



2018

4th INTERNATIONAL CONGRESS ON APPLIED BIOLOGICAL SCIENCES

Abstract Book

www.icabs.gen.tr



ANADOLU UNIVERSITY

NOBEL

NOBEL SCIENCE

NOBEL SCIENCES CENTER

NOBEL SCIENCES CENTER NOBEL SCIE

NOBEL SCIENCES CENTER NOBEL SCIEN



CONTENT

Foreword.....	3
Organizing Committee.....	4
Scientific Committee	5
Invited Speakers	9
Oral Presentation.....	17
Poster Presentation.....	125
Sponsors.....	253



Dear Colleagues,

On behalf of the organizing committee, we are pleased to announce that the 4rd International Conference on Applied Biological Sciences (ICABS 2018) will be held from May 3 to 5, 2018 in Eskişehir, Turkey. ICABS 2018 provides an ideal academic platform for researchers to present the latest research findings in Biological and Pharmaceutical Sciences issues. The conference seeks to contribute to presenting novel research results in all aspects of Biological and Pharmaceutical Sciences.

The scientific program will focus on current advances in the research, production and use of Biological and Pharmaceutical Sciences with particular focus on their role in maintaining academic level in Biological and Pharmaceutical Sciences and elevating the science level.

The conference's goal will to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in scientific experiments.

Best regards,

*Prof. Dr. Yusuf Öztürk
Conference Chairman*



ORGANIZATION COMMITTEE

Congress Chairman

Prof. Dr. Yusuf ÖZTÜRK
Anadolu University

Coordinator

Prof. Dr. Mehmet KARATAŞ
Necmettin Erbakan University

Organizing Committee

Prof. Dr. Nilgün ÖZTÜRK (Anadolu University)
Assoc. Prof. Dr. Miriş DİKMEN (Anadolu University)
Assoc. Prof. Dr. Zerrin CANTÜRK (Anadolu University)

Congress Secretariat

Res. Assist. Dr. Hülya Tuba KIYAN (Anadolu University)
Res. Assist. Mustafa Güçlü ÖZARDA (Anadolu University)
Res. Assist. Elif KAYA TİLKİ (Anadolu University)
MSc. Bio. Selin ENGÜR (Anadolu University)



SCIENTIFIC COMMITTEE

- Prof. Dr. Smain AMIRA (Ferhat Abbas University of Setif/Algeria)
Prof. Dr. Yusuf BARAN (Abdullah Gül University/Kayseri)
Prof. Dr. Erdal BEDİR (İzmir Institute of Technology/İzmir)
Prof.Dr. Noureddine DJEBLI (Mostaganem University/Algeria)
Prof. Dr. İlkay ERDOĞAN ORHAN (Gazi University/Ankara)
Prof. Dr. Mehmet KARATAŞ (Necmettin Erbakan University/ Konya)
Prof. Dr. Muhsin KONUK (Üsküdar University/İstanbul)
Prof. Dr. Canan NEBİGİL (Strasbourg University/France)
Prof. Dr. Besim ÖĞRETMEN (The Medical University of South Carolina/USA)
Prof. Dr. Temel ÖZEK (Anadolu University/Eskişehir)
Prof. Dr. VinodD. RANGARI (Guru Ghasidas Vishwavidyalaya University/India)
Prof. Dr. Belgin SÜSLEYİCİ (Marmara University /İstanbul)
Prof. Dr. Deniz TAŞDEMİR (GEOMAR Centre for Marine Biotechnology/Germany)
Assoc. Prof. Dr. Filippo MAGGI (Camerino University/ Italy)
Assoc. Prof. Dr. Gianni SAGRATINI (Camerino University/ Italy)
Assoc. Prof. Dr. Amir WASEEM (Quaid-i Azam University/Pakistan)
Dr. Ahmed M. MUSTAFA (Zagazig University/Egypt)

"call for paper"

Nobel Journals is one of the largest publishers in Turkey for academic scientific journals. Nobel Journals mission as an expert publisher is to create long-term partnerships with our clients that enhance learning, disseminate research, and improve the quality of professional practice.

Highlights

Online manuscript submission

Rapid publication

Fast, efficient reviewing

International collaborations

Abstracts of meetings

Article Pool

Now Inviting Submission

NOBEL SCIENCE

" SCIENCE CENTER OF TURKEY "

NOBEL INTERNATIONAL JOURNALS



IJSES

IJNES

IABS

Now Inviting Submition

www.nobel.gen.tr



INVITED SPEAKERS



Lentils (*Lens culinaris* Medik) as tool for a novel nutraceutical approach

¹**Gianni Sagratini**, ¹Giovanni Caprioli, ³Cinzia Cecchini, ²Carlo Cifani, ³Maria Magdalena Co-man, ³Alberto Cresci, ⁴Dennis Fiorini, ²Maria Vittoria Micioni Di Bonaventura,
¹Massimo Ricciutelli, ³Stefania Silvi, ¹Pilar Vila Donat, ³Sauro Vittori

¹School of Pharmacy, University of Camerino, Via Sant'Agostino 1, 62032 Camerino, Italy

²School of Pharmacy, Pharmacology Unit, University of Camerino, Camerino, Italy

³Synbiotec, Via Gentile III da Varano, Camerino, Italy

⁴School of Science and Technology, Chemistry Division, U. of Camerino,
Via S. Agostino 1, I-62032 Camerino, Italy

⁵School of Bioscience and Veterinary Medicine, University of Camerino,
Via Gentile III da Varano, Camerino, Italy

gianni.sagratin@unicam.it

Abstract

Legumes, which are a major component of the Mediterranean diet, are an important source of macronutrients such as proteins, carbohydrates, and dietary fibre. The Food and Agriculture Organization of the United Nations (FAO) declared 2016 the International Year of Pulses, highlighting the importance of these foods not only for their nutritional and healthy aspects, but also for their low environmental impact. Among the various bioactive compounds of legumes, saponins appear to be able to reduce the blood cholesterol levels. In our laboratories have been developed sensitive and specific analytical methodologies for evaluating the level of soyasaponins I and *bg* in lentils by using HPLC-MS/MS equipments. Saponins can be considered components of dietary fibre which are neither digested nor absorbed in the human small intestine; these components together with other carbohydrates present in lentils could possess an important prebiotic action. In this work we have evaluated the hypocholesterolemic and prebiotic activity of a lentil extract by monitoring the plasmatic cholesterol level in an animal model of diet-induced hypercholesterolemia and the concentration of bile acids excreted by faeces, both with the prebiotic effect by using an *in vitro* model.

Keywords: Lentils, legumes, saponins, hypocholesterolemic, prebiotic



Discovery of Cardioprotective Non-Peptide Prokineticin Receptor Agonist

¹**Prof. Dr. Canan Nebigil-Desaubry**

¹Director of Research at CNRS, University of Strasbourg, France

canandesaubry@gmail.com

Abstract

Prokineticins are angiogenic hormones that utilize two G protein-coupled receptors: PKR1 and PKR2. PKR1 plays a critical role for cardiovascular homeostasis and cardioprotection. Through a combination of *in silico* studies, medicinal chemistry, and pharmacological profiling approaches, *in vivo* preclinical mice model for myocardial infarction and cardiotoxicity, we describe first PKR1 agonist and demonstrated its cardioprotective activity. Identification of non-peptide PKR1 agonist that contributes to myocardial repair and collateral vessel growth hold promises for treatment of heart diseases.

Keywords: Prokineticins, cardioprotectivity, PKR1



Naturally Protection of Neurotoxic Effects of Heavy Metals “Experimental Studies in Mice”

1Noureddine Djebli

¹Pharmacognosy & Api phytotherapy laboratory, Mostaganem University, Algeria

djebli_n@yahoo.fr

Abstract

Human exposure to heavy metals is a global public health problem. Epidemiological studies have shown that occupational exposure to high doses have led to persistent clinical neurologic or neuropsychological abnormalities. A significant number of epidemiological studies on the neurodevelopmental effects of metal exposure have been published in the last twenty years. In spite of the efforts and of the scientific advances the human exposure to toxic metals continuous to occur, these mainly constitute a risk for the public health.

Rapid changes in life-style, environmental pollution and excessive use of fertilizers and hazardous toxic chemicals during the production of food materials, are seriously life threatening for human beings and causing health hazards. These toxic chemicals produce neurotoxins that affect the transmission of chemical signals between neurons resulting into neurodegenerating disorders. Currently there are no cures for neurodegeneration.

Plants and natural sources form the basis of today's modern medicine and contribute largely to the commercial drug preparations manufactured today. The objective of this study was to evaluate the in vivo protective effect of some medicinal plants on chronic intoxication induced by some heavy metals in mice with its concentration decreasing in brain and to characterize the effect of a hypothetical treatment of a model of neurodegeneratives disease after eleven weeks of chronic treatment with ingestion of Aluminium and lead by intraperitoneal.

The effects of herbs used on spatial memory performance in the test twice H, however, the potential effects on anxiety were tested in an elevated plus maze, those in a depression on the forced swimming test. The results show an attenuation of the behavioral disturbance and impaired spatial memory, after treatment with wheatgrass. In addition, histological examination of the cerebral cortex confirms cognitive attenuation.

Keywords: neurotoxic, heavy metals, neurodegeneratives diseases, medicinal plants, mice



Effect of N-Viro soil and Amonia (NH3) on Egg Hatch of Soybean Cyst Nematode (SCN), *Heterodera glycines Ichinohe*

¹Yaşar Alptekin, ²Richard Mac Riedel

¹Department of Plant Protection, Faculty of Agriculture, Kahramanmaraş Sütçü İmam University,
Kahramanmaraş, Turkey

²Department of Plant Pathology, The Ohio State University, 201 Kottman Hall,
2021 Coffey Road Columbus, Ohio, USA

alptekin69@ksu.edu.tr

Abstract

The soybean cyst Nematode (SCN), *Heterodera glycines Ichinohe*, is a devastating root pathogen of soybean. Symptoms of SCN can be confused with the symptoms of nutrient deficiencies, and chemical. Infected plants may exhibit chlorosis or be stunted and the ameliorating conditions such as nutrient supply and ample water are favorable to the pathogen. Chlorosis is caused primarily due to N deficiency as a result of suppression of *Rhizobium* nodule formation by the nematode infection. NVS is a municipal biosolid product in which human pathogens killed by an alkaline stabilization process combining alkaline pH, drying, high temperature, high ammonia and salts. Clear understanding of the mechanisms of egg hatch and environmental and chemical factors that influence egg hatch must be known to develop an effective management tactics for SCN. In this study, effects of N-viro leachates extracted from varying ages of N-viro soils and the impact of different concentrations of ammonia on the egg hatch of SCN in vitro were investigated. Age of N-viro soil was positively correlated with percent egg hatch of SCN *in vitro*. Egg hatch of SCN was suppressed by the leachates from 0 to 1 month-old NVS in which cumulative percent egg hatch was 0, and 1.48, respectively. Egg hatch was not affected in leachates from 3, 6, and 12 month-old NVS or in 3 mM zinc sulfate solution compared to distilled water at 24 hr. Average cumulative percent egg hatch was 3.36, 3.52, and 4.60 in leachates of 3, 6, and 12 month-old NVS, respectively, at 24 hr. All the concentrations of ammonia (0.001, 0.01, and 0.1 M) significantly ($P \leq 0.01$) suppressed emergence of J2 juveniles from SCN eggs compared to distilled water and 0.02 M phosphate buffer at 48 hr.

Keywords: Soybean Cyst Nematode (SCN), *Heterodera glycines*, N-viro soil (NVS), egg hatch



The morphological and anatomical investigation and quantitative analysis of *Hedysarum formosum Basiner* and *Hedysarum atropatanum Boiss*

¹Narmin Babayeva, ¹Cavanshir Isayev

¹Department of Pharmacognosy and Botany, Faculty of Pharmacy,
Azerbaijan Medical University, Baku, Azerbaijan

narabyeva91@gmail.com

Abstract

The genus *Hedysarum* is represented by 9 species in Azerbaijan. First investigation show that *Hedysarum formosum* Basiner and *Hedysarum atropatanum* Boiss. are most prospective species. The aim of this study is to investigate morphological and anatomical features of *H. formosum* Basiner and *H. atropatanum* Boiss. from flora of Azerbaijan. For the first time a detailed description of the species is reported in this study. The morphological features have been compared between two species. Anatomical studies have been carried out on cross-sections of roots, stems, leaves. The anatomical results show that the plants have secondary growth roots, protruding stems, amphistomatic and equifacial leaves with tannin. The hypodermis, which is located on a single layer under the upper and lower epidermis, has been identified at the transverse sections of the leaves. Under the lower and upper part of the stipule of *H. atrapatonum* are located superficial glandular hairs, cells filled with orange pigments, stomata, and calcium oxalate crystals throughout the surface of the vessels. The root of the plants have a secondary structure. The general view of the transverse section of the roots are round shaped. The phenolic constituents of extracts of herb of *H. formosum* and *H. atropatanum* were determined using HPLC.

Keywords: *Hedysarum*, anatomical study, quantitative analysis, phenolic compounds, HPLC



ONGUENT: Multidisciplinary Project on Medicinal Tar in the Mediterranean from Medieval Time to the Present

¹**Muhsin Konuk**

¹Üsküdar University, Faculty of Engineering and Natural Sciences, 34662-Üsküdar, Istanbul-Turkey

muhsin.konuk@uskudar.edu.tr

Abstract

Although wood tar is extracted from different sources in all over the world, this study will explain its story in the Middle East, northern Africa, and Europe. This talk will include the topics below:

- i. Strategies for management and use of plants involved in tar production and assessment environmental impact of such activity
- ii. Past and present knowledge, know-how and techniques
- iii. The chemical composition of tars of the various tar species
- iv. Inventory and comparison between past and present medicinal uses
- v. Identification and assessment of the real bioactivity
- vi. Assessment of the mid-term/long-term toxicity

Keywords: Wood tar, production, biological activity, usage in different continents



Mechanisms of Multidrug Resistance and Its Reversal in Hematological Malignancies

1Prof. Dr. Yusuf BARAN

¹Izmir Institute of Technology, Faculty of Science,
Department of Molecular Biology and Genetics, Izmir, Turkey

yusuf.baran@agu.edu.tr

Abstract

Chemotherapy is the most widely used treatment strategy for cancer which is the highest second reason for humanbeing deaths after heart related diseases. However, cellular resistance mechanisms developed by cancer cells and tissues in the beginning or proceeding times to applied anticancer agents is a significant problem preventing succesfull therapy. Resistance developed by cancer cells to structurally and functionally different cytotoxic agents is called as multi drug resistance. The resistance can be observed in the beginning of the treatment or during the treatment known as intrinsic or acquired resistance, respectively. The resistance phenotype is associated with the tumor cells that gain a cross-resistance to large range of drugs that are structurally and functionally different.

Drug resistance mechanisms have different molecular genetics and biochemical reasons depending on the applied drug and the type of cancer. Secondary genetic alterations and disorders in cancer cells may also result in drug resistance. That is why it has vital importance to study and consider all signaling pathways, in multidrug resistance of cancer.

Multidrug resistance raises via many unrelated mechanisms, such as overexpression of energy-dependent efflux proteins, decrease in uptake of the agents, increase or alteration in drug targets, alterations in cell cycle checkpoints, inactivation of the agents, compartmentalization of the agents, inhibition of apoptosis, increases in DNA repair mechanisms, problems related with drug metabolism and aberrant metabolism of bioactive sphingolipids. Exact elucidation of resistance mechanisms and molecular and biochemical approaches to overcome multidrug resistance have been a major goal in cancer research. In this talk, we will explain the mechanisms contributing multidrug resistance in cancer chemotherapy and also touche on the approaches for reversing the resistance.

Keywords: Multidrug resistance, hematological malignancies



ORAL PRESENTATIONS



Pharmacogenetics: Implementing Personalized Medicine in Turkish Clinical Practice

^{1,2}Prof. Dr. Belgin Süsleyici

¹Marmara University Faculty of Science and Arts, Biology Division, Department of Molecular Biology, Istanbul-Turkey.

²TSPPT (Turkish Society for Pharmacogenomics and Personalized Therapy), President

belgin.susleyici@marmara.edu.tr

Abstract

The vision of precision medicine is compelling for the future of medical care. Precision Medicine foresees the use of molecular data to classify disease, to treat patients with more efficacy and specificity and fewer adverse events, to facilitate the development and validation of new targeted therapies and to more accurately determine disease predisposition. Pharmacogenetics and pharmacogenomics have been widely recognized as fundamental steps toward personalized medicine and deal with genetically determined variants in how individuals respond to drugs, and hold the promise to revolutionize drug therapy by tailoring it according to individual genotypes.

The clinical need for novel approaches to improve drug therapy derives from the high rate of adverse reactions to drugs and their lack of efficacy in many individuals that may be predicted by pharmacogenetic analysis in Turkey. The clinical utility and applications of pharmacogenetics and pharmacogenomics are at present particularly evident in oncology, psychiatry, cardiology, physical therapy and rehabilitation, chest disease, neurology, endocrinology etc. and the results obtained in our strategic pilot Project have demonstrated that the genetic and molecular foundations of personalized medicine appear solid and evidence indicates its clear importance in healthcare system and economy.

Keywords: Personalized Medicine, pharmacogenomics



Genetic Susceptibility for Hypermetropia within a Population From Eskişehir

¹Huseyin Gursoy

¹Ophthalmology Department, Eskisehir Osmangazi University, Eskisehir, Turkey

hhgursoy@hotmail.com

Abstract

The aim was to evaluate the genetic susceptibility for hypermetropia within a population from Eskisehir. 45 hyperopic (group 1), 76 emmetropic (group 2) cases aged between 18 and 40 years old were included. The accepted range for emmetropy in the study was -0.50 D to +0.50 D. Cases with corneal and/or lenticular diseases (keratoconus etc.), myopia-related genetic disorders (Marfan Syndrome, retinitis pigmentosa etc.), history of ocular trauma, history of previous intraocular surgery, history of retinopathy of prematurity were excluded. A total of eleven polymorphisms in *vitamin D receptor* (*VDR*), *mitochondrial fusion protein-1* (*MFN1*) and *hepatocyte growth factor* (*HGF*) genes were investigated. SNaPshot (Minisecans) technique was used for genetic analysis. Statistically significant differences were found in four polymorphisms out of eleven among two groups: rs3819545 (p = 0.003) and rs2239182 (p = 0.039) SNP regions in *VDR* gene, rs7041 SNP region in *group-specific component (vitamin D binding protein)* gene (p = 0.009), rs3735520 SNP region in *HGF* gene (p = 0.030). Our results support that genetic susceptibility may be a risk factor for hypermetropia. Further studies including more subjects are required to support our findings.

Keywords: Genetics, hypermetropia, Eskisehir, polymorphism



Comparison of structural ANK1 gene expression differences in twelve different muscle groups

1Mehmet Cevat Temizkan

¹Ankara University, Institute of Health Sciences, Department of Genetics, Ankara, Turkey

cevata@hotmail.co.uk

Abstract

The research was carried out with the aim of detecting the expression of the cell-structural ANK1 gene between different muscle groups of the bovine skeletal muscle. In the present study, 15 Angus were used in the same age and gender, and 12 different muscle groups were sampled which were offered for consumption. Gene expression values of ANK1 analyzed by using qPCR. Our findings reveal that ANK1 gene expression was found significantly higher ($p < 0.001$) in high quality muscles like m. psoas major comparing with low quality muscles like m. extensor digitorum. Furthermore, the trend of ANK1 gene expression has shown decrease from high to low quality muscles. In this regard, the effects of ANK1 gene on meat quality seem high and may have been underestimated because of its trend and significant differences between high and low quality muscles based on this study.

Keywords: ANK1, qPCR, Gene expression, Skeletal muscles, Muscle groups, Bovine



**Bacterial Cellulose production by a native
Komagataeibacter intermedius isolate**

¹Kübra Erçalışkan, ²M. Türkay Aytekin, ¹Kıymet Güven

¹Department of Biology, Science Faculty, Anadolu University, 26470 Eskişehir, Turkey

²Department of Physics, Science Faculty, Anadolu University, 26470 Eskişehir, Turkey

kguven@anadolu.edu.tr

Abstract

Although bacterial cellulose has the same chemical structure as plant cellulose, it is a biopolymer whose molecular structure and physical properties are superior. The use of bacterial cellulose, especially in medicine and pharmacy, is rapidly increasing. In this study, isolation of native acetic acid bacterial species capable of producing bacterial cellulose from homemade vinegar and then bacterial cellulose production with high efficiency were aimed. Bacterial cellulose production was carried out in both static and agar culture with the isolate identified as *Komagataeibacter intermedius* by 16S rDNA sequence analysis. The specific product yield coefficient, water retention capacity of the bacterial cellulose sample was examined and scanning electron microscope (SEM) images were obtained. In addition, characteristics of the cellulose sample produced in the static culture were characterized by Elementel Analysis, CP / MAS 13C solid NMR, TGA, FT-IR and XRD analyzes. This study showed that the yield of 22% bacterial cellulose obtained was higher than those obtained with similar studies of *Komagataeibacter intermedius* isolates and this is the first record of the Turkish isolate of the bacterium for bacterial cellulose production.

Keywords: Bacterial cellulose, *Komagataeibacter intermedius*, fermentation, homemade vinegar



FOXP3 rs3761548 Polymorphism is Associated with Osteoarthritis in a Turkish Population

1Aslihan Esra Bildirici, 1Nilgün Cekin, 1Ergun Pinarbasi, 2Zekeriya Oztemur, 1Seyda Akin

¹Department of Medical Biology, Medicine Faculty, Cumhuriyet University, Sivas, Turkey

²Department of Orthopaedics and Traumatology, Cumhuriyet University, Sivas, Turkey

aslihanbildirici@hotmail.com

Abstract

Functional polymorphisms located in the FOXP3 intron was found to be associated with rheumatoid arthritis (RA) recently. Although RA is a autoimmune disease there are supporting evidence that activated maladaptive responses including pro-inflammatory pathways play roles in Osteoarthritis (OA) similar to RA. The aim of this study was to explore the relationship between -924A/G (rs2232365) and -3279C/A (rs3761548) polymorphisms as well as possible changes in 600 bp promoter region of FOXP3 and OA. Patients with OA ($n = 300$) and healthy individuals ($n = 300$) were examined for -3279C/A and -924A/G FOXP3 gene polymorphisms by the polymerase chain reaction-restriction fragment-length polymorphism method. The 600 bp promoter region (between -500 and +100) of the gene was also sequenced with direct sequencing in 50 OA patients and 50 healthy individuals. There were no sequence variants in the promoter region tested both in OA patients and healthy controls. The SNP -924A/G showed no association with OA susceptibility and severity and the results of other genetic models were also nonsignificant.. On the other hand -3279 CA ($p=0.003$), CC+AA ($p=0.0014$) as well as CA+AA ($p=0.40$) genotypes showed association with Grade 4 OA patients. Our findings indicated that the association between FOXP3 -924A/G polymorphism and OA tended to yield negative result but the FOXP3 -3279A allele was associated with elevated risk of OA in Grade 4 OA patients in the Turkish population.

Keywords: Osteoarthritis, FOXP3, polymorphism, promoter, Turkish population



Familial Mediterranean Fever in patients from Tokat city of Turkey; sequencing results of whole exons of MEFV gene.

¹Nilgün Cekin, ¹Ergun Pinarbaşı, ¹Aslihan Esra Bildirici, ¹Seyda Akin, ²Koksal Deveci

¹Cumhuriyet University, Faculty of Medicine, Department of Medical Biology, Sivas, Turkey

²Gazi Osman Paşa University, Faculty of Medicine, Department of Medical Biology, Tokat, Turkey

nilgun_cekin@yahoo.com

Abstract

Familial Mediterranean Fever is a common hereditary disease that affects people from the Mediterranean region, including Turks, Armenians, non-Ashkenazi Jews, Arabs, and, less commonly, Greeks and Italians. It is characterized by recurrent episodes of fever, abdominal and pleuritic pain, arthritis and cutaneous rashes. Most studies investigating MEFV gene mutations in FMF patients mainly concentrated on common mutations of exons 2,3,5 and 10 of the gene. Here we report the sequencing results of 10 exons of MEFV gene in 100 FMF patients from Tokat city of Turkey. A total of 10 different mutations were detected in heterozygous, homozygous and compound heterozygous type. The most common mutation were found to be M694V and E148Q. These two mutations were found to be higher in females. There are many polymorphic variants of the gene that was detected either in complex form or accompanied with a mutation. P588P, D510D, Q476Q, E474E, R314R and G138G were the most common polymorphic variants observed among patients. Distribution of these polymorphic variants among males and females are almost equal. The most complex polymorphic variants were E474E het/Q476Qhet/D510Dhet, E474Ehom/Q476Qhom/D510Dhom, D102Dhet/G138Ghet/A165Ahet/R202Qhet, D102Dhom/G138Ghom/A165Ahom/R202Qhom, D102Dhom/G138Ghom/A165Ahom/R202Qhet were seen in 21, 18, 11, 3 and 3 patients respectively.

Keywords: Familial Mediterranean Fever, polymorphism, whole exons



Phylogenetic assessment of *Melanoleuca* species (Fungi: Basidiomycota) in Turkey and identification of *Melanoleuca angelesiana* as a first record

1Aysenur Kalmer, 2Ismail Acar, 1Ayten Dizkirici Tekpinar

¹Department of Molecular Biology and Genetics, Van Yüzüncü Yıl University, 65080, Van, Turkey

²Department of Organic Agriculture, Başkale Vocational High School,
Van Yüzüncü Yıl University, 65080, Van, Turkey

aysenurkalmer@gmail.com

Abstract

Melanoleuca Pat. is an edible macrofungus genus classified in the Tricholomataceae family. During identification of the species, many incorrect determinations were done because of morphological similarities among them. Some researchers divided the genus into three subgenera, *Acystis*, *Urticocystis* and *Melanoleuca*, by using traditional classification. However, the number of subgenus was reduced from three to two, *Urticocystis* and *Melanoleuca*, when both morphological characters and molecular techniques were studied. In the current study, taxonomic positions of species within the *Melanoleuca* genus were evaluated based on morphological characters and the sequences of nuclear ribosomal Internal Transcribed spacer (nrITS) region. Twenty samples, representatives of 13 species, were studied and structures of pileus, stipe, lamellae, and basidia, cystidia, spores were used as macroscopic and microscopic features, respectively. Phylogenetic tree was constructed based on nucleotide variations via the Maximum Likelihood (ML) methods and two major clades with high bootstrap values were formed, clade A and clade B. Clade A consisted of four of studied species (*M. communis*, *M. heterocystidiosa*, *M. arcuata* and *M. polioleuca*) which are found in subgenera *Melanoleuca* and Clade B consisted of nine of them (*M. brevipes*, *M. dryophila*, *M. substrictipes*, *M. paedida*, *M. grammopodia*, *M. exscissa*, *M. angelesiana*, *M. graminicola*, and *M. microcephala*) which located in subgenera *Urticocystis*. Within studied species, *Melanoleuca angelesiana* was firstly reported for mycobiota of Turkey. It is distinguished from other species by greenish-brown stipe, amiloid warts, grey lamellae and central hill pileus and grouped with its representative in the constructed tree.

Keywords: Phylogeny, ITS, fungal taxonomy, *Melanoleuca*, new record



Tamoxifen loaded solid lipid nanoparticles in reversing of tamoxifen-resistance: microRNA expression profiles

¹**Gamze Guney Eskiler**, ²**Gulsah Cecener**, ²**Unal Egeli**, ²**Berrin Tunca**

¹Department of Medical Biology, Faculty of Medicine, Sakarya University, Sakarya, Turkey

²Department of Medical Biology, Faculty of Medicine, Uludag University, Bursa, Turkey

gamzeguney@sakarya.edu.tr

Abstract

microRNAs (miRNAs) play a key role in cancer progression, metastasis, and therapeutic resistance due to regulating the expression and function of their related target genes. Dysregulations of many miRNAs associated with tamoxifen (Tam) resistance have been identified in breast cancer. Solid lipid nanoparticles (SLNs) have received considerable attention from cancer researchers for reducing adverse side effects and overcoming drug resistance. In the present study, we investigated the levels of Tam and Tam loaded SLNs response-related miRNAs including miR-101, miR-497 and miR-519a in MCF7 and MCF7-TamR (tamoxifen resistance) cells. We found that miR-497 was significantly overexpressed, while miR-101 and miR-519a were markedly underexpressed in MCF7 cells treated with Tam and Tam-SLNs ($p<0.05$). However, the level of miR-497 was decreased, whereas the expression of miR-101 and miR-519a were significantly increased in MCF7-TamR cells due to acquired resistance to Tam. When MCF7-TamR cells were treated with Tam-SLNs, the miR-101 and miR-519a expression level were decreased, while the expression of miR-497 was significantly up-regulated ($p<0.05$). Thus, Tam-SLNs overcome drug resistance by altering Tam- resistance-associated miRNA expression.

Keywords: Breast cancer, tamoxifen, drug resistance, solid lipid nanoparticles, miRNA



Genotoxic effect of Azadirachtin on greater wax moth *Galleria mellonella* (Lepidoptera: Pyralidae)

¹Emine Duman, ²Hülya Altuntaş

¹Department of Biology, Faculty of Science, Karadeniz Technical University, Trabzon

²Department of Biology, Faculty of Science, Anadolu University, Eskişehir Turkey

Abstract

In order to eliminate the ecological and economical losses resulting from synthetic insecticides used in pest management, there are plant-based insecticides among the alternatives to be used instead of these chemical compounds. These bioinsecticides are safer than chemical pesticides due to no left residue, rapid degradation in environment, and low toxicity against vertebrates. In this study, single cell gel electrophoresis (COMET) assays were performed to determine the genotoxic effects of the azadirachtin (AZA), belonging to tetrnortriterpenoid (limonoid) family and obtained from *Azadirachta indica* (Neem, Meliaceae), on the larval hemocytes of model insect and storage pest *Galleria mellonella* L. (Lepidoptera: Pyralidae). For this purpose, effective AZA doses (0.5, 1, 1.5 and 2 µg/larva) given to the wax moth, *G. mellonella* larvae via force feeding were investigated. DNA damage indicators which are tail intensity, tail moment and tail migration, increased in dose-depending manner on the AZA when compared with the untreated larval hemocytes. Consequently, the results show that AZA caused significant damage in the genome of *G. mellonella* larvae depend on doses.

Keywords: Azadirachtin, *Galleria mellonella*, COMET, genotoxicity



Assessment of practice of pedigree drawing and application of standardized patient in medical faculty students

^{1,2}**Sezgin Gunes**, ¹Gulgez Neslihan Taskurt Hekim and ¹Asli Metin Mahmutoglu

¹Department of Medical Biology, Ondokuz Mayis University, Samsun, Turkey

²Department of Molecular Medicine, Ondokuz Mayis University, Samsun, Turkey

sgunes@omu.edu.tr

Abstract

Drawing a pedigree is a useful and effective tool in medical genetics and has an important place in the medical education. The aim of this study is to share the our feedbacks of the pedigree drawing practice of 3rd year students with a standardized patient applied in professional training skills program at Ondokuz Mayis University, Faculty of Medicine between academic years 2012-2017. A total of 583 medical faculty students asked appropriate questions to a standardized patient and drew a family tree. At the end of the practice students were asked to fill an evaluation form. Propositions on the form were rated according to the 5-Likert scale. A general assessment on the forms was also included. Correlation between scoring and the use of standardized patient were investigated with χ^2 test. Of the 566 students, 97.08% rated strongly agreed or agreed for that appropriate tools and equipments were used in the practice. The attitude of the instructor was evaluated appropriate, representing 98.11% of the participants. About 97.09% of the respondents (n=569) reported that the time of practice was enough. These skills were reported as necessary and were able be to used in their professional life, representing 82.19% and 78.35% respectively. No correlation was found between scoring of propositions and the application of standardized patient. As a consequence of this study applied family tree drawing trainings were evaluated positively by the students and standardized patient use did not make any differences in student evaluations.

Keywords: Pedigree, medical education, standardized patient, feedback



First record of subgenus *Mesoplophora* (*Mesoplophora*) Berlese, 1904 (Acari, Oribatida) from Turkey

¹Şule Baran, ¹Merve Yaşa

¹Sakarya University, Faculty Arts and Sciences, Department of Biology, Sakarya, Turkey

sbaran@sakarya.edu.tr

Abstract

Although Oribatid mites may occur in considerable numbers in the above ground parts of vegetation, among aquatic plants, in the marine littoral zone, in stored food, and in house dust, they are mainly soil living microarthropods and consist of about 11,000 described species worldwide. Organic layers of temperate forests with predominance of fungal over bacterial decomposition accommodates the highest diversities of oribatids. Oribatid mites have an important role in mineralization and decomposition of plant residues in soils and they can also be used as bioindicator. They show a high degree of diversity in morphology, habit and habitat. Studies concerning the oribatid mite fauna of Turkey are so restricted and approximately 250 oribatid mite species recorded from Turkey up to date. There is need for much more work to clarify the diversity and distribution of oribatid mites in Turkey. The subgenus *Mesoplophora* (*Mesoplophora*) Berlese, 1904 contains twenty five species and firstly recorded from Turkey. Previously only one species belonging to the genus *Mesoplophora*; *Mesoplophora* (*Parplophora*) *pulchra* Sellnick, 1928 was recorded from Turkey in 1985 by Niedbala. In this study redescription and Scanning electron microscopy investigations of the firstly recorded species *Mesoplophora* (*Mesoplophora*) *michaeliana* Berlese, 1904 is provided. Morphological features our specimens are in accordance with those of previously studied specimens.

Keywords: Acari, Oribatida, *Mesoplophora*, first record, Turkey



Reconstruction of Three-Dimensional Artificial Human Skin Models for Pharmacological Testing

¹**Beste Kinikoglu**, ²**Odile Damour**

¹Acibadem University, School of Pharmacy and School of Medicine, Istanbul, Turkey

²Université de Lyon, Faculty of Pharmacy, Lyon, France

Beste.Kinikoglu@acibadem.edu.tr

Abstract

Tissue engineered, three-dimensional (3D), artificial human skin models have various applications in the clinic and in the laboratory. They have been successfully used in the clinic for the treatment of chronic wounds and burns. In the laboratory, they furthermore serve as *in vitro* models to elucidate the mechanisms of action of active substances and to test the innocuity as well as the efficacy of finished products such as drugs and cosmetics in the pharmaceutical industry and dermocosmetology. In this study, various full-thickness artificial human skin models developed in our laboratory are presented. These 3D skin models were reconstructed by the co-culture of human skin fibroblasts, keratinocytes, melanocytes, adipocytes and Langerhans cells in a collagen-based porous scaffold. Histological, immunohistological and transmission electron microscopic analyses of these skin substitutes demonstrated the expression of markers characteristic of epidermal differentiation (keratin 10), and also the presence of a pluristratified epidermis including a stratum corneum and an ultrastructurally well-organized basement membrane expressing laminin 332. The synthesis of new extracellular matrix by the fibroblasts was also demonstrated. These 3D human skin models are very similar to native skin, reproducible and can be used in pharmacotoxicological trials as an alternative to animal experimentation.

Keywords: Artificial skin, cell culture, pharmacological testing, skin tissue engineering



Neuroprotective Effects of Boric Acid Against Fluoride Toxicity on Rat Synaptosomes

1Ceyhan Hacıoğlu, 1Fatih Kar, 1Güngör Kanbak

1Eskisehir Osmangazi University, Faculty of Medicine, Department of Medical Biochemistry
ceyhanhacioglu@gmail.com

Abstract

Fluoride toxicity primarily contributes to the production of reactive oxygen and nitrogen derivatives, triggering cell death pathways by causing lipid peroxidation and DNA damage. Boric acid (BA) contributes to preservation of membrane integrity and function and maintenance of redox balance due to its high affinity to some metabolites in the organism. Synaptosomes have provided valuable information about the molecular mechanisms underlying neurotransmitter release, aging, and the pathogenesis of neurodegenerative diseases, and thus become a useful tool for monitoring molecular and bioenergetic changes in synapses. The aim of this study was to investigate the protective effect of boric acid (25mM) on neurodegenerative processes against the toxic effects of sodium fluoride (NaF; 20, 40 and 80mg/L concentrations) administered at different doses on rat brain synaptosomes. Synaptosomes obtained from the rat frontal cortex were administered NaF at different doses and the parameters of malondialdehyde (MDA), superoxide dismutase (SOD), Na/K ATPase and DNA fragmentation were measured spectrophotometrically to determine the most toxic dose. There was a statistically significant difference between the measurement parameters, when the 80mg/L NaF group was compared with the control group ($P < 0,001$). In our previous studies, we found a dose of protective properties of 25mM concentration of boric acid. We found an improvement of 46.6% in MDA, 45% in SOD, 50% in Na/K ATPase and 68% in DNA fragmentation when compared to the 80mg/L NaF+25mM BA with 80mg/L NaF toxic dose group. In conclusion, it was found that BA has neuroprotective effects against cellular damage caused by NaF.

Keywords: Sodium fluoride, cellular damage, boric acid, neuroprotection.



Analysis of Breast Tru-cut Biopsies by Applying Immunohistochemical Study of Myoepithelial Markers and Estrogen Progesterone Receptors

¹Mecdi Gurhan Balci, ¹Mahir Tayfur

¹Department of Pathology, Faculty of Medicine, Erzincan University, Erzincan, Turkey
gurhanbalci@hotmail.com

Abstract

Breast cancer is the most common and most frequent cause of death in women. The most common type of breast cancer is invasive ductal carcinoma. The most important features in the diagnosis of breast cancer are atypical cellular features such as invasion, desmoplasia, pleomorphism, hyperchromasia, nuclear irregularity. Loss of myoepithelial layer in malignant cases is a very important feature in the diagnosis. 52 breast tru-cut biopsy materials were reviewed between 2015 and 2017 years. 29 cases had been reported as malignant epithelial tumors. 23 cases had been reported as benign disease such as fibroadenoma, adenosis, fibrosis, fibrocystic changes. Calponin, P63, CK5/6, E-cadherin, estrogen, progesterone and c-erbB2 immunohistochemical markers were performed in all cases. The age range was 19–64 year in benign cases and 33–81 in malignant cases. The mean age was 33.6 year in benign cases and 57.5 in malignant cases. The most common age group was 30–40 year in benign cases and 50–60 in malignant cases. Immunohistochemical studies of Calponin, P63, CK5/6 showed that the myoepithelial layer disappeared in malignant cases. Microglandular adenosis is a benign lesion showing loss of staining in the myoepithelial layer. Its differential diagnosis was made from cancer with the absence of cellular atypia and the absence of staining with estrogen and progesterone receptors. We shared the results of 52 breast biopsy materials between 2015-2017. It was emphasized that the combined immunohistochemical study of breast tru-cut biopsies would improve diagnostic efficiency.

Keywords: Breast, cancer, immunocytochemical study



The new perspective neuroprotective effect of boric acid against ethanol-induced oxidative damage on synaptosome

¹Fatih Kar, ¹Ceyhan Hacıoğlu, ¹Mete Özkoç, ¹Növber Üstünışık, ¹Arda Bütün, ¹Sema Uslu,
¹Güngör Kanbak

¹Medical Biochemistry, Faculty of Medicine, Eskişehir Osmangazi University, Eskişehir

fkar@ogu.edu.tr

Abstract

In this study, the effects of ethanol toxicity (200 mM) in vitro and the application of boric acid (BA) (5, 10 and 25 mM) at different doses were investigated for potential protective and antioxidant roles on rat brain synaptosomes. Synaptosomes were used as a sample of five groups (control, ethanol, ethanol+5 mM BA, ethanol+10 mM BA, ethanol+25 mM BA), which include six samples. Malondialdehyde (MDA), Nitric Oxide (NO) levels and Catalase (CAT) activity were measured as oxidative stress markers in ethanol-induced oxidative stress in rat brain synaptosomes. The levels of MDA significantly increased in the ethanol-treated synaptosomal samples, as compared those in the control samples. However, the levels of MDA significantly decreased in the BA-treated groups having a greater effect with the highest concentration (25 mM) of BA used ($P<0.05$). The levels of MDA in the ethanol-treated + boric acid (25 mM) group were found to be significantly lower than in the ethanol-treated group ($P<0.05$). The CAT activities of the ethanol-treated group were higher than in control group, and the CAT activities of the BA (5 mM, 25 mM) groups were found to be close to that of the control groups ($P<0.01$). NO levels in ethanol-treated groups were slightly decreased as compared to control groups but not statistically significant. Nevertheless, NO levels in ethanol-treated + boric acid (25 mM) groups were increased ($P<0.05$). In conclusion, our data showed that BA treatment might be neuroprotective effective against ethanol-induced neurotoxicity as antioxidant properties.

Keywords: Boric Acid, ethanol, synaptosome, oxidative stress, neuroprotective effect



The Effects of Metformin on LPS-Induced Kidney Damage in Rats

¹Ezgi Yaver, ¹İ. Özkan Alataş, ²Varol Şahintürk, ³Semih Öz

¹Department of Medical Biochemistry, Faculty of Medicine, Osmangazi University, Eskişehir

²Department of Histology and Embryology, Faculty of Medicine, Osmangazi University, Eskişehir

³Vocational School of Health Services, Eskişehir Osmangazi University, Eskişehir

eyaver@ogu.edu.tr

Abstract

Metformin is a commonly used oral Type II diabetes drug around worldwide. It mainly exhibits anti-hyperglycaemic effect by suppressing hepatic gluconeogenesis. Metformin is substantially excreted by the kidney. Beyond low cost and limited side effects, metformin has also anti-aging, anti-cancer and anti-inflammatory properties. In this study, it was aimed to investigate the effects of metformin on renal tissue after LPS-induced renal injury in rats. 30 male *Sprague Dawley* rats were used in the study. Rats divided into 5 groups; randomize control (n=6), only LPS injected (LPS, n=6), metformin given one hour before LPS injection (protective group, n=6), metformin given one hour after LPS injection (treatment 1 group, n=6) and metformin given three hours after LPS injection (treatment 2 group, n=6). Metformin and LPS, 200mg/kg and 5mg/kg respectively, were injected intraperitoneally to the rats. 24 hours after LPS administration, the rats were sacrificed and their blood and kidney tissues were removed. Creatinine, blood urea nitrogen (BUN) and lactate dehydrogenase (LDH) levels were determined in serum samples. Malondialdehyde (MDA) and myeloperoxidase (MPO) enzyme levels were measured in kidney tissues of rats. In addition, kidney tissues were examined histologically by hematoxylen-eosin (H-E) dye method. When biochemical and histopathological results were evaluated, it was determined that LPS caused damage to the kidneys of rats. However, it was observed that this damage decreased considerably in the metformin-given rats. Especially the rats in protective group had the closest results to control group and metformin has been shown to have a protective effect against inflammatory damage.

Keywords: Kidney, Lipopolysaccharides, Metformin, Rat



Comparison of Scanning Electron and Fluorescence Microscopy for Biofilm Formation on Titanium Implants

¹Arzu Erol

¹Bülent Ecevit University, Department of Molecular Biology and Genetics, Zonguldak

erol.arzu@yahoo.com

Abstract

Bacterial biofilms are integrated, single- or multi-species communities of cells that play profound roles in human dental disease. The formation of biofilms requires interactions between bacteria and the surfaces they colonize, and the surface can specifically impact the structure, function, and composition of these communities. Investigating biofilm formation *in situ*, their assembly kinetics, and particularly identifying substances that could interfere with or inhibit biofilm growth is thus a major scientific and practical goal. The most method for enumeration and morphological observation of biofilm formation on surface is microscopy. This includes direct counting methods such light microscopy as fluorescence, scanning electron microscopy. If the biofilm is thin, direct fluorescence microscopy is the most feasible method, using specific dyes. Biofilm of more than 3-4 μm thickness usually cannot be handle with common light microscopes. Scanning elektron microscopy provides another technic fort he investigation of biofilm formation. However, it must be taken into account that the process of sample preparation includes complete dewatering. This article presents a 24 h *in situ* biofilm formation on laser treated Titanium specimens detection by SEM and Flourescence microscopy. Microscopy data demonstrate that the bacterial cells and resultant biofilm specifically target.

Keywords: Ti, SEM, FM, Biofilm formation



Isolation, Identification and Characterization of Thermoalkaliphilic *Bacillus paralicheniformis* strain FMB2

¹Fatma Matpan Bekler, ²Kemal Giiven, ³Reyhan Güle Güven

¹Dicle University, Science Faculty, Department of Biology, 21280 Diyarbakır/Turkey

² Dicle University, Science Faculty, Department of Molecular Biology and Genetics,
21280 Diyarbakır/Turkey

³ Dicle University, Education Faculty, Science Teaching Section, 2
1280 Diyarbakır/Turkey

fatmatpan@hotmail.com

Abstract

In this study, *Bacillus paralicheniformis* strain FMB2 isolated from Sorgun hot spring in Turkey. Isolation, identification and characterization were carried out by conventional methods such as morphological, physiological, biochemical and also 16S rRNA gene sequencing. In phenotypic characterization, the novel strain FMB2 was found to be an aerobic, Gram-positive, rod shaped and endosporeforming. The isolate FMB2 was positive for catalase, indole, oxidase, citritase, urease, and starch hydrolysis, while it was negative for casein and gelatine hydrolysis. Furthermore, the strain grew at 30-70 °C (optimum temperature at 50 °C), pH 7.0-12.0 (optimum growth at 9.0), and incubation period for bacterial growth at 24 h, and to tolerate up to 2% (w/v) NaCl. The result of 16S rRNA gene sequence analysis showed that, the strain FMB2 related to the *Bacillus paralicheniformis* (99.65% similarity). According to phenotypic and phylogenetic analyses, this strain represents a novel species within the genus *Bacillus*, for which the name *Bacillus paralicheniformis* is proposed, with type strain FMB2 (GenBank accession number is KP992870). This strain was found to produce biotechnologically important enzymes for industrial application.

Keywords: *Bacillus paralicheniformis*, isolation, thermoalkaliphilic, 16S rRNA



The effects of pulp extract of *Nigella sativa* L. on angiogenesis

¹Gamze Tan

¹Department of Biology, Faculty of Science, and Letters, Aksaray University, Aksaray, Turkey
gamzetan2003@yahoo.com, gamze.tan@aksaray.edu.tr

Abstract

Phytotherapeutic approaches have been used to treat many diseases and disorders since time immemorial. Plant-based research efforts have still been attracting much attention and studies in this area has gained momentum in recent years. Among medicinal plants, *Nigella sativa* L. draws attention with its therapeutic effectiveness from medical perspective thanks to their radical scavenging, antibacterial and anticancer properties. The vast majority of studies with plant extracts are limited by determining the active constituents of the plant or by testing its effectiveness *in vitro* conditions. In addition, most studies on *Nigella sativa* L. in the relevant literature had been conducted with *Nigella sativa* L. seed extract or its essential oil. Therefore, this study aimed to investigate the antiangiogenic activities of the extract, which is obtained from the *Nigella sativa* L. pulp produced as a by-product of the oil production, on biological model system. The antiangiogenic properties of the pulp extract were tested on *in ovo* models of chick chorioallantoic membrane via VEGF-induced vascularization. In order to induce abnormal vascularization and development conditions, 10 ng/mL VEGF was injected into chorioallantoic membranes. *Nigella sativa* L. pulp extract was then applied at different concentrations (0-500 µg/mL). The VEGF-treated group showed an increase in all selected vascularization parameters compared to non-treated group. The results revealed that *Nigella sativa* L. pulp extract (especially at 100 µg/mL concentration) significantly reduced vascular parameters approximately in half in VEGF-treated groups ($p < 0.05$). *Nigella sativa* L. pulp extract also limited the VEGF-induced development as well. This study has a guiding role regarding the further studies on biological activity of other plants' pulp extracts.

Keywords: *Nigella sativa*, Antiangiogenic activity, Pulp extract, Vascular endothelial growth factor, Chick chorioallantoic membrane



Relations of animal needs index parameters with milk production in dual purpose cows in the Middle Black Sea region conditions

¹Cigdem Durmaz, ²Savas Atasever

¹Department of Animal Science, Graduate School of Natural and Applied Sciences,
Ondokuz Mayis University, Samsun, Turkey

²Department of Animal Science, Faculty of Agriculture,
Ondokuz Mayis University, Samsun, Turkey

satasev@omu.edu.tr

Abstract

The objective of this research was to reveal the influence of animal needs index (ANI) parameters with lactation milk yields (LMY) of Simmental and Brown Swiss cows. A total of 51 farms located in Kavak region of Samsun province of Turkey was investigated. Herds were visually scored using a 100 point scale by ANI parameters those consist of locomotion (L), social interaction (SI), flooring (F), barn conditions (BC) and stockmanship (S). While LMY was not affected by the parameters, Kendall's tau-b correlation coefficient of HS with LMY found to be significant ($P<0.05$; $r= 0.204$). The overall ANI and LMY means were calculated to be 74.05 ± 1.69 points and 3266.441 ± 120.313 kg, respectively. To boost productivity of herds, new regulations on the management are suggested.

Keywords: Animal needs index, comfort, cow, milk yield



Monthly variation of the oribatid mite genus *Eupterotegaeus* Berlese, 1916 collected from Kocaeli province of Turkey

¹Merve Yasa, ¹Şule Baran

¹Sakarya University, Faculty Arts and Sciences, Department of Biology, Sakarya, Turkey

merve.yasa1@ogr.sakarya.edu.tr

Abstract

Oribatid mites are one of the largest and diverse group in soil and they have a worldwide distribution. Oribatids have important roles in soil ecosystem such as organic matter decomposition, nutrient cycling, and soil formation. Climatic factors like rainfall, soil moisture, temperature and solar radiation effect the abundance of these mites. Temperature and moisture have great effect on oribatid mites because like other invertebrates they are exothermic and have limited tolerance to desiccation. The tolerance to moisture differs one species to another and also differs according to life stages within a species. Oribatid mites belonging to genus *Eupterotegaeus* prefer warmer environments and usually live on moss and rotting logs. They feed on moss, fungi and lichens. Genus *Eupterotegaeus* has nine known species around the world. This study comprises the investigation of relationship between the climatic factors and the monthly abundance of the species. The analysis put in evidence that the correlation between environmental conditions and the occurrence of *Eupterotegaeus* is strong. While there is a positive correlation between temperature and number of individual, there is a negative correlation between rainfall and number of individual. The number of individual slightly increases at the humidity decreases.

Keywords: Acari, Oribatida, *Eupterotegaeus*, monthly variation



Ethanol extracts of *Salvia kroenenburgii* have a wound healing effect on excisional and incisional wound models in diabetic rats

¹Sevda Guzel, ²Yusuf Ozay, ³Ebru Gokalp-Ozkorkmaz

¹Department of Pharmacognosy, Faculty of Pharmacy, Mersin University, Mersin, Turkey

²Department of Medical Biology, Faculty of Medicine, Adiyaman University, Adiyaman, Turkey

³Faculty of Health Sciences, Ankara Yildirim Beyazit University, Ankara, Turkey

egozkorkmaz@ybu.edu.tr

Abstract

Although several chemical agents are available for the treatment of diabetes, medicinal plants are still being investigated for their beneficial effects. Used in folk medicine, *Salvia* species are tried for their anti-inflammatory, antioxidative, antiproliferative effects and also for the treatment of wound healing. The purpose of this study was to investigate if the ointments prepared with endemic *Salvia kroenenburgii* ethanol extract have a healing effect on diabetic wounds. Male Wistar albino rats weighing 200-250 g were used in this study (n:60). A single dose of streptozotocin (45 mg/dl) was given to rats to introduce diabetes. Excisional and incisional wounds on diabetic rats were created under anesthesia. Ointment base prepared with *S. kroenenburgii* at dosages of 0.5% and 1% were applied topically for 7 and 14 days. Tissues were evaluated with macroscopic, biochemical and histopathological analysis at the end of 7th and 14th days. When compared with diabetic and control groups, NOx, MDA and GSH results of ointment treated groups were statistically significant ($P<0.01$) besides wound healing ratios of *S. kroenenburgii* were higher than all tested groups for both 7 and 14 days application periods. Results obtained from histopathological studies in the meaning of re-epithelialization, angiogenesis and collagen content revealed that ointments of *S. kroenenburgii* have a healing effect on diabetic wounds.

Keywords: *Salvia kroenenburgii*, extract, wound, diabetes, antioxidants



The prognostic value of long noncoding RNAs as biomarkers in early stage colon cancer

¹**Secil Ak Aksoy**, ¹**Berrin Tunca**, ²**Ersin Ozturk**, ²**Tuncay Yilmazlar**,
³**Omer Yerci**, ¹**Gulsah Cecener**, ¹**Unal Egeli**

¹Department of Medical Biology, Medical Faculty, Uludag University, Bursa, Turkey

²Department of General Surgery, Medical Faculty, Uludag University, Bursa, Turkey

³Department of Pathology, Medical Faculty, Uludag University, Bursa, Turkey

ak.secil08@gmail.com

Abstract

The TNM classification and histopathological features of tumor are the well-known criteria for identifying patients at a high risk for poor prognosis and determining the therapeutic approach for patients in stage II colon cancer (CC). Nevertheless, recurrence can be observed unexpectedly in some stage II CC after surgery. The present study aimed to analyze the association between long noncoding RNAs (lncRNAs) expression profiles and future metastases in early stage CCs. 120 paraffin-embedded stage II CC and 120 normal colon specimens were analyzed for 14 different lncRNAs by RT-PCR. The MALAT1 and HOTAIR expressions were 22.56-fold ($P = 0.0134$) and 18.62-fold ($P = 0.0247$) higher, and the PTENP1 expression was 9.7-fold lower ($P = 0.0359$) in tumor tissues compared with normal tissues. The over expression of MALAT1 and HOTAIR was related with systemic recurrence ($P = 0.013$, $P = 0.022$). Moreover, multivariate analysis showed that high MALAT1 expression was an independent poor prognostic factor for overall survival ($P = 0.001$). The decision to treat a patient with stage II CC with adjuvant chemotherapy can be still challenging. Our findings indicate that stage II colorectal cancer patients expressing high levels of MALAT1 might be considered for adjuvant chemotherapy.

Keywords: Early stage, long non coding, MALAT1, colon cancer



ARF6 gene expression in colorectal cancer

¹Yasmin Alahdab, ²Turkan Gurer, ³Alper Aytekin

¹Department of Biochemistry Science and Technology, Institute of Science, University of Gaziantep, Gaziantep/Turkey

²Department of Biology, Faculty of Arts and Sciences, University of Gaziantep, Gaziantep/Turkey

³Department of General Surgery, Faculty of Medicine, University of Gaziantep, Gaziantep/Turkey

yasmin.alahdab@gmail.com

Abstract

Colorectal cancer is one of the most common cancers in the world. Colorectal cancer develops after a long and multistep carcinogenesis process. Adenosine diphosphate-ribosylation factors (ARFs) are a family of Ras-related GTP binding proteins. ARF6 functions are concerned with actin cytoskeletal remodelling, cell polarity and cell migration and thus may have an important role in driving carcinogenesis. In many types of cancer such as breast, lung, brain and skin, ARF6 has been associated with these cancer types. This study aims to clarify the relationship between the level of ARF6 expression and tumor and normal colon / rectum tissues of colorectal cancer patients in Turkish community. Ethics committee approval required for the study was obtained from the Gaziantep University Medical Faculty Local Ethics Committee. Normal and tumor tissue samples were obtained from 43 patients with colorectal cancer. ARF6 mRNA expressions were analyzed by real time-PCR. Results of the study show that there was no statistically significant difference between Arf6 expression levels in normal and tumour tissues ($p > 0.05$).

Keywords: ARF6, colorectal cancer, gene expressions.

*This study was supported by the Scientific Research Projects Department of Gaziantep University (Project No: FEF.YLT.17.08).



The Importance of Protease Enzyme in Leather Industry

¹Neslihan Ozturk, ²Meral Birbir, ³Ayse Ogan and ²Pinar Caglayan

¹Marmara University, Institute of Pure and Applied Sciences, Kadikoy, 34722 Istanbul, Turkey

²Marmara University, Faculty of Arts and Sciences,
Department of Biology, Kadikoy, 34722 Istanbul, Turkey

³Marmara University, Faculty of Arts and Sciences,
Department of Chemistry, Kadikoy, 34722 Istanbul, Turkey

nozturk@marun.edu.tr

Abstract

Protease enzyme of moderately halophilic bacteria may cause destruction of grain layer of leather. The goal of this study was to examine proteolytic activity of moderately halophilic bacteria isolated from salted sheep skins salt cured in South Africa, USA, Bulgaria and Turkey. *Chromohalobacter canadensis* (TR6), *Staphylococcus equorum* (GA7), *Marinococcus tarjensis* (GAM3) and *Halomonas eurihalina* (BL5), which were characterized according to both 16S rRNA sequence analysis and conventional biochemical tests in the previous study, were used as test isolates. Proteolytic activities of test isolates were examined on gelatin agar medium at 37°C during 5 days incubation period. Clear zones around isolates were accepted as positive proteolytic activity. While diameters of clear zones around test isolates were ranged from 10 mm to 15 mm after 24 hours incubation period, the zones around test isolates were detected as 37 mm and 47 mm after 120 hours. Although the highest proteolytic activity was detected at *Staphylococcus equorum*, the lowest proteolytic activity was observed at *Halomonas eurihalina*. Study results showed that proteolytic halophilic bacteria may give damage to skin structure during storage at high temperature.

Keywords: Protease enzyme, moderately halophilic bacteria, leather industry



Boron(B) removal from irrigation water by low-cost and eco-friendly adsorption techniques based on dead wetland plant

¹Onur Can Türker, ²Çağdaş Saz, ²Cengiz Türe, ²Anıl Yakar

¹ Department of Biology, Faculty of Science and Letters, Aksaray University, Aksaray, Turkey

² Department of Biology, Faculty of Science, Anadolu University, Eskişehir, Turkey

cagdassaz@gmail.com

Abstract

Excessive boron (B) concentrations in the water environment can be created a hazardous element to organisms, and thus the water purification process is needed. The use of dried plant biomass for water removal of boron (B) derived from anthropogenic activities as a low cost sorbent material has been increasing in the recent years. The boron removal from irrigation water by 3 wetland plant biomass (*Typha latifolia*, *Lemna gibba*, and *Phragmites australis*) was investigated in the present experiment. The highest B removal was achieved as 96% by *L.gibba* dry biomass for 4 mg L⁻¹ initial B concentrations, whereas the lowest removal value was recorded as 2.1% for *P.australis* for 32 mg L⁻¹ initial B concentrations during the experiment. The boron removal mechanisms of the dried samples also evaluated by Langmuir and Freundlich isotherms, as well as kinetic models. The maximum B removal was also determined at the pH value of 6 and 0.5 g dried sample of the wetland plants in the experiment period. In this respect, it can be suggested that our low cost and eco-friendly method using in this experiment could be promising for boron removal from irrigation water anywhere in the world.

Keywords: Boron removal, Irrigation water, Dead wetland plants, Boron adsorption, Eco-technology



Identification of Gammaherpesvirus Encoded miRNA Targets in Latency, Reactivation and Lytic Replication

1Mehmet Kara, 2Scott Tibbetts

**¹Department of Molecular Biology and Genetics, Faculty of Science,
Uludag University, Bursa Turkey**

**²Department of Molecular Genetics and Microbiology, Faculty of Medicine,
University of Florida, Florida USA
mehmetkara@uludag.edu.tr**

Abstract

Gammaherpesviruses, including the human pathogens Epstein-Barr virus (EBV) and Kaposi's sarcoma-associated herpesvirus (KSHV), are oncogenic viruses that establish lifelong infections in hosts and are associated with the development of lymphoproliferative diseases and lymphomas. Murine gammaherpesvirus 68 (MHV68) is a natural pathogen of rodents, and is genetically and pathogenically related to EBV and KSHV, providing a highly tractable model for studies of gammaherpesvirus biology and pathogenesis. miRNAs are ~20-22 nt long, noncoding RNA molecules that can inhibit gene expression by translational repression through selective binding of a target transcript. In the last decade multiple studies showed that viruses encode numerous miRNAs whose functions have not been fully elucidated yet. Several studies have been conducted to understand the role of miRNA in MHV68 during latency however, none of these miRNA targets have been identified. We have utilized crosslinking immunoprecipitation and sequencing of hybrids (CLASH) technique to identify viral miRNA targets during latency, reactivation and lytic replication. We have identified hundreds of targets for viral miRNAs and several of them were further tested for biological effects using luciferase assays. Based on these results we hypothesize that viral miRNAs regulate important pathways to the benefit of viral life cycle.

Keywords: Gammaherpesvirus, miRNA, latency, oncogenesis, CLASH



Microwave-assisted protein digestion using immobilized papain on magnetic nanoparticles

¹Nuray Güy

¹Department of Chemistry, Faculty of Science & Arts, Sakarya University, Sakarya, Turkey
nurayg@sakarya.edu.tr

Abstract

Fast and effective protein digestion is a vital process for mass spectrometry (MS) based protein analysis. This method is based on protease immobilization on nanoparticles for proteolysis. Immobilized proteolytic enzymes feature a number of benefits including increased stability of activity, no contamination with biocatalyst, reduced extent of autodigestion, and ease of reusability. In this study, NiFe₂O₄ magnetic nanoparticles (MNPs) were prepared and were functionalized with gallic acid. Then, papain was immobilized on gallic acid modified with NiFe₂O₄ MNPs. In addition, the hydrolysis products of protein by free and immobilized papain were determined via matrix-assisted laser desorption/ionization mass spectrometry (MALDI-MS).

Keywords: Papain, protein digestion, magnetic nanoparticles



Oxidative stress, inflammation and fatty acid oxidation increased in diabetic rats kidneys

1Ezgi Bektur, 1Sedat Kaçar, 1Erhan Şahin, 1Varol Şahintürk

**¹Department of Histology and Embryology, Faculty of Medicine,
Eskisehir Osmangazi University, Eskisehir, Turkey**

ezgi.bektur@gmail.com

Abstract

NF-κβ is the protein that plays crucial roles in many cellular events including oxidized LDL, stress, free radical formation and hyperglycemia. Free fatty acids (FFAs) are important substrates for mitochondrial oxidative metabolism and ATP synthesis but also cause serious stress to various tissues, contributing to the development of metabolic diseases. Stimulation of systemic CPT1 activity may be an attractive means to accelerate peripheral FFAs oxidation and hence improve insulin sensitivity. In the present study, our goal is to ascertain how diabetes effects the proteins of NF-κβ and CPT1 in kidney. For this study, the rats were assigned to control and diabetic (55 mg/kg Streptozotocin, i.p.) groups. At the end of 6th week after streptozotocin injection, immunohistochemistry staining was implemented for NF-κβ and CPT1 proteins, and classical hematoxylin-eosin (HE) was applied for morphological evaluation of the kidney tissues. Renal tissue MDA levels were also measured by colorimetric assay. HE staining showed that Bowman's space became narrow and diameter of glomeruli decreased in diabetes group. While CPT1 immunoreactivity decreased, NF-κβ immunoreactivity and MDA levels increased in diabetic group when compared to control. In conclusion, streptozotocin-induced type 1 diabetes increased oxidative stress and inflammation, and decreased fatty acid oxidation in kidney tissues. In future studies, protective or therapeutic agents should be developed against these degenerative effects of diabetes. To elucidate the pathophysiology of diabetes, detailed molecular mechanisms should be investigated.

Keywords: Type 1 diabetes, ROS, Kidney, NF-κβ and CPT1



Optimization of pigment production of *Penicillium mallochii* isolate of orange-red pigment maker and determination of factors affecting pigment production

¹Youcef Bouhri, ¹Tülin Aşkun

¹Department of Biology, Faculty of Science and Letters, Balikesir University, Balikesir, Turkey

youcefbouhri@gmail.com

Abstract

It is now known that the use of synthetic dyes has harmful effects on the environment and human beings, causing allergic asthma, toxigenic and carcinogenic diseases in humans. For this reason, the search for natural pigments that do not harm people and the environment from natural sources continues all over the world. For this reason, the search for natural pigments that do not harm people and the environment from natural sources continues all over the world. The investigation to obtain pigments from fungi are quite new. The red-orange pigment producing strain, *Penicillium mallochii*, used in this study was identified by molecular methods and pigment production was investigated. Different media were used for pigment production and the highest yield was obtained from Sabouraud Dextrose Agar (SDA) medium. Temperature and pH effects on pigment production of fungi incubated for 18 days in both light and dark at different temperatures and different pH on SDA medium were investigated. To obtain the pigment extract, the fungus filaments were removed from the agar surface and then the agar blocks were taken up in ethanol (w/v: 1/1: g; mL) and left in a shaking incubator at 160 rpm at 26 °C for 72 hours and then filtered. The solvent was removed by rotary evaporator and the orange-red pigment extract was lyophilized (25mg/mL). The highest pigment production fungus was obtained when the fungus was produced in the dark at pH 5 °C and temperature 30 °C. The highest pigment (28 g/L) was obtained from SDA medium. The color characterization of the pigment solution was made with different pH, different temperatures and different solvents. As a result, it was determined that the color absorbance determined at 450 nm wavelength in spectrophotometer did not change between pH (2-12) and temperature (25 °C-100 °C). Furthermore, when water, ethanol and acetic acid were used as solvents, the highest absorbance value was obtained in ethanol, among the values read in the spectrophotometer. The fact that the use of fungi as natural pigment producers does not cause adverse effects on the environment and the living things makes fungus advantageous.

Keywords: Characterization, optimal, pigment production, *Penicillium mallochii*, color



Determination of the Surface Properties of – Poly (Methyl Methacrylate)/ZSM-5 Zeolite

¹Ceyda Bilgiç, ¹Bengi Bozkır

¹Department of Chemical Engineering, Engineering and Architecture Faculty, Eskeşehir Osmangazi University, 26480 Eskeşehir, Turkey

bozkirbengi@gmail.com, ceydabilgic@gmail.com

Abstract

Poly (methyl methacrylate) (PMMA) is an important member in the family of polyacrylic and methacrylic esters. Poly (methyl methacrylate)/ ZSM-5 zeolite composite was prepared using the solution blending method with the application of ultrasound and using chloroform as solvent. Ultrasonic waves were used to enhance the nanoscale dispersion of the zeolite. Polymer nanocomposites of a Poly (methyl methacrylate) (PMMA) matrix containing 5% ZSM-5 zeolite (ZZ) by mass was investigated using inverse gas chromatography (IGC). The dispersive component of the surface energy (γ_s^d), and the acid/base character of composite surface were estimated by using the retention time of different non-polar and polar probes at infinite dilution region. The specific free energy of adsorption (ΔG^φ), the specific enthalpy of adsorption (ΔH^φ), and the specific entropy of adsorption (ΔS^φ) of polar probes on PMMA/ZZ were determined. ΔG^φ were correlated with the donor and acceptor numbers of the probes to quantify the acidic K_A and the basic K_D parameters of the PMMA/ZZ surface. Polymer composite of a PMMA matrix containing 5% ZSM-5 zeolite (ZZ) by mass was investigated using X-ray diffraction (XRD), Scanning electron microscopy (SEM) and transmission electron microscopy (TEM).

Keywords: Poly (methyl methacrylate) (PMMA), ZSM-5 zeolite, nanocomposites, inverse gas chromatography, characterization.



Anticancer efficiency of rice husk protein extracts loaded chitosan nanoparticles: Promising for lung carcinoma

¹Gozde Budak, ²Esra Ilhan, ¹Zeynep Betts, ²Sultan Gulce-Iz, ²Ozlem Yesil-Celiktas,

¹Canan Sevimli-Gur

¹ Department of Biology, Science and Art Faculty, Kocaeli University, Kocaeli, Turkey

² Department of Bioengineering, Faculty of Engineering, Ege University, Izmir, Turkey

g.budak.92@gmail.com

Abstract

Cancer is known as abnormal cell proliferation in organisms and is known as an important disease that leads human life to a great risk. Rice is a staple food that is grown in lots of regions of the World, especially in Asian countries. Rice husk contains crude protein, lipid, crude fiber, and cinder. Lots of protein, phenolic, and flavonoid compounds are known to have antioxidant activity and cleaning activity of free radicals in cytotoxic activity of tumor cells. In this study, our goal is to determine the cytotoxic activity of characterized rice husk encapsulated with chitosan protein extracts on cancer cells. The protein extracts are encapsulated with chitosan using ionic gelation method. In this context, Chitosan nanoparticles were prepared by the bonding between chitosan and sodium tripolyphosphate (TPP). Chitosan nanoparticles were characterized by scanning electron microscopy (SEM), differential scanning calorimetry (DSC) and fourier transform infrared spectroscopy (FTIR) analysis. The physicochemical parameters of chitosan nanoparticles such as zeta potential and encapsulation efficiency were also investigated. The anticancer activity of chitosan nanoparticles was evaluated against human breast adenocarsnoma (MDA-MB-231), human lung adenocarsinoma (A549), human breast adenocarsinoma (MCF-7) and African green monkey kidney (VERO) cell lines within six different concentrations ranging between 3.12 and 100 µg/ml for 48 hours using by MTT. Consequently, the lowest particle size was 171.6nm (PDI 0.346) and its encapsulation efficiency was 65%. Rice husk extract exhibited the highest cytotoxicity particularly towards A-549, MCF-7, and MDA-MB-231 among three different cancer cell lines tested and was not cytotoxic to the normal VERO cells, indicating a selective activity. Rice husk proteins exhibited the lowest IC₅₀ value against A-549 exhibited which was 3.13 µg/mL. Chitosan nanoprparticle exhibited the highest cytotoxicity particularly on human lung carsinoma (A549) cells among three different cancer cell lines tested and was not cytotoxic to the normal Vero cells. The lowest cell viability observed as 41% at 3.13 µg/ml with A549.

Keywords: High pressure hot water extraction, rice husk, nanoparticle, DSC, FTIR, SEM, cytotoxic activity



Evaluation of combined antitumoral effect of usnic acid and MDV3100 (Enzalutamide) on hormone-dependent prostate cancer cells

¹Isil Ezgi Eryilmaz, ²Gamze Guney Eskiler, ¹Unal Egeli, ¹Beste Yurdacan,
¹Gulsah Cecener, ¹Berrin Tunca

¹Department of Medical Biology, Faculty of Medicine, Uludag University, Bursa, Turkey

²Department of Medical Biology, Faculty of Medicine, Sakarya University, Sakarya, Turkey

ezgi.eryilmaz@dpu.edu.tr

Abstract

Usnic acid (UA), a lichen secondary metabolite, having numerous biological activities such as antimicrobial, antioxidative and anti-inflammatory. UA has also antitumoral effect on many cancer cells. However, the effect of UA alone or in combination with a known hormone therapy drug on hormone-dependent prostate cancer cells has not been investigated yet. We analyzed for the first time combined therapeutic effect of UA and MDV3100 on LNCaP cells. The cells were treated with increasing concentrations of UA (12.5-150 µM) and MDV3100 (100-1000 µM) and then cell proliferation, cell death and cell cycle analyses were performed. Both UA and MDV3100 were found to have cytotoxic, apoptotic and G0/G1 cell cycle arrest effects in a time- and dose-dependent manner. The IC₅₀ levels of UA and MDV3100 were detected as 77.5 µM for 48 h and 235.7 µM for 72 h, respectively. Based on the results, the two lower doses under the IC₅₀ were selected for UA (12.5 and 25 µM) and MDV3100 (100 and 250 µM) for combined treatments. The cell viability decreased to 33.0%, the percentage of apoptotic cells was 59.0% and the percentage of cells in G0/G1 phase increased from 58.2% to 66.5% at 12.5 µM+100 µM MDV3100 for 24 h. Similar cytotoxic and apoptotic effects were observed when MDV3100 was combined with UA. Thus, UA and MDV3100 were found to have synergistic effects at the lowest doses for 24, 48 and 72 h. As a result, UA has increased the efficiency of MDV3100 by decreasing the dose and incubation time.

Keywords: Enzalutamide, Usnic acid, Combined therapy, Prostate cancer



Effects of Boric Acid to Renal Ischemia Reperfusion Induced Oxidative Stress Injury on Kidney Function Tests

¹Hakan Şentürk, ²Ceyhan Hacıoğlu, ²Fatih Kar, ²Güngör Kanbak

² Department of Medical Biochemistry, Faculty of Medicine, Osmangazi University, Eskişehir

¹ Department of Biology, Faculty of Science and Letters, Osmangazi University, Eskişehir

hsenturk@ogu.edu.tr

Abstract

Ischemia / reperfusion injury (I/R) is caused by a temporary transient impairment of blood flow in a particular organ. I/R is usually associated with a strong inflammatory and oxidative stress response to hypoxia and reperfusion that impairs organ function. Renal damage caused by renal IR contributes to high morbidity and mortality. Boric acid is found in nature as a mineral and is used in many clinical situations including cancer therapy. Boric acid is an antioxidant agent in IR damage. The aim of this study was to investigate the effects of boric acid in the rat model of renal IR injury. 35 rats were divided into five groups: sham, ischemia reperfusion and ischemia-reperfusion + boric acid (intraperitoneally at doses of 50, 100 and 200 mg / kg). Sham group was only subjected to surgical stress procedure. After ischemia for 45 min in rats, the clamps were opened and reperfusion was achieved. After 24 hours, rats were decapitated and blood samples taken to assess renal function tests. BUN, creatinine and urea values were measured. Boric Acid is an important component that plays a role in cell membrane function and enzymatic reactions. As a result of the use of boric acid, which has a significant antioxidant property, at certain doses, it has minimally reduced the damage of inflammation and oxidative stress during I/R.

Keywords: Kidney, Ischemia Reperfusion, Oxidative Stress, Boric Acid

Investigation of Possible Protective Effects of Protocatechuic Acid Against Renal Ischemia Reperfusion Injury

1Fatma Yıldız, 2Hakan Senturk

**¹Department of Medical Laboratory Techniques, Health Services Vocational School,
Alanya Alaaddin Keykubat University, Alanya, Turkey**

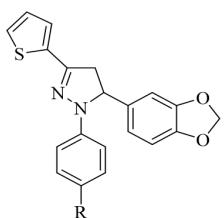
²Department of Biology, Faculty of Science and Letters, Osmangazi University, Eskişehir, Turkey

fatma.yildiz@alanya.edu.tr

Abstract

Ischemia/reperfusion (I/R) damage in the kidneys results in vascular and tissue damage due to free oxygen radicals. The severity of this damage increases with the duration of ischemia and shows clinical patterns ranging from severe tubular or cortical necrosis to severe acute renal failure without significant tissue damage. In this study, possible protective effects of protocatechuic acid (PCA) against renal I/R injury in rats were investigated biochemically and histologically. A total of 35 male Spraque-dawley rats weighing 250-300 g were divided into five groups ($n = 7$). Experimental groups were determined as Group I (Sham), Grup II (I/R+ Polyethylene glycol) Group III (I/R+40 mg/kg PCA), Group IV (I/R+80 mg/kg PCA) and Grorp V (I/R+120 mg/kg PCA). Right kidney nephrectomy was performed in all groups under anesthesia. After 15 days of recovery, PCA was administered intraperitoneally to the rats 45 minutes before I/R. Except for Group I, the rats in the whole group were subjected to 45 minutes of ischemia and 24 hours of reperfusion. At the end of the experiment, blood urea nitrogen (BUN), creatinine (CRE) values were measured in the serum. Tubular damage and structural changes were assessed by light microscopy. There was a significant difference in BUN and CRE levels in Group II compared to Group I ($p < 0.05$). Group II with I/R injury showed a significant difference when compared with PCA applied groups ($p < 0.05$). The results obtained from histological examinations support biochemical findings.

Keywords: Renal Ischemia/Reperfusion, Protocatechuic Acid, Free Radicals, Oxidative Stress



Compound	R	Compound	R
1	H	6	CH ₃
2	CN	7	OCH ₃
3	F	8	SO ₂ CH ₃
4	Cl	9	SO ₂ NH ₂
5	Br		

Figure 1. The substituents of compounds 1-9



Synthesis and evaluation of a series of pyrazoline derivatives as potential neuroprotective agents

¹Belgin Sever, ¹Mehlika Dilek Altintop, ²Elif Kaya Tilki, ²Miriş Dikmen, ¹Ahmet Özdemir

¹Department of Pharmaceutical Chemistry, Faculty of Pharmacy,
Anadolu University, Eskişehir, Turkey

² Department of Pharmacology, Faculty of Pharmacy, Anadolu University, Eskişehir, Turkey

belginsever@anadolu.edu.tr

Abstract

Parkinson's disease (PD) is a common neurodegenerative disorder characterized by progressive cell loss confined mostly to dopaminergic neurons of the substantia nigra pars compacta. Due to the importance of pyrazolines for the treatment of neurodegenerative disorders, a series of pyrazoline derivatives (**1-9**) was designed and synthesized *via* the treatment of 3-(1,3-benzodioxol-5-yl)-1-(thiophen-2-yl) prop-2-en-1-one (A) with phenylhydrazine hydrochloride derivatives in acetic acid. The compounds were evaluated for their neuroprotective effects using *in vitro* 6-hydroxydopamine (6-OHDA) induced neurotoxicity model of PD in PC-12 Adh cell line. According to the results, the treatment with the compounds at 100 µg/mL did not reduce cell viability significantly and demonstrated their protective effects against cell death in differentiated PC-12 Adh cells treated with 6-OHDA (150 µM) for 24 hours. The reduction in cell viability by 6-OHDA (150 µM) was found as 42.13%; whilst the percentages were found as 34.1, 59.27, 53.96, 75.63, 55.74, 41.32, 61.64, 69.17, 23.25 and 87.48% following the treatment with 100 µg/mL of compounds A, **1**, **2**, **3**, **4**, **5**, **6**, **7**, **8** and **9**, respectively. According to these results, all compounds reduced cell viability significantly as compared to the control group after 24 hours 6-OHDA exposure (****P < 0.0001). Compounds **A** and **8** might have neuroprotective potential against 6-OHDA induced neurotoxicity in PC-12 Adh cells, but only the induction in cell viability% with compound **8** was significant as compared to the 6-OHDA positive control group according to the statistical analysis (**P< 0.01).

Keywords: Parkinson's disease, Pyrazolines, Neuroprotective effects



Antiproliferative and Apoptotic Impacts of Some Viable Lactic Acid Bacteria on Colon Adenocarcinoma Cell Line (HT-29)

¹Ummugulsum Tukenmez, ¹Belma Aslim

¹Department of Biology, Faculty of Science, Gazi University, Ankara, TURKEY

utukenmez@gazi.edu.tr

Abstract

The accumulation of recent evidence suggests that lactic acid bacteria inhibit the onset or progression of carcinogenesis through various pathways. In the present study, we aimed to determine the anti-proliferative and apoptotic effect of viable *Lactobacillus* spp. named as *Lactobacillus plantarum* GD2, *Lactobacillus rhamnosus* E9, *Lactobacillus brevis* LB63, and *Lactobacillus delbrueckii* ssp. *bulgaricus* B3 on colon adenocarcinoma cell line (HT-29) after 18, 24, and 48h treatments. Firstly, antiproliferative activity was detected with WST-1 assay. Secondly, apoptotic effect was determined with evaluation of changes in the expression levels of apoptotic pathway related genes (Bax, Bcl-2, caspase-3, and caspase-9) by qRT-PCR at the mRNA level and western blot analysis at the protein level. Administration of four viable *Lactobacillus* spp. on HT-29 cell line increased a time-dependent antiproliferative activity. A high rate of decrease in viability of HT-29 cells incubated with *L. plantarum* GD2 for 48 h was detected (91%, $p<0.05$). In addition, all viable *Lactobacillus* spp. induced apoptotic cell death in HT-29 cell line. *Lactobacillus* spp. increased the mRNA and protein expression of Bax, caspase-3, caspase-9, while decreased Bcl-2 at different rates during different application times ($p<0.05$). The highest apoptotic effect were determined at the 18 and 24h treatments of *L. plantarum* GD2 and *L. delbrueckii* ssp. *bulgaricus* B3 strains. In conclusion, viable *Lactobacillus* spp. significantly inhibited the growth of HT-29 cells by inducing apoptosis in a time- dependent manner. According to these *in vitro* results in HT-29 cells, *Lactobacillus* spp. may be used in the treatment or prevention of colon cancer.

Keywords: Anticancer, Apoptosis, Colon cancer, Lactic acid bacteria

*This work was supported by TUBITAK, Project No: 115R282.



Vitamin D Levels in Fibromyalgia Patients

Merih Özgen, Ayşe Merve Aydoğan, Ali Uygur

Department of Physical Medicine and Rehabilitation, Faculty of Medicine, Eskişehir Osmangazi University, Eskişehir, Turkey

merihsarhus@hotmail.com

Abstract

Fibromyalgia syndrome (FM) is characterized by chronic and diffuse pain; sleep disorders, fatigue and cognitive dysfunction accompanied by a musculoskeletal problem. Vitamin D; is an important immunomodulator that acts as an active cofactor in many diseases. Lack of vitamin D may cause proximal muscle weakness, skeletal mineralization deficiency, increased risk of falls in the elderly, and widespread body pain. Symptoms of fibromyalgia are similar to those observed in the absence of vitamin D deficiency. We aimed to examine vitamin D levels of fibromyalgia patients followed in our polyclinic by this information. Between 2016 and 2017, 151 patients with fibromyalgia diagnosed according to the 1990 ACR diagnostic criteria and treated with follow-up were screened retrospectively. 62 patients with complete file information were included in the study. Demographic data of patients, vitamin D levels, number of tender points were evaluated. Values of D vitamine level below 20 ng / mL were found to be D deficiency, values between 20-30 ng / mL D vitamine insufficient, 30 ng / mL and above values normal. One of the patients included in the study were male, 62 were female. The mean age was 50.18 ± 11.14 . The mean vitamin D levels of 62 patients (92%) were 17.17 ± 11.73 . When vitamin D levels were examined, there were 41 patients between 0-19.99 ng / ml, 14 patients between 20-29.99 ng / ml and 7 patients above 30 ng / ml. There was no significant correlation between vitamin D levels and tender point counts of patients. In only 7 of the fibromyalgia patients (11.3%) vitamin D levels were found in sufficient level. . There was no correlation between vitamin D levels and fibromyalgia symptoms. However, it is important to consider that vitamin D deficiency may increase the symptoms and complaints of patients with fibromyalgia syndrome.

Keywords: Fibromyalgia, vitamin D, pain



Immobilization of Urease onto Modified Calcium Silicate by Covalently and Characterization of Free and Immobilized Ureas

¹Özlem Alptekin

¹Department of Biochemistry, Faculty of Pharmacy, Cukurova University, 01330, Adana, Turkey
oalptekin@cu.edu.tr

Abstract

Urease (EC 3.5.1.5) is an enzyme that catalyses the conversion of urea to ammonia and carbon dioxide. Immobilized urease is used in biosensors for diagnostic purposes in the field of health, in the removal of urea from blood or haemodialysis, and in the regeneration of synthetic dialysate solution. Urease has been covalently immobilized on carrier materials such as epoxy-derived membrane, gold nanoparticles, nylon-6,6 beads in the literature. Immobilization via covalent bonds is a preferable method. In this study, calcium silicate was modified with glutaraldehyde by surface activation with 3-aminopropyl triethoxysilane. After modification of the carrier, the urease from *Canavalia ensiformis* was immobilized onto carrier by covalently. Scanning Electron Microscope was used to obtain image of the immobilized urease. Nessler reagent was used for determination of urease activity. Free urease and immobilized urease preparation were characterized. The percentage of urease bound onto carrier was 98%. Free urease and immobilized urease preparation showed their maximum activities at pH 6.5 and 7.0, respectively. Free urease and immobilized urease preparation had their maximum activities at 50 and 60 °C, respectively. The Km value of immobilized urease (6.7 mM) was higher than that of the free urease (2.7 mM). The Vmax value of immobilized urease was about 0.1% of the Vmax value of free urease. The half-lives of free urease and immobilized urease were calculated as 7.2×10^{-2} h and 18.9 h at 60 °C. The remaining activity of the immobilized urease was about 67% after 10 cycles of batch operation.

Keywords: Urease, immobilization, calcium silicate, glutaraldehyde, reactor

*This work was supported by Research Grants TSA-2016-5312 from Cukurova University.



The Effects of Putrescine Application against Aluminum Toxicity in Wheat (*Triticum aestivum* L.) Roots

¹Özge Akgün, ¹Aslıhan Çetinbaş-Genç, ¹Fatma Yanık, ¹Filiz Vardar

¹Department of Biology, Faculty of Arts and Sciences, Marmara University,
Göztepe, 34722, İstanbul, Turkey

filiz.vardar@gmail.com

Abstract

Aluminum (Al) is a major constraint to crop production in acid soils. This study aims to investigate alleviating effects of putrescine (Put) on Al toxicity in wheat (*Triticum aestivum* L.). Put is a polyamine which is one of the plant growth regulators. Put takes part in the essential cellular events such as cell division, differentiation, gene expression, DNA replication, protein synthesis and apoptosis. In this respect wheat roots were exposed to 100µM AlCl₃, 100µM AlCl₃+5mM Put and 100µM AlCl₃+10mM Put for 96 h. For positive control roots were treated with 5 and 10mM Put. To evaluate the ameliorating effects of Put on Al toxicity some cellular stress responses were investigated including root elongation, Al uptake, loss of plasma membrane integrity, mitotic abnormalities and antioxidant enzyme activities. According to our results Al inhibited root elongation progressively, but Put treatment alleviated root growth. Besides, Put treatment inhibited Al uptake and protected plasma membrane integrity. Similarly Put reduced lipid peroxidation in Al treated groups. Antioxidant enzyme activities such as catalase, superoxide dismutase, guaiacol peroxidase and glutathione peroxidase, was affected by Put treatment. Moreover Put treatment increased mitotic activity. It has been known that under stress conditions polyamine concentration increases and ensure membran stability, ion homeostasis, scavenge with reactive oxygene species (ROS) by activating the antioxidant enzyme system. The presented results suggested that Put could alleviate Al-induced toxicity in wheat roots.

Keywords: Aluminum, antioxidant enzymes, root, putrescine, wheat.



Perlite/Poly(Methyl Methacrylate) Composite Characterization by Inverse Gas Chromatography

ORAL PRESENTATIONS

OP-041

¹Ceyda Bilgiç, ¹Özge Kanık, ²Naile Karakehya

¹Eskişehir Osmangazi University, Engineering and Architecture Faculty, Department of Chemical Engineering, , 26480 Eskişehir, Turkey

²Eskişehir Osmangazi University, Environmental Control and Protection Programme, Eskişehir Vocational School, 26480 Eskişehir, Turkey

ozgedgnknk@gmail.com

Abstract

Perlite/ Poly (methyl methacrylate) composite was prepared using the solution blending method with the application of ultrasound and using chloroform as solvent. Ultrasonic waves were used to enhance the nanoscale dispersion of the perlite. Polymer nanocomposites of a Poly (methyl methacrylate) (PMMA) matrix containing 5% perlite (P) by mass was investigated using inverse gas chromatography (IGC), X-ray diffraction (XRD), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). X-ray diffraction and transmission electron microscopy revealed the mixed nanomorphology of nanocomposites. The majority of perlite is dispersed in the polymer matrix in the form of an ordered tactoid (multilayer particles) structure consisting of few silicate layers and a small amount of exfoliation was achieved.

Keywords: Poly (methyl methacrylate) (PMMA), perlite, nanocomposites, characterization



The Effects of Antimycotic Drugs on Human Serum Paraoxonase-I

¹Cüneyt Türkeş, ²Şükrü Beydemir

¹Department of Biochemistry, Faculty of Pharmacy, Erzincan University, Erzincan, Turkey

²Department of Biochemistry, Faculty of Pharmacy, Anadolu University, Eskişehir, Turkey

cuneyt.turkes@erzincan.edu.tr

Abstract

Paraoxonase-I (A-esterase, EC 3.1.8.1, PON1), associated with high-density lipoprotein (HDL), hydrolyzes oxidized lipids pro-inflammatory, thereby blunting the inflammatory response. Increased oxidative stress leading to inflammation plays a role in the etiology of various diseases such as atherosclerosis, diabetes mellitus and some neurological disorders. Antimycotic drugs, also known as an antifungal medication, are a pharmaceutical fungicide or fungistatic used to treat and prevent mycoses. In this study, we investigated the effects of some antimycotic drugs (caspofungin acetate, amfotericine B, anidulafungin and fluconazole) on enzyme activity *in vitro* of human serum paraoxonase-I (hPON1). For this aim, hPON1 was purified from human serum by using simple chromatographic methods. The purification procedure involved the preparation of serum, ammonium sulfate precipitation, ion-exchange chromatography and gel filtration chromatography. Molecular weight of the enzyme was determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). IC₅₀ values and Ki constants were 0.037±0.001 mM and 0.0105±0.0015 mM for caspofungin acetate, 0.266±0.002 mM and 0.3206±0.0196 mM for amfotericine B, 0.521±0.013 mM and 0.1674±0.0233 mM for anidulafungin, 5.728±0.043 mM and 2.5464±0.1655 mM for fluconazole, respectively. Caspofungin acetate showed better inhibitory effect compared with the other antimycotic drugs. Amfotericine B had non-competitive inhibition, whereas the others showed competitive inhibition.

Keywords: Paraoxonase, PON, HDL, enzyme inhibition, antimycotic drug



A Questionnaire to Determine Major Problems of Leather Industry In Raw Hide And Soaking Process

1Didem Berber, 1Meral Birbir

¹Department of Biology, Faculty of Arts and Sciences, Marmara University, Istanbul, Turkey

yazi47@hotmail.com

Abstract

Hide quality is adversely affected during salt-curing and soaking processes especially due to bacterial activities of microorganisms. These organisms may cause irreversible grain damage, pinpricks, disruption of collagen fibers and uneven dyeing that cannot be recovered by leather production process. To determine major problems and technical procedures on salted and soaked skins/hides, a questionnaire study (28 questions) was applied to leather technicians in Leather Organized Tannery Region, Istanbul, Turkey in both 2009 and 2018. While most tanneries were processing skins/hides (sheep, goat, lamb, cattle) imported from foreign countries in 2009, local cattle hides are processed in 2018. Conventional salt curing method is applied to skins/hides in warehouses. The most striking point is that the salt is applied randomly during preservation. Although tanneries do not store rawhide more than one month, there is no information about how long they store in warehouses. Most of tanneries reported red spots, unpleasant odor, hair slip, loss of elasticity, holes in grain surface, bacterial and fungal growth on skin/hides. Leather-making processes are performed at ambient temperature of tanneries. No difference was observed in application of soaking process in both 2009 and 2018 surveys. This questionnaire study showed that most of problems were related with microbial damage, bloodstain, burns due to manure and flaying mistakes at slaughterhouses.

Keywords: skins, hides, leather, questionnaire



The Effects of 3,5-Dimethylaniline Metabolite on DNA Damage and Apoptosis in Human Urothelial Cells

^{1,2}Pinar Erkekoglu, ^{1,3}Ming-Wei Chao, ⁴Chia-Yi Tseng, ¹Bevin P. Engelward,
²Belma Kocer-Gumusel, ¹Gerald N. Wogan, ¹Steven R. Tannenbaum

¹Department of Pharmaceutical Toxicology, Faculty of Pharmacy,
Hacettepe University, 06100 Ankara, Turkey

²Department of Biology Engineering, Massachusetts Technology Institute (MIT),
Cambridge, MA 02139, ABDA

³Department of Bioscience Technology, Science College,
Chung Yuan Christian University, Zhongli Area, Taoyuan, Tayvan 320

⁴Department of Biomedical Engineering, Engineering College,
Chung Yuan Christian University, Zhongli Area, Taoyuan, Tayvan 320

erkekkp@yahoo.com, erkekkp@hacettepe.edu.tr

Abstract

Alkylanilines are widespread environmental contaminants with multiple exposure sources. High exposure to these chemicals are suggested to cause bladder cancer in humans. Their main oxidative metabolites are their o- or p-phenol derivatives. 3,5-dimethylaniline (3,5-DMA) is an alkylaniline and it is used in the production of azo dyes, pharmaceuticals, antioxidants, antiozonants, gasoline, detergents, wood preservatives and textiles. The phenolic metabolite of 3,5-DMA, namely 3,5-dimethylaminophenol (3,5-DMAP), is suggested to cause oxidative stress in mammalian cells. The aim of this study is to investigate different types of DNA damage and apoptosis caused by 3,5-DMAP in human bladder urothelial cell line (UROtsa cells). Both single and double strand DNA breaks were determined by high throughput Comet assay ("CometChip"). For determination of single strand DNA breaks, alkaline CometChip conditions were used whereas for double strand DNA breaks neutral assay conditions were used. Caspase 3 and caspase 8 activities were evaluated by using spectrophotometric kits. In alkaline CometChip, 3,5-DMAP caused significant increases in both percent tail DNA (25%) and Olive tail moment (24%) when compared to control. However, 3,5-DMAP did not cause any significant increase in double strand DNA breaks. Moreover, 3,5-DMAP treatment caused a significant (87%) increase in caspase 3 activity and 39% increase in caspase 8 activity. Therefore, we can suggest that extrinsic apoptosis was triggered by 3,5DMAP exposure. This is the first study that shows the DNA damaging and apoptotic effects of 3,5-DMAP on human urothelial cells. More studies are needed to show the carcinogenicity mechanism of alkylanilines and their metabolites.

Key words: 3,5-dimethylaniline, 3,5-dimethylaminophenol, alkylaniline, apoptosis, DNA damage



Association of *IL2-330* Gene Polymorphism with Lung Cancer

¹Öyküm Genç, ¹Erdi Akar, ²Erkan Arpacı, ²Hüseyin Engin, ¹Sevim Karakaş Çelik

¹Department of Molecular Biology and Genetics, Faculty of Science,
Bülent Ecevit University, Zonguldak

²Department of Medical Oncology, Faculty of Medicine,
Bülent Ecevit University, Zonguldak

gencoykum@gmail.com

Abstract

Cytokines are responsible for the functions of the immune system cells to gain growth, development, differentiation and activation. It is known that cytokines are role of the cancer pathogenesis. Although there are a few studies showing that *IL2-330* gene polymorphism is associated with many types of cancer, as far as we know, there is no study investigating the association between lung cancer and *IL2-330* gene polymorphism. In this study, the role of *IL2-330* gene polymorphism in the pathogenesis of lung cancer was investigated. 96 patients who were diagnosed with lung cancer and 96 healthy subjects participated in the study. *IL2-330* gene polymorphism was determined by polymerase chain reaction-confronting two pairs primer method. In the patient group TT, GT and GG genotypes were found in 21.9%, 67.7% and 10.4% respectively and in the control group it was found as 17.7%, 79.2% and 3.1% respectively. Statistically no significant difference was found between these two groups. When the distribution of *IL2-330* T / G polymorphic allele frequencies is considered also here was no statistically significant difference between the groups ($p > 0.05$). When analyzed for the lung cancer group and the healthy group according to *IL2-330* gene polymorphism, genotype and allele distribution were found to be similar in both groups. As a result; there was no statistically significant difference between the groups. Considering the ethnic variation of lung cancer, further studies are needed to define the role of this polymorphism on the pathogenesis of lung cancer.

Keywords: Cytokine, Interleukin 2, IL2, lung cancer, polymorphism



Loading pharmaceutically active agent Rutin into PLGA nanoparticles by different methods

¹Tuğçe Kirik, ¹Kadriye Kızılbey

¹Biomedical Engineering Department, Faculty of Engineering and Architecture, İstanbul Yeni
Yüzyıl University, Yılanlı Ayazma Caddesi, 34010, Cevizlibağ, Zeytinburnu, İstanbul

kadriyekizilbey@gmail.com

Abstract

Rutin, a flavonol glycoside, has been verified as nontoxic as a result of clinical studies. It is widely used in medical pharmacy owing to its anti-allergic, anti-oxidant, anti-inflammatory, anti-tumor, antibacterial, anti-viral, anti-diabetic and anti-cancer activities. Generally, flavonoids have poor solubility and low bioavailability in living systems. In addition, when taking these molecules orally, they are destroyed in the gastric environment and that leads them poor bioavailability and restriction of clinical use. In order to overcome the low bioavailability of these molecules, polymer based nano-sized drug delivery systems (between 10-1000 nm in size) have been developed. In this study, for the first time in the literature Rutin-loaded-PLGA nanoparticles (NP) were synthesized using different methods such as single emulsion solvent evaporation (o/w), nanoprecipitation and salting out in order to increase the bioavailability of Rutin molecule. The synthesized NPs were characterized by their encapsulation efficiency, Zeta sizer, FTIR and SEM. in vitro % Rutin release studies of selected NPs, NP3 and NP5, were investigated. Rutin release from NP5 reached 41% in 48 hours. This study will enable the synthesized Rutin-loaded nanoparticles to become a suitable candidate for future multidisciplinary work in the field of nanomedicine.

Keywords: Rutin, PLGA, nanoparticle, single emulsion solvent evaporation, nanoprecipitation, salting out



Effects of Magnetic Field on Tissue Culture of *Melissa officinalis*

1Canan Ülgen, 2Arzu Birinci Yıldırım, 1Arzu Uçar Türker

¹Department of Biology, Faculty of Science and Letters, Abant İzzet Baysal University, Bolu

²Department of Field Crops, Faculty of Agriculture and Natural Sciences,
Abant İzzet Baysal Üniversitesi, Bolu

cananulgen@ibu.edu.tr

Abstract

Melissa officinalis L., commonly known as the lemon balm, is a perennial plant of the Lamiaceae family. It has been used in the treatment of disorders such as dyspepsia, irritability, insect bites, melancholy, insomnia, hysteria, depression and heart failure in traditional medicine. In this study, effects of magnetic field on tissue culture of *M. officinalis* were investigated. Different magnetic fields (50 mT, 100 mT and 150 mT) were created using neodymium block magnets. Firstly, an *in vitro* culture protocol was established for lemon balm plant. Sterile seedlings were obtained from surface sterilized seeds and 4 different explants (petiole, leaf, stem and root) were transferred to petri plates containing different combinations and concentrations of plant growth regulators. Regeneration was not observed with these explants. Also, different concentrations of chitosan and silver nitrate were incorporated into medium. But, regeneration was not achieved. After that, regeneration studies were preceded with buds (shoot tip, axillary and hypocotyl buds). Best regeneration was obtained with axillary buds at 1.5 mg/l benzyladenine (BA). In the second part of the study, bud explants were exposed to 3 different magnetic fields at different times (5 min, 15 min, 30 min, 1 h and 3 h). Positive effect of magnetic field on the regeneration of *M. officinalis* was observed and best result was obtained with axillary node with 1 h exposure (15.8 shoots; 100% explants formed shoots). Regenerated shoots were transferred to rooting media containing different levels of IAA, indole-3-butyric acid (IBA), naphthalene acetic acid (NAA) or 2,4 dichlorophenoxyacetic acid (2,4-D). The best root formation was observed with Murashige and Skoog (MS) basal medium (control). Rooted explants were transferred to plastic pots containing potting soil and maintained in the plant growth room.

Keywords: Magnetic field, *Melissa officinalis*, tissue culture



Synthesis, Characterization and Biological Application of Furanoside-based NHC Ligands

¹Fatma Çetin Telli, ¹Serpil Denizaltı, ²Murat Yavuz, ³Suna Timur, ¹Yeşim Salman

¹Chemistry Department, Faculty of Science, Ege University, 35100 Bornova, Izmir, Turkey

²Chemistry Department, Faculty of Science, Dicle University, 21280 Diyarbakir, Turkey

³Biochemistry Department, Faculty of Science, Ege University, 35100 Bornova, Izmir, Turkey

fatma.cetin@ege.edu.tr

Abstract

N-Heterocyclic carbenes (NHCs) are important structural motifs for the synthesis of biologically and pharmaceutically active compounds.¹ Carbohydrate-based NHC ligands originally attracted the attention of organometallic chemists, because it is known that carbohydrates play key role in a variety of biological signalling and recognition processes. Many carbohydrate-based ligands have been designed, synthesized and attached to different metal centres for the discovery of novel metal-based drugs.²⁻⁴ In this study, we synthesized the furanoside-based NHC ligands (**1a-c**) and their precursor salts (**2a-c**) using amino alcohols from the chloralose derivatives of glucose (**a**), galactose (**b**), and mannose (**c**).⁵ These compounds were fully characterized by ¹H NMR, ¹³C NMR, and elemental analyses. The synthesized ligands showed excellent antimicrobial activity against both three Gram-positive bacteria and four Gram-negative bacterial strains and yeast *Candida albicans* ATCC 10231 according to disc diffusion method (Figure 1).

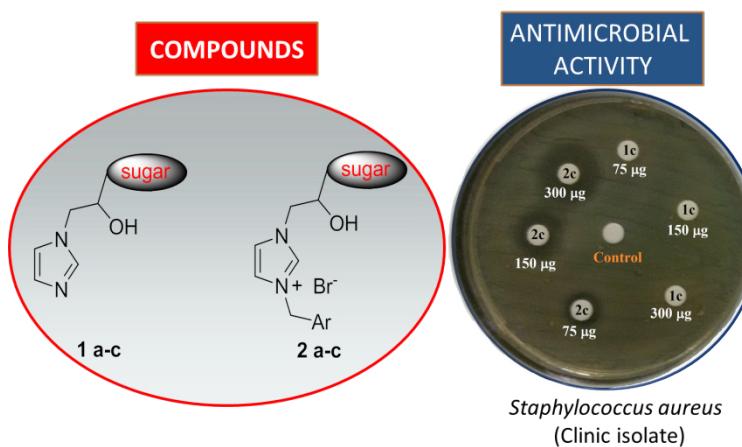


Figure 1. The structure and biological application of furanoside-based NHC ligands.

Keywords: Aminosugars, N-Heterocyclic Carbene Ligands, antimicrobial Activity



Laboratory Rearing of Cotton Bollworm, *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae) Wild Colony on Different Artificial Diets

¹Seda Yücel, ¹Hanife Genç

¹Department of Agricultural Biotechnology, Faculty of Agriculture,
Çanakkale Onsekiz Mart University, 17100, Çanakkale, Turkey

hgenc@comu.edu.tr

Abstract

The cotton bollworm, *Helicoverpa armigera* Hübner (Lepidoptera: Noctuidae) is a major pest in agricultural areas in the world. It is important to study the pest biology, behaviour, insecticides resistance and control methods in the laboratory conditions in all year around without depending on the natural host plant. In order to do that, the pest should be reared on artificial diet continuously. The aim of the study is to test known artificial diets for laboratory rearing and adaptation of the cotton bollworm and modify them if necessary to find out the best larval diet. The bollworm larvae were brought to the laboratory with infested tomatoes from Çanakkale provinces. Six artificial diets were prepared with basic ingredients including pinto bean flour, soybean meal, corn meal, chickpea meal, wheat germ, brewer's yeast, torula yeast, sucrose, vitamins and mold inhibitors. Larvae also reared on tomato fruits as control during the experiments. Some biological parameters such as number of larval stages, survival of larval and pupal stages and development times, pupal weights and adult emergence rate were determined on six different artificial diets in the laboratory. As a result, Diet I, originally developed for *Grapholita molesta* that supported larval development successfully and completed 11.6 ± 1.5 days and had 331.8 mg pupal weights. Another diet called as Diet II, originally developed for Lepidopteran species, also successfully used to rear the cotton bollworm larvae with 16.6 ± 1.4 days of larval durations. The cotton bollworm was reared consecutive four generations on both diets. The study results showed that Diet I and Diet II were sufficient and nutritionally suitable for laboratory uses and adaptation of wild colony.

Keywords: Artificial diet, *Helicoverpa armigera*, Lepidoptera, cotton bollworm, rearing

*This research was finally supported by Canakkale Onsekiz Mart University, Scientific Research Projects Commission (FYL-2018/2466).



Investigation of the Effects of Combination Drug Treatment with Trastuzumab and 5-Fluorouracil on A549 Human Lung Cancer Cell Line

1Elif Korkut, 1Onur Eroğlu

¹Department of Molecular Biology and Genetics, Faculty of Science and Letters, Bilecik Şeyh Edebali University, Bilecik, Turkey

elif.k92@gmail.com

Abstract

Lung cancer is one of the most common malignancies in the world and the leading cause of cancer-related death. Trastuzumab is a recombinant, humanized monoclonal antibody, targeting the extracellular domain of the oncogenic factor HER-2/neu. 5-fluorouracil is an antimetabolite drug that is exerts its anti-cancer effects through inhibition of thymidylate synthase and incorporation of its metabolites into RNA, DNA. In this study, we aim to investigate the effects of combining trastuzumab and 5-FU on the HER-2-positive human NSCLC cell line A549.

A549 was cultured in RPMI medium with 10% FBS, 1% penicillin/streptomycin, at 37°C in 5% CO₂ incubator. MTT assay was performed to evaluate the effects of various concentrations of trastuzumab, 5-FU and combination for 24h-48h. To determine the cytotoxic effect of drugs combination were used in survival assay for every 24h(24h-144h). The effect of Trastuzumab, 5-FU and combination were investigated by wound healing assay for 24h-96h. We observed that IC₅₀ values for trastuzumab, 5-FU and combination by MTT assay 70µM, 75µM and 30µM-30µM respectively. Survival analysis showed that combination therapy with trastuzumab 5-Fluorouracil for 24h-144h significantly reduced cell viability. Incubation of A549 cells with trastuzumab, 5-Fluorouracil and combination for 48-96h were inhibited migration into the scratched area as compared to untreated cells.

Keywords: Trastuzumab, 5-Fluorouracil, A549



Determination of Phenolic Compound and Antioxidant Capacities of *Salvia russelli* and *Salvia multicaulis* Species Growing in Elazığ

¹**Mustafa Yunus Emre**, ²**Vesile Yıldırım**, ²**Ökkeş Yılmaz**, ³**Murat Kurşat**

¹Vocational School of Health Care Services, Artuklu University, Mardin

² Department of Biology, Faculty of Science, Fırat University, Elazığ

³Department of Biology, Faculty of Science and Letters, Bitlis Eren University, Bitlis

y_emre85@hotmail.com

Abstract

The aim of this research is to determine the phenolic compound and antioxidant capacities of *Salvia russelli* and *Salvia multicaulis* belonging to Lamiaceae family growing in Elazığ. Chromatographic analyzes of flavanoid and phenolic acid contents of *Salvia* L. species were determined by PREVAIL C18 reversed-phase column (15x4.6mm, 5µm, USA), antioxidant capacity by DPPH radical reduction method. When the phenolic content of the study was examined, it was found that two *Salvia* species contained high routine content ($393,6 \pm 1,2$ - $500,2 \pm 4,2$). At the same time, when we examine the phenolic contents of these two species we have studied, the phenolic content of camphorol, naringin and naringenin in *Salvia russelli* species has never been determined, and only myricetin phenolic content has been found in *Salvia multicaulis*. When the results of DPPH radical reduction studies of these two species were examined, it was determined that the results were between $49.4 \% \pm 0.6$ - $58.2 \% \pm 1.2$. The results obtained from this study showed that two species studied do not have high antioxidant capacity.

Keywords: Antioxidant, phenolic compounds, radical reduction, *Salvia*



Lipase Enzyme Produced from Moderately Halophilic Bacteria in Leather Industry

¹**Burcin Guclu**, ²Meral Birbir, ³Ayse Ogan, ²Pinar Caglayan

¹Institute of Pure and Applied Sciences, Marmara University, Kadikoy, 34722 Istanbul, Turkey

²Department of Biology, Faculty of Arts and Sciences, Marmara University,
Kadikoy, 34722 Istanbul,Turkey

³Department of Chemistry, Faculty of Arts and Sciences, Marmara University,
Kadikoy, 34722 Istanbul,Turkey

burcinguclu@marun.edu.tr

Abstract

Lipase enzymes of moderately halophilic bacteria may give damage to salted sheep skins, reducing quality of leather. Hence, the aim of this study was to investigate lipolytic activities of identified moderately halophilic bacteria obtained from salted sheep skins belonging to South Africa (GA) and Israel (ISR). *Idiomarina loihensis* (GA3) and *Staphylococcus nepalensis* (ISR2) identified using 16S ribosomal RNA gene sequence analysis and traditional tests in previous study, were used in this study. Lipase production by these isolates was investigated according to orangish halos around colonies on olive agar medium at 37°C during five days incubation period. The diameter of orangish halo around *Staphylococcus nepalensis* (6 mm) was larger than the diameter of orangish halo around *Idiomarina loihensis* (5 mm) after 24 hours incubation. While the diameter of orangish halo around *Staphylococcus nepalensis* was detected as 7 mm after 120 hours incubation period, diameter of orangish halo around *Idiomarina loihensis* was observed as 9 mm at the same incubation period. Hence, effective inactivation method should be applied during salt curing of skins to eradicate these destructive microorganisms in the leather industry.

Keywords : Lipase, moderately halophilic bacteria, leather



A geometric morphometrics based evaluation of *Muscardinus avellanarius* (Linnaeus, 1758) populations from Anatolia

¹Güliz Yavuz, ²Hatice Mutlu Eyison, ²Erkut Kivanç, ²Ercüment Çolak

¹Department of Plant Protection, Faculty of Agriculture, Ahi Evran University, Kırşehir, Turkey

²Department of Biology, Faculty of Science, Ankara University, Ankara, Turkey

glzyvz@gmail.com

Abstract

We tested that molar shape of the hazel dormouse, *Muscardinus avellanarius*, may differentiate with geographic locations using landmark-based geometric morphometrics. Nine landmarks digitized to the first upper molar. The canonical variates analysis showed two canonical values for 70% of the total variation of the samples for landmark analysis. In these results, 42% of the total variation was found on the first canonical variable axis and 28% on the second canonical variable axis. Analysis of shape variation revealed that the hazel dormouse populations of Anatolia clustered as Northeastern and Northwestern populations. Different shape variations from molar teeth are related to feeding biology. The morphological variation between Northeastern Anatolia and Northwestern Anatolia may explain with difference in feeding biology because of habitat diversity among the analyzed *Muscardinus* populations in Anatolia.

Keywords: *Muscardinus avellanarius*, Anatolia, geometric morphometrics, molar teeth.

*This study was supported by the TÜBİTAK projects TBAG-467 and 113Z822.



Determination of Forelimb Bone Mineral Measurement Values by Dual-Energy X-Ray Absorptiometry in Van Cats

¹Osman Yılmaz, ¹Zafer Soygüder

¹Department of Anatomy, Faculty of Veterinary Medicine, University of Yuzuncu Yıl, Van, Turkey

osman_40_5@hotmail.com

Abstract

This study was carried out to determine the measurement values of forelimb mineral density using Dual-energy X-ray Absorptiometry (DEXA) method in adult Van Cats, have existed in the Lake Van region of eastern Turkey, and to show the differences between these indicators in both genders. Measurements were made using the DEXA instrument. The instrument's calibrations, tests, controls and phantom measurements were performed by certified technicians. A total 16 adult Van Cats, 8 male and 8 female, were used in the study. Animals were anesthetized with ketamine-xylazine combination and were scanned by DEXA. Then from the forearm region; area (cm^2), bone mineral content (BMC; gr), bone mineral density (BMD; gr/ cm^2), fat mass (gr), lean mass (gr), lean + BMC (gr), total mass (gr), % fat measurements were obtained and statistical analysis was performed. Total weight, area, BMC, lean mass, lean + BMC, total mass values of male cats were seen higher than female cats. These differences were revealed to be statistically significant ($p < 0.05$). In addition, statistically significant correlation ($p < 0.05$) were found between total weight of the male cats with the measurements of lean mass and lean + BMC. Similarly, the correlation between age of the female cats with BMD and % fat measurements were observed to be statistically significant ($p < 0.05$). It is considered that the data obtained by DEXA method can be used in clinical applications as reference bone mineral density parameters in the evaluation of diagnosis and treatment activities of skeletal system related diseases in Van Cats.

Keywords: Bone Mineral Density, DEXA, forelimb, Van Cat



Determining The Levels of Genetic Variation Using 16S rRNA of mtDNA in Different Chromosome Races of *Nannospalax xanthodon* (Rodentia: Spalacidae)

¹Teoman Kankılıç, ¹Habibe Didem Çelikbilek, ¹Cihan Düşgün, ²Tolga Kankılıç

¹Department of Biotechnology, Faculty of Arts and Science,
Nigde Ömer Halisdemir University, Nigde, Turkey

²Department of Biology, Faculty of Arts and Science, Aksaray University, Aksaray, Turkey

tkankilic@ohu.edu.tr

Abstract

In this study, Genetic differences in 16S rRNA regions of mitochondrial DNA in *Nannospalax xanthodon*, *Nannospalax ehrenbergi* and *Nannospalax leucodon* were determined by sequence analysis. For three species distributed in Turkey, 93 samples belonging to 67 populations of *Nannospalax xanthodon*, 10 populations of *Nannospalax ehrenbergi* and 4 populations of *Nannospalax leucodon* were studied. In the result of sequence analysis, 90 haplotypes for 16S rRNA regions of mitochondrial DNA were determined in 93 samples. According to results of this study, *N. nehringi* distributed in Eastern Anatolia region, *N. cilicus* distributed in central Anatolia and *N. tuncelicus* located in Tunceli vicinity determined to be a valid species and not synonym of *N. xanthodon*. There are six species of blind mole rats with allopatric distribution in Turkey.

Keywords: mtDNA, 16S rRNA, *Nannospalax leucodon*, *N. ehrenbergi*, *N. xanthodon*, *N. cilicus*, *N. tuncelicus*, *N. Nehringi*

*This work was supported by the TUBITAK Rapid Support Project (112 T 606) and the FEB 2012/02 project, Niğde Ömer Halisdemir University Scientific Research Projects Unit (FEB 2012/02).



The Protective Effect of Boron Against Cyclophosphamide Induced Hematotoxicity in Rats

¹Mustafa Cengiz, ²Özgün Teksoy, ²Adnan Ayhancı

¹The Faculty of Education, Science Teacher, Siirt University, Siirt, Turkey

²Department of Biology, Faculty of Art and Science, Osmangazi University, Eskişehir, Turkey

aayhanci@ogu.edu.tr

Abstract

Boron (B) is a naturally occurring mineral which is known for its antioxidant properties and used in healthcare, industry, agriculture and cosmetics. B has been shown to be potent anti-osteoporotic, anti-inflammatory, hypolipemic, anti-coagulant, and anti-neoplastic agents both in vitro and in vivo in animals. Current knowledge about the protective effects of boron on humans needs to be improved. The aim of this study was to investigate the possible hematoprotective effects of B on cyclophosphamide (CP)-induced hematotoxicity. Male Wistar albino rats were treated intraperitoneally (i.p.) with boric acid (200 mg/kg) daily for 6 days and received 200 mg/kg CP in distilled water on day 4. Results have showed that administration of B considerably balance the negative changes of periferic blood parameters (leukocytes, erythrocytes hemoglobin, hematocrit, platelet counts) and thiol groups (natural thiol, Total thiol, and thiol disulfid) were induced by CP in rats. Thiol groups homeostasis status have critical roles in antioxidant protection, detoxification, apoptosis, regulation of enzyme activity and cellular signaling activity. Our findings suggest that at convenient concentration B could be a potentially effective drug in the treatment of CP-induced damage and could provide us with the hope in prevention and treatment of CP toxicity. For this reason, increasing boron intake by consuming a diet rich in fruits, vegetables, nuts and pulses should be recognized as a reasonable dietary recommendation to enhance health and well-being.

Keywords: Boron, cyclophosphamide, hematotoxicity, hematoprotective, rats



Bioethanol production by repeated batch fermentation from lactose containing waste by *E. coli* expressing *Vitreoscilla* hemoglobin

1Taner Sar, 1,2Meltem Yesilcimen Akbas

¹Department of Molecular Biology and Genetics, Faculty of Science,
Gebze Technical University, Gebze, Kocaeli Turkey

²Institute of Biotechnology, Gebze Technical University,
Gebze, Kocaeli Turkey

tsar@gtu.edu.tr

Abstract

Bioethanol production from various biomass is an attractive alternative to the fossil fuels. Whey powder is a concentrated form of cheese whey and could be used as a carbon source for biometabolite production. To improve bioethanol production, new biotechnological practices are available. Among these the immobilized cell systems have been widely used for enhancement of ethanol production. Moreover, *Vitreoscilla* hemoglobin (VHb) is effectively used for improving the biometabolite production in various organisms. In this study, the combined approach including both VHb technology and immobilization was investigated for effective bioethanol fermentation from whey powder by using repeated batch fermentation. Immobilized *E.coli* strains FBR5 (*vgb*-) and TS3 (*vgb*+) were incubated in lactose containing waste medium and at least 15 repeated batch were run in shake flask cultures. At the end of the all repeated batch fermentations, *E.coli* strain TS3 (*vgb*+) produced more ethanol than strain FBR5 (*vgb*-). In addition, levels of ethanol production by the strain FBR5 (*vgb*-) was gradually reduced after the twelfth batch fermentation while strain TS3 (*vgb*+) continued to produce stable level of ethanol. It was shown that VHb strategy in combination with immobilization technique could be used effectively for repeated batch fermentation for effective ethanol production.

Keywords: Bioethanol, whey, immobilization, *Vitreoscilla*, hemoglobin, repeated use

*This work was supported by Gebze Technical University (2017-A102-19).



Various Biological Activities of Plane Tree (*Platanus orientalis* L.) Extracts

¹Fazlı Sözmen, ²Esra Uçar, ³Nuraniye Eruygur, ⁴Mehmet Ataş, ⁵Merve Ergül, ⁵Mustafa Ergül

¹Department of Nanotechnology Engineering, Cumhuriyet University, Sivas, Turkey

²Vocational High School of Sivas, Cumhuriyet University, Sivas

³Department of Pharmacognosy, Faculty of Pharmacy, Cumhuriyet University, Sivas

⁴Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Cumhuriyet University, Sivas

⁵Department of Biochemistry, Faculty of Pharmacy, Cumhuriyet University, Sivas

fsozmen@hotmail.com

Abstract

The *Platanus orientalis* L. (plane tree) is a member of Platanaceae family and grows naturally in the Mediterranean region of south-Europe and south-western Asia especially in microclimate region. The *P. orientalis* has deeply lobed leaves and very strong branches. Today, it is well known that many diseases such as cancer, autoimmune disorders, aging, cardiovascular, and neurodegenerative diseases are directly related to oxidative stress and antioxidants are the compounds that can prevent or stop cell damage caused by oxidants. In other words they improve the body's cellular defence system against oxidative damage. So they are extremely important for our health and we can easily reach them from natural sources especially plants. This study has been carried out for identification and comparison of chemical content of extracts obtained from water and methanol extraction of *P. orientalis* leaves. Additionally, in order to understand the pharmacological value of *P. orientalis* leaves, we have studied the antimicrobial, anticancer, antioxidant, and various enzyme inhibition activities of these two extracts. Especially we were interested in its inhibitory effects against Alzheimer's disease related enzymes Acetylcholinesterase (AChE) and Butyrylcholinesterase (BuChE), diabetes mellitus related enzymes α -glucosidase and α -amylase. The antioxidant, anticancer, and antimicrobial activities of leaves have been also studied. According to results, both water and methanol extracts of *P. orientalis* demonstrated more α -glucosidase and α -amylase inhibition activity than the antidiabetic drug-acarbose at the same concentration level. In addition, extracts showed good inhibition activity against AChE and BuChE. We also found significant results regarding antioxidant, anticancer, and antimicrobial activities. These results are very promising especially for improving pharmaceutical formulations to treat various diseases such as age related diseases, cancer, diabetes etc. and it is necessary to conduct further experiments.

Keywords: *Platanus orientalis* L., Platanaceae, Alzheimer's disease



Evaluation of Red Meat Products by Species Identification in Terms of Pork Adulteration

¹Gözde Türköz Bakırıcı, ²Ezgi Yağmur

¹Gastronomy and Culinary Arts Programme, Seferihisar Fevziye Hepkon School of Applied Sciences, Dokuz Eylül University, İzmir, Turkey
²Food Control and Research Laboratory, Edge, İzmir, Turkey

ezgi.yagmur@edge.com.tr

Abstract

Meat is a nutritional element that must be a place at well-balanced diet because of its rich protein content. It has important constitutive and regulatory functions in body. Meat products are obtained by processing the meat to give new specialty. Species identification in these products is important for costumers due to religious reasons, economic losses and food allergies. Therefore, it is stated in legal regulations that meat products must be correctly labeled for the protection of consumers. According to Notification (2012/74), meat of cattle and small cattle breeds can be mixed and meat of poultry species can be mixed with each other. The other species can not be mixed. Detection of animal species is done by various analytical methods. By developing Polymerase Chain Reaction (PCR) technique, species can be identified more quickly, easily and sensitively. The aim of this study is to evaluate the appropriateness of the absence of pork in 30 red meat and meat products obtained from butchers, delicatessens and restaurants in Izmir province and surrounding areas. After grinding, isolation was carried out with the Magrev DNA Genomic DNA Isolation Kit (Anatolia Geneworks). Subsequently, pork meat detection analysis was performed using Real Time PCR and Bosphore Species Identification Kit Pork v1 (Anatolia Geneworks). As a result of analysis, pork meat was not found. When the results are evaluated, these products conform to the notification in terms of not having pork meat. As a result, meat products must be properly labeled by producers and routinely inspected by food authorities.

Keywords: Meat, meat products, Real Time PCR, species identification

ORAL PRESENTATIONS

OP-059



Genetic Variations in the NLRP3 Inflammasome and Risk of Type 2 Diabetes

¹**Cansu Ozbayer**, ²**Medine Nur Kebapci**, ³**Emine Yagci**, ³**Hulyam Kurt**,
³**Hasan Veysi Gunes**, ³**Irfan Degirmenci**

¹ School of Health Sciences, Dumlupinar University, Kutahya, Turkey

² Department of Endocrinology, Medical Faculty,
Eskisehir Osmangazi University, Eskisehir, Turkey

³Department of Molecular Biology, Medical Faculty,
Eskisehir Osmangazi University, Eskisehir, Turkey

c.ozbayer@gmail.com

Abstract

Type 2 diabetes (T2DM) is a disease characterized by a complete or partial deficiency of insulin, hyperglycaemia and insulin resistance. Inflammation is the natural defensive response of the organism against any harmful, foreign or destructive effect. Recent studies have emphasized the link between inflammation, insulin resistance and pathogenesis of type 2 diabetes. Inflammasome is a protein complex that recognizes stimulants with the potential to produce inflammation and, in response, processes a process responsible for the production and secretion of proinflammatory cytokines. There are different types of inflammatory structures, but NLRP3 (Nod-like receptor pyrin domain-containing-3) inflammasome has been associated with type 2 diabetes, insulin resistance and obesity. In macrophages, NLRP3 activates inflammation and impairs insulin signaling, causes insulin resistance by TNF-dependent and TNF-independent pathways in cells targeted to insulin. The aim of our study is to investigate the relationship of rs10925027 and rs4925659 variants of the NLRP3 gene. For this purpose, DNA samples isolated from blood samples of 100 T2DM patients and 100 control individuals were genotyped using the Sequenom MassARRAY system and the Iplex GOLD SNP protocol for the NLRP3 rs10925027 and rs4925659 variants and then evaluated with appropriate statistical methods. We found significant differences in frequencies of rs10925027 ($p=0.0013$) and rs4925659 ($p<0.001$) genotypes between control and T2DM subjects. The rs10925027 T allele was found to be significantly higher in controls, whereas C allele was most frequent in T2DM individuals ($p=0.002$). The GG genotype of rs4925659 also showed to high frequencies in T2DM patients ($p<0.001$). In conclusion, rs10925027 and rs4925659 variants from the NLRP3 gene involved in the structure of the inflammasome are closely related to T2DM risk in patients with Turkish origin. The NLRP3 genotype rs10925027 CC genotype and the rs4925659 GG genotype were identified as significant risk factors for the T2DM.

Keywords: Inflammation, Inflammasome, NLRP3, Type 2 Diabetes, rs10925027, rs4925659



Copper Bioaccumulation of Fungi and Oxidative Responses

¹Hulyam Kurt, ²Semra Malkoc, ³Cansu Ozbayer, ¹Emine Yagci

¹Department of Medical Biology, Medical Faculty,
Eskisehir Osmangazi University, Eskisehir, Turkey

²Applied Research Centre for Environmental Problems, Anadolu University Eskisehir, Turkey

³School of Health Sciences, Kutahya Dumlupinar University, Kutahya, Turkey

satik@anadolu.edu.tr

Abstract

Copper in the world as quantity is one of the metals with the highest consumption and one of the major heavy metals causing soil pollution, is also not desired in the water; those with hepatic insufficiency or Wilson's disease are more susceptible to vomiting. The accumulation of copper in micro-organisms is known. The present work investigated the effect of copper (Cu) on the growth, metal accumulation ((50-150 mg/L), total oxidant status (TOS) for oxidative stress, total antioxidant status (TAS) for antioxidant response, malondialdehyde (MDA) and total protein in eight fungal isolates. MDA, total protein, TAS and TOS levels were determined by spectrophotometrically. Observed data were evaluated by IBM SPSS OneWay ANOVA analysis. MDA level is end of the products of lipid peroxidation and commonly known as a marker of oxidative stress. MDA levels were significantly higher in the group of 50 mg / L ($P <0.001$) and 100 mg / L ($P = 0.031$) compared with the control. There was no difference between groups when total protein level was compared ($P = 0.173$). There was no difference between groups when TAS level was compared ($P = 0.486$). When compared to control, we found significantly high TOS levels in 50 mg / L and 100 mg / L group ($P <0.001$, $P = 0.009$, respectively), in parallel with the MDA levels. In a conclusion, Cu accumulation induce the lipid peroxidation and oxidative stress in fungal isolates.

Keywords: Bioaccumulation, copper, oxidative response, pollution



Investigation of Decellularized Heart Matrix's Impacts on Differentiation Capacity of Mesenchymal Stem Cell into Cardiomyocytes

1Kamil Can Kılıç, 1,2,3Yusufhan Yazır, 1Ahmet Öztürk, 1,2Gökhan Duruksu, 1,2Gülçin Gacar

¹Department of Stem Cell, Institute of Health Sciences, Kocaeli University, Kocaeli, Turkey

²Center for Stem Cell and Gene Therapies Research and Practice, Kocaeli University, Turkey

³Department of Histology and Embryology, Faculty of Medicine, Kocaeli University, Turkey

can.kilic@kocaeli.edu.tr

Abstract

Cardiovascular diseases have the highest rates of morbidity and mortality worldwide. Conventional pharmacological and surgical treatments are major options for acute and chronic cardiovascular diseases. However, tissue engineering-based therapies are alternative to surgical interventions due to donor insufficiency. Main consideration of tissue engineering studies is to combine stem cells that repair physiological damage with natural or synthetic scaffolds that provide mechanical and biochemical support. Natural scaffolds, which are non-immunogenic and tissue-specific, are obtained by decellularization technique that means of removing cells from organs. Decellularized scaffolds are significant component for tissue engineering. However, informations about regenerative capability of natural scaffolds are still limited. Aim of our study is to investigate effects of 3D decellularized heart matrix on cardiomyogenic differentiation. To obtain scaffold, rat heart was decellularized by Triton X-100 and SDS detergent application. DNA content of matrix was determined by PCR to identify decellularization efficiency. Decellularized matrix was examined with immunofluorescence staining for fibronectin and collagen1a1 and hematoxylin&eosin staining. Recellularization was done with mesenchymal stem cells. Recellularized cells' viability onto scaffold was determined by WST-1 analysis. Cardiomogenic differentiation was achieved with chemical stimuli in 3D decellularized heart matrix and 2D culture. Decellularized matrix-induced cardiomyogenic differentiation was examined comparatively by differentiation in 2D culture. For differentiation process, RT-PCR was performed by cardiomyocyte-specific cTN3-I, TBX, GATA-4 and Nkx2.5 genes. When differentiation on 3D matrix and 2D culture were examined, 3D matrix triggered more efficient differentiation. Taken advantages of our results, we obtained informations about heart regeneration and repair potential of mesenchymal stem cells.

Keywords: Decellularization, heart, extracellular matrix, recellularization, tissue engineering



Cryopreservation of Acellular Heart and Lung Scaffolds With Different Cryogenic Methods

**¹Ahmet Öztürk, ¹Kamil Can Kılıç, ^{1,2,3}Yusufhan Yazır, ^{1,2,4}Z. Seda Halbutoğulları,
^{1,2}Gökhan Duruksu**

¹Department of Stem Cell, Institute of Health Sciences, Kocaeli University, Kocaeli, Turkey

²Center for Stem Cell and Gene Therapies Research and Practice, Kocaeli University, Turkey

³Department of Histology and Embryology, Faculty of Medicine, Kocaeli University, Turkey

⁴Department of Medical Biology, Faculty of Medicine, Kocaeli University, Kocaeli, Turkey

ahmet.ozturk@kocaeli.edu.tr

Abstract

Tissue engineering-based therapies are one of important treatment alternatives in cases where organ and tissue transplantation are necessary. Decellularization, a technique through removing cells from tissues, is commonly used to obtain scaffold in tissue engineering studies. Decellularized scaffolds are non-immunogenic and tissue-specific structures. Despite widespread use, studies on cryopreservation of scaffolds are scarce. Cryopreservation of decellularized scaffolds is significant issue when considering requirement for those in great deal. Target of our study is determination suitable and economic cryogenic methods for decellularized heart and lung scaffolds. For this purpose, rat heart and lung were firstly undergone decellularization with Triton X-100 and SDS detergents. To verify decellularization; PCR was performed to show that no DNA remained in matrix. Heart and lung scaffolds were cryopreserved in different cryogenic conditions. Decellularized and cryopreserved scaffolds were then thawed and matrix's integrity were examined by immunofluorescent methods. To evaluate functionality, after cryopreservation, matrixes were recellularized with mesenchymal stem cells. Cryogenic conditions' impacts on cell viability and attachment onto decellularized matrix were examined by WST-1. In our study, results obtained by PCR analysis to measure amount of DNA in matrix showed that decellularization were completely achieved. When protective effects of different freezing mediums on matrix integrity and cell viability were examined by immunofluorescence methods, we saw that cryopreservation with medium+serum and medium+serum+DMSO were adequate to support. Cell viability assays showed that cryopreserved heart and lung scaffolds with medium+serum+DMSO provide better support after recellularization. In our study, effective and economical cryopreservation conditions were determined for decellularized scaffolds.

Keywords: Tissue Engineering, Decellularization, Cryopreservation, Heart, Lung



Does Acrylamide Induce Leptin and Galanin Expressions in Clone 9 Cells?

1Sedat Kaçar, 1Nuriye Ezgi Bektur, 1Varol Şahintürk

**¹Department of Histology and Embryology, Faculty of Medicine,
Eskisehir Osmangazi University, Eskisehir, Turkey**

skacar@ogu.edu.tr

Abstract

Acrylamide is a monomer which exerts neurotoxic, genotoxic, mutagenic effects on humans and experimental animals. It is exposed not only in workplaces but also by our daily foods. Leptin and galanin are important hormones associated with body metabolism. There is no study about the expressions of leptin and galanin in acrylamide-treated Clone 9 hepatocyte cells. Thus, in this current study, we aimed to examine expressions of these hormones as well as morphological changes in acrylamide-treated Clone 9 cells. The cells were maintained at 37°C in an incubator with stable 5% CO₂ and 95% air in flasks. The experiment was conducted in six-well plates. Briefly, detached cells were seeded on a slide at a density of 3×10⁵ and either treated with acrylamide or not treated. After 24 h, the cells were observed under inverted microscope and applied a routine immunocytochemistry procedure for leptin and galanin proteins. Besides, the cells were stained with hematoxylin-eosin. In immunochemistry, leptin and galanin expressions were detected to increase in acrylamide-treated groups while almost no or less reactivity is observed in the untreated group. Morphological analysis showed cell degenerations, including nuclear fragmentation, nuclear condensation, membrane blebbing and apoptotic bodies. To conclude, this is the first study which examined leptin and galanin expressions in acrylamide-treated Clone 9 hepatocyte cells. Further studies are needed to confirm interaction between these hormones and acrylamide.

Keywords: Acrylamide, leptin, galanin, hepatocyte cells



Antioxidant Responses of Barley Roots to Salicylic Acid under Combined Drought, Heat and Salt Stresses

¹Hülya Torun

¹Faculty of Agricultural and Natural Sciences, Duzce University, 81620 Duzce, Turkey

hulyatorun@duzce.edu.tr

Abstract

Plants are exposed to more than one unfavorable environmental stress conditions in field. Plant growth and development are regulated by hormonal control and there are signaling networks related to abiotic stress tolerance mechanisms. Salicylic acid (SA), a plant phenolic phytohormone, can affect a range of physiological and biochemical processes and has significant effects on the resistance to abiotic stresses. In this study, the influence of exogenous application of SA on hulled and non-hulled barley (*Hordeum vulgare* L. 'Tarm' and 'Özen', respectively) roots under combined stress conditions of drought, heat and salinity were investigated. Combined stresses caused markedly reductions root length and the reduction in root length was more pronounced in Özen. Moreover, the proline content of Tarm was greatly increased under combined stresses as compared to Özen. In the first 24h of stress treatment, SOD and POX activity in Tarm roots increased, while decreased in Özen. Furthermore, CAT, APX and GR showed higher activities during combined stresses in Tarm as compared Özen. The sensitivity of non-hulled barley roots may be related with a decreased activity of SOD, POX, CAT and GR. SA improved the activities of GR in Tarm and POX and CAT in Özen during 72h of combined stress applications. According to these findings, the comparative study in osmoregulation, root length, and lipid peroxidation of roots of hulled and non-hulled barley genotypes reveal that Tarm has a better adaptation to triple combined stresses and SA-alleviated the damaging effects of triple stress by improving the antioxidative system is cultivar dependent.

Keywords: Antioxidant, barley, combined stress, root, salicylic acid

*This work has been supported by funding from Duzce University Research Foundation (2014.11.01.283).



The Relationships between Landscape Character and Landscape Metrics as Ecological Aspects

1Engin Eroğlu, 1Sertaç Kaya, 2Alperen Meral, 1Nermin Başaran, 1Tuba Gül Doğan

**¹Department of Landscape Architecture, Faculty of Forestry, Duzce University,
81620, Düzce, Turkey**

**²Department of Landscape Architecture, Faculty of Agriculture, Bingöl University,
12000, Bingöl, Turkey**

engineroglu@duzce.edu.tr

Abstract

Landscape character is the perception of landscape elements having a coherent, distinct and unique characteristics. Basically the landscape character is landscape parts having unique characteristics. Landscape Character Assessment can be used as a supportive tool for being the milestone of sustainable development in environmental conservation and resource management. In some European countries such as England and Scotland, it has an important role in landscape and its applications. Landscape metrics exist at the patch, class (patch type) and landscape level. At the class and landscape level, some of the metrics quantify landscape composition, while others quantify landscape configuration. Landscape composition and configuration can affect ecological processes independently and interactively. Thus, it is especially important to understand for each metric what aspect of landscape pattern is being quantified. In addition, many of the metrics are partially or completely redundant; that is, they quantify a similar or identical aspect of landscape pattern. In most cases, redundant metrics will be very highly or even perfectly correlated. The main purpose of the study is to understand the relations between landscape character and their assessment by using landscape metrics at the same time by using a case study which is patch analyze in fragmentation of the roadside corridor and to identify ecological units of the landscape in a mountain.

Consequently according to the case study results, it has shown that there are differences depends on fragmentation between Landscape character and landscape units. Because of this reason, landscape metric values of landscape character and units show differences.

Keywords: Fragstat, metrics, ecology, mountain landscapes



Gis1 regulates *NTH1* gene expression in *Saccharomyces cerevisiae*

¹Tülay Turgut Genç, ²Burak Servili

¹Department of Biology, Faculty of Arts and Science, Onsekiz Mart University, Çanakkale, Turkey

²Graduate School of Bioinformatics and Genetics, Kadir Has University, İstanbul, Turkey

tturgutgenc@comu.edu.tr

Abstract

GIS1 is a C₂H₂ zing finger DNA binding transcription factor that acts as a both transcriptional activator and repressor for different target genes in *Saccharomyces cerevisiae*. Gis1 regulates gene expressions in response to diauxic shift which is changing metabolism from fermentation of glucose to oxidation of ethanol whenever glucose consumed. Gis1 acts as a transcriptional activator of genes involved in stationary phase. Gis1 specifically binds T(A/T)AGGGAT sequence, PDS (Post Diauxic Shift) element, that is present in the promoters of target genes. *GIS1* is a regulatory target of the Protein Kinase A (PKA), Sch9 kinase and TOR pathway. *NTH1* gene encodes neutral trehalase enzyme that is responsible from the degradation of stres accumulated trehalose in *S. cerevisiae* yeast cells. The transcription of *NTH1* gene is activated in different stress conditions through a Stress Response Element (STRE) and PDS element that is present in the promotor of *NTH1* gene. *NTH1* gene expression is regulated by PKA and TOR pathways, also. That's why in our research we investigated the effects of Gis1 transcription factor on *NTH1* gene expression. For that purpose, Δgis1 mutant yeast and its isogenic wild-type yeast strain, BY4741, were used to analyze *NTH1* gene induction in logarithmic, post diauxic and stationary stages of cell growth. We found that Gis1 worked as a repressor during logarithmic phase, and as an activator during post diauxic shift and stationary phases of growth.

Keywords: *NTH1*, Gis1, PDS, *Saccharomyces cerevisiae*

*This work was supported by Çanakkale Onsekiz Mart University The Scientific Research Coordination Unit, Project number: FYL-2016-805.



Photocatalytic Disinfection of *S. aureus* and *C. albicans* Under Visible Light Irradiation

¹Öge Artagan, ¹Ali İmran Vaizoğullar

¹Department of Medical Service and Techniques, Vocational School of Health Services,
Muğla Sıtkı Koçman University, Muğla, Turkey

ogebasoglan@mu.edu.tr

Abstract

In the present study, a new composite catalyst which highly active under the visible light was synthesized by immobilizing onto bentonite surface using ZnO materials (ZnO/Bent). For this a simple in situ participant technique was used. The samples were characterized using SEM, XRD, BET techniques. SEM images possess that ZnO particles have nearly spherical structure. Bentonite clay was used to increase the surface area of the samples. The obtained BET surface area of the samples shows that ZnO/Bent catalyst was lower than that of pure Bentonite. The aim of the research was to evaluate the effectiveness of photocatalytic disinfection with ZnO-Bent composite against a major human pathogens under visible light irradiation. The obtained results showed that when *C. albicans* strain was subjected to ZnO-Bent mediated photocatalytic disinfection under solar irradiation, 73.83 % of the targeted microorganism was disinfected within 2 hours. 44 % of *S. aureus* colonies were inactivated within 4 hours under solar irradiation. Possible degradation mechanism for ZnO/Bent composite was proposed in this study.

Keywords: Photocatalytic Disinfection, ZnO-Bent, *S. aureus*, *C. albicans*, visible light.



Determination of Phytochemical Constituents of *Phlomis lunariifolia* SM. by LC-MS/MS and Biological Activity

¹Gamze Göger, ^{2,3,4}Fatih Göger, ⁵Yavuz Bülent Köse

¹Department of Pharmacognosy, Faculty of Pharmacy, Trakya University, Edirne, Turkey

² Program in Pharmacy Services, Yunus Emre Vocational School, Anadolu University, Eskisehir

³ Medicinal Plants, Drugs and Scientific Research Centre, (AUBIBAM),
Anadolu University, Eskisehir

⁴Department of Pharmacognosy, Faculty of Pharmacy, Anadolu University, Eskisehir, Turkey

⁵Department of Pharmaceutical Botany, Faculty of Pharmacy,
Anadolu University, Eskisehir, Turkey

gamzegoger@trakya.edu.tr

Abstract

Phlomis L. (Lamiaceae) species are important medicinal plants that is known as “Çalba” in local name and have antidiabetic, antiinflammatory, antiallergic, anticancer, antiparasitic and antimicrobial effects. The purpose of this study was to identify the phytochemical constituents of the methanol extract of *P. lunariifolia* and the antibacterial effects against some pathogenic bacteria. It was collected from Anamur (Mersin) in 2015. Antibacterial activity was carried out by *in vitro* microdilution method against *Bacillus cereus* NRRL B 3711, *Escherichia coli* ATCC 8739, *Pseudomonas aeruginosa* ATCC 13888, *Staphylococcus aureus* ATCC BAA 1026 and *Acinetobacter baumannii* ATCC 19606 strains. Ciprofloxacin, used as a standard antibacterial agent. Phytochemical constituents of the methanol extract was analyzed by LC-MS / MS analysis. The results of phytochemical analysis of methanol extract were determined chrysoeriol, rutinoside, luteolin rutinoside and apigenin rutinoside as main compounds. The results of antibacterial activity of the methanol extract were given by the minimum inhibitory concentration (MIC, µg / mL) values against tested bacteria. The antibacterial effect of *P. lunariifolia* methanol extract was generally found as MIC = 1250 µg / mL against tested bacterial strain.

Keywords: *Phlomis lunariifolia*, LC-MS/MS, antibacterial activity



Demonstration of Fat Body Cells in *Culex pipiens* Using Different Histochemical Techniques

1Mehtap Gülmез, 1Gamze Turgay İzzetoglu, 2M. Salih Yıkılmaz

¹Department of Zoology, Faculty of Science, Ege University, İzmir

²Department of Molecular Biology, Faculty of Science, Ege University, İzmir

mehtapg.3535@gmail.com

Abstract

Fat body is a mesodermal originated tissue which possess biosynthetic and metabolic activity and composed of thin layer of one or two cell thickness in insects. Fat body is an endocrine organ for the insects and known that it is homology to the liver in vertebrates. In this research, its structure is determined the first time in larvae, pupae and adults of mosquito *Culex pipiens*, causing many contagious diseases in humans. The structure, cell types and their contents of fat body are shown by using different fixative solutions and various specific histochemical staining methods. The cells of the fat body are one-two lines in some regions, while the others in groups. In the differently stained sections, the cells in the fat body tissue are shown in detail. The most common of these cells are trophocytes and oenocytes which associated with the fat body. These cells, which are found in the body cavity of insects and have very important functions in the immune system, are thought to be central of humoral response of the immune system in mosquitoes.

Keywords: *Culex pipiens*, fat body, histochemistry



CAPS Marker Polymorphisms in *Fusarium culmorum*

¹Aylin Gazdağı, ¹Gizem Gökcen Yılmaz, ²Gülruh Albayrak

¹Institute of Graduate Studies Science and Engineering, Istanbul University 34134,
Vezneciler, İstanbul, Turkey

²Department of Molecular Biology and Genetics, Faculty of Science,
Istanbul University, 34314, İstanbul, Turkey

gulruh@istanbul.edu.tr

Abstract

In the current study, coding region variations of the specific genes responsible for basic cellular processes in *Fusarium culmorum* were analysed for the first time. Actin (*act*), Histon3 (*H3*), β -tubulin, ribosomal protein (*FG10010.1*) genes were amplified from 24 isolates through CAPS method. 1200, 440, 720 and 800 bp gene-amplicons were obtained, respectively. Null alleles were detected in a few isolates due to mutations on primer binding sites of each gene. *Cla*I endonuclease revealed restriction polymorphisms (RPs) of 250 and 950 bp long fragments in the *act* gene product of five isolates. *NmuCI* also displayed RPs (two identical fragments with 600 bp) in the same isolates and gene. In addition, sequencing data showed SNPs, *in-dels* were also found in *act*. But, RPs were not obtained from digestion of *H3* with *Ava*II and *Tfi*I. All isolates had the same restriction profiles (155 and 285 bp for *Ava*II, 120 and 320 bp for *Tfi*I). Monomorphic restriction profiles were also shown in digestion of β -tubulin with *Tfi*I (610 and 110 bp) and *NmuCI* (260, 260 and 200 bp). Similarly, no polymorphic profiles were observed in *FG10010.1* when digested with *Ava*II and *NmuCI* (700 and 100 bp). *H3*, β -tubulin and *FG10010.1* genes showed 100 % sequence homology with reference genome (CS7071). It was revealed that *act* gene was to be polymorphic in *F. culmorum*. CAPS analysis not only provided to determine the RPs in the genes which are basic for cellular life, when the analysis was supported with sequencing enables to reveal SNPs and *in-dels*.

Key words: *Fusarium culmorum*, CAPS molecular marker, restriction polymorphism, SNPs, *in-dels*

*The study was supported by Research Fund of Istanbul University by project number 41643



Investigation of Myxomycetes (Myxomycota) in south Amanos mountains (Hatay-Turkey)

Hayri Baba, Yücel Doğan

Department of Biology, Faculty of Arts and Sciences,
Mustafa Kemal University, 31040, Antakya-Hatay, Turkey

hayribaba_68@hotmail.com

Abstract

Myxomycetes samples collected 10 different areas from South Amanos Mountain Hatay during 2013-2017. The samples were gathered from leaves, barks, litterfalls, decayed or unspoiled herbal materials. It was meant to try to develop myxomycetes sporophores by applying Moist Chamber Culture to collected samples. In addition, myxomycetes, which grew up in their natural environment were obtained. As a result of field and laboratory studies 48 taxa belonging to 10 families and 18 genera were identified. A total of 304 samples were collected in our study. In 122 samples, members of Myxomycetes were encountered. 7 taxa were detected naturally, and 115 of them were detected by the Moist Chamber Technique. 23 (48%) were rare, 14 (29%) were common and 11 (23%) were abundant and rare species were not found in our study area. The ratio of the number of species to the number of species (T / C) is used as a sign of taxonomic diversity. In our study, T / C value of 48 taxa is 2.66. If we look at the substrate preferences of the 122 samples we have obtained; 86 lignicolous, 33 corticolous and 3 foliicolous were obtained. Field trips cover 4 seasons of the year; 47 in the autumn land visit, 38 in the winter season, 29 in the spring and 8 in the summer season were obtained from Mycetozoa. When the 48 types detected are examined at the team level; the members of the Trichiida team were the most common (16), followed by Physarida (12) and Stemonitida (11) teams. The Protostelida team, which is the only species, was recorded as the team with the least number of members. When analyzes are made on the substrates developed by the samples; It has been found that Myxomycetes members often use materials from various coniferous trees as substrate in the rotten parts of woody plants. By examining 48 cases; The Trichiaceous plasmodium type, which is characteristic for the Trichiales team, was more frequent (16), while the other plasmodium types were less common (8), phaneroplazmodium (12) and aphanoplazmodium (12). When 48 sports were examined; it is noted that wartime sports (27) are more intense. Spine spores (7) are least common, whereas spastic spores (14) are relatively common. When our samples are compared to sporophore types; 14 aethalium, 5 pseudoaethalium, 8 plasmodiocarp and 21 sporangium species were recorded.

Keywords: Myxomycetes, Diversity, South Amanos Mountains- Hatay



Comparison of Pluripotency Capacity Between Pericytes and Mesenchymal Stem Cells

1Selen Polat, 1,2,3Yusufhan Yazır, 1,2Büşra Öncel Duman, 1,2Gökhan Duruksu

¹Center for Stem Cell and Gene Therapies Research and Practice, Kocaeli University, Izmit, Turkey

² Department of Stem Cell, Institute of Health Sciences, Kocaeli University, Izmit, Kocaeli, Turkey

³ Department of Histology and Embryology, Medical School, Kocaeli University Kocaeli, Turkey

selenonder91@gmail.com

Abstract

Pericytes are periendothelial vascular mural cells that are located around endothelial cells at small capillaries. Pericytes have important roles in immun system, wound healing, inflammation and angiogenesis. In addition they have tissue specific functions. They are also considered as a good potential source for tissue regeneration. These cells can be identified by their double expression of PDGFR β , NG2, aSMA and CD146. Mesenchymal stem cells have been used for years as a treatment for different type of diseases. In this study, proliferation capacity between mesenchymal stem cell and pericytes will be compared. Pericyte isolation was performed by mechanical and enzymatic methods from human placenta. Mesenchymal stem cell was isolated from human wharton jelly. Characterization of both pericyte and mesenchymal stem cells was performed with flow cytometry and immunofluorescence techniques. Pluripotency capacity of these cells was performed with gene expression. For this purpose, pluripotency markers compared according to cells' passages. Pluripotency capacities were performed for both mesenchymal stem cell and pericytes as separate. In this study, Lin28, ZPF42, GATA6, FoxD3, Rex1, UTF-1, Sox2, Tert, Nr6a1, Msx1, Oct4, Pdx1 were used as a pluripotency panel. Pluripotency capacity of placental pericytes has been decreased according to their passages. In P4 pericyte have more expression level for UTF1, Sox2, ZPF42, Lin28, FoxD3. In addition, P6 MSC have more expression level for Lin28, ZPF42, FoxD3, UTF1, Sox2. Both cell types have decreased gene expression level in P8. In addition, PDGFRB expression has been observed in pericytes. However, the MSC doesn't contain the PDGFRB gene expression.

Keywords: Pericytes, Mesenchymal Stem Cells, Pluripotency, PDGFRB



Retrotransposon-based Molecular Marker Monitoring in *Fusarium graminearum*

¹Gizem Gökçen Yılmaz, ²Gülruh Albayrak

¹Institute of Graduated Studies Science and Engineering,
Istanbul University, 34134, Vezneciler, İstanbul, Turkey

²Department of Molecular Biology and Genetics, Faculty of Science,
Istanbul University, 34314, İstanbul, Turkey

gulruh@istanbul.edu.tr

Abstract

Presence of LTR likes sequences belongs to retrotransposon *BARE-1* on *Fusarium graminearum* genome was demonstrated and relationship among 47 isolates was evaluated by using inter retrotransposon amplified polymorphism (IRAP), in this study. Five universal primers, developed for barley genome, were used at four different combinations in the amplification of inter regions of LTRs. Totally 43 IRAP markers, ranged from 100 to 5000 bp were scored. Similarities among isolates were calculated according to Nei and Li coefficient, and genetic relationship among them was shown with a dendrogram. Similarity between T2 and T3 isolates were calculated as 100%. The most distant isolates were Fg4 and Sh15. Moreover, similarity between two references was 80%. Totally 45 nods were in the dendrogram. After isolates were separated into two main groups, they were divided into phenons and subphenons. Isolate Fg170 stayed out of the two groups since it had different retrotransposon mobility profiles from another isolates. All isolates originated from Turkey, except five, located as related clusters, dispersed among Iranian isolates. Moreover, two references were found within the same subgroup together with Turkish isolates. Genetic relationship was revealed based on similarity of inter retrotransposons regions within the genome instead of whole genomic similarity and/or diversity. Actively moving retroelements are responsible for the diversity among *F. graminearum* isolates. Detection of inter regions of LTRs belongs to *BARE-1* on *F. graminearum* genome is thought that these sequences should be transferred to fungal genome from barley as a result of plant-pathogen interaction in evolutionary process.

Keywords: Inter retrotransposon amplification polymorphism, *F. graminearum*, *BARE-1*, retrotransposon mobility, genetic relationship

*The study was supported by Research Fund of Istanbul University by project number 58541



Post embedding immunogold labelling of airborne *Alternaria alternata* allergen

1Bükay Yenice Gürsu, 1İllknur Dağ, 2Semra İlhan

¹Eskişehir Osmangazi University; Central Research Laboratory Application and Research Center (ARUM) 26480, Odunpazarı Eskişehir, Turkey

²Department of Biology, Graduate School of Natural and Applied Sciences, Eskişehir Osmangazi University, 26480, Eskişehir Turkey

bgursu@ogu.edu.tr

Abstract

Alternaria is a common plant pathogenic fungus and it releases allergen-bearing spores to environment in late summer and early autumn terms. The increase in rates of *Alternaria* spores have strongly associated with variety respiratory allergy types such as asthma or rhinitis. *Alternaria alternata* was isolated from urban area of Eskisehir atmosphere by petri plate gravitational method. The isolate was cultivated on Sabouraud glucose agar plate for one week at 25 C. Pieces of 0.5 mm² agar from cultivated petri plate was fixed by 0,1 M sodium cacodylate buffer containing 4% (w/v) paraformaldehyde and 0.5% (v/v) glutaraldehyde. Sample was dehydrated and embedded epoxy resin. Ultrathin sections of samples on nickel grids at a thickness of 60 nm. They were labelled by M1 and goat pAb to Ms IgG antibodies (10-nm gold particles). Transmission electron microscopy was used to visualization. As a result, M1 located in outer layer of fungal cell wall.

Keywords: Immunogold labelling, Alternaria, TEM



The Role of SWR1 Complex on *NTH1* Gene Expression in *Saccharomyces cerevisiae*

¹Tülay Turgut Genç, ¹Nihan Akıncı

¹Department of Biology, Faculty of Arts and Sciences,
Çanakkale Onsekiz Mart University, 17020 Çanakkale, Turkey

akincinihan@gmail.com

Abstract

Trehalose is a non-reducing disaccharide that plays numerous important bio-functions in yeast. Neutral trehalase enzyme, encoded by *NTH1* gene, responsible from the hydrolysis of intracellular stress accumulated trehalose in *Saccharomyces cerevisiae*. Transcription of *NTH1* is activated by Msn2/4 which are stress activated transcription factors. For transcription to occur, DNA must be exposed to polymerase proteins and transcription factors by providing mobilization of nucleosomes through remodelers, in a process known as chromatin re-modeling. SWR1 chromatin remodeler, containing the catalytic subunit Swr1p, exchange H2A.Z-H2B dimers for canonical H2A-H2B dimers, which serves to specialize chromatin regions. In this study, we have analyzed if the SWR1 chromatin modifying complex involves in the transcription of *NTH1* gene under nitrogen starvation conditions by using Δ swr1 and wild type yeast strain. From the results, there was no difference between wild type and Δ swr1 yeast strain before stress was given. In addition, we found that *NTH1* transcription is 2-fold increased in Δ swr1 yeast strain and 4-fold in wild type yeast strain after addition prolin. Our results indicated that SWR1 chromatin remodeling complex is not necessary in basal transcription of *NTH1* gene but it is essential for the activation of *NTH1* gene under nitrogen starvation.

Keywords: *NTH1*, *Saccharomyces cerevisiae*, SWR1 complex, Trehalose

*This work was supported by Çanakkale Onsekiz Mart University The Scientific Research Coordination Unit, Project number: FDK-2018-1331



The Regenerative Effect of Exosomes Derived from Synovial Stem Cells in Rat Partial Meniscal Defect

¹Onur Uysal, ²Erol Göktürk, ³Erdal Karaöz, ²Ulukan İnan, ¹Bahar Demir, ⁴Cansu Subaşı Demir,
⁴Zehragül Ergül, ¹Ayla Eker Sarıboyacı

¹Department of Stem Cell, Cellular Therapy and Stem Cell Production, Application and Research Center ESTEM, Eskişehir Osmangazi University Eskişehir, Turkey

²Department of Orthopaedics and Traumatology, Faculty of Medicine, Eskişehir Osmangazi University, Eskişehir, Turkey

³Liv Hospital Regenerative Medicine Stem Cell Production Center, Department of Histology and Embryology, İstinye University, İstanbul, Turkey

⁴Liv Hospital Regenerative Medicine Stem Cell Production Center, İstanbul, Turkey

aylaekersariboyaci@yahoo.com

Abstract

Due to risks arising in the clinical practice of stem cell therapy; the use of exosomes are notable in terms of restriction and reliability. While the efficacy of exosomes has been investigated in various diseases, no research has been conducted in meniscal injury or fibrous cartilage repair. We hypothesized firstly the efficacy of using exosomes derived from joint itself in meniscus treatment as alternative to cellular therapy. In this study, it was aimed to compare the effect of intra-articular injections of synovial mesenchymal stem cell-derived (S-MSCs) exosomes, on meniscus regeneration and the effect of their parents on meniscus-damaged rats. First, S-MSCs were isolated and characterized from synovium, then exosomes were isolated from S-MSCs and after that characterization, transplantation and regeneration analyses were performed. After 4 and 8 weeks of injecting damaged rats with S-MSCs and S-MSC-exosomes, joints were removed for histo/immunohistochemical analysis. As a result, cells isolated from synovium tissue were characterized as MSC. Exosomes were characterized immunophenotypically and their regenerative ability was better than parents. In the histological scoring performed on 4th and 8th week of MSC and exosome injection; damage was decreased. Cells transfected GFP and cells uptaken exosomes shows increased expressions of Collagen type I, II and X similar to the control group. In conclusion, this study was the first to provide evidence that the effect of bioactive cell-free method of using exosome in meniscus injury therapy as successful as the use of MSC.

Keywords: Meniscus, Synovium, Mesenchymal Stem Cell, Exosome, Paracrine Effect

*This study was supported by grants from the Scientific and Technical Research Council of Turkey (TÜBİTAK 214S331)



Intracellular green synthesis of silver nanoparticles by *Desmodesmus* sp. and examination of pigment change

¹Betül Yılmaz Öztürk, ¹Tayfun Şengel, ²Derviş Öztürk

¹Center Research Laboratory Application and Research Center (ARUM),
Eskişehir Osmangazi University, Eskişehir, Turkey

²Department of Biology, Faculty of Science and Art,
Eskişehir Osmangazi University, Eskişehir, Turkey

byozturk@ogu.edu.tr

Abstract

Metal nanoparticles have many potential technological applications. Physical and chemical methods are used to synthesize such nanomaterials, but these methods are costly and also limit the application of toxic compounds. Biological synthesis of nanoparticles is a relatively new emerging field of nanotechnology which has economic and eco-friendly benefits over chemical and physical processes of synthesis. In the green synthesis, live cell (bacteria, algae etc.) can be used. In particular, the synthesis of nanoparticles in the cell can be achieved in a standard size and shape. In the present work, the green algae *Desmodesmus* sp. was used as a reducing agent for the synthesis of intracellular nanostructure silver particles (Ag-NPs). During this process, changes in the amount of chlorophyll *a*, *b* and carotenoid of the *Desmodesmus* sp. were examined at 24 hours using UV-Vis spectrophotometer for 3 days. As a result, the amount of carotenoid, especially with the onset of the reaction, decreased markedly. After 72 hours of reaction, the amount of carotenoid decreased from $2.88 \mu\text{g ml}^{-1}$ to $0,00 \mu\text{g/ml}$, chlorophyll *a* decreased $8,70 \mu\text{g ml}^{-1}$ to $0,23 \mu\text{g ml}^{-1}$, chlorophyll *b* decreased from $3,23 \mu\text{g ml}^{-1}$ to $2,3 \mu\text{g/ml}$. This change (pigment amount in cells) was also observed with a confocal microscope every 24 hours. According to the results, there is a decrease in the amount of pigment in the cell. This suggests that the pigments may be capping agents and trigger nanoparticle synthesis.

Keywords: Green algae, nanoparticle, silver, chlorophyll, carotenoid



Alteration of CYP450s expression under diabetic conditions

1Naile Merve Güven, 1Rahman Başaran, 1Benay Can Eke

**¹Department of Pharmaceutical Toxicology, Faculty of Pharmacy,
Ankara University, Ankara, Turkey**

nmguyen@ankara.edu.tr

Abstract

Cytochrome P450 (CYP450) enzymes belong to the large superfamily of heme-containing monooxygenases, which mediates biotransformation of environmental xenobiotics, pharmacological agents, endogenous and exogenous compounds. CYPs play a vital role in the metabolism of lipophilic chemicals to more water-soluble metabolites that are more easily excreted from the body. It has been reported that CYP450s expression is altered by factors such as gender, age, nutrition, genetic polymorphism, xenobiotic induction as well as pathophysiological conditions such as long-term alcohol consumption, nutritional deficiency, inflammation, and obesity. Diabetes has also been shown to alter the expression and activity of CYP450s. The altered expression of CYP450 can be associated with diabetes-induced changes in metabolism (increased ketone bodies, lipids, and carbohydrates) and regulation of certain hormones (insulin, glucagon). Changes in the expression of these enzymes responsible for biotransformation can lead to significant effects on the metabolism and toxicity of xenobiotics, including therapeutic agents and environmental chemicals. Modulation of CYPs expression can also induce the formation of toxic metabolites and may increase/decrease the efficacy of administered drugs in diabetes. The purposes of this study were to review investigations on this subject and evaluate the role of diabetes in the regulation of CYPs expression.

Keywords: CYP450, diabetes, protein expression, insulin



Determining The Mediators of GnRH Release Upon Prolactin Induction in GT1-7 Cells

¹**Sabriye Kocatürk-Sel**, ¹**Ayfer Pazarbaşı**, ¹**Hale Öksüz**, ²**Ezgi Özteçik**, ³**Mehtap Evran**,
¹**Eylül Akbal**, ¹**Lütфиye Özpak**, ¹**Ümit Lüleyap**, ¹**Mehmet Bertan Yılmaz**

¹Department of Medical Biology, Faculty of Medicine, University of Cukurova, Adana

²Department of Biotechnology, Institute of Natural and Applied Sciences,
University of Cukurova, Adana

³Department of Endocrinology and Metabolism, Faculty of Medicine,
University of Cukurova, Adana

selsabriye@gmail.com

Abstract

Prolactin is a protein hormone produced and secreted by the anterior pituitary gland. Human prolactin (PRL) is currently viewed as a hormone of pituitary origin, whose biological actions relate exclusively to lactation and reproductive functions, for which any genetic disorder is yet to be identified, and whose unique associated pathology is hyperprolactinemia. Elevated prolactin may impact reproduction through an action on the GnRH neurons of the hypothalamus and/or on the pituitary gland to affect secretion of the gonadotrophins, LH, and FSH. In recent years, kisspeptin (KISS1), kisspeptin receptor (KISS1R), TAC3 (in mouse TAC2) and TACR3 (in mouse TACR2) in the spotlight to play a major role as a regulator of GnRH release. Therefore the aim of the present study was to elucidate the possible connection between these puberty related genes and GnRH release in the presence of prolactin. GT1-7 mouse hypothalamic cell line was treated with the prolactin hormone (0,1 nM, 1 nM and 10 nM) and at 24 hours in the with or without fetal bovine serum (FBS). RNA was isolated and reverse transcribed then real time analysis was performed using TaqMan Gene Expression Assay and TaqMan Master Mix kit. 1nM prolactin without FBS treatment has been shown to increase the KISS1, KISS1R, TAC2 and TACR2 gene expression levels, however in the presence of FBS 0,1 nM, 1 nM and 10 nM replaced these genes expression levels. Presence or absence of FBS has differential effect on puberty related genes.

Keywords: GT1-7 Cell line, prolactin, neuroendocrine, reproduction



The Determination of Varroa (*Varroa destructor*) Infestation Level in Honeybee (*Apis mellifera anatoliaca*) Colonies with Powder Sugar Method and Selection

¹Selvinar Seven-Çakmak, ²İbrahim Çakmak, ³Stefan Fuchs, ¹İrfan Kandemir

¹Department of Biology, Faculty of Science, Ankara University, Tandoğan, Ankara, Turkey
²Beekeeping Development-Application and Research Center, Uludag University, Nilüfer, Bursa, Turkey

³Institute of Bienenkunde, Goethe University, Frankfurt, Germany

icakmak@uludag.edu.tr

Abstract

The goal of this study is to determine the varroa infestation level with powder sugar method on Anatolian bees in Balıkesir-Marmara Island. This study was performed on Anatolian bees in the years of 2014-2016. The total number of frames with bees, brood and varroa level with powder sugar method were counted and recorded in each colony. The difference between treated and treated-requeened colonies in 2014 for the total number of frames with bees was significant, brood and varroa percentages were not significant in 2015 summer respectively. The three groups of untreated, treated and treated-requeened colonies were compared for total number of frames with bees, brood, varroa percentage in each colony and differences were not significant for bee frame number and brood in 2015 Summer-Fall. However, the difference for varroa percentage is significant. Treated requeened colonies were found to have low number of varroa and higher number of frames with bees and brood compared to treated colonies. The number of varroa mites were decreased with 38 % with requeening process in the spring instead of summer in 2016. In general, varroa level has been found high in colonies with more brood and bees. However, a few colonies were found to have low level of varroa even though these colonies had high number of frames with bees and brood. The results of this study may be used for breeding studies.

Keywords: *Apis mellifera anatoliaca*, varroa infestation level, powder sugar, Marmara Island



Effeciency of Mussel (*Mytilus galloprovincialis* Lamarck, 1819) Spat Attachment on Jute Ropes

¹Aynur Lök, ¹Ali Kırtık, ¹Aysun Küçükdermenci, ¹Evrim Kurtay, ¹Selçuk Yiğitkurt

¹Aquaculture Department, Faculty of Fisheries, Ege University, Bornova-İzmir

aynur.lok@ege.edu.tr

Abstract

Rope materials are used for collecting spats from natural environment for mussel cultivation. In this study, jute ropes were selected as collector material. In the area where the mussel population is located, the ropes were suspended from the floating cage system and dropped to 9 different depths from the surface to a depth of 29 m. The collectors were sampled 3rd and 7th months after deployment, then mussel spats were counted and the growth was determined by dividing them into the length classes. The efficiency in the collectors showed a decrease on spat attachment due to the depth. The best amount of spat attachment is found in the collectors at the first 6 m of depth ($P<0.05$). The size of the spats was determined that in the first 3 months more than 50% of the spats were smaller than 500 μm in shell length. When the collectors were taken out of the seawater after 7 months, the mussel spats grew and the proportion of the 500 μm mussels fell to 5%.

Keywords: Mussel, *Mytilus galloprovincialis*, spat, jute, collector

*This research was funded by the Scientific Research Project Coordination of Ege University (BAP-project numbered 16/SUF/019)



Determination of NaClO and HCl Effects in the Sterilization of *Lucilia sericata* Eggs Used in Maggot Therapy

1Hülya Aksoy Aydinalı

¹Department of Biology, Faculty of Sciences and Arts, Osmangazi University, Eskisehir, Turkey

hulya1726@hotmail.com

Abstract

Maggot therapy (MT) is a type of biotherapy involving the introduction of live, disinfected maggots (fly larvae) into the non-healing skin and soft tissue wounds of a human or animal for the purpose of cleaning out the necrotic tissue within a wound (debridement) and disinfection. Internationally, *Lucilia sericata* is the most preferred species for MT. The preferred sterilants for egg sterilization of *L. sericata* are NaClO and HCl. Before experiment, we searched literature for NaClO and HCl doses and decided to use dosing range between %0,05; %1; %2 concentration and 1-3-5 application minute. *L. sericata* eggs were grown in an incubator at 36°C with on blood agar ready-to-use medium. For each determined sterilants concentration range, 12 adult groups (6 groups per single species) were formed. There are 100 eggs in each study group. Experiments have been repeated 3 times. Although many techniques have been proposed for sterilization, the most preferred method is egg sterilization. For egg sterilization, hydrochloric acid, sodium hypochloride, and formalin are suitable for egg sterilization. In our study: it was found that NaClO was effective sterilized from the preferred NaClO and HCl sterilants, and the number of live eggs after sterilization was higher than HCl. In conclusion, for the egg to be used in Maggot Therapy: 1 minute application of 0.05% NaClO is suitable for effective sterilization and high efficiency live eggs. In addition to this results, highly live efficient for efficient egg sterilization requires extensive studies with different sterilants.

Keywords: *Lucilia sericata*, egg sterilization, Maggot Therapy, NaClO, HCl



Biocomposites Prepared by Using Industrial Wastes for Food and Health Applications

¹Demet Topaloğlu Yazıcı

¹Department of Chemical Engineering, Faculty of Engineering and Architecture,
Eskişehir Osmangazi University, Eskişehir, Turkey

demett@ogu.edu.tr

Abstract

Disposing the huge amounts of industrial wastes is a considerable environmental problem. Combustion, burial and composting are some of the disposal methods. Moreover the possible methods, processing these industrial wastes for preparing biocomposites is more favorable nowadays. Besides disposing the waste, environmentally benign, biodegradable biocomposites developed for food coating, controlled fertilization in agriculture, disposable medical utilities etc. These industrial wastes are used as reinforcements and biopolymers are used as matrix in a biocomposite. Biodegradable industrial wastes which have germicidal and germistatic activities against human pathogenic bacteria and biocompatible polymers which are bioactive and antibacterial were used. Coupling both materials is the challenging part of the study. It is the most important optimization parameter while preparing the biocomposites. Solvent casting or freeze drying methods were used for biocomposite preparation. Optimization studies in order to develop the biocomposite especially for disposable medical utilities were done on the parameters of formulation like the effect of the component and plasticizer ratios, pH, mixing temperature, time and rate. Structural, thermal and morphological analyses of biocomposites were performed and additionally drug release profiles of the drug loaded biocomposites were determined. Coupling agents among the optimization parameters were found to have the main effect on the results.

Keywords: Biocomposite, disposable medicals, food coating, industrial waste



Bioenergetic Alterations in Pancreatic Beta Cells after the Exposure to Advanced Glycation End Products (AGEs)

^{1,2,3}Gökhan Duruksu, ^{1,2}Yusufhan Yazır

¹Center for Stem Cell and Gene Therapies Research and Application,
Kocaeli University, Izmit, Kocaeli

²Department of Stem Cells, Institute of Health Sciences, Kocaeli University, Izmit, Kocaeli

³Kocaeli University, Umuttepe Campus Research Hospital C-Block F1
KOGEM 41380 Izmit Kocaeli,

gokhanduruksu@gmail.com

Abstract

The transformation of energy is achieved by bioenergetics in cells, and alterations might occur under various disease conditions to maintain the energy homeostasis. In the type 2 diabetes mellitus, beta-cells show a bioenergetic organization distinct from healthy cells. The increased interaction of beta cells with AGEs as a consequence of increasing age or diabetes might cause some impairment in the pancreatic beta-cell functions. ATP production in normal cells depends primarily on mitochondrial oxidative phosphorylation, but any cellular disturbance might cause the induction of glycolysis, and affect the insulin secretion. In this study, it is aimed to reveal the effects of mitochondrial impairment by AGEs on ATP synthesis and insulin release in human beta cell line, 1.1B4. The highest non-cytotoxic doses of 3 different AGEs, Ne-(1-carboxymethyl)-L-lysine, Ne-(1-carboxyethyl)-L-lysine and fructolysine, were used in the culture. Insulin levels were determined by ELISA, and ATP levels were measured by colorimetric methods. The impairments in insulin secretion and mitochondrial function were assessed by gene expression analysis. Oligomycin (100 nM) was added to the cell culture to determine the non-oxidative ATP synthesis rate. The inhibition of ATP production independent of oxidative phosphorylation was achieved by antimycin A (50 nM). Our results demonstrated that AGEs cause to increase oxidative stress, proton leak, lower ATP levels, and impaired glucose-induced insulin secretion at high glucose concentrations. The energy metabolism shifts slightly towards glycolysis from oxidative phosphorylation in parallel with the mitochondrial damages detected by TMRM staining.

Keywords: Diabetes, energy metabolism, beta cells, aging



Comparison of The Effects of Silicon Nanoparticles on The Barley Leaves Under Drought Stress of Depending on The Duration and Concentration

^{1,2}Ayşin Güzel Değer, ²Şükran Yıldız, ³Aytunç Yıldızlı, ⁴Kasım Ocakoğlu, ^{2,3}Serpil Ünyayar

¹Department of Food Technology, Vocational School of Technical Sciences,
Mersin University, Mersin Turkey;

²Institute of Science, Department of Biotechnology, Mersin University, Mersin, Turkey

³Science and Literature Faculty, Department of Biology, Mersin University, Mersin, Turkey

⁴Advanced Technology, Education, Research and Application Center,
Mersin University, Mersin, Turkey

agozel@mersin.edu.tr

Abstract

Among environmental stressors, drought is one of the factors that have the most severe effect in agriculture. Under the stress of drought, the main strategy in achieving the increase in agricultural yield is to bring together the necessary features to sustain the yield and to provide the appropriate conditions. In our study, SiO₂ nanoparticles of barley plant under drought stress were applied at concentrations of 50 mg / L, 100 mg / L, 150 mg / L and 200 mg / L, aiming to use the property of reducing the water loss of silicon. Two experimental sets were set up to observe the effect of SiO₂ application on the leaves of barley plants depending on the time and concentration. In the first set of experiments: SiO₂ was sprayed onto the plant leaves for 3 days before the drought and duration the drought. In the 2nd test set: SiO₂ application was made only 3 days before the drought. On the seventh day of drought, relative water content, leaf water potential, and lipid peroxidation analyzes were carried out in two experimental sets. Root and leaf measurements were also taken. According to the results, it was found that the plants in the experimental set where the SiO₂ nanoparticles were applied for a long time showed more resistance to the dry control. It was also determined that the most effective concentration was 150 mg / L under this condition.

Keywords: Drought stress, barley, silicon nanoparticles



The Effects of Different Extraction Methods on Antimicrobial Activity of *Veronica officinalis L.*

¹Esra Uçar, ²Nuraniye Eruygur, ³Mehmet Ataş

¹Vocational High School of Sivas, Cumhuriyet University, Sivas

²Department of Pharmacognosy, Faculty of Pharmacy, Cumhuriyet University, Sivas

³Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Cumhuriyet University, Sivas

eucar@cumhuriyet.edu.tr

Abstract

The *Veronica officinalis L.* which belongs to family of *Plantaginaceae* is generally used for the treatment of cough, rheumatism and it has also wound-healing properties. In this study, *in-vitro* antimicrobial activities of methanol and water extracts of *V. officinalis* were determined. For this, the microdilution broth method was employed for the determination of minimum inhibitory concentration (MIC) of methanol and water extracts of *Veronica officinalis*. *Staphylococcus aureus* (ATCC 29213), *Enterococcus faecalis* (ATCC 29212), *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 25922), *Klebsiella pneumonia* (ATCC 13883) and *Candida albicans* (ATCC 10231) microorganisms were used. According to the obtained data, this plant were found to be moderate both water and methanol extracts (respectively 0.156 mg/mL and 0.312 mg/mL) on the *Staphylococcus aureus*. Additionally, the methanol extracts of *Veronica officinalis* were detected to be moderate (0.625 mg/mL) on the *P. aeruginosa*.

Keywords: *Veronica officinalis L.*, *Plantaginaceae*, microdilution broth method, antimicrobial activity, MIC



Neuroprotective Potentials, Antioxidant Activities and Total Polyphenolic Composition of Shell, Cup and Shelled Acorn Parts of *Quercus coccifera* L. Fruits: A Novel Functional Food in the Treatment of Alzheimer's Disease and Cancer

¹Sevgi Gezici, ¹Didem Koçum, ²Nazim Sekeroglu

¹Department of Molecular Biology and Genetics, Faculty of Arts and Sciences,
Kilis 7 Aralik University, 79000, Kilis, Turkey

²Department of Food Engineering, Faculty of Engineering and Architecture,
Kilis 7 Aralik University, 79000, Kilis, Turkey

drsevgigezici@gmail.com

Abstract

Acorns, fruits of *Quercus coccifera* L. (kermes oak) species, which have been used against hemorrhoids, diabetes, diarrhea, kidney stones, and wound-healing in Anatolian folk medicine. Enzyme inhibitory activity, radical scavenging and ferric reducing antioxidant power activities of different parts from acorn have not previously been reported elsewhere. Therefore, the aim of this study was to evaluate total polyphenolic contents, neuroprotective and enzyme inhibitory effects of the ethanol and water extracts from the shell, cup and shelled acorn parts of acorn consumed as herbal coffee in some regions. Acorns were harvested from wild *Q. coccifera* L. tree and shrubs in Kilis province, located in Eastern Mediterranean Region in November 2016. To prepare the extracts, air dried samples (40g) obtained from the shell, cup and shelled inner parts of Acorn were individually extracted with 250 ml ethanol and water for 2 days in the room temperature. Then, the extracts were freeze-dried, and stored at +4°C until analyzed. Total phenolic and flavonoid contents of the extracts were determined spectrophotometrically. Antioxidant activity was analyzed by using DPPH free radical scavenging and ferric reducing antioxidant power (FRAP) assays. Neuroprotective activities of the extracts on AChE and BChE were evaluated according to the method of our previous research. All the assays were carried out in triplicate, and the results were expressed as mean ± SD. Extraction yields of the ethanol and water extracts of the shell, cup and shelled acorn parts were determined as 0.83%, 0.58%, 3.41%, 1.21%, 6.68%, and 12.56% (w/w), respectively. Regarding of total phenol and flavonoid quantities, all the ethanol extracts possessed higher polyphenolic contents, comparing the water extracts. Ethanol extract prepared from the shelled acorn parts were found the highest amount of total phenol (100.14 ± 1.42 mg/g extract as GAE), while water extract prepared form the shelled acorn part possessed the lowest amount of total phenol (67.98 ± 1.01 mg/g extract as GAE). Ethanol extract prepared from the shell showed the highest total flavonoid quantity (178.96 ± 1.07 mg/g extract, as QE), when water extract prepared from the shelled acorn showed the lowest total flavonoid quantity (41.37 ± 0.03 mg/g extract, as QE). According to antioxidant assays, all the extracts obtained from different parts of acorn exhibited remarkable scavenging activities on DPPH and FRAP. Scavenging activity of the ethanol extract from the cup and shelled acorn parts on DPPH were determined as 91.09 ± 1.71 mg TE/g extract. It is followed by the ethanol and water extracts of the shell part (88.35 ± 1.08 and 85.70 ± 0.39 mg TE/g extract), respectively. In DPPH and FRAP assays, the water extract from the cup showed the weakest antioxidant activity. All of the ethanol extracts exhibited the highest cholinesterase inhibitory activity on both enzymes. They showed significant led to 74.18 and 8.36 mg GALAEs/g extract inhibition against AChE and BChE, respectively. In conclusion, these results suggest that different parts of Acorn could be used as a novel herbal product in the treatment of Alzheimer's disease for their inhibitory activity on the AChE and BChE enzymes, and also cancer for their rich antioxidant capacity.

Keywords: Acorn, *Quercus coccifera* L., neuroprotective, polyphenolic content, antioxidant, enzyme inhibition



A Rare Case with Hyperferritinemia-Cataract Syndrome

¹Oguz Cilingir

¹Department of Medical Genetics, Medical Faculty, Osmangazi University, Eskisehir, Turkey

drozi1@gmail.com

Abstract

Hyperferritinemia-cataract syndrome is a rare autosomal dominant disorder characterized by excess of ferritin in the blood and in other tissues. The disorder is caused by pathogenic variants of FTL (Ferritin Light Chain) gene and its prevalence is estimated to be around 1/200.000 - 1.000.000. Affected individuals usually have early onset cataract which is progressive and may cause the loss of vision without treatment. Hyperferritinemia-cataract syndrome is not expected to generate any other health problems and doesn't require unnecessary treatments such as phlebotomy. Here we report a 34 year-old woman who has been investigated for hyperferritinemia for years and not diagnosed until she was referred to the medical genetics clinic. She had surgery for bilateral cataracts and had iron deficiency anemia for years. On abdominal MRI, no hepatic complications detected and the iron levels of liver reported to be normal. There was a family history for hyperferritinemia; the patient's father, step-sister, step-brother, grandfather and two children had hyperferritinemia. We performed whole exome sequencing and found c.-160A>G variant on FTL gene, which was classified as pathogenic on HGMD (The Human Gene Mutation Database) before. The patient was diagnosed with hyperferritinemia-cataract syndrome and informed on the inheritance and complications.

Keywords: Hyperferritinemia, cataract, whole exome sequencing



Caspase Activation and Mitochondrial Membrane Potential on Combination of Cisplatin with Resveratrol in Breast Cancer

1Arda Sever, 1Filiz Özdemir, 1Yüksel Öğünç, 1Zerrin İncesu

¹Department of Biochemistry, Faculty of Pharmacy, Anadolu University, 26470, Eskişehir, Turkey

ardasever@anadolu.edu.tr

Abstract

Resveratrol (RSV) is a natural polyphenol having antiproliferative, antioxidant, antiinflammatory and anticarcinogenic properties. Resveratrol in combination with cisplatin (CDDP) drug, minimizes toxicity and increases efficacy of the treatment. Purpose of this study was to investigate whether RSV in combination with cisplatin exerts synergistic anti-proliferative activity on breast cancer cells. For this reason effects on caspase-3, caspase-9 and mitochondrial membrane potentials of RSV, CDDP and RSV + CDDP combination were investigated. Activation of caspase-9, -3 in MDA-MB-231 breast cancer cells after incubation with CDDP and/or RSV in different doses was measured by flow cytometry. Caspase-9 activation in MDA-MB-231 cells increased maximally (30.5%) after by using combined CDDP (23 μ M) and RSV (72 μ M) treatment for 24 hours. Whereas it was measured 8.9% after using 46 μ M CDDP and 12.7% for 144 μ M RSV. The combination of 23 μ M CDDP and 72 μ M RSV caused the maximum caspase-3 activation in MDA-MB-231 cells (26.3%) at the end of the 24h incubation period. While with using CDDP (46 μ M) alone a 11.7% activation was detected, using RSV (144 μ M) alone caused 12.4% caspase-3 activation. Mitochondrial membrane permeabilization ($\Delta\psi_m$) was determined using JC-1 analysis. When 46 μ M CDDP, 144 μ M RSV and 23 μ M CDDP+72 μ M RSV combination were compared with control group, $\Delta\psi_m$ changes at the 24 hour were found to be 12%, 17.5%, 31% and 5.2%, respectively. The combined administration of CDDP+RSV was found to be more effective on the permeability of the mitochondrial membrane. It was concluded that combination of low concentrations of cisplatin and resveratrol triggers apoptotic mechanism via activation of caspase-9 and caspase- 3.

Keywords: MDA-MB-231 cell line, resveratrol, caspases, MMP

*This work was funded by a grant from the Anadolu University (Project No. 1708S485).



Investigations on Decapoda Fauna in Eskişehir and Kütahya Environment

Tuğrul Öntürk

¹Department of Biology, Faculty of Arts and Science,
Osmangazi University, Eskişehir, Turkey

tugrulonturk@gmail.com

Abstract

This study aims to determine the distribution of Decapoda species and regions spreading in the region. This work was carried out around Eskişehir and Kütahya. The fieldwork was repeated for one year each month between October 2011 and November 2012. The specimens were caught by trapping the cages with suitable feed. The cages were placed in the study area the day before. The following day, the cages were inspected and the samples were taken into the laboratory by fixing in 4% Formaldehyde. Protected samples are protected in the laboratory. Some water parameters were recorded in the laboratory during the field studies and in the water samples taken from the land. 2 families and 3 species belonging to Decapoda team were determined as the result of the diagnoses made. Palaemonidae family; *Paleamonetes turcorum* (Holthuis, 1961) from the Potamidae family; *Potamon potamios persicum* (Pretzmann, 1962) and *Potamon potamios* (Olivier, 1804).

Keywords: Decapoda, Fauna, Palaemonidae family, Potamidae family, Eskisehir, Kutahya

*This work was supported by the project No 201119037 by the Scientific Research Projects Commission of Eskişehir Osmangazi University.



Boron Determination and Pollen Morphology Studies on Endemic *Centaurea lanigera* DC. (Asteraceae)

¹Murat Ardiç, ¹İsmühan Potoğlu Erkara, ¹Okan Sezer, ¹Koray Yaylacı, ¹Onur Koyuncu

¹Department of Biology, Faculty of Arts and Science,
Osmangazi University, Eskişehir, Turkey

ismuhan@ogu.edu.tr

Abstract

Deficiency and toxicity levels of boron is too close in plants which need to be trace amounts of boron for vital activities. B requirements show great differences between the plants. Leaves and generative organs deposite the highest amount of B. In contrast to this, root, fruit and seed deposite minimal amounts of B. Also pollen production level is directly related with the B content of soil. Within this scope, boron determination and pollen morphology studies were performed on endemic *Centaurea lanigera* in this study. B content of root, stem and flower were measured by Curcimin methode for *C. lanigera*. Pollen grain microphotographs of examined taxon have been taken from prepares which were made by Wodehouse ve Erdtman techniques. Examinations and measurements have been performed on these and morphometric results given. According to the Curcimin technique, B element has been measured $5,68 \text{ mg kg}^{-1}$ dry weight (ppm.) in root, $6,27 \text{ mg kg}^{-1}$ dry weight (ppm.) in stem and $6,11 \text{ mg kg}^{-1}$ dry weight (ppm.) in flower of studied taxon. Type of the pollen grain of studied taxon has determined as tricolporate according to the Wodehouse and Erdtman methodes. We believe that comparisons and evaluations of obtained data from like these studies will make important contributions to plant taxonomy in future.

Keywords: *Centaurea lanigera* DC. (Asteraceae), boron amount, pollen morphology



Determination of Boron Content in Endemic *Fritillaria fleischeriana* Steud. & Hochst. ex Schult.f. (Colchicaceae)

¹Okan Sezer, ¹Murat Ardiç, ¹Onur Koyuncu, ¹Koray Yayılacı, ¹İsmühan Potoğlu Erkara

¹Department of Biology, Faculty of Arts and Science, Osmangazi University, Eskişehir, Turkey

muratjuniperus@gmail.com

Abstract

Deficiency and toxicity levels of boron is too close in plants which need to be trace amounts of boron for vital activities. B requirements show great differences between the plants. Leaves and generative organs deposite the highest amount of B. In contrast to this, root, fruit and seed deposite minimal amounts of B. Also pollen production level is directly related with the B content of soil. Within this scope, boron determination studies were performed on endemic *Fritillaria fleischeriana* in this study. B content of root, stem and flower were measured by kurkimin methode for *F. fleischeriana*. According to the kurkimin technique, B element as been measured $6,25 \text{ mg kg}^{-1}$ dry weight (ppm.) in root, $6,89 \text{ mg kg}^{-1}$ dry weight (ppm.) in stem and $6,74 \text{ mg kg}^{-1}$ dry weight (ppm.) in flower of studied taxon. We believe that comparisons and evaluations of obtained data from like these studies will make important contributions to plant taxonomy in future.

Keywords: *Fritillaria fleischeriana* Steud. & Hochst. ex Schult.f., Colchicaceae, boron amount



Current Situation of *Klasea yunus-emrei* (Asteraceae) in the Nature and Some Conservation Offers About It

¹Murat Ardiç, ¹Okan Sezer, ¹İsmühan Potoğlu Erkara, ¹Koray Yaylacı, ¹Onur Koyuncu

¹Department of Biology, Faculty of Arts and Science, Osmangazi University, Eskişehir, Turkey

okanszr@gmail.com

Abstract

Klasea is naturally distributed in Central Asia, Iran, Turkey, the Mediterranean region, China and the Himalayas, SE Europe and southern Russia. Populations of these endemic Asteraceae taxa are very sensitive to changes in their environs caused from biotic and abiotic environmental factors. The genus *Klasea* was revised by Davis and Kupicha for the flora of Turkey. According to him, *Klasea* is represented by 15 species and *Serratula* is represented by one species within the Mediterranean and Irano-Turanian phytogeographic regions of Turkey. Five of these species are endemic to Turkey, resulting in an endemism ratio of 33.3%. However, since that revision several new taxa have been added in the last three decades. Unfortunately, any conservation biology study on endemic *Klasea* taxa of Turkey hasn't been performed yet. In this study, population properties of critically endangered *Klasea yunus emrei* which were described from calcareous steppe from Bozan in Eskişehir province have been observed between 2013-2017 years. It founds in only one locality where has calcareous rich soil and base rock. Totally 98 individuals were counted from population. Population size and individual numbers approximately decrease 10 % (20 individuals) in this period. According to the obtained data from observations, ecological factors which effect to the populations of *K. yunus-emrei* have been determined. In the light of obtained data, in situ and ex situ conservation strategies like organizing education programs, stocking seeds and etc. have been offered.

Keywords: *Klasea yunus-emrei* (Asteraceae), conservation, IUCN



Distribution of *Mesocricetus brandti* on Black Sea Region in Turkey

¹Pınar Çam İcik

¹Department of Biology, Faculty of Science and Art, Sinop University, Sinop, Turkey

pinar82mail@gmail.com

Abstract

Mesocricetus brandti (Turkish hamster) has wide distribution area in Turkey. The aim of this study is to determine the extent of the *M. brandti*'s distribution on Black Sea Region. For this purpose, field work was carried out from Zonguldak's terrestrial regions to Artvin. All field studies were completed in 2015- 2017. From Bolu to Artvin, hamsters burrows were searched at certain stations where *M. brandti*'s natural habitats. Hamsters were caught with live traps in their burrow entries to determine if they were active burrows. After the hamster has been proven, the animals are left in their burrows. Result of the field study and burrow checks, hamsters were caught in 20 different stations. These stations belong to different cities in the Black Sea Region. These stations where the active *M. brandti* burrow is found, almost identifies the extent of the distribution of the Black Sea region. According to the studies; Black Sea stations where hamsters trapped are; Mudurnu (Bolu province), Gerede (Bolu province), Osmancık (Çorum province), Boyabat (Sinop province), Durağan (Sinop province), Havza (Samsun province), Kavak (Samsun province), Amasya, Erbaa (Tokat province), Zile (Tokat province), Turhal (Tokat province), Niksar (Tokat province), Avlunlar (Tokat province), Şebinka-rahisar (Giresun province), Çalgan (Giresun province), Suluova (Amasya province), Kitre (Bayburt province), Aydintepe (Bayburt province), Yoncalı (Trabzon province) and Demirdöven (Artvin). There were no hamster holes in the coastline of Black Sea, wetlands and mountainous and rugged areas. With this study, *M. brandti* distribution in the Black Sea region has been roughly defined.

Keywords: *Mesocricetus brandti*, Black Sea Region, Turkish hamster, hamster's distribution



Morpho-anatomical and Palynological Investigations on Endangered *Achillea ketenoglui* H. Duman

¹Okan Sezer, ¹Onur Koyuncu, ¹Murat Ardıç, ¹Koray Yaylacı, ¹Ümmüsen Gökçen,
¹İsmühan Potoğlu Erkara

¹Department of Biology, Faculty of Arts and Science, Osmangazi University, Eskişehir, Turkey

okoyuncu@ogu.edu.tr

Abstract

In this study, morpho-anatomical and polynological features of Endangered *Achillea ketenoglui* H. Duman were investigated. For anatomical investigation, transverse sections of root, stem and leaf have been taken from *A. ketenoglui* by scapel. All sections examined by light microscope. Morphological characters of *A. ketenoglui* were investigated by stereomicroscope. In the cross sections of the root, the pith was completely covered by xylem cells. As to stem, it was observed that large parenchymatic cells were present in the pith of the stems. Leaves have amaryllis type of stomata. They are xeromorphic. The results of the light microscope investigation revealed that the pollen grains of *A. ketenoglui* are echinate, tricolporate and exine scabrate. We believe that findings of this study will make contributions to the biodiversity and taxonomy in future.

Keywords: *Achillea ketenoglui* H. Duman, Asteraceae, morpho-anatomy, pollen morphology



Heat Shock Effects on Ecophysiological Parameters of *Acer pseudoplatanus* L. Seeds

¹Gülçin Işık, ¹Sertaç Özgün

¹Department of Biology, Faculty of Sciences, Anadolu University, Eskişehir, Turkey

gulciny@anadolu.edu.tr

Abstract

Ecophysiological responses of plant species must be observed to measure tolerance of plants against ecological factors such as heat. *Acer pseudoplatanus* L. (Aceraceae) is a widespread deciduous tree species. In this study, seeds of *A. pseudoplatanus* used as experimental material. The seeds were counted (10 seeds per petri dish). The seedbeds which were containing sterile petri dish and double layer filter paper were used to germinate seeds. Distilled water was used for all seedbeds as germination solution. Different heat shock applications (Control as 22°C, 60°C/10 minutes, 60°C/20 m, 60°C/40 m, 80°C/5 m, 80°C/10 m, 80°C/20 m, 100°C/2,5 m, 100°C/5 m and 100°C/10 m) were applied to the seeds. Then heat shock applied seeds were sowed into the seedbeds and placed into growth chamber (Sanyo, MLR 350) at 22°C, 16 hours light/8 hours dark photoperiod. Germination percentage, shoot development, biomass and seedling vigour index parameters were calculated as ecophysiological indicators. 80°C/20 m, 100°C/5 m and 100°C/10 m applications were resulted as the lowest values for germination percentage, root length, stem length, biomass and SVI. The highest value for germination percentage was observed at 60°C/10 m application (%82.5); the longest root length was observed at 60°C/20 m application (4.98 cm); stem length was observed at control group (3.05 cm); the highest biomass value was at 60°C/40 m (9275.17 kg/ha) and the highest SVI was at 60°C/20 m application (226.60). In the light of experimental data, we can say that *A. pseudoplatanus* can resist heat shock if exposure time is short.

Keywords: *Acer pseudoplatanus*, biomass, ecophysiology, germination, heat shock



Determination of carbonic anyhydrase inhibition potentials of 5,7-disubstituted tacrine derivatives

¹Makbule Ekiz, ²Salih Ökten, ³Ümit Muhammet Koçyiğit, ¹Ahmet Tutar

¹Department of Chemistry, Faculty of Art and Science, Sakarya University, Serdivan, Turkey

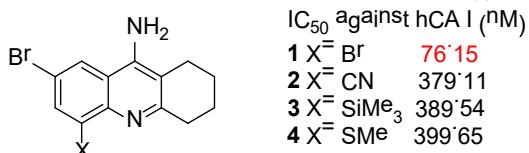
²Department of Maths and Science Education, Division of Science Education, Faculty of Education,
Kırıkkale University, Yahşihan, Kırıkkale, Turkey

³Vocational School of Health Services, Cumhuriyet University, Sivas, Turkey

salihokten@kku.edu.tr

Abstract

CA inhibitors (CAIs) have recently been common studying area due to their significant applications for the treatment and prevention of an extensive number of diseases. In our previous paper [1, 2], recently reported 5,7-disubstituted tacrines derivatives on going our research were tested for their carbonic anyhydrase inhibition potentials. The inhibition potentials of 5,7-disubstituted tacrine derivatives were determined against two physiologically relevant cytosolic CA isoforms by a stopped flow CO₂ hydrase assay method [3]. Acetazolamide (AZA), a clinically used sulfonamide CAI was used in the assays as a standard drug. The results are reported as IC₅₀ values in nanomolar (nM) scale.



These disubstituted tacrine analogues were found to be potent inhibitors of the cytosolic isoform hCA I with nanomolar IC₅₀ in the range of 76.15–399.65 nM, as well as a moderate selectivity against other cytosolic isoforms hCA II with IC₅₀ in the range of 99.06–565.71 nM compared with AZA, standart compound. The best inhibitions for these isoforms (hCA I and hCA II) were determined by 5,7-dibromo tacrine derivatives, with IC₅₀ values of 76.15 and 99.06 nM, respectively. On the other hand, sulphonamide acetazolamide (AZA) was defined for broad-specificity CA inhibitor owing to its common inhibition of CAs, which showed IC₅₀ values of 3745.94 nM and 3347.82 against hCA I and hCA II, respectively. These results suggest that the disubstituted tacrine derivatives may lead to be candidate for novel and effective CA inhibitors. In conclusion, this present study and our ongoing research can contribute to the the treatment and prevention for an extensive number of diseases.

Keywords: Tacrine, bromotacrine, cyanotacrine, carbonic anhydrase, inhibition.

Anticandidal and Apoptotic Effects of Some 4-Hydroxy-3-Methoxy Benzaldehyde Derivatives

¹Hakan Ünver, ²Zerrin Cantürk, ²M. Güçlü Özarda

¹Department of Chemistry, Faculty of Science, Anadolu University, Eskişehir, Turkey

²Department of Pharmaceutical Microbiology, Faculty of Pharmacy,
Anadolu University, Eskişehir, Turkey

hakanunver2013@gmail.com

Abstract

4-hydroxy-3-methoxy benzaldehyde (Vanillin) and its analogues (Figure 1) are important molecules owing to possesses several biological properties including anti-bacterial, anti-fungal, anti-candidal etc.

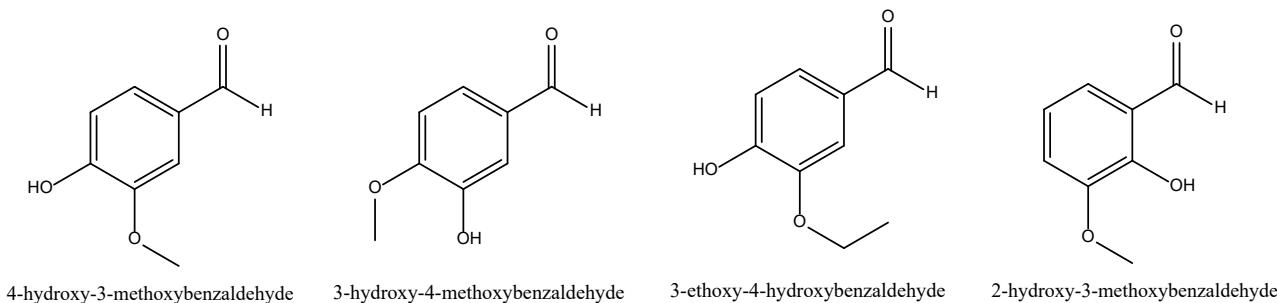


Figure 1. Several analogues of vanillin compound

Our present study includes the synthesis and characterization of several 4-hydroxy-3-methoxy benzaldehyde derivatives and investigating their anti-candidal and apoptotic activities on *Candida albicans*, *C. glabrata*, *C. krusei* and *C. parapsilosis*. 12 derivatives tested for anticandidal activity and most of their activities has found 200 μ g/mL. In this study, ketoconazole was used positive control. For the subject compounds, apoptotic rates of analogues on *C. albicans*, *C. glabrata*, *C. krusei*, *C. parapsilosis* were found 3.8, 13, 91.5, 1 for analogue 233 and 9.7, 76, 92.2, 1,9 for analogue 240 and 25.9, 59.4, 94, 12.2 for 241, respectively. According to these apoptotic rates, analogue 233, 240 and 241 can be promising antifungal candidates for Candidiasis, especially on *Candida glabrata* and *Candida krusei*.

Keywords: vanillin analogues, *Candida*, apoptosis



The Protective Effects of Geraniol Against Damage of Long Term Renal Ischemia-Reperfusion in Rats

¹**Senanur Can, ¹Mediha Canbek**

¹Department of Biology, Faculty of Science and Literature, Osmangazi University, Eskisehir

senanurc@hotmail.com

Abstract

In this study, the possible protective effects of geraniol, which is known to be an antioxidant, were investigated against experimentally induced long-term renal ischemia/reperfusion (IR) injury in rats. Wistar-albino 28 male rats were used ($n=7$). They were randomly separated into 4 groups as follows: Group I (Sham Group), Group II (IR + SF), Group III (IR + 50 mg/kg geraniol), Group IV (IR + 100 mg/kg geraniol). Right nephrectomies were performed under anesthesia in all group. Groups I and II were inoculated with SF (1 ml/kg) and Groups III and IV were inoculated with 50 mg/kg and 100 mg/kg of geraniol, injected intraperitoneally. For Groups II, III and IV, IR durations were determined to be 60 mins and 24 hours respectively. At the end of the experiment, Urea (BUN), Creatinine (CRE) activities in the blood serum and the catalase (CAT), glutathione peroxidase (Gpx) and Superoxide dismutases (SOD), enzyme activities in kidney tissue were measured with Native Page Electrophoresis. Histologic sections were examined by light microscopy using Hematoxylin & Eosine. As a result of the study, it was determined that 100 mg / kg geraniol against renal IR injury shows more antioxidant effect and protects against geraniol than 50 mg / kg geraniol.

Keywords: Kidney, ischemia/reperfusion, geraniol, free radical, rat.



Cytokine Gene Polymorphisms in the Pathogenesis of Psoriasis

¹Esra Ermis, ¹Sevim Karakas Celik, ²Nilgün Solak

¹Department of Molecular Biology and Genetics, Faculty of Sciences and Arts,
Bülent Ecevit University, Zonguldak, Turkey

²Department of Dermatology, Faculty of Medicine, Bülent Ecevit University, Zonguldak, Turkey

esraermis@gmail.com

Abstract

The aim of our study was to investigate the relationship between Psoriasis disease between *IL-1RN*, *IL-2* and *IL-18* gene polymorphisms. *IL-1RN(VNTR)*, *IL-2(rs2069762)*, *IL-18-137(rs187238)* and *IL-18-607(rs1946518)* gene polymorphisms were studied by PCR-RFLP method in 104 healthy controls with similarity in terms of age-sex distribution with 97 psoriasis patients followed in Bülent Ecevit University Dermatology Polyclinic. In our study genotype distribution in patients and control groups, respectively rs187238 GG (49.5%-69.2%), CG (40.2%-26.9%), CC (10.3%-3.8%); rs1946518 CC(39.2%-53.4%), CA (44.3%-27.2%), AA (16.5%-19.4%); rs2069762 TT (23.7%-36.7%), GT (64.9%-50%), GG (11.3%-13.3%); IL-1RN RN1/RN1 (64.6%-64.4%), RN1/RN2 (22.9%-26.7%), RN1/RN3 (3.1%-2.2%), RN2/RN2 (5.2%-4.4%), RN2/RN3 (2.1%-2.2%), RN3/RN3 (1%-0%), RN4/RN4 (1%-0%) were determined. There was a statistically significant difference in rs187238 and rs1946518 polymorphisms in patient and control groups ($p=0.011$ and $p=0.037$, respectively), in terms of rs2069762 and IL1-RN polymorphisms the difference between the two groups was not statistically significant ($p=0.101$ and $p=0.795$, respectively). In this study, the relationship between psoriasis and rs187238, rs1946518, rs2069762, IL1-RN polymorphisms was investigated for the first time. Our findings showed that rs187238 and rs1946518 found association between psoriasis, whereas rs2069762 and IL1-RN were not play an effective role in psoriasis pathogenesis.

Keywords: IL-1RN, IL-2, IL-18, polymorphism, psoriasis



Endocrine Disrupting Chemicals and Oxidative Stress Markers in Children with Hashimoto's Thyroiditis

^{1,2}Unzile Sur, ¹Pinar Erkekoglu, ³Ayse Derya Bulus, ⁴Nesibe Andiran,
⁵Belma Kocer-Gumusel

¹Department of Toxicology, Faculty of Pharmacy, Hacettepe University, Sıhhiye, Ankara Turkey

² Department of Toxicology, Faculty of Pharmacy, Ataturk University, Erzurum, Turkey

³ Pediatric Endocrinology Unit, Keçiören Research and Training Hospital, Turkish Ministry of Health, Ankara, Turkey

⁴ Yasam Cad. No:13a - 2 D:4 Ankara, Turkey

belmagumusel@yahoo.com

Abstract

Hashimoto's thyroiditis (HT) is a multifactorial autoimmune disease. Selenium and zinc have substantial roles in normal functioning of thyroid. Oxidative stress is an important phenomenon in pathogenesis of autoimmune diseases. Endocrine disrupting chemicals (EDCs) may produce adverse effects on thyroid. This study aimed to investigate thyroid parameters, oxidative stress markers, selenoprotein P, trace element and EDC levels in children with HT. Study group consisted of 29 children with HT (age=8-16 years, 3 boys, 26 girls) and 29 age-matched children were recruited as controls (age=8-16 years, 4 boys, 25 girls). TSH (412%) levels were significantly higher and fT₃ (30.5%) and fT₄ (34.1%) levels were markedly lower in HT group vs. control. Iodine (45.8%) and zinc (19.3%) levels were significantly lower in HT group compared to controls. Erythrocyte superoxide dismutase activity (24.1%) and glutathione peroxidase (GPx) 1 activity decreased (45.5%) while GPx3 activity increased (%15.6) markedly in HT group vs. control ($p<0.05$, both). Plasma mono(2-ethylhexyl)phthalate (MEHP) levels showed a marked increase (138.2%) in HT group vs. control. Our findings show that oxidant/antioxidant balance is impaired in children with HT. Both iodine and zinc deficiencies and increases in plasma phthalates levels can be important contributing factors to the emerging of this disease.

Keywords: Bisphenol A, Di (2ethylhexyl) phthalate, Hashimoto's thyroiditis, oxidative stress, thyroid hormones



Morphological and Molecular Study of Intraspecific Variations of Prickly Pear (*Opuntia ficus-indica* [L.] Mill.) in Eastern Mediterranean Region*

¹Murat Zurnaci, ¹Cenap Yilmaz

¹Department of Horticultural, Faculty of Agriculture, Osmangazi University, Eskişehir, Turkey

cyilmaz@ogu.edu.tr

Abstract

Prickly pear (*Opuntia ficus-indica* L.) belongs to *Opuntia* geneous of Cactaceae family. Prickly pear is naturally grown in Mediterranean region of Turkey particularly in Adana, Mersin, Osmaniye, Hatay, Antalya and southern Aegean. It is sold and consumed in summer time at local markets. There is no statistical data of production and consumption amounts of prickly pear in Turkey. The aim of the determination of morphological and molecular biodiversity of prickly pear (*O. ficus-indica* L.) genetic resources in Eastern Mediterranean Region. In this project, 40 prickly pear genotypes were selected in Eastern Mediterranean Region have been examined as pomological and molecular DNA properties. It was determined that fruit pomological properties showed wide diversity. Nineteen RAPD primers generated a total of 137 reproducible bands; 81.75% of which were polymorphic. It was determined that there was a high genetic difference (0.61-0.93 genetic similarity) among 40 prickly pear genotypes.

Keywords: Prickly pear, *Opuntia ficus-indica*, selection, pomology, RAPD

*This work was funded by TUBITAK [project number: 111O135] and ESOGÜ BAP [project number: 2014/23A106]



Effect of S- Allyl Cysteine on Inflammattuary Cascade at Lipopolysaccharide Induced Experimental Sepsis Rats

¹Neslihan Tekin, ²Fahrettin Akyüz, ³Cihan Tanrikut, ³Umut Kerem Kolaç,

⁴Emre Entok, ⁵Derya Üstüner, ³M. Cengiz Üstüner

¹Department of Biotechnology and Molecular Biology,
Faculty of Arts and Science, Aksaray University, Aksaray, Turkey

²Department of Medical Biochemistry, Faculty of Medicine,
Eskişehir Osmangazi University, Eskişehir, Turkey

³Department of Medical Biology, Faculty of Medicine,
Eskişehir Osmangazi University, Eskişehir, Turkey

⁴Department of Nuclear Medicine, Faculty of Medicine,
Eskişehir Osmangazi University, Eskişehir, Turkey

⁵Department of Medical Laboratory, Vocational School of Health Services,
Eskişehir Osmangazi University, Eskişehir, Turkey

chntnrkt@gmail.com

Abstract

Bacterial Lipopolysaccharide (LPS) is the major component of outer cell membrane of Gram negative bacteria and stimulates inflammatory responses in eukaryotic organisms. Exposure to high dose of endotoxin causes septic shock which results in death with damage to critical organs such as heart, liver and brain. S-allyl-cysteine (SAC), which is a natural product present highly in garlic, has strong antioxidant and radical scavenger activities. In that study, our aim is to research the antioxidant and anti-inflammatory effects of SAC on LPS induced experimental septic rats by measuring serum NF- κ B and TNF- α levels. 42 Wistar albino female rats were divided to 6 groups and 3 of them were injected with a single dose of 5 mg/kg LPS to induce sepsis. 2 out of 3 sepsis groups were treated via 50 mg/kg and 100 mg/kg SAC. NF- κ B levels in sepsis group were found significantly higher compared to all other groups. SAC treatment lowered the NF- κ B levels compared to sepsis group but not as low as control group. The same results were also obtained for TNF- α levels, only difference is being that SAC 50 mg/kg and 100 mg/kg administrated control groups even had lower TNF- α levels compared to control group. In conclusion, SAC being a natural product decreased inflammatory responses in rats upon activated by LPS which makes it as a potential natural candidate for treatment of inflammation due to its anti-inflammatory effects.

Keywords: LPS, SAC, inflammation



Chromosomal Heteromorphisms in Prenataly Identified Cases with Amniocentesis

¹Ayfer Pazarbasi, ¹Lutfiye Ozpak, ¹Sabriye Kocaturk-Sel, ¹Umit Luleyap,
¹Nilgün Tanrıverdi

¹Department of Medical Biology, Faculty of Medicine, Cukurova University, Balcali, Adana, Turkey

payfer@cu.edu.tr

Abstract

Amniocentesis is a very crucial diagnostic procedure for preventing the birth of genetically defective fetuses in order to decrease the prevalence of genetic diseases in populations. Submicroscopic copy number variations (CNVs) that detectable primarily by molecular genetics, they are abbreviated as MG-CNVs. These MG-CNVs are located in euchromatic regions and dispersed over the entire human genome. Cytogenetically visible CNVs (= CG-CNVs) are considered as harmless among cytogeneticists. On chromosomal level the numbers and kinds of CG-CNVs detected during routine cytogenetics is high. So, there are no individuals which are really the same on a chromosomal level, especially concerning the pericentric regions, the acrocentric short arms and in male cytoband Yq12. Harmless human CG-CNVs can include heterochromatic and even euchromatic regions. Euchromatic regions are designated as such which contain genes. The most frequently observed chromosomal heteromorphisms are present in 4.5-6% of the general population. A retrospective review of our amniocentesis database for the period from January 2000 to February 2018 was carried out. The karyotyping of 7975 fetuses was carried out in Department of Medical Biology from the samples of amniotic fluids which were sent from Department of Gynecology and Obstetrics of Balcali Hospital. A standart nomenclature has been developed to describe each of types of abnormality found in human chromosomes. Fetal chromosomal abnormality ratio that we found was 6.83% while heteromorphism rate was 0.90%. Combining cytogenetics with molecular genetics could help to find possible solutions of yet not understood phenomena in human health.

Keywords: Heteromorphism, acrocentric chromosom, cytogenetic, variant, general population



Interactive effects of Thidiazuron (TDZ) and Light Emitting Diodes (LEDs) on in vitro adventitious shoot regeneration of water hyssop (*Bacopa monnieri*)

Muhammad Aasim, Mehmet Karataş

Department of Biotechnology, Faculty of Science, Necmettin Erbakan University, Konya, Turkey

mshazim@gmail.com

Abstract

Aquatic plants or semi aquatic plants that live within or near water bodies are economically important plants due to their use as medicinal, human nutrition and as an ornamental plant. Water hyssop or Brahmi (*Bacopa monnieri* L.) belongs to India is an important semi-aquatic/aquatic medicinal plant since ancient time in Indian subcontinent. It contains several important secondary metabolites like Bacosides which are commercially used as memory enhancer tonic. Besides that, Brahmi based registered drugs are used for curing various diseases and disorders like Alzheimer's disease, anxiety, asthma, stomach ulcers, respiratory ailments and for curing chronic diseases like cancer in India and other countries. Due to its high demand and collection from wild, non-cultivated plant and low propagation from seeds due to limited availability and viability of seeds brings this plant near to extinction threat. Keeping in view, the present study was designed to investigate the interactive effects of thidiazuron (TDZ) and different light emitting diodes (LEDs) light on in vitro adventitious shoot regeneration of water hyssop. Leaf explants were taken from in vitro rooted plants in our lab and cultured on MS medium enriched with 0.25, 0.50 and 1.0 mg/l TDZ and placed under red, blue and white LEDs for 16h light photoperiod. Callus induction with shoot buds induction was recorded under all lights and TDZ used. However, these shoot buds failed to generate shoots after 6 weeks of culture. Therefore, plants were transferred to MSO medium for shoot induction which exerted positive effects and multiple shoot induction was recorded. In this study, data regarding shoot regeneration frequency (%), number of shoots per explant and shoot length were taken and analysed statistically.

Key Words: Water hyssop, light emitting diodes (LEDs), Leaf explant, Adventitious



ORAL PRESENTATIONS



**4th INTERNATIONAL CONGRESS ON
APPLIED BIOLOGICAL
SCIENCES
(ICABS)**

03 - 05 May, 2018





Phytochemical Profiling and Evaluation of *Stachys longiflora* Boiss. & Balansa Potential Against Oxidative Damage, α -Amylase, Lipoxygenase, Xanthine Oxidase and Tyrosinase Enzymes

¹Gülmira Özek, ^{1,2}Süleyman Yur, ^{1,2}Fatih Goger, ³Muhittin Dinç, ⁴Süleyman Doğu, ^{1,2}Temel Özek

¹Department of Pharmacognosy, Faculty of Pharmacy,

Anadolu University, 26470-Eskisehir, Turkey

²Medicinal Plant, Drug and Scientific Research Center (AUBIBAM),

Anadolu University, 26470-Eskisehir, Turkey

³Department of Biology, Ahmet Keleşoğlu Faculty of Education,

Necmettin Erbakan University, Konya, Turkey

⁴Department of Animal and Plant Production, Meram Vocational School,

Necmettin Erbakan University, Konya, Turkey

gulmiraozek@gmail.com

Abstract

The chemical profiles of the volatile and non-volatile metabolites of *Stachys longiflora* Boiss. & Balansa (Lamiaceae) were investigated with GC-FID, GC/MS and LC-MS/MS techniques. (*E*)-Nerolidol (50.8%), 9-geranyl-*p*-cymene (8.5%), β -caryophyllene (2.2%), phytol (3.9%), hexahydro-farnesylacetone (2.3%) and hexadecanoic acid (4.7%) were found to be the main constituents of the essential oil. Phenolic constituents, 4'-O-methylisoscutellarein-7-O-[6'-acetylallosyl(1→2)] glucopiranoside, 4'-O-methylisoscutellarein-7-O-allosyl(1-2)] glucoside, 5-caffeoylequinic acid and verbascoside were detected in the methanol extract.

The methanol extract of *S. longiflora* showed antityrosinase activity (Inh. 57%) and free radical scavenging activity towards to model free radical DPPH (IC_{50} 0.8 mg/mL). The extract moderate inhibited peroxidation of lipids (Inh. 30 %). The essential oil of *S. longiflora* noteworthy inhibited α -amylase enzyme (59%). However, the oil demonstrated scarce antioxidant activity. The present work is the first investigation of biological potential of *S. longiflora* essential oil and extract.

Keywords: *Stachys longiflora* Boiss. & Balansa, Lamiaceae, essential oil, GC/MS, LC-MS.



Novel Chalcone Derivatives Induced Apoptosis in Pancreatic Cell Carcinoma and Lung Adenocarcinoma

¹Gülşen Akalın Çiftçi

¹Department of Biochemistry, Faculty of Pharmacy, Anadolu University, 26470 Eskisehir, Turkey

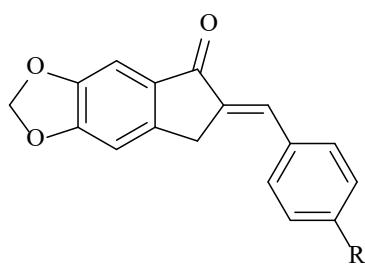
gakalin@anadolu.edu.tr

Abstract

Chalcones are one of the most widely used compounds by providing the stimulation of apoptosis mechanism that allows the elimination of cancer cells. Due to the importance of chalcones for anticancer drug discovery, herein ten chalcone derivatives (Fig. 1) were investigated for their cytotoxic effects on A549 and PANC-1 cells using MTT assay, antiproliferative effects were investigated by BRDU assay. The effects of the most effective anticancer agents on apoptosis, caspase 3 activation, mitochondrial membrane potential were determined on a BD FACS Aria (I) flow cytometer.

MTT assay demonstrated that A549 cells are highly sensitive to compounds **2**, **4**, **5** and **10** (IC_{50} values of <3.9, <3.9, 5.67 and 6.03 μ g/mL, respectively), whereas PANC-1 cells are highly sensitive to compounds **1**, **2**, **4** and **9** with an IC_{50} values of <3.9, <3.9, <3.9 and 4.5 μ g/mL respectively. Compound **2** also inhibited DNA synthesis in A549 cell line while compounds **2** and **4** were most powerfull in PANC-1 cell line for DNA synthesis inhibition. The primary mode of PANC-1 cell destruction was apoptosis as demonstrated by the annexin V-FITC, activation of procaspase-3 and mitochondrial membrane depolarization by compounds **1**, **2** and **4** while primar mode of A549 cell destruction was apoptosis as demonstrated by the annexin V-FITC, and mitochondrial membrane depolarization by compounds **2** and **4**. According to *in vitro* cell culture studies, compounds **2** and **4** stand out as promising candidates for the treatment of A549 and PANC-1 cells while compound **1** was only effective for PANC-1 cells.

Keywords: Apoptosis, chalcone, DNA synthesis, Caspase 3



Compound	R
1	Dimethylamino
2	Diethylamino
3	Acetamido
4	Pyrrolidinyl
5	Piperidinyl
6	Morpholinyl
7	4-Methyl-1-piperazinyl
8	1 <i>H</i> -Imidazol-1-yl
9	1 <i>H</i> -1,2,4-Triazol-1-yl
10	2-Morpholinoethoxy

Figure 1. The structures of compounds **1-10**



Medical Aspects of Earthworms

¹Mete Mısırlıoğlu, ¹Okan Akçınar, ²Hristo Valchovski, ¹Veli Temel, ¹Osman Şen, ¹Ersin Yalçın

¹Eskişehir Osmangazi University, Faculty of Science and Letters, Department of Biology,
26480 Eskişehir, Turkey.

²Department of Soil Microbiology, Institute of Soil Science “N. Poushkarov”,
7 Shosse Bankya Str., 1080 Sofia, Bulgaria.

okanakcinar@gmail.com

Abstract

In traditional Chinese medicine, earthworms have been used throughout the ages. However, some recent academic studies suggest that compounds derived from these organisms may have an impact on human health. In these studies, it is stated that the compounds of earthworm origin have more or less clinical effects on nervous, circulatory, cardiovascular, respiratory and reproductive systems. According to these studies carried out especially in the Far East countries, compounds obtained from earthworms seem potentially useful in many diseases such as bronchial asthma, epilepsy, high blood pressure, mumps, eczema, urticaria, chronic prostatitis, burns and fractures, chronic lumbago, anemia, apoplexy, soft tissue injuries, vertigo, hematemesis and hematuria and stomach ulcers. There are also some studies showing that some of the compounds have anti-tumor effects.

Keywords: Annelida, Clitellata, earthworms, medical aspect of earthworms, complementary medicine.



Green Synthesis of Silver Nanoparticles by Equisetum arvense Leaf Extract for Antimicrobial Applications

¹**Kıymet Güven**

¹Anadolu University Faculty of Science Department of Biology, Eskişehir

kguven@anadolu.edu.tr

Abstract

A cost-effective and eco-friendly method has been developed to form colloidal solutions of silver (Ag-NPs) nanoparticles using *Equisetum arvense* leaf extract as a combined reducing and capping agent for the first time. The silver nanoparticles (AgNPs) synthesized by water or methanol extracts demonstrated potential antimicrobial activity on *Staphylococcus aureus*, *Acinetobacter baumannii*, *Klebsiella pneumoniae*, *Enterococcus faecalis*, *Enterobacter aerogenes*, *Pseudomonas aureginosa*, *Escherichia coli*, *Proteus vulgaris* and *Candida albicans*, *C. parapsilosis*, *C. zeylanoides*, *C. crusei*, *C. tropicalis* and *C. glabrata*. The outcomes of this study indicate that, these nanoparticles could be effectively utilized in pharmaceutical, biotechnological and biomedical applications.

Keywords: *Equisetum arvense*, Antimicrobial, Silver Nanoparticles, Diffusion tests



Antidiabetic Effect of Saharian Honey from Algeria *in vivo* Studies in Rats

1Hadjer Chenini, 1Imane Abdelsadok, 1Faiza Attari and 1Noureddine Djebli

¹Pharmacognosy & apitherapy laboratory, Mostaganem University -ALGERIA-
Bendiab_hadjer@yahoo.fr

Abstract

Diabetes mellitus, the disease of the century, is a chronic pathology which has severe impact on life and human health. Today, there are approximately 415 million diabetics worldwide. It is expected to increase to nearly 642 million in 2040. The traditional medicine based on apitherapy is a new approach widely practised, using bee products such as "honey", to prevent and treat many illnesses, the diabetes. The aim of the work was to evaluate the therapeutic effects of *honey* on blood glucose level, lipid profile as well as on the *histological* changes in pancreas, liver and kidney of Streptozotocin (STZ) induced *diabetic rats*. This study presents the experimental studies completed in the recent years, which support honey as a novel antidiabetic agent that might be of potential significance for the management of diabetes and its complications and also highlights the potential impacts in Streptozotocin- induced (STZ) diabetic rats (wistar) at 60mg/kg and future perspectives on the use of honey as an antidiabetic agent. After 21 days of prophylactic treatment with honey at 10% orally we determine the role of honey on hypoglycemic. At the end of the experiment (6 weeks), the blood glucose level, triglycerides, cholesterol, creatinine and enzymatic activity of AST, ALT were measured by using commercial kits and effect of honey on the histology of pancreas, liver and kidney. The results obtained revealed that Honey bee-treatment significantly decreases blood glucose level in diabetic rats. The histological study approved the results by demonstrating an almost normal aspect of pancreas in the diabetic rats that were treated unlike the diabetic's rats who reflect irreversible damage of the diabetes on their pancreas. This research provides us with an opportunity to affirm the antihyperglycemic effect of the Algerian Saharian honey.

Keywords: diabetic, honey, streptozotocin, glucose, rat



Achene ultrastructure in *Senecio salsuginea* and *Senecio olympicus* (Asteraceae: *Senecio*)

¹H. Nurhan Büyükkartal, ²Hatice Çölgeçen, ³Ümit Budak, ⁴Esra Koç

^{1, 4} Ankara University, Faculty of Science, Department of Biology, Ankara, Turkey,

² Bülent Ecevit University, Faculty of Arts and Sciences,

Department of Biology, Zonguldak, Turkey

³ Bozok University, Faculty of Arts and Sciences, Department of Biology, Yozgat, Turkey

bkartal@science.ankara.edu.tr

Abstract

The genus *Senecio* L. belongs to the tribe Senecioneae Cass. of the family Asteraceae (*Compositae*) which is the richest plant family of Turkey in terms of endemic species. Achene structure was examined by light microscopy and transmission electron microscopy (TEM) in order to identify morphological, anatomical and histological modifications and resolve taxonomical problems of the genus. In both taxa, a pericarp differentiated into four main region; the exocarp (outer epidermis), mesocarp, sclerenchyma region and endocarp (inner epidermis). It was observed that there was a thick and darkly stained cuticle layer on the epidermal cells. *S. olympicus* was found in the secretory ducts along the achene wall. But, *S. salsuginea* thick-walled sclerenchymatous cells were observed in achene.

Key Words: *Senecio*, achene, TEM, Turkey, Anatomy



Ethylenediamine dihydrochloride (EDA-2HCl) has a toxic role on ultrastructure and antioxidant enzyme activities in liver and kidney

¹Aysegul Cerkezkayabekir, ²Elvan Bakar, ³Gulnur Kizilay Ozfidan, ¹Filiz Sanal

¹Department of Biology, Trakya University, Faculty of Science, Edirne, Turkey

²Department of Basic Pharmaceutical Science, Trakya University,

Faculty of Pharmacy, Edirne, Turkey

³Department of Histology & Embryology, Trakya University, School of Medicine, Edirne, Turkey

aysegulckb@gmail.com

Abstract

Ethylenediamine dihydrochloride (EDA-2HCl, 50 mg/kg/day) was given to Wistar albino rats for ten days and the histopathologically effects on liver and kidney were examined by electron microscope. Besides the effects of EDA-2HCl on superoxide dismutase (SOD), glutathione peroxidase (GPX), catalase (CAT) activities and amount of total sialic acid (TSA) and malondialdehyde (MDA) in plasma and tissues, amount of total protein in tissues were determined. Degeneration of membrane in hepatocytes and in tubule cell in kidney; dysmorphism, loosing of Krista and increasing of count of mitochondria in hepatocytes and hypertrophy in kidney; reduction of intensity of nuclear matrix, loosing of cytoplasm, swelling of smooth endoplasmic reticulum (SER) in hepatocyte and tubule cell; dilatation and decreasing of microvillus of bile canaliculi in hepatocytes, untidiness of basal membrane and derangement of basal infoldings in kidney were observed. Amount of TSA was increased significantly ($p<0.05$) only in plasma and decreased significantly ($p<0.001$) only in kidney. Amount of MDA was increased in plasma, liver and kidney significantly ($p<0.001$). SOD activity was decreased significantly ($p<0.001$) only in liver. GPX and CAT activities were not changed in liver and kidney. Amount of total protein was decreased only in kidney significantly ($p<0.001$). These findings indicate that EDA-HCl has toxic effect on ultrastructural morphology and also on these biochemical parameters even in this lowest dose untested before. Therefore we believe that the toxic potential of EDA-HCl should be investigated further by using lower doses in details.

Keywords: Ethylenediamine dihydrochloride, antioxidant enzymes, rat, ultrastructure.



Mammalian faunal diversity of Şavşat (Artvin) district

¹Pınar Çam İcik

Department of Biology, Science and Art Faculty, Sinop University, Sinop, Turkey

pinar82mail@gmail.com

Abstract

This study aimed to identify mammalian species diversity of Şavşat (Artvin) district. For this study, field and observational study was conducted in 2016 (January)-2017 (May), in different habitats of Şavşat. During the fieldwork, for two years, optical devices (cameras, telescopes) and *global positioning system devices* has been used. Live capture traps for capture small mammals and mist- net mechanism for capture bats has been used. Individuals captured were released back to nature after species identification. Moreover, determination of mammalian species has been used for animal tracks (footprint, feces etc.). This research resulted in the terrestrial biotope at regions around the Şavşat district, is likely to spread 49 mammal species were identified. This mammal species belong to the following orders; Chiroptera (20 species), Carnivora (7 species), Rodentia (12 species), Cetartiodactyla (2 species), Artiodactyla (1 species), Lagomorpha (1 species) and Eulipotyphla (6 species). Mammalian faunu of Şavşat district, evaluated by IUCN category are determined endangered species. In this context, the five Chiroptera species (*Rhinolophus euryale*- Mediterranean Horseshoe Bat, *Myotis capaccinii*- Long-fingered Bat, *Rhinolophus mehelyi*- Mehely's Horseshoe Bat, *Myotis bechsteinii*- Bechstein's bat and *Nyctalus lasiopterus*- Greater Noctule bat) are under threat in Şavşat District. Other mammal species in the LC (low risk, widely distributed) category. There are no endemic mammalian species in Şavşat district.

Keywords: Mammalian fauna, Mammalian diversity, Şavşat, Artvin



A partial elastin gene duplication in supravalvular aortic stenosis

¹Sevinç Akçay

¹Ahi Evran Üniversitesi, Fen Edebiyat Fakültesi, Moleküler Biyoloji ve Genetik Bölümü, Kırşehir

sevinc.akcay@ahievran.edu.tr

Abstract

Elastin gene mutations result in several skin, cardiovascular and pulmonary phenotypes. SVAS is characterized by narrowing or obstruction of the ascending aorta. We studied an SVAS family segregating an 80 kb duplication which includes 5'-flanking sequences, exon 1 and intron 1 of the *ELN* gene genetically and functionally. Dermal fibroblasts from an SVAS family were used to solve the exact nature of the duplication. Gene-dosage analysis showed that a tetranucleotide repeat in intron 1 was within the duplicated region. RT-PCR of pre-mRNA showed that a SNP in intron 23 of the mutant allele was not expressed. Decreased elastin deposition was found in affected individuals, supporting that this partial duplication yielded a null allele. Genetic and functional analysis of SVAS contributed to the molecular mechanism of elastinopathies. Overall, studies on elastinopathies can inform the understanding and treatment approaches to the some common diseases such as aortic aneurysms, arterial stenosis end emphysema.

Keywords: supravalvular aortic stenosis, elastin, duplication.



Second record of *Licnodamaeus pulcherrimus* (Paoli, 1908) (Acari, Oribatida) from Turkey

Sule Baran¹, Merve Yaşa¹

¹Sakarya University, Faculty Arts and Sciences, Department of Biology, Sakarya, Turkey

sbaran@sakarya.edu.tr

Abstract

Oribatid mites are the most abundant arthropod taxa in soils especially in decaying organic matter. They contribute to the process of organic matter decomposition, activation and dispersal of microbial flora and indication of soil quality. The genus *Licnodamaeus* Grandjean, 1931 contains twelve species and distributed in Paleartic, Oriental and Neotropical regions. The main characteristics of this genus are prodorsum without true lamellae, cerotegument formed by large microtubercles, exuviae absent from adult body, flat and leaf-shaped bothridial sensillus, , large dorsal lyrifissures, flat-topped and elliptical notogaster with reticulate or smooth cuticle, contiguous genital and anal openings. In this study redescription and Scanning electron microscopy investigations of the secondly recorded species *Licnodamaeus pulcherrimus* is provided. Morphological features our specimens are in accordance with those of previously studied specimens.

Key words: Acari, Oribatida, *Licnodamaeus*, Turkey



Amyloid Toxicity in Alzheimer's Disease

¹Naile Merve Güven, ¹Başak Özlem Perk, ¹Benay Can Eke

¹Department of Pharmaceutical Toxicology, Faculty of Pharmacy,
Ankara University, Ankara, Turkey

nmguyen@ankara.edu.tr

Abstract

Alzheimer's disease (AD), a chronic neurodegenerative disease, is the most common cause of progressive cognitive and functional decline in the elderly, accounting for 60-80% of all dementias. The formation of senile plaques is the most important histopathological sign of the disease and is especially seen in amygdala, hippocampus and neocortex. Amyloid plaques are composed of amyloid beta (A β) peptide, a metabolic product of the "Amyloid Precursor Protein (APP)". A β is produced in the brain as extracellular and intracellular. A β shows the neurotoxic effect by creating pores and increasing the entry of calcium into the cell, leading to the formation of reactive oxygen species and the loss of membrane potential. The harmful effects of A β include activating neuronal apoptosis, causing synaptic loss, disrupting synaptic plasticity, and inhibiting hippocampal long-term potentiation (LTP). The interaction between A β and apolipoprotein (ApoE), a cholesterol-carrying protein, also contributes significantly to the development of AD. Furthermore, cytokines released by activation of microglial by A β accumulation induce the production and distribution of more A β oligomers of the astrocyte-neuron complex around them. There are a number of studies to reduce A β production as an approach to slowing or preventing AD development. A β formation is due to amyloidogenic cleavage of APP. Reconfiguring this process to reduce amyloid production is possible by reducing APP or by inhibiting the amyloid-converting enzymes of APP.

Keywords: Alzheimer's disease, Amyloid, Amyloid Precursor Protein, Neurotoxic.



Distribution of AB0 Blood Groups in Acute Lymphocytic Leukemia and Acute Myeloid Leukemia Patients

¹Fatih Kar, ¹Ceyhan Hacıoğlu, ¹Zeynep Küskü Kiraz, ²Neslihan Andıç, ⁴Ş. Oğuzhan Albayrak,
⁴Buket Aydın, ⁴Ekin Çapar, ⁴Aybüké Keskin, ⁴Elif Kivrak, ⁴T. Harun Özdemir, ⁴Uğur Şekertekin,
⁴Damla Tüysüzoğlu, ³Setenay Öner, ¹Sema Uslu

¹Eskişehir Osmangazi University, Faculty of Medicine, Department of Medical Chemistry, Eskişehir

²Eskişehir Osmangazi University, Faculty of Medicine, Department of Haematology, Eskişehir

³Eskişehir Osmangazi University, Faculty of Medicine, Department of Biostatistics, Eskişehir
Eskişehir Osmangazi University, Faculty of Medicine, Eskişehir

fkar@ogu.edu.tr

Abstract

Following the first clinical observations longer than 60 years, several investigators have extensively studied the role of the ABO blood group in cancer biology. ABO blood groups can be used as an epidemiologic marker or primary screening assistant to identify populations at high risk for certain hematological malignancies. Much of the study on blood type and cancer risks is made in the western world and the evidence published in other populations is limited. ABO blood group distribution has been shown to vary widely between populations. For this purpose, the distribution of ABO blood groups in Acute Lymphoblastic Leukemia (ALL), Acute Myeloid Leukemia (AML) patients was evaluated retrospectively in Eskişehir Osmangazi University Medical Faculty Hematology Clinic. Blood groups of 499 AML and ALL patients were studied in the study. The age range was found to be average 51.19 ± 23.926 (min age: 0, max age: 94). In both ALL and AML patients, the percentages of patients with O and A blood groups were higher (O: 35,8%, A:38,4% for ALL and O:27,3 %, A:46,0 % for AML). There was no statistically significant difference between blood groups with AML and ALL patients ($p > 0.05$). According to these results, it is necessary to increase the number of populations including other types of leukemia and to apply other blood group tests in order to evaluate the distribution of blood groups in patient groups more comprehensively.

Keywords: ALL, AML, Blood Groups, Leukemia,



Effects of Cytokinin Type on *In vitro* Shoot Multiplication in Endemic *Lathyrus undulatus* Boiss.

¹Buse Çökmez, ¹Arda Acemi, ¹Fazıl Özen

¹Kocaeli Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 41380 Kocaeli, Türkiye

buse.ckmez@outlook.com

Abstract

Lathyrus undulatus Boiss. is an endemic plant which belongs to Fabaceae (Pea Family) family. In the Red Data Book of Turkish Plants, it is listed in “VU (vulnerable)” category. The aim of this study is to investigate the effects of different cytokinins on multiplication of *in vitro* shoots raised from nodal explants of adult *Lathyrus undulatus* individuals. Nodal segments from the adult plant were cultured on MS medium supplemented with 1.0 mg/I BAP to reach the number of *in vitro* shoots required for the study. The effects of BAP (6-benzylaminopurine), TDZ (Thidiazuron) and 2-IP (2-isopentenyl-ladenine) (0.25, 0.5, 1.0 and 2.0 mg/I) were tested on *in vitro* shoots from these cultures. The highest percentage of mean shoot induction frequency (98%) was found in the medium with 2.0 mg/I BAP. The highest mean shoot length (6.4 ± 0.4 cm) was recorded from the medium supplemented with 0.25 mg/I 2-IP while the lowest mean shoot length (1.4 ± 0.1 cm) was found in the medium with 2.0 mg/I TDZ. The highest mean number of shoots per explant (2.8 ± 0.3) was noted from the medium supplemented with 2.0 mg/I TDZ while the lowest mean value for this parameter (1.5 ± 0.1) was recorded from the medium with BAP at 1.0 mg/I concentration. It was found that the optimum cytokinin type for *in vitro* shoot multiplication of *L. undulatus* is BAP used at a concentration of 0.25 mg/I. With this study, an effective and reliable *in vitro* shoot multiplication protocol was described for endemic *L. undulatus*.

Keywords: Endemic, *Lathyrus undulatus*, nodal explant, *in vitro* shoot multiplication



Effects of husbandry and feeding practices on milk production in dairy farms: A case from Samsun region of Turkey

¹Murat Satilmis, ²Savas Atasever

¹Department of Animal Science, Graduate School of Natural and Applied Sciences,
Ondokuz Mayis University, Samsun, Turkey

²Department of Animal Science, Faculty of Agriculture, Ondokuz Mayis University,
Samsun, Turkey

satasev@omu.edu.tr

Abstract

The aim of the present study was to reveal the relationships of herd management factors with milk yield of dairy cows. Questionnaires were applied in a total of 59 dairy enterprises located in Ondokuz Mayis town of Samsun province of Turkey. Information on the education level of farm owner (EL), personnel number responsible cow milking (PN), experience in dairy farming (E), number of milking cows (NC), using concentrate feeds (CF) and milking techniques (MT) was recorded. E ($P=0.006$), NC ($P=0.026$) and MT ($P=0.029$) affected daily milk yield (DMY), significantly. It was determined that most of the farmers (39.7%) prefer selling raw milk at the local bazaars and poorly pasture is the major problem (18.5%), percentage of parasitic disorders are the very high (25.5%) in the herds. To elevate milk production, herd management issues have to be restored in the investigated dairy farms.

Keywords: Dairy cow, Farm, Management, Milk yield.



A new record *Chamobates (C.) subglobulus* (Oudemans, 1900) (Acari, Oribatida) for the Turkish Fauna from Kocaeli City Forest

Merve Yasa¹, Sule Baran¹

¹ Sakarya University, Faculty Arts and Sciences, Department of Biology, Sakarya, Turkey

merve.yasa1@ogr.sakarya.edu.tr

Abstract

Oribatid mites are mainly soil living decomposer microarthropods and consist of about 11,000 described species worldwide. Oribatid mites have an important role in mineralization and decomposition of plant residues in soils. The subgenus *Chamobates* (*Chamobates*) Hull, 1916 contains twenty one species and distributed in Holartic and Paleotropical regions. The main characteristics of this genus are the absence of notogastral setae, lamellar setae originate at the end of the lamellar cuspis near to rostral region and interlamellar setae originate near to dorso sejugal suture. In this study redescription and Scanning electron microscopy investigations of the firstly recorded species *Chamobates (C.) subglobulus* (Oudemans, 1900) is provided. Morphological features our specimens are in accordance with those of previously studied specimens.

Keywords: Acari, Oribatida, *Chamobates*, first record, Kocaeli.



In vivo anti-inflammatory activity of argan oil (Algeria)

**¹Hanane Ben menni, ¹Meriem Belarbi, ¹Dounia Ben menni, ²Hadjer Bendiab,
²Noureddine Djebli**

¹Department of Biology, Faculty of SNV-STU, Natural Products Laboratory (LAPRONA).
Abou Bekr Belkaid University, Tlemcen, Algeria

² Pharmacognosy & api phytotherapy laboratory, Mostaganem University –ALGERIA-

hanascott@live.com

Abstract

Many plants are used in traditional medicine for the treatment of several diseases including inflammatory component diseases. The objective of this study is to evaluate the anti-inflammatory activity of argan oil (Algeria) *in vivo*. For this purpose, we tested two doses (5 and 8 mg / kg p.w) of argan oil, administered orally, on the model of the edema of the mouse paw induced by carrageenan. The volume of the paw was measured 1h until 6h after the injection of carrageenan. A histopathological study was performed to confirm the study. The results were compared with those of the standard group (diclofenac 50 mg / kg) and those of the control group (NaCl). Oral administration of (5 mg / kg) and (8 mg / kg) argan oil significantly reduced paw edema compared to control animals ($P <0.001$) with a % inhibition higher than (80%). The anti-inflammatory activity of the two selected doses of the argan oil was found to be better than that of Diclofenac (50 mg / kg) in the fourth and fifth hours. The histological study of the mouse paws confirms that argan oil has an inhibitory effect on the paw edema induced by carrageenan. From these results, it was found that this oil has biologically active constituents that have significant anti-inflammatory effects, with its efficiency comparable with that of diclofenac, we can conclude that argan oil can be consumed as a product alternative, which can substitute nonsteroidal anti-inflammatory drugs.

Keywords: argan oil, anti-inflammatory, edema, *in vivo*.



CD33 and Alzheimer's Disease

1Başak Özlem Perk, 1Naile Merve Güven, 1Benay Can Eke

**¹Department of Pharmaceutical Toxicology, Faculty of Pharmacy,
Ankara University, Ankara, Turkey**

perk@ankara.edu.tr

Abstract

Alzheimer's disease (AD), which is mainly characterized by impaired memory, is a rapidly growing clinical and public health issue due to the aging population. The neuropathological hallmarks of the disease include accumulation of senile plaques, composed of amyloid-beta, and neurofibrillary tangles. The amyloid-beta peptide (A β) cascade hypothesis suggests A β accumulation is the fundamental initiator and major pathogenic event for AD. Recent genome-wide association studies have illuminated cluster of differentiation 33 (CD33) is a new genetic risk factor for AD. CD33 as a type 1 transmembrane protein is mediating the cell-cell interaction. In the brain, CD33 is mainly expressed on microglial cells. In AD brain, the CD33 level is found to be positively correlated with amyloid plaque burden and disease severity.

Keywords: Alzheimer's disease, CD33, sialic acid, amyloid



A Novel High-Performance Liquid Chromatography Method to Obtain the Fingerprint Chromatogram of *Pilosella hoppeana*

¹Sila Ozlem Sener, ²Merve Badem, ²Nuriye Korkmaz, ²Seyda Akkaya,
²Rezzan Aliyazicioglu, ¹Ufuk Ozgen

¹Department of Pharmacognosy, Faculty of Pharmacy,
Karadeniz Technical University, 61080 Trabzon, Turkey

²Department of Biochemistry, Faculty of Pharmacy,
Karadeniz Technical University, 61080 Trabzon, Turkey

rezzan@ktu.edu.tr

Abstract

Phenolic compounds are antibacterial, antifungal, antiviral, antioxidant, anticancer effective secondary drug metabolites that are pharmacologically important [1]. In this study, it was aimed to obtain the fingerprint chromatograms of the methanol extract of the aerial parts of *Pilosella hoppeana* in terms of some phenolic compounds. A 16-minute new RP-HPLC method using 7 phenolic compounds (gallic acid, p-hydroxybenzoic acid, vanillic acid, syringaldehyde, coumaric acid, sinapic acid, benzoic acid and quercetin) was developed. The method was validated in terms of linearity, LOD, LOQ, reproducibility, precision, and selectivity. Phenolic compounds were found in the plant analyzed by this method. As a result, sinapic acid and benzoic acid among the phenolic compounds were observed in the plant.

Keywords: HPLC, Phenolic Compounds, *Pilosella hoppeana*

Acknowledgements: Sila Özlem Şener and Merve Badem would like to acknowledge the scholarship by the Turkish Scientific and Technical Research Council.



Study the Effect of Proline Treatment on Contents of Antocyanin, Caretenoid, Chlorophyll, Malondialdehyde and Available Water in the Different Pepper Cultivars Under *Phytophthora capsici* Stress

¹Esra Koç, ²Cemil İşlek, H. ¹Nurhan Büyükkartal

¹Department of Biology, Faculty of Sciences, Ankara University, Ankara, Turkey.

²Department of Biotechnology, Faculty of Art and Sciences, Niğde Ömer Halisdemir University, Niğde, Turkey.

ekoc@science.ankara.edu.tr

Abstract

The root rot pathogen *Phytophthora capsici* can severely damage production of peppers (*Capsicum annuum* L.). The effect of exogenous proline (1 and 10 mM) on the relation between antocyanin, caretenoid, chlorophyll a-b, malondialdehyde and available water contents in two cultivars of pepper (*Capsicum annuum* L.) was investigated. The highest antocyanin amount was found in Sirena RZ F1 cultivar in the *P. capsici* application alone. In the proline applications, the highest antocyanin and caretenoid contents were determined in the 1 mM proline + *P. capsici* application compared with the *P. capsici* application alone in Kekova cultivar. The highest chlorophyll a and b amount were found in two cultivars in the 10 mM proline application. *P. capsici* alone caused an increase in the amounts of malondialdehyde on the fifth and seventh days. Conversely; under the stress of *P. capsici*, pre-application of 1 and 10 mM proline at all times in Sirena RZ F1 cultivar decreased the amount of malondialdehyde. While 1 mM proline decreased the amount of malondialdehyde at all times in two cultivars, 10 mM proline application increased the amount of malondialdehyde compared to *P. capsici* application alone in Kekova cultivar. This data indicates that exogenous proline application before inoculation decreases the plasma membrane injury by decreasing the level of malondialdehyde and regulating the amount of antocyanin, caretenoid, chlorophyll, available water in different pepper cultivars. Therefore, we suggest that exogenous proline application at the proper concentration could play a protective role in protecting the pepper seedlings from *P. capsici* stress.

Keywords: Biotic stress, *Capsicum annuum*, *Phytophthora blight*, Physiological parameter, Lipid peroxidation



Determination of Phytochemical Constituents of *Phlomis lunariifolia* Sm by LC-MS / MS and Biological Activity

1Gamze Göger, 2,3,4Fatih Göger, 5Yavuz Bülent Köse

¹Department of Pharmacognosy, Faculty of Pharmacy, Trakya University, Edirne, Turkey

²Yunus Emre Vocational School / Department of Pharmacy
Program in Pharmacy Services, Eskişehir

³Anadolu University Medicinal Plants, Drugs and Scientific Research Centre,
(AUBIBAM), Eskişehir

⁴Department of Pharmacognosy, Faculty of Pharmacy, Anadolu University, Eskişehir, Turkey

⁵Department of Pharmaceutical Botany, Faculty of Pharmacy,
Anadolu University, Eskişehir, Turkey

gamzegoger@trakya.edu.tr

Abstract

Phlomis L. (Lamiaceae) species are important medicinal plants that is known as “Çalba” in local name and have antidiabetic, antiinflammatory, antiallergic, anticancer, antiparasitic and antimicrobial effects. The purpose of this study was to identify the phytochemical constituents of the methanol extract of *P. lunariifolia* and the antibacterial effects against some pathogenic bacteria. It was collected from Anamur (Mersin) in 2015. Antibacterial activity was carried out by *in vitro* microdilution method against *Bacillus cereus* NRRL B 3711, *Escherichia coli* ATCC 8739, *Pseudomonas aeruginosa* ATCC 13888, *Staphylococcus aureus* ATCC BAA 1026 and *Acinetobacter baumannii* ATCC 19606 strains. Ciprofloxacin, used as a standard antibacterial agent. Phytochemical constituents of the methanol extract was analyzed by LC-MS / MS analysis. The results of phytochemical analysis of methanol extract were determined chrysoeriol, rutinoside, luteolin rutinoside and apigenin rutinoside as main compounds. The results of antibacterial activity of the methanol extract were given by the minimum inhibitory concentration (MIC, µg / mL) values against tested bacteria. The antibacterial effect of *P. lunariifolia* methanol extract was generally found as MIC = 1250 µg / mL against tested bacterial strain.

Key words: *Phlomis lunariifolia*, LC-MS/MS, antibacterial activity



Molecular Characterisation of *Acinetobacter baumannii* Isolates in an Intensive Care Units

1Ebru Önem, 2Özlem Ünalı, 3Rıza Durmaz

¹Department of Pharmaceutical Microbiology, Faculty of Pharmacy,
Süleyman Demirel University, Isparta, Turkey

²National Molecular Microbiology Reference Laboratory, Ministry of Health, Ankara, Turkey

³Department of Medical Microbiology, Faculty of Medicine,
Yıldırım Beyazıt University, Ankara, Turkey

ebruonem@sdu.edu.tr

Abstract

Acinetobacter baumannii is one of the main causes of morbidity and mortality in critical condition patients in hospitalized patients. The aim of this study was to determine the outbreak by investigating the clonal relationship between 26 *A. baumannii* clinical isolates from intensive care unit of a tertiary hospital located in Isparta. The study was conducted between May-November 2015. The clinical sample distributions of the 26 isolates were; 13 tracheal aspirate, 5 blood, 5 urine, 2 wound and 1 sputum. To determine the clonal relationship between the isolates Pulsed-field Gel Electrophoresis (PFGE) method were used. According to PFGE results 18 different pulsotypes were identified and twelve pulsotypes as clusters with 2-4 isolates and a clustering range was found 46%. Based on the similarity coefficient higher than 85%, 54% of isolates were clonally related to each other. In recent years, PFGE is highly regarded as a remarkable technique in control or prevention of hospital outbreaks.

Keywords: *A. baumannii*, PFGE, molecular typing



Determination of H₂O₂ Dose to Induce Oxidative Stress in Clone 9 Cells

¹Nuriye Ezgi Bektur, ¹Sedat Kacar, ¹Varol Sahinturk

¹Department of Histology and Embryology, Faculty of Medicine,
Osmangazi University, Eskisehir, Turkey

nebektur@ogu.edu.tr

Abstract

Reactive oxygen species (ROS) are produced by living organisms as a result of normal cellular metabolism and environmental factors, such as air pollutants or cigarette smoke. The shift in the balance between oxidants and antioxidants in favor of oxidants is termed oxidative stress, which contributes to many pathological conditions and diseases, including cancer, neurological disorders, atherosclerosis, hypertension, ischemia/perfusion, diabetes, chronic obstructive pulmonary disease, and asthma. In this study, we aimed to determine how H₂O₂-induced oxidative stress influences the Clone 9 hepatocyte cells. Clone 9 cells were grown in an incubator at 37°C with 5% CO₂ in a standard medium. After the cells were detached, they were seeded in 96-well plate at a density of 25,000 cells per well. Then, the cells were treated with 7 different H₂O₂ doses including 31.25, 62.5, 125, 250, 500, 1000 and 2000 μM. After 24 h, the cells were treated with MTT solution, solubilized with DMSO and the absorbance values were measured by ELISA reader. The cell viabilities at the H₂O₂ doses of 31.25 and 62.5 μM were similar to those of untreated cells. At the dose of 125 μM, almost three quarters of the cells died. On the other hand, at the doses between 250 and 2000 μM, no cell viability was detected. In conclusion, H₂O₂ doses higher than 62.5 μM were found to decrease cell viability of Clone 9 hepatocyte cells significantly. These results might be considered in oxidative stress associated studies.

Keywords: Oxidative stress, H₂O₂, Clone 9 cells



Promising Anticancer Effects of Usnic Acid in Breast Cancer

¹Gamze Guney Eskiler, ²Isil Ezgi Eryilmaz, ²Unal Egeli, ²Beste Yurdacan,
²Gulsah Cecener, ²Berrin Tunca

¹Department of Medical Biology, Faculty of Medicine, Sakarya University, Sakarya, Turkey

²Department of Medical Biology, Faculty of Medicine, Uludag University, Bursa, Turkey

gamzeguney@sakarya.edu.tr

Abstract

Usnic acid (UA), a secondary metabolite in lichen, demonstrates antitumor, antioxidative and anti-inflammatory effects on a variety of cancer cells. UA has also indicated antiproliferative activity against normal cell lines, such as skin keratinocytes, fibroblasts and peripheral blood lymphocytes. For this purpose, we aimed to investigate the cytotoxic and apoptotic effects of UA on MCF7 breast cancer and MCF-10A mammary epithelial cells. Firstly, MCF7 and MCF-10A cells treated with different concentrations of UA (0-150 µM) and then cytotoxic and apoptotic analyses were performed. The cell viability of MCF-7 and MCF-10A cells reduced 18.0% and 72.0% at 150 µM after 48 h treatment, respectively ($p<0.05$). After treatment with 150 µM of UA in MCF7 and MCF-10A cells, the percentage of late-apoptotic cells was 56.8% and 18.5%, respectively ($p<0.05$). Additionally, UA induced a significant G0/G1 arrest in MCF7 cells (from 45.0% to 89.0%) as compared to MCF-10A control cells (from 77.0% to 81.5%). Thus, UA has a significant cytotoxic effect on MCF-7 cells without damaging MCF-10A control cells by inducing apoptosis and arresting cell in the G0/G1 phase.

Keywords: Breast cancer, Usnic Acid, Apoptosis.



Examination of cytotoxic effect of acrylamide on HepG2 cells by a colorimetric assay

1Sedat Kacar, 1Varol Sahinturk

**¹Department of Histology and Embryology, Faculty of Medicine,
Osmangazi University, Eskisehir, Turkey**

skacar@ogu.edu.tr

Abstract

Acrylamide is exposed in many ways such as various industrial workplaces, laboratories, cigarette smoke and high-temperature processed foods. The toxic effects of acrylamide have been investigated mainly on the nervous and reproductive systems. However, there are a handful of studies about its effects on the hepatocytes. The aim of this study is to investigate the effect of acrylamide on human HepG2 cells. Cells were supplemented with medium containing 10% FBS and 1% penicillin-strep-tomycin and cultured at 37°C in an incubator containing 5% CO₂. Cells were passaged before they reached 80% confluence. In the experiment, cells detached by trypsinisation were counted and seeded into 96 well plate at a density of 25,000 cells per well. The acrylamide was then exposed by serial dilution starting with 100 mM concentration. After 24 h incubation, 20 µl MTT was added and incubated at 37°C for 4 h. Then, medium with MTT was discarded, 100 µl of DMSO was added, and absorbance values were measured at 570 nm in the ELISA reader. Acrylamide reduced the viability of HepG2 cells in a dose-dependent manner. There was no significant change at the three doses between 0-6.25 mM, although the dose of 1.56 mM appeared to increase the cell viability. At the dose of 12.5, 25, 50 and 100 mM, there was a significant decrease in cell viability (47, 36, 18 and 12%, respectively). In conclusion, acrylamide has cytotoxic and antiproliferative effects on the HepG2 cells.

Keywords: Acrylamide, HepG2 cells, MTT, Cytotoxicity



How Different Pregabalin Doses Affect Clone 9 Hepatocyte Cells

1Hülya Aksoy Aydinli, 1Nuriye Ezgi Bektur, 1Sedat Kacar, 1Varol Sahinturk

**¹Department of Histology and Embryology, Faculty of Medicine,
Osmangazi University, Eskisehir, Turkey**

*hulya1726@hotmail.com

Abstract

Pregabalin is a widely used analgesic, anticonvulsant and anxiolytic agent. It is generally used in the treatments of neuropathic pain and anxiety disorders. The present study was designed to determine the impacts of pregabalin doses on hepatocyte (Clone 9) cells. During the experiment, hepatocytes were cultured in an incubator at 37°C with 5% CO₂ in a ready-to-use medium. The cells were detached by trypsin-EDTA application and seeded into 96-well plate at a density of 25,000 cells per well. After pregabalin treatment, the cells were kept in the incubator for 24 h. Then, MTT solution was added and the cells were incubated at 37°C for 4 h. Thereafter, the insoluble formazan was solubilized in DMSO and the absorbance was measured at 570 nm. According to our results, it is revealed that pregabalin doses of 31.25 µM, 62.5 µM and 125 µM did not inhibit the cell proliferation, even the doses of 31.25 µM and 62.5 µM increased cell viability slightly. At the pregabalin dose of 250 µM, the cell viability decreased by an average of 10% whereas at the doses of 500, 1000 and 2000 µM, by an average between 20-25%. In conclusion, in the present study, even the highest dose of pregabalin (2000 µM) was revealed not to extensively affect the cell viability of Clone 9 cells. Despite this, the use of high doses of pregabalin should be avoided to prevent any possible side effects in other cells and organs.

Keywords: Pregabalin, Clone 9 hepatocytes, Cytotoxicity, MTT



Effect of Mirtazapine in Different Doses on Clone 9 Cells

¹Ridvan Bagci, ¹Nuriye Ezgi Bektur, ¹Sedat Kacar, ¹Varol Sahinturk

¹Department of Histology and Embryology, Faculty of Medicine,
Osmangazi University, Eskisehir, Turkey

rbagci@ogu.edu.tr

Abstract

Mirtazapine is a noradrenergic and specific serotonergic antidepressant. Mirtazapine represses the production of enzymatic and non-enzymatic oxidation indicators while increasing the antioxidant parameters. In this study, we tried to examine the effect of mirtazapine on the viability of Clone 9 cells, which are epithelial-derived, healthy rat hepatocyte cells. Clone 9 cells were grown in a medium containing 1% penicillin-streptomycin and 10% FBS at 37°C in an incubator with 5% CO₂. Cells were allowed to adhere to the surface of the flask by being seeded 24 hours before the experiment. Then, 7 mirtazapine doses were given to the cell medium. After 24 hours, 5 mg /ml MTT medium was exerted to the cells by diluting ten times with culture medium. The cells were incubated at 37°C for 4 hours. At last, the absorbance values of the cells were measured at 570 nm following dimethyl sulfoxide_(DMSO) administration. In respect to MTT results, cell viability rates at mirtazapine doses of 31.25, 62.5, 125, and 250 µM were close to that of untreated group, but cell viability rate at a 500 µM dose of mirtazapine was reduced to 60%. On the other hand, at the mirtazapine doses of 1000 µM and 2000 µM, cell viability decreased to 22.6 and 9.9%, respectively. In conclusion, it can be suggested that mirtazapine doses higher than 125 µM exerted a dose-dependent cytotoxic effect on Clone 9 cells.

Keywords: Mirtazapine, Clone 9, MTT



Changes in Photosynthetic Pigment Quantities of *Ipomoea purpurea* Due to *In vitro* Chitosan Treatment

¹Ece Gün, ¹Bahar Bayrak, ¹Elif Demiryürek, ¹Merve Çakır, ¹Arda Acemi, ¹Fazıl Özén

Department of Biology, Sciences and Arts Faculty, Kocaeli University, Kocaeli, Turkey

arda.acemi@kocaeli.edu.tr

Abstract

Morning glory (*Ipomoea purpurea* (L.) Roth.) is a climber plant known for its ornamental properties and ease of cultivation in temperate climates. Quality and color of flowers and leaves, especially in the production of ornamentals, are important parameters both for producers and for customers. The aim of this study is to reveal the changes in photosynthetic pigment quantities of *in vitro* propagated *I. purpurea* due to chitosan treatment with different polymerization degrees (DP) and to determine the indirect effect of this biopolymer on leaf quality of the plant. The nodal explants of *I. purpurea* were cultured in the medium supplemented with 5, 10 and 20 mg·l⁻¹ concentrations of chitosan oligomers mixture with the degree of polymerization (DP) 2-15 and chitosan polymer with DP of 70. Photosynthetic pigment determination was done using the leaves collected at the end of the incubation period of one month. It was found that both oligomeric and polymeric chitosan treatments increased chlorophyll-a contents in the leaves when compared to the control group. These increments were found to be 70.83%, 60.58% and 24.41% due to the chitosan oligomer treatment and 49.84%, 36.29% and 36.98% due to the polymeric chitosan treatment tested at 5, 10 and 20 mg·l⁻¹ concentrations, respectively. Regardless of their polymerization degrees, chitosan treatments enhanced chlorophyll-b contents. The carotenoid quantities also changed parallel to the chlorophyll-a levels. The results of this study showed that oligomeric chitosan treatment enhances photosynthetic pigment content and quality of *I. purpurea* leaves more than the polymeric chitosan treatment.

Keywords: Chitosan, *Ipomoea purpurea*, Photosynthetic pigments, Polymerization degree.



Quantification of biofilm structures on Laser Treated Titanium Implants by the novel computer program COMSTAT

¹Arzu Erol

¹Bülent Ecevit Üniversitesi / Moleküler Biyoloji ve Genetik Bölümü / Zonguldak

erol.arzu@yahoo.com

Abstract

The structure of biofilm formation on Titanium treated with Laser surface was analysed by a novel computer program, COMSTAT, which comprises ten features for quantifying three-dimensional biofilm SEM and Flourescence Microscopy image stacks. In situ 24h biofilms of same volunteeree results were used for analysed. Analysis by the COMSTAT program of four variables describing biofilm structure – mean thickness, roughness, substratum coverage and surface to volume ratio –showed that the four different Titanium surface represent different modes of biofilm growth. Titanium polished surface had a unique developmental pattern starting with single bacterial layer on the surface growing into more colonies. Titanium polished surface had a stronger tendency to form micro-colonies and uniform biofilm formation . Titanium polished after treated with Laser surface had thin biofilm formation and more less bacterial colonies. Finally, the biofilm structures of Titanium etched after treated with Laser surface had a more thickness biofilm layer and different type of phenotype bacteria. Analysis of biofilms of a different type of Titaium surface growing in situ 24h showed that mean biofilm thickness related with surface topology. The laser treated surface had characterized less adherence surface for dental bacteria. Moreover, biofilm roughness decreased with etched surface, whereas surface to topology ratio increased with treated surface mean that polished titanium after laser treated surface had not useful for bacterial adherence.

Keywords: COMSTAT, Ti, Biofilm formation, dental implant



Application of Different Analytical Techniques for the Surface Properties of Poly (Vinyl Chloride) /Perlite Composite

¹Ceyda Bilgiç, ¹Bengi Bozkır

¹Eskişehir Osmangazi University, Engineering and Architecture Faculty,
Department of Chemical Engineering, Eskişehir, Turkey

bozkirbengi@gmail.com,

Abstract

Poly (vinyl chloride) (PVC), as an important commercial polymer, has been studied and used widely in industrial fields for many years. The perlite sample were obtained from Cumaovası Processing Plants Perlite of Etibank (İzmir, Turkey) used in this work. Poly (vinyl chloride)/perlite composites were prepared using the solution blending method with the application of ultrasound and using tetrahydrofuran as solvent. Ultrasonic waves were used to enhance the nanoscale dispersion of the silicate. Polymer composite of a poly (vinyl chloride) (PVC) matrix containing 5% perlite (P) by mass was investigated using X-ray diffraction (XRD), Scanning electron microscopy (SEM), transmission electron microscopy (TEM).

Keywords: Poly (vinyl chloride); Nanocomposites; TEM, SEM, XRD



Phylogenetic Groups, Virulence Factors and Antibiotic Susceptibility of *Escherichia coli* Strains from Urinary Tract Infections in Hatay

¹Ebru Şebnem Yılmaz, ²Özkan Aslantaş, ³Erdoğan Büyükyazıcı

¹Department of Biology, Faculty of Art and Science, Mustafa Kemal University,
TR-31060 Hatay, Turkey.

²Department of Microbiology, Faculty of Veterinary Medicine, Mustafa Kemal University,
TR-31060 Hatay, Turkey.

³Microbiology Laboratory, Mosaic Hospital, Hatay, Turkey.

ebrusebnem@gmail.com

Abstract

In this study, it was aimed to determine the antibiotic susceptibility, phylogenetic groups and virulence genes of 153 *Escherichia coli* strains isolated from patients, admitted to Hatay State Hospital with complaints of urinary system infections. Antimicrobial susceptibility of the isolates to different class of antimicrobials was determined by the VITEK-2 automated system. Presence of virulence genes (*iucD*, *hlyA*, *cnf1*, *papC*, *papE-F*, *sfa/focDE*, *f17A*, *f17a-A*, *f17b-A*, *f17c-A*, *17d-A*, *afa D-8*, *afa E-8*, *clpG*, *cnf2*, *stx1*, *stx2*, *eaeA*) and phylogenetic groups were investigated by polymerase chain reaction (PCR). While all isolates were found susceptible to imipenem, meropenem and fosfomycine, various rates of resistance to other antimicrobials tested were observed. 26.1% (n=40) of the isolates were found to be susceptible to all antimicrobials tested. Multi drug resistance (MDR) was observed in 34.6% (n = 53) of the isolates. The majority of the isolates belonged to the phylogenetic group B2₃ (55, 35.9%), followed by A1 (32, 20.9%), D1 (29, 18.9%), D2 (19, 12.4%), A0 (9, %5.9), B1 (6, 3.9%) and B2 (3, 1.9%) phylogenetic groups. Among *E. coli* strains examined, 49% (n=75) had *iucD*, 32.7% (n=50) *papE-F*, 26.1% (n=40) *papC*, 15% (n=23) *cnf2*, 11.1% (n=17) *sfa*, 7.8% (n=12) *cnf1*, 1.3% (n=2) *afaE*, 1.3% (n=2) *afaD*, 1.3% (n=2) *hlyA*, 0.7% (n=1) had *f17a-A*, 0.7% (n=1) *clpG* and 0.7% (n=1) *eaeA* genes. Virulence genes were present alone or in combination with other virulence genes except *f17a-A*, which was only found alone. No virulence genes were detected in 28.8% (n=44) of the isolates.

Keywords: *Escherichia coli*, Urinary Tract Infections, Virulence genes, Phylogenetic Grouping

This study was granted by Mustafa Kemal University Scientific Research Fund (Project Number: 267)



Antiproliferative Activity of Some Lactic Acid Bacteria and Their Exopolysaccharides on Colon Cancer Cells (HT-29) and Determination of Linkage Structure of Exopolysaccharides

¹Ummugulsum Tukenmez, ¹Belma Aslim, ²Serkan Yavuz

¹Gazi University, Faculty of Science, Department of Biology, Ankara, TURKEY

²Gazi University, Faculty of Science, Department of Chemistry, Ankara, TURKEY

utukenmez@gazi.edu.tr

Abstract

There is growing interest in exploiting lactic acid bacteria (LAB), which produces exopolysaccharide (EPS) for numerous biological activities such as anticancer activity. EPS, obtained from safe, natural sources such as LAB, may be a good alternative for synthetic anticancer agents. Anticancer activity of polysaccharides is related to their structural properties such as beta-type glycosidic linkages, glucose, sulfate groups, are also conducive to enhance their anticancer activity. In the present study, antiproliferative activity of four high EPS producer *Lactobacillus* spp. (*L. plantarum* GD2, *L. rhamnosus* E9, *L. brevis* LB63, and *L. delbrueckii* ssp. *bulgaricus* B3) and their lyophilized EPSs (L-EPSs) on HT-29 cell line were determined by MTT assay after 18, 24 and 48h applications. In addition, linkage structure of L-EPSs were determined by 1D-NMR (¹H) and 2D-NMR (NOESY, COSY). EPS producer strains and their L-EPSs were capable of inhibiting proliferation of HT-29 cells in a time-dependent manner. EPS producer strains showed higher antiproliferative activity on HT-29 cells than L-EPSs. The highest antiproliferative activity was found at the 48 h application of *L. plantarum* GD2, (93%, $p<0.05$). It was determined that the linkage types found in the structure of all L-EPSs were similar to each other. Alpha-(1-2), and beta-(1-3) linkages were determined in the structure of all L-EPSs. It has been reported in literature that the antitumor property of EPS may be due to beta-1,3 glycosidic linkage in its structure. The results obtained from this study suggest that, LAB and their EPSs could be a good candidate as an anticancer agent.

Keywords: Anticancer, Colon cancer, Exopolysaccharides, Lactic acid bacteria, Linkage structure

Acknowledgments: This work was supported by TUBITAK, Project No: 115R282.



Effect of electrospun PCL nanofibrous scaffolds on the *in vitro* proliferation of human primary dermal fibroblasts

¹**Isil Ezgi Eryilmaz**, ¹Havva Tezcan, ²Sebnem Duzyer, ²Serpil Koral Koc, ¹Gulsah Cecener, ²Asli Hockenberger, ¹Unal Egeli, ¹Berrin Tunca

¹Department of Medical Biology, Faculty of Medicine, Uludag University, Bursa, Turkey

²Department of Textile Engineering, Engineering Faculty, Uludag University, Bursa, Turkey

ezgi.eryilmaz@dpu.edu.tr

Abstract

The use of nanotechnology and development of nanostructured materials for skin tissue regeneration have increased in recent years. The aim of this study was to fabricate polycaprolactone (PCL) nanofibrous scaffolds and their potential usage for human dermal fibroblast proliferation. Therefore, PCL nanofibrous scaffolds were produced by electrospinning. After sterilization, human dermal fibroblasts were cultured on PCL scaffolds. On the 14th day, the interactions between cell and scaffold were analyzed by MTS cell proliferation assay. Cell morphology was also observed by scanning electron microscopy (SEM). The results showed that the electrospun nanofiber diameter was around 800 nm. Fibroblast proliferation was increased 114% in PCL scaffolds compared to the cell culture without PCL scaffold (on polystyrene plate). Proliferation assay results were compatible with the SEM images. It was concluded, PCL can be good candidate for tissue engineering applications.

Keywords: Nanofiber scaffolds, Tissue engineering, Cell culture.



Protective Effect of Dose-Dependent Boric Acid on Liver Function as Distant Tissue in Renal Ischemia / Reperfusion Injury

¹Hakan Şentürk, ²Fatih Kar, ²Ceyhan Hacıoğlu, ²Güngör Kanbak

²Eskişehir Osmangazi University, Faculty of Medicine, Medical Biochemistry, Eskişehir

¹Eskişehir Osmangazi University, Faculty of Science and Letters, Biology, Eskişehir

hsenturk@ogu.edu.tr

Abstract

Renal Ischemia-Reperfusion elicits tissue damage in a number of organs: heart, lung, and liver. Among the major regulatory organs in our body are the liver and the kidney. Any liver or kidney damage can affect the other. Renal Ischemia-reperfusion injury (RIRI) defines tissue ischemia, which is a source of insufficient oxygen, followed by reperfusion that initiates a broad array of inflammatory responses. Distal organ injury is an oxidative damage that can be seen in various organs from the tissue exposed to RIRI. Boric acid has protective and antioxidant effects. It is not known whether boric acid will prevent liver function as a distant tissue damage due to RIRI. Therefore, we investigated the protective effects of dose-dependent boric acid on distal tissue damage. 35 rats were divided into five groups: sham, ischemia reperfusion and ischemia-reperfusion + boric acid (intraperitoneally at doses of 50, 100 and 200 mg / kg). Sham group was only subjected to surgical stress procedure. After ischemia for 45 min in rats, the clamps were opened and reperfusion was achieved. After 24 hours, rats were decapitated and blood samples taken to assess liver function tests. Alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma-glutamyl transferase (GGT) values were measured. Superoxide dismutase (SOD), malondialdehyde (MDA), catalase (CAT), glutathione (GSH) levels were measured in tissue samples to demonstrate the antioxidant activity of boric acid. Conclusion, boric acid protects against the remote liver injury induced by renal IRI and rapid restoration of cellular and architectural integrity of the liver.

Keywords: Kidney, Ischemia Reperfusion, Liver, Oxidative Stress, Boric Acid



Evaluation of Long-Term Quercetin Administration on Age-Related Oxidative Stress Induced By D-Galactose in Rats

**Burcu Çevreli, Hamza Kulaksız, Tayfun Gözler, Ayşe Özçetin Şenöz, Emel Serdaroglu Kaşikçi,
Ahmet Midi**

burcu.cevreli@uskudar.edu.tr

Abstract

This study aimed to determine if D-galactose-induced oxidative stress can be limited by the oral administration of quercetin. Adult male Wistar rats were treated daily for 3 months with subcutaneously injected D-galactose (150 mg/kg/day). A second group of rats received D-galactose (150 mg/kg/day) with quercetin (30 mg/kg/day) by oral gavage. Glutathione, malondialdehyde, nitric oxide levels as well as superoxide dismutase activity in rat brain tissue were measured using spectrophotometric analysis. Brain tissues were prepared for a histopathological evaluation. Structural and oxidative damage was induced by D-galactose. In the group administrated with quercetin, glutathione levels and superoxide dismutase activity were significantly higher than those in the untreated group. Additionally, malondialdehyde and nitric oxide levels were inversely proportional to glutathione levels and superoxide dismutase activity. Histopathological structural damage was identified in the brain tissue of D-galactose treated rats. Our results indicated that although D-galactose induced oxidative stress, quercetin limited oxidative damage caused by D-galactose in rats.

Keywords: D-galactose, quercetin, ageing, oxidative stress



Covalent Immobilization of Urease onto Florisil

¹Özlem Alptekin

¹Cukurova University, Faculty of Pharmacy, Department of Biochemistry, 01330, Adana, Turkey

oalptekin@cu.edu.tr

Abstract

Enzyme immobilization is confinement of enzyme to a phase (matrix/carrier) different from the one for substrates and products. Inert polymers and inorganic materials are usually used as carrier matrices. Florisil which contains 15% MgO and 85% SiO₂ shows good mechanical properties, thermal stability and resistance against microbial attack. Urease (EC.3.5.1.5) is a nickel-dependent enzyme that catalyzes the hydrolysis of urea to form ammonia and carbon dioxide that is accompanied by an increase in pH. In the present study, urease was immobilized covalently with glutaraldehyde onto Florisil. Scanning Electron Microscope was used to obtain image of the immobilized urease. The characteristics and stabilities of immobilized urease preparation were studied. Free urease and immobilized urease preparation showed their maximum activities at pH 6.5 and 7.0, respectively. Free urease and immobilized urease preparation had their maximum activities at 50 and 60 °C, respectively. The Km value of immobilized urease (5.9 mM) was higher than that of the free urease (2.7 mM). The Vmax value of immobilized urease was about 0.2% of the Vmax value of free urease. The changes in the kinetics of immobilized enzymes are controlled mainly by four factors, i.e. (1) change in enzyme conformation, (2) steric effects, (3) microenvironmental and (4) bulk and diffusional effects. The higher Km values for the solid-phase enzymes may be a result of a number of effects. The migration of substrate from the solution to the microenvironment of an immobilized enzyme can be a major factor increase in Km values.

Keywords: Florisil, urease, immobilization, kinetic parameters



Analyzing the Surface Properties of of Al-Pillared Montmorillonite/Poly (Vinyl Chloride) Composite

¹Ceyda Bilgiç, ²Özge Kanık, ³Naile Karakehya

^{1,2}Eskişehir Osmangazi University, Engineering and Architecture Faculty, Department of Chemical Engineering, Eskişehir, Turkey

³Eskişehir Osmangazi University, Environmental Control and Protection Programme, Eskişehir Vocational School, Eskişehir, Turkey
ozgedgnknk@gmail.com,

Abstract

The pillared clay (Al- pillared montmorillonite) of a commercial product was used in this work. Poly (vinyl chloride)/ Al- pillared montmorillonite composites were prepared using the solution blending method with the application of ultrasound and using tetrahydrofuran as solvent. Ultrasonic waves were used to enhance the nanoscale dispersion of the silicate. Polymer composite of a poly(vinyl chloride) (PVC) matrix containing 5% Al- pillared montmorillonite (Al-PILC) by mass was investigated using inverse gas chromatography (IGC), X-ray diffraction (XRD), Scanning electron microscopy (SEM), transmission electron microscopy (TEM). The dispersive component of the surface energy, and the acid/base character of composite surface were estimated by using the retention time of different non-polar and polar probes at infinite dilution region.

Keywords: Poly (vinyl chloride); Nanocomposites; Al-PILC; Surface properties



Temporal Analysis of Al-Induced Programmed Cell Death in Barley (*Hordeum vulgare L.*) Roots

¹Büşra Huri Gölge, ¹Filiz Vardar

¹Marmara University, Faculty of Arts and Sciences, Department of Biology, Göztepe,
34722, İstanbul, Turkey

filiz.vardar@gmail.com

Abstract

Aluminium is one of the most common mineral in the earth after oxygen and silicon although it is not essential in terms of plant nutrition. Aluminium that is uptaken by the plant's roots when the soil becomes acidic form, in a short span of time it causes changes in the cell structure and inhibits plant development. There are various studies which tackle the aluminium toxicity in plants in terms of molecular biology, biochemistry and morphology. However, there are less study about analysis of programmed cell death (PCD) induced by aluminium toxicity. In this study, *Hordeum vulgare L.* (barley) seeds were germinated and their roots were stayed in the solution that contain 100 µM AlCl₃ (pH 4,5) with different time intervals (0-7, 24, 48, 72 and 96 h). After treatment Al uptake, loss of plasma membrane integrity, caspase-1 activity, cytoplasmic cytochrome c and DNA fragmentation by flow cytometry were analyzed. According to our results Al affected barley roots within 30 min and caused PCD. The toxicity symptoms become more intense time dependently.

Keywords: Aluminum, barley, caspase-1, cytochrome c, root.



Antimicrobial Activity and Drug Release Properties of Amoxicillin-Loaded PVA-Chitosan Electrospun Nanofiber Mats Containing Silver Nanoparticles

1Kardelen Ecevit, 1Sibel Emir Diltemiz

¹Fen Fakültesi, Kimya Bölümü, Anadolu Üniversitesi, ESKİŞEHİR

kecevit@anadolu.edu.tr

Abstract

Amoxicillin (Amox) is one of the most important antibiotics of the penicillin family and has a broad antimicrobial activity, a bactericidal effect, and a high therapeutic index. The antimicrobial effects of silver products are directly related to the amount and proportion of silver released. Although silver in its metallic state is inert, when it interacts with moisture from the skin and with fluid from a wound, silver is ionized leading to antimicrobial effects. Polyvinyl alcohol (PVA) and chitosan were chosen for this work because they are biocompatible and biodegradable polymers that have been used in many previous studies for controlled drug release. In this study, we aim to increase the antimicrobial activity of Chitosan / PVA / Amox nanofibers by the addition of antibacterial reagents silver nitrate (AgNO_3). PVA and chitosan nanofibers with entrapped amoxicillin and silver were produced by electrospinning. The release of the nanofibers containing only amoxicillin and both silver and amoxicillin were determined by using HPLC method. Characterization of Amox and Amox-Ag fibers was performed by scanning electron microscopy (SEM), Infrared Spectrometer (IR), Energy Diffraction X-ray Analysis (EDX) and *X-ray diffraction (XRD)*.

Keywords: Electrospinning, Drug release, Amoxicillin, Silver nanoparticles, Antimicrobial activity



Investigation of Phytase Production from Yeast

¹Gamze Gültekin, ¹Yasemin Karasu, ¹Merih Kivanç

¹Anadolu University, Faculty of Science, Department of Biology, Eskisehir, TURKEY

gamzegultekin@anadolu.edu.tr

Abstract

Biotechnology, environmental protection and foodscientists and entrepreneurs pay attention to phytases for last 15 years. Phytases are enzymes that catalyze hydrolysis of the inositol core of phytate- the basic storage form of phosphate in cereals- to myo-inositol and inorganic phosphat. In this study, phytase enzyme production of *Kluyveromycesmarxianus* and *Candida kefyr* isolates that isolated from kefir was investigated. At the first stage of the study, yeast isolation was made from kefir and malt extract Agar was used for the purification phase. A total of 44 yeasts were isolated. Biochemical characteristics of isolates were determined. In order to investigate the presence of phytase enzyme, sodium phytate-containing isolates were left at 30 ° C for 24-48 h incubation and the zone diameters were measured. 13 of the isolates with the widest zone diameter were selected and continued to work with those isolates. Thirteen isolates with phytase enzyme activity in solid medium were found to have the high degree ability of phytase enzyme activity in liquid medium. Phytase enzyme extractions were done from the isolates. According to this study it is thought that the yeast strains tested in this study contain high levels of phytase enzyme and these findings can be used in further studies.

Keywords: Phytase, Yeast, Phytic Acid.



Distribution of Aflatoxin in Peanuts (*Arachis hypogaea* l.) in East Mediterranean Region of Turkey

¹ Yaşar Alptekin, ¹Ahmet A. Abdulhameed

¹Department of Plant Protection, Faculty of Agriculture, Kahramanmaraş Sutcu Imam University,
46100, Kahramanmaraş, Turkiye.

alptekin69@ksu.edu.tr

Abstract

This study was carried out in order to identify fungal genera isolated from peanut and to determine aflatoxin levels in peanut samples collected after harvest in Osmaniye and in 2012-2013. Total of 43 peanut shelled and unshelled samples were collected and tested for the presence of internal and external aflatoxigenic fungal genera and Aflatoxin B1 (AFB1) and total Aflatoxin (AFB1+AFB2+AF-G1+AFG2). As result of this study, fungi belonging to *Aspergillus* genus were more frequently observed. Fungi belong to *Fusarium* and *Pencillium* genera were less frequently observed than *Aspergillus sp.* Moreover, 43 peanut samples were tested for fungal genera on seed surface. As result of this study, fungi belonging to *Fusarium* genus were more frequently observed. Fungi belong to *Aspergillus* and *Pencillium* genera were less frequently observed than *Fusarium sp.* And forty three peanut samples were tested for aflatoxin content in HPLC after harvest. As a result HPLC analysis, the all of peanut shelled and unshelled samples of AFB₁ content less the 5ppb limit, and total of aflatoxin (AFB₁+AFB₂+AFG₁+AFG₂) contents in all peanut shelled and unshelled less than 10 limit.

Keywords: Mycoflora, Peanut, Aflatoxin, HPLC.



5-Hydroxy-1,4-naphthoquinone, Morin hydrate and Valeric acid Inhibit Human Serum Paraoxonase-I

¹Cüneyt Türkeş, ²Şükrü Beydemir

¹Department of Biochemistry, Faculty of Pharmacy, Erzincan University, Erzincan, Turkey

²Department of Biochemistry, Faculty of Pharmacy, Anadolu University, Eskişehir, Turkey

cuneyt.turkes@erzincan.edu.tr

Abstract

Paraoxonase-I (hPON1, EC 3.1.8.1) is an high-density lipoprotein (HDL)-related lactonase with antioxidant and anti-atherogenic properties. The enzyme protects against macrophage-mediated low-density lipoprotein (LDL) oxidation. hPON1 enhances the binding of HDL to macrophages, which stimulates HDL's ability to promote cholesterol efflux. In the present study, hPON1 enzyme was purified and characterized from fresh blood human serum by ammonium sulfate precipitation, ion-exchange chromatography and gel filtration chromatography. Sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) was performed to determine the purity of the enzymes. 5-Hydroxy-1,4-naphthoquinone, morin hydrate and valeric acid as phenols had excellent inhibitory effects against hPON1. These phenolic compounds were tested on paraoxonase activity of the enzyme and demonstrated efficient inhibition profiles with K_i values in the range of 0.0218 ± 0.0013 , 0.1512 ± 0.0037 and 0.4804 ± 0.0292 mM against hPON1, respectively. The inhibition mechanism of 5-Hydroxy-1,4-naphthoquinone and morin hydrate were non-competitive, and for valeric acid was competitive.

Keywords: Paraoxonase, PON, HDL, enzyme inhibition, phenolic compound



PP-040

Oxidative Stress Biomarkers in Coronary Artery and Cerebrovascular Disease

¹Mesut Işık, ²Şükrü Beydemir, ³Abdullah Tunç

¹Department of Pharmacy Services, Health Services Vocational School, Harran University, Şanlıurfa, Turkey

²Department of Biochemistry, Faculty of Pharmacy, Anadolu University, Eskişehir, Turkey

³Department of Occupational Health and Safety, Faculty of Health Science, Bingöl University, Bingöl, Turkey

sukrubeydemir@anadolu.edu.tr

Abstract

The enzyme activities of catalase (CAT), glutathione-S-transferase (GST) and paraoxonase (PON1), amount of protein carbonyl, MDA, total thiol in 18 cerebrovascular patients (9 males and 9 females, mean age 71.34), 20 coronary artery patients (11 males and 9 females, mean age 72.34) and 23 (12 male and 11 female, mean age 70.06) healthy adults were measured by spectrophotometric methods. In the present study, PCO level was significantly increased ($p<0.01$) in coronary artery group compared to the control group. T-SH level in coronary artery group is not significantly lower ($p>0.05$) than control. MDA level in the cerebrovascular group was significantly higher ($p<0.05$) than in the control group. Plasma CAT activity of cerebrovascular and coronary artery groups was not significantly different from control ($p>0.05$), whereas activity in cerebrovascular group was significantly higher ($p<0.05$) than that in coronary artery group. Plasma GST activity level in the coronary artery group ($p<0.001$) was significantly lower than that in the control group. GST activity in erythrocytes of coronary artery patients was higher than control group ($p<0.001$) and than cerebrovascular group ($p<0.05$). Plasma PON1 activity in the control group was higher than both cerebrovascular ($p<0.001$) and coronary artery ($p>0.01$) patients. These findings showed that it can give information about this diseases by the determination of oxidative stress markers and activity of enzymes.

Keywords: Oxidative stress, coronary artery, enzyme activity, biomarker



The Effects of Chitosan Application against Aluminum Toxicity in Wheat (*Triticum aestivum L.*)

¹Gamze Kurtuluş, ¹Filiz Vardar

Marmara University, Faculty of Arts and Sciences, Department of Biology,
Göztepe, 34722, İstanbul, Turkey

gamzekurtulus@marun.edu.tr

Abstract

Aluminium (Al) toxicity is one of the major growth limiting factors that affects large agricultural areas resulting in reduced crop production in acid soils. Chitosan (CHT) is the most abundant amino polysaccharide after cellulose and is a new functional material of high potential in various fields such as alleviation of stress symptoms. In this respect wheat roots were exposed to 100 μ M AlCl₃, 100 μ M AlCl₃+0.1mg/L CHT, 100 μ M AlCl₃+0.25mg/L CHT and 100 μ M AlCl₃+0.5mg/L CHT for 96 h. For positive control roots were treated with 0.1, 0.25 and 0.5 mg/L CHT. The concentrations of CHT were chosen according to the previous studies and our preliminary studies. To evaluate the ameliorating effects of CHT on Al toxicity some cellular stress responses were investigated including root elongation, Al uptake, loss of plasma membrane integrity and lipid peroxidation. According to our results Al inhibited root elongation progressively, but CHT treatment alleviated root growth. Besides, CHT treatment inhibited Al uptake and protected plasma membrane integrity. Similarly CHT reduced lipid peroxidation in Al treated groups. Based on our results CHT could alleviate Al-induced toxicity in wheat roots.

Keywords: Aluminum, chitosan, lipid peroxidation, root elongation, wheat.



Applications of Nanofibers as Dermatological Drug Release Systems and Investigation of Drug Release Parameters

¹Serçin Cevizlidere, ¹Sibel Emir Diltemiz

¹Department of Chemistry, Faculty of Science, Anadolu University, Eskisehir, TURKEY

scevizlidere@anadolu.edu.tr

Abstract

Nanofibers refer to fibers having diameters less than 100 nanometers and thus provide a much larger specific surface area. There are many application fields such as nanofibers, filtration applications, protective textile applications, electrical and optical applications, biomedical applications, catalysis applications, tissue scaffold applications [1], [2]. Nanofiber production methods; self-assemble, template synthesis, phase separation method, melt-blown technology and electrospinning. Recently electrospinning method is very preferred for prepare to drug carrier systems [3]. In this study, photo-crosslinkable monomer, Gelatin-methacryloyl (GelMA), based nanofiber membranes were prepared. Firstly, GelMA was synthesized and characterized and then GelMA was mixed biocompatible monomer Polycaprolactone (PCL) solution. Dexamethasone (DexpH), a drug substance, was added with different amount to GelMA/PCL solution. GelMA-PCL-DexpH nanofiber was produced with electrospinning system and nanofibers were crosslinked with UV (254 nm) to increase durability. The release parameters of drug-loaded nanofibers were analyzed by High Performance Liquid Chromatography (HPLC). Scanning electron microscopy (SEM) was used to determine the nanofibers' morphology. Attenuated Total Reflection-Fourier Transform Infrared Spectroscopy (ATR-FTIR) and X-Ray Diffraction Analysis (XRD) were used in the determination of the structures and Contact Angle Measurement was performed to determine the hydrophilicity.

Keywords: Dexamethasone, Drug Release, Electrospinning, Nanofiber,

Acknowledgement: This work has been supported by Anadolu University, Commission of Scientific Research Projects (Project No: 1706F394).



Cloning and Molecular Analysis of Endemic *Brucella abortus* Omp25 Gene

¹Tugba Atabey, ¹Günseli Kurt Gür, ¹Emel Ordu, ¹Aysegül Erdemir Üstündag, ²Medine Güllüce,
¹Tülin Arasoğlu

¹Department of Molecular Biology and Genetics, Faculty of Science,
Yıldız Technical University, Istanbul, Turkey

²Department of Biology, Faculty of Science, Atatürk University, Erzurum, Turkey

atabeytugba@gmail.com

Abstract

Brucellosis caused by *Brucella* bacteria, is a zoonotic disease that affects livestock animals and causes economic damage due to reproductive losses. While several Brucellosis vaccines are available they have disadvantages such as poor serologic diagnosis, abortion and reduced milk yield. Nowadays, the sub-unit vaccine studies carried out especially for this purpose are promising. In these studies, usually, proteins with high virulence properties located on the outer membrane of *Brucella*, are preferred. Based on this idea, *Brucella*'s Omp25 outer membrane protein was selected as the target gene region in the study. Firstly, endemic *Brucella abortus* was obtained from Erzurum region and its whole genome was isolated. Subsequently, the gene encoding the immunogenic major 25 kilodalton outer membrane protein was amplified by PCR using appropriate primers. The Omp25 gene region was cloned into pET102 / D-TOP[®] vector. The constructed vector was transformed into DH5α Chemically Competent *E. coli* cells. Inserts were confirmed by colony PCR and submitted for sequencing. Following sequencing, the obtained Omp25 gene region was evaluated for homology in 16 different *Brucella* species including the *Brucella abortus* strain 2308 and the S19 strain using the MEGA 7.0.26 software. The phylogenetic analysis of sequenced gene showed that the Omp25 gene was nearly identical in different *Brucella* species and found to be the same as that of the *Brucella abortus* 2308 reference strain and the S19 vaccine strain. The multiple sequence alignment of the different *Brucella* Omp25 sequences showed that the protein was preserved at high levels among the *Brucella* pathogens. In the future, this gene may be proposed as a candidate for the development of buselozis vaccine.

Keywords: *Brucella abortus*, brucellosis, Omp25, cloning, Phylogenetic analysis

Funding Acknowledgements: This research was supported by TÜBİTAK (Project no: 116S471).



Investigation of the Effect of Different Formulations of Doxorubicin on Antioxidant System in Liver Tissue in Mice Ehrlich Acid Tumor Formed

¹Elvan Bakar, ²Emre Bayram, ³Özlem Demirkiran, ⁴Enis Ulucam

¹Department of Basic Pharmaceutical Science,
Trakya University Faculty of Pharmacy, Edirne, Turkey

² Department of Pharmaceutical Nanotechnology
Trakya University Institute of Health Sciences, Edirne, Turkey

³ Department of Pharmacognosy, Trakya University Faculty of Pharmacy, Edirne, Turkey

⁴Department of Anatomy Trakya University Faculty of Medicine, Edirne, Turkey

Abstract

Cancer is one of the most prevalent reason of death in the world. The most fatal cancers are lung, stomach, liver, large intestine and breast cancers. Breast cancer can spread via lymphs. Doxorubicine (DOX), is one of the most widely used agents for curing cancer. However DOX is a chemotherapeutic agent with a lot of adverse effects. It is known that DOX cause increase in reactive oxygen species. DOX is attached to Deoxiribonucleic Acid (DNA) and prevents DNA replication. This process causes free radicals to occur. Free oxygen radicals are produced more by the action of agents such as DOX, causing oxidative stress in the cells. In determining the cytotoxic effect of DOX, antioxidant system plays an important role. Within the scope of our study, the effects of different forms of DOX on hepatic tissue in the breast tumor model experimentally generated in bulb-c mice were evaluated by examining the expression levels of antioxidant enzymes, Superoxide dismutase (SOD), Catalase (CAT) and Glutathione synthetase (GSH). Bulb-c mice weighing 30-35 g were divided into five groups, randomly, control, breast tumor, liposomal DOX and PEGylated liposomal DOX as 8 animals in each group. 200 μ L Ehrlich acid tumor (EAT) cells were injected subcutaneously into the left legs of the experimental animals and waited for 10 days for tumor formation. At the end of the 10th day, taking into account animal body weights loading efficiency spectrophotometric calculated dosing (0,18 mg), respectively 1st 2nd, 4th and 6 days was administered to animals by intraperitoneally. At the end of the 10th day, control and tumor groups, at the end of the treatment period the other groups were sacrificed under anesthesia and qRT-PCR analysis were assayed to evaluate oxidative stress by measuring expression levels of SOD, CAT and GS genes, using cDNA generated from isolated total RNA. Melt-curve analysis was performed to confirm the specificity of the chosen primers and absence of primer-dimers. Expression quantities of target genes were normalized using GAPDH as an internal gene. For statistical analysis, SPSS 19 program was used. Descriptive statistics were expressed as mean \pm standard deviation. The Kruscal-Wallis test was used for multiple comparisons between groups, and the Mann-Whitney U test for binary comparisons. The expression levels of SOD, CAT and GSH, increased significantly in tumor group ($p<0.01$). When the tumor group was compared with the DOX group, it was seen that the expression of SOD and GSH was increased but the expression of cat was not changed ($p<0.05$). However, it was observed that SOD expression was increased but GSH expression was decreased in liposomal DOX and PEGylated liposomal DOX groups ($p<0.01$). When the DOX and liposome DOX groups were compared, it was observed that the expression of SOD and CAT was increased whereas the expression of GSH was decreased ($p<0.05$). When DOX and PEG-liposomal DOX groups were evaluated, it was determined that SOD expression was increased while GSH expression was decreased ($p<0.05$) and CAT expression was not changed. There was no difference in enzyme expression levels in liposomal DOX and PEGylated liposomal DOX groups. Gene expression levels showed that DOX was lead to toxic effect in the liver and induced oxidative stress. However, it should be underlined that no difference was observed in enzyme expression levels in Liposomal DOX and PEGylated liposomal DOX groups. Further investigation is needed in this regard.

Keywords: Doxorubicine, breast tumor, liver toxicity, antioxidant enzyme



Monitoring of Microbial Flocs and Cells with Electron and Fluorescence Microscopy

1Nilgun Poyraz, 2Mehmet Burcin Mutlu

¹Department of Biology, Faculty of Arts and Science, Dumlupınar University, Kütahya, Turkey

²Department of Biology, Faculty of Science, Anadolu University, Eskisehir, Turkey

nilgun.kavak@dpu.edu.tr

Abstract

Treatment of wastewater is globally crucial topic for environment. For efficient treatment, operational conditions, sludge structure and proliferation of specific microbiological cells must be controlled, so stabilization of microbial structure, monitoring of floc structure and filamentous bacteria and microbial community analysis in wastewater treatment plant become important. For these purposes visualization and quantification of adherent, floc forming and filamentous bacteria is one of the crucial topics in wastewater treatment plants. For microbial community structure analysis, microscopic techniques has been used for many years. Bright-field microscopy, phase-contrast microscopy, electron microscopic techniques such as transmission electron microscopy, scanning electron microscopy and fluorescence microscopic approaches can offer detailed insight into bacterial morphology, structure and number. In the scope of these techniques, we used SEM (Scannig Electron Microscopy) and fluorescence microscopy techniques as a preliminary experiment to analyze our samples. For this purpose, we performed microscopic analyzes after by pre-processing of samples. As a result of analysis, we have obtained data on morphology, filamentous microorganisms and microbial density of microorganisms.

Keywords: Wastewater, SEM (Scannig Electron Microscopy), Fluorescence microscopy, Microbial community, Bacteria



Investigation of Antimicrobial Activity and Total Phenolics of *Muscaria neglect* Flowers

¹Alican Bahadır Semerci, ¹Kenan Tunç

¹Departman of Biology, Faculty of Science Literature, Sakarya University, Sakarya, Turkey

alicannn5434@gmail.com

Abstract

Phenolic compounds have many biological properties such as antioxidant properties, anticancer, antimicrobial and antiinflammatory effects and these compounds are increasingly important. In our study, antimicrobial activity and total phenolic contents of *Muscaria neglectum* plant collected from Esentepe campus of Sakarya University were investigated. The collected flowers were extracted from the soxhlet apparatus using methanol solution after being dried. Antimicrobial activities of *Candida albicans*, *Pseudomonas aeruginosa*, *Bacillus subtilis* *Escherichia coli*, *Staphylococcus aureus* and *Staphylococcus epidermidis* strains were determined by disk diffusion method. As a result, only antimicrobial activity was found on *Candida albicans*. The resulting extract produced a 11 mm inhibition zone diameter on the *Candida albicans* strain. Total phenolic substance analysis; 1 ml of the prepared extract was taken and 1 ml of Folin-ciocalteu extract was added. After standing for 5 minutes, 1 ml Na₂CO₃ solvent was added to the mixture. The resulting mixture was added to 7 ml of distilled water and the mixture was added to 10 ml. The absorbance value at a wavelength of 725 nm was read in the sample spectrophotometer and the sum of the phenolic compounds was determined using a previously prepared gallic acid standard curve. The observation of antifungal effects indicates that plants containing phenolic substances can be used therapeutically in fungal diseases and may be an alternative to synthetic antifungals.,

Keywords: Muscari, antifungal activity, disc diffusion, total phenolic



Investigation of the Antibacterial Effect of *Salix alba* and *Salix babylonica* Species

1Dilek İnceçayır, 1Alican Bahadır Semerci, 1Kenan Tunç

1Departman of Biology, Faculty of Science Literature,
Sakarya University, Sakarya, Turkey

dince76@hotmail.com

Abstract

Acetyl salicylic acid, the active ingredient of aspirin, is used in the treatment of many diseases. This study, the antibacterial effect of *Salix babylonica* and *Salix alba* species, the natural form of salicylic acid in acetyl salicylic acid, has studied. Extracts were obtained by using ethanol and acetone by shell and leaf soxlet method. Antibacterial effects of extracts obtained from *Bacillus subtilis* *Escherichia coli*, *Enterococcus faecalis*, *Staphylococcus aureus*, *Staphylococcus epidermidis* and *Salmonella typhimurium* were investigated by disk diffusion method. It was determined that the extract prepared with *Salix alba* shell acetone produced 10.5 mm inhibition zone diameter on *E. coli* bacteria. Both species showed higher antibacterial activity than the extracts from the leaves of the extracts obtained from than the crusts. *Salix alba* showed higher antibacterial activity than *Salix babylonica*. Every treatment we make in the herbal product will help to increase herbal drug value and to improve our country. Investigation of naturally grown and medical importance of having facilities such plants can be used in the health sector and industry in Turkey is extremely important. It is extremely important to investigate the possibilities. We think that it is possible to minimize the damage of these natural agents by taking the place of synthetic agents.

Keywords: Salix, antibacterial activity, disc diffusion



Using MS-MLPA Technique in Examination of 15q11-q13 Region Related with Prader Willi Syndrome

^{1,2}**Berna Akça**, ²Ece Keskin, ²Pelin Özyavuz Çubuk, ²Hasan Taşlıdere, ²Bahadir Şükür, ¹M. Hamza Müslümanoğlu

¹Department of Molecular Biology and Genetics, Faculty of Arts and Science,
Yıldız Technical University, İstanbul, Turkey

²Department of Molecular Genetics, Genetic Diagnosis Center,
Haseki Training and Research Hospital, İstanbul, Turkey

bernaakca@gmail.com

Abstract

Prader Willi Syndrome is a rare neurogenetic disorder resulting from the expression defects of imprinting genes located in q11-q13 region of 15th chromosome. There are three different molecular mechanisms that can cause Prader Willi Syndrome: deletions in 15q11-q13 region of paternal allele, maternal uniparental disomy and defects in imprinting center. The techniques used in genetic diagnosis also varies due to these complex genetic mechanisms. The deletions which are observed in 75 % of the effected individuals can be diagnosed by cytogenetic studies, FISH and chromosomal microarray. On the other hand, methylation-specific techniques are required to determine the DNA methylation anomalies. However, MS-MLPA (methylation-specific multiplex ligation dependent probe amplification) technique can diagnose copy number changes, deletions and methylation anomalies. In our study, 165 cases who were referred to our genetic diagnosis center with pre-diagnosed Prader Willi Syndrome were examined using SALSA MS-MLPA probemix ME028. Different status of deletions, disomy and methylation are presented in 15q11-13 region related with Prader Willi Syndrome of 13 cases.

Keywords: MS-MLPA, Prader Willi Syndrome, 15q11-q13 region



The effect of AM251 (Cannabinoid 1 receptor antagonist) and AM630 (Cannabinoid 2 receptor antagonist) on ischemia/reperfusion-induced arrhythmias

¹Ersöz Gonca, ¹Lale Göksu Türkmen, ¹Duygu Çatlı, ¹Salih Erdem

¹Department of Biology, Faculty of Art and Sciences, Bülent Ecevit University, Zonguldak, Turkey

ersozgonca67@hotmail.com

Abstract

The aim of this study is to investigate the effects of AM251 (cannabinoid-1 receptor antagonist) and AM630 (cannabinoid-2 receptor antagonist) on ischemia/reperfusion (I/R)- induced arrhythmias in rats. Wistar Albino male rats were divided into 3 groups: I) Control (n = 13), II) AM251 (n = 17) and III) AM630 (n = 17). AM251 and AM630 were administered intravenously at a dose of 1 mg/ kg, 10 minutes prior to ligation. In anesthetized rats, the left main coronary artery ligation was performed for 6 minutes of the ischemia. Reperfusion was performed for 10 minutes by loosening the occluded coronary artery vessels. Ventricular arrhythmia durations, QRS, Q-T and P-R intervals, heart rate and mean arterial blood pressure were calculated from the ECG recordings in ischemia and reperfusion periods. AM251 significantly increased mortality, the incidence of ventricular tachycardia, the duration of total length of arrhythmias and the arrhythmia scores compared to control group ($p<0.05$). AM251 significantly increased P-R interval compared to control ($p<0.05$). The cannabinoid-1 receptor antagonist, AM251 increased the generation of ischemia/reperfusion-induced ventricular arrhythmias. The cannabinoid-2 receptor antagonist AM630 did not show any effect. These results demonstrate that endogenous cannabinoids may suppress the generation of ventricular arrhythmias via CB1 receptor activation.

Key words: AM251, AM630, Cannabinoids, Ischemia/reperfusion arrhythmias,



The effects of lidocaine with epinephrine on bupivacaine-induced cardiotoxicity

¹Ersöz Gonca, ¹Duygu Çatlı

¹Department of Biology, Faculty of Art and Sciences, Bülent Ecevit University, Zonguldak, Turkey

ersozgonca67@hotmail.com

Abstract

Bupivacaine is a local anesthetic substance which is most commonly used in regional anesthesia. It may lead to ventricular arrhythmias and cardiac arrest when it was given to systemic circulation by mistake. Lidocaine, a sodium channel blocker is used in combination with epinephrine. The aim of the present study is to research the effects of lidocaine with epinephrine (vilcain: 20 mg+10⁻² mg/ml) in bupivacaine-induced cardiotoxicity in rats. Twenty-four Wistar albino rats were divided into four groups; I) Control, II) Lidocaine with epinephrine, 1mg/kg, III) Lidocaine with epinephrine, 3 mg/kg and IV) Lidocaine with epinephrine, 6 mg/kg. Bupivacaine at a dose of 3 mg/kg/min was given to rats anesthetized with ketamine and xylazine in all groups. Lidocaine with epinephrine was given with infusion at the doses of 1, 3, and 6 mg/kg/min. The asystole time and 50% and 75% decreament time in mean arterial blood pressure (MABP) were determined. P-Q, Q-T and QRS intervals were measured in ECG recordings. Lidocaine with epinephrine treatments significantly increased the asystole time, 50% and 75% decreament time in MABP. Lidocaine with epinephrine at low doses (1 mg/kg) significantly increased these values compared to other groups and decreased P-Q, Q-T and QRS lengths in ECG recordings ($P<0.05$). These results reveal that lidocaine with epinephrine reduces the cardiotoxic effect of bupivacaine. This effect is more prominent in a dose of 1 mg/kg. The administration of lidocaine with epinephrine may decrease the cardiotoxic effect of bupivacaine in clinical application.

Keywords: Bupivacaine, Cardiotoxicity, Epinephrine, Lidocaine, Rat



Some Endemic Plants of the Cremna Ancient City, Turkey

1Belkis Yapıcı Akça, 2Hüseyin Sümbül

¹Akdeniz University, Graduate School of Applied and Natural Sciences,
Department of Biology, Antalya, Turkey

² Akdeniz University, Faculty of Science, Department of Biology, Antalya, Turkey

blkysypc@gmail.com

Abstract

Cremna was a *town* in Pisidia. It is an ancient city built in Cestrus valley by Pisidians on a dominating hill of which surroundings is cliff. Cremna ancient city is located 25 km east of Bucak. Bucak is a district within Burdur province. In this study, general features of some endemic plants distributed in Cremna ancient city were investigated. Cremna is located in C3 square according to Grid system. The study material is composed of some endemic plants gathered from Cremna and its surroundings. Plant samples that collected during the field studies conducted between 2016-2017 were identified using "Flora of Turkey and East Aegean Islands". The scientific names, Turkish name, family, phytogeographic region, life form and habitat were given during the study. In order to be transmitted to future generations, we need to define and protect our endemic plants that are spreading in narrow areas. In this study, some characteristics of 10 endemic plants growing in Cremna ancient city were given.

Keywords: Biodiversity, Bucak, Cremna, Endemic, Turkey



In vitro proliferative and adhesive properties of human dermal fibroblasts on electrospun poly(ε-caprolactone) scaffolds

¹Havva Tezcan, ¹Isil Ezgi Eryilmaz, ²Sebnem Duzyer, ²Serpil Koral Koc, ¹Gulsah Cecener, ¹Unal Egeli, ²Asli Hockenberger, ¹ Berrin Tunca

¹Department of Medical Biology, Faculty of Medicine, Uludag University, Bursa, Turkey

²Department of Textile Engineering, Engineering Faculty, Uludag University, Bursa, Turkey

havvatezcanmail@gmail.com

Abstract

Skin tissue engineering remains a valid option to treat difficult skin defects such as burns, congenital giant nevi, soft tissue trauma, disfiguring scars or tumor resection. The purposes of this study were to fabricate electrospun nanofibrous scaffolds from biodegradable poly(ε-caprolactone) (PCL) and to investigate cell proliferation and morphology of cell-matrix interaction. PCL nanofibrous scaffolds were fabricated by electrospinning with a rotational speed of 500 rpm. The fabricated PCL scaffolds were sterilized for cell culture. Human dermal fibroblast cells were cultured on PCL scaffolds. MTS cell proliferation assay was used to analyze the interaction between cell and scaffolds on the 14th day. Morphology of cell-matrix interaction was also observed by using scanning electron microscopy (SEM). Fibroblast proliferation on PCL scaffolds was increased by 122% on the 14th day compared to cell culture on polystyrene plate. The SEM images showed the proper nanofibrous structure of the prepared scaffold. Moreover, nanofibers were biocompatible and cells attached to the surface of the scaffolds properly. The results of the proliferation assay were also confirmed by SEM analyses. Our results showed that PCL is a remarkable alternative for tissue engineering applications.

Keywords: Polycaprolactone, Nanofiber scaffolds, Skin tissue engineering, Cell culture.



Investigation of Antibacterial Activity of Various Extracts Against Clinical Bacterial Isolates

¹İlke Karakas, ¹Binnur Meriçli Yapıcı

¹Department of Biology, Faculty of Science, Çanakkale Onsekiz Mart University, Çanakkale, Turkey

ilkekarakass@gmail.com

Abstract

In this study, antibacterial activity of four essential oils, tea with clove bud and *Eisenia fetida* coelomic fluid against eight different clinical isolates were investigated. Disc diffusion method was applied in order to determine the effectiveness of antimicrobial substances against clinical isolates. The cultures obtained from the hospital laboratories were grouped as throat, ear, wound and urine. Six different antibiotics were used to evaluate the results of antibacterial activity and to determine whether clinical isolates were susceptible to antibiotics in the study. According to the results of the study, it was found that thyme, rosemary and clove bud essential oils and *Eisenia fetida* coelomic fluid were exhibit significant antibacterial activity on all of the clinical isolates tested in the study. Especially, it was determined that the inhibition zone values obtained from thyme, rosemary and clove essential oils are higher than antibiotics. *Hypericum perforatum* essential oil and tea with clove bud were effective on four and two clinical isolates, respectively. Four of the six antibiotics tested against the urine and ear clinical isolates used in the study were found to be ineffective. With this research has led to the conclusion that further investigations should be conducted with eight different antimicrobial agents used in the experiments.

Keywords: Thyme, Rosemary, *Eisenia fetida* coelomic fluid, Clove bud, Essential oil.



Optimization of PCR Method for Simultaneous Detection of Common Mitochondrial DNA Mutations in Human Semen Samples

¹Elnaz Moshfeghi, ¹Tuğba Atabey, ²Necati Findikli, ¹Tülin Arasoglu

^¹Department of Molecular Biology and Genetics, Faculty of Science, Yıldız Technical University,
Istanbul, Turkey

^²Bahceci Health Group, Istanbul, Turkey

elimoshfeghi123@gmail.com

Abstract

Absence of or decrease in sperm motility in semen is one of the most common reasons of male infertility. Recent studies show that fertilization-competent sperm should possess mitochondria with functional oxidative phosphorylation (OXPHOS) units, which are partially encoded in sperm mitochondrial DNA (mtDNA) genome. In this perspective, mutations or deletions in sperm mtDNA are recently attributed to be a leading cause of poor sperm motility and sperm dysfunction leading to impaired conception. Here, an optimized PCR methodology that is developed to detect 3 most common mtDNA mutations in the same semen sample. After designing the appropriate primers sets for all three genomic regions, PCR conditions were optimized in order to simultaneously and effectively amplify the regions spanning aforementioned and putative mutations. PCR efficiency and reproducibility were determined by running the PCR products on 1% agarose gel and visualizing the bands under UV light according to their product sizes. Finally, the primer shift technique was used for confirmation of expected deletions. Methodology was tested by using semen samples of five healthy subjects. In all samples, PCR resulted in amplification products showing bands of expected sizes, indicating that the technique can be efficiently used to screen these common mutations in a given infertile male population. Furthermore, our approach can be effectively coupled with already available sperm molecular diagnostic tests aimed at detecting abnormalities on sperm genome (sperm DNA fragmentation, chromatin packaging or sperm aneuploidy tests etc.) in order to increase the clinical effectiveness as well as the value of sperm genomic tests.

Keywords: Male infertility, Sperm mtDNA, Deletion, Motility, PCR

Funding Acknowledgements: This research was supported by BAP (Project no: FYL-2018-3260).



The Morphological Changes in Clone 9 Hepatocyte Cells As A Result of The Reaction Between B-Carotene And Ready-To-Use Medium

1Rifat Ertekin, 1Sedat Kaçar, 1Erhan Şahin, 1Varol Şahintürk

**¹Department of Histology and Embryology, Faculty of Medicine,
Eskisehir Osmangazi University, Eskisehir, Turkey**

rertekin@ogu.edu.tr

Abstract

While antioxidants generally serve as cell protectors and radical scavengers, some can damage the cells by reacting with the cell culture medium and forming hydrogen peroxide (H_2O_2) and other oxidant agents. β -carotene is an antioxidant substance and the precursor of vitamin A. The aim of this study is to examine how β -carotene affects the Clone 9 cells cultured in Iscove's modified Dulbecco's medium (IMDM). Cells were grown at 37°C in an incubator containing 5% CO_2 throughout the experiment. One day prior to the experiment, Clone 9 cells at a density of 3×10^5 were added to 75 cm² flasks containing IMDM. After adhering, the cells were separated into two groups as control and β -carotene (20 μM). At the end of the experiment, cells were examined under an inverted microscope. Then, the cells were detached by trypsin-EDTA solution and examined after hematoxylin staining. Morphological degenerations such as cell rounding and shrinkage were observed in the β -carotene treated cells. There were also in the red-colored artifact formation over these cells. On the other hand, untreated cells maintained their normal structure. In conclusion, β -carotene possibly interacted with the substances in the medium, thereby causing excessive amounts of reactive H_2O_2 and artifacts. In cell culture studies, to prevent any undesirable results, the compatibility of antioxidant and medium should be considered and tested before the main study.

Keywords: β -carotene, Ready-to-use medium, Clone 9 hepatocyte cells, Artifact formation



Low Cost and Simple Method for Electric Generation By An Up-Flow Tubular Wetland Type Plant Microbial Fuel Cell (UTW-PMFC)

¹Anıl YAKAR, ¹Cengiz TÜRE, ²Onur Can TÜRKER, ¹Çağdaş SAZ,

¹ Faculty of Science, Department of Biology, Anadolu University, Eskişehir, TURKEY

²Faculty of Science and Letters, Department of Biology, Aksaray University, Aksaray, TURKEY

cagdassaz@gmail.com

Abstract

In this experiment, an up-flow tubular wetland type plant microbial fuel cell (UTW-PMFC) with *Typha latifolia* was tested in order to generate electricity for the first time in an eco-technological study. The highest bioelectric production was recorded as 1.19 V when solar radiation and outdoor temperature were highest values in the experiment period. The average output voltage output was also maximized and obtained as 0.772 ± 0.137 under the direct sunlight hours which between 12:00 and 15:00 during the experiment. Moreover, the highest power density was also measured as 3757 mWatt/m² with current density of 13.7 mA/m² by UTW-PMFC reactor. The results from the experiment indicated that increasing temperature and solar radiation led to maximizes the secretion of rhizodeposits into the reactor matrix which was resulted the generating voltage by electrogenic bacteria. The Pearson statistical analysis suggested that significant positive correlation between voltage output and outdoor temperature, solar radiation, and physicochemical parameters for water samples. On the other hand, we found that GR enzyme activity in *T. latifolia* played role on interaction of secretory signaling associated with secretion of roots exudes, and so a significant correlation was found between current generation and GR enzyme activity. However, we did not determine any significant relationships between soil enzymes including dehydrogenase, urease, phosphatase and current generation during the experiment, emphasizing that further experiments are needed.

Keywords: Plant microbial fuel cell, *Typha latifolia*, Enzyme activity, Wetland environment, Bioelectric production



Sucrose As A New Additive To Improve The Magnetic Cross-Linked Enzyme Aggregates (Cleas) Activities

¹Wesen Adel Mehdi, ¹Atheer Awad Mehde, ²Zeynep Ziyade Özcar, ³Nuray Güy,
^{1,3}Mahmut Özcar

¹ Biomedical, Magnetic and Semiconductor Materials Research Center (BIMAS-RC),
Sakarya University, 54187 Sakarya, Turkey.

² Department of Food Engineering, Faculty of Engineering, Sakarya University,
54187 Sakarya, Turkey.

³ Department of Chemistry, Faculty of Science & Arts, Sakarya University,
Sakarya, Turkey.

nurayg@sakarya.edu.tr

Abstract

Among enzyme immobilization techniques, the preparation of cross-linked enzyme aggregates (CLEAs) has shown promising results in biocatalysis, because they are simple and economic advantages in the industrial applications. The method involves the precipitation of enzymes with ammonium sulfate or an organic solvent and subsequent cross-linking between enzyme and the matrix using glutaraldehyde. The separation of enzymes from the bio-product medium is important step in the total process. The separation of enzymes from the bio-product medium constitutes a significant part of total process cost. Therefore, it is of crucial importance that the separation processes for enzymes be specially developed. In this study, the advantages of CLEAs and magnetite (Fe_3O_4) magnetic nanoparticles (MNPs) have been combined in magnetic CLEAs matrix. The MNPs were synthesized by coprecipitating Fe^{2+} and Fe^{3+} in alkaline solution. The MNPs were functionalized with tannic acid. After functionalization process, novel tannic acid magnetic cross-linked enzyme aggregates of peroxidase (TA-MNPs-CLEAs) were prepared by cross-linking of enzyme aggregates with sucrose as a new additive. The synthesized MNPs and CLEAs were characterized by XRD, SEM, VSM, FTIR. The TA-MNPs-CLEAs had significant enhancement on the storage stability, thermal stability, reusability. These improved properties of TA-MNPs-CLEAs could be an attractive feature towards more stable CLEAs preparation. The high cost of complex separation processes could be eliminated with TA-MNPs-CLEAs. The obtained results suggest that TA-MNPs-CLEAs-peroxidase can become a powerful biocatalyst for environmental biotechnology, wastewater treatment and different industry applications.

Keywords: Saccharides, magnetic cross-linked enzyme aggregates, *Candida Antarctica* lipase, peroxidase.



Identification of yeast samples and yeast biodiversity from *Arbutus unedo L.* berries

¹Sezai Türkel, ²Süeda Sarıca

¹Department of Molecular Biology and Genetics, Faculty of Arts and Sciences, Uludag University,
Bursa, Turkey

²Department of Molecular Biology and Genetics, Graduate School of Natural and Applied Sciences,
Uludag University, Bursa, Turkey

sturkel@uludag.edu.tr

Abstract

Arbutus unedo L. belongs to the *Ericaceae* family which grows mostly in the coastal regions of Mediterranean countries. It is also present in the certain localities in the Marmara and Black sea regions of Turkey. *A. unedo* fruits are very rich in sugars, fatty acids and phenolic compounds. *A. unedo* fruits are used to make jams, jellies, marmalades, alcoholic drinks, and also seldomly consumed as fresh fruits. In this study, we have investigated the yeast biodiversity in the fruits of *A. unedo*. Fruit samples were collected from the randomly selected 5 different *A. unedo* trees located in the nearby forests of Akçakoca city of Düzce province on October, 2016. Fruits were suspended without disruption in sterile serum physiologic, then 100 ml of samples were plated on YGC agar plates. After 48 hours of incubation, 150 yeast colonies were randomly selected for microbiological analyses. Yeast samples were analysed depending on their colony morphologies and growth features on different growth media. Species identifications of selected yeast isolates were done by sequencing of their 5.8S rRNA ITS and D1/D2 regions of large subunit rRNA gene. We have found that the most abundant yeast species in *A. unedo* fruits is *Metschnikowia pulcherrima*. Other yeast species, with descending frequencies that were identified in fruits are; *Hanseniaspora uvarum*, *M. fructicola*, *Pichia kluveri*, *P. membranifaciens*, *Aerobasidium pullulans*, *Kluyveromyces dobzhanskii*, and *Rhodotorula sp.* Enzyme activities of selected yeast samples were also analysed. The results indicate that *A. unedo* fruits are the rich resources for unconventional yeast species.

Keywords: *Arbutus unedo*, Biodiversity, ITS region, *Metschnikowia*, Yeast,



Apiaceae species used for medical purposes in Anatolia

¹Ayla Kaya, ¹Sıraç Topdemir

Anadolu University, Faculty of Pharmacy, Pharmaceutical Botany, 26470 Eskişehir-Turkey

srctpdmr@gmail.com

Abstract

The Apiaceae is a best-known family of flowering plants because of its characteristic inflorescences and fruits, and the diverse chemistry reflected odour, flavour and even toxicity of many of its members. Treatment with plants has been used since very early years. Despite the fact that our country has a very rich flora and cultural heritage, the number of scientific studies on the use of wild plants in the treatment, food and other purposes of the people in Anatolia is extremely low. In this study, 31 genera and 57 taxa of Apiaceae used for medical purposes in Anatolia were determined. The most commonly used genus of familya are found as *Anthriscus* (3 taxa), *Eryngium* (6 taxa), *Ferula* (7 taxa), *Heracleum* (3 taxa) and *Pimpinella* (3 taxa). The most commonly used taxa: *Anethum graveolens* L., *Coriandrum sativum* L., *Eryngium campestre* L. var. *virens* Link, *Foeniculum vulgare* Mill. and *Petroselinum crispum* (Miller) A.W. Hill.

Key words: Apiaceae, Ethnobotany, Medicinal herbs



Recovery of Phenolic Compounds from Wastes of Fruit-Vegetable Processing Industry with Ultrasound-Assisted Extraction Method

1Ayşe Gül Çamuroğlu, 1Sami Gökhan Özkal

¹Department of Food Engineering, Faculty of Engineering, Pamukkale University, Denizli, Turkey

adonmez142@pau.edu.tr

Abstract

The global population is increasing every year at an exponential rate. It is estimated that the world population will reach 34% more than the current population by 2050. It is becoming a problem to meet the food and energy needs of the society in the face of the increasing population. As a precaution against this problem, food and energy use should be made more efficient and waste should be avoided. Recycling of some of the compounds in food industry wastes with green technology may contribute to the solution of this problem. The waste of fruit-vegetable processing industries can be peel, seeds, stalks, pulps etc... Wastes of fruit-vegetable have been reported in many studies involving high phenolic compounds. Furthermore, research suggests that increased consumption of fruit and vegetables is associated with a reduction in major chronic disease risk. Phenolic compounds have been linked to disease prevention and cancer control, therefore being the focus of much research concerning their importance to human health. Different methods are used for extraction of plant compounds. Compared to traditional extraction methods, ultrasound-assisted extraction offers many advantages including shorter extraction time, less amount of solvent and higher extraction yields and it is included in green technology methods.

Recovery of phenolic compounds from waste of fruit-vegetable processing industry with ultrasound-assisted extraction is a study focused on contributing solution of increasing global population and decreasing food and energy sources problem. In this review the studies including the extraction of phenolic compounds from fruit-vegetable wastes by using ultrasound are summarized.

Keywords: Phenolic compounds, ultrasound-assisted extraction, waste, fruit-vegetable processing industry

Acknowledgement: This study was supported by Scientific Research Coordination Unit of Pamukkale University under the project number 2017FEBE021.



The Use of Bacterial Cellulose And Its Nanocomposites For Potential Industrial Applications

¹Taner Sar, ^{1,2}Meltem Yeşilçimen Akbaş

¹Department of Molecular Biology and Genetics, Faculty of Science, Gebze Technical University,
Gebze-Kocaeli Turkey

²Institute of Biotechnology, Gebze Technical University, Gebze-Kocaeli Turkey

akbasm@gtu.edu.tr

Abstract

Bacterial cellulose (BC) is a natural and inexpensive biopolymer produced by cellulose producing *Gluconacetobacter xylinus* strains. BC shows specific characteristics like high purity and water holding capacity and good mechanical strength. Therefore, BC is an attractive biomaterial for making nanocomposites with nanoparticles for biological applications, electrical practices and food industry. In this work, the culture conditions for nanocomposite productions by bacterial cellulose were investigated. For this, bacterial cellulose and its nanocomposites were produced at different incubation conditions. The obtained nanocomposites were further analysed for their characteristics (XRD, SEM, TGA and FTIR). The produced BC is stable up to 300 °C and has high water absorption capacity (more than 300%). The nanocomposite production was successfully achieved through nanoparticle inclusion into the fermentation media. It was shown that BC nanocomposites can be easily synthesized and this would provide more opportunities in its widespread utilization in industry as food packing materials for food industry or skin wound healing or tissue regeneration materials for biomedical applications, or as a conductor or anode materials for energy production and storage.

Key Words: Bacterial cellulose, nanocomposites, biomaterial, *G. xylinus*.



Toxicity Assessment of Machinery Industry Wastewater with *Lepidium sativum* and *Vibrio fischeri* Toxicity Test Methods

¹Çağla Uygun, ¹Gamze Tunca, ²Ceren Tiftikci, ²Cansu Filik Iscen

¹Eskişehir Osmangazi University, Graduate School of Sciences, Eskişehir/Turkey

²Eskişehir Osmangazi University, Faculty of Education, Department of Mathematics and Science Education, 26480, Eskisehir/Turkey,

caglauygun26@gmail.com

Abstract

Rapid industrial development and urbanization result in social, economic and environmental problems. Water resources and the resources required for living are adversely affected by industrialization and urbanization. Environmental problems arise from the contamination of this weld after industrial activities. In this study, the toxicity of the machinery industry wastewater, which has a large share in the industry, which is related to health and environmental pollution problems, has been determined by two different methods. The most frequently used bioassay in environmental risk assessments is the toxicity test methods. Machine industry wastewater can cause both toxic effects in prokaryotic cells as well as in eukaryotic cells. For this reason, in this study, the toxicity of the industrial wastewater was assessed using *Vibrio fischeri* and *Lepidium sativum* toxicity test methods. In the *Vibrio fischeri* toxicity test, the toxicity level was measured with a microtox analyzer (Microtox® Model 500 analyser). In the *Lepidium sativum* toxicity test, root and stem lengths were measured at different concentrations. EC50 values were determined as the result of these two toxicity test methods. As a result, the toxicity levels were increased as the concentration samples increased.

Keywords: Toxicity, *Lepidium Sativum*, *Vibrio fischeri*, Machinery Industry Wastewater



Examination of Resveratrol's Neuroprotective Effects on Brain Cortex and Hippocampal Tissue of Rats Exposed Unpredictable Chronic Mild Stress (UCMS) Model

^{1,2}Gülçin Gacar, ^{1,2,5}Zehra Seda Halbutoğulları, ¹Kamil Can Kılıç, ¹Ayşenur Kaya, ³Tijen Utkan,
^{1,2,4}Yusufhan Yazır

¹Department of Stem Cell, Institute of Health Sciences, Kocaeli University, Kocaeli, Turkey

²Center for Stem Cell and Gene Therapies Research and Practice, Kocaeli University, Turkey

³Department of Pharmacology, Faculty of Medicine, Kocaeli University, Kocaeli, Turkey

⁴Department of Histology and Embryology, Faculty of Medicine, Kocaeli University, Turkey

⁵Department of Medical Biology, Faculty of Medicine, Kocaeli University, Kocaeli, Turkey

gulcingacar@gmail.com

Abstract

It has been demonstrated that chronic or acute physiological stress can lead to neurogenic diseases regarding with neuroinflammation. Resveratrol (trans-3,5,4-trihydroxystilbene) is a significant molecule for prevention from neuroinflammation and providing neuroprotection. In our investigation, experimental groups were divided into four (n=6 per group); control group which is not applied UCMS or resveratrol, stress group which is applied only UCMS and not resveratrol, resveratrol group which is applied resveratrol (20 mg.kg^{-1} per day, i.p., pending 12 weeks) and stress+resveratrol group which is applied both UCMS and resveratrol. After the 12 weeks duration of UCMS, cortex and hippocampus samples of brain were obtained from rats under general anesthesia and alteration in associated brain tissue and total body weight of animal were examined. In order for investigation of detrimental influence of UCMS on neural cortex and hippocampus tissue, we evaluated the level of inflammation inducing cytokines with ELISA. The expression profile of TNF α , IL1 β , IL6, CRP, MCP-1, nNOS, eNOS genes in cortex and hippocampus were analyzed by RT-PCR. The effects of resveratrol on stressed animals for locomotor activity, learning and memory and depression situation were examined. Statistical analyzes were performed. UCMS led to cognitive, learning and memory impairments and neuroinflammation in stressed animals. According to our findings, we designated that the decline in cognitive and hippocampal functions was rescued with chronic resveratrol treatment and considered that resveratrol was a remedial agent to attenuate the stress-related effects on brain tissue.

Key Words: Resveratrol, Stress, neuroinflammation, Cortex, Hippocampus



Determination of Toxicity in Synthetic Textile Wastewater by *Lepidium sativum* and *Vibrio fischeri* Toxicity Test Method

¹Gamze Tunca, ¹Çağla Uygun, ²Cansu Filik Iscen

¹Eskişehir Osmangazi University, Graduate School of Sciences, Eskişehir/Turkey

²Eskişehir Osmangazi University, Faculty of Education, Department of Mathematics and Science Education, Eskişehir/Turkey,

gamzetuncaa@gmail.com

Abstract

The textile industry is the sector that has the most harmful effects on the environment and human health, where the chemicals are the most used and leave a lot of waste to the environment. In this study toxicity was determined by two different toxicity tests of a dye present in textile wastewaters which causes health and environmental pollution problems. Toxicity testing is a useful bio-analysis that is often used in environmental risk assessment. Textile dyes can cause toxic effects. For this reason, in this study, it was aimed to find the toxicity of textile dye Burazol Navy ED. *Vibrio fischeri* and *Lepidium sativum* toxicity test methods were used to evaluate the toxic effect. In the *Lepidium sativum* toxicity test method, different concentrations toxicity test samples of root and hypokotyl lengths were measured. *Vibrio fischeri* toxicity test method was measured with a microtox analyzer (Microtox® Model 500 analyser). EC50 values were determined. As a result, as samples of concentration increases, toxicity level is increased.

Keywords: Burazol Navy ED, Toxicity, *Lepidium Sativum*, *Vibrio fischeri*



Efficient Techniques for the Removal of Toxic Heavy Metals from Environment

¹Semra Malkoç

Anadolu University, Applied Research Centre for Environmental Problems, Eskisehir, Turkey.

satik@anadolu.edu.tr

Abstract

The environmental pollution threatening the ecosystem and human life has been tried to be emphasized in recent years in terms of metal pollution. Because of this toxic heavy metals cause serious health problems, it is a source of concern in the environment. In this review, the use of different biological materials and the precaution were evaluated from the methods used to remove metal pollution. In addition to the current methods used in heavy metal removal, it is appropriate to provide information on the methods applied to important biomaterials in laboratory studies.

Keywords: Heavy metals, Environment, Treatment technologies



Determination of Suitable Cryopreservative Conditions for Decellularized Kidney

¹**Ahmet Öztürk**, ¹**Kamil Can Kılıç**, ^{1,2}**Gökhan Duruksu**, ^{Z.} ^{1,2,4}**Seda Halbutoğulları**,
^{1,2,3}**Yusufhan Yazır**

¹ Department of Stem Cell, Institute of Health Sciences, Kocaeli University, Kocaeli, Turkey

² Center for Stem Cell and Gene Therapies Research and Practice, Kocaeli University, Turkey

³ Department of Histology and Embryology, Faculty of Medicine, Kocaeli University, Turkey

⁴ Department of Medical Biology, Faculty of Medicine, Kocaeli University, Turkey

ahmet.ozturk@kocaeli.edu.tr

Abstract

Renal diseases are important diseases waiting to be cured, seriously reducing life quality, sometimes result in morbidity. Although organ transplantation is the most important hope for patients, researchers tend to research alternative treatments because of lower organ donation and obligation for immunosuppressive drug usage. In recent years, tissue engineering studies in progress have important potential to address these problems. Decellularization techniques based on removal of cells from organs and storage of natural decellularized matrix will take significant position for production of tissue and organ using patients' individual cells. Purpose of our study is to determine appropriate and less material-needed cryogenic methods for decellularized renal scaffold. For this purpose, cells of rat kidneys were removed using Triton X-100 and SDS detergents to obtain 3D scaffolds. PCR was performed to evaluate efficiency of decellularization and to show that no DNA remained after detergent treatment. Decellularized kidney scaffolds were cryopreserved in different cryogenic environments containing medium, medium+serum and medium+serum+DMSO. After cryopreservation, decellularized scaffolds were thawed to examine matrix's integrity as immunofluorescence. Scaffolds were recellularized with mesenchymal stem cells for evaluation effect of freezing on matrix's functionality. PCR analysis to determine amount of DNA showed that kidney was efficiently decellularized. Immunofluorescence staining of collagen1a1 and fibronectin indicated preservation of matrix's integrity. WST-1 cell viability assays utilized for examination effect of cryopreservation conditions on matrix results in lower recellularization. Although scaffolds frozen with medium+serum provide better cell viability than other groups, it is needed to investigate more detailed cryogenic environments for cryopreservation of renal scaffolds.

Keywords: Tissue Engineering, Decellularization, Cryoprotection, Scaffold, Kidney



Transcriptomic Analysis of *Yarrowia lipolytica* *YlNTH1* and *YlTPS1* Genes Under Different Carbon Sources

¹Tülay Turgut Genc, ²Burak Servili

¹Department of Biology, Faculty of Arts and Science, Çanakkale Onsekiz Mart University, Turkey

²Graduate School of Bioinformatics and Genetics, Kadir Has University, İstanbul, Turkey

tturgutgenc@comu.edu.tr

Abstract

The biosynthesis of trehalose is catalyzed by synthase enzyme complex and degraded by neutral trehalase enzyme. *Yarrowia lipolytica* is a dimorphic yeast that can shift from yeast to hyphal form and vice versa. *Y. lipolytica* is also used as a model organism for understanding of lipid metabolism in higher eukaryotes. *YlTPS1* and *YlNTH1* genes are responsible from the recycling of threhalose in *Y. lipolytica*. The aim of this work is to determine the expression patterns of *YlTPS1* and *YlNTH1* genes under different carbon sources by using RNAseq study. The files used in this analysis were obtained from the EMBL-EBI data bank and Study ID is “PRJEB2863”. The substrates used in the work are Alkane, Glucose, Glycerol, Oleic Acid, Tributyrin and Triolein. The run accession numbers of substrates are ERR073010, ERR073011, ERR073009, ERR073008, ERR073012 and ERR073007, respectively. “Trimmomatic” tool was used for cropping the readings in the next generation sequencing files. Reference genome of *Y. lipolytica* were obtained from Ensembl genome data base. The files were converted to “ERR0730xx_tophat2.bam” files and used in the “FeatureCounts” tool. We found that 176, 185, 155, 306, 141 and 158 read counts were detected for *YlNTH1* gene, and 360, 479, 480, 557, 559 and 525 read counts detected for *YlTPS1* gene in alkane, glucose, glycerol, oleic acid, tributyrin and triolein carbon sources, respectively. The transcript level *YlTPS1* gene was 2 to 4 times higher than *YlNTH1* gene. In *Y. lipolytica* the rate of trehalose synthesis is greater than rate of breakdown in different carbon sources.

Keywords: *YlTPS1*, *YlNTH1*, RNAseq, *Yarrowia lipolytica*



Investigation of Effects Combined Treatment with Caffeic Acid Phenethyl Ester and Propranolol on MDA-MB-231 Breast Cancer Cell Line

1Melike Bugul, 1Esin Guvenir Celik, 1Hacer Kaya, 1Elif Korkut, 2Onur Eroglu

¹Bilecik Şeyh Edebali University, Faculty of Science and Letters, Department of Molecular Biology and Genetics, Bilecik/Turkey

²Bilecik Seyh Edebali University, Biotechnology Research and Application Center, Bilecik/Turkey

melikebugul@gmail.com

Abstract

Caffeic acid phenethyl ester (CAPE) is one of the active components of propolis with anti-cancer effects. Propranolol has been shown to be a protective effect in the development of cancer due to its antiangiogenesis and β -adrenergic receptor suppression. Recently, drug combination studies have been widely used in the treatment of many fetal diseases such as cancer. Combined treatment can prefer both benefit and reduce side effects of patient. The aim of this study is to find the migration analysis of MDA-MB-231 breast cancer cell line with combined treatment of CAPE and Propranolol. In this study cell viability was measured by MTT assay. For Wound healing, the MDA-MB-231 cell line was cultured to be 10^5 cells in 100 μ L in a 6-well culture plate. After 90% confluence, we applied 30 μ M CAPE, 150 μ M Propranolol and combined treatment at 15 μ M CAPE and 75 μ M Propranolol. We observed width of scar 0, 24, 48 and 72 hours with inverted microscope. When the data about wound closure rates were evaluated, it was observed that combined therapy inhibited migration of cancer cells compared to untreated cells and singly therapy.

Keywords: *Breast Cancer, CAPE, Propranolol, Wound Healing*



Isolation of Hemolytic Group Streptococci and Determination of Their Antibiotic Sensitivity

1Mehzat Altun, 2Binnur Meriçli Yapıcı

¹Department of Biology, Faculty of Science, Çanakkale Onsekiz Mart University, Çanakkale, Turkey

mehzataltun@yahoo.com

Abstract

In this study, antibiotic susceptibility profiles of α , β , and γ haemolytic streptococci were examined. Twenty-five throat culture samples taken from acute tonsillopharyngitis patients who were admitted to Çanakkale Onsekiz Mart University Research Hospital with the complaint of sore throat were used in the research. Samples were inoculated in 5% sheep blood agar and divided into three groups according to their haemolytic properties as α , β and γ . In the study, fifteen β , five α and five γ haemolytic streptococcus were tested whether or not susceptibility to seven different antibiotics by disk diffusion method. Antibiotics used in the study were selected on the basis of literature information. According to the results of the research, it was observed that most of the β and α haemolytic group bacteria were resistant to Penicillin G, Vancomycin, Clindamycin and Amoxillin antibiotics and only two bacteria in γ haemolytic group were resistant to the same antibiotics. Almost all of the three groups of bacteria used in the study were found to be susceptible to Chloramphenicol, Ampicillin and Tetracycline antibiotics. It is planned to continue the investigation by increase the number of samples and applying phenotypic and genotypic tests to bacteria.

Keywords: Haemolytic bacteria, Streptococcus, Antibiotic, Resistance, Tonsilopharyngitis



Determination of Benzoic Acid in Cranberry (*Vaccinium macrocarpon* Ait) by HPLC with Using Different Extraction Methods

¹Busra Nagihan Ozturk, ²Serap Ayaz Seyhan, ²Dilek Bilgic Alkaya

¹Marmara University Institute of Health Sciences, İstanbul

²Marmara University Faculty of Pharmacy Department of Analytical Chemistry, İstanbul

busra.n.ozturk@hotmail.com

Abstract

The cultivated cranberry, *Vaccinium macrocarpon* Ait., is a member of the *Ericaceae* family, evergreen, creeping shrubs native to cool temperate, acidic soils and peat wetlands of the northeastern US and southern Canada. Cranberry contains high levels of phytochemicals which have health promoting properties. Organic acids such as quinic, citric and malic acids, and small amounts of benzoic and glucuronic acids are important components in cranberry fruits and contribute to their characteristic flavor. Benzoic acid (C_6H_5COOH) is widely used in the food industry as a preservative in acid foods, under code number E210, owing to its antimicrobial activity against various bacteria, yeasts and fungi involved in food poisoning and food spoilage. It is a safe preservative used to protect taste, odor, appearance, structure of food during storage, preparation, packaging, transport and storage of food. Benzoic acid can be obtained synthetically or it can be obtained naturally from some foods such as fruits, vegetables, spices, nuts, milk and dairy products. However, their excessive use could lead to metabolic acidosis, convulsions, and hyperpnoea in humans. In this study, it was aimed to obtain natural benzoic acid at the highest level in cranberry (*Vaccinium macrocarpon* Ait) by trying different extraction methods such as ultrasonic extraction, orbital shaker at different durations. Chromatographic conditions; mobile phase: 0.1 M acetate buffer/ MeOH. Column: Kromasil C18 (5 μ m, 4.6 \times 250 mm i.d.), Column Temperature: 25 °C, Detector: DAD, Wavelength λ : 230 nm, Flow Rate: 1 mL/min., Injection Volume: 20 μ L. Results of ultrasonic extraction by using methanol: water (70:30) solution; 5th, 15th, and 30th minutes, respectively, as 7.4 ppm, 30.8 ppm, and 19.6 ppm. Results of extraction with orbital shaker; 30th, 60th and 120th minutes, respectively, as 23.0 ppm, 27.6 ppm and 28.1 ppm. According to this study 15 minutes of ultrasonic extraction gave better results than the 2 hour of orbital shaker and it showed that benzoic acid's structure was damaged by over 15 minutes of ultrasonic extraction.

Keywords: Benzoic acid, Crannberry (*Vaccinium macrocarpon* Ait), Extraction, HPLC, Determination



Ecological and Evolutionary Perspective on Cancer Biology

¹Muge Gidis, ²Cansu Ozbayer

Dumlupınar University, School of Health Sciences, Kutahya, Turkey

c.ozbayer@gmail.com

Abstract

Cancer is an evolutionary disease and this is not a new approach. Species life seem to be perfectly coordinated in a stable ecosystem but if one species escapes from ecological constraints and multiplies rapidly, the balance triggers the disappearance of other species. And this ecological process in medicine is known as cancer. Ecology investigate the dynamics of species and their interactions therewithal examples of many different ecological interactions can be found in neoplasms. If neoplasms internally conditioned they are called as spontaneous, but if they are externally conditioned known as induced. Neoplasms are an ecosystem of cells competing and cooperating with each other and with other cells in the microenvironment, and this has important implications for both neoplastic progression and therapy. Most of the genetic and epigenetic changes in neoplasms are evolutionarily neutral. And also, large numbers of neutral hitchhiker mutations might be carried to fixation by mutations which are adaptive. Tumors of the same organ and of the same cell type may have quite different properties in different patients. In addition, even a single type of tumor may have different variations. Genetic heterogeneity in tumors is typically thought to originate from random mutations. Selection of genes at different levels can cause hereditary damage in the mechanism of tumor suppression and the genome of cells and organisms can exposed to oncogenesis. However, as in all living systems, the evolution of tumors is linked to Darwinist principles. This indicates that Darwinian dynamics at the distant site play a fundamentally important role in the metastatic cascade. To understand cancer, we must understand the population dynamics and evolutionary parameters of neoplasms. Understanding evolutionary dynamics are important in cell-level evolution within neoplasms. Applying evolutionary and ecological approaches to the problem of therapeutic resistance will help to understand the behavior of cancer cells. Evolutionary biology must be an integral part of the education of cancer biologists and oncologists. The application of evolutionary biology and ecology to cancer will help to better understand the cancer pathway, predict and control cancer.

Keywords: Ecology, Evolution, Cancer Biology, Neoplasm.



Elevated Serum Level of Inducible Nitric Oxide Synthase in Patients with Lung Cancer

¹Emine Yagci, ²Cansu Ozbayer, ¹Hulyam Kurt, ³Guntulu Ak, ⁴Selma Metintas,
³Muzaffer Metintas

¹Eskisehir Osmangazi University, Medical Faculty, Department of Medical Biology, Eskisehir, Turkey, ²Dumlupinar University, School of Health Sciences, Kutahya, Turkey, ³Eskisehir Osmangazi University, Medical Faculty, Department of Pulmonary Diseases, Eskisehir, Turkey, ⁴Eskisehir Osmangazi University, Medical Faculty, Department of Public Health, Eskisehir, Turkey

hkurtayda@gmail.com

Abstract

Lung cancer is a malignant lung tumor characterized by uncontrolled cell growth in lung tissues. The most important cause of the disease is tobacco smoke, asbestos exposure and genetic factors. In 1863, Virchow established a link between inflammation and cancer, and suggesting that the origin of cancer is chronic inflammatory sites. Today, we know that inflammation is a powerful force in cancer development, helping tumor growth and spreading to the body. A major mediator of inflammation is inducible nitric oxide synthase (iNOS) that synthesizes nitric oxide from L-arginine. While the expression of iNOS in many tumors is high, the role of iNOS in tumor progression is very complex and quite surprising, both promoter and inhibitory effects have been described. In the present study, we aimed to determine the relationship between serum levels of iNOS and lung cancer. The serum concentrations of iNOS were determined using sandwich ELISA method in 90 of lung cancer patients (36 of squamous cell carcinoma, 18 of small cell carcinoma and 36 of adenocarcinoma) and 90 of healthy control individuals. Statistical analysis was performed with IBM SPSS Statistics package software. As a result of study, the serum concentration of iNOS was found to be significantly increased in lung cancer patients when compared to control individuals ($p<0.001$). But there was no statistical significant difference among histological subtypes in cancer patients ($p>0.05$). In a conclusion, we found a significant relation between increased plasma levels of iNOS with lung cancer.

Key words: iNOS, Elisa, Inflammation, Lung Cancer



Comparative Study of Free and Immobilized Polyphenol Oxidase

¹**Nurten Aslan**, ¹**Reyhan Gul Guven**, ²**Fatma Matpan Bekler**, ³**Kemal Guven**

¹ Dicle University, Education Faculty, Department of Mathematics and Science Education
Diyarbakir, Turkey

² Dicle University, Science Faculty, Biology Department, Diyarbakir, Turkey

³ Dicle University, Science Faculty, Molecular Biology and Genetics Department,
Diyarbakir, Turkey

rgguven@dicle.edu.tr

Abstract

In this study, polyphenol oxidase (PPO) from corn tassel was extracted and partially purified through $(\text{NH}_4)_2\text{SO}_4$ precipitation, dialysis, ultrafiltration and gel filtration chromatography. The isolated PPO was then immobilized into gelatin by chemical cross linking with gluteraldehyde. In order to examine the PPO activity, the oxygen electrode was utilised. Some parameters such as optimum pH, temperature and most suitable substrate for the immobilized enzyme were determined and compared with those of partially purified free enzyme. Optimum pH for the free and immobilised enzyme was found as 8.0 and 7.0, respectively while optimum temperature was determined as 40°C for both free and crosslinked PPO from corn tassel. Catechol was the most suitable substrate for free and immobilized enzyme. Sodium azide and SDS were found to inhibit the enzyme activity.

Keywords: Corn tassel, polyphenol oxidase, free and immobilized enzyme, comparison.



Protective Effect of Carvacrol Against Oxidative Stress Injury in Rats Following Renal Ischemia/Reperfusion

¹Ozlem Gunduz, ¹Mediha Canbek, ¹Emre Ceyhan, ¹Mustafa Uyanoglu, ¹Hakan Senturk, ²Gokhan Bayramoglu, ³Gungor Kanbak, ³Kazim Kartkaya, ³Aysegul Oglakci, ¹Ayşe Ozmen Yaylaci ¹

¹ Department of Biology, Faculty of Science, Eskisehir Osmangazi University, Eskisehir, Turkey

² Department of Biology, Faculty of Science, Artvin Çoruh University, Artvin, Turkey

³ Department of Biochemistry, Faculty of Medicine Osmangazi University, Eskisehir, Turkey

ozmen@ogu.edu.tr

Abstract

The possible protective effects of carvacrol in experimental renal ischemia/reperfusion (I/R) injury in rats were investigated in this study. This study, possible protective effect of carvacrol, whose anti-oxidant function against oxidative stress injury during renal I/R is known. A total of 35 male *Sprague dawley* rats were divided into 5 groups by randomized selection (n=7). Five groups were designed as Group I (Control), Group II (I/R+saline solution), Group III (I/R+olive oil), Group IV (I/R+olive oil+25 mg/kg carvacrol) and Group V (I/R+ olive oil +50 mg/kg carvacrol). Right nephrectomies were performed under xylazine (10 mg/kg) and ketamine (70 mg/kg) anaesthesia in all rat groups except for Group I. Saline, olive oil and carvacrol were given with gavage in Group II, III, IV and V rats every day during a week and then, 45 minutes of Ischemia and 24 hours of Reperfusion were applied to these rat groups. At the end of the experiment, blood samples and kidney tissues were immediately taken from rats belonging to all of the groups. Urea nitrogen, creatinine, malondialdehyde, and myeloperoxidase enzyme activity were increased. As for the kidney tissue, Superoxide dismutase, Catalase, Glutathione peroxidase isoenzyme activity were increased compared to Group I. Histopathologically, expansion in the structure between the tubules and cell fragments were determined to be in glomeruli in the Group II. Histopathological and biochemical changes in Group V show that I/R injuries were prevented. The results of this study have demonstrated that carvacrol (50 mg/kg per os) prevents renal I/R injury.

Keywords: Renal ischemia/reperfusion, Antioxidant, Carvacrol, Kidney, Reactive oxygen species



How is Bisphenol an Effects on Endometrial Cancer

¹Hulyam Kurt, ¹H. Melike Ozturk, ²Cansu Ozbayar, ¹Emine Yagci

¹Eskisehir Osmangazi University, Medical Faculty, Department of Medical Biology, Eskisehir, Turkey,
²Dumlupinar University, School of Health Sciences, Kutahya, Turkey,

hmelikeozturk@gmail.com

Abstract

Bisphenol A [2,2-bis (4-hydroxyphenyl) propane (BPA); BPA is an estrogen mimetic industrial compound, and today it is a chemical that plays an active role especially in the production of materials such as plastic, polyester and PVC. BPA goes to the food it touches and this passing work increases with temperature. Toxicology studies have shown that the maximum dose for BPA is 1000 mg / kg body weight (BW). It recommends a value of 50 mg / kg / day at the appropriate level to be used for risk assessment of human exposure. People are exposed to BPA a lot. It has been shown that female gonad, especially ovarian steroidogenesis, folliculogenesis and impairment in its interaction with over morphology, is caused by BPA. BPA has been shown to mimic the activities of endogenous chemicals synthesized by the endocrine system. Thus, besides many organs, it especially affects the urinary system and thyroid glands. BPA acts as a strong synthetic estrogen, diethylstilbestrol (DES), and it is known that prenatal exposure causes genital anomalies and carcinomas in the uterus. Endometrium cancer is the cancer of the uterine inner membrane called the endometrium. Almost all endometrium cancers are composed of cells that secrete endometrium, which is called endometrium adenocarcinoma. In 1983, Bockhman et al., distinguished two groups, type 1 and type 2, based on the molecular characteristics of endometrial cancers. In particular, Type 1 represents 80% of endometrium cancers that are caused by increased estrogen. Typically, it has a good prognosis. Depending on the hormonal factors, these carcinomas have been shown to cause cancer by binding BPA to estrogen receptor alpha (ER α) and regulating ER target genes and impairing normal endocrine signaling. Determination of the basic molecular mechanisms of cancer biogenesis and cancer, accelerating early prognosis and diagnosis is of great importance for the prevention and treatment of cancer, which is one of the most important diseases of our age. Therefore, determination of BPA serum level and disease association in endometrium cancer due to products containing BPA is important in early prognosis and treatment of the disease.

Keywords: Bisphenol A, Endometrium cancer, estrogen



Exosomes in Cancer: Smart Munchkins

¹Hulyam Kurt, ¹Emine Yagci, ²Cansu Ozbayer

¹Eskisehir Osmangazi University, Medical Faculty, Department of Medical Biology,
Eskisehir, Turkey,

²Dumlupinar University, School of Health Sciences, Kutahya, Turkey

eminetsci@gmail.com

Abstract

Exosomes; are bioactive receptors which is indirectly originating from the cell membrane. The dimensions vary between 50-140 nm. The most important features distinguishing exosomes from other extracellular vesicles (microvesicles and apoptotic bodies) are their unique biogenesis pathways, lipid compositions, and RNA cargos (mRNA, miRNA, lncRNA) they carry. Exosomes that play a role in cell-cell interaction by virtue of their RNA content can alter the transcriptome and function of the cell with the RNA strands they carry when transferred to the recipient cell. It has also been identified that they carry nucleic acids (DNA, RNA), proteins, nucleoproteins and various enzymes for use in signal transduction. Exosomes are also secreted by cancer cells and tumor-associated stromal cells as they are secreted from healthy cells under physiological conditions. Through exosomes, autocrine, paracrine and endocrine communication are established between cancer cells. Although exosomal oscillation is a normal process, the increase in rate and exosomal mediated transfer of different cargos (oncogenic signals) may mediate oncogenic progression and metastasis. The increase in exosomal quantities and altered cargo expression can be considered as a powerful biomarker for altering normal physiological conditions and can be used to diagnose cancer and many other diseases. Exosomes can be obtained by ultracentrifugation from body fluids such as blood, plasma, cerebrospinal fluid, bile, breast milk, amniotic fluid, saliva, urine and can be evaluated for molecular components such as DNA, RNA, miRNA and proteins. In addition, as they are derived from the plasma membrane, they are inherently liposomal and nano-sized and can easily move through the blood brain barrier, due to their protein-lipid content in their membranes. As a result, exosomes are smart munchkins carrying cargo between cells and have the ability to convert healthy cells to carcinoma according to the load they carry. They can also be obtained from whole body fluids and can be used for targeted treatment with their ability to enter the cells easily and to carry them in circulation.

Keywords: Exosome, cancer, miRNA, transcriptome.

Synthesis, characterization and cytotoxic activity of the novel (E)-2-((4-(dimethylamino) benzylidene) amino)-5-methylphenol

¹Halil Berber, ¹Ulku Dilek Uysal, ²Oğuzhan Karaosmanoğlu,
¹Ayşe Aydoğdu, ²Hülya Sivas

¹ Department of Chemistry, Science Faculty, Anadolu University, Eskisehir, Turkey

² Department of Biology, Science Faculty, Anadolu University, Eskisehir, Turkey

oguzhankaraosmanoglu@windowslive.com

Abstract

Schiff bases are formed by the condensation of an active carbonyl group with primary amine or N-substituted imine containing an imino group (R-C=N-). Schiff bases derived from aromatic o-hydroxyaldehydes have received attention due to their biological properties including antifungal, antibacterial, antimarial, antiproliferative, anti-inflammatory, antiviral, antipyretic, and herbicide properties and their anti-tumor activity [1-3]. In this study, a new Schiff base, (E)-2-((4-(dimethylamino) benzylidene) amino)-5-methylphenol (7S4), was synthesized. Its structure has been elucidated by ¹H-NMR, ¹³C-NMR, IR and elemental analysis spectroscopy methods (Figure). The cytotoxic activity of the molecule has been tested by using the neutral red uptake assay against two normal and five cancerous cell lines. Cells have been exposed a serial dilutions of the compound for 72 h. After addition of neutral red, absorbance values have been measured at 540 nm and the percentage of cell viability has been evaluated. IC50 values of the molecule has been found to be more than 30 µg/ml for all cell types.

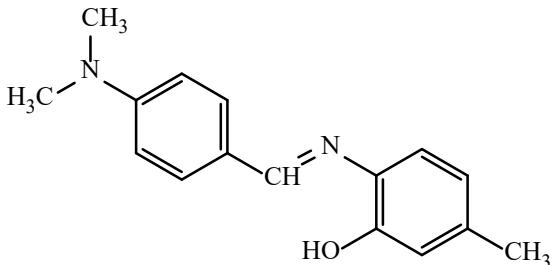


Figure. (E)-2-((4-(dimethylamino)benzylidene)amino)-5-methylphenol (7S4).

Keywords: Cytotoxic activity, Schiff base, (E)-2-((4-(dimethylamino)benzylidene)amino)-5-methylphenol



The use of different chromatographic methods for determination of bioactive compounds in the waste of fruit processing industry

¹Cansel Albayrak, ¹Merve Balaban, ¹Taner Sar, ¹Meltem Yesilcimen Akbas

¹Department of Molecular Biology and Genetics, Faculty of Science, Gebze Technical University,
Gebze-Kocaeli Turkey

akbasm@gtu.edu.tr

Abstract

In the fruit processing industry high amount of wastes are generated. It causes pollution problem if not utilized or disposed-off properly. Thus, the use of these by-products for the production of bioactive metabolites have gained increasing interest because these compounds are high-value products and their recovery may be economically attractive. In this study, the bioactive compounds found in the fruit processing waste was isolated and characterized by use of different thin layer chromatographic methods. The results obtained from this study showed that TLC could be a valuable tool for differentiation and identification of bioactive compounds from the fruit industry wastes.

Keywords: fruit waste, extraction, chromatography, bioactive compounds



A New Myxomycetes Record from Turkey

1Hayri Baba, 1Yücel Doğan

**¹Department of Biology, Faculty of Arts and Sciences, Mustafa Kemal University,
31040, Antakya-Hatay, Turkey,**

hayribaba_68@hotmail.com

Abstract

The myxomycetes are eukaryotic microorganisms that occur wherever conditions on the earth's surface permit the growth of vegetation but are especially common in terrestrial forest areas. In this study *Didymium tussilaginis* (Berk. & Broome) Massee was grown with the moist chamber culture in laboratory at Batiayaz, Hatay. Sporocarps irregularly rounded, rarely oblong plasmodiocarps, light grey, often conspicuously flat, sessile on a broad base, 0.2-0.4 mm tall, 0.4-1.5 (-2.5) mm wide, scattered or in loose groups, sometimes growing in groups of 5-25 sporocarps; Stalk absent; Columella inconspicuous, but mostly appearing as a clearly distinct, thin, chalky base, white, dirty white to beige, slightly shiny, sometimes with humplike outgrowths or short ridge-like elevations; Peridium simple, membranous, under the magnifying glass mostly with metallic, sometimes light blue iridescence, under transmitted light almost translucent, very pale brown or pale yellow, usually only sparsely covered with calcareous scales, these fine crystalline or mostly amorphous with irregular, angular shape, 5-20 (-32) μm in size; Capillitium whitish under the lens, almost colorless in transmitted light or pale brown, rarely darker brown, irregularly branched or sometimes reticulate, often with small inclusions of crystalline or amorphous calcium, 0.6-3 (-5) μm in diameter, somewhat elastic, mostly smooth, some threads with darker swellings; Spores free, in mass dark brown, by transmitted light pale brown to violaceous brown, with a wall of uniform thickness, without obviously lighter germination pore, densely and irregular spinulose, occasionally with \pm conspicuous groups of slightly darker spines, spores spherical, (11-) 12-13 (-15) μm .

Keywords: *Didymium tussilaginis*, Myxomycetes, new record, Turkey



Antioxidant Activity of *Russula delica* Mushroom and Its Modulatory Effect on Glutathione Peroxidase Enzyme

¹Naznoosh Shomali, ¹Okan Onar, ¹Ilgaz Akata, ¹Ozlem Yildirim

¹Department of Biology, Faculty of Science, Ankara University, Ankara, Turkey

okanonar@gmail.com

Abstract

Edible mushrooms show an ideal food nature due to their low sugar and oil content, nutritional value and especially because of being good diet products. Nowadays there is a growing interest in new drugs against secondary metabolites derived from fungi and for the discovery of precursor compounds. These bioactive components are becoming popular sources of natural antioxidant, antitumor, and immunomodulatory agents. In this study, we investigated the ethanolic extract of an edible mushroom *Russula delica* to find a new bioactive agent with antioxidant activity. *R. delica* mushroom was obtained from the local bazaar of the Black Sea region and analyzed for the phenolic and flavonoid compound content. The total antioxidant capacity of the extract was determined by DPPH method. Also, its effect on the glutathione peroxidase (GPx) enzyme activity which plays important role in cellular oxidative defense was examined by the kinetic assay. According to the results, total phenolic and flavonoid content of the ethanolic extract of *R. delica* was determined as 3.960 ± 0.0021 mg GAE/g and 1.171 ± 0.0048 mg QE/g values, respectively. The half-maximal inhibitory concentration for DPPH radical scavenging capacity of the extract was determined as 1.756 ± 0.0002 mg/mL. Also, glutathione peroxidase enzyme activity was effectively activated as 36% at the 10 mg/ml extract concentration. The results indicate that *R. delica* has high antioxidant potential and ability to activate GPx enzyme. Therefore, *R. delica* can be considered as a functional food for the detoxification and antioxidant defense system.

Keywords: *R. delica*, Edible mushrooms, Antioxidants, Detoxification system

Acknowledgements: This study was supported by the Grant (116Z125) from The Scientific and Technological Research Council of Turkey (TÜBİTAK).



Biodiversity of Algae in Some Hot and Mineralized Waters in the Northeast of Elazığ

¹Vesil Yıldırım, ²M. Yunus Emre, ³A. Kadri Çetin

¹ Fırat University Faculty of Science Department of Biology

²Mardin Artuklu University Health Care Vocational School

³ Fırat University Faculty of Science Department of Biology

y_emre85@hotmail.com

Abstract

In this study, algal flora of some hot and mineralized waters were investigated together with physicochemical properties. During the study algal flora consist of 68 taxa belonging to Cyanophyta (28), Bacillariophyta (35) Chlorophyta (5) were identified. Temperature, pH, and electrical conductivity were analysed. The temperature, pH, and electrical conductivity of thermal waters are in the ranges of 20 to 44.5 °C, 6.06 to 6.48 and 1020 to 4953 µS/cm, respectively. The dominant genus of blue green algae were *Spirulina*, *Phormidium* and *Oscillatoria*. Which were found at the temperature 30-45 °C. The dominant genus of diatoms were *Epithemia* and *Rhopalodi*.

Keywords: Algae, Hot springs, Thermal stream, Biodiversity



Changes in Some miRNA Levels of Rats in Different Environments within 7 Days and 14 Days of Experimental Subarachnoid Hemorrhage

¹**Fulya Buge Ergen**, ^{2,1}**Didem Turgut Cosan**, ³**Turan Kandemir**, ⁴**Fezan Mutlu**,
^{3,1}**Tevfik Erhan Cosan**

¹Department of Interdisciplinary Neuroscience, Health Science Institute,
Osmangazi University, Eskisehir, Turkey.

²Department of Medical Biology, Health Science Institute, Osmangazi University,
Eskisehir, Turkey.

³Department of Neurosurgery, Faculty of Medicine, Osmangazi University, Eskisehir, Turkey.

⁴Department of Biostatistics, Health Science Institute, Osmangazi University, Eskisehir, Turkey.

fulyabugeergen@gmail.com

Abstract

Various studies show that environmental conditions have effects on post-SAH recovery. Nowadays, patients with subarachnoid-hemorrhage(SAH) are kept in isolated environments. This study aimed to observe the effects of different environmental conditions on the levels of some miRNAs at different time intervals that is associated with cognitive dysfunction post-SAH in the frontal lobes of rats. Adult female Sprague-Dawley rats(n=35) are divided into 5 groups: control group(n=7), enriched environment groups (post-SAH 7days(n=7) and post-SAH 14days(n=7)), isolated-environment(IE) groups (post-SAH 7days(n=7) and post-SAH 14days(n=7)). Experimental-SAH was created by cisterna magna double-injection method. The control group was housed in standard rat cages without SAH formation while others were in EE/IE cages for 7/14 days after SAH was induced. The levels of miR-132, miR-134 and miR-138 in the frontal lobe tissues were determined by Real-Time PCR and statistical differences were calculated using one-way ANOVA test. There was a statistically significant increase of miR-132($p<0.001$), miR-134($p<0.01$) and miR-138($p<0.001$) levels in 7days-IE group while there wasn't any statistical difference between 7days-EE and control groups ($p>0.05$). In contrast, there was a statistically significant increase of all miRNA levels in 14days-EE group($p<0.001$) while there wasn't any statistical difference between 14days-IE and control groups($p>0.05$). These results suggests that the values of these miRNAs in the frontal lobes may be affected by different environmental conditions. That simultaneous increase of miRNA expressions known to have different effects on the synaptic plasticity may be the result of synaptic remodeling process. In this case, it can be said that synaptic reconstruction is more intense in IE during 1-7days post-SAH and in EE during 7-14days post-SAH.

Keywords: SAH, Enriched environment, Isolated environment, miR-132, miR-134, miR-138

This study was supported by Eskişehir Osmangazi University Scientific Research Project Committee with project support number 201611003.



Clomipramine Hydrochloride Has Cytotoxic and Anticancer Properties Against A549 Lung Adenocarcinoma Cell Line

1Bahar Demir, 2Gülşen Akalın Çiftçi

**¹Department of Stem Cell, Cellular Therapy and Stem Cell Production,
Application and Research Center ESTEM
Eskisehir Osmangazi University, 26480 Eskisehir, Turkey**

**²Anadolu University, Faculty of Pharmacy, Department of Pharmaceutical Chemistry,
26470, Eskisehir, Turkey**

bdemir92@gmail.com

Abstract

Cancer has attracted attention of the scientific world due to increased incidence and mortality rate in the recent years therefore it is investigated for various treatment methods. In this study, effects of antidepressant Clomipramine Hydrochloride and Cisplatin as positive control were investigated on A549 and L929 cells by cytotoxic, apoptotic and morphologic analysis. After the concentration ranges have been calculated with MTT, anti-proliferative effects/IC50 values of Clomipramine on A549 after 24, 48 and 72 hours were 89.16, 119.71, 121.51 μ M while respectively results with Cisplatin were 33.91, 18.42, 19.78 μ M on Real Time Cell Analysis System. After 24 and 48 hour of treated substances on A549, apoptotic effects were analysed by flow cytometry (Annexin V/PI, caspase-3 activation and JC-1) and confocal and electron microscope. The apoptotic effect of Clomipramine with Annexin V/ PI after 24 hours was %15.8 while it was %18.3 after 48 hours. The apoptotic effect of Clomipramine with JC-1 compared with Cisplatin was approximately 1.6-fold at IC50/2 at 24 hours which shows 1.4-fold increase at IC50; and in 48 hours relative to concentration shows 3-fold increase. Similar to Cisplatin, Clomipramine at 24 and 48 hours, cells show kidney shaped nucleus and condense chromatin similar to apoptotic cells and confocal microscopy showed that marked mitochondria with MitoTracker Red changed of morphology from tubular to spherical. Ultrastructural analysis showed apoptotic blebs, membrane integrity deterioration, activated lysosomes, and autophagosomes similar to the Cisplatin's effect. As a result we found Clomipramine has the same apoptotic effect as Cisplatin on A549 cells.

Keywords: A549, Clomipramine Hydrochloride, apoptosis, cytotoxicity



MGMT Methylation Level and Clinical Outcome in Turkish Glioblastoma Patients

Secil Ak Aksoy, Melis Mutlu, M Nafi Civan, Berrin Tunca, M. Ozgur Taskapilioglu, Unal Ege- li, Gulsah Cecener, Gokay Argadal, I Seckin Kaya, R Nur Balcin, Hasan Kocaeli, Ahmet Bekar, Sahsine Tolunay

¹Department of Medical Biology, Medical Faculty, Uludag University, Bursa, Turkey

²Department of Neurosurgery, Medical Faculty, Uludag University, Bursa, Turkey

³Department of Pathology, Medical Faculty, Uludag University, Bursa, Turkey

ak.secil08@gmail.com

Abstract

O6-methylguanine-DNA methyltransferase (MGMT) promoter methylation has been associated with improved survival in glioblastoma. The aim of this study is to evaluate the prevalence of MGMT methylation in Turkish glioblastoma cases.

We analyzed 40 glioblastoma patients treated between 2010 and 2017 stratified according to Real Time PCR-based quantitative methylation in: unmethylated, intermediate and highly methylated. Unmethylated, methylated and intermediate statuses were found in 10%, 82.5% and 5.5% of tissue samples, respectively. median progression-free survival of patients for three groups: 12.5, 6.6 and 11 months respectively. Methylation was associated with increased progression-free survival ($p = 0.03$). Our study confirmed that the independent prognostic role of MGMT methylation status. Otherwise, MGMT-promoter methylation frequency in Turkish glioblastoma is higher than other populations.

Keywords: MGMT, Glioblastoma, Methylation,



Green synthesis Ag and CuO nanoparticles using *Viscum album* L.

¹Derviş Öztürk, ²Tayfun Şengel, ²Betül Yılmaz Öztürk

¹Department of Biology, Faculty of Science and Art, Osmangazi University, Eskişehir, Turkey

²Center Research Laboratory Application and Research Center (ARUM),
Eskişehir Osmangazi University, Eskişehir, Turkey

Abstract

Nanoparticles can be produced with different methods. Chemical methods are associated with certain disadvantages such as involvement of hazardous chemicals, high energy requirements, increased the environmental toxicity, and cost un-effectiveness. Different researchers offer numerous synthesis routes using plant extracts as reducing agents in a biosynthesis or so-called green synthesis scheme for metals NPs. Green synthesis has multiple advantages, for instance, it is cost effective, eco-friendly and does not require energy, temperature or the use of toxic chemical reagents. Our study using different type extraction (alcholic, boiling water) of *Viscum album* L., silver and copper oxide nanoparticles were synthesized. The biosynthesized nanoparticles were characterized using UV-Vis spectrophotometer, light scattering method for particle size analysis, TEM for morphology studies, X-ray diffraction analysis for crystallographic determination, energy dispersive X-ray analysis for element determination.

Keywords: Copper oxide, Green sythesis, Nanoparticle, Silver, *Viscum album*



Investigation of Antimicrobial Activity of Some Essential Oils Against Two Different Food Pathogen *Listeria monocytogenes* and *Salmonella* spp.

¹**Sinem Gizem Candan Zaman**, ¹**Binnur Meriçli Yapıcı**

¹Department of Biology, Faculty of Science, Çanakkale Onsekiz Mart University, Çanakkale, Turkey

sinemgizemcandan@hotmail.com

Abstract

In this study, antimicrobial activity of thyme, laurel and rosemary commercial essential oils and various antibiotics against *Listeria monocytogenes* and *Salmonella* spp. food pathogens were investigated. Species used in the research were defined isolated from fresh chicken meat kept at +4C° by conventional methods. Two different commercial essential oil were used for each plant. Disc diffusion method was used to detect antimicrobial activity and results were evaluated according to the inhibition zone diameters. According to research findings, almost all of the antibiotics tested against *Listeria monocytogenes* and *Salmonella* spp. isolates were found to be exhibit significant antimicrobial activity. It was found that only rosemary essential oil from essential oils used in the study to be effective against *Listeria monocytogenes* and inhibition zone diameter of 25.25 mm was obtained from RC1 essential oil. This value obtained from RC1 essential oil was determined to be close to the inhibition zone diameter values obtained from the antibiotics tested against the isolates in the study. The inhibition zone values obtained from essential oil of RC1 and RC2 for *Salmonella* spp. were determined as 21.50 mm and 14.50 mm, respectively. As a result, it has been concluded that further research on the possibilities of using of rosemary essential oil, which is effective for two important food pathogens, in the food industry has to be carried out.

Keywords: Thyme, Rosemary, Laurel, Chicken meat, Essential oil.



Comparison of Different Types of Silver Nanoparticles Synthesis Methods Using Cladophora Glomerata (L.) Kützing

1Tayfun Şengel, 2Derviş Öztürk, 1Betül Yılmaz Öztürk

**¹Center Research Laboratory Application and Research Center (ARUM),
Osmangazi University, Eskişehir, Turkey**

**²Department of Biology, Faculty of Science and Art,
Osmangazi University, Eskişehir, Turkey**

tsengel@ogu.edu.tr

Abstract

The metallic nanoparticles are most promising and remarkable biomedical agents. Silver nanoparticles are attractive option because they are non-toxic to the human body at low concentrations and have broadspectrum antibacterial actions. The biosynthesis of nanoparticles has received increasing attention due to the growing need to develop safe, cost-effective and environmentally friendly technologies for nano-materials synthesis. The presence of various biologically active phytochemicals and metabolic compounds in biological samples eliminates the use of toxic chemicals for reducing or capping purposes during the reaction. Various natural resources such as plants, plant products, and microorganisms (bacteria, fungi, algae, yeast and viruses), have been explored for the synthesis of metal nanoparticles. Algae are considered rich in natural bioactive components and are available in number of types such as red, green and brown macro and micro algae. Our study using different type (alcoholic, boiled) extraction of *Cladophora glomerata* silver nanoparticles were synthesized and nanoparticle synthesis was also performed using a microwave technique. The biosynthesized nanoparticles were characterized using UV–Vis spectrophotometer, light scattering method for particle size analysis, TEM for morphology studies, X-ray diffraction analysis for crystallographic determination and energy dispersive X-ray analysis for element determination.

Keywords: Cladophora glomerata, Green synthesis, Extraction, Silver Nanoparticle,



Effects of Prenatal Endocrine Disrupting Chemical Exposure on Oxidative Stress in Rat Brain

^{1,2}**Anıl Yirün**, ^{1,3}**Gizem Özkekmehlı**, ¹**Pınar Erkekoglu**, ¹**Belma Kocer-Gumusel**

¹Hacettepe Üniversitesi, Eczacılık Fakültesi, Farmasötik Toksikoloji Anabilim Dalı,
06100 Ankara, Türkiye.

²Çukurova Üniversitesi, Eczacılık Fakültesi, Farmasötik Toksikoloji Anabilim Dalı,
06100 Adana, Türkiye.

³Erzincan Üniversitesi, Eczacılık Fakültesi, Farmasötik Toksikoloji Anabilim Dalı,
06100 Erzincan, Türkiye.

belmagumusel@yahoo.com

Abstract

With the increase in the production volume of toxic chemicals, an increase in the prevalence of neurodevelopmental disorders has been observed. Bisphenol A (BPA) and phthalates are suggested to be endocrine disrupting chemicals (EDCs). Most EDCs can accumulate in brain, act directly on neuronal functions and affect normal brain development. They may also cause neurotoxicity through other mechanisms, like oxidative stress. Brain is vulnerable to oxidative damage and this might be one of the underlying factors of different neurodegenerative diseases. BPA is widely used in the production of polycarbonate plastics. Di-(2-ethylhexyl) phthalate (DEHP) is one of the most widely used phthalic acid ester. Both of these compounds are used as plasticizers. The present study aimed to investigate the effects of prenatal and lactational exposures to BPA, DEHP and their combination on oxidative stress parameters in rat brain. Female rats were dosed with BPA (50 mg/kg/day), DEHP (30 mg/kg/day) and BPA+DEHP throughout their pregnancy and lactation periods. Their offspring were euthanized after 10 weeks of age and oxidative stress was evaluated in their brain tissues. We observed significant increases in glutathione levels in BPA (146%) and combined exposure (144%) groups. Moreover, lipid peroxidation showed significant increases in all of the study groups (BPA 122%; DEHP 52%; BPA+DEHP 99%) vs. control. These changes suggest that these EDCs can induce oxidative stress and combined exposure can have more pronounced effects on brain. Therefore, oxidative stress can be considered as an underlying mechanism for neurodevelopmental effects of EDCs.

Key words: bisphenol A, di(2-ethylhexyl)phthalate, lipid peroxidation, neurodevelopment, oxidative stress



The Role of Sfingosin-1-Phosphate and Receptors in Erectile Dysfunction

¹Didem Turgut Cosan, ¹İbrahim Uğur Çalış, ²Gülcan Kalender Güleç

¹Department of Medical Biology, Faculty of Medicine,
Osmangazi University, Eskisehir, Turkey

²Department of Psychiatry, Faculty of Medicine,
Osmangazi University, Eskisehir, Turkey

ugur0620@gmail.com

Abstract

Erectile dysfunction (ED) can not continue or maintain sexual activity for at least six or insufficient rigidity. This is related to physical and psychosocial health. Penile erectile tissue plays an important role in the erectile process, especially in the smooth muscles of the cavernous smooth muscles and walls of the arterial. Molecular and clinical studies on the molecular mechanisms of smooth muscle contraction and relaxation improve the understanding of erectile function. Sphingosine-1-phosphate (S1P) is a bioactive molecule. S1P is a ligand of the five (S1P1- S1P5) surface receptor bound to G protein. It binds to S1P receptors and regulates many physiological functions such as growth, survival, cytoskeleton and movement. S1P regulates smooth muscle (SM) contraction and apoptosis with three G protein-bound receptors (S1P1, S1P2, S1P3) predominantly in mammals. According to studies conducted in male rats S1P and its associated pathways showed smooth muscle loss after interactions. Researchers at high levels of S1P in the plasma of patients with human ED have suggested S1P as a potential marker of ED. The presence of S1P1, S1P2 and S1P3 receptors in human corpus cavernosum has been reported. S1P has been shown to cause an increase in the vascular response mediated by the RhoA / ROK pathway (via S1P2 and S1P3 receptors) and the phospholipase C beta1 and beta3 pathway (via S1P1 / S1P2 receptors). In erectile dysfunction, S1P and its associated pathways for experimental animals and humans are the therapeutic targets.

Keywords: Erectile Dysfunction, S1P, S1PR



Exploration of Lake Acıgöl For Novel Extremophilic Protease by Using Genome Walking Approach

^{1,2}**Begum Ozden**, ^{1,2,3}**Meryem Menekse Kılıç**, ⁴**Nurgul Celik Balci**, ^{1,2}**Nevin Gul Karaguler**

¹Istanbul Technical University, Faculty of Science and Letters,
Department of Molecular Biology and Genetics, 34469 Istanbul Turkey

²Istanbul Technical University Molecular Biology-Biotechnology & Genetics Research Center
(MOBGAM), 34469 Istanbul Turkey

³Istanbul Ayvansaray University, Plato Vocational School,
Medical Laboratory Techniques Program, 34087, *İstanbul Turkey*

⁴Istanbul Technical University, Faculty of Mines, Department of Geological Engineering,
34469 Istanbul Turkey

bgm.ozden@gmail.com

Abstract

Extreme environments are valuable sources for discovery of new species and novel proteins which can be used in various fields. In our previous studies, samples were taken from Lake Acıgöl which is considered as an extreme environment due to its high salt. Potential colonies showing protease activity were selected and determined by 16S rDNA PCR method. The results indicated that one of the isolate shows 92% similarity with *Virgibacillus marismortui* strain 123 and the other isolate shows 95% similarity with *Planococcus rifetoensis* strain M8. Based on the literature review, degenerate primers were designed and partial fragment was amplified to obtain the serine protease enzyme from *Virgibacillus marismortui* strain 123 by using genome walking strategy. Initially, four different genome walking libraries were constructed digesting the PCR fragment with four different restriction enzymes and ligated into the specific adaptors respectively. Then Nested PCR method was applied with gene specific primers and adaptor primers. The PCR products were isolated and cloned into the vector by using TOPO TA cloning method and transformed into *E. coli* TOP10 cells. As a result of Blue-white screening, white colonies were selected and plasmid isolations were carried out and sequenced. The 5' sequence part of the enzyme assembled with the initial partial genome of the enzyme coding sequence by using open access CAP3 Assembly Program.

Key Words: Genome Walking, Extramophilic Serine Protease, Lake Acıgöl



Purple dye production from Muricids (*Gastropod-Mollusca*)

¹Aynur Lök, ¹Aysun Küçükdermenci, ¹Ali Kirtik, ¹Evrims Kurtay

¹Ege University, Faculty of Fisheries, Department of Aquaculture, 35100 Izmir, Turkey

aynur.lok@ege.edu.tr

Abstract

Muricid species have economic value and are used in different areas such as food for human, bait for line fishing, shells for decoration and purple dye source. *Murex trunculus*, *M. brandaris*, *Purpura haemastoma* are the most important Muricids to produce purple dye. In Japan, diving clothes are stained with purple dye obtained from *Rapana bezoar* because they are believed to have supernatural power. Purple dye obtained from gastropod molluscs has always been symbolic importance of royalty, power, wealth, luxury, religious and social status. Archaeological records show the first use of purple dye is around the Mediterranean basin. It is called porphyra in ancient Greek mythology, Tyrian purple in Phoenician city of Tyros. It calls Royal and imperial purple because of coloured garments were worn by Emperors and Royalty. Tyrian purple is obtained from tryptophan derivatives called chromogens in hypobranchial gland of muricids. When it is exposed to oxygen and light, colour becomes to be visible. From blue to deep red colourants variety depends on which species and extraction conditions. In the time of Phoenicians, the purple dye production that started in the Mediterranean spread over time to West Africa and Ireland. From the 16th to the 18th century linen dyeing with purple dye was widespread in Ireland, South Wales, Scotland, France, Norway, and other parts of Europe.

Keywords: Muricidae, *Murex turunculus*, gastropoda, purple dye

(Supported by the TUBITAK project numbered 116O646)



Enzyme Biosensor for Rapid detection of 17- Alpha-OHP; A New Perspective for Screening Congenital Adrenal Hyperplasia in Newborn

1Ebru Dündar Yenilmez, 1Umut Kökbaş, 1Abdullah Tuli

Çukurova University, Faculty of Medicine, Department of Medical Biochemistry, Adana, Turkey

edundar@cu.edu.tr

Abstract

Congenital Adrenal Hyperplasia (CAH) is a family of autosomal recessive disorders characterized by deficiency in one or another of the enzymes of cortisol biosynthesis. The most prevalent form of the disorder is 21-hydroxylase (21OH) deficiency which is the most frequent inborn metabolism error and 17-Alpha-OHP is secreted in abundant excess. Measurement of 17-Alpha-OHP is therefore valuable in the initial diagnosis of CAH. Newborn screening procedures for CAH are still suboptimal because of low specificity, particularly in premature infants. In this study, a biosensor designed to detect 17-Alpha-OHP for a new alternative method for newborn screening of CAH. The electrochemical measurements were performed using a gold electrode coated with Au-Poly HemaMac, combined with the reference Ag/AgCl electrode and the auxiliary Au/Pd (98/2%) electrode. UV immobilization performed with 17-Alpha-OHP-horseradish peroxidase on the modified gold electrode surface with anilin (20µL enzyme and 20µL anilin). Optimization studies determine the most suitable working conditions for using the biosensor. Polymerization time was 2h, the enzyme concentration used 0.5mg/mL, temperature was 35°C, pH was 6.5 with phosphate buffer. After the characterization studies of the biosensor the detection limit was 0.015ng/mL-7.5ng/mL, repeatability was 2.98±0.04. The demonstrated method for 17-Alpha-OHP detection in newborn is useful and can be carry out rapidly in clinical diagnosis. Using automated biosensors are reproducible, quick and results can be generated within a few minutes compared to the traditional tests in use.

Keywords: Biosensor, enzyme, 17- Alpha-OHP, CAH



Cloning of the Amylopullulanase (*apu*) gene of *Thermoanaerobacter brockii brockii* into *E. coli* and optimization of expression

^{1,2}Hande Mumcu, ^{1,2}Nevin Güle Karagüler

¹Istanbul Technical University, Faculty of Science and Letters, Department of Molecular Biology and Genetics, 34469 Istanbul Turkey

²Istanbul Technical University Molecular Biology-Biotechnology & Genetics Research Center (MOBGAM), 34469 Istanbul Turkey
mumcuh@itu.edu.tr

Abstract

Glycosyl hydrolyses play an important role in industrial processes especially in the hydrolysis of starch to degrade it from the branching points. Starch is mostly used as raw material in industry and it has to be hydrolyzed before using by gelatinization, liquefaction and saccharification steps, respectively. Firstly, raw starch is exposed to high temperature to obtain it like gel form material. After that gel form starch is treated with some endo-amylase enzymes such as α -amylase in liquefaction step. In the saccharification step, exo-amylases such as glycol-amylase enzyme and de-branched enzymes are used to hydrolyze the starch from the branch points which occur in every 20-25 D-glucose units. Amylopullulanase enzyme (EC 3.2.1.41) that belongs to glycoside hydrolases is one of the de-branched enzymes with an extra α -amylase activity. So it would be possible to decrease of by product formation and process time and also with increase of yield in starch hydrolysis process. Amylopullulanase enzyme from thermophilic *Thermoanaerobacter brockii brockii* has a high potential in starch industry. In our previous study the sequence of amylopullulanase enzyme from *Thermoanaerobacter brockii brockii* has been identified. Here we aimed to clone the gene of amylopullulanase enzyme to His-tag expression vector. So we can optimize the gene expression in *E. coli* to produce recombinant amylopullulanase enzyme.

Keywords: *T. brockii brockii*, De-branching, Amylopullulanase, His-tag



Production and Characterization of Sinapic Acid Loaded PLGA Nanoparticles

¹**Fatma Sayan Poyraz**, ¹**Gulşah Akbas**, ²**Serap Derman**, ³**Dilek Duranoglu**, ¹**Tülin Arasoğlu**, ¹**Banu Mansuroglu**

¹ Yıldız Technical University, Faculty of Arts and Sciences,
Department of Molecular Biology and Genetics, Istanbul

² Yıldız Technical University, Faculty of Chemical and Metallurgy,
Department of Bioengineering, Istanbul

³ Yıldız Technical University, Faculty of Chemical and Metallurgy,
Department of Chemical Engineering, Istanbul

sayanpoyraz@gmail.com

Abstract

Polymeric nanoparticles with high stability in biological fluids and prepared from biodegradable materials can be easily sterilized, protect the active substance entrapped in the solid matrix from degradation and they ensure that the active substance is targeted, controlled and maintained. They reduce the systemic toxicity of other organs and tissues since they release the active substance in the target area. Poly- (D, L-lactic-co-glycolic acid) (PLGA) with high biocompatibility and biodegradable and low toxicity and immunogenicity is widely used for the encapsulation of various therapeutic agents due to their appropriate mechanical properties and toxicity of their degradation products.

Phenolic compounds are secondary herbicides that result from the defence mechanism of the plant against environmental stress conditions. Sinapic acid is a phenolic compound commonly found in plants and is a member of the phenylpropanoid family. Several in vitro / in vivo studies have been conducted to determine the pharmacological properties of the sinapic acid on organisms and to elucidate the mechanism of action of this substance, and these studies have proven to be mainly anti-inflammatory, antimicrobial, cardioprotective, antihyperglycemic, anticancer, anxiolytic, hepatoprotective, neuroprotective and antioxidant properties [4] however, its low water solubility limits the use of sinapic acid in the pharmaceutical field. In this work, polymeric nanoparticles were prepared by oil/water (w / o) monolithic emulsion solvent evaporation method using low water-soluble Sinapic Acid molecule and biodegradable PLGA copolymer. Sinapic acid loaded polymeric nanoparticles studied for the first time in the literature and characterized by reaction yield (RY), encapsulation efficiency (EE), drug loading (DL), particle size (Z-Ave), polydispersity index (PDI), zeta potential (ZP) and FT-IR. FT-IR analysis showed that the molecule was loaded into PLGA and optimized particles were produced. The sizes, RY, EE, DL, PDI and ZP values of the optimized nanoparticle formulation were 178.1 nm-185 nm, 37.69-40%, 72.6-74.06%, 69.43-73,54%, 0,096-0,113, -20,7 mV and -23,7 mV, respectively.

Keywords: polymeric nanoparticle, sinapic acid, characterization.



Investigations on The Eskişehir and Circumference Amphipoda Fauna

1Tuğrul Öntürk, 1Mehmet İpek

¹Eskişehir Osmangazi University, Faculty of Arts and Sciences, Department of Biology, Meslik

tugrulonturk@gmail.com

Abstract

The Anatolian peninsula, which has a continental character with its unique characteristics, is home to a great variety of species. However, due to lack of sufficient researchers and resource constraints, a complete research has not been realized. Taking into consideration the previous studies in our region, it is thought that we will carry out future studies for our region in the direction of the findings obtained as a result of this study. As a result of the diagnoses made, 1 family and 4 species belonging to Amphipoda group were determined.

Keywords: Turkey, Eskisehir, Amphipoda, Fauna.

Acknowledgment: This work was supported by the project No: 201119037 by the Scientific Research Projects Commission of Eskişehir Osmangazi University.



Investigation of the cytotoxic and apoptotic effects of Diosgenin on U87MG and U373 Glioblastoma Cells

¹Levent Elmas, ¹Mücahit Secme, ²Ahmet Yagbasan, ¹Yavuz Dodurga, Muhammed ²Hamza Muslumanoglu

¹Pamukkale University, Faculty of Medicine, Department of Medical Biology, Denizli, Turkey

²Yildiz Technical University, Faculty of Arts and Science,
Molecular Biology and Genetics Department, Istanbul, Turkey

elmas.levent@gmail.com

Abstract

Glioblastoma multiforme (GBM) is the most common central nervous system and aggressive brain tumour mainly occur in adults. Despite surgical, radiotherapy and chemotherapy, survival of the disease is 14.6 months. Diosgenin which has a lipophilic core in the steroid or triterpenoid structure and one or more carbohydrate side chains, is a glycoside and it is naturally found in various plants. It is demonstrated that, Diosgenin shows anti-oxidant, anti-inflammatory, anti-carcinogenic and anti-metastatic effects on different cancer types such as lung, colon, etc. The aim of this study is to investigate the possible cytotoxic and apoptotic effects of Diosgenin on U87MG and U373 GBM cell lines *in vitro*. Diosgenin was applied to cells 10 – 70 µM concentration and cytotoxic effects of Diosgenin were determined with XTT method in a time- and dose-dependent manner then IC₅₀ concentrations were calculated for both cell lines. IC₅₀ doses were applied the cells for 24h and total RNA was isolated via Trizol reagent. A commercial kit was used for cDNA synthesis. Expression levels of apoptotic and anti-apoptotic genes were analyzed through quantitative real-time PCR method. IC₅₀ doses of Diosgenin were calculated as 20 µM and 30 µM for 24th hours on U87MG and U373 cell lines. According to qPCR results, Diosgenin induced some apoptotic and reduced some anti-apoptotic gene expressions in both cell lines. These results are preliminary data of Diosgenin on GBM cell lines and detailed studies is needed to identify the effect of Diosgenin on GBM. Diosgenin may be a novel agent for GBM by single or combination with other agents.

Keywords: Glioblastoma multiforme, Diosgenin, Apoptosis



Pericarp Histology and Cytology of Two Species of The Genus *Salvia* sect. *Hymenophace* (Lamiaceae)

¹Ahmet Kahraman, ²H. Nurhan Büyükkartal, ³Mümin İcik

¹ Department of Biology, Faculty of Arts and Sciences, Usak University, Usak, Turkey

^{2,3} Department of Biology, Faculty of Science, Ankara University, Ankara, Turkey

mmn.icik@gmail.com

Abstract

In this investigation, the pericarp ultrastructure of *Salvia sericeo-tomentosa* and *Salvia euphratica* var. *Leocalycina* assigned to in the section *Hymenophace* of the genus *Salvia* was studied by light and transmission electron microscopy (TEM) for the first time. The exocarp represents elongated mucilaginous cells when mericarps of the studied species were wetted. Below the exocarp, the mesocarp was composed of thin-walled parenchyma cells and thick-walled sclerenchyma cells. Macrosclereid cells were found in the sclerenchyma region. The endocarp consisted of a single layer of transversely arranged cells. There were large transparent starch granules, lipids and proteins in the endosperm.

Keywords: Lamiaceae, Pericarp, *Salvia*, Turkey.



Curcumin and Oxidative Stress

¹Mine Ezer, ¹Filiz Özdemir

¹Anadolu University, Faculty of Pharmacy, Department of Biochemistry, 26470, Eskişehir, Turkey

minezer66@gmail.com

Abstract

Oxidative stress is known as the imbalance between oxidant and antioxidant. High concentrations of reactive oxygen species (ROS) lead to oxidative damage, especially in DNA, and may result in mutations leading to cancer. Antioxidant substances are used to minimize the harmful effects of oxidative stress. Antioxidants neutralize the formation of free radicals and form the first line of defense. Traditional medicine based on natural and herbal methods for the treatment of diseases has been used by many different cultures throughout history. Among the numerous herbal compounds used for medicinal purposes are curcumin, a polyphenol derived from the golden spice turmeric (*Curcuma longa*) of the Zingiberaceae family, which is characterized by many characteristics. Curcumin is a natural antioxidant with poor water solubility and hydrophobic character. Despite the well-known activity as a therapeutic plant, the pharmacological properties of curcumin have only been scientifically proven over the past century. Nowadays, curcumin has a wide range of uses such as antioxidants, anti-inflammatory, anti-proliferative, anti-carcinogenic and anti-microbial. Several studies have shown that inhibition of cancer development by inhibiting specific signal pathways participating in carcinogenesis. It has also been proved by studies that curcumin has a protective effect against cancer of the colon, skin, mouth and intestine as a chemotherapeutic agent. This review contains a summary of the effects of curcumin antioxidant substance on oxidative stress.

Keywords: Curcumin, oxidative stress, cancer



In vitro Activity of Fusidic Acid on Probiotic Microorganisms

¹Alper Cimik, ²Feyza Alyu Tekes, ²Yusuf Ozturk

¹Department of Pharmacognosy, Faculty of Pharmacy, Anadolu University, Eskisehir, Turkey

²Department of Pharmacology, Faculty of Pharmacy, Anadolu University, Eskisehir, Turkey

yozturk@anadolu.edu.tr

Abstract

Fusidic acid (fusidate) is a widely used antibiotic and an important drug for research on microbiota because of its broad spectrum of effects, high oral bioavailability and low side effects. In this study, minimum inhibitor concentrations (MIC) of fusidate on various types of probiotic microorganisms located in the gastrointestinal tract microflora were determined by microdilution method. The aim is to determine the concentration interval which fusidate does not have an inhibitory effect on tested probiotics to compare this interval with the plasma concentration of fusidate. MIC values were evaluated for *Lactobacillus acidophilus*, *Bacillus coagulans*, *Streptococcus salivarius*, *Bacillus subtilis var. natto*, and *Saccharomyces cerevisiae* by microdilution method in the Research Laboratory of Pharmacognosy Department, Faculty of Pharmacy, Anadolu University. Mueller Hinton Broth was used as the bacterial medium, and Sabouraud Dextrose Broth as the fungal medium. MIC values of fusidate for *Lactobacillus acidophilus*, *Bacillus coagulans*, *Streptococcus salivarius*, *Bacillus subtilis var. natto* and *Saccharomyces cerevisiae* were 100mg/L, 200mg/L, 800mg/L, 400 mg/L and 800mg/L, respectively. In our previous study, MIC values of fusidate were shown to be lower for probiotic species *Streptococcus thermophilus*, *Bacillus clausii*, *Lactobacillus reuterii*, *Lactobacillus rhamnosus* and *Saccharomyces cerevisiae var. boulardii*, suggesting that probiotic strains in this study are more resistant than the previous microorganisms. Clinical plasma concentration of fusidate is 36mg/L, which is significantly lower than MIC values, suggesting the possibility that fusidate treatment at clinical doses may not have a detrimental effect on intestinal microflora. Further studies including *in vivo* experiments are necessary to evaluate this hypothesis.

Keywords: Probiotic, Antibiotic, Fusidate, Plasma, Microdilution



Arylated indenoquinolines-based carbonic anyhydrase inhibitors: enzyme inhibitory activity of novel indenoquinoline analogues

¹Makbule Ekiz, ²Salih Ökten, ³Ümit Muhammet Koçyiğit, ¹Ahmet Tutar,
⁴Pharham Talsimi

¹Department of Chemistry, Faculty of Art and Science, University, Serdivan, Sakarya, Turkey

²Department of Maths and Science Education, Division of Science Education, Faculty of Education, Kırıkkale University, Yahşihan, Kırıkkale, Turkey

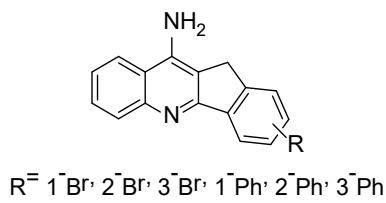
³Vocational School of Health Services, Cumhuriyet University, Sivas, Turkey

⁴Department of Chemistry, Faculty of Science, Ataturk University, Erzurum 25240, Turkey

salihokten@kku.edu.tr

Abstract

Carbonic anhydrase (CA, EC 4.2.1.1) is a member of the metalloenzyme family. It catalyzes the rapid conversion of carbon dioxide (CO_2) and water to bicarbonate (HCO_3^-) and protons (H^+) and also plays an important role in biochemical and physiological processes. In this study, a series of novel synthesized indenoquinoline amine derivatives via Friedlander and Suzuki coupling reaction were tested for their carbonic anhydrase inhibition potentials. Mono bromo and phenyl substituted indenoquinoline derivatives were determined as inhibitors of two physiologically relevant CA isoforms, the cytosolic by a stopped flow CO_2 hydrase assay method. The K_i values of these compounds in micromolar (nM) scale were compared with Acetazolamide (AZA), a clinically used sulfonamide CAI as standard inhibitor.



These compounds exhibited good inhibitory effects, in the micromolar range, with K_i values in the range of 0.32–1.15 μM against hCA I and in the range of 0.49–1.45 M against hCA II. Our findings suggest that the novel indenoquinoline amine derivatives have superior inhibitory effect over acetazolamide (AZA), which is used as clinical CA inhibitor with K_i values of 3.32 and 2.72 μM against the hCA I and hCA II isoenzymes, respectively. The best inhibition for hCA I was determined by 1-bromo indenoquinoline amine, with K_i value of 0.32 μM , while 1-bromo indenoquinoline amine significantly inhibited hCA II with K_i value of 0.50 μM according to the other derivatives and AZA. In conclusion, This present study and our ongoing research can contribute to the treatment and prevention for an extensive number of diseases.

Keywords: indenoquinoline amine, bromoindenoquinoline, phenyl, carbonic anhydrase, inhibition.



Optimization and Follow Up of Cultivation of *Acidithiobacillus ferrooxidans*

1Kübra Trabzonlu, 1Tuğba Atabay, 1Tülin Arasoğlu

**¹Faculty of Science and Letters, Molecular Biology and Genetics Department,
Yıldız Technical University, Istanbul, Turkey**

ktrabzonlu@gmail.com

Abstract

Acidithiobacillus ferrooxidans are the most important microorganisms used in the industrial recovery of insoluble metal sulfides, also called as bioleaching. It is a chemolithoautrophic, γ -proteobacterium using energy from the oxidation of iron- and sulfur-containing minerals for growth. The aim of this study is to prepare modified liquid and solid media for *A. ferrooxidans* growth and proliferation. Five different solid media were prepared and bacterial growth and colony formation were observed in a solid medium. Growth and development were observed with time-dependent changes in pH, absorbance and Fe^{+2} parameters. In our study, firstly modified liquid 9K liquid was prepared for growth of *A. ferrooxidans*. 4ml, 7ml and 10ml of bacteria were added to the flasks containing 3 different 100ml 9K media and cultured for 15 days at 30°C in 150rpm shaking incubator and the pH and absorbance values were measured daily. However, the amount of ferrous iron reduced by Fe^{2+} Fe^{3+} conversion simultaneously was determined by the permanganometric method. In cultures with 4ml, 7ml and 10ml bacteria, the pH values were 1.79, 1.81 in the first day and 1.99, 2.12 in the second week, respectively. Spectrophotometric absorbance measurements at 600nm were 0.029A^0 , 0.054A^0 , 0.034A^0 on the first day and 0.077 A^0 , 0.180A^0 , 0.100A^0 after two weeks respectively. On the first day, the amount of Fe^{+2} was 1.75 mg and the amount of Fe^{+2} on Day7 decreased to 1.28 mg as expected. The pH and absorbance values of *A. ferrooxidans* were increased with time and Fe^{+2} value decreased with time.

Keywords: *A. ferrooxidans*, bioleaching, ferrous



Boron Determination and Pollen Morphology Studies on Endemic *Matthiola anchonifolia* Hub.-Mor. (Brassicaceae)

¹Okan Sezer, ¹İsmühan Potoğlu Erkara, ¹Murat Ardıç, ¹Koray Yaylacı, ¹Onur Koyuncu

¹Eskişehir Osmangazi University, Faculty of Arts and Science,
Department of Biology, Eskişehir-Turkey

Abstract

Deficiency and toxicity levels of boron is too close in plants which need to be trace amounts of boron for vital activities. B requirements show great differences between the plants. Leaves and generative organs deposite the highest amount of B. In contrast to this, root, fruit and seed deposite minimal amounts of B. Also pollen production level is directly related with the B content of soil. Within this scope, boron determination and pollen morphology studies were performed on endemic *Matthiola anchonifolia* in this study. B content of root, stem and flower were measured by kurkimin methode for *M. anchonifolia*. Pollen grain microphotographs of examined taxon have been taken from preaprates which were made by Wodehouse ve Erdtman techniques. Examinations and measurements have been performed on these and morphometric results given. According to the kurkimin technique, B element as been measured $7,14 \text{ mg kg}^{-1}$ dry weight (ppm.) in root, $7,58 \text{ mg kg}^{-1}$ dry weight (ppm.) in stem and $7,32 \text{ mg kg}^{-1}$ dry weight (ppm.) in flower of studied taxon. Type of the pollen grain of studied taxon has determined as tricolpatae according to the Wodehouse and Erdtman methodes. We believe that comparisons and evaluations of obtained data from like these studies will make important contributions to plant taxonomy in future.

Keywords: *Matthiola anchonifolia* Hub.-Mor. (Brassicaceae), Boron Amount, Pollen Morphology



Boron Determination and Pollen Morphology Studies on Endangered Endemic *Scabiosa hololeuca* Bornm. (Caprifoliaceae)

¹Okan Sezer, ¹Murat Ardiç, ¹İsmühan Potoğlu Erkara, ¹Koray Yaylacı, ¹Onur Koyuncu

¹Eskişehir Osmangazi University, Faculty of Arts and Science, Department of Biology,
Eskişehir-Turkey

Abstract

Deficiency and toxicity levels of boron is too close in plants which need to be trace amounts of boron for vital activities. B requirements show great differences between the plants. Leaves and generative organs deposite the highest amount of B. In contrast to this, root, fruit and seed deposite minimal amounts of B. Also pollen production level is directly related with the B content of soil. Within this scope, boron determination and pollen morphology studies were performed on endemic *Scabiosa hololeuca* in this study. B content of root, stem and flower were measured by curcimin methode for *S. hololeuca*. Pollen grain microphotographs of examined taxon have been taken from prepares which were made by Wodehouse ve Erdtman techniques. Examinations and measurements have been performed on these and morphometric results given. According to the curcimin technique, B element as been measured $7,17 \text{ mg kg}^{-1}$ dry weight (ppm.) in root, $8,48 \text{ mg kg}^{-1}$ dry weight (ppm.) in stem and $8,13 \text{ mg kg}^{-1}$ dry weight (ppm.) in flower of studied taxon. Type of the pollen grain of studied taxon has determined as tricolpatae according to the Wodehouse and Erdtman methodes. We believe that comparisons and evaluations of obtained data from like these studies will make important contributions to plant taxonomy in future.

Keywords: *Scabiosa hololeuca* Bornm. (Caprifoliaceae), Boron Amount, Pollen Morphology



Boron Determination and Pollen Morphology Studies on Vulnerable Endemic *Convolvulus phrygius* Bornm. (Convolvulaceae)

¹Murat Ardiç, ¹Okan Sezer, ¹Onur Koyuncu, ¹Koray Yayınlacı, ¹İsmühan Potoğlu Erkara

¹Eskişehir Osmangazi University, Faculty of Arts and Science, Department of Biology,
Eskişehir-Turkey

Abstract

Deficiency and toxicity levels of boron is too close in plants which need to be trace amounts of boron for vital activities. B requirements show great differences between the plants. Leaves and generative organs deposite the highest amount of B. In contrast to this, root, fruit and seed deposite minimal amounts of B. Also pollen production level is directly related with the B content of soil. Within this scope, boron determination and pollen morphology studies were performed on endemic *Convolvulus phrygius* in this study. B content of root, stem and flower were measured by curcimin methode for *C. phrygius*. Pollen grain microphotographs of examined taxon have been taken from prepares which were made by Wodehouse ve Erdtman techniques. Examinations and measurements have been performed on these and morphometric results given. According to the curcimin technique, B element as been measured $7,02 \text{ mg kg}^{-1}$ dry weight (ppm.) in root, $7,64 \text{ mg kg}^{-1}$ dry weight (ppm.) in stem and $7,39 \text{ mg kg}^{-1}$ dry weight (ppm.) in flower of studied taxon. Type of the pollen grain of studied taxon has determined as tricolpatae according to the Wodehouse and Erdtman methodes. We believe that comparisons and evaluations of obtained data from like these studies will make important contributions to plant taxonomy in future.

Keywords: *Convolvulus phrygius* Bornm. (Convolvulaceae), Boron Amount, Pollen Morphology



Influence of DMSO with Dextran, PVP or PEG in Freezing Extender on Post-Thaw Drone Semen

¹Zekariya Nur, ²Selvinar Seven Çakmak, ³Ibrahim Çakmak, ¹Nail Tekin Önder, ¹Elif Gökçe,

¹Burcu Üstüner, ¹Selim Alçay, ¹M. Berk Toker, ³Hasan Şen, ¹M. Kemal Soylu

¹Uludag University, Faculty of Veterinary Sciences, Department of Artificial Insemination, Bursa

²Ankara University, Faculty of Sciences, Department of Biology, Ankara

³Uludag University, Beekeeping Development-Application and Research Center, Bursa,

icakmak@uludag.edu.tr

Abstract

The objective of this study was to elucidate the toxicity of widely used penetrating cryoprotective agents (DMSO) to frozen drone semen. DMSO was replaced totally or partially with the dextran, polyvinylpyrrolidone (PVP), and polyethylen glychol (PEG); some of the non-penetrating cryoprotectant. The freezing extender with the %12, %8, %4 and %0 DMSO were supplemented with the %0, %4, %8 and %12 of dextran, PVP or PEG; respectively. For all treatment groups the final cryoprotectant concentration was %12 except control group was %0. Extended and straw (0.25ml) filled semen were frozen with LN vapor for the 7-10min and then were plunged in LN until thawing. Fresh and post-thaw semen motility and plasma membrane functional integrity were evaluated under phase-contrast microscopy (400×). Freeze-thaw process is detrimental to post-thaw drone sperm motility. Post-thaw sperm quality of the DMSO was the best group than mixed cryoprotectant groups. The DMSO replacement with dextran, polyvinylpyrrolidone (PVP), and polyethylen glychol (PEG); was not successful for the prevention of cryodamage. The partially replacement of DMSO with the used non-penetrating cryoprotectant also affected post-thaw sperm motility ($P<0.05$) and plasma membrane integrity. Totally exclusion of DMSO from freezing extender results in 0% post-thaw motility in all groups. The dextran and PVP 4% supplemented groups performed better post-thaw sperm quality than other supplemented groups ($P<0.05$). All used cryoprotectants support post thaw plasma membrane integrity to some degree compared to control group, generally. Finally, 12% DMSO supplemented extenders are a better choice for drone semen freezing compared to mixed cryoprotectant groups.

Keywords: Honey bee, drone, DMSO, Dextran, PVP

This work was supported by TÜBİTAK (Project Number: TOVAG215O586).



Morpho-anatomy and Pollen Morphology of *Eranthis hyemalis* (L.) Salisb.

¹Murat Ardiç, ¹Onur Koyuncu, ¹Okan Sezer, ¹Koray Yaylacı, ¹Ümmüsen Gökçen,
¹İsmühan Potoğlu Erkara

¹Eskişehir Osmangazi University, Faculty of Arts and Science,
Department of Biology, Eskişehir-Turkey

Abstract

In this study, morpho-anatomical and polynological features of *Eranthis hyemalis* (L.) Salisb. were investigated. For palynological analysis of plant materials, pollen preparations of each taxon were prepared for light microscopy research according to the Wodehouse and Erdtman methods and measurement of the morphological characters of pollen were carried out. For anatomical investigation, transverse sections of root, stem and leaf have been taken from *E. hyemalis* by scapel. All sections examined by light microscope. Morphological characters of *E. hyemalis* were investigated by stereomicroscope. In the cross sections of the root, the pith was completely covered by xylem cells. In contrast to this, the pith of the stems is hollow. Leaves have amaryllis type of stomata. They are mesomorphic. The results of the light microscope investigation revealed that the pollen grains of *E. hyemalis* are tricolporate and exine scabrate. We believe that findings of this study will make contributions to the biodiversity and taxonomy in future.

Keywords: *Eranthis hyemalis* (L.) Salisb. (Ranunculaceae), Morpho-anatomy, Pollen Morphology



Screening of Single Nucleotide Polymorphisms in Certain Genes In Plasma Cell Free DNA in Bladder Cancer Patients

¹**Soner Baydeniz**, ²**Mehmet Gürbüzel**, ³**İlyas Sayar**, ⁴**Aliseydi Bozkurt**

¹Department of Biology, Graduate School of Natural and Applied Sciences, Erzincan University, Erzincan, Turkey

²Department of Medical Biology, Faculty of Medicine, Erzincan University, Erzincan, Turkey

³Department of Pathology, Faculty of Medicine, Erzincan University, Erzincan, Turkey

⁴Department of Urology, Faculty of Medicine, Erzincan University, Erzincan, Turkey

sonerbaydeniz@hotmail.com

Abstract

In this study, blood samples were taken from patients who were referred to the Urology Clinic of Erzincan Mengücek Gazi Education and Research Hospital and whose diagnosis of bladder cancer was given. Subsequently, the *samples* were *centrifuged immediately*. The obtained plasma samples were stored at -80 °C. Blood samples were also taken from individuals who applied to the clinic but who were healthy and were subjected to the same procedures to comprise a control group. The nucleotide polymorphisms identified in four different genes were the following: for rs6983267 (CCAT2) control = GG allele ($n=6$), GT allele ($n=14$), TT allele ($n=9$), undetermined ($n=1$), bladder = GG allele ($n=2$), GT allele ($n=11$), TT allele ($n=10$), no amplification ($n=2$); for rs12628 (HRAS) control = TT allele ($n=6$), TC allele ($n=19$), CC allele ($n=3$), undetermined ($n=2$), bladder = TT allele ($n=15$), TC allele ($n=5$), CC allele ($n=3$), no amplification ($n=2$); for rs2910164 (MIR146A) control = CG allele ($n=11$), GG allele ($n=18$), undetermined ($n=1$), bladder = CC allele ($n=2$), CG allele ($n=4$), GG allele ($n=18$), no amplification ($n=1$); for rs1799939 (RET) control = GG allele ($n=14$), GA allele ($n=8$), AA allele ($n=8$), bladder = GG allele ($n=15$), GA allele ($n=7$), AA allele ($n=1$), no amplification ($n=2$). These initial findings show that free DNA may be suitable for single nucleotide polymorphism scans.

Keywords: Bladder cancer, Cell free DNA, Single nucleotide polymorphism



Ecophysiological responses of some *Cucumis melo* L. varieties to different heat shock applications

¹Gülçin Işık, ¹Gülin Bilgenoğlu

¹Department of Biology, Faculty of Sciences, Anadolu University, Eskişehir, Turkey

gulciny@anadolu.edu.tr

Abstract

Heat stress is one of the major environmental problems all over the World and finding out heat tolerant plant species, especially edible ones, is very important for both nutritional and agricultural activities. *Cucumis melo* L. (Cucurbitaceae) is a worldwide consuming plant species because of its fruit. In this research, seeds of Kırkağaç and Ananas varieties of *C. melo* were used as experimental material. The seeds were counted (10 seeds per petri dish) and sowed into the seedbeds which were containing sterile petri dish and double layer filter paper. Distilled water was used for germination solution. Heat shock applications (Control, 25 °C, 30 °C, 35 °C, 40 °C, 45 °C and 50 °C) were applied with 16 hours light/8 hours dark photoperiod at growth chamber (Sanyo, MLR 350). The longest radicle length was observed at 30 °C application of Ananas variety (13.59 cm), the shortest one was 45 °C application of Kırkağaç variety (4.57 cm). The lowest hypocotyle lengths were observed at 50 °C application of both varieties (0.72 cm). The highest germination percentage was observed at control group of Ananas variety (% 90) and lowest one was at 50 °C application of Kırkağaç variety (% 45). According to SVI values, the highest data was observed at 30 °C application of Kırkağaç variety (298.15) and the lowest one was at 50 °C application of Kırkağaç variety (37.76). In the light of experimental data, we can say that Ananas variety of *C. melo* is more tolerant than Kırkağaç variety to heat shock.

Keywords: Biomass, *Cucumis melo*, Ecophysiology, Heat shock, Germination



Effects of Cocaine and Amphetamine Regulated Transcript (CART) on The Differentiation of Insulin Producing Cells From Human Adipose-Derived Mesenchymal Stem Cells

1Büşra Öncel Duman, ^{1,2,3}Yusufhan Yazır, ¹Selen Polat, ^{1,2,4}Zehra Seda Halbutoğulları, ¹Aysegül Açıksarı, ^{1,2}Gökhan Duruksu

¹Department of Stem Cell, Institute of Health Sciences, Kocaeli University, Kocaeli, Turkey

²Center for Stem Cell and Gene Therapies Research and Practice,
Kocaeli University, Kocaeli, Turkey

³Department of Histology and Embryology, Faculty of Medicine, Kocaeli University, Kocaeli, Turkey

⁴Department of Medical Biology, Faculty of Medicine, Kocaeli University, Kocaeli, Turkey

busraoncel@gmail.com

Abstract

Cocaine and amphetamine regulated transcript (CART) are an anorexigenic peptide that is expressed extensively in central and peripheral nervous systems, as well as in endocrine cells. It has been shown that endogenous beta-cell CART plays an important role in regulation of beta-cell function and beta-cell phenotype. The exogenous CART peptide also has a regulatory effect on insulin secretion and beta cell proliferation. Therefore, the aim of the study is to develop a multistep method using direct non-viral genomic reprogramming approach to direct human adipose tissue-derived mesenchymal stem cells (hAD-MSC) to insulin-producing cells (IPCs) and to investigate the role of CART peptide in the production of IPCs. A three-stage culture strategy was used to induce hAD-MSCs differentiation into insulin-producing cells. Cells cultured in medium without inducers were used as controls. The undifferentiated and differentiated cells were stained with İnsulin, Pdx1, MafA, Glut2, Pax4 antibodies for immunofluorescent characterizations. Gene expression analysis was also performed with qRT-PCR to support immunofluorescence characterization. Immunofluorescence assay showed that the differentiated hAD-MSCs were positively staining for Pdx-1, MafA, Glut2, Pax4 and İnsulin. Real-time PCR analysis showed that pancreatic differentiation of transcription factors Pdx-1 MafA, Glut2, Pax4 and İnsulin were stably expressed during the process of induction. Statistical analysis were performed and the results support that differentiation induced with CART peptide. This study suggests another non-pancreatic, low-invasive source of cells for islet regeneration and a possible new therapeutic strategy for the treatment of type 1 diabetes mellitus.

Keywords: CART peptide, insulin producing cell, mesenchymal stem cell, differentiation, type 1 diabetes mellitus



Examination of the Antibiofilm Activity of Juglone-PLGA Nanoparticles

¹Busra Gumus, ²Tayfun Acar, ¹Tugba Atabey, ¹Banu Mansuroglu, ²Serap Derman,
¹Tulin Arasoglu

¹Molecular Biology and Genetics Department, Science and Letters Faculty,
Yildiz Technical University, Istanbul

²Bioengineering Department, Chemical and Metallurgy Faculty,
Yildiz Technical University, Istanbul

ozbektulin@gmail.com

Abstract

Juglone is an allelochemical obtained from walnut—which has antifungal, antibacterial, antiviral, anticancer, antioxidant, cytotoxic and genotoxic effects. However, its hydrophobic nature and high toxicity limit the use of the juglone in biological systems. In recent years, polymeric nanoparticles have been frequently used to increase the biocompatibility and bioavailability of substances with similar characteristics and to provide the use of less active substance through controlled release. In this study, nanoparticulate systems were prepared by encapsulating the juglone molecule into poly(D,L-lactic-co-glycolic acid) (PLGA) by single emulsion solvent evaporation method and then characterized. The effect of the nanoparticles on *Candida albicans* biofilm was investigated in comparison with the free juglone by performing standard plate count and confocal microscopy analyses. In order to examine the effect on biofilm formation; *C. albicans* cells were incubated with 10, 5, 2.5, 1.25, and 0.625 mg/ml juglone or equivalent doses of nanoparticles for 6 hours. On the other hand, the effect against early phase biofilms was assessed after the 24 hours incubation of the test substances with biofilm layer formed for 6 hours. Juglone-PLGA nanoparticles and free juglone were found to inhibit the formation of *C. albicans* biofilm and pre-formed biofilms (98-100%) at all doses applied. It is extremely important that the antibiofilm effect of the juglone-PLGA nanoparticles is similar to that of the juglone used at the same concentration, since similar effect is provided by using less active substance due to controlled release and the PLGA nanoparticulate system reduces toxicity according to the literature.

Keywords: Juglone, PLGA, nanoparticle, antibiofilm activity

Funding Acknowledgements: This research was supported by YTU-BAP (Yildiz Technical University, Office of Scientific Research Project Coordination) (Project no: FBA-2018-3101).



The Morphological Characterization of Pomegranates in the Middle of Sakarya River Basin

¹Emre Akbel, ¹Cenap Yılmaz

¹Eskişehir Osmangazi University Agricultural Faculty Horticultural Department, Eskişehir, Turkey

Abstract

In this study, it's focused on determining some chemical and pomological specialities of 30 pomegranate genotypes, which are very well adapted to Sakarya river basin. In results, fruit weights 153,5 g – 409,9 g, fruit widths 64,4 – 96,3 mm, fruit heights 59,9 – 83,5 mm, number of calyx 5,6 – 7,5, height of calyx 10,6 – 22,1 mm, calyx diameters 15,6 – 37,5 mm, peel thickness 1,9 – 5,7 mm, aril yield % 40,5 – 68,5, juice yield % 28,5 – 53,7, 100 aril weight 17,5 – 46,6 g, shape index 0,83 – 1,03 were determined. And also total soluble solid matter ranged from 15,6 – 24,0, %, titrable acidity 0,3 – 3,4 %, total anthocyanin content 20 – 3271 mg/L, ascorbic acid content 5,5 – 22,3 mg/100 g, total phenolic substance 551 – 3282 mg/kg, antioxidative capacity 4,45 – 12,35 mM troloks/ml were clarifeid. Beside of those the colour of peel colour (L, a, b, chroma and hue value), aril colour (L, a, b, chroma and hue value), seed hardness and fruit taste were determined.

Keywords: Pomegranate, Punica granatum, Sakarya riverbasin, genotypes, pomology.



Optimization of Spheroid Growth in AlgiMatrix 3D Culture System

¹**Selin Engür**, ²Miriş Dikmen, ²Elif Kaya Tilki, ³Zerrin Cantürk

¹Institute of Health Sciences, Anadolu University, Eskisehir/Turkey

²Department of Pharmacology, Faculty of Pharmacy, Anadolu University, Eskisehir/Turkey.

³Department of Pharmaceutical Microbiology, Faculty of Pharmacy, Anadolu University, Eskisehir/Turkey.

sengur@anadolu.edu.tr

Abstract

Traditionally, most *in-vitro* cell cultures are grown in two dimensional (2D) environments. Cancer researchers typically rely on 2D *in-vitro* studies and small animal models to study the complex mechanisms of tumor angiogenesis, invasion, and metastasis. The cell-cell and cell matrix interactions observed during *in vivo* tumor progression cannot be studied in 2D models while, 3D models are capable of mimicking these conditions. The 3D cultures may play a potential role in cancer drug discovery due to the lack of relevant preclinical models and advantages over 2D cultures.

The aim of this study is to adapt 3D lung cancer model instead of 2D model, which is commonly used in our laboratory, with AlgiMatrix 3D culture system on A549 cells. To determine the optimal time for the formation of spheroids in 96-well 3D alginate scaffold plates, cells at 2×10^4 density per well were incorporated into 3D alginate scaffold in 100 mL of media. After 20 min, another 100 mL of media was added and cells were grown in incubator at 37°C with 5% CO₂. Media was changed every 48 h. The growth of tumor spheroids were assessed by observing formation of the spheroids in 3D alginate scaffold wells. Because of the observability of the spheroids growing in the 3D alginate scaffold without dissolving the matrix or removing media, at 3, 5 and 7 days after cell seeding, images were taken using an inverted microscope (Leica DM 300) and the size of spheroids were determined by Leica LAS Analysis programme. Also cell spheroids were imaged by Hoechst fluorescent dye using BioTek Cytation 3 Imaging Multi-mode Reader. Based on results, average spheroid size at the end of 3, 5 and 7 days were found as 382.733, 755.77 and 1865.66 μm² for 20000 cell density, respectively. Cultured cells on 3D alginate scaffolds exhibited unique morphology. Based on the size of the spheroids, optimum spheroid growth was observed on 7th day on 3D alginate scaffold.

Keywords: 3D cell culture, AlgiMatrix Culture System, spheroids, A549

This study was supported by Anadolu University Scientific Research Projects numbered 1704S095.



Protective effects of *Hipericum triquetrifolium turra* upon chemotherapy-induced testicular toxicity in rats

¹**Senanur Can**, ²**Varol Şahintürk**, ⁴**Songül Çetik**, ⁴**Cumali Keskin**, ³**H. Mehtap Kutlu**,
¹**Özgün Teksoy**, ¹**Adnan Ayhancı**

¹Eskişehir Osmangazi University, Faculty of Arts and Science,
Department of Biology, Eskişehir, Turkey

²Eskişehir Osmangazi University, Faculty of Medicine, Department of Histology and Embryology,
Eskişehir, Turkey

³Anadolu University, Faculty of Arts and Science, Department of Biology, Eskisehir, Turkey

⁴Mardin Artuklu University, Health Services Vocational High School, Turkey

Abstract

Cyclophosphamide (CP), cause multiple-organ toxicity. While testicular damage is not uncommon, the adverse effects of anti-cancer drugs upon this organ have been studied less extensively than those on other organs. Therefore, the study aims to investigate the possible preventive effects of *Hypericum triquetrifolium Turra* (HT), known for its effective antioxidant and anti-cancer properties, against the testicular toxicity due to CP, a widely-used anti cancer drug. With this in mind, Wistar albino rats, were divided into 9 groups, each including 7 animals (Control, 150 mg/kg CP, 25, 50, 100 µg/ml HT, CP+25, 50, 100 µg/dl HT and 0.2 ml DMSO). All the injections were applied intraperitoneally. Except for CP, all the other chemicals were given for 6 consecutive days. In the CP groups, the drug was given only one dose a day. On the 7th day, the rats were sacrificed under anaesthesia before their tissue samples could be taken for analysis. Testicular damage were then examined with a Laser Detected Confocal Florasans Microscope. Our experimental results have shown that HT has got antioxidant and anti-carcinogenic effects, and that it becomes highly protective and curative when used along with various cytotoxic drugs.

Keywords: Cyclophosphamide, Testiküler toxicity, *Hypericum triquetrifolium* Turra extract, Confocal Microscope, rats



Angiogenic Evaluation of Angiotensin Receptor and TRPC Blockers in Combination Using in vivo CAM Assay

¹Ebru Gürel-Gürevin, ²Hülya Tuba Kışan, ³Ayça Üvez, ³O. B. Burak Esener, ⁴Nadim Yılmazer,
⁵Savaş Üstünova, ³Elif İlkay Armutak

¹Department of Biology, Faculty of Science, Istanbul University, Istanbul, Turkey;

²Department of Pharmacognosy, Faculty of Pharmacy, Anadolu University, Eskisehir, Turkey;

³Department of Histology and Embryology, Faculty of Veterinary Medicine, Istanbul University,
Istanbul, Turkey;

⁴Department of Biology, Faculty of Science, Namik Kemal University, Tekirdağ, Turkey;

⁵Department of Physiology, Faculty of Medicine, Bezmialem University, Istanbul, Turkey

Abstract

Angiogenesis, which means neovascularization occurs physiologically in some conditions such as corpus luteum formation, wound healing and embryo growth whereas pathologically in tumorigenesis, inflammatory and cardiovascular diseases. The chorioallantoic membrane (CAM) assay is an in vivo and animal alternative method to determine the angiogenic activities as well as irritation potential of compounds includes natural products and synthetic drugs. In this study, the angiogenic effects of a selective angiotensin type 1 receptor antagonist and antihypertensive agent Losartan, an angiotensin type 2 receptor blocker PD123319 and their combination, a TRPC3 blocker Pyr-3, and a TRPC blocker SKF-96365 were investigated by using in vivo CAM assay at various concentrations. According to the activity results, Losartan (50 µg/pellet) and PD123319 (25 µg/pellet) alone exhibited strong antiangiogenic activity (0.88 ± 0.13 , 1.08 ± 0.24 , respectively) with slight and strong irritation whereas no antiangiogenic activity but strong irritation in combination. Also Pyr-3 (2.5 µg/pellet) and SKF-96365 (50 µg/pellet) inhibited angiogenesis significantly with scores 1.00 ± 0.27 and 1.0 ± 0.12 respectively but caused no and slight irritation on the CAM. Angiogenesis may become an effective therapeutic target in the discovery of more effective new bioactive agents with less toxicity to treat angiogenesis originated pathologies such as cancer, inflammation and cardiovascular diseases. Through this perspective and research outputs, angiotensin II antagonists and TRPC blockers offer hope to be new antiangiogenic and antiinvasive drugs used against neoplastic diseases.

Keywords: CAM assay, angiogenesis, angiotensin receptor blocker, TRPC blocker.



In vitro Anti-Psoriatic Activity of VEGF Receptor Tyrosine Kinase Inhibitor

1Yusuf Öztürk, 1Miriş Dikmen, 2Zerrin Cantürk, 1Ayşegül Varol,

Anadolu University, Faculty of Pharmacy, ¹ Department of Pharmacology and

² Department of Pharmaceutical Microbiology, Eskişehir, Turkey

yozturk@anadolu.edu.tr

Abstract

Psoriasis is a chronic inflammatory disease, which affects skin and small joints and, immune mediated and angiogenesis-dependent disease. Activated keratinocytes in psoriatic lesions produce pro-angiogenic cytokines, including vascular endothelial growth factor (VEGF), which binds to vascular endothelial growth factor receptor (VEGFR) and promotes cell proliferation and angiogenesis. Pazopanib, a multi-kinase inhibitor with activity against VEGFR and other receptors, was recently approved by the FDA for the treatment of advanced renal cell carcinoma. In this study, it was evaluated to antipsoriatic effects of pazopanib on human keratinocyte HaCaT /LPS-stimulated THP-1 macrophage co-culture psoriasis cell model. Firstly, different concentrations (0.2, 2, 20, 100, 200 µM) of pazopanib were treated on the HaCaT and THP-1 cells for determining to toxic/nontoxic concentrations by using MTT method. Then antiproliferative effects of concentrations of pazopanib (0.2, 2 and 20 µM) on non stimulated HaCaT cells and HaCaT /THP-1 co-culture cell model were analysis using Real Time Cell analysis System (Xcelligence) during 48 hours. Supernatants were obtained for cytokine measurements. Cytokine levels at 48h were determined by using flow cytometry analysis (CBA Human Inflammation Kit). As a result, in the psoriasis co-culture model, LPS stimulating increased to TNF-α releasing from THP-1 cell and, increasing of TNF-α was made proliferative effects on HaCaT cells. Then, treatment of pazopanib nontoxic concentrations on HaCaT cells in case of co-culture, reduced cell proliferation according to solvent control (0.1 % DMSO) and control of HaCaT/stimulated THP-1 co-culture. Especially 0.2 and 2 µM pazopanib reduced HaCaT cell proliferation even in the case of inflammation. This study was examine the therapeutic potential of VEGF inhibitor, pazopanib in psoriasis and describe the potential of VEGF inhibitors to be effective in the treatment of psoriasis.

Key words: pazopanib, psoriasis, co-culture, cell proliferation, inflammation

This study was supported by Anadolu University Scientific Research Projects numbered 1705S303.



Sweetgum Oil (*Liquidambar orientalis*) Promotes Migration and Proliferation of HaCaT Human Keratinocytes Cells

¹Burcu Gökşen Ekiz, ²Miriş Dikmen, ²Yusuf Öztürk, ¹Selin Engür

¹Institute of Health Sciences, Anadolu University, Eskisehir/Turkey

²Department of Pharmacology, Faculty of Pharmacy, Anadolu University, Eskisehir/Turkey.
bgoksen@gmail.com

Abstract

The sweetgum tree is an endemic species in Turkey belonging to the Hamamelidaceae family. Sweetgum oil (SO) is a substance with gum-like consistency, harvested by tapping the bark of sweetgum trees (*Liquidambar orientalis*). It is used as an antiseptic, topical parasiticide, expectorant, and in the treatment of some skin and respiratory system diseases. In this study, two sweetgum oil sample (SO-1 and SO-2) that produced by injuries on the trunk of *L. orientalis* were purchased from two different local producers in Marmaris (Muğla, Turkey) in order to investigate wound healing activities on human keratinocyte cells (HaCaT). Firstly, different concentrations (100, 10, 1, 0.1, 0.01 µg/ml) of SO samples were treated on the HaCaT cells for determining to toxic/nontoxic concentrations by using MTT method. Then the effects of nontoxic concentrations of SO-1 and SO-2 on HaCaT cell proliferation were determined by using Real Time Cell Analysis System (RTCA-DP). Scratch wound-healing assay was performed to examine keratinocyte migration. Also *Centella asiatica* extract used as positive control. As a result, we determined non toxic concentrations (0.1, 0.01, 0.001 µg/ml) of SO-1 and SO-2 on HaCat cells. According to result of Real-Time Cell Analyzer, SO-1 made a significant increase on cell proliferation dependent on the time. When we also evaluated cell migration with a model of scratch assay; keratinocyte cells treated with nontoxic concentrations of SO samples, were proliferated and migrated from wound edges within 48h. Particularly, SO-1 (0.001 µg/ml) was more effective on cell proliferation and migration rather than SO-2 (0.001 µg/ml) and the positive control *Centella asiatica* extract. Further studies should be performed, however it can be said that sweetgum oil may be a potential therapeutic for wound repair by improving healing process.

Keywords: sweetgum oil, keratinocyte, migration, proliferation, RTCA-DP

This study was supported by Anadolu University Scientific Research Projects numbered 1705S306.



Total Phenolic Content and Free Radical Scavenging Activity of Endemic *Hypericum thymopsis* Boiss.

1Benan Okyay, 1H. Tuba Kıyan, 2Mehmet Tekin, 1Nilgün Öztürk

¹Anadolu University, Faculty of Pharmacy, Department of Pharmacognosy, Tepebaşı, Eskişehir

²Trakya University, Faculty of Pharmacy, Department of Pharmaceutical Botany, Edirne

okyaybenan@gmail.com

Abstract

Eighty-nine *Hypericum* species occur in Turkey, 43 of which are endemic as recorded in the flora of Turkey. *Hypericum thymopsis* Boiss., (Clusiaceae) is also an endemic herb which generally grows at the calcareous steppe regions of Central Turkey, is in danger of extinction. In flowering stage, the aerial parts of this species are used for wound-healing and sedation, and its infusions are used against stomach diseases and throat infections by local people. In this study, total phenolic content of *H. thymopsis* methanol extract were determined by the Folin–Ciocalteu method. spectroscopically. Antioxidant effectiveness was assessed using free radical scavenging activity, in comparison with chlorogenic acid and reference antioxidant. Methanol extract of *H. thymopsis* were found to have a specific radical scavenging effect. The values of 5.13 %, 15.58 %, 27.37%, 59.05, 92.28% and 94.07% were obtained for tested concentrations of 1.16, 4.9, 8.1, 16, 31 and 38.5 mg/mL, respectively. Also, all tested extracts exhibited anti-radical activity in a dose dependent manner. This effect was found to be related to the high total phenolic content of the extract (168.20 ± 1.24 mg GAE /g extract). In addition, it was observed that antioxidative activities of methanol extract of *H. thymopsis* are comparable with BHT and chlorogenic acid. The results indicate us *Hypericum* species are promising plants because of their potential antioxidant activity.

Key words: *Hypericum thymopsis* Boiss., Antioxidant, Free radical scavenging activity, Phenolics.

This study have been supported by Anadolu University Scientific Research Projects Commission (Project Number: 1705S340).



Preliminary Evaluation of *Lagoecia cuminoides* L. Lipids

¹Gülmira Özek, ¹Ceyda Afşin Berdanoglu, ²Safinaz Elmasulu, ³Ahu Çınar,
⁴Gökhan Deniz, ^{1,5}Temel Özek

¹Anadolu University, Faculty of Pharmacy, Department of Pharmacognosy, 26470 Eskisehir, Turkey

² Akdeniz University, Korkuteli Vocational School, Department of Herbal and Animal Production,
Programme of Medicinal and Aromatic Plants, 07800 Korkuteli-Antalya, Turkey

³ Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Research and
Policies, Western Mediterranean Agricultural Research Institute, Department of Food Technology
and Medicinal and Aromatic Plants, 07110 Aksu-Antalya, Turkey

⁴ Akdeniz University, Faculty of Education, Department of Mathematics and Sciences, Campus,
07058 Antalya, Turkey

⁵ Medicinal Plant, Drug and Scientific Research Center (AUBIBAM), Anadolu University,
26470-Eskisehir, Turkey

Abstract

Lagoecia cuminoides L. (Apiaceae) is the single representative of the genus *Lagoecia* growing in Mediterranean region of Turkey [1]. The plant is known as “pülüsün” in Turkey. The fruits of the plant were collected in Antalya province during maturation period, dried under shade and subjected to investigation of the fatty acids composition. For this purpose, the fruits were grounded and extracted with CHCl₃:CH₃OH (2:1) according to Folch method to yield total lipids fraction [2]. The triglycerides were saponified and the free fatty acids after acidification were extracted with diethyl ether. The free fatty acids were subjected to esterification with BF₃ reagent and then analyzed using GC/MS and GC-FID techniques. Palmitic, stearic, oleic, elaidic, linoleic, linolenic and arachidic acids were found to be the main fatty acids of *L. cuminoides* fruits. The present work is the first investigation of *L. cuminoides* lipids.



Effects of Sorbicillin-like Secondary Metabolite on 6-OHDA-Induced *in vitro* Parkinson's Disease Model

1Elif Kaya Tilki, 1Miriş Dikmen, 2Selin Engür, 3Zerrin Cantürk, 3Mustafa Güçlü Özarda

¹Department of Pharmacology, Faculty of Pharmacy, Anadolu University, Eskisehir/Turkey.

²Institute of Health Sciences, Anadolu University, Eskisehir/Turkey.

³Department of Pharmaceutical Microbiology, Faculty of Pharmacy,
Anadolu University, Eskisehir/Turkey.

elif_kaya@anadolu.edu.tr

Abstract

Halotolerant fungi, which survive in high salt concentrated extreme environments, are capable of producing biologically active secondary metabolites by specialized metabolic pathways when organism faced with any stress. The generation of free radicals and oxidative stress has been linked to several neurodegenerative diseases. Therefore using free radical scavenging molecules for the reduction of intracellular reactive oxygen species is one of the strategies against neurodegeneration. Fungal secondary metabolism is a rich source of novel molecules with potential bioactivity.-Sorbicillin is a secondary metabolite compound that is known to have anti-oxidant property and neuroprotective analogues. In order to evaluate potential neuroprotective sorbicillin-like analogues, halotolerant *Penicillium flavigenum* is isolated from Tuz Lake, an inland hyper saline water body, and sorbicillin-like secondary metabolite from water was fractioned. Firstly, cytotoxic effects of both sorbicillin and water fraction were evaluated on PC-12 Adh cell line using WST-1 analysis, and non-cytotoxic concentrations were determined. In order to observe neuroprotective potentials of the compounds *in vitro*, 6-OHDA (150 µM) induced neurodegeneration model of Parkinson's Disease (PD) was conducted with xCELLigence Real Time Cell Analyzer System. Subsequently, mitochondrial membrane depolarization levels were determined by JC-1 flow cytometer analysis. According to our results, 10 and 1 µg/mL sorbicillin and water fraction were found non-cytotoxic and have potential neuroprotective potential on PD model. Also, JC-1 results were supported these results by reducing 6-OHDA membrane depolarization from 34.4% to 13.5, 13.8, 15.3 and 10.4%, respectively. In conclusion, novel sorbicillin-like secondary metabolite might hold promise for neurodegenerative disorders with further investigations.

Keywords: sorbicillin, neuroprotection, halotolerant, *Penicillium flavigenum*.

This study is a part of 116R006 numbered “3001- Starting R&D Projects Funding Program” supported by grant from The Scientific and Technological Research Council of Turkey.



Clinical or in Clinical Trials Use of Proteasome Inhibitors

¹Miriş Dikmen, ²Zerrin Cantürk

Anadolu University, Faculty of Pharmacy, Departments of ¹Pharmacology and ²Pharmaceutical Microbiology, Tepebaşı, Eskisehir, Turkey
mirisd@anadolu.edu.tr

Abstract

The proteasome is a multi-unit enzyme complex found in the cytoplasm and nucleus of eukaryotic cells and is responsible for degradation of unnecessary or damaged intracellular proteins by proteolysis. Potent small peptide inhibitors of proteasomes also represent a novel approach to the treatment of cancer and inflammatory diseases include activation of the transcription factor NF-κB. The proteasome has become an charming target for the treatment of many different cancers, with the inhibition of proteasome function having appeared as a important strategy for anticancer therapy. The anticaner functions of these proteasome inhibitors are not only so notable since they induce both apoptosis and cell cycle arrest in different tumor types but also proteasome inhibitors have been showed to inhibit angiogenesis, cell-cell adhesion, cell migration, immune and inflammatory responses, and DNA repair response. A number of proteasome inhibitors are now in clinical trials to treat multiple myeloma and solid tumors, as it is estimated that proteasome inhibitors will act as antitumor and immune-regulatory agents soon. Bortezomib, important one of the proteasome inhibitor, is a first-in-class proteasome inhibitor approved for the treatment of multiple myeloma. Clinical approval of the bortezomib as a therapeutic target has encouraged the development of a second generation of proteasome inhibitors. In this study reviews data on the use of the approved proteasome inhibitors as well as newer agents under development. Emphasis is placed on the clinical use of proteasome inhibitors, including control of side effects and combination with other agents.

Keywords: proteasome inhibitors, bortezomib, cancer, clinical trials



In vitro Antioxidant Activity of *Epicoccum nigrum* Culture Fluid

¹Melike Börühان Çetin, ¹Göksu Ceylan, ²Zerrin Cantürk, ³Nilgün Öztürk,
⁴Ayşe Betül Karaduman, ⁵Mustafa Yamaç

¹ Eskisehir Osmangazi University, Graduate School of Science, Eskisehir, Turkey.

² Anadolu University, Faculty of Pharmacy, Department of Pharmaceutical Microbiology,
Eskisehir, Turkey.

³ Anadolu University, Faculty of Pharmacy, Department of Pharmacognosy,
Eskişehir, Turkey.

⁴ Deliklitaş Mah. Yunus Emre Cad. No:39 Daire:3 Eskisehir, Turkey.

⁵ Eskisehir Osmangazi University, Faculty of Science and Arts, Department of Biology,
Eskisehir, Turkey.

myamac@ogu.edu.tr

Abstract

In the presented study, in vitro antioxidant activity of the mycelial submerged culture of the *Epicoccum nigrum* was investigated. The studied isolate was selected with a screening study among 132 fungus isolates for its scavenging ability on 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals and the phenolic acid content. Then, scavenging effect on the DPPH and ABTS radicals, reducing power, chelating effect on ferrous ions, β-carotene – linoleic acid, and inhibition of lipid peroxidation were also evaluated. As a result, the EC₅₀ values of the culture fluid extract of the *Epicoccum nigrum* for DPPH, ABTS radical, and chelating effect on ferrous ions were 3,98 mg/ml, 2,49 mg/ml and 3,68 mg/ml, respectively. The optimum conditions for the antioxidant activity of *Epicoccum nigrum* culture fluid were determined as static culture, PMP medium, 10 days of incubation, 4.5 initial pH and 20-27 °C incubation temperature.

Keywords: *Epicoccum nigrum*, antioxidant activity, Submerged culture

Acknowledgement: This study has been supported by The Scientific and Technological Research Council of Turkey (TUBITAK) with the project No: 113Z746.



Beverage Inherited from the 19th Century; KEFIR

¹Nilgün Öztürk

¹Anadolu University, Faculty of Pharmacy, Department of Pharmacognosy, Tepebaşı 26470
Eskişehir

nozturk@anadolu.edu.tr

Abstract

The use of probiotics has been known to mankind since centuries and quest for its health benefits is increasing in this century through focused research on various food products. For this purpose, researchers have a growing interest in probiotics from fermented milk products. Kefir, originates from the Caucasus and Tibet, is known nutraceutical dairy product produced through fermentation of yeasts and bacteria naturally present in grains of kefir. It is characterized by its distinct flavour, typical of yeast, and an effervescent effect felt in the mouth. The beverage are consist of vital nutrients such as carbohydrates, proteins, minerals, vitamins, and some nutraceutical components. Due to the claimed health benefits of kefir which include reduction of lactose intolerance symptoms, stimulation of the immune system, lowering cholesterol, and antimutagenic and anticarcinogenic properties, kefir has become an important functional dairy food and consequently, research on kefir has increased in the past decade. The purpose of this study is to give information about chemical, nutritional, and therapeutic aspects of kefir.

Keywords: Kefir, Probiotic, Health benefits, Nutraceutic.



Comperative Evaluation of the Oxidative Stress Caused by Different Bisphenol Derivatives in HepG2 Cells

¹Büşra Özyurt, ^{1,2}Gizem Özkekmehlı, ¹Belma Kocer-Gumusel, ¹Pınar Erkekoglu

¹Hacettepe University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology,
06100 Ankara, Turkey.

² Erzincan University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology,
Erzincan, Turkey.

erkekp@yahoo.com, erkekp@hacettepe.edu.tr

Abstract

Studies have shown that many environmental chemicals can possess endocrin disrupting properties. Some of the endocrine disrupting chemicals may have toxic effects on liver and they mat cause hepatocarcinogenesis through different mechanisms, particularly by peroxisome proliferation. Bisphenols are substances with “diphenylmetane” structure and they are widely used in the production of polycarbonate plastics. Some of the chemicals are proclaimed to have endocrine disrupting characteristics. General population is highly exposed to bisphenols particularly through water carboys, feeding bottles, food and inner lining of drink cans. Bisphenol A (BPA) is the most widely used bisphenol derivative. As the toxicity of BPA is well-known and its use is limited, derivatives like bisphenol F (BPF) and bisphenol S (BPS) are preferred. However, there is limited data on the toxicity of the compounds. The aim of this study was to comperatively evaluate the oxidative stress producing effects by different bisphenol derivatives in HepG2 cells. Cells were exposed to inhibitory concentration 30 of the biphenol derivatives (397.27, 371.89 ve 191.52 µg/ml for BPA, BPF and BPS, respectively) for 24 h. Glutathione peroxidase activity did not change after BPA treatment vs. control, while BPF (25.75%) and BPS (49.82%) exposures caused significant decreases. On the other hand, BPA caused marked increases in superoxide dismutase activity (48.24%) while BPF and BPS did not cause significant alterations when compared to control. Lipid peroxidation did not change in the study groups while total glutathione levels increased in all of the study groups vs. control. Protein oxidation significantly increased in BPF and BPS groups. These results show that BPF and BPS can induce oxidative stress even more than BPA. BPF and BPS may not be good alternatives of BPA and less toxicity exerting compounds should be investigated in order to be used as alternatives of BPA.

Keywords: bisphenol A, bisphenol F, bisphenol S, lipid peroxidation, oxidative stress



Effects of Helenalin on Cell proliferation and Migration in Inflammatory and Non-inflammatory Conditions

1Sevda Nur Yüksel, 1Miriş Dikmen, 2Zerrin Cantürk

¹Anadolu Üniversity, Faculty of Pharmacy, Department of Pharmacology

²Department of Pharmaceutical Microbiology, Eskişehir, Turkey

sevdaeal@hotmail.com

Abstract

Arnica montana (*A. montana*) is used for its anti-inflammatory and tissue healing properties after trauma, bruises, or tissue injuries, but its cellular and molecular mechanisms are largely unknown. One of the main active compounds of *A. montana* is Helenalin, a sesquiterpene lactone that can be found in various plants in Asteraceae. In this study, wound healing activity of Helenalin in LPS-stimulated and non-stimulated medium conditions on HaCaT cells was evaluated. THP-1 cells were stimulated by LPS containing medium. Firstly, HaCaT and THP-1 cells were treated with different concentrations (between 50 to 0.095 μ M) of helenalin for determining the toxic or non-toxic concentrations by using WST-1 method. Then the effects of non-cytotoxic concentrations (0.02, 0.2 and 2 μ M) of helenalin on HaCaT cell proliferation and cell migration were determined using Real Time Cell Analysis System (xCELLigence). Wound healing effects were evaluated by using scratch method and cytokine levels were measured by using flow cytometry analysis (CBA Human Inflammation Kit) at 24h. and 48h. As a result, high concentrations (up to 1.56 μ M) of Helenalin showed significant cytotoxic effects on HaCaT and THP-1 cells. Therefore, wound healing activity at 0.02, 0.2 and 2 μ M of helenalin were investigated. According to the results of real time cell proliferation, migration, scratch and cytokine analyses, HaCaT cells treated with 0.02 and 0.2 μ M helenalin in LPS-stimulated medium have significantly increased cell proliferation, scratch closure and anti-inflammatory effects. In particular, the highest wound healing activity on HaCaT cells was determined with 0.02 μ M Helenalin in LPS-stimulated medium.

Keywords: Helenalin, wound healing, THP-1 cell, HaCaT cell, inflammation



Investigation of the Effects of Gallic Acid on Biofilm Formation

¹Songül Gönel, ²Zerrin Cantürk

¹Anadolu University, Institute of Health Sciences, Department of Pharmaceutical Microbiology,
Eskişehir, Turkey

² Anadolu University, Faculty of Pharmacy, Department of Pharmaceutical Microbiology,
Eskişehir, Turkey

zkcanturk@anadolu.edu.tr

Abstract

Many microorganisms have the ability to formation biofilms. The biofilm-forming bacteria show high resistance to antibiotics and disinfectants. The potential for inhibiting the ability of natural compounds to form biofilms is quite high. Gallic acid (GA) is a hydrolysated natural product of tannin in Chinese gall. This study was conducted to determine the inhibitory effect of gallic acid (GA) against, *Escherichia coli* (ATCC 35218), *Escherichia coli* (ATCC 25922) and *Staphylococcus aureus* (ATCC 25923) biofilm formation. If inoculum is prepared from bacteria cultivated on agar plates, then the wells of the microtiter plate are filled with 180 mL of TSB supplemented with 1% glucose. Thereafter, a 20 mL quantity of previously prepared bacterial suspensions is added to each well incubated at 37 °C for 48 h. The adherent biofilm layer formed in each microtiter-plate well is stained with 150 mL of crystal violet used for 0.1% crystal violet for 15 min at room temperature. Minimal inhibitory concentration (MIC) values of GA against *E. coli* (ATCC 35218), *E. coli* (ATCC 25922) and *S. aureus* (ATCC 25923), were 500, 500 and 250 µM/mL, respectively. Our results altogether demonstrate that GA inhibited viable bacteria biofilm formation, marking a novel approach to the prevention and treatment of biofilm-related infections in the biomedical application.

Key Words: Biofilm, Gallic acid, Bacteria



Alterations of water content and antioxidant enzyme system in alleviating of oxidative stress caused by molybdenum or/and cadmium in wheat leaves

1Ceyda Ozfidan-Konakci, 2Evren Yildiztugay, 3Mustafa Kucukoduk, 2Busra Zengin

¹Department of Molecular Biology and Genetics, Faculty of Science, Necmettin Erbakan University,
Meram, Konya, Turkey

²Department of Biotechnology, Faculty of Science, Selcuk University, Selcuklu, Konya, Turkey

³Department of Biology, Faculty of Science, Selcuk University, Selcuklu, Konya, Turkey

cozfidan@konya.edu.tr

Abstract

Molybdenum (Mo), an essential micronutrient for plants, plays a role in electron donors/or acceptors in molybdoenzymes in plants, such as nitrate reductase, aldehyde oxidase, xanthine oxidase and nitrogenase. On the other hand, cadmium (Cd) is known to be a toxic metal that can cause severe damage to plants. However, little is known about the defensive mechanisms within plants under combination of Mo and Cd stresses. This study was designed to investigate the effects of Mo on Cd-induced oxidative stress in wheat (*Triticum aestivum L.*) leaves. For this purpose, the plants were grown in nutrient solution containing Cd (150 and 300 μ M) and/or Mo (0.15 and 0.3 mM) for 7 days (d). After exposure to Cd stress, the significant reduction in water content (RWC) observed in wheat. Cd excess caused an increase in the activities of superoxide dismutase (SOD), catalase (CAT), peroxidase (POX) and the contents of hydrogen peroxide (H_2O_2), proline (Pro) and lipid peroxidation (TBARS). Under the increased rate of Mo application, the oxidative stress induced by Cd treatments was reduced as from the first day of stress, providing the decrease in RWC, the contents of H_2O_2 and TBARS and increase in Pro and the activities of SOD, POX and glutathione reductase (GR) when compared to the Mo and Cd treatments alone. Collectively, these data indicate that addition of Mo can provide protection against the adverse effects of Cd stress by modulating cellular antioxidant systems and water status in wheat leaves exposed to Cd.

Keywords: Antioxidant enzymes, Cadmium, Molybdenum, *Triticum aestivum L.*, Water content



SPONSORS



ABC ANALİTİK BİYOTEKNOLOJİ VE ÇEVRE LAB. CİH. SAN.VE TİC. LTD. ŞTİ.





2018

4th INTERNATIONAL CONGRESS ON APPLIED BIOLOGICAL SCIENCES

