants in Eastern Anatolia Region of Turkey. Nutritional value and mineral compositions of wild edible plants have been investigated for food security and human health. It is though that wild edible plants gathered from nature are cheaper food and important for human health. They are also special ingredients for distinguished taste and aroma of traditional cousins. Although they are cheap and available in the near, their mineral composition and nutritional value are important for public health. Thus, in the present study nutritional value and mineral composition of used parts of *Cephalaria Schrader* was investigated.

In laboratory analysis, dry matter, total ash, N%, crude protein, crude fiber and pH were examined as nutritional value. Useful minerals (Ca, Cu, Fe, K, Mg, Mn, Na, P, S and Zn) and heavy metals (Cd, Co, Cr and Pb) that hazardous elements for livings were also determined. The Dry matter, pH, ash and total nitrogen contents of the plant ranged from 18.22 %, 6.33 %, 6.3 % and 1.77%, respectively. Mineral analysis showed that the wild plant contained considerably high amounts of potassium (12.31 g/kg), phosphorus (1.14 g/kg), calcium (9.67 g/kg), magnesium (1.97 g/kg), iron (146.23 mg/kg), manganese (24.25 mg/kg) and zinc (18.70 mg/kg). This work contributed to the nutritional properties of some wild plant, and the information may be useful for the evaluation of dietary information.

Key words: Nutrient content, wild plant, *Cepheleria*, East Anatolia

ORAL PRESENTATION - 96

HOME GARDEN HERBS AND MEDICINAL PLANTS OF LEFKE, CYPRUS

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Objective: The objective of this study was to record edible herbs and fruits derived from home gardens in Lefke, Cyprus and in addition to determine the local residents' knowledge of medicinal uses of home growing plants within their home gardens.

Material and methods: This study was performed in old Turkish Cypriot town Lefke, Cyprus. During the surveys between November 2016 and February 2017 the fruit and edible herb production was documented and standard interviews were performed with garden owners.

Results: A total number of eight herb and 20 fruit tree species were determined during the surveys. The most widely used herb was mint (*Menhta spicata* L.) followed by Origanum (*Origanum majorona* L.). Almost all home garden owners were aware of the health benefits of mint. The most widely used fruits were lemons (*Citrus x limon*) and oranges (*Citrus x aurantium*). The residents were aware of the Vitamin C content and health benefits of these fruits. However, almost all recorded fruit species were used for culinary purposes rather than their medicinal uses.

Conclusion: Through this research, the role of Cypriot home gardens for traditionally grown herb and fruit plants and their effect on cultural-ecological socialization as well as their health benefits were determined.

Keywords: herbs, medicinal, home gardens, rural, Cyprus

ORAL PRESENTATION - 97

EFFECT OF SUMAC (*RHUS CORIARIA L.)* POWDER AS AN ANTIBIOTIC GROWTH PROMOTER SUBSTITUTION ON GROWTH PERFORMANCE, IMMUNE RESPONSES AND SERUM LIPID PROFILE OF BROILER CHICKS

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Objective: This experiment was conducted to evaluate effect of different levels of sumac *(Rhus coriaria* L.*)* powder as an antibiotic growth promoter (AGP) substitution on performance, immune responses and serum lipid profile of broiler chicks.

Materials and Methods: A totally of 260 one-day-old broiler chicks (Ross 308) were used in a completely randomized design with four treatments and five replicate pens from 1 to 42 d. The treatments consisted of basal diet (control) and basal diet with antibiotic growth promoter (flavophospholipol), 3 and 7 g/kg sumac powder. Feed consumption, weight gain and feed conversion ratio were recorded in different growth periods. Antibody titres against sheep red blood cell (SRBC), Newcastle disease (NDV) and avian Influenza viruses (AIV) and heterophils to lymphocytes ratio (H/L) were measured. Serum concentration of triglyceride, cholestrol, LDL and HDL cholestrol were determined at 42 d.

Results: Feed consumption in broilers fed 3 and 7 g/kg sumac powder significantly decreased ($P< 0.05$) but weight gain were not affected by dietary treatments ($P> 0.05$). Feed conversion ratio was significantly improved in broilers fed 7 g/kg sumac powder compared to antibiotic and control ($P< 0.05$). Antibody titres against SRBC, NDV and AIV, lymphoid organs weight and serum lipid parameters were not affected by dietary treatments ($P> 0.05$). Improvement in H/L were observed in broilers fed 7 g/kg sumac powder and antibiotic ($P< 0.05$).

Conclusion: The results suggested that dietary inclusion of 7 g/kg sumac powder can be applied as alternatives to in-feed antibiotics for broiler chick diets.

Keywords: Broiler chick, Sumac, Performance, Immunity, Lipid.

ORAL PRESENTATION - 98

EFFECT OF DIFFERENT EXTRACTS ON DPPH SCAVENGING ACTVITY PROPERTIES AND ESSENTIAL OIL OF *Pistacia terebinthus* LEAVES

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Objective / Purpose: Pistachio genus belonging to family Anacardiaceae is used for many purposes because of their food, medicinal and ornamental values. Besides this, traditionally various species of this genus have folkloric uses in Turkey and many countries. Different parts of these plants such as leaf, stem, bark, galls and fruit are used for ethnobotanical properties. The present study was designed to examine the essential oil composition and antioxidant activities of *Pistacia terebinthus* leaves extracted using different methods to compare antioxidant and biochemical properties.

Material and Methods: The *Pistacia terebinthus* leaves were sampled from trees which are used as rootstock from pistachio orchard. For the extraction of leaves, ethanol, methanol, acetone, hexane and water were used as solvents. DPPH test was used to determine the ability of the extracts to reduce the DPPH radical. The antioxidant activities of extracts were measured by UV-vis spectrophotometer at 517 nm. 1,1-diphenyl-2-picrylhydrazyl (DPPH) were employed as reference and free radical. The essential oil was obtained by hydrodistillation in a clevenger apparatus and analysed by gas chromatography–mass spectrometry (GC-MS).

Results: This study has demonstrated that all of the *Pistacia terebinthus* plant extracts exhibited different antioxidant potentials depending on the solvent used. Bornyl acetate, a-terpineol, germacrene D and d-cadinene were of the determined essential components in the leaves.

Conclusion / Discussion: This present study showed that extracts of leaves of *Pistacia terebinthus* have antioxidant activity in different *in vitro* methods. The differences are likely ascribed to the metabolites extracted from different solvents. Advances in extraction techniques for the isolation of active ingredients from plants will be important for reveal pharmaceutical properties of plants in future.

Keywords: *Pistacia terebinthus*, essential oil, antioxidant, DPPH

ORAL PRESENTATION - 99

FRUIT EXTRACTS OF SUMAC (*Rhus coriaria* L.) FROM SOUTH-EASTERN PART OF TURKEY AS POTENT ANTICANCER, LYSOSOMAL AND LACTATE DEHYDROGENASE EFFECTS AGAINST HUMAN CANCER CELLS (A549, H1299 and H460) AS WELL AS ANTIMICROBIAL and ANTIOXIDANT ACTIVITIES

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Background: Sumac (*Rhus coriaria* L.), belonging to *Anacardiaceae* family, is traditionally used edible-plant as spice in the Anatolia. Additionally, use of sumac has been considered interestingly as alternative therapeutic approaches, because of the presence of various bioactive phytochemicals e.g. tannins, phenolic acids, flavonoids, gallic acids, anthocyanins, terpenoids etc.

Objective / Purpose: Therefore, in this study we aimed to evaluate totally biological properties of various extracts from *R. coriaria* L. fruits, growing in South-eastern part of Turkey, activities that support its medicinal and traditional uses.

Material and Methods: The fruits of *R. coriaria* L. were collected from southeastern part of Turkey, and extracted with water, methanol, hexan and dichloromethane by Soxhlet apparatus. Then *in vitr*o antibacterial, antifungal, antioxidant, cytotoxic, anti-proliferative, lysosomal and lactate dehydrogenase activities of the extracts were analyzed. For evaluation the potential anticancer effects of the sumac extracts on A549, H1299 and H460 human cancer cells MTT, anti-proliferation, neutral red uptake (lysosomal activity) and lactate dehydrogenase release assays were carried out, as well as their corresponding IC_{50}, compairing with non-tumorous HUVEC cells. MIC assay was performed to determine antimicrobial activies of the extracts against *E. coli*, *P. aeruginosa*, *S. aureus* and *C. albicans* microorganisms, and free radical scavenging activities of the sumac extracts were determined by microplate DPPH assay.

Results and Discussion: The results of this study showed that almost all the extracts of sumac exhibited significant anticancer and cytotoxic activities, but aqueous and methanolic extracts were found to be highly cytotoxic with IC_{50}

values in range of 5,08 – 6,49 µg/mL, against all tested human cancer cell lines. Moreover, it was observed that the aqueous and methanolic extracts of sumac were decreased the cell growth significantly through increasing cell death in cancer cells, suggesting that these extracts could have great anticancer potential. Regarding of MIC assay, all the extracts of sumac fruits demonstrated more inhibitory effects against gram negative bacteria than gram positive bacteria strains, and MIC values range from 3,9 µg/mL to 62,5 µg/mL. In terms of DPPH radical scavenging activity (%) of the extracts, almost all the extracts of sumac showed significant antioxidant capacity, methanol extracts of *R. coriaria* L. seemed to possess stronger scavenging activity with IC_{50} estimated at 50,01 ± 1,86 µg/mL.

Conclusion: These findings support the fruits of *R. coriaria* L. have potential uses in microbial disorders and cancer therapy as alternative therapeutics as well as the uses in nutrition and pharmacology. Although, there are some evidence in support of anticancer activity of sumac, further researches should be conducted to identify which bioactive phytochemical(s) are responsible for these effects actually, and also confirmed *in vivo* with animal models to be certain of the mechanisms underlying the biological activities of its.

Keywords: *Rhus coriaria* L., sumac, anti-proliferative activity, MTT, DPPH, IC_{50}, lysosomal activity, lactate dehydrogenase, cytotoxicity

ORAL PRESENTATION - 100

IN VITRO ANTICANCER ACTIVITY AND ANTIOXIDANT PROPERTIES OF EOS FROM *Populus alba* and *Rosmarinus officinalis* GROWING IN SOUTH EASTERN ANATOLIA OF TURKEY

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Background: A large number of secondary metabolites, including essential oils (EOs), derived from medicinal plants were found to exhibit interesting anti-tumor, anti-mutagenic and anti-carcinogenic activities against various cancer cells. Nowadays, there is a growing interest in using EOs in various sectors and industries, due to their anti-oxidant and anti-microbial activities, as well as their potential chemopreventive properties for cancer. In the present study, we investigate potential biological activities of EOs from *Populus alba* L. (*Salicaceae*, also known as white poplar) and *Rosmarinus officinalis* L. (*Lamiaceae*, also known as rosemary) as they are a rich source of EOs.

Objective / Purpose: The aim of the present study was to investigate antioxidant properties and *in vitro* cytotoxic activities of EOs from *P. alba* and *R. officinalis* against three human cancer cell lines: A549 cells (human lung carcinoma), H1299 (non-small lung cancer) and MCF-7 (human breast cancer), obtained from the American Type Culture Collection (ATCC).

Material and Methods: MTT was assay carried out to determine the potential antiproliferative and cytotoxic properties of the essential oils as well as their corresponding IC_{50}. Cells were cultured on RPMI-1640 medium, supplemented with 10% fetal bovine serum, 100 U/ml penicillin and 100 µg/mL streptomycin in the flasks with 5% CO_2 at 37°C. The 5 x 10^3 cells per ml were treated with EOs with concentrations of 0, 1, 10, 100 µM, for 48h. Then, the OD was measured at 570 nm and the inhibition (%) calculated. Antioxidant activity was determined using 2,2-diphenyl-2-picrylhydrazyl (DPPH) and thiobarbituric acid-reactive substances (TBARS) using ascorbic acid as standard.

Results: The EOs from *P. alba* and *R. officinalis* were analyzed for their *in vitro* cytotoxic and antioxidant activities. Regarding cytotoxic activities. EOs of *R. officinalis* possesed strong inhibition (IC_{50} = 3.06-7.38 µg/ml) of cell proliferation

in comparison to those of *P. alba* (IC_{50} = 10.53-28.16 µg/ml). Additionally, EOs from *R. officinalis* was found to have higher antioxidant activity than other. Moreover, both of the EOs were found to exhibit higher cytotoxic potential against A549 and H1299 cells, and moderate cytotoxic potential against MCF-7 cells. As a result, it can be concluded both of the EOs exhibited the strongest antiproliferative and cytotoxic properties, and also potent antioxidant activities.

Discussion: EOs of *P. alba* and *R. officinalis* were found to possess anticancer properties against three human cell lines. On the other hand, the production of reactive oxygen species (ROS) which originate oxidation and inflammation, can cause various types of cancer. ROS may activate signaling pathways, specifically those that contribute to cancer development and metastasis through the induction of apoptosis and cell cycle arrest.

Conclusion: The results of this study indicate that these EOs may have a potential for treatment of some cancer types. However, further studies using cell culture and animal models to understand the mechanisms underlying the cytotoxicity and anticancer activity of these EOs are needed to better understand the biological events and molecular targets of EOs to safeguard their usage as therapeutic agents.

Keywords: Cytotoxic activity, EOs, MTT, TBARS, IC_{50}

ORAL PRESENTATION - 101

APPLICATION OF ETHNOBOTANICAL INDICES ON THE USE OF MEDICINAL PLANTS IN SAUDI ARABIAN VILLAGES

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Objective /Purpose: Arabian Bedouins still closely linked to its environment, culture and traditional healthcare. Our ethnobotanical study has been performed in order to preserve this knowledge to conserve biodiversity of the wild medicinal plants and to propose some of these plants for a possible use in pharmacology process.

Material and Methods: More than twenty villages have been surveyed by using ethno-botanical questionnaire by the students in their respective villages, asking native inhabitants about the plants, their local names, the use of parts of plants and its doses, the preparation and the respective treatment. The data were analyzed through the use of informant consensus factor (FIC) and fidelity level (FL).

Conclusion/ Discussion: Several wild medicinal species have been identified which have different interesting and valuable biological activities. These species belong to different families such as Lamiaceae, Asteraceae, Poaceae and Loranthaceae. The ethno-medicinal knowledge and plants with high FIC and FL values should be further analyzed chemically and biologically for the future exploration such as *Plicosepalus acaciae*, which can be recommended for diabetes, cardiovascular and cancer care in pharmaceutical research.

Keywords: Ethnobotany, FIC, *Plicosepalus acaciae*

ORAL PRESENTATION - 102

EVALUATION OF DRYING METHODS WITH RESPECT TO SOME QUALITY AND NUTRITIONAL PROPERTIES OF LAURUS *NOBILIS* L. GROWN IN TURKEY

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Objective / Purpose: Laurus *nobilis* L. (bay leaf) is a perennial and an evergreen shrub that belongs to the *Lauraceae* family and consumed as fresh or industrially processed. Bay leaf deteriorates rapidly during postharvest storage period by losing flavor and some quality characteristics. Drying is one of the preparation method of bay leaves for marketing. This study represents the effects of traditional sun and shade drying, convective and microwave drying methods on some quality characteristics of bay leaves.

Material and Methods: Harvested leaves from Mersin in Turkey were dried at 50 ^{o}C in conventional oven, microwave oven (400W) and under shade and sun (in October). Comparison of drying methods were evaluated by physical, chemical and nutritional quality with determining moisture content, water activity, Hunter L, a, b value, total phenolic content and total antioxidant activity [1, 2].

Results: The results showed that final moisture content and water activity of dried samples were about 3.49-6.31 % and 0,267-0,371 for all drying methods, respectively. Minimum color difference value is obtained by microwave drying (6.49) compare to oven (8.67), shade (10.54) and sun (19.54) drying methods. Microwave dried leaves showed the highest antioxidant activity (54.3 mg/g $FeSO_4.7H_2O$) and total phenolic content (26.1 mg/g Gallic Acid Equivalents) on dry basis.

Conclusion / Discussion: As a result bay leaf could be reported as a rich source of phenolic compounds and microwave drying methods is recommended for the production of high quality bay leaves for marketing.

Keywords: Drying, *Laurus nobilis*, phenolic content and antioxidant activity.

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ORAL PRESENTATION - 103

TOTAL PHENOLIC AND FLAVANOID CONTENTS, ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES OF TRADITIONAL UNRIPE GRAPE PRODUCTS

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Purpose: To evaluate total phenolic and flavanoid contents, antioxidant capacity and the antimicrobial activity of unripe grape samples (juice, powder and piece) extracted by various solvents.

Material and Methods: Samples were extracted separately by ethanol and distilled water (10%). After concentrated, samples were suspended in methanol at final concentration 100 mg/mL. For the six different unripe grape juice extracts were determined total phenolic and flavonoid contents by using spectrophotometric method. Antioxidant capacity by DPPH radical's inhibition and antimicrobial activity against *E. coli*, *C. albicans* and *S. aureus* by disc diffusion method were investigated.

Results: Percentage yield in sample extracts were observed to range from 4.19 to 17.76. While the total phenolic contents of ethanol and distilled water extracts were revealed to range from 505.682 to 758.523 and 424.432 to 603.409 mg GAE/g, the total flavonoid contents of extracts were 0.073 to 0.147 and 0.041 to 0.055 mg RE/g, respectively. Antioxidant capacity of extracts was calculated between 64.07 (ethanol) and 82.64 % (distilled water). Sample extracts showed antimicrobial activity against only one test microorganism, *C. albicans*. The highest antibacterial activity (8 mm) was observed in grape piece distilled water extract.

Conclusion/Discussion: For ethanol extracts, the highest total phenolic and flavonoid contents, antioxidant activity and percentage yield in unripe grape juices were revealed. But in distilled water extracts, while the highest total phenolic content and antioxidant activity were detected in unripe grape powder, the maximum total phenolic content was in unripe grape juice extract.

Keywords: Phenolics, flavonoid, antioxidant, antimicrobial, unripe grape

ORAL PRESENTATION - 104

IN VITRO EVALUATION OF ANTICANCER AND ANTIPROLIFERATIVE ACTIVITIES OF LAVENDER *(Lavandula angustifolia* Mill.*)* ESSENTIAL OIL UNDER DIFFERENT GROWING CONDITIONS

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Background: Essential oils (EOs) from Lavender (*Lavandula angustifolia* Mill.) have been widely used as a wide variety of therapeutic purposes because of their rich anti-oxidant, anti-microbial, anti-depressive, anti-spasmodic, activities, as well as their potential chemopreventive and antineoplastic properties for cancer and, more recently, used in aromatherapy and incorporated into perfumes, pharmaceuticals, soaps, shower gels, cosmetics, detergents, washing powders, and also natural food processing products, accordingly EOs continue to be as popular today. Alternative agricultural practices are likely to play a significant point when considering to increase flower yield with obtained a rich constituent and high quality EOs.

Objective / Purpose: In this study, we aimed to investigate potential anticancer and antiproliferative activities of Lavender EOs against three human cancer cell lines: A549 (human lung carcinoma), H1299 (non-small lung cancer), U-87MG (human glioblastoma) cancer cell lines, and non-tumorous HUVEC cells, obtained from the American Type Culture Collection (ATCC). Moreover, aimed to determine whether agricultural practices can increase the effect on high EO content or not. For this purpose, we compared the anticancer activities of the EOs that distilled from two different growing media (traditional system and plastic mulch) and

Material and Methods: Lavender (*Lavandula angustifolia* Mill.), growing under traditional system and plastic mulch, was harvested from first and second year products during the blooming season from Kilis, Turkey. Lavender EOs were distilled by traditional distillation process. MTT, anti-proliferation, neutral red uptake (lysosomal activity) and lactate dehydrogenase release assay were used to evaluate the potential anticancer effects of the Lavender EOs against A549, H1299 and U-87MG cancer cells, as well as their corresponding IC_{50}. Cells were cultured on DMEM supplemented with 10% fetal bovine serum, 1% antibiotics (100 U/mL

penicillin and 100 µg/mL streptomycin) in the flasks at 37°C with 5% CO_2. All the experiments were performed in triplicates.

Results and Discussion: The results showed Lavender EOs exhibited strong anticancer and cytotoxic activity against all cancer cells, and decrease the cell growth by increasing cell death in cancer cells significantly, and also higher toxicity towards U-87MG glioblastoma cell line than the lung cell lines. The IC_{50} values of the EO <5 µg/mL for U-87MG cells, and ranged between 10 µg/mL and 30 µg/mL for lung cancer cell lines, whereas, 160 µg/mL for normal HUVEC cells. Regarding anti-proliferation and lysosomal activity assays, the EO showed greater effect on the cell viability of A549 and H1299 cells than U-87MG cell. Furthermore, higher cytotoxicity and anticancer activity were observed under growing plastic mulch as compared to that of traditional system. Additionally, the amount and quality of bioactive constituents were decreasing obviously depending the year.

Conclusion: Overall, this study demonstrated that Lavender EO is significantly anticancer and antiproliferative to the cancer cell lines in a dose dependent manner, particularly to brain cancer cell lines, and it can be used as an alternative cancer therapy agent on the management of neurodegenerative diseases. However, further studies must be conducted to identify which components are responsible for these anticancer and antiproliferative effects actually, and also isolated active component must be confirmed in vivo with animal models to ascertain the mechanisms underlying the cytotoxicity and anticancer activity of Lavender EO as anticancer agent.

Keywords: Anticancer activity, antiproliferative, essential oils, Lavender, IC_{50}.

ORAL PRESENTATION - 105

REGULATION OF MicroRNAs BY NATURAL PRODUCTS AND BIOACTIVE COMPOUNDS OBTAINED FROM COMMON MEDICINAL PLANTS: NOVEL STRATEGY IN CANCER THERAPY

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Background: Micro RNAs (miRNAs) are known to contribute to the epigenetic regulation process in various cancer cells, including the regulation of cancer progression, proliferation and metastasis of cancer cells, differentiation of the cells and process of apoptosis. Furthermore, they are crucial for the regulation of cancer stem cells, and management the process of epithelial to mesenchymal transition of cancer cells, implicating in the cancer cells.

Objective / Purpose: In this review, we aimed to provide an overview the activities of natural compounds and/or products, isolated from medicinal plants, on miRNAs which are closely related to cancer progression and metastasis. Several cancer studies have showed that their roles are changeable depending on biological processes, for example miR-17, miR-20a, miR-19b-1, miR-18a, miR-19a, miR-92-1, miR-21, and miR-155 may have critical roles as oncogenic miRNAs (oncomiRs), while miR-15, miR-16, let-7, miR-34, miR-48, miR-84, miR-241 may have anticancer activities as tumor suppressor miRNAs. Therefore, the regulation of miRNAs levels by natural compounds and/or products could be a promising strategy for cancer treatment, especially in order to inhibit cancer progression and proliferation, prevent metastasis, control the process of transition of cancer cells, and overcome chemotherapeutic resistance by increasing drug sensitivity.

Discussion: Recent studies and clinical trials which are aimed to find novel targets for the treatment of cancer, have emphasized the importance of the consumption of natural agents-rich diet, including curcumin, berberine, alkaloids, mitomycin C, resveratrol, camptothecin, topotecan, trabectedin, matrine, honokiol, isoflovones, indole-3-carbinol, sulforaphane, water soluble vitamins, diallyl disulfide, 3,3'-diindolylmethane, epigallocatechin-3-gallate etc., additionally syntheses of natural products by the liposome or nanoparticle formulations assays to regulate the expression levels of miRNAs by effecting the cell signaling and apoptotic pathways such as PI3K-Akt-mTOR, AR, Akt and ERK signaling, Wnt signaling, p53, Erb and MAPK signaling, Src/Ras/ERK and TGF-β signaling. These natural

agents are obtained from various medicinal plants such as *Allium* species, *Brassica* vegetables, *Magnolia* sp., *Ganoderma* sp., *Berberis aristata, Aloe vera*, *Mentha longifolia, Citrus medica, Betula pendula, Mimosa pudica, Passiflora incarnate, Cannabis sativa, Azadirachta indica, Calendula officinalis, Glyccheriza glabra, Oraxylum indicum, Lithosprmum radix, Myrciaria floribunda, Thymus vulgaris, Xylopia frutescens, Neolitsea variabillima, Guatteria pogonopus, Tridax procumbens, Myrica gale, Boswellia carterii, Commiphora pyracanthoides, Amomum tsaoko, Zingiber officinale, Jasminum grandiflora, Nectandra megapotamica, Matricaria chamomilla, Rosa damascena, Zanthoxylum rhoifolium* Lam., *Lavandula angustifolia, Lavandula stoechas* ssp. *stoechas, Talauma ovata, Mentha spicata* L., *Symphyopappus itatiayensis, Psidium cattleianum, Citrus limon* Burm. f., *Citrus paradise* Macf., *Juniperus phoenicea, Malus domestica, Comptonia peregrina* L., *Artemisia indica, Litsea cubeba, Casearia sylvestris, Photinia serrulata* and *Plectranthus amboinicus.*

Conclusion: Consequently, regulation of microRNAs by natural products and/or bioactive compounds obtained from common medicinal plants would likely provide a novel therapeutic agent for cancer therapy in the following years particularly when provided to be certain that there are no side effects of dietary intake.

Keywords: microRNAs, cancer therapy, natural products, bioactive molecules, medicinal plants

POSTER PRESENTATIONS (1 – 158)

POSTER PRESENTATION - 1

CHEMICAL COMPOSITION, ANTIBACTERIAL, ANTIFUNGAL AND ANTIOXIDANT PROPERTIES OF ESSENTIAL OILS FROM HAIRY AND NORMAL ROOTS OF *LEONURUS SIBIRICUS* L.

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Objective/Purpose: The aim of this study was isolation and chemical composition of essential oils from hairy and normal roots of *Leonurus sibiricus* and evaluation of antimicrobial, antifungal and antioxidant properties of these essential oils.

Material and methods: The essential oils were isolated by hydrodestilation and were analysed by GC-MS method. Antimicrobial and antifungal activity were determined by MIC, MBC and MFC methods. Antioxidant properties were evaluated by ABTS and DPPH tests.

Results: Eighty-five components were identified in total. Seventy components were identified for NR essential oil. The major constituents in NR essential oil were β-selinene (9.9%), selina-4,7-diene (9.7%), (*E*)-β-caryophyllene (7.3%), myli-4(15)-ene (6.4%), guaia-1(10),11-diene (5.9%). Sixty-seven components were identified in HR essential oil. The main constituents being (*E*)-β-caryophyllene (22.6%) and germacrene D (19.8%). The essential oils were tested for antimicrobial (*Staphylococcus aureus, Enterococcus faecalis, Escherichia coli, Pseudomonas aeruginosa),* antifungal (*Candida albicans* and *Saccharomyces cerevisaea*) and antioxidant (ABTS and DPPH assays) activities. Both essential oils showed activity antimicrobial and antifungal (MIC and MFC values of 2500 to 125 µg/L). The essential oils exhibited moderate antioxidant activity in ABTS (EC_{50}= 98 and 88 µg/mL) assay and low antioxidant activity in DPPH test about 500 µg/mL.

Conclusion: This is the first study to examine composition of the essential oils of *L. sibiricus* roots and their antimicrobial, antifungal and antioxidant activities. The results indicate that essential oils may be used in future as an alternative to synthetic antimicrobial agents with potential application in the food and pharmaceutical industries.

Keywords: Hairy roots of *Leonurus sibiricus*, essential oil, antioxidant activity, antimicrobial activity, antifungal activity

POSTER PRESENTATION - 2

ACUTE AND SUBACUTE TOXICOLOGY STUDY OF EXTRACTED *NELUMBO NUCIFERA GAERTN* LEAVES IN MICE AND HYPERTENSIVE RATS

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Objective / Purpose: To increase the safety of the lotus leaves for medicinal herbs to treat or prevent certain diseases especially Antihypertensive effect. The purposes of this study were therefore designed to investigate the acute and Subacute toxicity of lotus leaf extract in mice and hypertensive rats.

Material and Methods: The acute oral, intraperitoneal injection and subacute toxicity study were equally divided either both sex mice or male hypertensive rats into four groups, respectively. The control group received 0.9% NaCl solution, the treatment group received the extract at the oral dose of 8g./kg and intraperitoneal injection toxicity administered with the extract 1, 5 and 8 g./kg respectively, in subacute toxicology, control and negative control groups received sterile water, I and II hypertensive rats groups administered extract at oral dose 400 and 800 mg/kg. Acute toxicology have evaluated signs or symptoms of acute toxicity and the mortality rats observing within 24 h after the administration. For subacute toxicology, blood biochemical parameter and organ pathology in hypertensive rats have measured and examined after receiving extracted leave for 30 days.

Results: In the acute toxicity test, the leaf extract administration by orally the LD50 (Median lethal dose) is greater than 8 g / kg. and by intraperitoneal injection showed that the LD50 (Median lethal dose) of male mice was 1.62 g/kg. mice and female was 1.41 g/ kg. and the body weight in groups of mice. mostly toxic symptoms occurred probably caused by abnormalities in the functioning of the central nervous system and autonomic nervous system but less, numbers of survived mice by orally and intraperitoneal injection were no significant difference ($P < 0.05$) within two weeks. Subacute toxicology, all biochemistry parameters

were no statistically significant difference ($P < 0.05$) for 30 days and no toxic organ pathology were found.

Conclusion / Discussion: These results suggest that the oral lethal dose of *Nelumbo nucifera* leave extract for both male and female mice is in excess of 8 g/kg and the no-observed-adverse-effect level (NOAEL) of the extract for hypotensive male rat is considered to be 800 mg/kg/day.

Keywords: *Nelumbo nucifera* leave, acute oral toxicity, acute intraperitoneal toxicity, subacute toxicology

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POSTER PRESENTATION - 3

OPPORTUNITIES OF USE OF SOME MEDICAL AND AROMATIC PLANTS INDIGENOUS TO OUR COUNTRY IN LANDSCAPING WORKS

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Purpose: The purpose of this study is to investigate use of some woody plants in the natural vegetation of our country and which are also known for their medical aromatic properties in landscape architecture works.

Material and Methods: The plants of *Liquidambar orientalis, Laurus nobilis, Myrtus communis, Rosa canina, Rosmarinus officinalis* and *Lavandula stoechus,* known for their medical aromatic characteristics and naturally grown in Turkey, form the main material of the study. The studies on these species were primarily examined in this research and their medical aromatic characteristics were revealed. Then, the characteristics causing use of these plants in landscape architecture projects and their areas of use were determined.

Results: Use of some woody plants *(Liquidambar orientalis, Laurus nobilis, Myrtus communis, Rosa canina, Rosmarinus officinalis, Lavandula stoechus)* in the natural vegetation of our country and which are also known for their medical aromatic properties in landscape architecture works was investigated in this study. Our country is one of the important geographies in the world due to its rich biodiversity. Many medical-aromatic plants which are traded in the world, are indigenous to our country, and sold in the world market. These plants which are indigenous to our country provide opportunities of use not only in commerce but also in outdoor landscaping works with many aesthetic properties such as form, colour and smell; and functional properties such as forming shadow, being fence and border instruments or road tree.

Conclusion / Discussion: The plants which are precious for their medical aromatic characteristics such as *Liquidambar orientalis, Laurus nobilis, Myrtus communis, Rosa canina, Rosmarinus officinalis* and *Lavandula stoechus* are irreplaceable herbs for landscaping projects with regards to functional purposes such as limiting, screening and fencing due to their resistance to trimming, root structure and intense tissue in addition to their many aesthetic properties such as leaf colour, colour effect created in autumn and odour.

Keywords: Medical aromatic plant, Natural vegetation, Landscape Architecture

POSTER PRESENTATION - 4

FRUIT, SEED AND POLLEN MORPHOLOGY OF TURKISH *CHORISPORA* DC. SPECIES (*BRASSICACEAE*)

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Purpose: Fruits of the family Brassicaceae are a capsule forming siliqua or silicula and as much of the taxonomy of the family is based on fruit characters. Pollen morphology has provided an approach to the systematic relationships among the genera of the Brassicaceae. Three species of the genus are found in Turkish Flora. The present investigation concern with the taxonomic significance of fruit, seed and pollen characters as a criterion for the separation of *Chorispora* species studied in Turkey.

Material and Methods: *Chorispora* species were collected from different localities in Turkey. The fruit, seed and pollen macro-micromorphological characters of Turkish *Chorispora* species were studied using scanning electron microscope (SEM) and stereoscope.

Results: Typical fruits are linear, straight or strongly curved upward. Nonglandular and glandular trichomes are present or absent. Seeds varied in shape from oblong, oblong-broadly elliptic to subglobose and winged at the apex and base or not. The pollen grains are tricolpate and the basic shape of the pollen grains in species studied is perprolate. The surface sculpturing type is reticulate.

Discussion: Among the studied characters, fruit, seed size and colour, seed shape, fruit trichome structure, pollen size were found to have major taxonomic importance and proved to be valuable characters for separating taxa. A key for the identification of the investigated taxa based on fruit and seed characters is provided. The results obtained in the present study are in concordance with the earlier data.

Keywords: Brassicaceae, *Chorispora,* fruit, seed, pollen, scanning electron microscopy

POSTER PRESENTATION - 5

DETERMINATION OF PHYTOL CONTENT IN SOME VEGETABLES AND FRUITS

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Phytol is widely used in the synthesis of vitamin and E and K, in the fragrance industry, cosmetics, as a food additive etc [1]. The use of phytol in the human body is essential in activating enzymes that have a positive effect on the production of insulin and enzymes that decrease blood cholesterol [2].

The present study investigates phytol content in samples of fresh fruits and vegetables grown in the Republic of Macedonia. For that purpose a total of 170 samples of different fresh vegetables: tomato, cucumber, paprika, potato, beans, carrot, beetroot, leek, eggplant, zucchini and okra; fruits: apples, grapes, plums, peaches, watermelon and melon were tested. Extraction of the plants was performed with acetone followed by re-extraction with petroleum ether (40-60) and purification on cartridges packed with polymerically bonded ethylenediamine-N-propyl phase (PSA). Identification and determination of phytol was performed with gas chromatography – tandem mass spectrometry (GC-MS). The results of the study showed that content of phytol in the extract of analyzed fruit samples was in the range from less than 0.01% (w/w) for plums to 3.5% (w/w) for grapes. Vegetables with low content of phytol were: eggplant, tomato, potato, carrot, beetroot, and beans. Cucumber was the crop with highest phytol content with average value of 26.9% (w/w). The extracts obtained from leek contained 7.2% (w/w) phytol, and the extracts obtained from okra contained 3.8% (w/w) phytol.

Results of our investigations showed that vegetables with higher content of chlorophyll as cucumber and leek contain phytol in higher concentration.

Keywords: phytol, vegetables, fruits, gas chromatography tandem mass spectrometry (GC-MS)

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POSTER PRESENTATION - 6

MEDICINAL PLANTS USED IN MERİÇ TOWN FROM TURKEY

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Purpose: The aim of this study is to determine the parts used and usage purposes of medicinal plants used by local people in Meriç town.

Material and Methods: The study was performed from March to October in the years 2013-2015 in Meriç town and surrounding 23 villages as face-to-face interviews with 38 people from the local community. The identification of the plant species determined to be used for medicinal purposes was based on "Flora of Turkey and East Aegean Islands" (Davis, 1965-1985; Güner et al. 2012). The plant samples identified are kept in Faculty of Pharmacy of Trakya University.

Results: As result of the study, 46 plant taxa within 27 families were recorded as medicinal plants used. The scientific names of the plants, their local names, families, usable parts and forms of utilization were listed alphabetically in a table.

Conclusion: This is the first ethnobotanical study about the local names and uses of folk medicinal plants conducted in Meriç town.

Keywords: Meriç Town, Edirne, Medicinal Plants, Ethnobotany

Acknowledgement: The author would like to thank to all the villagers of Meriç town who collaborated in the realization of this study. This study was supported by The Scientific Research Fund of Trakya University (Project no. TUBAP 2013/22).

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ORAL PRESENTATION - 113

ANTIDIABETIC AND ANTIOXIDANT ACTIVITIES OF *INULA MONTBRETIANA* DC.

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Objective / Purpose: To evaluate the carbohydrate digestive enzyme inhibitory and antioxidant activities of the flower, leaf and root extracts of *Inula montbretiana* together with some of its phenolic constituents.

Material and Methods: *I. montbretiana* was collected from İdris Mountain near Ankara. α-glucosidase and α-amylase enzymes were used to evaluate the antidiabetic activity. Metal chelating, ferric reducing and total antioxidant capacity assays were investigated to present the antioxidant potential. Total phenol and flavonoid contents of the extracts were also studied.

Results: The α-glucosidase enzyme inhibitory activities of the root, leaf and flower extracts were 64.73 ± 3.24, 72.96 ± 1.27 and 87.05 ± 0.92% at 3000 µg/ml, respectively. The inhibitory activity of all the extracts on α-amylase enzyme was weak. Also, some of the phenolic constituents were evaluated for their enzyme inhibitory activities. All the investigated flavonoids showed promising activity at 10 mM concentrations. The total flavonoid and phenolic contents of the flower extracts were 42.54 ± 2.19 mg QE/g extract and 201.59 ± 14.79 mg GAE/g extract, respectively. Total antioxidant power of *I. montbretiana* leaf (405.77 AAE) was determined much more than Trolox (382.50 AAE) at 3000 µg/ml.

Conclusion / Discussion: The α-glucosidase enzyme inhibitory activity of the extracts was remarkable at 3000 µg/ml, while the α-amylase enzyme inhibitory activity of the extracts was weak. To the best of our knowledge this is the only study setting light to the α-glucosidase and α-amylase inhibitory activities of *I. montbretiana*.

Keywords: *Inula montbretiana*, antidiabetic, α-glucosidase, α-amylase

POSTER PRESENTATION - 8

CYTOTOXIC EVALUATION AND ANTIOXIDANT ACTIVITIES OF SELECTED MEDICINAL PLANTS IN ANATOLIA

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Objective / Purpose: The World Health Organisation has reported that, at least 80% of the world's population use medicinal plants for primary health care. However the toxicological profiles of many medicinal plants have not been investigated clearly. In the present study, it is aimed to evaluate the selected medicinal plants, which are used in traditional medicine, in terms of their antioxidant and cytotoxic activities, based on ethnobotanical surveys.

Material and Methods: *Cuscuta arvensis* Beyr. ex Engelm. and *Bongardia chrysogonum* (L.) SPACH. were collected from Central and Southeastern Anatolia Region. Antioxidant activities and total phenolic contents of the methanolic extracts were determined by using DPPH free radical scavenging assay and Folin- Ciocalteu reagent, respectively. MTT assay was used for determination of cytotoxic activities of plant extracts on 3T3 Swiss albino mouse fibroblast cells.

Results: Both of plant extracts showed cytotoxic activity on 3T3 Swiss albino mouse fibroblast cells in a concentration dependent manner. Cytotoxic effect of the extract of *Bongardia chrysogonum* (L.) SPACH. (IC_{50}: 41.37µg/ml) was found to be higher than the extract of *Cuscuta arvensis* Beyr. ex Engelm. (IC_{50}: 176.07µg/ml). On the other hand, the extract of *Bongardia chrysogonum* (L.) SPACH. exhibited weak antioxidant activity and less phenolic content in comparison with *Cuscuta arvensis* Beyr. ex Engelm. extract.

Conclusion / Discussion: Cytotoxic and antioxidant evaluation of the plant extracts supply the preclinical knowledge related to safety profile of these extracts. Further investigations are necessary for chemical characterization of the active compounds and more comprehensive biological assays.

Keywords: Anatolian plants, cytotoxicity, MTT assay, DPPH, phenolic content, herbal remedy

POSTER PRESENTATION - 9

ANTIOXIDANT AND ANTIBACTERIAL PROPERTIES OF *ROSA DUMALIS* GENOTYPES FROM TURKEY

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Objective / Purpose: Most of the rose shrubs harvested for hips are derived from seed and show tremendous variability in terms of plant and fruit properties like growth habit, fruit shape, weight, length, color and diameter. In the present study the antibacterial and antioxidant characteristic of hips from 10 rose genotypes belongs to *Rosa dumalis* sampled from Erzincan were determined to understand genotypic variation within specie.

Material and Methods: A total of 100 fresh fruits from pre-selected 10 *Rosa dumalis* genotypes were collected from the naturally growing areas in Erzincan province of Turkey at the end of September. 2014. Ascorbic acid (Vitamin C) of samples was quantified with the reflectometer set of Merck Co (Merck RQflex) and expressed as mg/100 g fresh weight. After thawing to room temperature, triplicate of 100 g lots of rose hip fruits from each genotype were homogenized in a blender and they were screened for their total phenolic, total carotenoid, total flavonoid and antioxidant capacity, following a single extraction procedure For this procedure, 3 g aliquots of each homogenate were transferred to polypropylene tubes and extracted with 20 mL of extraction buffer containing acetone, deionized water and acetic acid (70:29.5:0.5 v/v), for one hour. Total phenolics were determined colorimetrically using Folin-Ciocalteu reagent.

Results: The results indicated that there were significant differences among *Rosa dumalis* genotypes for all studied physicochemical characteristics of fruits All *Rosa dumalis* genotypes fruit extracts inhibited growth of *B. cereus* with 8-15 mm inhibition zones. Total phenolics, vitamin C and antioxidant activity varied from 65 to 97 mg GAE/g DW; 588-789 mg/100 g FW and 85.11-89.56% in β-Carotene method.

Conclusion / Discussion: The results of the present investigation clearly indicated that the bioactive properties vary within *Rosa dumalis* genotypes. The variation in bioactive content noticed in the hereby investigation can be useful in food production, health industry and future breeding programs.

Keywords: Rose, bioactive content, antibacterial, diversity

POSTER PRESENTATION - 10

EVALUATION THE ANTIMICROBIAL EFFECTS of *PISTACIA TEREBENTHUS* and *PAPAVER RHOEAS* EXTRACTS AGAINST SOME PATHOGEN MICROORGANISMS

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Objective / Purpose: In this study, the antimicrobial activity of *Pistacia terebenthus* and *Papaver rhoeas* extracts were tested against some pathogen microorganisms.

Material and Methods: Leaves of the plant samples were freeze-dried and powdered. 10 grams of this material was extracted separately in 150mL of methanol, ethyl acetate, and boiled water for 6 hours at Soxhlet.The extracts were concentrated and then kept at 4°C. The agar well diffusion method is used for the antimicrobial activities of extracts.

Results: The result of the methanol and ethyl acetate of *Pistacia terebenthus* was found to be effective against tested bacterial pathogens *S. aureus* ATCC 25923, *S. typhimirium* ATCC 14028, *K. pneumonia* ATCC 13882, *M. smegmatis* ATCC 607, *C. xerosis* ATCC 373, *C. albicans* ATCC 10231 and *C. utilis* ATCC 9950, while extract in boiled distilled water showed only against *S. aureus* ATCC 25923, *M. smegmatis* ATCC 607, *Aspergillus niger*. However, the methanol extract of *Papaver rhoeas* showed only against *C. albicans* ATCC 10231, while extract in boiled distilled water demonstrated *C. albicans* ATCC 10231, *C. utilis* ATCC 9950 and *Aspergillus niger*.

Conclusion / Discussion: *Pistacia terebenthus* indicated antimicrobial effect against microorganisms more than *Papaver rhoeas*. In addition, antimicrobial activity of methanol extract was higher than those of ethyl acetate and boiled water extracts. The methanol and ethyl acetate extracts of *Pistacia terebenthus* reveal secondary metabolites like alkaloids, tannins, and flavonoids and these have an antimicrobial effect.

Keywords: *Pistacia terebenthus*, *Papaver rhoeas*, Folkloric medicine, Antimicrobial effect, Agar well diffusion method

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POSTER PRESENTATION - 11

ANTIMICROBIAL ACTIVITY of *ECHINOPHORA TENUIFOLIA* and *RAPHANUS SATIVUS* EXTRACTS

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Objective / Purpose: In this study, the antimicrobial activity of *Echinophora tenuifolia* and *Raphanus sativus* extracts were tested against some pathogen microorganisms.

Material and Methods: Leaves of the plant samples were freeze-dried and powdered. 10 grams of this material was extracted separately in 150mL of methanol, ethyl acetate, and boiled water for 6 hours at Soxhlet. The extracts were concentrated and then kept at 4°C. The agar well diffusion method is used for the antimicrobial activities of extracts.

Results: The methanol extract of *Echinophora tenuifolia* was found to be effective against tested bacterial pathogens *M. smegmatis* ATCC 607, *C. xerosis* ATCC 373, *C. utilis* ATCC 9950, while extract in boiled distilled water showed only against *Aspergillus niger*. However, ethyl acetate extract of *Echinophora tenuifolia showed no activity. The* extract in boiled distilled water *of Raphanus sativus* demonstrated effect against *C. xerosis* ATCC 373 and *Aspergillus niger*. In addition, the methanol extract *of Raphanus sativus* showed only against *S. aureus* ATCC 25923, while ethyl acetate extract inferred only against *C. xerosis* ATCC 373.

Conclusion / Discussion: The methanol extract of *Echinophora tenuifolia and* boiled water extract of *Raphanus sativus* was more effective than the ethyl acetate extract. The methanol extract of *Echinophora tenuifolia and the* extract in boiled distilled water *of Raphanus sativus* find out phenolic compounds like alkaloids, tannins, and flavonoids and these have an antimicrobial effect.

Keywords: *Echinophora tenuifolia*, *Raphanus sativus*, Antimicrobial effect, Agar well diffusion method

References:

[1] Çoban, E.P., Bıyık, H.H., & Uzun C. (2009). Investigation of antimicrobial activity of some natural plants which are not-cultivated and are sold at bazaars in Aydın. *International Journal of Natural and Engineering Sciences*, *3*(2), 59-62.

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POSTER PRESENTATION - 12

ANTIBACTERIAL ACTIVITY OF *MORINGA OLIFERA* AGAINST *HELICOBACTER PYLORI*

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Objective / Purpose: To study the antibacterial effect of different concentration of chloroform and methanol and aqueous extraction of *Moringa oleifera* leaves against *Helicobacter pylori* bacteria.

Material and Methods: Preparation of the chloroform and methanol grinded using mortar and pestle and successively extracted chloroform and methanol using soxhelt extractor apparatus
Preparation of the aqueous extract:100 g of the plant leaves was soaked in 500 ml hot distilled water, Extract was then filtered and freezed, extract was dried using freezdrear till powdered extract obtained.
Laboratory antimicrobial sensitivity testing performed using diffusion technique the culture is examined for areas of no growth around the disc (zone of inhibition)(1).
Cut plate technique: In the cut plate technique measure the minimum bactericidal concentration (MBC)

Results: 20% 10% and 5% concentration of methanol extraction of *Moringa oleifera* gaves Mean diameter of *H. pylori* inhibition zone 23, 21 and 20 mm respectively
20% 10% and 5% concentration of aqueous extraction of *Moringa oleifera* gaves Mean diameter of *H. pylori* inhibition zone 25, 24 and 24 mm respectively
The mean diameter of *Helicobacter pylori* inhibition zone around the positive control disc (ciprofloxacin) was 20 mm.

Conclusion / Discussion: We found high antibacterial activity of both methanol and aqueous extraction of *Moringa oleifera* leaves against *Helicobacter pylori.*
The study has clearly shown the in vitro anti-bacterial activity of both methanol and aqueous extract of *Moringa oleifera* on *Helicobacter pylori*.

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POSTER PRESENTATION - 13

COMPARISON of ANTIMICROBIAL EFFECTS of CHEMICAL DISINFECTANTS with CENTAUR OIL

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Objective / Purpose: In this study is to compare the antimicrobial activities of commercially obtained centaury oil with silver nitrate and benzalkonium chloride against the clinically important microorganisms.

Material and Methods: The antimicrobial activity of the centaury oils, %0.1 silver nitrate, and %0.1 benzalkonium chloride were tested against *E. coli* ATCC 35218, *S. aureus* ATCC 25923, *S. typhimirium* ATCC 14028, *K. pneumoniae* ATCC 13882, *M. smegmatis* ATCC 607, *C. xerosis* ATCC 373, *C. albicans* ATCC 10231, *C. utilis* ATCC 9950, *Aspergillus niger* and *Penicillium expansum*. Agar-well method was used to show the antimicrobial activity by measuring the zone diameters.

Results: There were no antimicrobial effects for centaury oil but %0.1 silver nitrate and %0.1 benzalkonium chloride had effect against used test microorganisms. The effects of %0.1 benzalkonium chloride were higher than %0.1 silver nitrate.

Conclusion / Discussion: %0.1 benzalkonium chloride has a stronger antimicrobial activity than the%0.1 silver nitrate and centaury oils. Although *Hypericum perforatum* was used as folk medicine in the treatment of many diseases, it is a surprising result that the effect of centaury oil on microorganisms is not seen. The reason of this, the centaury oil dose may be inadequate against the microorganisms used.

Keywords: Centaury oils, Silver nitrate, Benzalkonium chloride, microorganism, antimicrobial effect

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POSTER PRESENTATION - 14

DETERMINATION OF THE CHEMICAL COMPOSITION AND *IN VIVO* ANTIPARASITIC ACTIVITY OF *ARTEMISIA ABSINTHIUM* ETHANOL EXTRACT AGAINST HEXAMITIOSIS IN RAINBOW TROUT (*ONCORHYNCHUS MYKISS*)

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Objective / Purpose: The present study was to determine the *in vivo* antiparasitic activity, preventing and treatment to disease (Hexamitiosis) of the plant ethanol extracts in rainbow trout.

Material and Methods: The plant ethanol exracts were tested with diets as 1.0, 1.5, 2.5, 3.0 g kg^{-1} diet. Fish (average 1.5-2.0 g) were distributed to various treatment at the rate of 100 fish per 400 L aquarium for short (7 days) and long (21 days) time. Optimum treatment doses were obtained for plant species.

Results: The results of the present study showed that *Artemisia absinthium* L. displayed the antiparasitic activity against *H. salmonis* in treated groups, compared with the negative control ($P \leq 0.05$). Cumulative mortalities were decreased in all treatment groups and positive control. The number of *H. salmonis* trophozoites decreased after 11th days. The long period (21 day) was more effective than short period (7 days) in treatments. The composition of extract of *Artemisia absinthium* L . was analyzed by GS-MS and the major components of *Artemisia absinthium* L. were sabinol (42.22%), chrysanthenylacetate (14.73%), epoxy-ocimene (4.97%), thujone (2.19%), d-isothujone (3.97%), β selinene (2.60%), hexanal (2.30%), cymene (1.71%) and benzaldehyde (1.04%).

Conclusion / Discussion: *Artemisia absinthium* L. determined the antiparasitic activity against *H. salmonis* in rainbow trout.

Keywords: *Artemisia absinthium* L., *Hexamita salmonis*, Rainbow trout

References:

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POSTER PRESENTATION - 15

EVALUATION OF COMPOSITION OF FREMONT MANDARIN OIL OBTAINED BY SUPERCRITICAL CO_2 EXTRACTION METHOD AND ANTIOXIDANT ACTIVITY

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Objective: *Citrus reticulata* 'Fremont' is one of several *Citrus* species of the mandarin group, the result of a cross between the Clementine and Ponkan mandarins. Mandarin is produced in Southern Aegean and Mediterranean costs of Turkey and mandarin is the second largest *Citrus* fruit crop after orange [1].

Material and Methods: The *Citrus reticulata* 'Fremont'peel oil was obtained by Supercritical CO_2 extraction method. Fremont mandarin samples used in the present study were planted at BATEM located at Antalya, South Turkey, in December 2013. CO_2 was supplied by Linde (Turkey). The operating conditions were 313 K and 100 bar (10 MPa). The CO_2 flow was $1x10^{-3}$ $m^3.min^{-1}$ in the experiments. Pressure was set at 10 MPa in order to allow extraction of a significant fraction. The extraction time 180 minutes. For quantitative results of the volatile fraction, each sample was analysed by gas chromatograph (GC), on a Thermo Finnigan TRACE GC equipped with FID detector. The quantitative composition was obtained by peak area normalization. Identification of constituents was based on comparison GC Retention indices (RI) determined relative to the retention time of a homolog series of n-alkanes (C_8-C_{18}) with linear interpolation, with those of authentic compounds and computer matching with the MS database NIST and Wiley libraries of the GC/MS, as well as by the comparison of the fragmentation pattern in the mass spectra with those reported by Adams [2]. Radical-Scavenging Activity (Antioxidant Activity) of the extracts was determined by the DPPH.

Results: The chemical compositions of the peel oil samples were analysed by gas chromatography (GC) and gas chromatography mass spectrometry (GC/MS). Forty five components were identified by mass spectra, linear retention indices. The antioxidant activity of the *Citrus reticulata* 'Fremont 'peel oil samples was assessed by DPPH radical scavenging capacity assay.

Conclusion: Citrus *reticulata* 'Fremont 'peel oil has high content of monoterpene hydrocarbons (90.87 %). The major monoterpene hydrocarbon was found limonene

(85.18 %). *Citrus reticulate* 'Fremont' peel oil samples showed high (58,17 inhibisyon %) DPPH scavenging activities.

Keywords: Fremont, Supercritical CO_2 extraction, Essential Oil, Antioxidant Activity.

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POSTER PRESENTATION - 16

A SURVEY ON THE AROMATIC PLANTS OF LIBYA

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Objectives: The aim of this study is to investigate on some the aromatic plants growing in Libya, their major volatile oils contents and traditional uses. Indicating dangerous hazards facing plant biodiversity especially medicinal plants in Libya and measures taken to protect them.

Methods: The study is mainly based on electronic database survey using Scopus, PubMed, and Science Direct, etc. and communication with Libyan local inhabitants of some areas. Gathered information has been evaluated and summarized in tables.

Results: Aromatic plant of 41 species has been mentioned of medicinal value represented by 14 plant families and 29 genera. Including 3 species growing in Libya that are used worldwide medicinaly but not recognized in Libya. Endemic species are mentioned; *Origanum cyrenaicum*, *Thymus algeriensis*, *Teucrium zononii* and *Ballota andreuzziana* [1].

Conclusions: Even though Libya remains as one of the most biologically diverse countries in the Mediterranean region, scarce information about aromatic medicinal plants could be documented in this study. On the other hand Libya is suffering from extreme biodiversity destruction and degradation due to Sahara expenses and climate changes and other reasons [2].To deal with the problem IUCN Centre for Mediterranean Cooperation has made a mission in Libya to promote projects.

Keywords: Aromatic plants, volatile oils, traditional uses, endemic species, IUCN missions.

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POSTER PRESENTATION - 17

SOME MEDICINAL AND AROMATIC PLANTS USED AS FOLK MEDICINE FOR GASTROINTESTINAL SYSTEM DISEASES IN EUROPEAN TURKEY

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Objective / Purpose: Most of the medicinal and aromatic plants have been used for gastrointestinal system diseases such as constipation, gallstone and stomach aches as folk medicine. In according to this, this paper includes some traditional medicinal plants which are used for gastrointestinal system diseases in European Turkey.

Material and Methods: In this presentation the photographs of some of the plants, locations of them in European Turkey and information about how they could be used for gastrointestinal diseases as folk medicines, plant parts which were used for treatment, preparations, therapeutic effects, using dosages were given.

Results: The evaluation of relevant data in literature revealed that, *Amaranthus retroflexus* L., *Cornus mas* L., *Ficus carica* L. subsp. *carica*, *Rumex crispus* L., *Rubus sanctus* Schreber were used for constipation while *Cotinus coggyria* Scop., *Anacyclus clavatus* (Desf.) Pers, *Cupressus sempervirens* L., *Hypericum perforatum* L., *Malva neglecta* Wallr, *Morus alba* L., *Cynodon dactylon* (L.) Pers. var. *villosus* Regel, *Rumex acetosella* L., *Prunus spinosa* L., *Urtica dioica* L., *Urtica urens* L., *Momordica charantia* L., *Artemisia absinthium* L., *Sorbus domestica* L., *Sorbus torminalis* (L.) Crantz var. *torminalis* were used for stomach diseases. In addition to this, it was seen that some plants *Prunus divaricata* Ledeb., subsp. *divaricata*, *Cydonia oblonga* Miller and *Pyrus amygdaliformis* Vill. var. *amygdaliformis* used for gallstone.

Conclusion / Discussion: In spite of the well-developed medicinal facilities, the local people still use folk medicines for the treatment of gastrointestinal system diseases. It is important to document the valuable information because the transmission of knowledge from the old to the new generation.

Keywords: European Turkey, gastrointestinal diseases, traditional medicinal plants

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POSTER PRESENTATION - 18

EVALUATION OF α-AMYLASE, α-GLUCOSIDASE, CHOLINESTERASE INHIBITION AND ANTIOXIDANT ACTIVITY OF SOME LAMIACEAE PLANTS

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Objective/Purpose: Diabetes mellitus is a growing health problem worldwide causing severe and costly complications including blindness, cardiac and kidney diseases and increases the risk of cognitive impairment and dementia. The aim of the study is to determine antidiabetic, antioxidant and antialzheimer effect *in vitro* of aerial parts of *Lamium purpureum* var. *purpureum, Origanum onites, Salvia virgata, Thymus zygioides* var. *lycaonius* and leaves and flowers of *S. sclarea*.

Material and Methods: 80% Ethanol extracts were prepared. α-amylase and α-glucosidase enzyme inhibition methods were used to examine antidiabetic activity. Acetylcholinesterase (AChE) and Butyrylcholinesterase (BChE) inhibition methods were used to determine antialzheimer activity. DPPH and DMPD radical scavenging, metal-chelation, ferric-reducing antioxidant power (FRAP) assays were utilized for screening of antioxidant activity. Total flavonoid and phenolic content of the extracts were calculated.

Results: Our results revealed that all of the extracts were inactive against AChE, while *S. sclarea* leaf extract showed BChE inhibition (51.76±1.04%). Among the tested extracts, *T. zygioides* var. *lycaonius* extract (85.28±0.89%) displayed the highest inhibitory activity against α-glucosidase enzyme. *S. sclarea* leaf (1.3356±0.075) and flower (1.3377±0.075) extracts showed the highest FRAP activity. *S. virgata* extract (30.12±1.29) exhibited the highest DMPD activity. All plant samples displayed lower inhibition than 50% α-amylase inhibition.

Conclusion/Discussion: Our findings indicated that *O. onites, S. virgata, S. sclarea* and *T. zygioides* var. *lycaonius* extracts exhibited valuable inhibitory activity and emerged as the sources of possible α-glucosidase inhibitors for future studies.

Keywords: Alzheimer, Antioxidant, Diabetes, *Lamium purpureum* var. *purpureum*, *Salvia* sp., *Thymus zygioides* var. *lycaonius*

POSTER PRESENTATION - 19

CHEMICAL COMPOUNDS OF OAK (*Quercus ssp*.) SPECIES WHICH HAVE MANY DIFFERENT MEDICAL EFFECTS IN EASTERN BLACK SEA REGION

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Objective / Purpose: It is known that Oak (*Quercus ssp*.) has many different medical effects. In literature it is possible to find many researches about anti-inflammatory, wound healing, anthelmintic, antibacterial and antioxidant effects of this plant.

Material and Methods: In this work, the quantities of chemical composition of heartwood, sapwood and bark of Strendzha Oak (*Quercus hartwissiana*), Sessile Oak (*Quercus petraea*) and Eastern Black Sea Oak (*Quercus pontica*) have been determined by means of standard methods. Additionally, chemical components of the heartwood, sapwood and bark of Strendzha Oak (*Quercus hartwissiana*) were analyzed by GC-MS.

Results: In the studies about Sessile Oak, the highest holocellulose and cellulose amount were determined in sapwood; the highest lignin amount, cold water, hot water, 1% NaOH, alcohol and hexane soluble were found in bark. Likewise, on the Eastern Black Sea Oak, the highest holocellulose and cellulose amount were determined in heartwood; the highest lignin amount; cold water, hot water,1% NaOH, alcohol and hexane soluble were found in bark.

Conclusion / Discussion: As a result of GC-MS analyses, the compounds identified in heartwood with higher ratio were octacosane (5.50%), heptacosane (4.44%) and hexacosane (2.76%) while those in sapwood were found octacosane (7.09%), triacontane (6.50%) and heptacosane (4.72%). Additionally, Vitamin E (5.38%), stigsmastan-3,5-dien (2.53%) and campestrol (1.85%) were found higher ratio in the bark of Strendzha Oak.

When this oak species were compared other angiosperm species, chemical compounds and resolution values of woods of Strendzha Oak, Sessile Oak and Eastern Black Sea Oak were found quite high.

Key words: Oak, wood, bark, chemical compound, GC-MS.

POSTER PRESENTATION - 20

EFFECT OF METHYL JASMONATE AND CAFFEIC ACID APPLICATIONS ON SECONDARY METABOLITE PRODUCTION IN MADDER (*RUBIA TINCTORUM*) ROOT CULTURES

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Objective / Purpose: Madder (*Rubia tinctorum*) is a valuable perennial plant species with high concentrations of anthraquinones in its roots and rhizomes. Besides their utilization as colorants, anthraquinone derivatives have been used since centuries for medical applications. Phenolic compounds are another unique compounds for human diet due to their antioxidant properties. This study was carried out to determine the effects of methyl jasmonate (MeJA) and caffeic acid (CA) applications on root growth and secondary metabolite accumulation in adventitious roots of madder.

Material and Methods: *In vitro* adventitious roots derived from internode parts were cultured in Murashige and Skoog media containing different concentrations of MeJA (10 and 100 µM) and CA (1 and 2 mM) for 7 days. Then roots were evaluated in terms of root growth and contents of total anthraquinones (AQ), alizarin, purpurin, total phenolic and individual phenolic compounds.

Results: MeJA decreased the root growth compared to control while CA had a positive influence on the root growth. 2 mM CA+100 µM MeJA combination was the most suitable application providing the highest total AQ, alizarin, purpurin and total phenolics. Individual phenolic compound concentrations also varied depending on the applications. To get high values for galic acid, *o*-cumaric acid, *p*-cumaric acid, chlorogenic acid and caffeic acid, it was required caffeic acid with MeJA while the highest catechin, rutin, ferulic acid, cinnamic acid and quercetin amounts were obtained from the 100 µM MeJA applications without regard to caffeic acid.

Conclusion / Discussion: As reported before [1,2,3], CA and MeJA have positive effects on the production of secondary metabolites including AQs and phenolics.

Key words *Rubia tinctorum*, CA, MeJA, secondary metabolite.

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POSTER PRESENTATION - 21

IN VITRO ANTIOXIDATION AND CYTOTOXICITY OF *Dipterocarpus alatus* EXTRACTS

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Objective: To investigate the antioxidant capacity, phenolic content and cytotoxicity of the crude extracts of *Dipterocarpus alatus* against cervical SiHa and Vero cells.

Material and Methods: Two types of viscous resin of *Dipterocarpus alatus* were prepared from its oleo-resin: (i) by addition of NaOH (resin-I) and (ii) by distillation (resin-II). The methanolic crude extracts were prepared from leaves, barks and twigs. Antioxidant activity using DPPH, ABTS and Total Phenolic Contents (TPC) of the crude extracts were determined. The phenolic constituents were identified by HPLC. Cytotoxicity was determined by neutral red assay.

Results: The crude extracts from bark, leaves and twigs exhibited antioxidant activity using DPPH (IC_{50} ranged 5.57-26.76 μg/ml) and ABTS (IC_{50} ranged 9.37-15.46 μg/ml), which was correlated to the TPC (128.29-266.43 mg GAE g/dry weight). Oleo-resin, resin-I and -II showed less antioxidant activity than the crude extracts. Gallic acid and protocatechuic acid were identified in leaves, bark and twigs while *p*-coumaric acid and ferulic acid were detected only in twigs. Oleo-resin showed the highest cytotoxicity against SiHa (IC_{50} = 59.6±1.7) and less cytotoxicity in Vero cells (IC_{50} = 88.7±4.1 μg/ml) compared to cisplatin, a positive control (IC_{50} = 145.9±9.9 and 92.3±3.6 μg/ml in SiHa and Vero cells, respectively).

Conclusion: The phenolic constituents are thought to be responsible for the antioxidant activity but not for the cytotoxicity of the crude extracts of *D. alatus.*

Keywords: *Dipterocarpus alatus,* Antioxidant, Cytotoxicity, Phenolics

POSTER PRESENTATION - 22

ANTIMICROBIAL ACTIVITIES and SOME FLAVONOIDS in EXTRACTS of SOME MEDICINAL PLANTS

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Objective / Purpose: Antimicrobial activity against 15 disease pathogens was studied in ethanol water extract of *Origanum majorana*, *Melissa officinalis*, *Anthemis cotula* and *Avena sativa* was investigated the presence of some flavonoids through HPLC.

Material and Methods: *O. majorana*, *M. officinalis*, *A. cotula* and *A. sativa* was used in this study. The plants were extracted with ethanol-water (65/35). Obtained extracts were investigated in terms of their antimicrobial activities against 15 microorganisms, namely, *Bacillus subtilis* DSMZ 1971, *Candida albicans* DSMZ 1386, *Enterobacter aerogenes* ATCC 13048, *Enterococcus faecalis* ATCC 29212, *Enterococcus faecium*, *Escherichia coli* ATCC 25922, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* DSMZ 50071, *Pseudomonas fluorescens* P1, *Salmonella enteritidis* ATCC 13075, *Salmonella infantis*, *Salmonella kentucky*, *Salmonella typhimurium* SL 1344, *Staphylococcus aureus* ATCC 25923 and *Staphylococcus epidermidis* DSMZ 20044 by using the disk diffusion method and techniques of MIC (Minimum Inhibitory Concentration), MBC (Minimum Bactericidal Concentration) and MFC (Minimal Fungicidal Concentration). Also, the presence of some flavonoids were analysed via HPLC.

Results: It was determined flavonoids in the extracts of *O. majorana*, *M. officinalis*, *A. cotula* and *A. sativa*. The extracts inhibited the development of microorganisms at different levels: *O. majorana*; *Staphylococcus aureus*, *Enterococcus faecium*, *Enterococcus faecalis*, *Salmonella typhimurium* and *Pseudomonas aeruginosa*, *M. officinalis*; *Enterococcus faecium* and *Enterococcus faecalis*, *A. cotula*; *Enterococcus faecium* and *A. sativa*; *Enterococcus faecium*.

Conclusion / Discussion: All extracts showed antibacterial activity against studied bacteria at different levels. The flavonoids were determined at different amounts in extracts.

Keywords: *O. majorana*, *M. officinalis*, *A. cotula*, *A. sativa*, Antimicrobial activity, flavonoid

POSTER PRESENTATION - 23

QUALITY ATTRIBUTES, ANTI-DIABETIC AND ANTI-CANCER ACTIVITIES OF TWO SELECTED SOUTH AFRICAN HERBAL TEAS

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Objective / Purpose: To determine the synergistic response on total phenol content, antioxidant activity, anti-diabetic and anti-proliferative effects of bush tea and special tea.

Material and Methods: The teas were extracted as pure teas and also in combined ratios for analysis. Extractions were arranged in a complete randomised design (CRD) replicated three times. The total phenol content was determined using the Folin-Ciocalteu reagent, antioxidant activity was measured using two Trolox scavenging assays (ABTS and DPPH) and FRAP. Anti-diabetic activities were determined using alpha amylase and alpha glucosidase inhibition assays. The anti-proliferative activities were measured using the MTT assay.

Results: Both the teas had significant phenol content, antioxidant activity, α-amylase inhibition ability, α-glucosidase inhibition ability and anti-proliferative activities. Special tea presented higher activities on all tested parameters compared to bush tea. There was no synergistic effect when special tea and bush tea were combined at any combination ratio prepared.

Conclusion / Discussion: Both bush tea and special tea could provide an alternative for treatment and management of both diabetes and cancer. However, future studies are needed to investigate the synergistic effect with a wide range of other commercial herbal teas.

Keywords: Alpha-amylase, Alpha-glycosidase, Anti-Proliferative

POSTER PRESENTATION - 24

EFFECTS OF ALTITUDE ON CHEMICAL COMPOSITION AND FUNCTIONS OF ESSENTIAL OILS OF*MICROMERIA BARBATA* FROM LEBANON

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Micromeria barbata, is an aromatic herb naturally grown in Lebanon. The aim of this study is to investigate the effects of altitude on the chemical compositions, antimicrobial and antioxidant activity of the essential oil form Micromeria barbata in Lebanon. Plants were collected during flowering season from three different altitudes 650m, 1200m and 1700m. The materials were dried at room temperature in a shadow place for 5 days. The oil essence was extracted by hydro-distillation and the chemical components were analysed by GC/MS. The oil yield was affected by the altitude: from (0.9%) at 650m to (1.6%) at 1200m and 1700m. GC/MS analyses revealed compounds, constituting 78.30%, 99.10% and 99.54% of total essential oils from low to high altitude respectively. At 650m, the major constituent of essential oils was pulegone (65.12%), this percentage was gradually reduced to 7.43% at 1200m to reach 1.97% at high altitude (1700m). Inversely, as the altitude increased from 650m to 1700m, the rates of some components in essential oil, such as Limonene (from 2.22 to 25.09%), Piperitone (from 0.15 to 21.75%) and 2-Pinen-7-one (from 0.57 to 26.7%), were increased, in contrast to Pulegone. These results also show that antioxidant and antimicrobial activities of Micromeria barbata essential oil vary with the altitude of the growing plant.

Keywords: *Micromeria barbata*, essential oil, altitude, chemical composition, antimicrobial, antioxidant.

POSTER PRESENTATION - 25

ANTIDEPRESSANT-LIKE ACTIVITY O *ALTERNANTHERA SESSILIS* EXTRACT AND ITS MECHANISM IN MENOPAUSAL-LIKE MODEL

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Objective / Purpose: *Alternanthera sessilis* (L.) DC. (Family Amaranthaceae) is used in Thai traditional medicine for normalizing menstruation in women. It is recognized that menopause is relevant to neurodeteriorated diseases. Therefore, the aims of this study were to investigate the antidepressant-like activity of *A. sessilis* extract as well as to clarfy its mechanism in ovariectomized mice (OVX) model.

Material and Methods: This study was conducted in OVX mice behavioral models that mimic estrogen deprivation which involved pathology of depression in menopausal women. The extract of *A. sessilis* (250 and 500 mg/kg/day) was orally administered to OVX mice wherein 17β-Estradiol (1μg/kg/day) was used as a positive control. Forty-five days after treatment, tail suspension and force swimming test were conducted to test the depressive-like behavior. To exclude false positive, locomotor activity test was evaluated using Y-Maze test. To confirm the mechanism, an expression of *CREB* and *BDNF* mRNA in frontal cortex that related to depression were evaluated by using reverse transcription-polymerase chain reaction. Uteri were collected to assess estrogenic activity.

Results: The results showed that OVX mice expressed depressive behaviors and also showed down-regulation of neurogenesis related genes. Interestingly, OVX mice treated with *A. sessilis* extract showed ability to recover from depression as well as to increase *BDNF* and *CREB* mRNA expression similar to those treated with 17β-estradiol. The extract was also found to enhance uterine weight and volume.

Conclusion / Discussion: The results from this study support the claims of the antidepressant activity of *A. sessilis* via estrogenic activity and neurogenesis process in frontal cortex.

Keywords: *Alternanthera sessilis*, ovariectomized mice, depression

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POSTER PRESENTATION - 26

THE INFLUENCE OF DIFFERENT DYING METHODS ON ESSENTIAL OIL CONTENT AND COMPOSITION OF PEPPERMINT (*Mentha piperita* L.) IN ÇUKUROVA CONDITION

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Objective: Peppermint (*Mentha piperita* L.) is a valuable essential oil and spice plant from the Lamiaceae family. Peppermint is largely cultivated as commercial in several country for the production of peppermint oil and its constituents for medicinal, cosmetic industries and food purposes (1, 2). In this study, the influence of different dying methods on essential oil content and composition of peppermint was determined.

Material and Methods: In this study was conducted in the Department of Field Crops, Faculty of Agriculture, Çukurova University. Field trial was arranged randomized complete block design, with three replications. Plants were rooted in the greenhouse from December (2015) until March (2016). Seedlings were transferred in the experiment field at March 31, 20016. In the flowering stage, plants were harvested (July 25, 2016). It was determined herbage yields and essential oil content. The plants were dried separately in the sun, shadow and oven at 38ºC for 48 h. The dry material was then submitted to hydro distillation in Clevenger for two hours in order to the oil as mL.100 g-1 dry matter. The chemical composition of essential oil from the flowering aerial part of peppermint analyzed by GC/MS.

Results: It was determined that plant height (22.7 – 31.8 cm), fresh (750-992 kg da^{-1}) and drug herbage yield (245 - 351 kg da^{-1}). The highest essential oil content (3.68 %) was obtained from shadow drying method, the lowest value (2.78 %) was obtained from drying under sun.

Conclusion: The drying method affected strongly the essential oil content of dried peppermint.

Keywords: Peppermint; *Mentha piperita*, L.; drying methods; essential oil content and composition.

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POSTER PRESENTATION - 27

CONTRIBUTION TO A STUDY OF THE EFFECT OF THE ESSENTIAL OIL OF HENNA (*Lawsonia inermis* L), ON THE BIOLOGICAL ASPECT OF WHITE SCALE (*Parlatoria blanchardi*) OF DATE PALM

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The study was carried to evaluate the effect of the essential oil of henna's leaves, flowers and seeds on the biological aspects (egg, larvae and adults stages) of *Parlatoria blanchardi*. the insect infected all the date palm cultivated in Algeria.

The leaves of date palm infested by the insect putted in Petri dishes were treated under the laboratory conditions with 05 treatments (C0, C1, C2, C+, C-); two were obtained by the dilution of the essential oil, and three controls (two negative controls and an insecticide as positive control).

The results obtained in the earliest 06 days of the experimentation, showed that the two treatments of the essential oil caused high mortality on different stages of *Parlatoria blanchardi*, the same rate obtained by the insecticide (100 %).

Keyswords: bio insecticides, infested leaves, laboratory conditions.

POSTER PRESENTATION - 28

HEAVY METAL INPURITIES AND RECOMMENDED LIMITS FOR HERBAL COSMETICS

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Heavy metals can be found naturally in the environment, which increasing with the industrial development. Herbal cosmetics may include heavy metals as impurities or naturel components at a certain level. The main routes of application of herbal cosmetics that cause to exposure heavy metals in case of including them are skin and oral cavity, which resulted as dermal, mucosal and oral absorption. Health risks generally occurred with dose and long-term use. In this direction heavy metals should be considered of first priority are Pb (lead), As (arsenic), Cd (cadmium), Hg (mercury) and Sb (antimony). [1-2] Factors to be considered in the evaluation of exposure to the heavy metals are; i. the concentration of heavy metal in the product, ii. the amount of application of the product, iii. the application site for the product on the body (skin, oral cavity, etc.), iv. the duration of exposure in terms of the type of product (rinse-off, leave-on, etc.), v. the structure of the formulation (virtue of increasing the absorption of the content of the product), vi. the consumer of the product (baby, adult, etc.). General limits should not be exceeded for heavy metals in cosmetics are; Pb, 20 ppm As: 5 ppm Cd: 5 ppm, Hg: 1 ppm Sb: 10 ppm, while limits are further decreased for the toothpastes thus; Pb:1 ppm, As: 0.5 ppm, Cd: 0.1 ppm, Hg: 0.2 ppm, Sb: 0.5 ppm. As recent global opinion that the limits for heavy metals in cosmetics need to be further decreased due to health risks.

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POSTER PRESENTATION - 29

A COMPARED OF SUBSURFACE IRRIGATION SYSTEM AND DRIP IRRIGATION SYSTEM ON SOME SOIL PROPERTIES AND YIELD OF GREEN ONION

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An experiment was conducted to compare the effect of subsurface irrigation system and drip irrigation system on some soil properties and yield of green onion, 2015. Subsurface irrigation system and drip irrigation system and two levels of irrigation interval included 4 days and 8 days were used in this research. Soil moisture, soil resistances penetration, soil salinity, and green onion yield were measured. The results showed: subsurface irrigation system got higher soil moister , 21.96%, and lower soil resistances penetration , 1.57 kg / cm2 , and higher soil salinity , 0.196 ds / m-1, and higher green onion yield , 19.38 t / ha , compared with the drip irrigation. 4 days irrigation interval showed the superiority in getting higher soil moister , 22.25%, lower soil resistances penetration , 1.46 kg / cm2 , higher soil salinity , 0.194 ds / m-1, and higher green onion yield, 20.15 t/ ha. The interaction between subsurface irrigation system with 4 days irrigation interval showed the superiority in getting higher soil moister, 22.25 %, lower soil resistances penetration, 1.46 kg / cm2, lower soil salinity , 0.189 ds / m-1 and higher green onion yield, 20.15 t/ha. Using subsurface irrigation system with 4 days irrigation intervals for planting onion was successfully done.

Keywords: Drip Irrigation, Subsurface Irrigation, irrigation interval soil moister content, and green onion yield.
*Part of M.Sc. thesis for the second researcher.

POSTER PRESENTATION - 30

PHYTOCHEMISTRY AND BIOACTIVITY OF THREE *AJUGA* SPECIES FROM ROMANIA

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Objective / Purpose: Some *Ajuga* species are used in Romanian traditional medicine for their anti- inflammatory, hepatoprotective and wound healing effects. The aim of this study was to evaluate the phytoconstituents from *Ajuga genevensis, A. reptans,* and *A. laxmannii* leaf extracts, as well as their antioxidant and anti-inflammatory effects.

Material and Methods: The identification and quantification of polyphenols were done by HPLC/UV/MS and spectrophotometric methods (total phenolic content, total flavonoid content), whilst the analysis of iridoids was assessed by HPLC/MS/MS. The antioxidant potential was determined using DPPH, TEAC, and EPR spectroscopy assays. In vivo anti-inflammatory effects were tested in acute rat experimental inflammation by measuring the acute phase bone marrow response, the phagocytic capacity and the serum nitro-oxidative stress status.

Results: Caffeic and ferulic acids, quercitrin, luteolin and apigenin were identified by LC-MS in all samples. *A. laxmannii* extract was the richest in total phenols and flavonoids, with rutin as major compound. Harpagide, 8-O-acetylharpagide, harpagoside, aucubin and catalpol were identified and quantified in all extracts. The major iridoids constituents were 8-O-acetylharpagide and harpagide. The results of antioxidant assays showed a better effect for *A. laxmannii* extract and a positive correlation between antioxidant activity and polyphenolic content. *Ajuga sp*. extracts had anti-inflammatory effect by reducing total leukocytes, PMN, phagocytosis and nitro-

oxidative stress. *A. genevensis* 25% and *A. laxmannii* 100% extracts had better anti-inflammatory effects.

Conclusion / Discussion: *Ajuga* sp. extracts contain bioactive compounds with antioxidant and anti- inflammatory properties as valuable ingredients for functional food formulations.

Keywords: *Ajuga* species, polyphenols, iridoids, antioxidant, anti-inflammatory.

Acknowledgements: The research leading to these results has received funding from the Romanian Executive Agency for Higher Education, Research, Development and Innovation Funding, research grant PN-II-RU-TE-2014-4-1247.

POSTER PRESENTATION - 31

FOOD PLANTS USED IN MERİÇ TOWN FROM TURKEY

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Purpose: The purpose of this study is to determine the local and latin names, the parts used, forms and purposes of utilization of the plants used by local people in Meriç province.

Material and Methods: The study is executed in March-October in the years of 2013-2015 in Meriç town and surrounding villages. Interviews were carried out face-to-face with the community. In this study, 23 villages of Meriç province were visited and interviews were performed with 37 persons in total. The identification of the plant species those determined to be in use was based on "Flora of Turkey and East Aegean Islands" (Davis, 1965-1988; Güner et al. 2012). The plant samples identified are kept in Faculty of Pharmacy.

Results: As result of this study, it was specified that 56 taxa of plants including in 24 families which are food plants used, were recorded. The scientific names of the plants, local names, families, usable parts and forms of utilization were listed alphabetically in the table.

Conclusion: There is no study performed in that area of research before about the local names and ethnobotanical properties of the plants.

Keywords: Edirne, etnobotany, food plants, Meriç

Acknowledgement: I wish to express our gratitude to all the villagers of Meriç and province, who have collaborated in the realization of this study. The study was carried out with the support of Trakya University (project 2013/22).

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POSTER PRESENTATION - 32

ANTI *HELICOBACTER PYLORI* ACTIVITY OF SOME PLANTS *Cinnamomum zeylanicum*, *Syzygium aromaticum* and *Zingiber Officinale*

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It had been shown that *Zingiber officinale* had high polyphenol contents (110 GAE / 100 g extract) relative to *Cinnamomum zeylanicum* (98.2 mg GAE / 100 g extract) and *Syzygium aromaticum* (98 GAE / 100 g extract).

The antioxidant activity of the methanol extract of our plants measured by FRAP method show that *S. aromaticum* had a high antioxidant activity (107.2 mg AAE / 100 g) in comparison to Z. *officinales* (105.1 mg AAE / 100 g) and *C. zeylanicum* (58 mg AAE / 100 g).

The results of the antibacterial activity show that the methanol extract of *C. zeylanicum*, *S. aromaticum* and *Z. officinal* gave a high activity against *Helicobacter pylori.*

Keywords: *Helicobacter pylori, Cinnamomum zeylanicum, Syzygium aromaticum, Zingiber officinale*, antioxidant activity, antibacterial activity

POSTER PRESENTATION - 33

PHENOLIC COMPOUNDS FROM SOME PHANEROGAMS MARINE PLANTS

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Seagrasses are aquatic angiosperms, which are confined to the marine environment. Four families consist of seagrasses, the Zosteraceae, the Cymodoceaceae, the Posidoniaceae and the Hydrocharitaceae,

The Posidoniaceae family encompasses *Posidonia oceanica* and other eight species. Cymodoceacea are exclusively marine organisms and encompass 15 species in four genera, Amphibolis, Cymodocea, Halodule, Syringodium and thalassondendron. Hydrocharitacea encompass three marine genera Enhalus (monospecific), Halophila (10 species) and thalassia (two species) [1-2].

In the aim to isolate new metabolites, we focus our attention on three species of Mediterranean basin: *Halophia stipulacea*, *Posidonia oceanica* and *Cymodocea nodosa*

Some extracts of each species were separated first by using LH20 sephadex column chromatography as the first fractionation. A series of purifications were focused using HPLC in RP-18 silica gel with a gradient of MeOH : H_2O. The structure identification was made by exploiting 1D and 2D NMR spectroscopic data (COSY, HSQC, and HMBC), as well as by mass spectroscopy.
Sterols, flavonoids and lignans were identified. Our results in these studies confirm well the existence of phenolic compounds as the main metabolites. To the best of our knowledge, this is the first finding of lignans in seagrasses.

Keywords: Posidoniaceae, Zosteraceae, Hydrocharitacea, Flavonoids, lignans, NMR.

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POSTER PRESENTATION - 34

APPLICATION OF EC-GA METHOD TO PHTHALAZINE ANALOGUES AS $GABA_A$ RECEPTOR ANTAGONISTS

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ɤ-Aminobutyric acid (GABA) is a major inhibitory aminoacid neurotransmitter receptor in the central nervous system and play important role regulation of brain excitability, many drugs such as benzodiazepines, barbiturates, neurosteroids [1]. The aim of this study was construct a 4D-QSAR model for 98 phthalazine analogues using Electron Conformational-Genetic Algorithm method [2]. EC-GA consist of three main step. At first conformational analysis and quantum chemical calculations of compounds were performed Spartan 10 software at Hartree Fock 6-31 G* level and water was used as solvent. The second step ECMC matrix was prepared all the conformers of all compounds that contains distances between atoms and mulliken charges for pharmacophore estimation. After the pharmacophore analysis, C1, C4, C7, C8, O1, C18, N5 atoms were dedected the pharmacophore group for explain drug-receptor mechanism in phthalazine derivatives. The last step merges with GA and cross validation tecnique for to predict the theoretical activity and select the best subset of descriptors. The data set of 98 molecules was randomly divided training and test set. In this model 70 molecules training, 28 molecules test set was used. Due to predictive capabilities best subset of descriptors were calculated for a range of 1-14 parameters at MATLAB software. Hence the model attains a stable situation as optimum 10 parameter number. LOO-CV method was evaluated for the predictive ability of 4D-QSAR model and E-statistical method was carried out to determination of the effect selected parameters. $R^2_{training}$, R^2_{test}, q^2, q^2_{ext1}, q^2_{ext2}, q^2_{ext3} and con1, con2, con3 values are given respectively 0.796, 0.732, 0.720, 0.757, 0.726, 0.751, 0.887, 0.852, 0.881.

This work was supported by the Research Fund of Erciyes University under [grant number FBD-40-1215]

Keywords: QSAR, EC-GA, Phthalazine, Pharmacophore, Genetic Algorithm

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POSTER PRESENTATION - 35

ISOLATION OF GLYCOLIPIDE FROM *LOTUS PUSILLUS* MEDIK. (*FABACEAE*)

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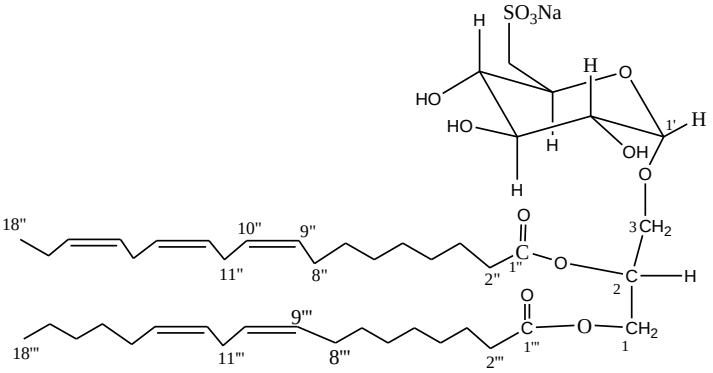
The genus *Lotus* (tribe Loteae, family leguminosae) comprises about 120–130 species in the Algerian flora and is represented by fifteen species most of which occur in the Sahara [1]. In folk medicine, plants of genus Lotus are used as contraceptives, prophylaxis and treatment of sexually transmitted disorders and peptic ulcers [2]. *Lotus pusillus* Medik. named also *Lotus halophilus* Boiss has a good antimicrobial activity against Gram-positive, Gram-negative bacteria and fungi. Phytochemical investigation of the aerial parts of *Lotus pusillus* Medik. Resulted in the isolation and identification of three known compounds. Liquid-Liquid fractionation of the crude extract followed by chromatographic purification resulted in the isolation of Soyacerebroside I (**1**), 1-*O*-(9Z,12Z-octadécadiénoyl)-2-*O*-(9Z,12Z,15Z-octadécatriénoyl)-3-*O*-(6′ sulfoquinovopyranosyl)-glycérol (**2**) and a saponoside was identified as Azukisaponine V. The molecular structures of isolated compounds were established by spectroscopic analysis particularly NMR 1D (^{1}H and ^{13}C J-modulated) and 2D (COSY, HSQC J-modulated, HMBC, TOCSY and ROESY), mass spectrometry EI-MS and by comparison with literature data.



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Keywords: *Lotus pusillus,* Leguminosae, maltol, saponins, RMN.

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POSTER PRESENTATION - 36

THE EFFECT OF CAJANUS CAJAN EXTRACTION ON SOME HAEMATOLOGICAL RAMETERS AMONG HAEMORRHAGICAL ANAEMIC RATS IN KHARTOUM – SUDAN

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Objective / Purpose: To determine the effect of *Cajanus Cajan* seeds extraction in some haematological parameters in hemorrhagic anaemia among rats.

Material and Methods: study was conducted in Khartoum in medicinal and aromatic plants research institute (MARPI). the parameter (RBCs, HB, PCV, MCV, MCH, MCHC, PLTs, WBCs) of rats are measured every week.

Plant materials: The *Cajanus Cajan* seeds crushed to powder, dried and (400g) was suspended in 1 litre of 80% ethanol for (24hr) this suspension was re suspended in an equal volume of 80% ethanol for (48hr) and filtrated again the filtrates were pooled and the solvents were evaporate.
Haematological method: some haematological parameters done. The rats were divided in to 4 groups of 6 rats: Group A: control anaemic continued to be fed the normal diet and served as control.
Group B, C and D gave 200,400 and 800mg/kg/day of extract orally respectively.

Results: High doss group represent significant increases Hb at $p<0002$, while 400mg/kg/day significant increase at $p<0.003$ and $p<0.00004$, 200mg/kg/day represent significant increase at $p<0.005$ and $p<0.0005$ respectively, when compared to control values(Group1).After three weeks the significant ($p<0.05$):mean,mode and Sd for (RBCs,Hb,PCV), (MCV,MCH,MCHC), Show increasing rate for different blood

Conclusion / Discussion: Our result found that the *Cajanus Cajan* extraction significantly increases the (HB, PCV, RBCs).

POSTER PRESENTATION - 37

In vitro ANTIBACTERIAL ACTIVITIES OF APPLE, Malus domestica, VINEGAR AGAINST Flavobacterium psychrophilum

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Objective / Purpose: The aim of this study was to assess the antibacterial activity of apple vinegar against *F. psychrophilum.*

Material and Methods: Pathogens F1 and F2 isolates (during outbreak from rainbow trout/Fethiye-Turkey) were refresh from our collection in Suleyman Demirel University.The antibacterial activity was determined by using agar well diffusion assays(NCCLS,1999). The test were performed on tryptone yeast extract salts (TYES) agar. The bacterial inoculum was adjusted so as to deliver a final inoculum of approximately 10^8 colony-forming units (CFU)/ml. The vinegars were dilueted in phosphate buffered saline. It were added to 25 µl of the vinegars in well. The plates were the incubated at 15°C for 72 hours. The antibacterial activity was evaluated measuring the diameter of the inhibition zone. All tests were performed in triplicate. It were used toPBS as negative control and florfenicol as positive control.

Results: Apple vinegar showed that remarkable antibacterial activity against *F. psychrophilum*with a diameter of inhibition zone ranging between 52 mm and 58 mm.

Conclusion / Discussion: Antibacterial and immunostimulant features of these vinegars are known to be therapeutic for human healthin many diseases.Apple vinegar which are a natural substance have a good antibacterial activity for *Flavobacterium psychrophilum.*The results confirmed the possible use of apple vinegar as a source of antimicrobial agentswhich could be used in aquaculture for the control of the bacterial infection.

Keywords: *Flavobacterium psychrophilum*, Apple, Vinegar, Antibacterial activity.

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POSTER PRESENTATION - 38

EXPLORING *IN VITRO* BUTYRYLCHOLINESTERASE INHIBITORY ACTIVITY OF HYPERFORIN

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Objective: Alzheimer's disease (AD), the most common type of dementia, is a progressive neurodegenerative disorder with a complex pathogenesis, which mainly affects the elderly population. In cholinergic hypothesis, deficiency in cholinergic neurotransmission through acetylcholine (ACh) and butyrylcholine (BCh) has been proven in the brains of AD patients. Therefore, ChE inhibitors are the mostly prescribed drug class for the treatment of AD at the moment.

Material and Methods: In this study hyperforin, a natural molecule from *Hypericum perforatum* L. (St. John's wort, Hypericeae) was tested *in vitro* for its AChE and BChE inhibitory activity by slightly modified spectrophotometric method of Ellman [1]. Then, this molecule was further proceeded to molecular docking experiments and its interactions at the active site of BChE were established.

Results: Hyperforin was ineffective against AChE, whereas it has moderate (IC_{50}= 141.60 ± 3.39 μM) BChE inhibitory activity as compared to that of galanthamine as the reference drug (IC_{50}= 46.58 ± 0.91 μM). In consistent with our *in vitro* data, the molecular docking results indicated that it is able to block the access to key residues in the catalytic triad of the enzyme, while it complements some of the hydrophobic residues of the cavity.

Conclusion: Our data indicated that hyperforin could be responsible for the marked BChE inhibitory effect of *Hypericum perforatum* extracts reported by different groups. Also, our current finding on the moderate BChE inhibitory effect of hyperforin may also donate to its neuroprotective effect.

Keywords: Butyrylcholinesterase, enzyme inhibition, hyperforin, molecular docking

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POSTER PRESENTATION - 39

A COMPARISON OF VOLATILE COMPOUNDS PROFILE AND ANTIOXIDANT ACTIVITY OF *Allium sativum* L.ESSENTIAL OILS EXTRACTED USING HYDRODISTILLATION, ULTRASOUND-ASSISTED AND SONO-HYDRODISTILLATION PROCESSES

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Objective: This work aims to study the effects of the process conditions on the extraction of essential oils of garlic bulbs. A comparison in term of quality and antioxidant activity of the essential oils of garlic bulbs, extracted using the conventional hydrodistillation method and new innovative processes such as ultrasound-assisted hydrodistillation and sono- hydrodistillation [1,2], will be presented.

Material and Methods: Conventional Hydrodistillation method (HD), Ultrasound-Assisted hydrodistillation (US-HD) and Sono- hydrodistillation (SHD) were used to extract essential oil from fresh garlic bulbs and their extraction kinetics were compared. The chemical composition of these essential oils was evaluated by the GC/MS and their antioxidant activity by using 2, 2-diphenyl-1-picrylhydrazyl (DPPH) method.

Results: The comparison of yield profiles of the essential oils obtained via the three different processes showed that higher performances were obtained when the direct application of ultrasound were used. Indeed, SHD allowed a higher yield after only 30 min of extraction time against 70 min and 90 min for the Ultrasound-assisted hydrodistillation and conventional hydrodistillation respectively. Among the total identified constituents, the sulphurous compounds were found to be the most abundant with similarities for the three processes. The oil concentration providing 50% inhibition (IC_{50}) was 0.96, 1.17 and 1.23 mg / ml for the different methods (HD, US-HD, SHD) respectively. The results indicated that essential oil of garlic bulbs exhibited a potential DPPH radical scavenging activity.

Conclusion: The use of ultrasound (assisted or coupled) for the extraction of essential oil from garlic reduce extraction time without causing changes to the volatile composition but with a slight difference in the antioxidant activity.

Keywords: Garlic essential oil, GC-MS, Antioxidant activity, Hydrodistillation, Ultrasound.

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POSTER PRESENTATION - 40

ANTIMICROBIAL ACTIVITY OF VARIOUS EXTRACTS AND TRADITIONAL HERBAL CREAM PREPARED FROM ALKANNET ROOT

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Objective/Purpose: To evaluate the antimicrobail activity of Alkannet roots extracts and traditional herbal cream against pathogenic microorganisms.

Material and Methods: The dried root powders were extracted separately by methanol, ethanol and acetonitrile (%10). After concentrated, samples were suspended in methanol at final concentration 20 mg/mL. For traditional herbal cream, a spoonful of butter and olive oil were put in a pan and mixed to the melt, added roots up to get color in mixture. In antimicrobial analyses, cream was used by solving in chloroform, due to lipoid content of it. The antimicrobial potential of three extracts and traditional herbal cream was investigated against pathogenic microorganisms (*E. coli*, *S. aureus*, *Proteus sp*, *Klebsiella sp*, *E. fecalis*, *S. haemolyticus*, *B. subtilis*, *C. albicans*), using disc diffusion method.

Results: Alkannet root extracts showed antimicrobial activity against only two test bacteria (*Proteus sp* and *S. haemolyticus*). In *S. haemolyticus*, the highest antibacterial activity of 16 mm by methanolic disc and least activity of 10 mm by ethanol and acetonitrile discs were measured. Against *Proteus* sp. was observed almost similar zones of inhibition. The traditional herbal cream not showed inhibitory effect on test microorganisms.

Conclusion / Discussion: None of the extracts was more active against *Proteus sp* and *S. haemolyticus* than standard chloramphenicol (in a range of 25-35 mm). Consequently, these zones of root extracts were not regarded. Antimicrobial activity on pathogens as revealed in this study not support the local uses of this herbal cream in traditional therapy.

Keywords: Alkannet root, antimicrobial, traditional herbal cream

POSTER PRESENTATION - 41

COMPARATIVE CYTOGENETIC OF SOME ALGERIAN SPECIES OF THE SUBFAMILY ALLIOIDEAE (*AMARYLLIDACEAE*) PROMISING MEDICINAL PROPERTIES

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Objective / Purpose: The bulbous family Amaryllidaceae J.St.-Hil. (Asparagales) represents the most significant group among petaloid monocots. Relevant ethno-botanical uses of these plants were reported as food crops, ornamental or medicinal herbs. Molecular phylogenetics evidenced the monophyletic origin of the Amaryllidaceae lineage nevertheless its genera were separated in two subfamilies distinguished by specialized secondary metabolites. Plants of subfamily Amaryllidoideae contain alkaloids Norbelladines those of Allioideae synthesize cysteine sulfoxides involved in prevention and healing cancers. The flora of Algeria is remarkable for a rare spontaneous species occurring in sensitive habitats; the latter subfamily is therefore an ideal model for comparing systematic with biochemical diversity.

Material and Methods: Plant materiel for species of genus *Allium* and *Nothoscordum*, was sampled in north Algeria afterward being subjected to taxonomic identification. Cytogenetic investigation was conducted by karyomorphometric analysis.

Results: Results reveal a high polymorphism of the species associated to an exceptional occurrence of dysploidy with four base numbers $x = 7$, $x = 8$, $x = 9$ and $x = 11$. Karyotypical asymmetry indexes suggested that chromosome-restructuring events appear as major evolutionary mechanism in this group.

Conclusion / Discussion: The evolutionary history of these genera remains unexplored in Algeria that represents an important center of origin and diversification. The presently evidenced systematic complexity of this wild species predicts a wide range of secondary metabolites with great bioactivity promises. The main results of this study is contribution to the cytogenetic database of Amaryllidaceae family from Algeria, that it could provide crucial information about the status of these genetic resources.

Keywords: Amaryllidaceae, Algeria, systematic, cytogenetic, biodiversity

POSTER PRESENTATION - 42

COMPOSITION OF INTERDONATO LEMON (*CITRUS* × *LIMON* L. BURM.F.) LEAF OIL AND ANTIOXIDANT ACTIVITY

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Objective: The composition of lemon peel oil has been the subject of a lot of studies reviewed by Lawrence. Although most of these studies concerned commercial oils for which neither the species nor the varieties were specified. A few other studies were carried out on essential oils obtained from *Citrus limon* species, without specification of the varieties, and others concerned peel oils of *Citrus limon* of specified varieties. Similarly, the composition of lemon leaf oil has been studied many times without specification of the varieties, although some studies concerned specified cultivars [1].

Material and Methods: The interdonato lemon (*Citrus* × *limon* L. Burm.f.) leaf oil was obtained by Supercritical CO_2 extraction method. The leaf samples used in the present study were supplied from BATEM located at Antalya, South Turkey, in October 2013. Leaf oil was obtained by Hydrodistillation method. The oil was hydrodistilled for three hours in an all-glass Clevenger apparatus. Heat was supplied to the heating mantle (100 °C) and the essential oil was extracted with 2 L of water for until no more essential oil was recovered. The essential oil was collected, dried over anhydrous Na_2SO_4 and stored at 4 °C until used.
For quantitative results of the volatile fraction, each sample was analysed by gas chromatograph (GC), on a Thermo Finnigan TRACE GC equipped with FID detector. The quantitative composition was obtained by peak area normalization. Identification of constituents was based on comparison GC Retention indices (RI) determined relative to the retention time of a homolog series of n-alkanes (C_8-C_{18}) with linear interpolation, with those of authentic compounds and computer matching with the MS database NIST and Wiley libraries of the GC/MS, as well as by the comparison of the fragmentation pattern in the mass spectra with those reported by Adams [2]. Radical-Scavenging Activity (Antioxidant Activity) of the extracts was determined by the DPPH.

Results: The chemical compositions of the leaf oil samples were analysed by gas chromatography (GC) and gas chromatography mass spectrometry (GC/MS). Fifty-

one components were identified by mass spectra, linear retention indices. The antioxidant activity of the interdonato lemon leaf oil samples was assessed by DPPH radical scavenging capacity assay.

Conclusion: Interdonato lemon leaf oil has high content of monoterpene hydrocarbons (63.56%) and oxygenated compounds (35.64 %)**.** The major monoterpene hydrocarbon and oxygenated compound were found respectively limonene (46.37 %) and geranial (14.68 %). Interdonato lemon leaf oil samples showed high (58.17 inhibition %) DPPH scavenging activities.

Keywords: Interdonato Lemon, Hydrodistillation, Essential Oil, Antioxidant Activity.

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POSTER PRESENTATION - 43

HEALTH BENEFITS OF GENUS GYPSOPHILA L. (*CARYOPHYLLACEAE*) AND ITS USE IN FOODS

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The genus Gypsophila L., also known as baby's-breath, consists of almost 150 species which are mainly found in northern temperate areas of the World. Various groups of biological active compounds such as flavonoids, sterols, triterpene saponins and volatiles are included in Gypsophila species. Some of these Gypsophila species are widely used in traditional medicine for diuretic, purgative, expectorant and contraceptive purposes and for the treatment of hepatitis, gastritis and bronchitis, for expectorant, antioxidant, hypoglycemic, acne remover, antimicrobial and hepatoprotective activities. The taxon of these species, which are rich in saponin and which have economic significance, are known as "baby's breath, soaproot, soapwort, chalk plant" among the public in Turkey. Due to the saponins it includes, it is used in the production of tahini halva as emulgator and also in the production of foam halva and nougat as whitener. In addition, it is used in the preparation of a great number of traditional foods such as Turkish delight, kerebiç dessert and herby cheese. This review discusses the properties of baby's breath, its effect on health and its traditional use in foods.

Keywords: Baby's breath, traditional foods, health

POSTER PRESENTATION - 44

QUALITY EVALUATION OF BAY (Laurus *nobilis* L.) POPULATION IN BEYLICE DISTRICT (MERSIN/TURKEY)

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Objective / Purpose: Bay leaves (*Laurus nobilis* L) is one of the important forest products and used for food, medicine, pharmaceutic and cosmetic industries. In this study, the physical, chemical and nutritional quality of bay leaves were evaluated by determining moisture content, water activity, Hunter L, a, b value, total phenolic content and total antioxidant activity.

Material and Methods: Bay leaf samples used in this experiments were harvested from its wild habitat Beylice (province) district inTarsus-Mersin Turkey in 2015. Bay leaves were separated from their stem parts and dried under shade for further analysis. Moisture contents, water activity, CIE color scale L*, a*, b* values and dimentions of dried leaves were determined. Methanol extraction was applied to dried bay leaves for measuring phenolic content by Folin-Ciocalteu method [1] and antioxidant activity by Ferric Reducing Ability of Plasma (FRAP) assay [2].

Results: Dried bay leaves have an average 28,68±6,75 mm width and 55,88±11,76 mm length. Moisture content and water activity values were determined respectively between 45-49% and between 0.924-0.959. The results indicated that there is a considerable variation for color values of leaves. Average total phenolic content and antioxidant activity of sample were 12.13 mg/g gallic acid equivalents and 26.69 mg $FeSO_4.7H_2O$ / g respectively.

Conclusion / Discussion: Bay leaves is one of the widely consumed medicinal and aromatic plants, either fresh or industrially processed. Quality characteristics of bay leaves produced or processed in Turkey should be well defined for maintaining/increasing markets.

Keywords: bay leaf, laurus *nobilis* L., leaf properties.

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POSTER PRESENTATION - 45

ANTIOXIDANT EFFECTS OF METHANOLIC EXTRACT FROM ROOTS OF *ASPHODELINE BAYTOPAE* E. TUZLACI

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Objective/ Purpose: The genus *Asphodeline* has medicinal importance and some *Asphodeline* members are traditionally used in different countries including Turkey. Antioxidant effects of methanolic extract from *A. baytopae* roots were investigated with spectrophotometric methods.

Material and Methods: Antioxidant capacity were evaluated using different assay including free radical scavenging (DPPH and ABTS), reducing power (FRAP and CUPRAC), and phosphomolybenum, Also, total phenolic and flavonoid content were calculated for the root extract.

Results: Total phenolic and flavonoid content were determined as 22.55 mgGAE/g extract and 17.30 mgRE/g extract, respectively. The free radical scavenging results were 16.00 mgTE/g for DPPH and 45.36 mgTE/g for ABTS, respectively

Conclusion / Discussion: The results could be suggested that *A. baytopae* roots are valuable source of natural antioxidants.

Keywords: *Asphodeline*, antioxidant, phenolic, Turkey.

POSTER PRESENTATION - 46

THE ANTIOXIDANT AND PROLIFERATIVE ACTIVITIES OF DIFFERENT EXTRACTS FROM SOME MEDICINAL PLANTS ON MOUSE FIBROBLAST CELLS

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Objective / Purpose: In recent years, the considerable attention has been focused on the biologically active compounds isolated from plant species, due to the reported adverse effects of synthethic drugs. For this purpose, in the present study, different extracts obtained from selected medicinal plants were investigated for their antioxidant activities, phenolic contents and proliferative activities on mouse fibroblast cells.

Material and Methods: *Ajuga chamaepitys* (L.) Schreb, *Phlomis grandiflora* H. S. THOMPSON var. *grandiflora* H. S. THOMPSON, *Achillea wilhelmsii* C. Koch, *Rubus sanctus* SCHREBER., *Verbascum* sp., *Lycium barbarum* L., *Solanum melongena* L., *Malva sylvestris* L. and *Cuscuta arvensis* Beyr. ex Engelm. were collected from Central and Southeastern Anatolian Region. The effects of methanolic extracts on fibroblast proliferation were determined by MTT assay. Moreover, DPPH radical scavenging assay and Folin- Ciocalteu reagent were used for determination of antioxidant activities and total phenolic contents of the extracts, respectively.

Results: All the extracts showed varying degrees of antioxidant activity and proliferative effect on mouse fibroblast cells. Especially, the extract obtained from *Rubus sanctus* SCHREBER. exhibited the highest DPPH radical scavenging activity with IC_{50} value of 15.38 µg/ml and the highest total phenolic content (269.59 mg GAE/g). As for proliferation, all the extracts increased fibroblast proliferation in a concentration-dependent manner, the highest proliferative effect was determined in extract of *Rubus sanctus* SCHREBER at all concentrations (104.68 %- 256.4 %)

Conclusion / Discussion: Beneficial clinical effects of selected medicinal plants were observed. The results suggest that the plant extracts exhibited promising antioxidant activity and proliferative effect on mouse fibroblast cells.

Keywords: Medicinal plants, antioxidant, proliferative, MTT assay, DPPH, Folin-Ciocalteu

POSTER PRESENTATION - 47

BIODIVERSITY OF GAVURDAG WILDLIFE DEVELOPMENT AREA

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Objective / Purpose: Considering the number of wildlife development areas and their distribution in Turkey, it is significantly important to make actual inventories of biodiversity for conserving these areas. This study aims to determine the floral and faunal elements of Gavurdag Wildlife Development Area located in Kastamonu.

Material and Methods: Floral and faunal elements constitutes the material of the study. Habitat classes were categorized due to EUNIS. Most of the study based on direct observations on the field. Sampling method were applied to data and results were mapped by using GIS software. Results were categorized due to IUCN conservation status.

Results: According to the results of research carried out in the Gavurdag Wildlife Development Area, 23 tree taxon, 27 bush and wrapping plant taxon, 567 herbaceous plants taxon were found. Total 617 taxon of 95 are endemic. 15 Mammal species were also found in Gavurdag Wildlife Development Area.

Conclusion / Discussion: Study results are important in order to conserve wildlife development areas and productivity of species. Studies on this region are limited. This study expected to be a basis for future studies on area. Protecting faunal elements can only possible with preserving floral balance in habitats. Planning the scale which will not change these balance by doing forestry and hunting activities is the most important factor for sustainability.

Keywords: Biodiversity, EUNIS, IUCN, flora, fauna, Kastamonu

POSTER PRESENTATION - 48

DETERMINATION OF ANESTHETIC EFFECTS OF SOME MEDICINAL PLANTS ON RAINBOW TROUT (*ONCORHYNCHUS MYKISS* WALBAUM, 1792)

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Objective / Purpose: In this study, anesthetics effects of spearmint (*Menta piperita*) oil and lavandula (*Lavandula angustifolia*) oil as alternative to clove (*Eugenia caryophylatta*) oil were evaluated on rainbow trout (*Oncorhynchus mykiss)*.

Material and Methods: Fish were exposed to different concentrations of the essential oils (30, 40, 50, 100, 150 and 200 mg l^{-1}) for induction of anesthesia.

Results: Results showed that induction time decreased with increasing of the concentration of the clove oil and spearmint oil. However, recovery time increased with increasing of the concentration of this anesthetics. 40 and 50 mg l^{-1} doses of clove oil and 200 mg l^{-1} of mint oil were showed similar anesthetic effect. Lavandula oil was showed sedative effects on rainbow trout.

Conclusion / Discussion: As a result, in this study, spearmint oil is useful anesthetics for rainbow trout. Hovewer, spearmint oil should be investigated anesthetics effects in other fish species in further studies.

Keywords: Clove oil, spearmint oil, lavandula oil, anesthesia, *Oncorhynchus mykiss*

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POSTER PRESENTATION - 49

KARYOMORPHOLOGICAL STUDY ON *CYANUS EFLANENSIS* Kaya & Bancheva AND *CYANUS LANIGERUS* (DC.) Holub (Asteraceae)

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Objective / Purpose: The aim of this study is to determine karyomorphological characteristics of *Cy. eflanensis*and *Cy. lanigerus.*

Material and Methods: Herbarium materials belonging to *Cy. eflanensis* and *Cy. lanigerus* were collected from the field between 2014 and 2016. Mature achenes were selected and periodically germinated for chromosomal analyses. Chromosome counts were made on somatic metaphases in root tips using the squash technique. After germinating, the root tips were pretreated by 8-hydroxyquinoline and fixed by the Carnoy solution. Before staining, root tips were hydrolyzed with 5-N HCl, and stained with 1% aceto-orcein. At least 10 metaphases were examined per taxa; the best metaphase plate was photographed. Moreover, the coefficient of variation of the chromosome length (CV_{CL}), coefficient of variation of the centromeric index (CV_{CI}) and mean centromeric asymmetry (M_{CA}) were calculated. Idiograms and karyograms of these taxa were made by using the KAMERAM analysis system.

Results:The Karyotypes of two endemic *Cyanus* species (*Cy. eflanensis* and *Cy. lanigerus*) naturally growing in Turkey were analyzed in detail. The somatic chromosome number was counted as 2n=20 for both species. In *Cy. eflanensis* the karyotype formula consist of 18m + 2sm pairs*;* total haploid chromosome length (THL) is 12.75 µm, coefficient of variation of the chromosome length (CV_{CL}), coefficient of variation of the centromeric index (CV_{CI}) and mean centromeric asymmetry (M_{CA}) are 9.89, 6.88and 10.94 respectively, whereas in *Cy. lanigerus;* the karyotype formula consist of 20m pairs*;* total haploid chromosome length (THL) is 13.25 µm, coefficient of variation of the chromosome length (CV_{CL}), coefficient of variation of the centromeric index (CV_{CI}) and mean centromeric asymmetry (M_{CA}) are 18.6, 5.5 and 9.88 respectively. In this study, the karyotype analysis and the asymmetry indices of *Cy. eflanensis* and *Cy. lanigerus* were determined for the first time.

Conclusion / Discussion: The result of this study indicated that the total haploid chromosome length (THL) of these two species are alike, but all asymmetry indices (CV_{CL}, CV_{CI}, and M_{CA}**)** are different each other.

Acknowledgements: This study was financially supported by Selçuk University (BAP Project Number: 15101001).

Keywords: Karyomorphology, Endemic, *Cyanus*, Compositae, Turkey

POSTER PRESENTATION - 50

COMPOSITIONS OF THE ESSENTIAL OILS OF *BALLOTA NIGRA* SUBSP. *UNCINATA* AND *BALLOTA NIGRA* SUBSP. *ANATOLICA*

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Purpose: *Ballota nigra* L. (Lamiaceae) is commonly distributed in Western Turkey and inner Anatolia where flowering aerial parts are used in medicine for treating cough, digestive, diuretic, antiseptic, antiinflammatory and more especially for neurosedative activities. Subsp. *uncinata* is a mediterranean element while subsp. *anatolica* is an endemic plant of the Irano-Turanian phytogeographic region. The medicinal properties attributed to the essential oil of the genus *Ballota*, prompted us to investigate the chemical constituents of the oil of two subspecies of *B. nigra*.

Material and Methods: The essential oils from aerial parts of subsp. *uncinata* and subsp. *anatolica* were isolated by steam distillation. The analysis was performed by using a gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS) systems, simultaneously.

Results: Twenty-two compounds were identified from the oil of subsp. *uncinata* representing 96.9% of the total oil and fourteen compounds were identified from the oil of subsp. *anatolica* representing 88% of the total oil. The major components were characterized as caryophyllene oxide (21.2 %), hexadecanoic acid (19.9 %), β-caryophyllene (18.9 %) for subsp. *uncinata* and hexadecanoic acid (40.9 %) and β-bisabolene (13.4 %) for subsp. *anatolica*, respectively.

Keywords: *Ballota nigra*, essential oil, subspecies

POSTER PRESENTATION - 51

PHYTOCHEMICAL ANALYSIS AND SOME BIOLOGICAL ACTIVITIES OF THE BULBS OF SELECTED *HYACINTHUS TAXA* FROM TURKEY

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Objective: Geophytes are well-known to possess economic and medicinal prominence. Turkey has a rich flora comprising of over 12000 plant species with 1045 geophytes. The geophytes growing in our country are being investigated from the point of medicinal view. For this purpose, we initiated a huge project from different scientific disciplines relevant to geophytes growing all over the country in order to search and collect all data relevant to their botany, cultivation as well as chemotaxonomy and some biological activity [1]. In this regard, the ethanol extract from *Hyacinthus orientalis* ssp. *orientalis* L. (Asparagaceae) was investigated by LC-MS and screened for their cytotoxicity, cholinesterase inhibitory as well as antioxidant activities.

Material and Methods: *Hyacinthus orientalis* ssp. *orientalis* L. (Asparagaceae) collected from different localities and the ethanolic extracts of the bulbs were analysed by LC-MS using ESI as well as were tested on cytotoxic activity against MCF-7 by using MTT assay, cholinesterase inhibitory activity was performed using Ellman's spectrophotometric method adapted to ELISA microtiter assay and antioxidant activity of the extracts, their DPPH radical scavenging effect was measured using ELISA microtiter assay.

Results: LC-MS analysis was showed that the presence of three compounds belonged to polyhydroxylated alkaloids named as α-Homonojirimycine, 1-Deoxynojirimycine and 6- Deoxynojirimycine as the chemotaxonomic marker compounds for this plant species.
More details and prominent results will be discussed in this presentation.

Conclusion: According to the results, *Hyacinthus orientalis* ssp. *orientalis* L. has chemical varieties depends on the locality. Further studies are going on in our laboratory for glucosidase inhibitory activity.

Keywords: *Hyacinthus orientalis* ssp. *orientalis* L., Asparagaceae, cytotoxic activity, cholinesterase inhibitory activity, antioxidant capacity

Acknowledgement

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POSTER PRESENTATION - 52

SOME PHYTOCHEMICAL CONTAINS OF *PRUNUS CERASIFERA CV.* "*PISSARDI NIGRA*"

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Objective /Purpose: *Prunus cerasifera* known as cherry or ornamental plum, is a small shrubby tree with intricate and occasionally spiny branches, which produces plum-like edible fruits[1]. In this study, phytochemical content (e.g. The flavonoid, resveratrol, phytosterol and sugar), lipid profile, protein levels and elements amounts of samples of *Prunus cerasifera* cv. "Pissardi Nigra" are researched.

Material and Methods: *Prunus cerasifera* cv. "Pissardi Nigra were collected from different localities in the province of Elazig. The flavonoid, resveratrol, phytosterol, sugar, lipid profile, protein levels and elements amounts of samples were determined according to the methods described in the related literature[2].

Results: As a result, high amount of morin in the examples, then routine, resveratrol and naringin were determined. Additionally, ergosterol, stigmasterol and β -sitosterol as phytosterols in samples were identified. The fruits were found to contain low levels of sugar. In all the examples palmitic, linoleic and lignoceric acid was detected. Protein amounts in the samples were measured the highest as 1.45 mg/g. Ca was the highest detected element which was found in the samples.

Conclusion/Discussion: The results obtained in this study are similar and different from previous studies.As a result of phytosterol analysis of *P. cerasifera*, ergesterol, which was not detected in Prunus genus, was found in this study.

Key Words: *Prunus cerasifera,* phytochemical content, proteins levels, elemental analysis

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POSTER PRESENTATION - 53

DETERMINATION OF ACUTE TOXICITY OF ISOLDESIS ON EUROPEAN LEAFROLLER (ELR) *ARCHIPS ROSANA* (LINNAEUS, 1758) (*LEPIDOPTERA: TORTRICIDAE*)

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Objective / Purpose: *Archips rosana'*s pest European leafroller (ELR) feds on large variety shrubs and trees in Thrace region (Northwest of Türkiye). Isoldesis is a synthetic pyrethroids insecticide that is used against of *A. rosana* and other pests in agriculture. It is aimed to investigate mortality ratio after exposed with Isoldedis on adult *A. rosana.*

Material and Methods: Commercial form of pesticide, Isoldesis 2,5 EC (Deltamethrin active ingredient) was used as test substance at recommended dose (r.d.) (7,5 µm), and half of r.d. and 1.10^{-1}, 1.10^{-2}, 1.10^{-3}, 1.10^{-4} fold diluted concentrations of record in laboratory conditions. After single dose application mortality ratios and LD_{50} values were determined after 7, 12 and 15 days.

Results: Adults of Rosaceae pest *A. rosana* reached 100% mortality after r.d. and half of r.d. application at 7th day. 10 fold diluted concentrations of r.d. ınduced %100 mortality at 12th day after application. Adult mortality was observed % 65 after 100 fold diluted concentration (1.10^{-2} r.d.) application after 15th day. LD_{50} concentrations of Isoldesis for adults forms were 0, 3993, 0,094, 0,071 for 7, 12 and 15 days respectively.

Conclusion / Discussion: The effective concentration of pesticide use might be decreased for to save environment and side effects on Rosaceae family.

Keywords: Rosaceae, isoldesis, *Archips rosana*, mortality, LD_{50}

POSTER PRESENTATION - 54

EVALUATING THE EFFECT OF *Salvia verticillata* (L.) subsp *verticillata* ON THE COLOUR STABILITY OF DIFFERENT PORCELAINS

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Objective / Purpose: The aim of this study was to investigate the effect of *Salvia verticillata* L. subsp *verticillata* on the colour stability of two different porcelains.

Materials and Method: Porcelain samples (Ceramco 3, Noritake) were produced by using teflon mold which is in 10 mm width and 2 mm depth. Color measurement were made before and after immersion in *Salvia verticillata* L. subsp *verticillata* with the help of non-contact type spectrophotometer and the changes were calculated by using CIE L*A*B colour system. Obtained data were statistically analyzed by ANOVA and t-test.

Results: As a result of ANOVA, it was statistically found that sage tea caused discoloration of the porcelain.

Conclusion: Colour changes occured on restorative materials resulting in clinically unacceptable color changes of the restoration may cause a unacceptable colour mismatch of the restoration. Therefore, especially for the restorations which will be held in the aesthetic zone, the clinician should know the characteristics of the restorative material.

Key words: Porcelain, *Salvia*, colour change

POSTER PRESENTATION - 55

ANTIFUNGAL ACTIVITY OF ESSENTIAL OIL FROM *ARTEMISIA CAMPESTRIS L* ON FUNGAL SPECIES DEVELOPMENT

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Objective / Purpose: This work studies the antifungal capacity of the essential oil of spontaneous aromatic plant with vocation medicinal used in the traditional treatments in the South-West of Algeria: *Artemisia campestris L*.

Material and Methods: Antifungal activity of the essential oil was studied witch respect to seven fungal strains with various concentrations. Other physicochemical parameters [1] are also measured in this study.

Results: The results of direct contact method show that all strains were inhibited at concentration as weak as 1/70 (v/v), *Fusarium oxysporum f.sp. albedinis* and *Penicilluim expansum* were most sensitive, being inhibited as from 1/800 (v/v) and 1/500 (v/v) respectively. In addition to the growth of the mycelium, the essential oil of plant showed, in vitro, an antifungal activity at least important on the two other developmental stages, germination and the sporulation, of all fungi . All strains were inhibited at concentration as weak as 1/100 (v/v). *Fusarium oxysporum f.sp. albedinis* was most sensitive, being inhibited as from 1/1500 (v/v).

Conclusion / Discussion: The essential oil of *Artemisia campestris L.* is proven very effective on the fungal development and has a fungistatic effect.

Keywords: Essential oil, *Artemisia campestris L*, Germination, Mycelial growth, Sporulation.

References:

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POSTER PRESENTATION - 56

POTENTIALITIES OF HUMIC ACIDS TO ALLEVIATE OF DAMAGE INDUCED BY CADMIUM STRESS IN WHEAT (*TRITICUM AESTIVUM* L.) ROOTS

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Objective/Purpose: Under the stress conditions, humic acid (HA) have a possible positive effect on plant growth. HA, which is commonly used as a soil supplement in agriculture, has proven to be a powerful organic electrolyte, serving to balance cell life. The information is unknown about the effects of HA on alleviating the harmful effect of Cd stress on antioxidant defense system in *Triticum aestivum* roots. The present study is aimed to study the effects of exogenous HA on water content (RWC), proline content (Pro), hydrogen peroxidase (H_2O_2), activities of some antioxidant enzymes and lipid peroxidation (TBARS) were investigated in roots of Cd-stressed wheat.

Results: For this, three-weeks-old wheat plants were treated with 100 and 200 □M Cd stress with/without HA (750 and 1500 mg L^{-1}) treatments for 7 days. A decrease in RWC and an increase in activities of superoxide dismutase (SOD), catalase (CAT) and peroxidase (POX) were observed in response to increasing levels of Cd concentration. These changes were observed more pronounced in 200 □M Cd stress-treated wheat roots. However, in Cd-stressed wheat, exogenous HA application resulted an alleviation on water content and a decline in H_2O_2 content. Also, when comparison to the plants treated with stress alone, added HA to Cd-stressed wheat significantly decreased TBARS content and significantly enhanced the activities of SOD, POX and ascorbate peroxidase (APX).

Conclusion: It could be concluded that exogenous HA may have the application possibility for a future practical trial of stress reduction leading to mitigated heavy metal toxicity and improved the water content and the antioxidant enzyme activities in wheat roots.

Keywords: Antioxidant enzyme, Cadmium, Humic acid, Reactive oxygen species, *Triticum aestivum*

POSTER PRESENTATION - 57

EVALUATION OF GEOPHYTES AS AN AQUAFEED ADDITIVES ON HEALTH MANAGEMENT OF FISH

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Fish diseases are the greatest problems in aquaculture. Especially, increasing in stocking density with developing fish farm systems becomes some problems as stress factors in fish. Stress is one of the main reasons of fish diseases. Antibiotics have been used for conventional treatments of fish diseases, but they cannot be recommended in aquaculture operations due to their residual effects in the muscle of fishes. Therefore, alternative practices for management and treatment of fish diseases are being developed. Attention is drawn to the availability of new herbal medicines. Medical plants are useful for health, growth and immunity in animals. It is easy to prepare and has less side effects than antibiotics in the treatment of diseases. These plants are included as a powder, oil and extract to aquafeeds. Geophytes are plants with a subversive perennation organ (bulb, corm, tuber, or rhizome) and leaves that die back annually. They have been reported to promote growth and immunostimulation in finfish due to the active principles such as alkaloids, flavonoids and phenolics.

Previous studies support the positive effects of geophyte plants on fish. A research has been carried out by [1] on the effects of grape hyacinth (*Muscari comosum*) on some blood and serum parameters of gilthead sea bream (*Sparus aurata*). The authors have been declared that the highest dose of grape hyacinth was improved the health parameters of this species. Cranesbills (Geranium sp.), amaryllis (*Sternbergia candida*) and cyclamen (*Cyclamen coum*) species have been used in some studies carried out on health and immunological parameters of rainbow trout (*Onchorynchus mykiss*). Also, some researches have been investigated that the antimicrobial activity of geophytes. Snowdrop (*Galanthus plicatus*) and saffron (*Crocus ancyrensis*) were used in an experiment carried out by [2] and these plants have positive antimicrobial effects to one of a fish pathogen (*Aeromonas hydrophyla*). The results of the previous studies have been indicated that the geophytes are useful for improving health status and protecting from diseases in fish species.

Keywords: Medicinal plants, geophytes, fish, health parameters, antimicrobial.

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POSTER PRESENTATION - 58

LICHEN USED IN PERFUMERY

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Objective / Purpose: This study aimed to presented comprehensive review on lichen used in perfumery.

Material and Methods: Scientific studies were edited in this review article.

Results: Some lichens contain various phenolic acids and essential oils that used in the fragrance industry. For centuries, the fragrance industry uses two species of lichen, *Evernia prunastri* (L.) Ach. commonly called "oakmoss", collected on oak trees, and *Pseudevernia furfuracea* (L.) Zopf., which grows especially on pine and cedar trees and is usually called "treemoss" in Europe for making perfume.

Conclusion / Discussion: The importance of lichen extracts as raw materials for perfumery industry is poorly known.

Keywords: *Evernia prunastri*, Lichen, *Pseudevernia furfuracea*, Fragrance industry

POSTER PRESENTATION - 59

ASYMMETRIC REDUCTION OF KETONES BY BIOCATALYSIS USING PLANTS GROWN IN HATAY

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Asymmetric reduction of prochiral aromatic ketones with chiral ligand-metal complexes afforded the corresponding aromatic secondary alcohols[1]. Asymmetric syntheses of chiral alcohols have found wide application in the production of drugs, agro-chemicals, flavours and pigments[2]. The catalysts for the asymmetric reduction of ketones can be classified into two categories: chemical and biological methodologies. Asymmetric reduction of prochiral aromatic ketones with chiral ligand-metal complexes afforded the corresponding aromatic secondary alcohols[1]. The production of these optically active alcohols using biocatalytic methods is getting more attention in last two decades[3].

The biocatalytic reduction of ketones was performed using different plants (Myrtle (Myrtus communis L.), apple, cauliflower ,spinacia, potato) grown in large amounts in Hatay. Variety of heterocyclic aromatic ketones was reduced with plants as catalyst in aqueous media. Prochiral ketones containing furan, thiophene, chroman, and thiochroman moieties are reduced with up to 98% ee.

The results indicate that the plants are excellent biocatalyst for the asymmetric reduction reaction of prochiral aromatic ketones. When reducing aromatic ketones, the presence of electrondonor and electron-withdrawing substituents in the aromatic moiety has an important effect in the biocatalytic properties of plants.
In conclusion, bio-reduction catalyzed by medlar fruits provides an attractive approach to access chiral alcohols with excellent enantiomeric excess.

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POSTER PRESENTATION - 60

THE METHODS USED FOR HERBAL TEA PREPARATION

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Herbal teas are watery extract obtained from one or more medicine and aromatic plant and are drunk for therapeutic purposes or consumed for pleasure.[1] Three kinds of herbal for consumed as tea are sold in the markets as ready-to-use products: tea-bag teas, spices (blended teas) and soluble teas.[1] There are three preparation methods of herbal tea such as infusion, decoction and cold maceration. In the infusion method, pour boiling water over the herb and waiting for 5-10 minutes. After that, filter tea. In the method of decoction, mix the herb with cold water and boil them. After boiling during 5-10 minutes, filter tea. In the cold maceration, cover the herb with cold water and the wait during 6-8 hours at a room temperature. Then, filter tea.[2] 10-20 g of herb usually need to produce one liter of tea. Because of that, one spoonful of herb (~ 5 g) is used for one cup (~ 250 ml) of tea. After tea is prepared, it can be sweetened or flavored and should be consumed, immediately. Infusion method is recommended for delicate tissues (e.g. leaves, flowers). The using of decoction method is suitable for very permeable compact tissues (wood, park, roots, seeds etc).[1] The method of cold maceration is also used for herbs with a high mucilage content such as marshmallow root, linseed and psyllium.[2]
Herbal teas should be prepared and consumed appropriately to maximize the health benefits without toxicological risks.

Keywords: herbal tea, preparation methods.

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POSTER PRESENTATION - 61

EMULGEL FORMULATION AND CHARACTERIZATION OF HELICHRYSUM ARENARIUM AND CISTUS CRETICUS EXTRACT AS A WOUND HEALING SYSTEM

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Objective: Among the topical pharmaceutical forms, emulgels, which are convenient for complex herbal ingredients can be defined as the combination of hydrogel and emulsions that possess the advantages of both emulsions and gels.[1] In this study it was aimed to prepare and characterize an emulgel containing the oil of Helichrysum arenarium and the extract of Cistus creticus, which would be a potent wound healing system for skin application.

Material and Methods: The Helichrysum arenarium oil, liquid paraffin, shea butter, polyethylene glycol hexadecyl ether, caprylic/capric triglyceride, diethylhexyl syringylidenemalonate and hydrogenated lecitin were mixed to prepare oil phase of the emulsion. The aqueous phase was prepared by mixing Cistus creticus extract, distilled water, propylene glycol, EDTA and NaOH. Both the oil and aqueous phases were separately heated to 50° to 55°C; then the oil phase were added to the aqueous phase with continuous stirring to obtain homogeny emulsion. Emulgel formulations were prepared by incorporation of emulsion into gel base with continuous stirring.[1] After preformulation studies, chosen emulgel formulation was characterized by consistency, electrical conductivity, homogeneity, viscosity, pH, accelerated stability and texture analyses.

Results: Results showed that the emulgel presented a gel consistence, it was homogeneous, pH of 5, 47 at 24±1 °C, an electrical conductivity of 2,68 mS/cm, a viscosity of 46,7 P at 24±1 °C, good stability and good texture profile with compressibility: 0.005±0.000N.min, adhesiveness: 0.004±0.000N.min, elasticity: 0.996±0.089 min., cohesiveness:1.039±0.019 and hardness:0.109±0.002N as TPA values.

Conclusion: As a conclusion results were encouraging for further investigations to develop a topical herbal medicine for wound healing.

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POSTER PRESENTATION - 62

BERRY FRUITS GROWN IN DUZCE AND ITS NEIGHBORHOOD, AND THEIR MEDICAL APPLICATIONS

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Berry fruits possess many positive effects on human health because of their phytochemical contents like phenolic compounds, antioxidants and anthocyanins, and they have also an important place among the functional foods. From the varieties of Isabella grape and Bursa-2 blackberry cultivated in Duzce and its neighborhood, aging-retardant cream, vinegar (cyme) which aids in the weight loss and alleviates the stomach discomfort, and grape and blackberry juice are produced. Besides, other berry fruits are also used but only in the form of folk medicine. Thus, further studies about the berry fruits grown in the region may increase the potential medical usages of those plants.

Keywords: Duzce, berry fruits, phenolic compounds, medical usage

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POSTER PRESENTATION - 63

THE ANTIBACTERIAL ACTIVITIES OF *PIPER NIGRUM* L. AGAINST MASTITIS PATHOGENS AND ITS ANTIOXIDANT ACTIVITIES

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Objective / Purpose: Bacteria causes one of the most common types of chronic mastitis. The most common causative organisms of udder disease include: Staphylococci, Streptococci and coliforms. Though some cows may blaze up with mastitis the infection is usually subclinical, causing high somatic cell counts but no discoverable changes in milk or the udder. Many animals remain infected throughout the primary lactation and behave as reservoirs for infecting other cows in the herd. The aim of this work was to investigate the antibacterial effects of *Piper nigrum* extracts against mastitis pathogens, and its other biological activities.

Materials and Methods: In this study, seven bacteria were used for all experiments. These bacteria include 2 *Staphylococcus aureus* and 5 Coagulase Negative *Staphylococcus.* Additionally, *Piper nigrum* were collected from Mugla herbalists in Turkey. In antibacterial activity studies, the plant extracts were tested by disc diffusion assay (1). The solvents are ethanol, methanol and ethyl acetate. The antioxidant activities of *Piper nigrum* extracts were also determined by ABTS method using trolox as standart (2).

Results: The methanol extract showed maximum inhibition zone against two bacteria and the zone was 10 mm. The bacteria showed the lowest sensitivity to 6500 µg/mL concentration for all extracts. The value found in ABTS method is highly effective (75.7%).

Conclusion / Discussion: As a result, the *in vitro* studies clearly indicate that the methanol and ethyl acetate extracts of *Piper nigrum* significant antibacterial and antioxidant activities. In addition to, the plant extracts could be used in treating disease caused by the test bacteria.

Keywords: Medicinal plant, mastitis, antibacterial activity, antioxidant activity

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POSTER PRESENTATION - 64

PHYTOTOXIC, CYTOTOXIC AND INSECTICIDAL ACTIVITIES OF *CHRYSOPHTHALMUM DICHOTOMUM* BOISS. & HELDR.

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Objective: *Chrysophthalmum dichotomum* Boiss. & Heldr. (Asteraceae-Inulaeae) is an endemic herbaceous plant that grows in wooded or shrubby valley beds in the district of Antalya, Turkey [1]. Up to date, no phytochemical data has been reported on the plant. In our previous study, we firstly reported the cytotoxicity of the plant against selected cancer cell lines by Sulforhodamine B assay [2]. Our continuing bioactivity researches on this plant, we now aimed to investigate *in vitro* phytotoxic, cytotoxic and insecticidal potentials of *C. dichotomum*.

Material and Methods: The MeOH extract of the whole of *C. dichotomum* was fractionated through subsequent solvent extractions in increasing polarity with *n*-hexane, chloroform and *n*-butanol. MeOH extract and *n*-hexane, chloroform, *n*-butanol and remainig water fractions of the plant were evaluated for their biological acitivities using *in vitro* screening bioassays such as cytotoxicity on brine shrimp lethality, phytotoxicity against *Lemna minor* and insecticidal activity against *Rhyzopertha dominica* and *Tribolium castaneum*.

Results:
The *n*-hexane and chloroform fractions showed significant phytotoxic activity (100 % growth inhibition) at 1000 µg/ml against *Lemna minor*. The cytotoxicity assay revealed that the chloroform and remaining water fractions of *C. dichotomum* have moderate and positive lethality with LD_{50} values of 169.48 and 46.26 µg/ml against the brine shrimp, respectively. In addition, the chloroform and *n*-butanol fractions had low and moderate insecticidal activity with 20 and 40 % of mortality against *Tribolium castaneum*, respectively.

Conclusion: The present study depicts the potential of the extracts of *C. dichotomum* on biological activities such as cytotoxicity against brine shrimp, phytotoxic and insecticidal effects *in vitro*.

Keywords: *Chrysophthalmum dichotomum*, Asteraceae, phytotoxic activity, cytotoxic activity, insecticidal activity

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POSTER PRESENTATION - 65

Arum euxinum R. MILL – A NEW ORNAMENTAL AND MEDICINAL PLANT FOR TURKEY

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Arum euxinum R. MILL. Belongs to the *Araceae* family and endemic species of Turkey. The species is a tuberous and its attractive flowers that are pale green with purple edges and base. It naturally grows from mountains the Black Sea coast of Northern Turkey. The species is moderate cold and water-tolerant plant. Horticultural popularity and demand of *Arum euxinum* especially among European garden enthusiasts and flower sellers has been recently increasing. Also, the species contain valuable some secondary metabolites (fatty acids, alkaloids, terpenoids etc.) and protein and has antibacterial and antitumor activities as in other species of *Arum* genus. Cultivation the species may be widespread especially in the rocky, stony, inclined areas of black sea region. Therefore, the species has a potential as a new ornamental and medicinal plant for export in Turkey.

Keywords: *Arum euxinum,* medicinal plant, Turkey

POSTER PRESENTATION - 66

SYNTHESIS OF GYPSOGENIN-CHALCONE COMPOUNDS

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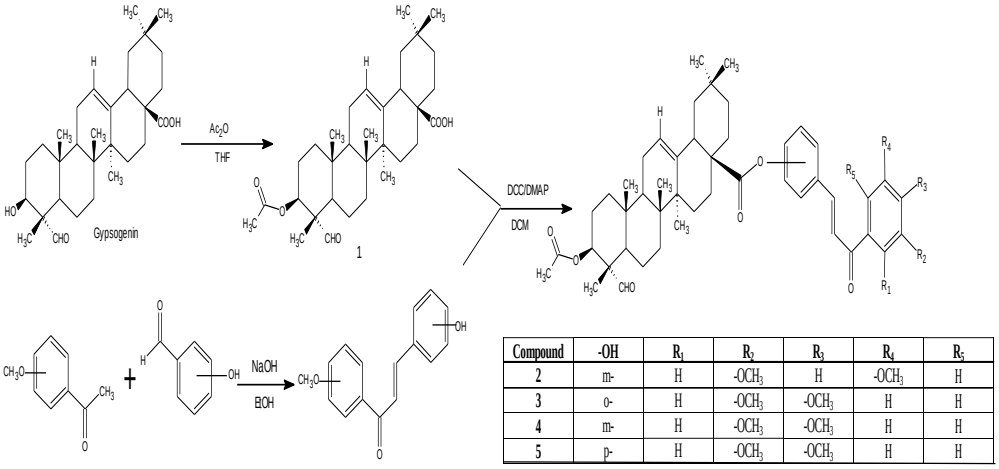
Objective / Purpose: Gypsogenin aglycone (3-Hydroxy-23-oxoolean-12-en-28-oic acid), a natural saponin, is found in Gypsophila. It is well know that gypsogenin aglycone with sugar chains has shown a variety of biological properties such as human cancer cell line, antimicrobial and antioxidant activities. On the other hand, chalcones are natural aglycone compounds which display a wide range of biological activities, such as anticancer, antimitotic, antiinflammatory, antituberculosis, antimalarial, antileishmanial, nitric oxide regulation modulatory, cardiovascular, and antihyperglycemic, activities. Literature survey reveals that when a biodynamic heterocyclic system was combined with another, obtained molecule had enhanced activity [1]. Therefore, under these investigations, we designed and synthesized new gypsogenin-chalcone hybrid compounds in this study.

Material and Methods: Compound **1** was synthesized by substation reactions involving acetylation at C-3 in gypsogenin aglycone. Also, four methoxy and hydroxy substituted chalcones were prepared by condensation of the 2'/3'-hydroxy substituted benzaldehyde with 3/4'-methoxy acetophenone as described in the literature [2]. In the third step of the study, compound 1 was combined with chalcone derivatives according to Steglich esterification by using DCC/DMAP in DCM to give the compounds **2-5**. Purification was carried out using chromatographic methods.

Results: In our continuous research we synthesized the novel gypsogenin-chalcone compounds (**2-5**) up to now. The synthesized compounds were established by IR, UV, ^{1}H NMR, APT, and LCMS analyses.
Conclusion / Discussion: In the last part of the study, biologically activities of new compounds will be investigated.

Keywords: Gypsogenin, Chalcone, Hibrid compounds



Compound	-OH	R_1	R_2	R_3	R_4	R_5
2	m-	H	$-OCH_3$	H	$-OCH_3$	H
3	o-	H	$-OCH_3$	$-OCH_3$	H	H
4	m-	H	$-OCH_3$	$-OCH_3$	H	H
5	p-	H	$-OCH_3$	$-OCH_3$	H	H

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POSTER PRESENTATION - 67

THE ANTIFUNGAL EFFECT OF SOME ESSENTIAL OILS FROM MEDICINAL PLANTS ON *PENICILLIUM* ISOLATES IN CITRUS FRUITS

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Plant essential oils have a potential which may be alternative to synthetic fungicides in order to control postharvest fruit and vegetable diseases. Fungal infections occur in processes that develop during harvest, packaging, storing, and transportation of fresh fruits and vegetables. In this study, isolates of *Penicillium* were obtained from lemon and citrus fruits collected from some market and shopping centers in the city center of Uşak. The study was conducted under *in-vitro* conditions to determine antifungal effect of some essential oils (*Lemon oil*, *Sage Leaf oil*, *Cinnamon oil*, *Thyme oil*, and *Peppermint oil)* on *Penicillium* isolates. 7 day-old cultures of isolates, which were grown in Potato Dextrose Agar (PDA) medium, were used. 5-mm mycelial disks taken from the grown cultures were inoculated in PDA medium containing different concentrations (50, 100, 200, 500, and 1000 ppm) of essential oils and incubated for 7 days at 25 °C. Trials were carried out 5 times for each of essential oils. Petri dishes containing only PDA medium were assessed as control. At the end of trial, mycelial development of fungus was calculated. No mycelial development was observed at all concentrations of thyme oil and 500 and 1000 ppm concentrations of cinnamon and peppermint oils. mycelial development was determined to be inhibited at increasing concentrations of sage leaf and lemon oil compared to control.

Key words: essential oil, antifungal activity, postharvest diseases, *Penicillium*, citrus

POSTER PRESENTATION - 68

FREE RADICAL SCAVENGING CAPACITY AND ANTIBACTERIAL ACTIVITY OF WILD *Cirsium creticum* FROM TURKEY

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Purpose: It is known that many taxa, belonging to the genus *Cirsium* Mill. (Koygocuren), have gained a rising interest in scientific area due to some pharmacologic activities (Loizzo et.al., 2004). *Cirsium creticum* (*Asteraceae*) which is wild plant species in Trakya region and we aimed the determination of antiradical and antibacterial activity in crude extracts.

Material and Methods: Crude extracts of plant obtained *n*-hexane, ether, EtOAc, MeOH extraction methods. The content of total phenolic was determined using Folin & Ciocalteu's phenol reagent and free radical scavenging activity was assayed by DPPH (2,2-diphenyl-2-picrylhydrazyl) method (Amarowicz, et al. 2005). The antibacterial activity was determined by using agar diffusion method against four bacteria strains, which were *Staphylococcus aureus* (ATCC 43300), *Escherichia coli* (ATCC 35218), *Bacillus subtilis* (NRRL NRS-744) and *Pseudomonasa eruginosa* (ATCC 27853) and Penicillin (10IU) and Gentamicin (10µg) was used as control.

Results: The TPC of different extracts ranged from 1.33 to 47.90 mg GAE/g ($p > 0.05$) in extracts and highest content was in methalonic extracts. The DPPH activity depermined as 91,65 % in methalonic extracts. While highest inhibition effect (21 mm in zone diameters) was found against *S. aureus*, which is Gram positive, lowest inhibition effect (13 mm in zone diameters) was determined against *E. coli* is Gram negative.

Conclusion / Discussion: Results presented that future investigations will be aimed the isolations of biologically active compounds such as flavonoids from *C.*

Creticum, as natural compounds for evaluation in pharmaceutical industry. Because of their antimicrobial activity, they can be used as topical preparation or by food preservation.

Keywords*:* Antiradical activity, total phenolic content, *Staphylococcus aureus*, *Escherichia coli.*

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POSTER PRESENTATION - 69

INVESTIGATION OF DNA PROTECTIVE ACTIVITITES OF *RUBUS L.* FRUIT

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Objective /Purpose: Etnobotanic studies in our country have been found to utilize different *Rubus L*. species for the aim of treatment among the people in Anatolia. Infusions which prepared from fresh leaves of *Rubus L.* species are used in diabetes. Dries and dusted leaves are used as wound healing by pressing on the wounds which is common among the people for the respiratory and chest diseases. In this study it is aimed to determine the DNA protection potential of *Rubus L*. fruit

Material and Methods: This study material was purchased as dry. *Rubus L.* Fruit was extracted using a Gerhart Soxhlex equipment. Extract of *Rubus L.* Fruit was obtanied by 0.01 mg was diluted with 1000 µl water. pBR322 plazmid DNA (vivantis) of extract was used for detection of DNA protecting activities from UV and oxidative damage. Plazmid DNA was damaged with H_2O_2 ve UV in the presence of extracts.

Results: According to gel electrophoresis results, DNA has protective potential activity agamst to DNA damage

Conclusion / Discussion: It is thought that *Rubus L*. fruits can be a supplement candidate for the cosmetic industry after purifying DNA protective effect compounds

Keywords: *Rubus L*, Gel electrophoresis, Supplement, Plazmid DNA, pBR322

POSTER PRESENTATION - 70

THE ESSENTIAL OIL COMPOSITIONS OF *ROSMARINUS OFFICINALIS* L. CULTIVATED AND COLLECTED FROM MERSİN-TURKEY

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Objective / Purpose: The aim of the study to compare of differences between the essential oil (EO) compositions of the dried and fresh aerial parts of *Rosmarinus officinalis* cultivated in the research field and collected from Mersin was investigated.

Material and Methods: Dried and fresh aerial parts (branch, leaf and herb) of the collected and cultivated *Rosmarinus officinalis* were subjected to hydrodistillation for 3 h using Clevenger type apparatus to produce essential oil. The EOs were stored at -20 ^{0}C until analyzed. The compositions of *Rosmarinus officinalis* L. (ROE), EOs were identificated by The GC-MS analyses.

Results: EOs were obtained from the aerial parts of the plant by using a Clevenger apparatus (distillation), for 4 h and were characterized by means of GC–MS. Results revelaed that there were significant ($p<0.01$) differences between the the dried and fresh aerial parts of the collected and cultivated *Rosmarinus officinalis* with respect to their EO compositions. While the oil yields of the collected rosmarin was determined to be 0.4 ml (in fresh) and 0.6 ml (in dried) aerial parts, the yields of the cultivated plants for fresh and dried parts were 0,32 ml (in fresh) and 0,9 ml (in dried), respectively.

Conclusion / Discussion:
The cultivation of rosamary will provide more profit (bring to profit) than collected plants.

Keywords: Essential oil, *Rosmarinus officinalis*, Clevenger, GC-MS, dried and fresh collected material.

POSTER PRESENTATION - 71

COMPARATIVE SCAPE ANATOMICAL CHARACTERISTICS OF SOME *ORNITHOGALUM* L. TAXA (*ASPARAGACEAE*) FROM TURKEY

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Objective / Purpose: The main goal of this study to investigate the anatomical properties of scape of *Ornithogalum collinum, O. brevipedicellatum, O. gussonei, O. kuereanum* and *O. pyreanicum.*

Material and Methods: The specimens were dried according to standard herbarium technique and some of them were put on 70% alcohol at field excursion. The cross sections of scape were taken by hand and stained with floroglisin-HCl. Slides were observed by Leica DM 1000 light microscope.

Results: The scapes of studied taxa share the similar anatomical layers of the monocotyledons. A single row epidermis limits the scapes and cortex follows it towards the centre with 7-8 rows in *O. collinum*, 6-7 rows in *O. gussonei*, 3-4 rows in *O. brevipedicellatum***,** 7-8 rows in *O. pyreanicum***,** 5-6 rows in *O. kuereanum.* The sclerenchymatic tissue, which is uninterrupted, follows cortex towards the centre in all studied taxa. Sclerenchymatic tissue is the thickest in *O. pyreanicum.* There are vascular bundles changing their numbers among 20-60 in vascular cylinder. The center of the scapes (the pith region) is composed of parenchymatous cells.

Conclusion / Discussion: We determined the scape characteristics of *O. collinum, O. brevipedicellatum, O. gussonei, O. kuereanum* and *O. pyreanicum* to contribute their systematic position for the first time.

Keywords: Anatomy, *Asparagaceae, Ornithogalum*, Scape, Turkey

POSTER PRESENTATION - 72

EFFECT ON NUTRIENT DIGESTIBILITY of ADDITION OREGANO ESSENTIAL OIL at DIFFERENT LEVELS IN RAINBOW TROUT (*Oncorhynchus mykiss*) DIETS

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In this study, apparent digestibility coefficients (ADC) of crude protein (CP), lipid, and dry matter were determined for rainbow trout. Experiment diets were supplemented with five different concentrate (0 (control), 0.125, 1.5, 2.5, 3.0 ml kg^{-1}) of *O. onites* oil. ADC was determined using 0.5 % Cr_2O_3 as an indicator. Five experiment diets were formulated to be isonitrogenous (crude protein 46 %) and isoenergetic (digestible energy 4213 kcal/kg). A total of 750 trout (initial mean body weight 122.6±4.21 g) were randomly stocked into 15 tanks. Feces were collected from three replicate groups of trout. The results of this study indicate that addition of *O. onites* in different rations to rainbow trout diets showed no significant differences in dry matter, protein and lipid digestibility.

Keywords: *Origanum onites*, rainbow trout, nutrient digestibility, oregano

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POSTER PRESENTATION - 73

EVALUATING THE EFFECT OF MEDICINAL PLANTS ON WHITENING OF THE PERMANENT TEETH

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Objective / Purpose: Nowadays, whitening of stained teeth has become the most popular topic in aesthetic and cosmetic dentistry. Because of the side effects of materials that were used for bleaching, in this study the effect of some plants which were used in Anatolian folk medicine (*Salvia verticillata* L. subsp *verticillata*, *Mentha longifolia*, *Thymus praecox* subsp. *caucasicus*) on the treatment of tooth staining were examined.

Materials and Methods: In this study, upper central incisors which were extracted for periodontal reasons were used. The colour values of numbered teeth were obtained and the teeth were immersed in to three different essential oils of medicinal plants (*Salvia verticillata* L. subsp *verticillata*, *Mentha longifolia*, *Thymus praecox* subsp. *caucasicus*) for different time periods (1 day, 1 week, 1 month). At the end of the immersion periods, colour measurements of all samples were made and the colour changes were analyzed. Obtained data were statistically analyzed by using ANOVA and Tukey HSD test.

Results: As a result of the variance analysis, plant species and the duration of immersion was found to be statistically significant ($p<0.001$).

Discussion: Within the limits of this study, we can indicate that tested medicinal plants has a whitening effect by resulting significant change in tooth colour.

Keywords: Medicinal plants, Teeth, Bleaching

POSTER PRESENTATION - 74

CHEMICAL COMPOSITIAN AND ANTIMICROBIAL ACTIVITY OF *Myristica fragrans* & *Elettaria cardamomum* ESSENTIAL OIL

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Objective / Purpose: In recent years, people have been interested in obtaining active compounds from natural sources of medicine and cosmetics. *Myristica fragrans* and *Elettaria cardamomum* could be a rich source of bioactive compounds. The objectives in this study were to determine the chemical composition and antimicrobial activity of the essential oils from *Myristica fragrans* and *Elettaria cardamomum*.

Material and Methods: *Myristica fragrans* and *Elettaria cardamomum* obtained from Özşen Lokman Hekim Company located in GIMAT-Ankara, TURKEY. For the identification of chemical components, each sample was analysed by GC-MS QP 2010 Ultra (Shimadzu) equipped with Rtx-5MS capillary column. The antimicrobial activities of these plant oils were tested against 18 different microorganisms by MIC method.

Results: The GC-MS analyses revealed that the main components of oils obtained from *Myristica fragrans* 54.92% methyl eugenol, 18.06% chavibetol, 4.45% myrcene and 4.10% caryophyllene which composed %81.53 of the total oil. The essential oil from *Elettaria cardamomum* was characterized by the presence of 36.80% carvacrol, 23.95% benzene, methyl (1-methylethyl), 9.36% linalool, 5.16% γ-terpinene, 3.09% caryophyllene oxide and 2.71% thymol which composed 81.07% of the total oil. The *Myristica fragrans* and *Elettaria cardamomum* oils showed strong antimicrobial activity against *E. durans, S. infantis, E. aerogenes, E. coli, P. aeruginosa, S. Kentucky, B. subtilis* and *S. typhimurium*.

Conclusion / Discussion: From GC-MS results, *Myristica fragrans* oil included high amount of methyl eugenol (54.92%) and *Elettaria cardamomum* oil included high amount of carvacrol (36.80%). It has been known that methyl eugenol has antimicrobial activities [1]. Also, carvacrol can be used for protective purpose with food [2]. These results suggested that the *Myristica fragrans* and *Elettaria cardamomum* oils can be exploited as a potential source of natural agents for food and pharmacology industries.

Keywords: *Myristica fragrans*, *Elettaria cardamomum*, essential oil, GC-MS, antimicrobial activity

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POSTER PRESENTATION - 75

4D-QSAR STUDIES AND PHARMOCOPHORE MODELLING OF PHENYLPYRAZINE DERIVATIVES AS PHOSPHODIESTERASE 10A INHIBITORS BY EC-GA METHOD

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Phosphodiesterases (PDEs) are a large family of enzymes encoded by 21 different genes in humans and play key role in the central nervaous system a variety biological processes. PDE10A inhibitors effective for the treatment of schizophrenia and the are single members of PDE10 family [1]. In this work the pharmacophore identification and bioactivity prediction for phenylprazine analogues of a series Phenylpyrazine analogues as class of PDE10A inhibitors by means of Electron Conformational-Genetic Algorithm method [2].

EC-GA method was developed that combines EC and GA methods. 3D structures of compounds, conformational analysis and quantum chemical calculations have been worked Spartan 10 software at Hartree Fock 3-21 G* level and water was used as solvent because it is the most like solvent to biological systems. Then the ECMC matrix was prepared that contains distances between atoms and mulliken charges for pharmacophore identification. To predict the theoretical activity and select the best subset of descriptors affecting bioactivities, nonlinear least square regression method and genetic algorithm were performed. For cross validation and statistical analysis compouds were classified training and test set. In this study 42 training, 25 test set was used. For the predictive capabilities best subset of descriptors were calculated for a range of 1-14 parameters at MATLAB software. Hence the model attains a stable situation as optimum 8 parameter number. LOO-CV method had been employed for the predictive ability of 4D-QSAR model. In addition to E-statistical method was used to determination of the effect selected parameters. $R^2_{training}$, R^2_{test}, q^2, q^2_{ext1}, q^2_{ext2}, q^2_{ext3} and con1, con2, con3 values are given respectively 0.863, 0.803, 0.804, 0.757, 0.742, 0.548, 0.925,0.819, 0.880.

This work was supported by the Research Fund of Erciyes University under [grant number FBD-40-1215]

Keywords: 4D-QSAR, EC-GA, Phenylpyrazine, Pharmacophore

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POSTER PRESENTATION - 76

FATTY ACID PROFILES OF *SCOMBER SCOMBRUS* (L., 1758)

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Objective / Purpose: Although there are numerous studies that have published fatty acid profiles of various fish species from different geographical regions, there is a limited amount of information on the fatty acid profile of *Scomber scombrus*. The main objective of this study was to measure the muscle fatty acid composition and ω3/ω6 fatty acids ratio of *Scomber scombrus*.

Material and Methods: In this study, total fatty acid compositions of *Scomber scombrus* (Linnaeus 1758) were investigated by gas chromatographic method. *S. scombrus* used in this study were obtained from market in Konya. Three individuals were sampled. Ten gram of muscle sample were extracted. FAMEs were analyzed on a HP (Hewlett Packard) Agilent 6890N model gas chromatograph (GC), equipped with a flame ionization detector (FID) and fitted to a HP-88 capillary column (100 m, 0.25 mm i.d. and 0.2 μm). Injector and detector temperatures were 240 ºC and 250 ºC, respectively. Results were expressed as FID response area in relative percentages. Each reported result is given in the average value of three GC analyses.

Results: 20 fatty acids identified in muscle lipids of *Scomber scombrus*. The highest fatty acids in the fish in were C18:1 ω9 oleic acid, C18:2 ω6 linoleic acid, C16:0 palmitic acid and DHA. *Scomber scombrus* was a rich n-3 PUFA.

Conclusion / Discussion: Stearic acid (C18:0) was the second highest SFA. Oleic acid was identified as a primary MUFA in the *Scomber scombrus*. This fatty acid in muscle tissue of *S. scombrus* was found to be 29.63%. 18:2 ω6 was the second highest fatty acid. Its ratio was 21.89%. C 14:1 ω5 and C 15:1 ω5 were found to be low amounts in the MUFA fractions of the muscle investigated. Fatty acid composition of fish lipids is extremely variable, even within species, depending upon different abiotic and biotic factors such as season, the type and amount of feed available, water temparature, pH, salinity and reproduction cycle. ω3 PUFA, principally DHA, has a role in maintaining the structure and functional integrity of fish cells. According to these data, it can be concluded that *Scomber scombrus* is a good sources for eicosapentaenoic acid (EPA) and DHA.

Keywords: Fish, *Scomber scombrus*, fatty acid composition.

POSTER PRESENTATION - 77

ANTICANDIDAL ACTIVITY OF THREE MEDICAL PLANTS FROM GUMUSHANE

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Objective / Purpose: Determine the anticandidal activity of various extracts of three medicinal plants that are *Equisetum arvense*, *Allium scorodoprasum* and *Alchemilla sp.* from Gumushane.

Material and Methods: Four solvents (ethanole, methanole, ethyl acetate and hexane) and aerial part of the plant were used for extraction. Totally twelve extracts were tested for anicandidal activity by using Kirby- Bauer disk diffusion method. *Candida albicans* DSMZ 5817 and *Candida albicans* ATCC 10231 were used for activity.

Results: All extracts exhibited significant antimicrobial activity against at least one test organisms. Especialy, *Equisetum arvense* ethanole extracts exhibit significant inhibition activity to both *Candida albicans* DSMZ 5817 (15 mm) and *Candida albicans* ATCC 10231 (15 mm). Addition to these, *Alchemilla sp.* ethanole extracts exhibit significant inhibition activity to both *Candida albicans* DSMZ 5817 (18 mm) and *Candida albicans* ATCC 10231 (14 mm).

Conclusion / Discussion: According to results, it has been found that three plants have significant antimicrobial activity to *Candida albicans*. Therefore, these plants could be potential source of new antimicrobial agents.

Keywords: medical plant, aerial parts, extracts, Candida, disk diffusion

POSTER PRESENTATION - 78

CONVECTIVE AND MICROWAVE DRYING OF MUSHROOMS (*Agaricus bisporus* and *Pleurotus ostreatus*)

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Objective / Purpose: The aim of this study was (i) to determine conventional and microwave drying kinetics of *A. bisporus* and *P. ostreatus*, (ii) to fit experimental drying data into 15 different mathematical models, (iii) to estimate effective moisture diffusivity of mushrooms, (iv) to calculate activation energies of samples.

Material and Methods: *Agaricus bisporus* ve *Pleurotus ostreatus* were produced by using composts in Mushroom House of Osmaniye Korkut Ata University. Samples were dried at 60, 70 and 80°C in laboratory type conventional oven and 180, 360 and 600 W in a kitchen type microwave oven until no weight changes were observed. In order to calculate effective moisture diffusivity and activation energy values (kJ/mol and W/kg), Fick's second law and Arhenius type equation were used respectively.

Results: Drying times for oven method were 12 h, 8 h and 6.5 h at 60, 70 and 80°C and for microwave method they were 47 min, 23 min and 12 min at 180, 360 and 600 W respectively. At the highest temperature/power, the maximum moisture diffusivities were seen. Diffusion coefficients of microwave drying were greater than conventional drying. Among 15 thin layer drying equations, Sigmoid model gave the best results (R^2>0.99).

Conclusion / Discussion: Microwave drying was faster and more effective than conventional drying of some mushroom species.

Keywords: *P. ostreatus, A. bisporus,* drying, mathematical modeling, diffusion coefficient, activation energy

POSTER PRESENTATION - 79

ANTIPARASITIC EFFECT OF TWO PLUMBAGINACEAE FROM SAHARA: *Limoniastrum Feei and Limonium Sp*.

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Objective / Purpose: Medicinal plants have become the source of most bioactive substances used in the treatment of various diseases among then, Parasites that damage and weaken the ability and various mental and physical productivity. Our research discusses the parasite as a world in its own stand, varied in its way of life reproduction such as *Giardia lambia and Trichomonas vaginalis* parasites.

Material and Methods: Dried powdered material (15 g plant) was extracted reflux with 100 ml of solvents, for 3h. We used this solvent for each plant: Acetone (A), Ether petrol (EP), Ethanol (ET), Dichloromethane (DM), Methanol (M), Chloroforme (C), Eau (Ea), Chloride Acid (CC). The residue was evaporated in vacuo apparatus to determine the present natural product in bioactive extract.

Results: The results of this study have shown the clear t of Antiparasitic effect plant extracts through the inhibition rate of parasite cells and the absorption value, so that the biological evaluation of *Limonium sp* and *Limoniastrum* feei. Following the results obtained, one can notice that plant extract have biological efficiency against the parasites under study and that inhibition was at varying rates.
PI (%) =1- (A extrait/A témoin)*100

Conclusion / Discussion: Most studies in recent year focused their attention towards medicinal plants due to their characteristics and benefits that cannot be denied which explain why most of our region inhabitants (south west of Algeria) still make use of these plants to treat diseases, and this because they have experienced that such plants contain active elements which vary from plant to plant or even in the same plant. According to the results we obtained concerning Antiparasitic efficiency of some plants, we conclude most of plant extracts showed an obvious efficiency against the tested parasites.

Keywords: Medicinal plants, Ethno pharmacological, Bioactive substance, *Giardia lamblia, Trichomonas vaginalis.*

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POSTER PRESENTATION - 80

THE EFFECTS OF PLANTING DENSITIES AND FERTILIZER APPLICATIONS ON YIELD AND YIELD COMPONENTS OF SAFFRON (Crocus sativus L.)

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Objective / Purpose: Saffron is a plant grown for 4000 years and used as a spice because of its smells, colors and healing properties but cultivation of saffron is gradually disappearing (Aslan, 1986). This study was carried out to investigate the effects of planting density and different fertilizer applications on the morphological and phenological characteristics, dry stigma yield and bulb yield of saffron in Amik plain ecological conditions of Hatay–Turkey.

Material and Methods: In the study, 8-12 cm (large size) saffron bulbs were used as a material. Three different planting densities (5x50, 10x50 and 15x50 cm) were applied. 5 kg/da pure nitrogen and phosphorus applied as fertilizer in four different ways; 1. No fertilization (control), 2. N (46% urea), 3. NP (20-20-0), 4. TSP (Triple super phosphate, 42% P_2O_5). The trial was conducted with three replications for two years.

Results: In the experiment, the number of leaves per plant varied between 4.7-10.7 and leaf length 17.5-39.6 cm. The maximum number of flowers were obtained in the second year of trial with 45.3 flower/m^2, at the 5 cm planting density in P_2O_5 application. The highest dry stigma yield also gathered from 5x50 cm planting density and P_2O_5 application with 1755.4 g/da. Contrary to flower yield, the highest bulb yield (1775.4 kg/da) was obtained from the parcels with 5x50 cm planting density, where nitrogen fertilizer was used.

Conclusion / Discussion: As a result, in the ecological conditions of Amik Plain (Southern Turkey), 5x50 cm planting density was found more suitable for saffron cultivation in case of dry stigma or baby bulb production. On the other hand, superphosphate fertilization for saffron dry stigma production and urea fertilization for bulb production should be applied.

Keywords: *Crocus sativus*, saffron, flower, stigma yield, bulb yield.

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POSTER PRESENTATION - 81

PHYTOCHEMICAL PROFILE AND ANTIBACTERIAL ACTIVITY OF TWO MEDICINAL PLANTS (ROSEMARY (*Rosmarinus officinalis* L.) AND LAUREL (*Laurus nobilis* L.)) IN THE REGION OF TIARET (ALGERIA)

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The objective of this research is to determine the phytochemical profile and antibacterial activity of two aromatic and medicinal plants; Rosemary (*Rosmarinus officinalis* L.) and Laurel (*Laurus nobilis* L.) in the region of Tiaret (Algeria).

The yield of water and methanol extract of our samples is 19.65%; 33.73% for *Rosmarinus officinalis* L. and 18.7%; 29.96% for *Laurus nobilis* L respectively.

The determination of total phenolic compounds in methanol extract of rosemary and laurel leaves using Folin Ciocalteu reagent gave an amount of 153.8 mg GAE / g; 87 mg GAE / g of extract respectively. Flavonoids content in rosemary and laurel was 109 µg QE / g extract and 35.5 µg QE / g extract respectively.

Phytochemical screening results showed that the methanol extract of our plants are rich in flavonoids and tannins.

The antioxidant activity of the methanol extract of our plants was measured by two methods: Free radical scavenging method (DPPH) which gave IC 50 values; IC 50= 0.04 mg / ml and 0.05 mg / ml for rosemary and laurel respectively in comparison to the ability of DPPH radical scavenging of ascorbic acid whose IC 50 = 0.045 mg / ml, and Hemolysis method which showed an increase in absorbance during the 180 min incubation of the erythrocytes.

The susceptibility tests of two bacteria; *Staphylococcus aureus* ATCC 25922 and *Escherichia coli* ATCC 10536 were carried out on solid medium. Both extracts exerted bacteriostatic activity on these two strains.

Keywords: Rosemary (*Rosmarinus officinalis* L.); Laurel (*Laurus nobilis* L.), Phytochemical; antibacterial

POSTER PRESENTATION - 82

THE INFLUENCE OF METHYL JASMONATE ON GROWTH AND CAFFEIC ACID DERIVATIVE CONTENTS OF *IN VITRO* SHOOT AND ROOTS IN ECHINACEAE *(Echinacea purpurea)*

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Objective / Purpose: *Echinacea purpurea* is a herbaceous perennial species that has gained international popularity because of its nutraceutical and medicinal properties [1]. Besides alkamides, polysaccharides and glycoproteins, *Echinacea purpurea* mainly contains caffeic acid derivatives. *In vitro* techniques combined elicitor treatments may be utilized effectively to improve the production of secondary metabolites in plants. In this study it was aimed to determine the effects of methyl jasmonate (MeJA) as an effective and frequently used elicitor on growth and caffeic acid derivative production of *in vitro* shoots and roots in *Echinacea purpurea*.

Material and Methods: *In vitro* plants obtained from the seeds were cultured in ½ Murashige and Skoog media containing different concentrations of MeJA (0, 10, 50 and 100 µM) and plants were harvested in three times at 15 days intervals. After harvest, shoot and root lengths, fresh and dry shoot and root weights and caffeic acid derivatives (caftaric acid, chlorogenic acid, caffeic acid, echinacoside, cichoric acid, *p*-cumaric acid and *o*-cumaric acid) by HPLC in shoot and roots separately were determined.

Results: All growth parameters of both shoot and roots decreased in line with the elevating level of MeJA applications. But MeJA applications increased the caffeic acid derivatives in both shoots and roots compared to the controls. The highest cichoric acid, the main caffeic acid derivative found in echinacea, was found in shoots and roots applied with 100 µM MeJA and harvested in 45 days after application.

Conclusion / Discussion: As reported before [2], MeJA may be promising elicitor for increasing secondary metabolite accumulation in plants.

Keywords: *Echinacea purpurea*, MeJA, caffeic acid derivatives.

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POSTER PRESENTATION - 83

CYTOTOXIC EFFECT OF *PRUNUS SPINOSA* FRUIT EXTRACT ON HT-29 COLON CANCER CELL LINE BY USING MTT ASSAY

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Objective / Purpose: *Prunus spinosa*, is good source of phenolic compounds, including anthocyanins and have potent antioxidant properties and anticancer activity. In this study, it was aimed to investigate cytotoxic effect of water extract of *Prunus spinosa* L. (Rosaceae) herb fruit traditionally known as blackthorn on HT-29 colon cancer cell line by using MTT assay.

Material and Methods: Cells were routinely maintained as adherent cell cultures in DMEM containing 10% FBS, 100 U/mL penicillin at 37 °C, in an incubator containing 5% CO_2. After attachment of cells for 24 hours, cells were treated for 24 and 48 h with various extract concentrations (between 44 µg/ml and 2250 µg/ml). $IC_{20,}$ $IC_{50,}$ IC_{80} values were calculated for 24 and 48 hour cytotoxicity.

Results: The *Prunus spinosa* fruit extract was found to reduce the number of viable cells after treatment on HT-29 cell lines at different concentrations for 24 and 48 hours. IC_{20}, IC_{50}, and IC_{80} values were determined as 1.27 µg/ml, 173.7 µg/ml and ↗1000 µg/ml respectively, after 48 hours of treatment.

Conclusion / Discussion: Our results showed that *Prunus spinosa* water extract has an inhibitor effect on cell viability on HT-29 cell line depending on concentration and exposure time. Extraction of metabolites by more advanced extraction methods from fruit extracts and advanced studies to determine activity of metabolites might increase the economic value of plant extracts to be included as a natural drug in the anticancer drug industry.

Keywords: *Prunus spinosa*, MTT, cytotoxicity, HT-29

POSTER PRESENTATION - 84

DETERMINATION OF THE BEST HARVEST PERIOD IN LAVANDIN (*Lavandula* x *intermedia*) IN HAYMANA ECOLOGICAL CONDITIONS

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Objective/Purpose: The objective of this work was aim to determine the exact harvest time in lavandin production for Central Anatolian climatic conditions.

Material and Methods: A three-years old lavandin (*Lavandula* x *intermedia*) plantation of CV Super A was evaluated in the experimental field of CRIFIC, Haymana. Five different harvest periods were conducted by using different growing and blooming stage of lavandin. Essential oils were extracted by steam distillation apparatus in the laboratory of Medicinal and Aromatic Plants Department, CRIFIC, Ankara, and were characterized by GC-MS in Anadolu University, Faculty of Pharmacy, Eskişehir.

Results: The highest essential oil was received from July harvest with 3.0-4.2% from blooms, while the lowest from May by 0.1-0.3% from the leaves. The main components of the samples were found as 1.8 cineole which was recorded by 52.0% the highest amount from early harvest of May. The camphor ratio was ranged 13.5 to 23.3%. And, another main component, borneol increased when the harvest delayed from May to September, from 4.2% to 9.7%, respectively.

Conclusion/Discussion: MAP (Medicinal and aromatic plants) cultivation in Central Anatolia is gaining importance due to the IPARD supports to the farmers and the demand to row material of new Companies, as well. Present work determined the seosanal variabilities on the components and essential oil changes in lavandin obtained at different pruning and harvesting times to offer different options to the growers.

Keywords: Lavandin (*Lavandula x intermedia*), essential oil, ontogenetic variability, 1.8 cineole, camphore.

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POSTER PRESENTATION - 85

ANTIHAEMORRHOIDAL PLANTS IN TURKEY

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Objective / Purpose: "Haemorrhoid" word is originated from the Greek 'haema' (blood) and 'rhoos' (flowing). Our aim is to take attention to plants traditionally used to treat haemorrhoidal disease that a benign perianal disease, which is basically caused by vasodilation on pleux haemorrhoidalis vein.

Material and Methods: Data were collected from personal communications and literatures of ethnobotanical studies (dates: 1984-2015) conducted in Turkey. Evaluation of their latin, Turkish and common names, parts of the plants and their method of application in treatment of the symptoms in Anatolia, Turkey were given in this study.

Results: The data showed that herbal remedies included 170 from 60 different plant families used in the treatment of haemorrhoids. Most of the plants that were included in folk medicine mainly from Lamiaceae family, which has 43 different species, followed by Rosaceae (42 species) and Asteraceae (23 different plant species) families, respectively.

Conclusion / Discussion: Although there are many natural based antihaemorrhoidal preparations in the world, just a few, imported, chemical and safe antihaemorrhoidal preparations prescribed in Turkey. This study can be a guide for phytochemical studies and to discovery of novel effective extracts or compounds for the treatment of haemorhoidal or related diseases

Keywords: haemorrhoid, hemorrhoid, plant, natural product

POSTER PRESENTATION - 86

FOLKLORIC MEDICINAL PLANTS IN NORTH CYPRUS

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Objective / Purpose: This study is carried out in Northern part of Cyprus which is aimed to document and provide information about their traditional usages of medicinal plants by Turkish Cypriots.

Material and Methods: In this research face to face interviews have been conducted with 75 informants (61 women, 14 men) in 15 villages and 3 towns. Interviewees ranged in age from 22 to 95 years and detailed questions were asked about the usage of medicinal plants, their local names, the source of their knowledge on medicinal plant usage, trustworthiness of medicinal plants and their first treatment choice when the disease symptoms has been preferred.

Results: As a result of observations, Turkish-speaking Cypriots used medicinal plants for wide range of diseases and they still use these plants for minor ailments as a first choice treatment. 65% of interviewee believe that medicinal plants are always safe and %45 of them specified that their knowledge is transmitted from their parents. The findings showed that the usage of medicinal plants and their local names varies from village to village and informants have well-knowledge about the toxicities of some plants.

Conclusion / Discussion: At the end of this study, 2 of them are endemic to Cyprus, 115 different plant species were recorded. 108 of those plants belong to 51 different families were identified. Botanical properties, habitats, local and latin names, medicinal activities, phytochemicals and traditional usages of 72 species were defined in this study.

Keywords: traditional herbal medicine; ethnobotanical study; Cyprus

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POSTER PRESENTATION - 87

VOLATILE COMPOUNDS AND BIOCHEMICAL COMPOSITIONS OF TWO ORANGE FRUIT VARIETIES

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Objective / Purpose: In Turkey, oranges produced and consumed higher amount among citrus species. Nowadays, consumers pay more attention to the antioxidants rich fruit which are associated with the reduced incidence of many diseases. In this paper 'Lane Late Smith' and 'Red Valencia' orange varieties were evaluated based on their fruit color, total phenol, total antioxidant activity, volatile compounds, organic acids and sugar composition.

Material and Methods: The organic acid contents of orange fruits were identified and quantified using an HPLC system (Agilent 1100 series G1322A; Germany) according to the method of Bozan et al., 1997. An Aminex HPX-87 H column (300 mm × 7.8 mm) was used in the HPLC system, which was controlled by Agilent software run on a personal computer. The organic acid content of samples was determined qualitatively and quantitatively. Total phenol content (TPC) (g gallic cid/100gext) of the fruit juices was determined by using Folin–Ciocalteu method of Spanos and Wrolstad (1990). Volatile constituents of orange fruits were determined by a headspace method.

Results: According to the obtained results phenol content was about 100 g gallic acid/100gext in 'Lane Late Smith' and 203 g gallic acid/100gext 'Red Valencia' orange varieties while total antioxidant activity detected as 182.69 µmoltrolox/g ext and in 'Lane Late Smith' 250 µmoltrolox/g ext in 'Red Valencia'. The differences obtained between two varieties based on fruit color, organic acid and sugar content.

Conclusion / Discussion: The results indicated that 'Red Valencia" orange fruits are rich in total phenol, total antioxidant activity, some of the organic acids content as well as volatile compounds.

Keywords: Orange, sugar, organic acid, aroma, phenol, antioxidant activity, 'Lane Late Smith' and 'Red Valencia'

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POSTER PRESENTATION - 88

THE COMPOUND ANALYSIS of *Eurhynchium striatum*, *Oxyrhynchium hians* and *Palamocladium euchloron* SPREAD IN ZONGULDAK

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Objective / Purpose: According to our knowledge, phenolic compounds of *Eurhynchium striatum*, *Oxyrhynchium hians* ve *Palamocladium euchloron (Brachytheciaceae family*) have not been investigated so far. Therefore, our study aimed to find out both the qualitative and quantitative amounts of these bryophytes.

Material and Methods: The samples of the plants were picked from nature within Zonguldak provincial border. Methanol extracts were prepared and HPLC was used to detect the phenolic compounds and their quantitative amounts.

Results: Twelve different phenolic compounds were found. According to HPLC results, the largest amount of the phenolic compound obtained from *Eurhynchium striatum* was taxifolin: 0,01238 mg/g (dry weight), the highest amount of phenolic compound obtained from *Oxyrhynchium hians* was daidzein: 0,00858 mg/g (dry weight) and the highest amount of phenolic compound obtained from *Palamocladium euchloron* was gallic acid: 0,00302 mg/g (dry weight).

Conclusion / Discussion: The presence of phenolic compounds in bryophytes is economically crucial and has important chemical and pharmacological aspects.

Keywords: Eurhynchium striatum, Oxyrhynchium hians, Palamocladium euchloron, taxifolin, daidzein, gallic acid.

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POSTER PRESENTATION - 89

INVESTIGATION OF SOME ANTIBACTERIAL AND ANTIOXIDANT PROPERTIES OF WILD *Cirsium vulgare* FROM TURKEY

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Purpose: Polyphenols are large group of natural compounds and many of them have been found in plant-based. *Circium vulgare* (Savi) Ten. (Asteraceae) is a species as wild-grown in Trakya region of Turkey and we aimed to determination of some antioxidant and antimicrobial activities of *C.vulgare*.

Material and Methods: Crude extracts of air dried whole plants was obtained by using n-hexane, diethylether, ethylacetate and methanol extractions. Total phenolic content (TPC) and DPPH (2,2-diphenyl-2-picrylhydrazyl) scavenging activity was determined in extracts (Amarowicz, et al. 2005). The antibacterial activity was tested against *Staphylococcus aureus* (ATCC 43300), *Escherichia coli* (ATCC 35218), *Bacillus subtilis* (NRRL NRS-744) and *Pseudomonas aeruginosa* (ATCC 27853) by using agar diffusion method compared to Penicillin (10 IU) and Gentamicin(10 µg).

Results: The TPC and DPPH activity of extracts revealed significant differences by following sequence MeOH>dether>EtOAc>hexzane. The DPPH scavenging activity was concentration dependent and varied from 6.26-91.68 % in extracts. Methanol extracts with highest TPC value (61, 21 mg GAE/g extract) used for determination antimicrobial activity. The highest inhibition effect of *C.vulgare* was found on *P. aeruginosa* among the bacteria strains which is 22 mm in diameter and higher than Gentamicin (15 mm zone diameter) as control.

Conclusion/Discussion: Results presented that *C.vulgare* can be researched for future investigations to determination of other biological activities and the isolations of biologically active compounds such as flavonoids, where some of their characteristics are expected to be contribute to the natural compounds in pharmaceutical industry. Additionally, because of their antimicrobial activity they can be used as topical preparation or by food preservation.

Keywords*:* *Cirsium vulgare*, antioxidant activity, total phenolic content, antibacterial activity.

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POSTER PRESENTATION - 90

MEDICINAL PROPERTIES OF AJOENE

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Natural plant products have recently begun to increase their popularity in the prevention of numerous diseases. Garlic is one of the most remarkable foods in nature which has also been valued for medicinal properties for a very long time. Organosulfur compounds and bioactive enzymes are the primary efficient elements of garlic. Other constituents related with garlic properties are ajoene, thiosulfinates, allicin and various other organosulfur compounds. Despite the fact that allicin cannot live long in aqueous solution, it produces more stable by-products, such as ajoene, which is produced in great amounts through a stable sulfoxide rearrangement of allicin despite being found minimally in freshly crushed garlic. In addition, existing as 2 E and Z isomers, ajoene is an important sulfur-containing compound in garlic extracts which are produced during heat treatment. There are various effects of ajoene such as antibacterial, antiviral, antioxidant, antifungal, antithrombotic and antiparasitic effects. In addition to these effects, ajoene lowers cholesterol and has anticancer activities. This review emphasizes the properties and the medicinal effects of ajoene.

Keywords: ajoene, allicin, health

POSTER PRESENTATION - 91

INVESTIGATION OF CYTOTOXIC EFFECTS OF SOME ETHNOBOTANIC PLANTS ON COLORECTAL CELL LINE

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Objective/ Purpose: In this study, we aimed to determine cytotoxic effects of five ethno-botanic plants on DLD-1 colorectal cell line.

Material and Methods: The plant samples were collected and dried. After aqueous extracts were prepared. For cell culture study, DLD-1 cells were incubated at 5% CO_2 at 37°C. Cytotoxicity test for cells treated by *Melissa officinalis, Achillea teretifolia, Achillea* sp., *Origanum* sp. and *Tubiflora* sp. aqueous extracts at doses 5% -0,1% at two different time intervals (24-48h). MTT test was performed to measure cytotoxicity and cell proliferation.

Results: From the results obtained from MTT, we found that the most effective extract is obtained from *Origanum* sp., on the other hand, the extracts from sourced *Achillea* displayed the less cytotoxical effect comparing to the others at applied dose and time intervals.

Conclusion / Discussion: This study gives some critics on potentials of some traditionally used plants in the pharmacology area as anticancer agent. In the future, it is aimed to reveal the molecular mechanism that causes cell death.

Keywords: Ethno-botany, DLD-1, MTT, Turkey.

POSTER PRESENTATION - 92

CHEMICAL COMPOSITION AND EXTRACTION YIELDS OF ESSENTIAL OIL FROM GUM OF *Pistacia khinjuk* Stocks

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Objective / Purpose: *Pistacia khinjuka* known as Pistacia genus in Anacardiaceae family is gaining lots of importance in medicinal uses. The various parts of *P. khinjuka* are a good source of functional compounds. The aim of the current study was to determine the chemical composition of essentials oil extracted from the gum of the plant.

Material and Methods: *Pistacia khnjuk* gums were collected from Iraq. The essential oil of the gum was obtained by using conventional extraction method for different times changed between 30 and 90 min, and microwave assisted essential oil system at the powers from 200 to 500 W and for times from 30 to 90 min. The chemical identification and percent amount of essential oil were determined via a gas chromatography-mass spectroscopy (GC-MS) instrument.

Results: According to the results, the highest and lowest essential oil yields calculated gravimetrically were 24.57% and 14.96% at the power of 200 and 500 W for 90 min, respectively for microwave method. On the other hand, for the conventional method, the highest and lowest yields were 17.97% and 9.06% for 90 min and 30 min, respectively. From the GC-MS results, the major compounds of essential oils were determined as (+)-α-pinene (77.48%) and it was followed by (±)-β-pinene (17.88 %), D- limonene (1.456 %), camphene (1.85 %).

Conclusion / Discussion: Consequently, the essential oil isolated from *P. khinjuka* gum had high yields. Besides, the percent amount of compounds in essential oils could be varied due to different extraction conditions. According to obtained results, the most effective essential oil extraction method was found as microwave assisted essential oil system.

Keywords: *Pistacia khinjuk*, gum, essential oil, conventional extraction method, microwave assisted essential oil system, GC-MS

POSTER PRESENTATION - 93

THE EFFECTS OF FREEZE DRYER AND CONVENTIONAL OVEN APPLICATIONS ON C-PHYCOCYANIN IN LARGE SCALE OF MICROALGAE PRODUCTION

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Objective: Phycocyanin is a natural dye and has pharmaceutical effects via its pigment-protein complex. It has been recommended by oncologists due to its pharmaceutic effects. Also, it can help to synthesis important enzymes needed for inhibition of cancer cell growth and promote cell regeneration in human metabolism [1]. In this trial, it is aimed to compare content of C-phycocyanin extracted from *Spirulina* powder produced in large scale with freeze drying and oven drying techniques.

Material and Methods: *Spirulina platensis* was cultured in 2500 L race-way algae ponds during 16 days in summer period at Greenhouse of Algae Culture, University of Yalova, Turkey. At the end of cultivation, *Spirulina* biomass was filtered from 45 μ of plankton cloth. In the first method, biomass was dried during 24 hours at +40°C in the industrial type oven. In the second method, the biomass was dried for 24 hours at -60°C by freeze drier. After each drying, samples were grinded and *Spirulina* powder was obtained. Phycocyanin analyses were done on *Spirulina* powder obtained from two different drying techniques.

Results: Phycocyanin yield was found 41.3 mg/g at the freeze dried samples and 37.7 mg/g at the oven dried samples. The purity ratio of phycocyanin (*A*620/*A*280) was achieved in samples of freeze dried and oven dried as 2.7 and 2.5 at reagent grade, respectively.

Conclusion / Discussion: In the pharmaceutical industry, the degree of purity of phycocyanin is required to be 4 or more. In the food industry, the degree of purity of phycocyanin that is expected to be higher than 0.7 and 2 purity is widely accepted [2]. In this study, obtained purity degree of oven drying technique is acceptable. However, freeze drying is recommended to achieve higher amount and purity ratio of phycocyanin.

Keywords: *Spirulina platensis*, phycocyanin, heat treatment.

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POSTER PRESENTATION - 94

MEDICINAL USES OF *USNEA*

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Objective / Purpose: This study aimed to explain the medicinal uses of *Usnea* Dill. ex Adans.

Material and Methods: Scientific studies were edited in this review article.

Results: *Usnea* is a lichen which fungi and algae or cyanobacteria form a symbiotic organisms. Usnic acid is a secondary metabolite that is naturally occurring in *Usnea* species. It is believed that usnic acid protects the lichen from adverse effects of sunlight exposure and deters grazing animals with its bitter taste. Usnic acid possesses a wide range of interesting biological properties. It is a potent antibiotic effective against Gram-positive bacteria, other bacteria such as *Mycobacterium tuberculosis*, and some pathogenic fungi. It also exhibits antiviral, antiprotozoal, antimitotic, anti-inflammatory and analgesic activity.

Conclusion / Discussion: Despide its strong selective antibacterial activity, usnic acid has the potential to be toxic so the taken doses are crucial.

Keywords: Antibacterial activity, Secondary metabolite, Usnea, Usnic acid.

POSTER PRESENTATION - 95

IN VITRO WOUND HEALING PROPERTIES AND ANTIOXIDANT ACTIVITIES OF *THYMUS SIPYLEUS* BOISS. SUBSP. *ROSULANS* (BORBAS) JALAS AQUEOUS EXTRACTS

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Objective / Purpose: While current therapeutic agents have inadequate efficacy and number of adverse effects, the medicinal plants have been used for the management and treatment of wounds since ancient years and are well known for their abilities to promote wound healing without serious side effects. The aim of the present study was to investigate the in vitro wound healing properties of *Thymus sipyleus* BOISS. subsp. *rosulans* (BORBAS) Jalas and evaluation of antioxidant capacity that may be responsible for its wound healing activity.

Material and Methods: The influence of the aqueous extracts (infusion and decoction) obtained from *T. sipyleus* BOISS. subsp. *rosulans* (BORBAS) Jalas on migration and proliferation of Swiss 3T3 albino mouse fibroblasts were assessed using Scratch wound assay and MTT assay. DPPH radical scavenging assay and Folin- Ciocalteu reagent were used for determination of antioxidant activities and total phenolic contents of extracts, respectively.

Results: Enhanced migration and wound closure were observed in infusion (89.08 %) and decoction (79.7 %) extracts. Also both of extracts stimulated fibroblast proliferation (108.72- 116.21% and 112.32-119.07%) compared to control at all concentrations. Infusion and decoction extracts exhibited strong antioxidant activities with IC_{50} values of 87.38 µg/ml and 43.39 µg/ml, respectively. Similarly, high total phenolic contents were observed in infusion (118.5 mg GAE/g) and decoction (147.64 mg GAE/g) extracts.

Conclusion / Discussion: Our findings suggested that aqueous extracts of *T. sipyleus* BOISS. subsp. *rosulans* (BORBAS) Jalas exhibited high wound healing

and antioxidant activities, also might be considered as a potential source of therapeutic agents for wound healing.

Keywords: Wound healing, *Thymus sipyleus* BOISS. subsp. *rosulans* (BORBAS) Jalas, scrath assay, MTT assay, antioxidant.

POSTER PRESENTATION - 96

AN ANATOMICAL ASPECT ON LOCAL ENDEMIC *NOCCAEA CAMLIKENSIS* AYTAÇ, NORDT & PAROLY (*BRASSICACEAE*) FROM TURKEY

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Objective / Purpose: The main goal of this study to investigate the anatomical properties of *Noccaea camlikensis* which grows on serpentine place and in Çamlık village from Konya province.

Material and Methods: The specimens of *Noccaea camlikensis* were collected from its natural habitat. The paraffin method was applied to vegetative organs of *Noccaea camlikensis* for cross sections. Permanent slides were observed by Leica DM 1000 light microscope. Measurements were made with Cameram 21 program and photos were taken with a Canon EOS 450D camera attached to the light microscope.

Results: The secondary root structure has observed in root cross sections of *N. camlikensis* with the peridermis, cortex, phloem and xylem. The cross sections of stem have an epidermis layer in outermost surface. Cortex is 5 or 6 layered and characterized with parenchymatic cells. The pith covers by parenchymatous cells. The leaves of studied taxon have between two epidermis layers with mesophyll tissue. Mesophyll is bifacial. The stomata are anizositic type and the leaves are amphistomatic.

Conclusion / Discussion: Anatomical biomarkers of different plant parts have been used as aids in the taxonomical recognition of species of medicinal plants. Therefore, we selected *Noccaea camlikensis* and determined its anatomical characteristics for the first time and the systematic position has been ensured to be confirmed.

Keywords: Anatomy, Brassicaceae, *Noccaea*, stomata

POSTER PRESENTATION - 97

POLLEN MORPHOLOGY OF *LYCIUM* (*SOLANACEAE*) IN IRAN

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Objective / Purpose: *Lycium* (Solanaceae) with almost 100 species in the world is a famous perennial medicinal plant. In Iran there are 6 *Lycium* species. These species are important for their antioxidant, antiaging and anticancer ingredients. As the pollen features of these species has not been studied in Iran, in this project the pollen grains were studied for the first time to provide diagnostic characters, efficient in species delimitations and separation.

Material and Methods: Accessions were gathered from different habitats of Iran. Totally 30 accessions of all native species as: *L. depressum*, *L. ruthenicum*, *L. shawii*, *L. edgeworthii* and *L. kopetdaghi* were gathered and studied. Qualitative and quantitative features were considered and multivariate statistical methods were used to reveal the diagnostic value of features. SPSS ver. 20 and PAST software were used. Cluster analysis, Factor analysis and Principal component analysis were done. Pollen grains were studied by use of light microscopy and Scanning electron microscopy.

Results: longest polar axis was observed in *L. depressum* subsp. *depressum* and the shortest was observed in *L. edgeworthii.* Later species showed the shortest equatorial axis too while *L. kopetdaghi* showed the longest one. Results are somehow in concordant with Perveen and Qaiser (2007) and Al_Quran (2004) findings.

Conclusion / Discussion: All studied pollen grains were trizonocolpate and isopolar. Pollen was of prolate – preprolate shape. Main sculpture of the species were striate except *L. shawii* which has rugulate ornamentations. Aperture number and exine sculpture provide diagnostic features in studied species. Species relationships are discussed based on pollen features.

Keywords: Pollen Morphology, Iran, *Lycium*.

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POSTER PRESENTATION - 98

MEDICINAL PLANTS SOLD IN HERBALISTS IN ORDU DISTRICT

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Objective / Purpose: This study was conducted to collect information about the usage of medicinal plants in the Ordu province. It was aimed to determine the general situation of the herbalist in the Ordu province, which plants were used in the region and the factors affecting the consumers' preferences.

Material and Methods: A questionnaire was applied by interviewing seven herbalists in Ordu province. In the study, a questionnaire was consisting of questions such as education status of herbalists, whether they had received training on medical plants, which drogs are the most preferred in the region, where to buy the drogs, what consumers have influenced plant preferences, which plants are preferred for the seasons, and whether they sell special plants for the region.

Results: According to the study results, it has been determined that the herbalists are not educated in an agricultural university, but they have received courses related to medicinal plants, with the exception of ones. It has been revealed that people have bought drogs in the winter months against flue. One of the herbalist stated that medicinal plants were collected in Giresun and Gümüşhane while others bought them. All of the herbalists indicated that the consumer prefers herbal drugs on the media through the doctor's advice. Herbalists have said that plants such as Melissa, Green Tea, Black Cumin, Turmeric, Thyme, Sage, Salep are the preferences and sales of the consumer on the doctor's advice, as the stomach relief of bitter squash. According to another result of the study, sesame seeds, black seeds, black grapes, linden, ginger, rose hip, cinnamon, avocet, various herbal teas and spices sells more effectively with seasonal changes in the region.

Conclusion / Discussion: Sönmez et al. (2015), in their survey study in Antalya, they found that none of the herbalists received agricultural education and most of them did not get training in medicinal plants. People have taken information from friends and surrounding people. They have determined that the media is 100% effective in product claims.

Keywords: Herbalist, Traditional use, Medicinal

Reference:

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POSTER PRESENTATION - 99

DETERMINATION OF ANTIMICROBIAL ACTIVITY OF *Cinnamomum zeylanicum* and *Acmella oleracea* ESSENTIAL OILS

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Purpose: The aim of this study was to evaluate the antimicrobial activity of essential oils of *Cinnamomum zeylanicum* and *Acmella oleracea* against *C. albicans* ATCC 10231, *S. mitis* ATCC 49456, *S.mutans* ATCC 13419, *S. oralis* ATCC 35037, *S. sanguinis* ATCC 10556.

Material and Methods: In this study, essential oils of plants was unfixed in 0.5 gr/5 ml DMSO, passed in 0.22 µL membran filtre and stored in the sterile container under +4 C° as stock solution. In all trials, 18 hour active cultures were used and each microorganism was treated using disk diffusion method. To test the antimicrobial activity, essential oils were impregnated to the empty disks as 5, 10, 20, 40, 60 µL and Mueller-Hilton Agar (for bacteria) and Sabouraud Dextrose Agar (for fungi) media was used. All trials were repeated 3 times and incubation zones were detected in mm after incubation.

Results: According to the variance analyses results; essential oil of plants, applied ratios and interactions between them were found to be statistically significant ($p<0.001$). No incubation zone was occured in microorganism groups for 5 µL, the most antimicrobial activity was occured in 60 µL and *S. Oralis* demonstrated 1.8 cm in essential oil of *Cinnamomum zeylanicum, S. Mitis* demonstrated 1 mm in essential oil of *Acmella oleracea.*

Conclusions: The highest antimicrobial activity was detected in 60 µL for all microorganisms, it was concluded that *Cinnamomum zeylanicum* and *Acmella oleracea* had an antimicrobial affect on tested microorganisms.

Keywords: Microorganisms, antimicrobial affect, oral and dental health.

POSTER PRESENTATION - 100

THE CHEMICAL COMPOSITIONS AND MEDICINAL EFFECTS OF SUMAC (*Rhus coriaria* L.)

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Sumac (*Rhus coriaria* L.) that belongs to the Anacardiaceae family, attracts attention as a small tree or shrub. It grows in North Africa, South Europe, Afghanistan, Iran and Mediterranean countries like Turkey.[1] Generally, sumac cultivates in non-agriculturally regions, and various species have been used by local people for medicinal and other purposes.[2] Sumac fruits contain approximately 9.6% for moisture, 7.4% for fat, 2.6% for protein, 14.6% for fibre, 1.8% for ash and 63.8% for water-soluble extract. They have valuable mineral content such as potassium, calcium, magnesium and phosphorus. Other than these, phenolic acids, flavonols, hydrolysable tannins, antocyanins and organic acids like malic, citric and tartaric acids are present in the sumac fruits.[1] Sumac is known as a condiment used as a major souring agent. It can be used as an appetizer by mixing with freshly cut onions. Turkish fast foods such as döner kebab can be flavoured with sumac powder. Kebabs, fish or chicken can be also rubbed with sumac powder.[1] The potential health effects of sumac are due to antifibrogenic, antifungal, antiinflammatory, antimalarial, antimicrobial, antimutagenic, antioxidant, antithrombin, antitumorigenic, antiviral, cytotoxic, hypoglycaemic, and leucopenic effects.[2]

Sumac is a very remarkable medicine and aromatic plant due to its nutritional properties and biological activities. The extraction of sumac's bioactive compounds using green extraction techniques should be given more importance and the consumption of powder form and of extract form of sumac should be made widespread.

Keywords: chemical composition, health, *Rhus coriaria* L., sumac.

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POSTER PRESENTATION - 101

POISONOUS PLANTS USED IN THE OPEN AND GREEN AREAS OF ORDU, TURKEY

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Purpose: The purpose of this study is to identify the poisonous plants in the urban open and green areas of Ordu and to present the problems stemming from their usage.

Material and Methods: The poisonous plants in the urban open and green areas of Ordu make up the main material of the study. First of all wood-like plants in all the open and green areas in the city centre were examined and the poisonous ones are determined. The places where these poisonous plants are used were put forward, it was determined if their status in that place was harmful to health and some precautions were presented.

Results: Some wood-like plants used in the urban open and green areas of Ordu have poisonous characteristics. The poisonous plants that are used densely in the urban open and green areas of Ordu are listed below. *Aesculus hippocastanum, Ligustrum vulgare, Buxus sempervirens, Berberis vulgaris, Robinia pseudoacacia, Ilex aquifolium* L., *Taxus baccata* L., *Nerium oleander* L., *Euonymus latifolius.*

Conclusion / Discussion: Poisonous plants have different levels of affect, and they can carry toxic effects in some of their parts. There are plants which carry poison in their seeds, flowers, leaves and even bodies. These plants being present in the urban areas where especially the children are in one-to-one interaction create some health risks. That is why people must be more attentive during the determination phase of the plants in planning and design studies and alongside with the ecological requests of the plants, their appropriateness to the place and intended use, their toxic characteristic must also be taken into consideration.

Keywords: City, urban open-green areas, poisonous plants.

POSTER PRESENTATION - 102

EVALUATION OF THE ANTIVIRAL ACTIVITY OF *Ribes uva-crispa* L. and *Ribes multiflorum* Kit. ex Romer and Schultes EXTRACTS

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In an effort to find new antiviral agents from natural products, methanol and aquoues extracts of leaves and fruits of *Ribes uva-crispa* and *Ribes multiflorum* naturally grown in Turkey were investigated as *in vitro* to reveal their antiviral activities against *Herpes simplex* virus type 1 (HSV-1) with a XTT-based colorimetric assay. Results demonstrated that all extracts exhibited anti-HSV-1 activity with different percentages of protection (varying between 2.65%-50.40%) in 10000 µg/mL which was at the highest concentration in Vero cells. 50% effective concentrations (EC_{50}) of the extracts which were determined having percentage of protection against HSV-1 at concentrations lower than 10000 µg/mL were calculated using GraphPad Prism Version 5.03 statistics program with non-linear regression analysis. These extracts were determined to have EC_{50} values ranging between 9710-70600 µg/mL and selectivity index (SI) are ranging between 0.14-1.03. On the basis of these results we believe that it would be worthwhile expanding these studies to include additional species of Turkish plants.

Keywords: *Ribes uva-crispa*, *Ribes multiflorum*, extracts, anti-HSV-1 activity

This research were financed by Selcuk University Scientific Research Project Council (BAP-14401088

POSTER PRESENTATION - 103

THE VOLATILE COMPOUNDS AND ANTIOXIDANT PROPERTIES OF DIFFERENT PARTS OF KALDIRAYAK PLANTS (*Trachystemon orientalis* (L.) G. Don)

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Objective / Purpose: Kaldirayak plants (*Trachystemon orientalis* (L.) G. Don) is an edible plant which has flowering branches, leaves, young stems in different cities of Black Sea Region in Turkey. In this study, the volatile compounds and antioxidant activities were determined in stem, flower and leaf parts of kaldirayak plants.

Material and Methods: The plants were collected from in Ordu (Turkey). Total phenolics was determined by Folin-Ciocalteu method. Antioxidant activity was studied by two methods: The ferric reducing/antioxidant power (FRAP) and DPPH (1,1-diphenyl-2-picrylhydrazyl) reducing power. Volatile compounds were analyzed by Headspace/Gas Chromatography/Mass Spectrometry (HS/GC/MS). The statistical evaluation was done using analysis of variance (one way ANOVA) followed by Duncan's multiple range test.

Results: Total phenolic, FRAP and DPPH (as EC50) were found as 2048.08±769.13 mg/kg, 3472.15±1555.89 µmol/g and 4.63±2.03 mg/ml in leaf, 761.91±296.33 mg/kg, 799.61±597.61 µmol/g and 15.68±11.32 mg/ml in stem, 2113.72±854.88 mg/kg, 2677.75±1358.30 µmol/g and 0.69±0.24 mg/ml in flower, respectively. The major aromatic components were dimethyl sulfide (28.31%), 3-methyl-butanal (15.46%), 2-methyl-propanal (14.28%) for the leaf parts, oxo-acetic acid (18.22%) for the stem parts, ethyl alcohol (24.59%), dimethyl sulfide (15.12%), oxo-acetic acid (14.80%) for the flower part.

Conclusion / Discussion: The flower part had higher total phenolics and antioxidant activity than the other parts. There were no statistically differences in phenolic contents and FRAP values for the leaf and flower, but the values of the stem were statistically different from them ($P<0.05$). In every parts, the volatile compounds were oxo-acetic acid, dimethyl sulfide, 2-methyl-propanal and 3-methyl-butanal.

Keywords: *Trachystemon orientalis,* kaldirayak, antioxidant activity, volatile compounds

POSTER PRESENTATION - 104

ANTIOXIDANT ACTIVITIES AND FATTY ACID PROFILE OF THE PETROLEUM ETHER EXTRACTS FROM DIFFERENT PARTS OF *IN VIVO* AND *IN VITRO* GROWN *PICTACIA LENTISCUS* L.

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Purpose: The aim of this study was to determine antioxidant activities and the fatty acid profile of the petroleum ether extracts from different parts of in vivo and in vitro grown P. lentiscus L.

Material and Methods: Fresh leaf and stem samples of female and male P. lentiscus L trees collected from trees grown in the vicinity of Çeşme county. The seeds of lentisk germinated in MS medium supplemented with 1 mg/l IBA for in vitro samples. β-Carotene-linoleic acid test system, DPPH free radical scavenging activity and ABTS cation radical decolorisation assays were carried out to determine the antioxidant activity.

Results: The fatty acid composition of the female genotype samples were found to be similar in terms of quality and quantity and their main components were palmitic and oleic acids. Likewise, the main components of the male genotype samples were palmitic and oleic acids. Especially, stem and root extracts of male genotype samples had high lignoceric acid whereas lignoceric acid was not observed in leaf extract. The most significant difference between male and female genotypes was lignoceric acid content. While the seed extracts showed much similarity among themselves, they were quite different from the other parts quantitatively and qualitatively. Similar results were observed in the stems, seeds and leaves of in-vitro grown specimens.

Conclusion: As a results of the antioxidant studies, all of the samples showed good lipid peroxidation activity and showed low and moderate DPPH and ABTS radical capture activity.
Acknowledgement: This research has been supported by a grant from TUBITAK- The Scientific and Technological Research Council of Turkey (Project No:**114Z842**)

Keywords: *Pictacia lentiscus* L., antioxidant activities, fatty acid, in vitro

POSTER PRESENTATION - 105

HERBAL CHEWING TABLET PREFORMULATION STUDIES USING A MEDITERRANEAN PLANT *CERATONIA SILIQUA* FOR WEIGHT CONTROL AND DIABETIC DISORDERS

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Objective / Purpose: A typical mediterranean plant "carob" (*Cerotonia siliqua*) grows in Norhern Cyprus and is traditionally used as laxative and expectorant. We aimed to develop a pharmaceutical product for weight control and diabetic disorders, using carob fruits powder with the combination of cinnamon.

Material and Methods: The characteristics of the produced chewing tablets (weight deviation, diameter elevation controls, hardness, dispersion, friability tests, wettability etc.) were determined and the patient compliance was selected [1]. The fingerprint chromatograms of the selected tablet and also the raw materials of cinnamon and carob were determined by using HPTLC analysis [2].

Results: According to the HPTLC fingerprint chromatograms of the patient compliance tablet samples and the raw materials cinnamon extract are similar. The major compounds are cinnamylaldehyde and caryophyllene. HPTLC analysis of Carob fruit extract was investigated for the first time, and the suitable mobile phase was determined. This study has been completed to determine the standardization of HPTLC analysis method for tablets which are determined to be the best patient compliance with preformulation studies of herbal chewing tablets which can be used as support for weight control and diabetes problems.

Conclusion / Discussion: Prior to the trial of tablets on humans, the fingerprint chromatograms, that are absolutely necessary for herbal pharmaceutical products, need to be determined by a HPTLC method that has been specified. To complete the project, approval of the ethics committee clinical applications using developed chewing tablets will be realized and the results will be evaluated.

Keywords: Chewing tablet, weight control, diabetes, carob, cinnamon, HPTLC.

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POSTER PRESENTATION - 106

USE OF *LAMIACAE* FAMILY PRODUCTS IN AQUACULTURE INDUSTRY

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Feeding has a key role for sustainability in aquaculture industry. Feed quality and feeding strategy are vital in fish farming. The oxidative stability of the feed is very important, not only in terms of the growth and health of the fish, but also with regard to their nutritional quality. Dietary antioxidants would seem to serve a function which is protecting the fat itself in the feed and later through some of active compounds on the fish flesh. The synthetic antioxidants like butylhydroxytoluene, butylhydroxyanisole and ethoxyquin are used to prevent undesirable effects in the feed. These compounds have a strong antioxidant activity. However, it has been proven that they are transferred to the muscle in worrying levels and have adverse health effects. Consumers demand using of natural additives instead of synthetic materials as alternative preservatives in foods because the safety of synthetic additives has been questioned consistently. Aromatic/medicinal plants and oils have been used for the care and management of fish due to their beneficial properties for health.

Lamiaceae or Labiatae is a family of flowering plants commonly known as the mint or deadnettle family. The family has a cosmopolitan distribution. The enlarged Lamiaceae contains approximately 7000 species. Many of the plants are aromatic in all parts and include widely used culinary herbs, such as basil, mint, rosemary, sage, oregano and thyme. The effects of usage of Lamiacea members in the preservation of fish have been widely studied by many authors. For example; Hernandez et. al. (2016) [1] tried thyme essential oil in sea bream feeds; Sönmez et al. (2015) [2] used mint, thyme and sage essential oils in rainbow trout feeds. Hernandez et al. (2016) [1] determined no negative effects of thyme essential oil on growth parameters of fish. Sönmez et al. (2015) [2] specified that FCR and SGR were negatively affected by mint essential oil. However, sage and thyme essential oils affected these parameters positively.

In the light of these information, the aim of this study to present the effects of lamiacae family products on aquaculture parameters of fish.

Keywords: Fish, *Lamiacae*, Essential oil, Extract, Feed, Aquaculture.

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POSTER PRESENTATION - 107

DETERMINATION OF NATURAL MEDICAL MACROFUNGI IN YENICE (KARABÜK) DISTRICT FROM TURKEY

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Objective / Purpose: With this study we aimed identify medicinal fungi growing in nature around Yenice(Karabük) district from Turkey.

Material and Methods: After the rains in spring and autumn, macrofungi samples were collected and dried in the laboratory. The diagnoses were made with the help of diagnostic books and literature.

Results: 17 species belonging to the 12 genera were identified. The medical properties of the fungi were given together with their identifications too.

Conclusion / Discussion: Medicinal mushrooms are specific species of wild edible mushrooms that are used for their unique and extraordinary health increasing compounds. These mushrooms are supplementary nutrients for the immune system and ensure a wide range of biological, biochemical and pharmacological activities. Having polysaccharides, like beta-glucans, as well as various other myco-nutrients and antioxidants, including triterpenoids, glycoproteins, flavonoids and ergosterols, they are exceptionally helpful for building a natural resistant to disease, viruses and environmental toxins. For example, some of the popular ones, such as *Ganoderma lucidium* (Reishi) and *Cordyceps sinensis* (Cordyceps), are renowned as major emphatic mushrooms and have been prepared in traditional Chinese tea formulations for centuries. Macrofungi, researched their extractions and benefits by scientists before, were identified again with this study from Turkey.

Keywords: Macrofungi, Medicinal, Diagnoses, Yenice, Karabük, Turkey.

POSTER PRESENTATION - 108

INVESTIGTION OF ANTIMICROBIAL EFFECT ON HERBAL GARGLE FORMULATION FROM NORTHERN CYPRUS

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Objective / Purpose: Ethnobotanical studies in Northern Cyprus; the medicinal teas of *Thymus capitatus* have been used traditionally to treat mild upper respiratory infections and mouth ulcers. The aim of this study to prepare a gargle formulation using volatile oil of *Thymus capitatus*[1].

Material and Methods: The volatile oil of *Thymus capitatus* collected from Yedidalga village in Northern Cyprus is obtained by hydro distillation and constituents are determined by GC-MS. *In- vitro* antimicrobial activities of this oil is determined using disc diffusion method. The gargles are prepared using different volatile oil concentrations by the solution preparation techniques; finished product and microbiological analysis are checked [2].

Results: Thymol content of *Thymus capitatus* essential oil is higher than other Mediterranean countries' samples (51.9%) [1]. Due to high thymol content, high antimicrobial activity is observed. According to the finished product analyzes of gargles, the formulation with the most appropriate concentration is determined. Stability studies of the selected formulation are still in progress.

Conclusion / Discussion: Selected formulation is compared with the same effective preparation in the market. According to this study, a new OTC herbal gargle product will be provided to present for the patient's health care.

Keywords: *Thymus capitatus*, thymol, gargle.

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POSTER PRESENTATION - 109

HEAVY METAL CONTENTS OF MELISSA WHICH IS SOLD IN HERBALISTS

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Objective / Purpose: The purpose of this study is to determine the heavy metal content that is important in human health and the plants sold as Melisa in herbalists.

Material and Methods: Plant samples were purchased from 14 different herbalist and specimens were identified by Flora of Turkey. Heavy metal contents (Fe, Co, Mn, Zn, Al, Cd) and some nutrients (Na, K, Ca, Mg) were identified by the ICP-OES method.

Results: As a result of the diagnoses, 4 of 14 samples were *Melissa officinalis* and others were identified as *Lippia citriodora*. According to ICP analysis, Zn, Cd and Co were not found in any sample. Other elements were found to be Al 200.93-695.29 mg/kg, Fe 4.51-339.37 mg/kg, Mn 1.61-73.59 mg/kg, Mg 3611.17-10001.73 mg/kg, Ca 9727.78-25435.9 mg/kg, K 10484.44-21975.71 mg/kg, Na 176.78-524.97 mg/kg, respectively.

Conclusion / Discussion: Fe, Ca and Mg has been found above the level of toxic effects in terms of human health, while other elements were within the optimum limit.

Keywords: Melissa, ICP, Heavy metal

POSTER PRESENTATION - 110

IN VITRO AND *IN VIVO* ANTIFUNGAL ACTIVITY OF *SATUREJA CUNEIFOLIA* TEN. ESSENTIAL OIL ON *Saprolegnia parasitica* STRAINS ISOLATED FROM RAINBOW TROUT (*Oncorhynchus mykiss*, WALBAUM) EGGS

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Objective / Purpose: In the present study, the chemical composition and in vitro and in vivo antifungal properties against *Saprolegnia parasitica* of the essential oils of thyme (*Satureja cuneifolia*) from Mediterranean region of Turkey were evaluated.

Material and Methods: The composition of oils was analysed using GC/MS. Antifungal effects of *S. cuneifolia* essential oil against *S. parasitica* strains were detected by disc diffusion and tube dilution assays. Following in vitro assays, effective doses of *S. cuneifolia* for disease control in rainbow trout eggs experimentally infected with *S. parasitica* were investigated. For this aim, infected eggs were treated with the essential oil (0, 5, 10, 20 and 50 ppm) during incubation period after fertilization. Formalin (5 ml l^{-1}) was used as positive control. Hatching rate of eggs at the end of incubation period were calculated.

Results: The major constituents of oil of *S. cuneifolia* were cavracrol (46.84%) and cymene (16.90%). The antifungal effect of *S. cuneifolia* was determined to be stronger against *S. parasitica* E1 isolate compared with *S. parasitica* A1 isolate. The highest hatching rates were recorded in *S. parasitica* E1 strain at 5 and 10 ppm concentrations of *S. cuneifolia* and in *S. parasitica* A1 strain at 10 and 20 ppm ($P < 0.05$).

Conclusion / Discussion: Our study suggests that natural products derived from *S. cuneilifolia* have the potential to be used as control of saprolegniasis in rainbow trout eggs in aquaculture.

Keywords: *Satureja cuneifolia*, essential oil, antifungal activity, *Saprolegnia parasitica*, rainbow trout eggs

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POSTER PRESENTATION - 111

INDUCTION OF GROWTH, WATER STATUS AND OSMOTIC ADJUSTMENT IN WHEAT EXPOSED TO COBALT EXCESS BY BIOCHAR, A SOIL-APPLIED CARBON SEQUESTERING AGENT

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Objective / Purpose: Biochar is a co-product of a thermochemical conversion of biomass that is recognized to be a beneficial soil amendment, which when incorporated into the soil increases soil water retention. The effect of 150 and 300 □M $CoCl_2$ on growth, relative growth rate (RGR), relative water content (RWC), osmotic potential (Ψ_Π), the maximal efficiency of PSII photochemistry (F_v/F_m), proline (Pro) content and thiobarbituric acid reactive substances (TBARS) evaluated in wheat (*Triticum aestivum* L.) growing in media with and without an amendment of biochar application (10% and 20%, mass fraction) for 7 days.

Results: After exposure to 300 □M, the significant reduction in RWC began after the first day of stress in wheat leaves. RGR, Ψ_Π and F_v/F_m decreased after 150 and 300 □M cobalt during the experimental period. Cobalt excess caused an increase in Pro as from the first day of stress. On the other hand, the addition of biochar to soil could change the solubility and mobility of cobalt and so the uptake to wheat of cobalt was reduced.

Conclusion: Under the increased rate of biochar application, the oxidative stress induced by cobalt treatments was reduced, providing the decrease in RGR, RWC, TBARS content and increase in F_v/F_m, Pro and Ψ_Π. It is concluded that addition of biochar had significant positive effects on oxidative damage, water status and photosynthetic activity in wheat leaves exposed to cobalt.

Keywords: Biochar, Cobalt treatment, Lipid peroxidation, Osmotic adjustment, *Triticum aestivum* L.

POSTER PRESENTATION - 112

ANTIOXIDANT ACTIVITIES OF *Saturaje hortensis* L. ESSENTIAL OILS DURING FLOWERING PERIOD

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Objective: *Satureja hortensis* L. is an aromatic and medicinal plant belonging to the family Lamiaceae used in the Turkey folk medicine as muscle and bone pain reliever. A number of studies have suggested that the activity of *Satureja hortensis* may relate to the antioxidant properties of its oil constituents. Objective of this study was to determine the antioxidant activities of *Saturaje hortensis* L. essential oils during flowering period.

Material and Methods: The plantation was established with natural cutting of *Saturaje hortensis* L. Three cutting stage (pre, full, post flowering) was done and dried by oven-drying at 35 °C. The analysis of essential oil in the leaves and flowers of *Saturaje hortensis* L. were carried out using Clevenger aparatues for three hours. Total phenolics and antioxidant activity of essential oils were measured by the Folin-Ciocalteu and DPPH free radical scavenging assays, respectively.

Results: The total phenolic content varied from 746±4 to 1087±44 µM and the highest value was found in post flowering stage. IC50 values in the DPPH assay ranged from 6.65±0,38 to 16.10±0,99 µM catechin equivalent and the highest activity was observed in full flowering stage.

Conclusion: The essential oil of full flowering period for *Saturaje hortensis* L. compared to their other essential oils showed the highest phenolic concentration and antioxidant activity. It is concluded that *Saturaje hortensis* L. is a fine natural antioxidant source because it has high phenolic concentration and antioxidant activity.

Keywords: *Saturaje hortensis* L., essential oil, antioxidant activity

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POSTER PRESENTATION - 113

EFFECTS OF SOME PLANT ESSENTIAL OILS AGAINST FUNGI ON WHEAT SEEDS

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Objective / Purpose: Wheat is one of the most important crops in terms of cultivation area, production and consumption. Diseases, especially caused by seed borne fungi, are among the factors decreasing yield and quality. Common bunt is one of the most important seed borne diseases of wheat worldwide. Contamination of wheat seeds by bunt spores cause significant loss of yield and seed quality. The main objective of the current study is to determine the effects of clove, ginger, mint, oregano and thyme essential oils on the fungal load of wheat seeds. In addition, effects of the essential oils on the germination rates of bunt spores was investigated.

Material and Methods: Blotter method was used to determine the effects of different concentrations (0.05 – 10%) of the oils on fungal load of wheat seeds. After incubation at 22°C for 7 days, seeds were investigated under stereomicroscope and fungi growing on the seeds were recorded. Germination rates of bunt spores was also determined after incubation with different concentrations of oils.

Results: Highest doses of clove, mint and oregano oils totally inhibited the fungal growth on wheat seeds, but they also inhibited the germination of seeds. Lower doses failed to inhibit saprobic fungi on seeds, however they decreased or totally inhibited the germination of bunt spores.

Conclusion / Discussion: Plant essential oils can be used against bunt disease of wheat as an alternative to fungicides.

Keywords: *Triticum aestivum*, *Tilletia* spp., control

References:

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POSTER PRESENTATION - 114

DETERMINATION OF BIOLOGICAL ACTIVITY OF *GENTIANA OLIVIERI*

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Objective / Purpose: *Gentiana olivieri* is the herbaceous plant which is part in Gentianaceae family. It grows in a wide area in the world. There are many bioactive compounds in the content of *G. olivieri*, known as "Afat" in Turkey and it has been used for centuries among Turkish people in particular.
The aim of this study was to determine the antitumoral activity of the *G. olivieri* by observing the effects of leaf and flower parts on lung cancer cell lines.

Material and Methods: Cytotoxic activity, apoptotic activity, immunohistochemical activity studies were performed on lung cancer cell lines by providing methanol and hexane extracts of *G. olivieri* leaf and flower samples. In addition, the DNA protective activity study was carried out with pBR 322 plasmid DNA.

Results: According to our study Gentiana olivieri was observed to be significantly cytotoxic and apoptotic activity of the particular leaf extracts on lung cancer, in addition both leaf and flower extracts were found to have DNA-protecting activity.

Conclusion / Discussion: Our data supports the researches done before. In this respect, it presents an important alternative to the academic mosque in the ongoing process of herbal treatment. We believe that *Gentiana olivieri* plant will provide important contributions to science world by carrying out more detailed studies and observing the response of metabolism.

Keywords: *Gentiana olivieri*, Lung cancer, H1299, A549, Apoptotic activity

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POSTER PRESENTATION - 115

EFFECT OF GERMINATION ON THE ANTIOXIDANT ACTIVITIES OF SOME CEREALS

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Objective / Purpose: In recent years, seed sprouts have been obtained great interest as functional foods. The aim of our study was to compare the antioxidant potential of seeds, sprouts and grass of some cereals.

Material and Methods: In this study, four different cereals including barley (*Hordeum vulgare* L.), oat (*Avena sativa* L.), rye (*Secale cereale* L.) and wheat (*Triticum aestivum* L.) were used. The materials were divided into 3 groups (1st group; seeds directly, 2nd group and 3rd group seeds sprouted at room temperature for 3 or 4 days and 9 or 10 days, respectively). The samples were extracted with methanol 80%, and analyzed for total phenolics and antioxidant activity including FRAP (ferric reducing/antioxidant power), ABTS (2,2'-azinobis-(3-ethylbenzothiazoline-6-sulphonic acid)) and DPPH (1,1-diphenyl-2-picrylhydrazyl) methods. The results were statistically analysed by Pearson's correlation, one way ANOVA and Duncan's multiple range test.

Results: It was found that the highest total phenolic (16434.98±2784.75 mg GAE/kg in DW), FRAP (230.42± 3.02 mmol Fe^{2+}/g in DW), DPPH (655.02±10.97 mmol TE/g in DW) values were in rye grass and ABTS (1726.42± 230.70 mmol TE/g in DW) values in barley grass, while the lowest total phenolics (516.97±93.90 mg GAE/kg in DW) in oat seed, and FRAP (7.66±0.63 mmol Fe^{2+}/g in DW), ABTS (12.82±0.27 mmol TE/g in DW) and DPPH (79.03±4.41 mmol TE/g in DW) in wheat seed.

Conclusion / Discussion: There was a significant correlation between the total phenolics and the antioxidant activity. Comparing with seeds, the results show that the antioxidant properties of the cereals can be improved by germination.

Keywords: Sprouting, cereal, antioxidant, grass

POSTER PRESENTATION - 116

ASSESMENT OF CHOLINESTERASE, α-AMYLASE, α-GLUCOSIDASE INHIBITION AND ANTIOXIDANT ACTIVITY OF *Sedum acre, Silene vulgaris* and *Achillea nobilis* subsp. *neilreichii*

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Objective/Purpose: Diabetes is chronic metabolic disorder which characterized by hyperglycaemia resulting from defects in insulin mechanism. The high glucose level of diabetic patients is the most important factor for the increased formation of free radicals such as superoxide which causes oxidative damage. It is considered that insulin signalling dysregulation is important contributing factors in Alzheimer's disease pathogenesis. The aim of the study is to determine antidiabetic, antioxidant and anti-alzheimer effect of *Sedum acre*, *Silene vulgaris*, *Achillea nobilis* subsp. *neilreichii*.

Material and Methods: 80% Ethanol extracts were prepared. α-amylase and α-glucosidase enzyme inhibition methods were used to examine antidiabetic activity. Acetylcholinesterase (AChE) and Butyrylcholinesterase (BChE) inhibition methods were used to determine antialzheimer activity. DPPH and DMPD radical scavenging, metal-chelation, ferric-reducing antioxidant power (FRAP) assays were utilized for screening of antioxidant activity. Total flavonoid and phenolic content of the extracts were calculated.

Results: Except *S. acre* extract (67.88±2.30%), all of the extracts were inactive against AChE. *S. acre* extract (96.29±0.98%) displayed the strongest BChE inhibitory activity. Among the tested extracts, *S. acre* (99.02±0.38%) and *A. nobilis* ssp. *neilreichii* extracts (54.20±2.68%) exhibited significant inhibition against α-glucosidase. All plant extracts displayed lower inhibition than 50% α-amylase inhibition. *S. acre* extract (1.2140±0.011) and *A. nobilis* ssp. *neilreichii* extract (1.2128±0.007) showed high FRAP activity.

Conclusion/Discussion: Our findings indicated that *S. acre* contains potential compounds having selective BChE and α-glucosidase inhibitory activity and our work is in progress to identify their active components.

Keywords: Alzheimer, Antioxidant, Diabetes, *Silene vulgaris*, *Achillea nobilis* subsp. *neilreichii*, *Sedum acre*

POSTER PRESENTATION - 117

MEDICINAL AND AROMATIC PLANTS IN URBAN PUBLIC SPACES: CHALLENGES AND CONTRIBUTIONS

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Some issues about medicinal and aromatic plant (MAP) which are used because of their aesthetics and functional characteristics in urban areas especially in public spaces should be considered carefully by municipalities and designers. These issues are included such as MAP's supplying conditions and pollution issue because of urban conditions, human health, public behaviors and perceptions, local authority's approaches. This study intends to clarify the possible challenges of using of medicinal and aromatic plants as design elements in the urban public spaces and it also explains the improving ways of positive effects of these plants in urban areas.

This study is focused on the answer of this main question: What are the politics and approaches of using MAP in public spaces? For this reason, MAP production opportunities, the politics and approaches for municipalities, the community attitudes and behaviors are analyzed by face to face interview with related connecting persons and observed public behaviors in urban parks.

As a result, MAP have some advantages from the context of landscape design such as sense of place, identity, the design of places which have strong aesthetical, functional, high quality of visual and peaceful places. On the other hand, the possibilities of negative effects on human health should be considered by local authorities, public and designers in the results of uncontrolled consuming of MAP by oral ways from the city dwellers in public spaces.

The use of MAP based on certain policies in public spaces is important for both ensuring more effective functions of these plants and gaining identity for city by using of native plants.

Keywords: Medicinal and aromatic plants, sense of place, urban landscape, identity.

POSTER PRESENTATION - 118

PRODUCTION PROBLEMS AND USE OF EXPORTED *DRACUNCULUS VULGARIS* SCHOTT. IN TURKEY

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Dracunculus vulgaris Schott. Iscommonly called the dragon arum, a tuberous perennial plant belonging to the Araceae family. *Dracunculus* genus has thermogenic species and also used for ornamental and medicinal in the world. The genus has a one taxon in Turkey and used for folk medicine. The species has been irregularly collected from their natural habitat and exported in Turkey for a long time. The species is a typical spring bloomer grown in the west coasts of Turkey. The species blooms in June, depending on latitude, precipitation and sun exposure. It has interesting flowers and contain volatile organic compounds. It contains some secondary metabolites (fatty acids, alkaloids, terpenoids etc.) and protein (lectin), the tubers and seeds of the species are used in treatment of in rheumatism and hemorrhoids respectively in naturally growing areas. However, advanced agronomic techniques are not used in growing areas of Turkey. There is no registered variety with certain agricultural and technological features in Turkey. Therefore high tuber yield and standard quality cannot be achieved, also there are frequent problems in export and production of the species. Therefore, development of generative and vegetative growing techniques by testing different agronomic applications are very important for this valuable species.

Keywords: *Dracunculus vulgaris*, secondary metabolites, production problems, Turkey

POSTER PRESENTATION - 119

COULD PESITICIDE USE BE DECREASED AFTER APPLICATION AT PUPA STAGE OF *ROSE TORTRIX ARCHIPS ROSANA* (LINNAEUS, 1758) (*LEPIDOPTERA: TORTRICIDAE*)

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Objective / Purpose: In many countries, the rates of pesticides use in agricultural areas are continuing to rise. It is important to avoid or minimize the exposure of living organisms by use of pesticides. *Archips rosana* (European Leaf Roller) pest is univoltine and its puapation takes place within the rolled and webbed Rosaceae leaves. Isoldesis is a synthetic pyrethroid insecticide used against *A. rosana* in agriculture. It is aimed to investigate morality ratio after exposed with diluted concentrations of recommended dose of Isoldesis on pupae of *A. rosana*.

Material and Methods: Isoldesis 2,5 EC active ingredient Deltamethrin was used as test substance. The concentrations were selected according to active ingredient Deltamethrin. Recommended dose (r.d) (7,5 µm) in agricultural use and half of r.d and 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}, fold diluted concentrations of r.d. were exposed in laboratory conditions on pupae of *A. rosana*. After single dose application mortality ratios were obtained after 7, 12, 15 days.

Results: Pupae of *A. rosana* reached 100% mortality even at 10 times diluted concentration of r.d. after 7th day. Mortality ratio was increased depending on the time. 100% mortality was observed after 100 times diluted (10^{-2}) exposure at 12th day and 1000 times diluted (10^{-3}) isoldedis exposure at 15th day. Even at 10^{-4} fold pesticide exposure induced 90% at 12th and 15th day.

Conclusion / Discussion: It is important to study the concentrations that are effective on pests. Therefore, this approach may be helpful for integrated pest management programmes for to save environment.

Keywords: isoldesis, *Archips rosana*, pest, mortality, rosaceae

POSTER PRESENTATION - 120

THE ESSENTIAL OIL COMPOSITIONS OF *ORIGANUM MAJORANA*L. CULTIVATED AND COLLECTED FROM MERSİN-TURKEY

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Objective / Purpose: The aim of the study to compare of differences between the essential oil (EO) compositions of the dried and fresh aerial parts of *Origanum majorana* cultivated in the research field (Konya) and collected from Mersin was investigated.

Material and Methods: Aerial parts (dried and fresh branch, leaf and herb) of the *Origanum majorana* were subjected to hydrodistillation for 3 h using Clevenger type apparatus to produce EO. The essential oils (EOs) were stored at -20 ^{0}C until analysed. The compositions of *Origanum majorana* L. (OME), EOs were identificated by The GC-MS analyses.

Results: Results revelaed that there were significant ($p<0.01$) differences between the the aerial parts of dried and fresh *O. majorana* (collected and cultivated) with respect to their EO compositions. While, the oil yields of the the collected marjoram was determined to be 2,5 ml both in dried and fresh aerial parts, the yields of the cultivated plants for fresh and dried parts were 3.6 ml and 5 ml, respectively. It can be easily seen that cultivation had positive effects on the EO yield. Drying of the material also increased the oil yield in the cultivated marjoram.

Conclusion / Discussion: The cultivation of marjoram (*O. majorana*) will provide more profit (bring to profit) than collected plants.

Keywords: Oregano, *Origanum majorana*, essential oil composition, carvacrol, linalool, oil yield.

POSTER PRESENTATION - 121

APPLICATION OF BIOAPIGYN® HERBAL OINTMENT FOR THE TREATMENT OF LOWER GENITAL TRACT INFECTIONS

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Objective / Purpose: The purpose of this work was development and testing of new herbal ointment for the treatment of lower genital tract infections in females.

Material and Methods: 80 female patients (age range from 19 to 73 years) with positive swabs to at least one microorganism (*U. urealyticum, M. hominis, E. coli and Candida* sp.) were randomly divided into three groups of similar age, life style and health status. First group was treated 12 days (twice a day) with antibiotic and 2 g of Bioapigyn® vaginal ointment (once a day), second group with 2 g of ointment only and third group with antibiotic only. The ointment was composed of the following ingredients: *Calendula officinalis, Plantago major, Matricaria chamomilla, Hypericum perforatum, Symphytum officinale, Lavandula officinalis, Achillea millefolium, Thymus serpyllum, Salvia officinalis, Mentha piperita, Alchemilla vulgaris, Olea europaea; essential oils: Melaleuca alternifolia, Timus vulgaris* ct. thymol, *Cinnamomum camphora* ct. cineol, *Cympobogon martini, Origanum compactum and Eugenia caryophyllata; Avena sativa, Cera flava;* honney; glycerol.

Results: Following the treatment with antibiotic and herbal ointment all the swabs were negative to *U. urealyticum*, *M. hominis*, and *Candida* sp. as well as 75% swabs to *E. coli*. The treatment with the ointment only resulted with 100% negative swabs *M. hominis*, and *Candida* sp. while the treatment efficiency of *U. urealyticum* and *E. coli* was 87% and 67%, respectively. The treatment with the antibiotic only resulted in 100% negative swabs *M. hominis*, 62% to *U. urealyticum*, 33% to *E. coli*. In the first and second group none of the patients developed antibiotic-asociated yeast infection while in the antibiotic only treated group 80% of them were positive to *Candida* sp. There was no significant diference in the treatment efficiency between first and second group. On the contrary, a significant diference was obtained between the first and third group for *U. urealyticum*, *E. coli* and *Candida sp.* as well as between second and third group in eradication of *Candida sp.* and *U. urealyticum.*

Conclusion / Discussion: Due to the additive and synergistic effects of bioactive compounds from oil extracts and essential oils of the selected medicinal plants

Bioapigyn® vaginal ointment has significant antimicrobial potential which is even better compared to antibiotic. It is highly effective in the prevention of antibiotic-associated yeast infection which was linked with significant prebiotic and probiotic activity of honey and low pH of the ointment (4.43). Furthermore, it showed additive effect with antibiotic which resulted in significantly better treatment efficiency for 3 of 4 tested microorganism.

Keywords: Bioapigyn® vaginal ointment, medicinal plants, genital infections

POSTER PRESENTATION - 122

AGROMORPHOLOGICAL CHARACTERIZATION OF CERTAIN MAPs AND THEIR EX-SITU PRESERVATION

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Objective/Purpose: The main purpose of establishing botanical gardens and accessories is to maintain the living plants of collections as well as conserve them for further scientific researches. The aim of establishing this MAP (Medicinal and aromatic plants) garden is to characterize the main MAP species agromorphologically in accordance with descriptor lists before ex situ preservation.

Material and Methods: 60 perennial and 14 annual MAP germplasm were phenologically characterized during the years of 2014 and 2015, in Ankara ecological conditions. Following main observations were recorded in sucsessive two years.

- Germination date (for annuals)
- Plant height (cm)
- The date of first flower formation
- The date of first and 50% flowering stage
- The date of last flowering stage
- Flowering period (day)
- The first seed binding date
- The last seed binding date
- Seeding period (day)
- The first and last harvest date

Results: Plant height was ranged 21.33 cm to 3.21 m, while the highest species was *Phytolacca americana* by 3.21 m, the shortest plant height was recorded at *Ecballium elaterium* as 21,33 cm. The first flowering date has changed from 10 April to 27 July. *Isatis* spp. were the early flowering species by April, 10th while *Salvia azurea* the latest by July 27th.The time between first flowering and 50 % flowering ranged from 2 to 45 days. *Satureja spicigera* was shown the longest flowering period by 45 days while the shortest period was recorded at *Echinaceae pallida* and *Echinaceae purpurea*. The period between the first seed binding and 50% seed binding changed from 3 to 38 days. The longest seed binding period belongs to *Thymus cilicicus* and *Origanum vulgare* with 38 days.

Conclusion/Discussion: Working by characterized material would help the MAP breeders to know their material agromorphologically and this is expected to helpful

in MAP breeding for shorten the brreding period and catching the quality material, as well.

Keywords: MAP collections and accessories, phenologic and agromorphologic observations, create herbarium, ex-situ conservation.

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POSTER PRESENTATION - 123

CHEMICAL COMPOSITION OF THE ESSENTIAL OIL OF LEAVES MYRTLE (*MYRTUS COMMUNIS* L.) FROM MERSIN

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Essential oils of plants and their other products from secondary metabolism have had a great usage in folk medicine, food flavoring, fragrance, and pharmaceutical industries. Some biological activities of essential oils have been known for long time[1].

Myrtle (*Myrtus communis* L.) is a medicinal plant endemic to the Mediterranean area and it has been used by locals for its culi-nary and medicinal properties since antiquity. Its leaves are very fragrant, which is the reason for the extensive use of the plant in the perfumery and cosmetic industries. It is traditionally used as antiseptic, disinfectant, and hypoglycemic agent. Different parts of the plant find various uses in the food industry, such as flavoring for meat and sauces[2].

In our study, the essential oils of leaves of Myrtle (*Myrtus communis* L.) collected from Mersin in the October 2015 were obtained using a Clevenger-type apparatus. The chemical composition of the essential oils was analyzed by GC-FID and GC-MS, simultanously.

Leaf oil was composed of 28 compounds representing 95.4% of the total composition of the oil. a-pinene was the major constituent of leaf oil at a concentration of (45.9%), followed by 1,8-cineole (24.2%).

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POSTER PRESENTATION - 124

DETERMINATION OF YIELD CHARACTERISTICS OF *M. LONGIFOLIA* PLANT GROWN IN ORDU ECOLOGICAL CONDITIONS

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Objective / Purpose: This study that intends to determine the yield criteria for *M. longifolia* plant grown in Ordu ecological conditions.

Material and Methods: The *M. longifolia* that is used as a material has been picked from the city of Ordu, Altınordu district, Cumhuriyet quarter and testing has been established according to "Complete Aleatoric Blocks Testing Plan" in 3 repetitions.

Results: According to the research studies; in *M. longifolia* plant from which four forms are taken in cultivation period, the effect of the forms on characters has been found highly important. The highest plant height (62,800 cm), green herba fertility (379,867 kg/da), drug herba fertility (110,567 kg/da), green leaf fertility (221,467 kg/da) and drug leaf fertility (67,500 kg/da) have been obtained in the first form. The lowest plant height was obtained in the fourth form (31,800 cm), in the third form, green herba (114,167 kg/da) and drug herba fertility (23,267 kg/da) in the second form, green leaf fertility (73,833 kg/da) and in the third form, drug herba fertility (16,133 kg/da) have been obtained.

Conclusion / Discussion: Telci *M. longifolia* (2001) which took two shapes in one year obtained the highest plant height (50,3 cm) in the first year, and the highest green herba fertility (1125,7 kg/da), drug herba fertility (276,9 kg/da), green leaf fertility (621,7 kg/da) and drug leaf fertility (146,7 kg/da) were obtained in the second form.

Keywords*:* *Mentha*, yield characteristics.

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POSTER PRESENTATION - 125

PHARMACOPOEIA ANALYSIS OF CITRUS AURANTIUM L. SSP. *AMARA* ENGL. AND IT'S FIXED OIL CONTENT

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Objective / Purpose: Our aim is to take attention to *Citrus aurantium* L. ssp. *amara* Engl. (Rutaceae), which grows widely along the Mediterranean and temperature regions that has very limited medical usage, mostly the peel is used to make jam and no commercial value in Turkey. The bitter orange fruits/peel growing in different regions were analysed in order to find out if they are suitable to the standards in Pharmacopeia. Essential oil from the peel, and fixed oil from the seeds were analyzed for its suitability to the European Pharmacopoeia and in order to figure out the oil quality to apply in medicinal and cosmeceutical usage.

Material and Methods: *C. aurantium* collected from different regions of Turkey, their parts and extracts were evaluated according to European Phamacopoeia 7.0. Essential and fix oil are obtained from fruit and seed. Seeds were crushed and fixed oil was obtained by cold squeezing. Essential oil obtained from the peel by cold pressing. Essential oil yield, index analysis of fixed oil and drog analysis were conducted in compliance with the procedures specified in the pharmacopoeia.

Results: Analysis and evaluation of the peel was found appropriate to pharmacopoeia. The study demonstrated that Aydın, Iskenderun and Mersin regions have been suitable to cultivate valuable product for the Pharmacopoie. Moreover, the fatty acid value has significant importance.

Conclusion / Discussion: Although this plant uses widely around the world, it has not widespread utilizing in Turkey.Thanks to this study, its benefits will be recognised and will be allowed to be consumed by Turkish people. Absolutely, phytochemical content must be taken into account before using.

Keywords: citrus, rutaceae, bitter orange, pharmacopoeia analysis, fixed oil

POSTER PRESENTATION - 126

ANTIBACTERIAL ACTIVITY OF THREE MEDICINAL PLANTS FROM GUMUSHANE

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Objective / Purpose: Determine the antimicrobial activity of various extracts of three medicinal plants which are *Equisetum arvense*, *Allium scorodoprasum* and *Alchemilla sp.* from Gumushane.

Material and Methods: Four solvents (ethanole, methanole, ethyl acetate and hexane) and aerial part of the plants were used for extraction. Totally twelve extracts were tested for antimicrobial activity by using Kirby- Bauer disk diffusion method. 6 Gram (+) microorganisms (*E. faecalis, S. epidermidis, S. aereus, E. faecium, MRSA, E. hirae*) and 6 Gram (–) microorganisms (*P. aeruginosa, E. coli, Y. enterocolitica, V. parahaemolyticus, S. typhimurium, K. pneumonie*) were used for activity.

Results: All extracts exhibited significant antimicrobial activity agains at least one test organisms. Especialy, ethanole and hexane extracts of *Equisetum arvense* showed significant inhibition activity to *E. faecalis* (14mm) and *P. aeruginosa* (14 mm), respectively.

Conclusion / Discussion: As a results, it has been found that three plants have significant antimicrobial activity to *Y. enterocolitica.* Besides, three plants extracts are more effective on Gram (+) bacteria. Consequently, these plants could be potential source of ne antimicrobial agents.

Keywords: medicinal plant, aerial parts, extract, Gram (+) bacteria, antibacterial effect

POSTER PRESENTATION - 127

ANTIBACTERIAL ACTIVITIES OF *MENTHA PIPERITA* L. EXTRACTS AGAINST BACTERIA ISOLATED FROM SOCCER PLAYER'S SHOES AND ITS ANTIOXIDANT ACTIVITIES

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Objective / Purpose: The bacteria most commonly attacks the feet. They have an easier entry into the sportsman's epidermis. Particularly *Staphylococcus aureus,* commonly determined on the skin or in the nose. The purpose of the study is to search the lack of knowledge about the antibacterial effects of *Mentha piperita* extracts against bacteria isolated from soccer player's shoes and its antioxidant effects.

Materials and Methods: The bacteria were isolated from soccer player's shoes from Balıkesir Spor soccer team after the competition. Additionally, *Mentha piperita* were collected from Mugla herbalists in Turkey. In antibacterial activity studies, the plant extracts were tested by disc diffusion assay (1). In addition, the different plants extracts were studied by ABTS decolorization assay (2).

Results: The highest antibacterial activities in bacteria were determined on isolate-BFT12 (21 mm) for *Mentha piperita*. The different extracts possessed antibacterial activity, and showed MIC effect at 3250 µg/mL. The highest antioxidant activity of *Mentha piperita* was determined from aqueous extract of plant by ABTS assay. This ratio is about 88%.

Conclusion / Discussion: Different extracts of *Mentha piperita* have antibacterial and antioxidant potential.

Keywords: Medicinal plant, Soccer player, bacteria, antibacterial activity, antioxidant activity

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POSTER PRESENTATION - 128

EFFECTS OF SOME ADSORBENTS ON PRE-PURIFICATION OF TAXAN OBTAINED FROM HAZELNUT NUT HUSK

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Objective: The cure for many cancer types have not been found yet in today's world, and the treatments for many cancer types are extremely expensive. The use of plants increase in cancer treatment, and therefore the isolation of many natural compounds is performed by using plants. The taxan compounds such as paclitaxel, baccatin III, Cephalomannine, 10-deacetylbaccatin which is shown as figure 1 are found in hazelnut nut husk in the Black Sea region of Turkey.

Material and Methods: The adsorbent effect on purification of some taxan compounds from hazelnut nut husk was studied using different adsorbent materials. For this purpose, extracts were obtained from samples of hazelnut nut husk, dried and ground in a 72-hour process in methanol. The resulting extract was concentrated to a stock solution. Each 1 ml sample taken from stock solution was separately treated with seven different adsorbent materials and then filtered and analysed with HPLC.

Results and Discussion: Both purity and recovery efficiency measurements were performed with HPLC in the stock solution before analysis and subsequent solution. Thus, the effects of extracts containing taxan compounds obtained from hazelnut nut husk on pre-purification processes before chromatographic were determined.

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POSTER PRESENTATION - 129

HOW ARE THE ENVIRONMENTAL AND POST-HARVEST PRACTICES INFLUENTIAL ON THE ESSENTIAL OIL CONTENT AND COMPOSITION IN THE MEDICINAL AND AROMATIC PLANTS?

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Objective / Purpose: In this study, it is aimed to determine how the important medicinal and aromatic plants tolerate biotic and abiotic stress factors and how the factors show variations in the essential oil composition

Material and Methods: The data with respect to the environment x medicinal plants interaction was collected using different databases and subsequently the effects of i) physiological variations concerned with plant itself, harvesting seasons, organ development etc., ii) environmental conditions in relation to the agro-ecological conditions, pollutions etc. iii) post-harvest conditions and practices on essential oil content and composition were monitored.

Results: Although it is certain that environmental stress factors have an adverse effect on plant growth and productivity, many scientific studies have shown that these factors have positive effects on the formation and composition of essential oils.

Conclusion / Discussion: As a result of human activities and natural phenomena, various changes occur in the natural environment, and the chemical composition of the air and soil varies and serious problems are encountered in the ecosystem living conditions. It is thought that these stress factors can be turned into an opportunity. It has become necessary to start working on the subject immediately in our country, which has an important potential for these plants, to reveal the positive effects of environmental factors on volatile oil formation.

Keywords: Environmental conditions, medicinal and aromatic plants, essential oil content and composition

POSTER PRESENTATION - 130

DRIED EXTRACTS AND ESSETIAL OILS OF SOME *PELARGONIUM SPECIES*: CHEMICAL AND BIOLOGICAL ASSESMENT

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Objective: To evaluate the beneficial properties of the most important groups of compounds present in the leaves of several *Pelargonium species*, the focus was on obtaining extracts which would ensure the isolation of both lipophilic compounds and hydrophilic compounds.

Material and Methods: The plant material was represented by mature leaves taken from *P. hispidum, P. grandiflorum, P. radens, P. peltatum* and *P. zonale*. Chemical assessment used UHPLC methods and the biological activity was established with DPPH and superoxide anion radical scavenging capacity tests. The essential oil separated by distillation with water vapours was investigated by GC-MS.

Results: The number of chemical compounds was higher in ethanol extracts. Comparing the five hydro-ethanolic extracts, it can be clearly seen that the corresponding samples obtained from the leaves of *P. zonale* (P5E) and *P. peltatum* (P4E) stand out; based on the used standards, these were found to have the most complex composition, with the largest number components identified. The *in vitro* evaluation of the antioxidant potential of these extracts varied with each sample, but a direct correlation to the total flavonoid content was noticed. The volatile fractions from the *Pelargonium* samples were different, the highest quantity of essential oil was found in *P. hispidum*. GC-MS of volatile oils in *Pelargonium*: *hispidum, grandiflorum* and *radens* revealed significant differences in the number and the type of volatile components.

Conclusion: These variations were not surprising, given the different macroscopic and microscopic characteristics.

Keywords: *Pelargonium*, antioxidant, polyphenols, essential oil

POSTER PRESENTATION - 131

ANTIMICROBIAL ACTIVITY AND CHEMICAL COMPOSITION SCREENING OF *Anacylus pyrethrum* ROOTS

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Objective / Purpose: Medical herbs have many bioactive component and they are used in microbial treatment since ancient time. The resistance of pathogen to antibiotics is became a critical problem, so novel antimicrobial agent related research is required. As far as the current literature is concerned *Anacylus pyrethrum* related wide range antimicrobial research doesn't exist, therefore root of this medical plant was applied against 17 bacteria and 1 fungi by using disk diffusion method.

Material and Methods: These microbial species include Bacillus, Enterobacter, Enterococcus, Escherichia, Klebsiella, Listeria, Pseudomonas, Salmonella, Staphylococcus and Candida genera. Twelve of them are standard species and they are important for exact determination of antimicrobial potential. 5.14, 10.29 and 20.57 mg samples were prepared by using ethanol extraction method. Besides, chemical composition of this sample was determined by Gas Chromatography-Mass Spectroscopy and National Institute of Standards and Technology (NIST) library was used for mass spectra analysis.

Results: The results were presented that *A. pyrethrum* has antimicrobial activity against all tested microbial species except *E. faecalis* and *S. typhimurium*. Two of them are ultra-susceptible (higher than 30 mm); three of them high susceptible (15-30 mm); six of them moderate susceptible (14-10 mm) and five of them are low susceptible (9-7 mm). Several active metabolites were identified, but some compounds in the composition of this sample is not matched with the library.

Conclusion / Discussion: Our study clearly presents that *A. pyrethrum* roots should have a possible medicinal uses. However, further researches are needed in order to analyse the active substances and their activity mechanisms in details. *A. pyrethrum* contains unknown molecules and this molecules should be analyzed by NMR spectra for their 3D structure determination and identification.

Keywords: Anacylus pyrethrum, medicinal plant, antimicrobial activity, disk diffusion method, ethanol extract.

POSTER PRESENTATION - 132

ESSENTIAL OIL AND FATTY OIL RATIOS AND COMPOSITIONS OF PARSLEY SEEDS (*Petroselinum crispum*) GROWN IN HATAY REGION

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Parsley (***Petroselinum crispum***) is a species of ***Petroselinum*** in the family ***Apiaceae***, in Europe and in the Mediterranean region (Italy, Greece, Algeria, and Tunisia), and widely cultivated as a herb, a spice, and a vegetable. Parsley was traditionally used in making tea for treating gallstones and dysentery. The leaves, seeds and roots of parsley were used in treating numerous digestive problems including diarrhea, ulcer, flatulence and colic pain. Parsley seed contains an essential oil, composed mainly of myristicin, apiole, and 2,3,4,5-tetramethoxyallylbenzene and, that is responsible for the pronounced odor and flavor of parsley. Parsley essential oil is either colorless or a very pale yellow color, and has a more bitter scent compared to the fresh plant.

Parsley Essential Oil has anti-microbial, anti-rheumatic, anti-arthritic, antiseptic, astringent, circulatory, detoxifier, digestive, diuretic, depurative, febrifuge, hypotensive, laxative, stimulating properties. On the other hand, Parsley Seed oil has good anti-spasmodic properties helping ease cramps and muscle spasm.

In this study, parsley seeds, obtained from Hatay/Arsuz (Turkey), had a moisture content of 12,6 wt.%, and ash content 6,86 wt.%, while the essential oil content, 2,52 wt.%, was determined by hydrodistillation and fatty oil content 8,85 wt.%, was determined by soxhlet extraction by using petroleum ether as solvent. Prior to the extraction procedure, the seeds were milled and sieved, so as to determine their mean particle size. The essential oil and fatty acid compositions were established with GC/MS.

Keywords: Parsley, seed, essential oil, fatty oil

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POSTER PRESENTATION - 133

CYTOTOXIC AND ANTILEISHMANIAL ACTIVITIES OF *Chrysophthalmum gueneri* AYTAC & ANDERB.

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Objective: *Chrysophthalmum gueneri* Aytac & Anderb. (*Asteraceae*), an endemic species to Turkey, is a perennial herb with slender divericately branched stems and slender peduncles that grows humid calcareous rock crevices and limestone cliffs [1]. Up to date, no phytochemical data has been reported on *C. gueneri*. In our previous study, we investigated the cytotoxicity of the plant against some cancer cell lines by Sulforhodamine B assay for the first time [2]. Our continuing researches on *C. gueneri*, we now aimed to evaluate cytotoxic activity against different cancer cell lines and antileishmanial effects.

Material and Methods: After extraction with 80% MeOH of the whole of *C. gueneri*, we further fractionated by successive solvent extractions with *n*-hexane, chloroform, *n*-butanol. All fractions and methanol extract were tested on cytotoxic activity against HELA, H-460, MCF-7, PC-3 and 3T3 by using MTT assay and leishmanicidal effects on promastigotes of *Leishmania major* by *in vitro* bioassay.

Results: MTT assay revealed that the chloroform fraction had significantly activities against the tested cancer cells with IC_{50} values ranging from 5.17±0.23 to 8.67±0.05 µg/ml. In consideration of the leishmanicidal activity of the plant, the chloroform and *n*-hexane fractions exerted significant and moderate activities with IC_{50} values of 15.99±0.1 and 57.74±0.5 µg/ml, respectively.

Conclusion: Our results showed that the chloroform fraction of *C. gueneri* has significant cytotoxic and antileishmanial effects. Further studies are going on in our laboratory to isolate and characterize the active compound(s) responsible having cytotoxic and antileishmanial activities.

Keywords: *Chrysophthalmum gueneri*, Asteraceae, cytotoxic activity, MTT assay, antileishmanial activity

Acknowledgement: This study was supported by TUBİTAK-2214/A, TUBİTAK-2211/A and ICCBS-HEJ.

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POSTER PRESENTATION - 134

FLAVONOIDS FROM *FUMANA MONTANA* POMEL

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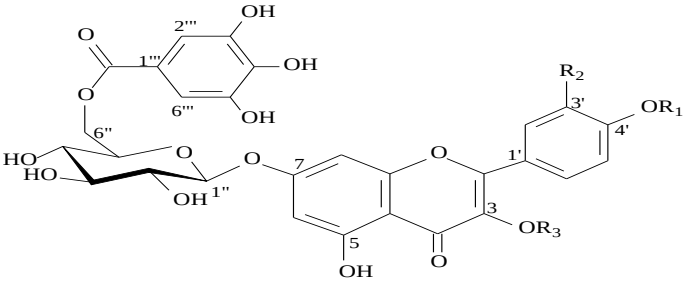
The Cistaceae family consists of eight genera and about 180 species. Five genera (*Cistus*, *Fumana*, *Halimium*, *Helianthemum* and *Tuberaria*) are native to the Mediterranean region [1]. Several phytochemical studies on the Cistaceae family revealed it to be essentially rich in essential oils [2], diterpenes [3] and flavonoid glycosides [4]. *Fumana montana* Pomel is a dwarf shrub growing on rocky ground of Algeria. This work reports the isolation of three new methylated flavonol glucosides: 3-methoxy-7-*O*-β-(6″-galloylglucopyranoside) quercetin (**1**), 3,4′-dimethoxy-7-*O*-β-(6″-galloylglucopyranoside) quercetin (**2**) and 3-methoxy-7-*O*-β-(6″-galloylglucopyranoside) kaempferol (**3**) from the ethyl acetate extract of the whole plant *Fumana montana*. The structural elucidations of these compounds were established by spectroscopic analysis particularly 1D and 2D NMR, mass spectrometry ESI-MS and UV, and comparison with literature data.



1	$R_1 = H$	$R_2 = OH$	$R_3 = Me$
2	$R_1 = Me$	$R_2 = OH$	$R_3 = Me$
3	$R_1 = H$	$R_2 = H$	$R_3 = Me$

Keywords: Cistaceae, *Fumana montana*, flavonoid glucosides, NMR.

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POSTER PRESENTATION - 135

USE OF *LAMIACAE* FAMILY PRODUCTS IN FISH PROCESSING INDUSTRY

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Fish is a highly perishable product that quality deterioration rapidly occurs due to its microbial and biochemical reactions. The shelf life term is so important for fish products. Some researches have been carried out freezing, chemical preservation, salting, and modified atmosphere packaging of seafood. These techniques have been utilized to improve the microbial safety, extend the shelf life and prevent quality losses of seafood products during the storage period.

In order to extend the storage time of seafood, synthetic additives are added to muscle foods because of the antimicrobial and antioxidant effects. However, natural additives has become more popular than synthetic chemicals because of concerns about their safety and health conditions. As a result of questioning the safety of synthetic additives, consumers demand the usage of natural additives instead of synthetic materials as alternative preservatives in foods. This demand continues increasingly and the replacement of synthetic materials is getting considerable attention.

Lamiaceae is a family has wide distribution and contains about 236 genera and approximately 7000 species. Many of the plants are aromatic and widely used materials such as basil, mint, rosemary, sage, savory, marjoram, oregano, hyssop, thyme, lavender, and perilla. Among Lamiaceae, rosemary and thyme have been the most studied and commonly marketed as an extract. Lamiacea members have been studied by many authors in the preservation of seafood products. For example; Altınelataman et al. (2015) [1] used sage and rosemary water phase extracts on sea bass fillets and recorded that sage was determined as more effective for chemical and rosemary was for other criterias. Mantoğlu (2010) [2] tested commercial thyme extract on sea bass fillets and determined that results of the thyme extract group was better than the control in terms of chemical parameters and the thyme extract had positive effects on sensory parameters of sea bass. As a result of these information, the aim of this study to exhibit the effects of Lamiacae family products on some shelf life parameters of fish products.

Keywords: Fish, *Lamiacae*, Medical Plants, Shelf life, Storage.

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POSTER PRESENTATION - 136

ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITORY EFFECTS OF HAZELNUT PROTEIN HYDROLYSATE PREPARED USING PEPSIN

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Objective / Purpose: The aim of this study is to find out the effect of pepsin hydrolysis of hazelnut protein on Angiotensin-Converting Enzyme (ACE) inhibition.

Material and Methods: Unshelled hazelnuts was firstly grinded and defatted by petroleum ether. Alkaline extraction and isoelectric precipitation method was used in order to obtain protein. Neutralised protein suspension was freeze dried before analysis and stored at -18 C.

Pepsin hydrolysis was conducted at pH 2 with 1:20 (w:w) enzyme/substrate ratio at 37ºC for 60min [1]. Hydrolysis was stopped by heating ed to 85ºC for enzyme inactivation. Hydrolysates were analysed for ACE inhibitory effect according to Wu et al. [2] with some modifications. 100µL of 2mM HHL, 20µL of hydrolysate and 20µL of 2mU of ACE were incubated in 37ºC for 60min. Reaction was terminated by adding 85µl of 1M HCl. Shimadzu HPLC system with C18 column and DAD was used for ACE inhibition analysis.

Results: Hazelnut protein isolate and hydrolysate have over 95 % ACE inhibition. On the other hand, IC50 values of samples taken at 0 and 60 minutes of pepsin hydrolysis were 1.29 mg protein/ml and 0.22 mg protein/ml respectively.

Conclusion / Discussion: Results shows that while hazelnut protein isolate has reasonable ACE inhibition properties, pepsin hydrolysis of hazelnut isolates gives almost 6 times more anti-hypertensive effect than hazelnut protein isolate due to bioactive peptide production.

Keywords: Hazelnut, Pepsin hydrolysis, ACE Inhibition

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POSTER PRESENTATION - 137

THE EFFECT OF ALTITUTES ON COMPOSITION AND CONTENT OF ESSENTIAL OILS OF *ORIGANUM SACCATUM* P.H. DAVIS

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The genus *Origanum* is represented in Turkey by 22 species or 32 taxa, 21 being endemic to Turkey. The rate of endemism among the Turkish *Origanum* species is 63%. Out of 52 known taxa of *Origanum*, 60% are recorded to grow in Turkey. *Origanum saccatum* is called as "Tahtacı Kekiği" in Alanya region around Antalya. It grows on the slopes at limestone rocks and the pine forests. It is endemic for C3 and C4 squares.

In this study, essential oil content and compositions of four *O. saccatum* plants were collected from Ermenek (Southern part of Turkey). The altitudes of collected places of plants were 1196 m, 1323 m, 1449 m and 1523 m from sea level. The essential oil content of *O. saccatum* plants was hydro-distilled by Clevenger apparatus, and they were determined between 0.20% and 0.33%. The highest essential oil content (0.33%) was obtained from 1196 m. The composition of essential oils was analyzed by GC/MS.

Keywords: *Origanum saccatum*, Ermenek, essential oil, endemic

POSTER PRESENTATION - 138

DETECTION OF DNA PROTECTIVE ACTIVITY OF BLACK CARROT (*DAUCUS CAROTA*)

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Objective/ Purpose: Carrot is a widespread vegatable specie in many countires and Turkey. At the present time Today, carrots are consumed as pickles, salads and with meals. Research has shown that carrot and carrot juice are very important for healthy nutrition. This effect comes from abundant amounts of vitamins (A, B, C, D) and antioxidant substances. Recently, the utilize of carrots in fermented carrot juice production, the effects on the composition and sensory properties of turnip juice are studied. In this study DNA protective activities are investigated.

Material and Methods: The study material was purchased as fresh. It was thinly sliced and dried in the shade on the blotter. Carrot was extracted using a Gerhart Soxhlex equipment. 0.01 mg Extract of *Daucus carota* was diluted with 1000 µl water. pBR322 plazmid DNA (vivantis) of extract was used for detection of DNA protecting activities from UV and oxidative damage.

Results: According to concentration difference, DNA protective activity wasdetermined.

Conclusion / Discussion: The DNA protective effect of *Daucus carota* was determined at high concentrations.

Keywords: *Daucus carota,* DNA protective

POSTER PRESENTATION - 139

INTER- SPECIES MORPHOLOGICAL VARIATION OF THE ENDEMIC SPECIES; *Phlomis physocalyx* and *Phlomis oppositiflora*

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Objective / Purpose: The high endemism rate of genus Phlomis (58,8 %) indicate that Turkey is one of the gene centers and *Phlomis physocalyx* and *Phlomis oppositiflora* are endemic species in Turkey. In this study, the differences of morphological characters and pollen fertilities of *P. physocalyx*, *P. oppositiflora* and their natural hybrids were investigated.

Material and Methods: A total of 11 populations were identified by the 28 quantitative morphological traits in the 309 samples. The Principle Component Analysis (PCA) was performed for clustering. In addition, each 10 samples from 11 populations were observed to determine the pollen viability. One Way Analysis of Variance (ANOVA) was fulfilled with counted pollens to determine the diversity among the taxa.

Results: The results of PCA showed that, the species were clustered separately. The hybrid samples were located between its ancestors and morphologically have characteristic both parental features.

Conclusion / Discussion: According to the findings, species are related to each other. The high endemism rate gets advantages to these endemic species for viability and competition against the changing environmental conditions.

Keywords: *Phlomis physocalyx*, *Phlomis oppositiflora*, endemic, PCA.

POSTER PRESENTATION - 140

DETERMINATION OF FUNGAL AGENTS IN TISSUE CULTURE STUDIES ON *ARUM ITALICUM*

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Plant cells, tissues, and organs are widely used in studies such as commercial production of plant metabolites, biotransformation of pharmaceuticals, production of antibiotic protein, plant genetic manipulation, and propagation of plants. Microbial contaminations, whether they are plant pathogen or not, affect *in vitro* development of tissues by releasing metabolites and proteins that affect plant tissues and by changing composition and/or pH of culture media. Explants taken from the plant *Arum italicum* were washed by being kept under tap water for 30 minutes. Bulbs were firstly kept in 95% ethanol for three minutes and were then subjected to sterilization within 50% commercial bleach for 20 minutes. Sterilized *Arum italicum* tubers were rinsed with sterile distilled water 3 times for 5 minutes, treated with fungicide with Captan as active ingredient, and left to form shoots in sterile brown paper bags at 24±1 °C. Afterwards, developed leaf, leafstalk, shoot, and stem explants were subjected to surface sterilization. The explants transfer into MS media containing plant growth regulators (1-4 mg/ L Kin and 0.25-1 mg/L NAA) sucrose and 0.8 % agar. Fungal contaminations were observed around shoot explants of *Arum italicum* after 72 hours during the study. The developed cultures were isolated into PDA (Potato Dextrose Agar) media in order to determine fungal agents. Isolated cultures were identified at genus level by examining under light microscope (100x40 magnification). Fungal agents were determined to be the species *Aspergillus* and *Penicillium*, mostly *Fusarium* sp.

Keywords: *Arum italicum*, *in vitro*, MS, fungal agent, fungicide

POSTER PRESENTATION - 141

AN ASSESSMENT OF DEVELOPMENTS IN PRODUCTION AND MARKETING OF SOME MEDICINAL PLANTS IN TURKEY

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Medicinal plants have long been used by people in many fields such as spices medicine, industry, cosmetics and etc. since ancient times. Nowadays, people's demand for medicinal plants have been increased due to side effects of synthetic and chemical drugs on human health Turkey is besides being an rich country with regard to genetic diversity and endemism because of its geographical structure difference, both gene center of many plants Turkey is among the most important countries of trade of the medicinal plants in the world However, despite the high potential of Turkey for the export of medicinal plants, the desired level has not yet been reached. The amount of exports of medicinal plants increased 146% from 33.623 tons to 49.118 tons from 2012 to 2016, value of exports of medicinal plants increased 158% from 100 million US Dollars to 158 million US Dollars from 2012 to 2016. While amount of imports of medicinal plants in Turkey were 16.976 tons in 2012, its increased by 150% in 2016 and reached 25.449 tons. The value of imports of medicinal plants, which had been 25 million US Dollars in 2012, increased by 161% and reached to 41 million US Dollars in 2016. The most exported medicinal plants in Turkey in 2016 are thyme, bay leaf, cumin, and anise. When Turkey's medicinal plants imported in 2016 are examined, black cumin, black pepper and ginger are in the top three ranks. In this study, production, amount and value of exports and imports of some medicinal plants, which are important for Turkey's imports and exports, were examined with regard to the selected years and some suggestions are given to increase the exports of these medicinal plants.

Keywords: medicinal plants, marketing, Turkey

POSTER PRESENTATION - 142

ATTENUATION BY ORAL OLEUROPEIN OF DRUG-INDUCED LUNG INJURY IN RAT

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Objective / Purpose: Drug-induced lung disease is a common responsible for significant morbidity and mortality, and no specific therapy is indicated for this. Indomethacin is one of the most commonly used drugs with potential toxicity and there is no evidence that it can cause a typical lung injury. Oleuropein is the most prevalent phenolic component in olive leaves, seed, pulp and peel of unripe olives. Oleuropein has different pharmacological properties such as antioxidant, anti-inflammatory, anti-cancer, antimicrobial, antiviral, hepatic-, cardiac- and neuro-protective effects. The aim of this study is to evaluate the effects of oleuropein on Indomethacin-induced lung injury in rats.

Material and Methods: Sprague-Dawley rats were randomly assigned to 5 groups of 5 rats each: Control, Indomethacin (25 mg/kg), Indomethacin + Oleuropein (50, 100, and 250 mg/kg). Oleuropein was orally administered to rats after 10 minutes from drug treatment. At 6 hours after the administration, the animals anesthetized and their lungs were removed. The tissue samples were assayed for total antioxidant/oxidant status (TAS/TOS) and histopathologic analyses.

Results: Indomethacin caused severe lung injury in rats, demonstrated by significant elevation of TOS level, reduction of TAS level, induction of histopathological changes. However, Oleuropein significantly attenuated lung oxidative damage and histopathologic alterations after Indomethacin.

Conclusion / Discussion: Oleuropein at two high doses exhibited a pronounced antioxidant effects. This effect highlighted once again the Oleuropein as a source of antioxidants able to reduce the frequency of oxidative stress-related Indomethacin-injury on lung.

Keywords: Histopathology, Indomethacin, Lung injury, Oleuropein, Oxidative stress.

POSTER PRESENTATION - 143

DIVERSITY OF THE ROSY GARLIC (*ALLIUM ROSEUM* L.) POLYPLOID COMPLEX IN ALGERIA EVIDENCED BY MORPHOMETRIC AND MOLECULAR DATA

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Objective / Purpose: The rosy garlic (*A. roseum* L.) is a traditional medicinal herb, member of genus *Allium* L. a key group within Asparagales. This species native from the Mediterranean region, become widely naturalized and sometimes cultivated throughout many countries. All parts of the plant were used in herbal medicine and, recently, it has been showed that peculiar sulfur compounds are involved in their antiproliferative and antimicrobial properties. In North Africa, the taxonomy of this group is still controversial due to high polymorphism of populations expressed at morphological and ecological levels. At last, twelve infraspecific taxa were described including the noteworthy endemic *A. odoratissimum* Desf.

Material and Methods: Plant material sampled from various bioclimatic sites in Algeria, was subjected to multivariate analyses based on measurement of 26 vegetative and floral characters. Chromosome counting was established for each population. Comparative molecular study covered both of Algerian and related Mediterranean populations. Phylogenetic analysis based on nuclear ribosomal ITS1-5.8S-ITS2 DNA sequences, was performed with Parsimony method.

Results: Results explain significant variability of flower segments correlated with diverse bulb structures suggesting occurrence of different breeding strategies. Morphological analyzes based on Principal component analysis, revealed two main groups structured in a north-south bioclimatic gradient, suggesting adaptation of peculiar populations to arid conditions. All analyzed populations were polyploids with $2n=4x=32$ and variable karyotypical parameters. The phylogenetic tree topology provided a common evolutionary history of the Algerian and Tunisia populations, which form a single well-supported clade.

Conclusion / Discussion: Result emphasizes the importance of morphological descriptors and molecular markers for the inventory and identification of critical populations that conservation most be based on systematic evolutionary approach. Diversity of this wild gene pool represents a source of novel bioactive compounds.

Keywords: *Allium*, Algeria, taxonomy, morphology, karyology, molecular phylogeny

POSTER PRESENTATION - 144

A STUDY ON DNA PROTECTIVE ACTIVITY OF STRAWBERRY *(Fragaria vesca)* JUICE AND EXTRACT

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Objective/ Purpose: Researchs demonstrate that fruit and vegetables play important roles in the prevention of diseases and protection of diseases. These effects of fruit and vegetables comes from rich antioxidant substances. Many researchers were determined the antioxidant capacities of fruits and vegetables were determined. Strawberry is a fruit that is widely consumed in our country, consumed in a great amount of fresh and jam. Many bioactive compounds such as antioxidants have potential. Strawberry juice and extracts were investigated for their protection potential of DNA against H2O2 and U.V, which damage DNA.

Material and Methods: 100gr strawberry was crashed and homojenized, filtered to obtain strawberry juice. Methanol extract was obtained after the same amount of strawberries thinly sliced and dried. The effects of the obtained extracts and strawberry juice on DNA damage induced by exposure to H2O2 and UV-C (260 nm) were investigated using pBR322 Plasmid DNA.
Results: It has been determined that DNA has protective potential. The most effective concentartion of DNA protective activity was determined.

Conclusion / Discussion: It is thought that Strawberry can be a supplement candidate for the cosmetic industry after purifiying DNA protective effect compounds of stawberry and

Keywords: *Fragaria vesca*, DNA protective

POSTER PRESENTATION - 145

ANTIMICROBIAL ACTIVITIES OF THE ESSENTIAL OIL FROM *HYPERICUM PERFORATUM*

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Objective / Purpose: The objective of the present study to monitor of the antimicrobial activities of the essential oil extracted from *Hypericum Perforatum.*

Material and Methods: Essential oil was tested against a wide range of bacterial species in order to find out the static (MIC) and cidal concentrations (MBC). Tested bacteria were *Staphylococcus aureus* ATCC 29213, *Bacillus cereus* (food isolate), *Enterococcus casseliflavus* ATCC 700327, *Escherichia coli* ATCC 25922, *Enterobacter hormaechei* ATCC 700323, *Klebsiella pneumoniae* ATCC 700603, *Stenotrophomonas maltophila* ATCC 17666, *Pseudomonas aeruginosa* ATCC 27853, and *Bacillus subtilis* ATCC 6633. Minimum Inhibitory Concentration of the essential oil were tested using macrobroth dilution assay. After MIC value, cidal concentration was determined. Essential oil ranging from 200 to 0.195 µl/ml was diluted in the broth medium plus Tween 80 solution (0.5%, v/v), and then all tubes were inoculated with the test microorganisms (10^6 cfu/ml). Assayed tubes were left for 24 h at 37 °C. All results were evaluated statistically using One way ANOVA and Tukey B.

Results: Essential oil of *Hypericum perforatum* revealed antibacterial activities against all tested microorganisms.

Conclusion / Discussion: The most significant antibacterial effect was observed on *S. aureus* ATCC 29213, *B. subtilis, B. cereus* EU and *E. casseliflavus* ATCC 700327. The essential oil revealed both static and cidal

effects towards gram negative bacterial species as well. Among the gram negative bacteria, *E. hormaechei* ATCC 700323 and *K. pneumoniae* ATCC700603 were the most resistant bacteria according to the cidal concentration (>100 ±0,00) of the essential oil of *H. perforatum*. The present result indicated that the antibacterial effect was mostly effective on gram positive bacteria rather than gram negative ones.

Keywords: *Hypericum perforatum, essential oil, antibacterial, Staphylococcus, Bacillus*

POSTER PRESENTATION - 146

OIL CONTENT AND FATTY ACID COMPOSITION OF TURKISH HAZELNUTS (*Corylus avellana* L.)

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Objective / Purpose: There is increasing evidence that diets that include nuts may be beneficial in decreasing the risk of coronary heart disease (CHD). Nuts are high in fat; however, nuts are thought to have a fatty acid profile that is cardioprotective [1].

Material and Methods: Commercial Turkish hazelnut products (*Corylus avellana* L.) were supplied from the Local Market. Approximately 10 g of hazelnut powder (kernels ground with a blender) was extracted with n-hexane for 3 hours using soxhlet. Fatty acid methyl esters in the nut extract were determined by GC–MS.

Results: The total oil content of the three selected nuts ranged from 35.3 to 60.8%. Palmitic (C16:0), stearic (C18:0), oleic (C18:1), and linoleic (C18:2) acids were identified in the oils of the products.

Conclusion / Discussion: It is mainly used as a source of natural anti-oxidant substances and monounsaturated fatty acids.

Keywords: Nuts, *Corylus avellana* L., Fatty acids, Soxhlet extraction.

References:

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POSTER PRESENTATION - 147

AN OPTIMIZATION OF THE EXTRACTION AND THE PHYSICO-CHEMICAL POSITION OF THE ESSENTIAL OIL OF *Lawsonia inermis* L., CULTIVATED IN BISKRA (DEPARTMENT OF ALGERIA)

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The henna *Lawsonia inermis* L., plant is one of the oldest cosmetic, medicinal and aromatic plants, well known in the worldwide. The objective of this study is the valorization of this plant by the extraction of its essential oil that can be used for a wide purpose such as: aromatherapy, bio-pesticide …etc.

Two methods of extraction were compared, the hydro distillation and the extraction assisted by microwaves, using different plant's part leaves, flowers and seeds.

The obtained essential oil was analyzed in laboratory allowed determining its physico-chemical composition. The results obtained of the essential oil insulated using the two methods of extraction are quantitatively and qualitatively similar with fair differences in yield and the extraction times, they are conformed with AFNOR norms.

Keyswords: Henna, essential oil extraction, hydro distillation, microwaves, AFNOR norms.

POSTER PRESENTATION - 148

FATTY ACID COMPOSITION OF SEA BUCKTHORN (*HIPPOPHAE RHAMNOIDES* L.) PULP/PEEL OIL EXTRACTED BY SUPERCRITICAL CARBON DIOXIDE

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Objective / Purpose: Seabuckthorn (*Hippophae rhamnoides* L.) berry oil having high nutraceutical, cosmeceutical, and therapeutic activity has been extracted from dried seabuckthorn (SBT) berry pomace using supercritical carbon dioxide (SC-CO_2), a green process for extraction of bioactives.

Material and Methods: Wild Turkey berries of *Hippophae rhamnoides* L. were collected from twenty-one different locations. Seeds were isolated from berries. The pulp/peel was dried at oven. For each experiment, dried SBT berry pulp/peel powder was subjected to SC-CO_2 extraction. Fatty acid methyl esters in the sea buckthorn extract were determined by GC–MS.

Results: The dominating fatty acids in pulp/peel oils were palmitic (23-32%), oleic (20-50%) and palmitoleic (11-40%).

Conclusion / Discussion: The studied samples of sea buckthorn from Turkey have proven to be potential sources of valuable oils.

Keywords: Sea buckthorn, *Hippophae rhamnoides* L., Fatty acids, Supercritical carbondioxide extraction.

POSTER PRESENTATION - 149

NUTRITIONAL EVALUATION OF WILD EDIBLE *Silene sclerophylla* CHOWDH. IN VAN

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In this study, some chemical properties and mineral contents of *Silene sclerophylla* CHOWDH. growing wild in Van province in Turkey were investigated. It is one of the commonly consumed wild plants as food and used for medicinal purposes by inhabitants in Eastern Anatolia Region of Turkey. Nutritional value and mineral compositions of wild plants have been investigated for food security and human health. Their mineral composition and nutritional value are important for public health. Mineral contents of the plant samples were determined by Atomic Absorption Spectrometry (AAS).

In laboratory analysis, dry matter, total ash, % N, crude protein, crude fiber and pH were examined as nutritional value. Useful minerals (Ca, Cu, Fe, K, Mg, Mn, Na, P, S and Zn) and heavy metals (Cd, Co, Cr and Pb) that hazardous elements for livings were also determined. Results in this research showed that *Silene sclerophylla* CHOWDH. contains medium level of macro elements such as sodium (0.77 g/kg), potassium (3.81 g/kg), magnesium (2.58 g/kg) and calcium (24.36 g/kg). Also, it has micro-elements such as iron (446.36 mg/kg), manganese (58.78 (mg/kg), copper (14.47 mg/kg) and zinc (13.74 mg/kg). The results indicated that *Silene sclerophylla* CHOWDH. leaves and stem could be a good supplement for some nutrients such as protein, Ca, K, Fe and Mn.

Key words: Nutrient content, wild plant, *Silene sclerophylla*, East Anatolia

POSTER PRESENTATION - 150

ETHNOBOTANICAL AND BOTANICAL PROPERTIES OF (*PLICOSEPALUS ACACIAE*) A MISTLETOE USED BY BEDOUINS IN NORTH WEST OF SAUDI ARABIA

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Objective /Purpose: In Saudi Arabia a tight relationship between Bedouins and plant exist since centuries. The mistletoe *Plicosepalus acaciae* - LORANTHACEAE has fascinated local people and has multiple usages. The objective of this survey is to gather the main ethnobotanical aspects of this stem parasite essentially medicinal uses and to study the botanical and morphogenetic properties.

Material and Methods: The survey is concerned AlUla area and the surrounding villages in the north west of Saudi Arabia. The plant material is constituted by different organs of *Plicosepalus acaciae*. The methods:

1- Field trips, interviews, questionnaires and collection of the plant.
2- Macroscopic and Microscopic study to follow the development of the mitletoe and the parasite-host relationship.

Conclusion/ Discussion: Ethnobotanical survey shows a high cultural knowledge transmitted orally from generation to generation between Bedouins and their vegetation. *Plicosepalus acaciae* has a very interesting folk medicinal properties especially antidiabetic and hypotensive effect, and can be further explored for the development of plant-based pharmaceutical program. Botanical survey have enlarged scientific knowledge about taxonomic and morphogenetic characterization. Histological investigation shows a specific relationship between the parasite haustorial tissues and hosts tissues.

Keywords: *Plicosepalus acacaiae*, ethnobotany, antidiabetic, hypotensive, stem parasite, haustorium

POSTER PRESENTATION - 151

ESSENTIAL OIL COMPONENTS of *DAPHNE SERICEA* VAHL. FROM FLORA of HATAY

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Objective / Purpose: Daphne genera has 7 species in flora of Turkey (Davis, 1988). *Daphne sericea* Vahl. and *Daphne oleiodes* Schreber var. *kurdica* Bornm are grown naturally in flora of Hatay. Due to its chemical contents of leaves, roots and cortex, daphne species have been used in folk medicine as a diuretic, anti-inflammatory, antifebrile, diaphoretic and in cancer treatments. Antioxidant capacity and fatty acid composition of *D. sericeae* have been studied but there is no scientific report on its essential oil. The aim of this study is to reveal the essential oil content and components of *Daphne sericea* Vahl. from flora of Hatay.

Material and Methods: Plant materials of Daphne were collected from the rural areas of Hatay province in Turkey. Leaves and flowers were separated and flowers were hydro distilled for 3 hours with Neo-Clevenger apparatus. The oils were obtained with hexane and then immediately analysed with GC-MS (Thermo Scientific ISQ).

Results: Essential oil content of Daphne were found very low. GC-MS analysis showed 49 component represented 100% of essential oil. Main essential oil components were determined as pentacosane (13.94%), methyl linoleate (10.92%), tetratetracontene (9.74%), decanal (8.08%), nonal (3.17%) and germacrene-D (3.06%).

Conclusion / Discussion: It has been found that *D. sericea* essential oil components differs from other species such as *D. pontica* (carvacrol and hexahydrofarnesyl-acetone) and *D. oleiodes* var. *oleiodes* (nanocosane and hexadecanoic acid) (Gurbuz et al., 2013)

Keywords: *Daphne sericea*, essential oil, GC-MS, Hatay

References:

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POSTER PRESENTATION - 152

ANTIFUNGAL ACTIVITIES OF ESSENTIAL OILS OF LAUREL AND FENNEL PLANTS AGAINST FUNGAL DISEASE AGENTS OF CYPRESS TREE

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Objective / Purpose: *Fusarium oxysporum* and *Pestalotiopsis funerea* are the most common fungal disease agents of conifer seedlings causing root rot and shoot or tip blight diseases. In this study, antifungal activities of essential oils of fennel (*Foeniculum vulgare* Mill.) and laurel (*Laurus nobilis* L.) were determined against *F. oxysporum* and *P. funerea in vitro* conditions.

Material and Methods: Chemical compositions of essential oils were determined by using GC-MS analysis. Antifungal volatile phase effects of essential oils were determined on inhibition of mycelial growth *in vitro* conditions by using different concentrations [1]. The effect of most effective concentrations of essential oils on the morphology of fungal hypha was also determined by using light microscope [2].

Results: GC-MS analysis of essential oils of laurel and fennel plants revealed that eucalyptol (46.97%) and α-terpinyl acetate (19.82%) were major components of laurel; *trans*-anethole (82.44%) and limonene (5.18%) were major components of fennel essential oils. Volatile phase effects of fennel and laurel essential oils were found to completely inhibit mycelial growth of *F. oxysporum* at 30.0 and 50.0 µl petri^{-1} concentrations, respectively. Complete growth inhibition of *P. funereal* by essential oil of fennel and laurel were observed at relatively lower concentrations (20.0 and 25.0 µl petri^{-1} concentrations, respectively). Light microscopic observations on hyphae, exposed to volatile phase of the most efficient essential oils, revealed considerable structural deformations such as cytoplasmic coagulation, vacuolations and protoplast leakage.

Conclusion / Discussion: In conclusion, our results suggest that essential oils have the potential for use in control of fungal diseases of conifer plants.

Keywords: Fennel, laurel, essential oil, antifungal, *Fusarium*, *Pestalotiopsis*

References:

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POSTER PRESENTATION - 153

EFFECT OF GIBBERELLIC ACID (GA_3) ON THE GERMINATION OF SOME NATIVE GROWN SAGE SPECIES (*SALVIA SPP.)* SEEDS

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Objective / Purpose: This study was carried out to investigate the possibilities of seed propagation of some naturally grown Salvia species in Hatay flora and to determine the effects of Gibberellic Acid (GA_3) doses on germination of salvia seeds.

Material and Methods: In the study, the seeds of sage species; *S. aramiensis*, *S. aucheri*, *S. sclarea*, *S. tomentosa*, *S. verticillata* subsp. *amasiaca*, *S. verbanaca* and *S. virgata* were used. Four different doses of GA_3 (0 (control), 250; 500 and 1000 ppm) were applied to seeds. The seeds were soaked in GA3 doses (10 ml) for 24 hours for priming and then placed in petri dishes for germination. They were germinated at room temperature (25°C) and in lighted environment. The experiment was set up with four replications, with 50 seeds per replicate, according to randomized plot design.

Results: The germination rates of *Salvia* spp. seeds as regard to GA_3 doses (0, 250, 500 and 1000 ppm), 65, 75, 70, 61% in *S. aramiensis*, 48, 57.5, 61, 56% in *S. virgata* 26, 29.5, 31.5, 28% in *S. sclarea*, 22, 30, 29.5, 38.5% in *S.verbanaca*, 0, 18, 27, 40% in *S. tomentosa* and 18, 12.5, 11, 15% in *S. verticillata* subsp. amasiaca, respectively. Almost no germination was observed in *S. aucheri*. The root length of *Salvia* species ranged between 6.0 to 32.6 mm.

Conclusion / Discussion: As a result, it can be said that germination rates of *S. aramiensis* and *S virgata* are higher than other species, and GA_3 applications have positive effects on germination of some species seeds.

Keywords: Sage, GA_3, Germination, *Salvia* sp., Hatay

Acknowledgement: This study was supported by TÜBİTAK (project no 109O161).

POSTER PRESENTATION - 154

THE EFFECT OF *ZINGGIBER OFFICINAL* ROOTS AGAINST *HELICOBACTER PYLORI*

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Objective / Purpose: To study the antibacterial effect of different concentration of methanol and aqueous extraction of *zinggiber officinal* roots, leaves against *Helicobacter pylori* bacteria**.** Preparation of the chloroform and methanol grinded using mortar and pestle and successively extracted methanol using soxhelt extractor apparatus. Preparation of the aqueous extract:100 g of the plant leaves was soaked in 500 ml hot distilled water, Extract was then filtered and freeze, extract was dried using freezer till powdered extract obtained.

Material and Methods: Antimicrobial sensitivity testing performed using diffusion technique the culture is examined for areas of no growth around the disc (zone of inhibition).(1) Cut plate technique: In the cut plate technique measure the minimum bactericidal concentration (MBC).

Results: 20% 10% and 5% Concentration of methanol extraction of *Zinggiber officinal roots* gaves Mean diameter of *H. pylori* inhibition zone 19,17 and 14 mm respectively 20% 10% and 5% Concentration of Aqueous extraction of *Zinggiber officinal* roots gaves Mean diameter of *H. pylori* inhibition zone 19,17 and 14 mm respectively. The mean diameter of *Helicobacter pylori* inhibition zone around the positive control disc (ciprofloxacin) was 20 mm.

Conclusion / Discussion: We found moderate antibacterial activity of both methanol and aqueous extraction of *Zinggiber officinal* roots against *Helicobacter pylori*, the study has clearly shown the in vitro anti-bacterial activity of both methanol and aqueous extract of *Zinggiber officinal* roots on *Helicobacter pylori*

POSTER PRESENTATION - 155

DETERMINATION OF BIOLOGICAL ACTIVITY OF *PISTACIA VERA*

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Objective/Purpose: Pistachio (*Pistacia vera* L.) is a member of the Anacardiaceae. Iran, USA, Turkey and Syria are the main countries producing pistachios. Pistachio is a rich source of nutrients in terms of minerals that are of great importance to nutrition. Recent studies showed that pistachio testa and seed have a strong antioxidant, anti-atherosclerotic and antimicrobial activity.

Material and Methods: We collected the plant samples in Campus of Gaziantep University. After the extraction, cytotoxic activity, apoptotic activity, immunohistochemical analysis was performed on A549 and H1299 lung cancer cell lines. DNA-protective activity studies of our plant extracts were examined using pBR322 plasmid DNA. In addition to these studies, antioxidant capacity determination studies of plant were determined by TAS, TOS and DPPH methods.

Results: As a result of the study, it was determined that especially the methanol extracts of *P. vera*, were strong in terms of cytotoxic activity, apoptotic activity, DNA protective activity and antioxidant activity.

Conclusion / Discussion: Considering the data in our study, we conclude that the *P. vera* plant, which has significant biological activity results, especially the parts of the testa results in correlation with the literature, in this way our study will shed light on the scientific community.

Keywords: *Pistacia vera*, Lung cancer, Apoptotic activitiy, Antioksidant, Phytotherapy.

References:

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POSTER PRESENTATION - 156

INVESTIGATION OF DNA PROTECTIVE ACTIVITITES OF *ROSA PULVERULENTA*

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Objective/ Purpose: *Rosa pulverulenta* is widespread in Turkey, perennial shrub form and useful plant species. Studies on the chemical composition of the *Rosa pulverulenta* plant pathology and antioxidants studies have led to their many uses in the medicine. Recently *Rosa pulverulenta* is widely used in many areas such as smell, taste, spices, beverage. In addition, it is offered as a medications for the prevention and treatment of diseases related to vitamin C deficiency (gastric acid weakness, infectious diseases, digestive system and urinary tract disorders).

Material and Methods: The samples were collected and brought to the herbarium in June from the Huzurlu highland of İslahiye in Gaziantep. In the shadow it was dried and then broken down into small pieces. Extract was obtained by 0.01 mg was diluted with 1000 µl water. pBR322 plazmid DNA (vivantis) of extract was used for detection of DNA protecting activities from UV and oxidative damage.

Results:. According to concentration of extract, protective activity was determined.

Conclusion / Discussion: *Rosa pulverelanta*, which is not a cultivar plant, should be detected active components in pure form for the future studies. If it is proved to be effective, it can be cultivated and potentail as a resource.

Keywords: *Rosa pulverelanta,* DNA protective

POSTER PRESENTATION - 157

AN ETHNOPHARMACOLOGICAL STUDY OF SAHARAN MEDICINAL PLANTS USED IN BECHAR, ALGERIA

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The Saharan Algerian people have used plants as medicine and food for thousands of years, spetialy in Bechar (in the South West of Algeria) the traditional medicine is a significant element in the cultural heritage remains the primary remedy for a large majority of people.

Ethnopharmacological took place in the frame of a more general medical study and was performs in different regions of the South West of Algeria.

Pharmacological and clinical studies of some Saharan medicinal plants and their natural products are the aim of this work. Different parts (leaves, stems, fruits, bark, areal part and latex), and different preparations were identified.

In this study we found that some parts are frequently used in the treatment of several diseases. These plants are used alone or in combination. Some recipes are specific to one disease, for against others can treat many diseases.

Keywords: Medicinal plants, Traditional medicine, South West of Algeria, Ethnopharmacological

POSTER PRESENTATION - 158

ORNAMENTAL *ASTERACEAE* SPECIES AS NEW SOURCES OF SECONDARY METABOLITES

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Objective: This paper presents the results regarding the morphplpgic characters and the content in total phenols and the metabolites profile of outdoor cultivated *Rudbeckia hirta var. Goldilocks and Tagetes erecta* plants fertilized with Osmocote.

Material and Methods: The plant material was represented by fully bloomed inflorescences taken from *Rudbeckia hirta* var. Goldilocks and *Tagetes erecta*. Chemical assessment used microscopy, TLC and UHPLC methods. The total phenolic content was established with Folin-Ciocalteu method. The biological activity was established with DPPH radical scavenging tests. The morphological parameters and the secondary metabolites were evaluated in two different nutritional statuses.

Results: The results indicated that the studied ornamental *Asteraceae* species represent rich sources of phenols. Moreover, the fertilization increases the plant biosynthetic capacity for polyphenols in a direct correlation manner for *Rudbeckia*. On the other hand, the nutritional regime had a significant influence on full flowering phenophase especially on *Tagetes*. Thus, by fertilizing the flowers of *Tagetes* "loose" components such as flavonoids and polyphenol ic acids by modifying their spectrum.

Conclusion: The concentration of plant secondary metabolites was found to be influenced by the nutritional status. Both species represent a good source for secondary metabolites but their biological potential remains to be established.

Keywords: *Asteraceae, Rudbeckia, Tagetes*, secondary metabolites

POSTER PRESENTATION - 159

THE QUALITATIVE-QUANTITATIVE CHARACTERISTICS OF GERMAN CHAMOMILE – VARIETY *LIANKA* FROM CULTIVATION IN 2016

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Chamomile, *Matricaria recutita* L., is something of a general physician. The board spectrum of its curative effects and uses could be compared to the healing power of the legendary root of ginseng. It is one of the few medicinal plants with an ever-increasing consumption in the world.

Slovakia is one of the European countries in which particular attention has been devoted to research of chamomile in all its aspect, including the propagating of this medicinal plant. Based on the study of chamomile´s pharmacodynamics properties, the sesquiterpenes: /-/α-Bisabolol, Chamazulene and /-/β-Farnesene are considered to be the most valuable constituents [1].

This contribution is aimed on compare of qualitative – quantitative characteristics of dry chamomile flower anthodia of the variety *LIANKA* and chamomile essential oil coming from experimental cultivation in 2016. Chamomile essential oil was isolated by means of hydro distillation. Individual compounds of essential oils were identified and quantified by method of gas-chromatography.

Gradually, between the years 2008 – 2013 the chamomile variety *LIANKA* were bred at the University of Presov, Slovakia. The variety is characterized by its high percentage of sequiterpenes (/-/-α-Bisabolol [52 – 55 %], Chamazulene [18 – 19 %], the low contents of /-/-α Bisabololoxides A and B [< 3 %] and essential oil content is from 0.65 to 0.85 %. These results were confirmed during the chamomile cultivation with the 4th harvests of flower heads in 2016.

Keywords: German Chamomile, cultivation, essential oil, properties, substances

[1] Salamon, I. (2007). Effect of the Internal and External Factors on Yield and Qualitative-quantitative Characteristics of Chamomile Essential Oil. *Acta Horticulturae*, (*749*): 45-64

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ASSESSMENT OF GENETIC VARIATION ON SOME CULTIVATED TURKISH CORIANDER (*CORIANDRUM SATIVUM L.)* VARIETIES BASED ON ISSR AND SRAP MARKERS

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Coriandrum sativum L. is the spices plant that using as medicinal plant including essential oil, belonging to the family Umbelliferae/Apiaceae. Its various chemical components in different parts are useful as antibacterial, antifungal and antioxidative. Therefore plays an important role in preserving the shelf life of foods by preventing their spoilage. Leaves and seeds of coriander mostly used in folk medicine and its essential oil used for pharmaceutical products and as an ingredient in perfumes cause of non-toxic to humans. Coriander has not much defined as molecularly. It has not gone far enough investigated in that way yet. Coriander breeding studies will probably result in more or less genetically identical varieties of *Coriandrum sativum L*. The acceptability of the genotypes is determined by the amount of genetic variability in the germplasm and utilizable information is limited in coriander. Studying to determine genetic diversity of identified characters and emphasis of importance for use convenient genotype in breeding program is required to enlarge the genetic base in coriander. Molecular markers are substantial instruments to assess genetic diversity and relationships among species and cultivars. In this study, genetic variation between some of Turkish coriander varieties was investigated using Inter Simple Sequence Repeats (ISSR) molecular markers and Sequence Related Amplified Markers (SRAP) to compare results from different molecular markers. In addition to, both markers combined together to assume more precisely differences between genotypes. All results from each markers and theire combined results has been shown the phylogenetic relationships between them.

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