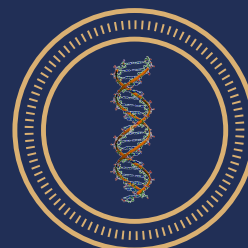


*Podgorica/Montenegro*

# ICABB 2018 CONGRESS



**2nd International Congress on  
Advances in Bioscience and  
Biotechnology**



## Book of Abstracts

**JUNE 26-30 2018**

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## **ICABB - Abstracts Book - 2018**

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**Published, 27/09/2018**

**ISBN: 978-605-67206-3-5**

Dear Scientist,

The second International Congress on Advances in Bioscience & Biotechnology (icabb) was organized in Podgorica, Montenegro. We are very happy for organizing this congress in such a beautiful city and country that we have strong historical ties.

We wanted to make this conference little bit special by bringing scientist together from different disciplines of veterinary area and also to open new research and cooperation fields for them. In this sense, we desired to bring the distinguished scientist together to get know each other and to develop and implement new joint projects.

The scientist joined the congress was from different country and mostly from Turkey. Total over the two hundred scientist were registered in the congress. The total number of submission were 179 and after a careful evaluation 134 submissions were accepted by our scientific committee and 54 of them were accepted as poster presentation and, 80 of them were accepted as oral presentation and all those presentation was taken place in the conference booklet.

We would like to send our special thanks to Mr. Musa Köse and Mr. İsmet Uzun, ZENITH Group workers for their special efforts. and finally the most importantly I would like to thank to all the participants individually who came from far away to join this conference.

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## Authentic Measurement of Ischemia Modified Albumin\*

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**Background and Objective:** N-Terminal residue of human serum albumin binds cobalt, nickel and copper ions at physiological conditions. However, in the presence of oxidative stress, hypoxia, acidosis, free-radical injury, and energy-dependent membrane disruption the binding capacity decreases and the levels change in various disorders. Original and conventionally used ischemia modified albumin (IMA) measurement methods have serious faults. In this study, it is aimed to develop an authentic measurement method which can be used manually and also fully automatically.

**Materials and Methods:** The assay has three steps. At the first step, apotransferrin molecules of the serum samples are completely saturated with iron atoms. In the second step, cobalt ions are added to the sample for the binding to albumin. In the last step, the remaining cobalt ions are bound to chromogen. The assay is calibrated directly using a novel calibrator and the results are given as serum IMA levels and also mol cobalt ions bound per one mol albumin molecule using synchronized measured of albumin.

**Results:** Original and conventional colorimetric IMA measurement methods were found to be inaccurately due to apotransferrins which bind cobalt ions. In the assay, this false positive interference was completely removed. In the conventional method, the pH value of the reaction medium was unstable status and in the new assay the hydrogen concentration of the reaction medium was stabilized using a new buffer solution. In the original and conventional methods, the results are given as absorbance in the form of AU, in the new method the results are given as SI unit.

**Conclusion:** The described colorimetric measurement method/kit, which has different assay principle, new reagents, novel chromogen and original calibrator/calibration process, has good analytical performance characteristics and it can be used to accurate measurement of IMA levels.

\*Granted by TÜBİTAK (117S455)

## **Big Benefits from Selectively Bred Fish \***

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Fish is crucial to any debate and action to reduce poverty and improve food security and nutrition. Until 2050, the increase in demand for animal-derived proteins will be doubled. Genetic improvement has been used for millennia on crops and livestock. However until the 1980s little work had been done with fish. Unfortunately %80 of aquaculture production still uses young fish from the wild. The results obtained from the selective breeding of aquatic species are very encouraging. Estimates of genetic gain per generation for key features such as growth rate can be doubled in 13% and 6<sup>th</sup> generations. In addition, more robust individuals are being achieved and promising developments are being made in obtaining more resistant individuals to diseases and environmental conditions. Aquaculture growers should be encouraged to start reproductive programs for large gains. To improve the sustainability of aquaculture and welfare of the animals, it is imperative to increase their productivity through selective breeding. This will increase productivity and make better use of natural resources. Also the welfare of the animals will be improved. Large genetic gains achieved with selective breeding are well documented with recent projects. The acquired knowledge should be shared with producers and sector directors to expand the application area.

### *Individual Custom Design and Production of Artificial Organs*

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Missing a limb or having to live with a deficient organ may affect living in a bad way. Medical procedures, treatment or therapy may make up the deficiency. Despite there are applications of artificial organs or limbs, there may be seen problems with attaching the organ or adapting to body due to the uniqueness of each person both anatomically and systemically. These problems and repeating the procedures after problems may cause activity and health deficiencies. Furthermore, adaptive period can only be monitored after the attachment procedure. The most common problem is, despite a successful operation, stinging feel of the attachment region caused by a slightest movement of the artificial organ. Surgeon must be well experienced for a successful artificial organ operation, even though a well experienced surgeon comes from many experimental operation. A total articular prosthesis is regaining articular function and stabilizing by replacing the non-functioning face of the articular with artificial materials, therefore aiming to relieve the pain. The project is creating a database with the current monitoring systems have acquired, run by a software then having a production ready sizing with "Finite Element Analysis" method. In addition, 3D scanning is used to acquire information to compare with the results obtained with Finite Element Analysis in the aspect of precision and producibility. The prototype of unique artificial organ is then created with a 3D Printer after choosing the proper material with reverse engineering method.

**Key words:** Artificial Organs, Reverse Code Engineering, Prostheses Prototyping

### *The Improving Potential of Biscuits Quality Produced with Quinoa Flour and Stevia-Based Preparation by Using HPMC and Inulin*

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Quinoa Includes Almost all kinds of vitamins, being rich in minerals, consisting of all basic amino acids, having ideal amino acid balance suggested by FAO in terms of histidine and lysine, compromising polyphenol, phytosterol, flavonoid in its formula, and having nutraceutical benefits is a highly nutritious and functional food product. Stevia is a sweetening with no calorie has been used as a natural sweetening in many countries. It is 300 times sweeter than sucrose and suggested for diabetic patients as it reduces the blood glucose without influencing insulin metabolism is used in almost every kind of food products, particularly in the formulation of bakery

products like biscuit. In this study, it was aimed to develop a novel and quality improved biscuit formula using quinoa flour and stevia for Celiac and Diabetic patients. Within the context of the study; it was made an effort to be partially eliminated quality weakness resulting from removal of two basic components (wheat flour and sucrose) of biscuit dough, by using hydroxypropylmethylcellulose (HPMC; 0%, 0.1%, 0.25%, 0.5%, 1%, 2%, 4%, and 6%) and inulin (0%, 0.5%, 1%, 2.5%, 5%, 10%, and 20%) additives at different levels. Important physical, chemical, color and textural properties of biscuit samples were determined. Addition of HPMC or inulin to the dough formula; increased the density of biscuit dough and decreased the biscuit thickness according to the control sample. Addition of HPMC resulted in a limited reduction in the diameter values and the biscuit volumes decreased in relation to the decrease in thickness and diameter values. No meaningful and significant effects were observed by using different levels HPMC and inulin on baking loss, moisture, color and texture values of biscuit samples. As a result, HPMC and inulin fortification at different ratios in the trial biscuit formula could not improve the product qualities. (This study is supported by Scientific Research Project Unit of Osmaniye Korkut Ata University)

**Key words:** Hydroxypropylmethylcellulose, Quinoa, Stevia, Biscuit, Inulin

### *Enzyme Mimic Aminoacid-Cu<sup>2+</sup> Hybrid Nanoflowers*

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Enzyme mimics have some advantages, such as having adjustable structures and catalytic activities, excellent tolerance to experimental conditions, low cost, as well as having catalytic activities similar to natural counterparts. As biomimetic catalyst, nanomaterials have been received much attention. However, enzyme mimetic nanomaterials have some serious disadvantages, such as the relatively low catalytic activity, specificity and selectivity. For this reason, in recent years, organic-inorganic hybrid materials have attracted much attention. Amino acids are considered as the major building blocks of all naturally occurring peptides and proteins. The interaction between metal ions and amino acids, peptides, or proteins have been known for over 60 years. The interaction between the aminoacids (and also peptides and proteins) and metal ions allows the formation of hybrid structures with flower-like shapes under certain conditions. In 2012, firstly Dr. Zare and co-workers reported protein-inorganic hybrid nanoflowers made of some proteins and Cu<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>·3H<sub>2</sub>O. Then several protein (enzyme)-inorganic hybrid nanoflowers have been subsequently reported. In this study, we synthesized organic-inorganic hybrid nanoflowers using some standart amino acids as the organic component

and Cu<sup>2+</sup> ions as the inorganic component under mild conditions. Then, some important features of the synthesized amino acid-inorganic hybrid nanoflowers were studied. For this purpose, SEM, FTIR, EDX and XRD analysis were performed. Enzyme like activities of the synthesized hybrid nanoflowers was also determined. (This study is supported by a grant (Project Number: FBA-2017-7311) from Scientific Research Projects Committee of Erciyes University)

**Key words:** Amino acid, Hybrid nanoflower, enzyme mimics

### ***Understanding Antifungal Activity and Inhibition Mechanisms of Various Plant Derived Natural Compounds***

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The significance of essential oils (EOs) extracted from different plants in food industry and medical applications as effective and nonhazardous antimicrobial agents have significantly grown in recent years. Besides, understanding inhibition mechanisms and main target sites of EOs in the cell are very important to improve more potent and specific antifungal agents. However, there is a significant limitation in usage of EOs due to variations in their content depending on differences in the extraction process and the period of storage. In this context, we aimed to investigate antifungal effects of various plant derived natural compounds including eugenol, thymol and carvacrol which are the major components of EOs such as thyme, oregano and clove oils against *Saccharomyces cerevisiae* cells. In this study, measurement of inhibition zones, minimum inhibitory and minimum fungicidal concentrations of EOs and their active ingredients such as eugenol, thymol, carvacrol and limonene were performed for the comparison of antifungal activity levels of both EOs and their more active ingredient. Not surprisingly, pure active ingredients are much more effective and reliable than the EOs. More importantly we showed that these reagents exert their activity via disruption of membrane integrity in yeast cells. For this reason, extracellular pH and conductivity measurements were carried out to demonstrate the extent of membrane damage caused by these reagents on yeast cells. These results increase our knowledge about the inhibition mechanisms of these plant derived natural compounds and can provide new insights to increase their usage in food, cosmetic and pharmaceutical industries.

**Key words:** Essential oils, active ingredient, antifungal activity, membrane integrity, *Saccharomyces cerevisiae*

### ***Labeo rohita as an Alternative to Turkey's Freshwater Fish Culture***

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Turkey has been restricted to freshwater aquaculture rainbow trout and carp species. Past fifty, sixty years dating back to the fish farming sector in Turkey, especially inland waters not limited only to the development of the two species has been prevented and go further. Turkey is the amount of fish from inland waters to produce about 105 thousand tons by the year 2016. A very important part of this is rainbow trout. The height of both the country's freshwater potential and the need for a new consumption alternative on the market are driving the relevant stakeholders towards alternative pursuits. In this context, Rohu carp (*Labeo rohita*), which is a species which can be easily produced in terms of cultivation techniques and can adapt easily to the climatic conditions of the country and can feed with foods of low animal protein origin and has easy fry production models, is attracting attention as an alternative species in our country. Rohu carp is the most important of the three major carp species used in polyculture systems. This elegant Indo-Gangetic species lives in the natural population of the river system of northern and central India and in the rivers of Pakistan, Bangladesh and Myanmar. The species have also been introduced in many countries, including Sri Lanka, the former USSR, Japan, China, and the Philippines, Malaysia, Nepal and some African countries. In recent years production values have exceeded 1.6 million tons. It is expected that the feed prices will increase further in the coming years and the interest in these species will increase.

**Key words:** Rohu, Labeo, Turkey, Alternative species

### ***Effects on Vegetable Production of Vermicompost Usage***

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Vermicompost is an organic fertilizer that is obtained by separating plant or food waste and passing through the digestive systems of red California worms. The worms pass the body fluids (syloimic liquid) that are found on their digestive systems and protect them, and the fertilizer provides resistance against pathogens in the plants. The worm's fertilizer is a clean agricultural product. The wormgrass contains a large number of symbiotic bacteria (*Rhizobium*) and bacteria (*Azotobacter*) and mycorrhiza fungi that fix nitrogen from asymbiotic microorganisms. These microorganisms break down the nutrients in the soil but not taken by the plant and transform it into a form that can be taken by the plant. In addition, nitrogen-fixing bacteria facilitate the uptake by the plant by providing the nitrogen in the air to the soil. It is 100% organic, ecological and non-toxic. The worm does nitrate residues in plants grown with fertilizer and its effect continues for 3-5 years. Plant resistance, rapid growth and development, provides early purity, improves soil with low humidities, increases the amount of organic fertilizers, stimulates beneficial microorganisms in the soil, accelerates root development in



the plant, increases fringing and improves soil regeneration. Seed germination reduces seed cost by providing 40% increase in energy. Seedling formation for 10-15 days and early harvest for 10-15 days. The aqueous solutions serve as pesticides on the leaves and hides. Liquid worm-fertilization is a combination of safe, natural, ecological, nutritive and empowering elements that accelerate the development and growth of the plant. The effects of liquid worm-fertilizer are 1-2 times more effective than those of solid worm-fertilizer.

**Key words:** Vermicompost, humus, organic matter

### ***The Effects of Ion Accumulation and Distribution of Roots and Levels of Different Nutrient Solutions in Curly Leaf Salad (Lactuca Sativa Var. Crispa) Grown in Water Culture***

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The study was carried out in order to determine the differences in the results of the applications of the different nutrient solutions applied to the Caipira variety curd salad grown in a water culture. The plants used in the experiment were cultured in the growth medium controlled climate conditions at 24 ° C, 16/8 hour light / dark and 70% moisture, in the cups containing Hoagland nutrient solution. Seven different applications were made in the study. In the first control group, standard hoagland solution was used. Magnesium (Mg) and phosphorus (P) were increased by 10% in the second application and Mg and Potassium (K) were increased by 10% in the third application and only Nitrogen (N) was increased by 10% in the fourth application by modifying the standard Hoagland nutrient solution. In the fifth application, the micro elements and N were increased by 10%. In the sixth application, the micro elements and K were increased by 10%. In the seventh application, Mg and N contents were increased by 10%. At the end of the study, the ion uptake and distribution of the samples taken from the root and leaves were examined. It is seen that there are differences between applications and plant organs.

**Key words:** Culture Of Stagnant Water, İon Accumulation, Curly Leaf Salad

### ***Evaluation of Acute Phase Proteins and Some Cytokine Levels in Pneumonic Calves***

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This study was conducted to determine the levels of various cytokines (TNF- $\alpha$ , IL-6, IL-8, ) and acute phase proteins (haptoglobin, serum amyloid A, CRP, alpha1-Acid glycoprotein, lactoferrin and fibrinogen) in pneumonic calves. Besides, in pneumonic calves according to etiologic factors (bacterial, viral, bacterial + viral), present changes in these parameters and determine whether these parameters could be used in the diagnosis and prognosis of the disease. The study was carried out on a total of 50 calves consisting of 10 healthy calves and 40 pneumonic calves aged 1 to 6 months. Pneumonic calves were classified in three groups as bacterial, viral and mix (bacterial + viral). It found that in pneumonic calves, IL-6, IL-8, CRP and TNF- $\alpha$  levels are statistically higher than in the control group animals. It is found that increase in levels of serum IL-6 and IL-8 are the highest in mix infected group (bacterial + viral), the minimal increase of these parameters is in viral infected group. Similarly, serum Hp, CRP, SAA,  $\alpha$ -1-AGP, LF levels were found to be more statistically significant (P <0.01) than the control group animals, but the changes in fibrinogen levels were not statistically significant. Although, TP and ALB levels of Pneumatic calves are found numerically higher than the same parameters of the control group, it was not statistically significant (P > 0.05). As a result; the determination of cytokine and acute phase protein levels can play an important role in calf pneumonia. Determining the levels of these parameters early can help to prevent deaths caused by pneumonia which is the leading cause of great losses and can also be helpful for early treatment of pneumonia in veterinary clinical field.

**Key words:** Calf, Pneumonia, Acute Phase Proteins, Cytokines

### ***Prevalence of Enteric Pathogens in Van Province Calves with Diarrhea***

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Diarrhea in neonatal period; It is one of the most important problems in Turkey and all over the world. It is usually seen within 2 to 10 days following birth and widely in the neonatal period (28 days). The etiology of neonatal calf diarrhea leads to significant economic loss as it causes widespread morbidity and mortality due to multifactorial. In this study aimed to determine the prevalence of rotavirus, coronavirus, E. coli K-99, Cryptosporidium and Giardia fecal samples in dairy calves and beef calves with diarrhoea collected from different localities covering in Van province, Turkey. The animal material of this study; 50 diarrheal calves were used at different ages, races and sex. When stool specimens are examined by rapid diagnosis test; The pathogenicity of 4% Rotavirus, 9% Rotavirus+E. coli, 10% E. coli, 12% Rotavirus + Cryptosporidium, 10% Cryptosporidium, 4% Rotavirus + Giardia and 7% E. coli + Coronavirus were detected in diarrhea and 44% other factors (except than bacterial, viral and parasitary agents) were identified. As a result, data on the presence and distribution of enterogenic pathogens causing



diarrhea in newborn calves in Van, Turkey were revealed and it was concluded that this study will provide a light for future scientific studies related with diarrhea.

**Key words:** Calves; Diarrhoea; enteric pathogens; prevalence

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***The Effect of Three Different Snood Design on the Catch Per Unit Effort (CPUE) on Silver-Cheeked Toadfish (*Lagocephalus Sceleratus*) Fishing with Longline***

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Silver-cheeked toadfish is an invasive species for the Mediterranean. It is a threat to human life by the fact that it is toxic. For this reason, the academic and administrative interest in this species is much higher than the other invasive species. In many countries, taking this risk into consideration; fishing, landing and selling all puffer fish species are prohibited. They are usually caught as non-target species in fishing for other species. This leads to difficulties for academic studies, especially where regular sample procurement is required. Deep trawl fishery, for example, is only carried out in a certain period of the year. Moreover, the amount of puffer fish obtained in trawling operations is very low and many other species are damaged too much. Similar situation applies in the set net fishery. For this reason, the most logical method for catching puffer fish looks like longline. It is known, however, that the puffer fish bite off the longline snoods. Therefore, there is a need to find solutions to this problem in supplying samples with longline. Within the scope of this study, three different snood designs were compared in terms of cut-off number and CPUE. The first snood type which fishermen traditionally used in demersal longlines was 80 cm length and 0.9 mm monofilament line. Second snood type was 80 lb of steel wire in the same length. In the case of the third snood type, a swivel and a clip were added to the end of the steel wire. The hook is attached directly to this clip. Hooks used in all three snoods are number 9/0. Other features of longline used are the same. (main line 1 mm, distance between snoods 9 m). The samples were conducted between March 2, 2017 and May 30, 2017 in the Finike Bay at depths of 15-45 m. A total of 30 operations were performed to obtain the data. One-way ANOVA analysis was applied to determine whether there was a difference between the snood types. The obtained data showed that the highest cut was in the first type of snood ( $7.10 \pm 1.20$  pcs / 100 hooks), followed by the second type of

snood ( $5.50 \pm 1.29$  pcs / 100 hooks). The lowest cut number was observed in the third snood ( $2.90 \pm 0.87$  pcs / 100 hooks). One-way ANOVA showed that there was a statistical significance of the snood type in terms of cuts ( $p < 0.05$ ). The highest CPUE value was obtained in the third type of snood ( $3.70 \pm 0.56$  pcs / 100 hooks). This was followed by the second ( $1.85 \pm 0.25$  pcs / 100 hooks) and the first ( $1.65 \pm 0.35$  pcs / 100 hooks) types of snoods. The effect of the snood type on the CPUE was found statistically significant ( $p < 0.05$ ). This study is supported by Çukurova University Scientific Research Project Commission (FDK-2017-7834)

**Key words:** *Lagocephalus sceleratus*, Longline, snoods, Northeastern Mediterranean

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***Bone Marrow Derived Mesenchymal Stem Cells Alleviate Cisplatin Induced Neuropathic Pain in Rats***

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Chemotherapy-induced peripheral neuropathy is a common adverse effect of many anticancer drugs. Effects of mesenchymal stem cells (MSCs) have been shown in several neurological diseases, however, there is no information about the effectiveness of MSCs in a widely used chemotherapeutic agent, cisplatin, induced peripheral neuropathy (CIPN) and neuropathic pain. So, we aimed to research the effectiveness of rat bone marrow derived MSCs in CIPN in rats. After measurement of mechanical thresholds neuropathic pain was induced by the injections of cisplatin for 5 weeks. Then we transplanted  $1 \times 10^6$  and  $5 \times 10^6$  MSCs by intravenous route. Some animals were injected with the PKH26 fluorescence dye labeled cells to evaluate the homings. We also evaluated the change of intraepidermal nerve fibers (IENFs) densities in foot pads of animals by immunohistochemistry technique. Spinal cord (L4-6) IL-1 $\beta$  and TNF- $\alpha$  levels were analysed by ELISA. Antiallodynic effect was observed 10 days after the transplantation of MSCs. Moreover, 5 million MSCs transplantations reversed the reduction in density of IENFs in the footpad that develops as a result of cisplatin treatment. Levels of inflammatory cytokines (TNF- $\alpha$  and IL-1 $\beta$ ) increased in the spinal cord of animals receiving chemotherapy, while the TNF- $\alpha$  levels decreased to control group levels in 5 million MSCs group. We observed that PKH26 labeled cells were located in the sciatic nerve and spinal cord samples with fluorescence microscopy. In our study, we have seen that MSCs can be effective in chemotherapy-induced neuropathy in rats, especially when high numbers of cells (5 million) are transplanted. MSCs may have shown their effects by homing to the damaged structures and possibly by reducing inflammation through a number of factors that they secrete.

This project has been supported by TUBITAK, we thank you for the support.

**Key words:** Mesenchymal Stem Cells, Chemotherapy Induced Peripheral Neuropathy, Cisplatin, Neuropathic Pain

### **Posterior Layering of 18F-Fluorodeoxyglucose in the Bladder on Positron Emission Tomography/Computed Tomography**

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Fluid-fluid level in the urinary bladder in 18F-fluorodeoxyglucose-positron emission tomography/computed tomography (FDG-PET/CT) imaging has been described in limited number of studies. Posterior layering of excreted FDG can be defined as the anterior placement of FDG free urine, when FDG is accumulated in the posterior bladder and the separation of these two different contents to give a definite border, usually in distended bladders. Although some hypotheses have been postulated concerning the cause of this rare phenomenon, such as infection or the precipitation of metabolically active cells such as tumor cells, or the delay in mixing with urine due to slow FDG excretion in the distended bladder, this has not been fully elucidated. In order to determine the frequency of this phenomenon and to evaluate the common features seen in the patients, 500 consecutive PET/CT images were retrospectively examined. Twelve patients (2.4%) were identified. When the blood tests of the patients were examined, 9 of 12 patients had C-reactive protein (CRP) result and all were high. Only 4 of the patients had urine analysis and one had urinary tract infection. Although the cause of this phenomenon has not yet been fully elucidated, because of high CRP outcome in our patients under study we think that it is closely related to infection or tumor burden. Therefore in our opinion, clinicians should be alert in terms of infection when fluid -fluid level seen in the bladder on PET/CT, and patients should be investigated with clinical and laboratory. This data showed that there is a need for more extensive and prospective research in this subject.

**Key words:** PET/CT, 18F-FDG, fluid-fluid level, urinary bladder.

### **Beehive Products and Their Antioxidant and Biotechnological Potentia**

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Bee products are used for centuries both as nutrients and in medicine. Once the investigation methods for the chemical composition of food products and of those used in conventional medical therapy and in alternative one were developed in the last decades, more and more answers are

found for the effects observed during centuries. Bee products are exhaustless sources of benefic factors for health and also for different biotechnological processes, for obtaining compounds and products with special properties. Honey, bee pollen, bee bread, propolis, royal jelly, apilarnil, queen larvae or bee larvae, are “alive” products, demonstrated by their analysis. One of our previous studies, using sensitive crystallization on honey, bee pollen and royal jelly, demonstrated clearly this. Antioxidant, antimicrobial and antitumoral properties were proved in different studies of our department, studies published in high ranked journals, having hundred citations until now. Honey is a complex matrix which possesses antioxidant and antimicrobial properties due to peroxidic activity and bioactive compounds from the class of polyphenols. The darker the honey, the higher the antioxidant and antibacterial potential is. Propolis is considered a powerful natural antibiotic, with excellent results as antibacterial and antitumoral agent due to its unique combination of resins in the chemical composition. Bee pollen, beside its excellent nutritional value, possess antitumoral properties, demonstrated by our research team and published recently. Royal jelly is used by the worker bees to feed the queen which have a lifetime ten times higher than a worker bee. One question raised from this observation: is there a connection between royal jelly and stem cells? Results obtained in antioxidant, antibacterial and antitumoral activity of bee products, open new and important perspectives in using these natural products in biotechnological and medical purposes.

**Key words:** Biotechnology, Bee Products, Conventional Medicine, Alternative Therapy

### **Effect of Nickel on Biological Heterotrophic Denitrification in Batch Units**

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Nickel is a common heavy metal and often occurs with nitrate wastewaters from mining and metal finishing industry. Biological treatment is considered as one of the most useful process to remove nitrate from water and wastewaters. Heterotrophic biological denitrification process is carried out under anoxic condition and an organic carbon is used as electron donor. In the biological denitrification process, microorganisms first reduce nitrates to nitrites and then produce nitric oxide, nitrous oxide, and nitrogen gas. The purpose of this batch experimental study was to investigate the effects of increasing concentrations of nickel on heterotrophic denitrification organism. The inoculation of microorganism lasted approximately five months for growth with daily replenishment of medium solution. Ni<sup>2+</sup> effect on the denitrification process by using ethanol as a carbon source were performed in serum bottles at the temperature of 32 °C. The samples were withdrawn daily from batch units and filtered using 0.45 µm filters. In order to determine the effects of Ni<sup>2+</sup> concentrations, experiments were carried by using synthetic wastewater. Experimental studies were

performed by varying the concentrations of Ni<sup>2+</sup> (zero (control), 3 and 5.0 mg/L) in three batch units for each concentration. Batch experiments were carried out 11 days and concentrations of NO<sub>3</sub>-N and NO<sub>2</sub>-N were determined in daily and initial and final concentrations of COD and MLSS were measured during the study. About 88% NO<sub>3</sub>-N removal efficiency and 2 mg/L of NO<sub>2</sub>-N in the final solution was observed in the control units. Although the NO<sub>3</sub>-N concentrations steadily decreased significantly as the applied Ni<sup>2+</sup> concentration to the denitrifying biomass increased, significant amount of NO<sub>2</sub>-N accumulation was observed for the applied Ni<sup>2+</sup> concentrations. About 5 and 42 mg/L NO<sub>2</sub>-N accumulations was observed for the initial Ni<sup>2+</sup> concentrations of 3 mg/L and 5 mg/L. Results of the experiments indicated that the Ni<sup>2+</sup> inhibited the overall denitrification process and caused accumulation of intermediates products.

**Key words:** Biological denitrification, Nickel, Wastewater

### *The Effects of the Biochemical and Physical Properties of The Baits (Lisa Carinata and Chelon Saliens) on the Catching Rate of Bluefish*

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Bluefish, an important species for professional fishing, is usually caught by pelagic longline in the Iskenderun Bay (North Eastern Mediterranean). In this method, mullet species (especially *Liza carinata* and *Chelon saliens*) are used as bait. The general belief among fishermen is that the catching rate of bluefish is the highest when *L. carinata* is used as bait. It is known that chemical and physical characters of bait such as freshness, odour and colour determine the catching rate of fish. Therefore, the aim of the current study was to investigate differences in catching rate of bluefish when two types of mullet were used as bait in terms of biochemical and physical parameters of baits. For this purpose, a total of 15 surveys were carried out and 131 bluefish individuals were caught: 68.83% of these individuals with *L. carinata* and 27.27% with *C. saliens*. The results showed that the types of mullet used as bait were statistically significant in catching rate of bluefish ( $P < 0.05$ ). It was also observed that there were significant differences in biochemical and physical parameters of two types of mullet. Their proximate components (protein, lipid and ash contents) and fatty acid compositions were significantly different from each other. Total MUFA and PUFA contents were found as 37.08% and 11.32% for *L. carinata* and 32.13% and 13.97 % for *C. saliens*, respectively. The hardness value was found as 3210.75-3284.90 g for *L. carinata* and 2231.93-2628.82 g for *C. saliens*. The whiteness value of *L. carinata* was determined in range of

61.43 to 93.56 for the head region and 67.40 to 90.01 for the tail region. For *C. saliens*, the whiteness value was found in range of 55.69 to 84.41 for the head region and 55.00 to 85.16 for the tail region. There were significant differences between all parts of two baits except upper part of head in terms of whiteness values. Therefore, it can be concluded that *L. carinata*, which has more harder and more whiteness properties, was more effective in bluefish catching. This project was supported by research fund of Cukurova University (FBA-2017-7834)

**Key words:** Bluefish catching, bait, catching rate, texture, colour, biochemical components

### *The Impact of the Addition of Fish Protein Isolate on the Oxidative Stability of Microencapsulated Anchovy Fish Oil (Engraulis Encrasicolus)*

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Microencapsulation technology is the most effective method to protect fish oil from oxidation and to mask fish oil's unpleasant flavour and odour. This method improves consumer acceptability and ease of use of a product owing to free flowing 'dry' powder form. Although there are many reports that food proteins such as milk proteins and soy proteins can be used as coating material for microencapsulation of fish oil, research on fish proteins as coating material is highly inadequate. This study represents the first scientific publication reporting fish protein isolate (FPI) made by pH shift processing as a coating material to encapsulate fish oil. The proteins of ponyfish (*Equulites klunzingeri*), discard fish, were extracted by using pH shift processing and used for microencapsulation of anchovy oil (*Engraulis encrasicolus*) as a coating material. As core material, 10% fish oil was used in all groups. In the first group, 10% sodium caseinate and 10% maltodextrin were used as coating material. In the second and third groups, 5% and 10% FPI were used instead of sodium caseinate, respectively. The oxidative stability of the microencapsulated fish oils was determined during a period of 7 weeks at 25 °C. The lowest value of peroxide value (PV) was obtained from fish oil containing 10% fish protein isolate after microencapsulation process. Although, there were significant increases in PV values in all groups during storage period, PV of all microencapsulated fish oils were below the Codex limit (10 meq/kg) for edible oil. No significant differences were found in free fatty acid values (FFA) and thiobarbituric acid values (TBA) between the control and FPI added groups after microencapsulation process. The highest TBA values (0.8-1.68 mg MA kg<sup>-1</sup>) were observed in microcapsules containing 10% FPI during storage. However these levels



were lower than the acceptability limit (2 mg MA kg<sup>-1</sup>). It can be concluded that addition of discard fish protein did not adversely affect the oxidative stability of microencapsulated fish oil. Therefore discard fish proteins can be used as coating materials for microencapsulation process.

**Key words:** Microencapsulation, fish oil, spray drying, oxidative stability, fish proteins

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***Seroprevalence of Toxoplasma Gondii, CMV, Rubella, HBV, HCV and HIV in Patients Admitted to a Pregnancy Outpatient Clinic in a University Hospital in Turkey, 2013-2017***

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Acute infections in pregnancy may cause abortion, intrauterine death, congenital anomalies, newborn infections; they can also lead to problems (deafness, cirrhosis, etc.) in older ages. In this respect, prenatal screening for Toxoplasma gondii (T. gondii), Rubella, CMV, HBV, HCV and HIV infections is important. In this study, the seropositivity rates of these infectious agents were investigated retrospectively in patients admitted to the pregnancy outpatient clinic during 5 years period (2013-2017). T. gondii IgG and IgM, CMV IgG and IgM, Rubella IgG and IgM, HBs Ag, anti-HBs, anti-HCV, anti-HIV antibodies were detected by enzyme immunoassay tests. T. gondii IgG antibodies (n=778) were detected in 41.5%, CMV IgG (n=330) in 98.5%, Rubella IgG (n=1730) in 96.5%, HBs Ag (n=506) in 1.2%, anti-HBs (n=207) in 51%, anti-HCV (n=227) in 2.2% women. Anti-HIV antibody (n=270) positivity was not observed in any patients. The seropositivity rate of T. gondii IgM (n=5588), Rubella IgM (n=5742) and CMV IgM (n=4985) were found as 3.1%, 0.6% and 0.3% respectively. The results of study suggest that CMV and Rubella have high seroprevalence rates and these rates can prevent from acute infection and harmful effects during pregnancy. But approximately 58.5% of women in this study have no IgG antibodies to T. gondii and this population are susceptible to infection with toxoplasmosis. It should also be remembered that HBV, HCV and HIV are significant intrauterine infections and they should be detected in pregnant women in suspicious situations.

**Key words:** Pregnancy, intrauterine infection, TORCH, HBV, HCV

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***Effects of Garlic (Allium sativum) Oral Supplementation on Some Blood Biochemical Values of Rainbow Trout (Oncorhynchus mykiss)***

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In this study, garlic (*Allium sativum*) was added to the rainbow trout (*Oncorhynchus mykiss*) diet and the effects of garlic supplemented feed on some blood biochemical values of trout fry were investigated. Research was done in cages placed in the concrete pond. In this study, garlic was added to the fish diet at the rate of 0.00% (G1-Control), 1.00% (G2), 1.50% (G3) and 2.00% (G4). In the experiment, 240 rainbow trout fry with an average live weight of 7.5 g were used. At the end of the feeding period, the live weights of the fishes reached 171,35 ± 1,52 g, 176,34 ± 2,14 g 181,97 ± 1,9 g, and 186,45 ± 2,5 g respectively. Calcium (Ca), Chlorine (Cl), Glucose, Albumin, Amylase, Bilirubin, Total Bilirubin and Potassium (K) levels were investigated in blood serum samples. The highest Ca, K, Albumin and Cl levels were found in the group with 2% garlic added, while the lowest values were determined in the control group. The highest glucose, amylase, bilirubin, and total bilirubin were determined in the control group while the lowest values were seen in the group fed with 2% garlic supplemented diet. As a result of the research, it was determined that the garlic added to the fish diet lowered the glucose level, which is increased in the trout blood Ca, K and Cl levels. Çalışma Ç. Ü. Araştırma Projeleri Birimi Tarafından Desteklenmiştir. Proje No: FYL-2015-3781

**Key words:** Blood Biochemicals, Trout, Garlic.

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***Theoretical Structure Analysis and DNA Interaction of an Anticancer Molecule***

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The piperazine-derived molecule has several important biological activities, such as anticancer, antimicrobial, etc. Since biological activities depend on the structures of the molecules, the determination of the conformation of the molecule has a very importance. The conformational states of piperazine-derived molecule that we have studied have been determined by conformational analysis. Optimized molecular structure of the subject molecule was then obtained optimizing the lowest energy conformation with 6-31++G(d,p) basis set at the DFT/B3LYP theory level by using Gaussian03 software. Some characteristic frequencies and IR and Raman intensities of the optimized molecule were calculated. Molecular docking is an important method for the identification of the active site of the receptor due to ligand-receptor interaction in the field of computational structural

biology, computer-aided drug designing. The goal of ligand-receptor binding is to predict the dominant binding mode of a ligand with a protein having a known three-dimensional structure. In this respect, ligand-receptor binding sites can be determined. In addition, because of the pharmacological target of most of the drugs used in clinical trials is DNA, the active site and orientation depending on the DNA interaction of piperazine-derived molecule have been determined and the binding energy is calculated. Depending on the binding energies, nine docking sites have been identified.

**Key words:** Conformational analysis, DFT, Docking

### *Some Properties of Ayran Fortified with Black Carrot Powder*

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Ayran is a traditional Turkish salty drinkable fermented product prepared by the addition of water to yogurt or by the addition of yogurt culture to standardized milk. Black carrot is well known as a very rich source of anthocyanins and combining with ayran was obtained a product that is natural, nutritious and highly attractive for consumer. In this study, black carrots were dried and powdered by freeze drying method and four batches of ayrans were manufactured by adding dried black carrots into the milk at increasing rates. One batch was treated as a control sample without black carrot addition and three batches of ayrans were manufactured by adding black carrot at the rates of 0.25%, 0.5% and 1%. All of the samples were pasteurized at 90°C for 5 minutes. Following the pasteurization, milks were cooled to 46±1°C and then inoculated with starter culture. Inoculated milks were incubated until 4.6-4.7 pH. Ayran samples were cooled down and 0.5% salt was added. The mixture was homogenized and filled into 200 g of cups and stored at 4°C before analyses. At the 5th and 20th minutes, the lowest antioxidant activity values were found to be 5.88% and 6.08% for control sample, while the highest antioxidant activity values were found 19.90% and 21.6% for ayran with 1% black carrot. Increasing concentrations of added black carrot into the milk, resulted higher antioxidant activity in ayran as determined by DPPH method ( $p < 0.05$ ). However, pH, dry matter, fat, protein and salt contents of the ayran samples were not influenced by black carrot addition ( $p > 0.05$ ). Acknowledgement: The authors express their gratitude to Cukurova University for financial support (Project No: FBA-2017-5695).

**Key words:** Antioxidant Activity, Ayran, Black Carrot, Composition

### *Structural and Docking Analysis with Nicotinic Acetylcholine Receptor of Thymopentin (Arg-Lys-Asp-Val-Tyr)*

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Thymopentin, an immunomodulatory peptide, has an important antitumor activity. Due to the association between molecular structure and activity, possible geometries of this molecule have been obtained by conformational research. The lowest energy conformation, obtained after the conformational search, is optimized at the B3LYP theory level with the density function theory by using Gaussian03 software. Some characteristic vibrational wavenumbers, IR and Raman intensities are calculated. Molecular docking has an important and effective use area in various fields, mainly computer-aided drug designing. Determination of the docking sites based on binding energy in ligand-protein, protein-protein, etc. interactions is an important step for efficient and rational drug design. The interaction of a protein with a small molecule plays an important role in protein dynamics, which can either increase or prevent biological function. The thymopentin molecule inhibits catecholamine release by regulating the responsiveness of the nicotinic receptor, which has important physiological functions and causes pathology when its structure deteriorates. Since drugs can be developed or improved according to the docking site, it is important to know the site of interaction between this molecule and the receptor. Depending on the binding energy, the active sites of the receptor and the possible conformation and orientation of the molecule in the receptor have been found and suggested.

**Key words:** Conformational analysis, DFT, Docking

### *The Quality Characteristics of Probiotic Yogurts Containing Dry Plum at Different Ratios During Storage*

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Fruit addition to yogurt impart natural flavours and contribute to health of the consumers by enhancing nutritive and functional properties of the yogurt. In this study, probiotic yogurts, which contain *Streptococcus thermophilus*, *Lactobacillus delbrueckii ssp. bulgaricus*, *Lactobacillus acidophilus* and *Bifidobacterium bifidum*, were produced with dry plum addition at a various level (0%, 6%, 9% and 12%, w/w), stored at 4°C ± 1°C for 15 days; and examined

the quality properties of probiotic yogurts containing dry plum. It was determined that the addition of dry plum at different ratios significantly affected the pH values of probiotic yogurts, titratable acidity, serum separation values showed significant changes in some periods of storage ( $p < 0.05$ ). Volatile fatty acids, acetaldehyde, gel firmness and viscosity values were found to be statistically insignificant ( $p > 0.05$ ). During storage period, titration acidity values of yogurt samples increased significantly and pH, volatile fatty acids, acetaldehyde; whey separation values showed great variation ( $p < 0.05$ ). However, gel firmness and viscosity values were not statistically significant ( $p > 0.05$ ). The sensory quality (taste, odor, structure and acidity) of the samples decreased after 8 days. The yogurt sample with the addition of 12% of dry plum had the highest score until the 8th day of storage, while the control sample was the highest score on the 15th day of storage. This study showed that the level of 12% of dry plum is recommended for probiotic yogurt production.

**Key words:** Dry Plum, Probiotic, Storage, Yogurt, Yogurt Quality

### ***Determination Method of Volatile Aromatic Compounds of Grape Must by SPME/GC-MS***

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Volatile compounds that are responsible for the aroma of grape must and wines, directly affect the quality. To determinate the volatile aromatic compounds, an analytical method based on SPME/GC-MS was developed and validated. For preliminary experiments different fibers have been tested at different temperatures, pressure and retention times. In the preliminary experiments, the program of temperature and duration has been modified, in particular during the first 10 minutes of injection, depending on whether the peaks are intercalated. The modification resultant peaks were completely separated and more accurate results were achieved. For analysis, 1 g of NaCL was added to the 5 mL must in a beaker for setting the free form of the volatile components and vortexed for 30 seconds. The must was heated to 40 °C and left to stand for 40 minutes with 65 µm PDMS / DVB (Supelco, Bellefonte, PA, USA) fiber. Subsequently, the fiber was injected into the GC-MS device and the analysis was carried out. Aroma analysis was performed by Shimadzu QP-2010/GC-MS with a Restek RTX-5MS (30mx0.25mmx 0.25µm) column. GC-MS parameters of the method used in our study were; injection temperature: 250°C, pressure: 49,7 kPa, column flow rate: 1.00 mL/min, column temperature 40°C, waiting time at first temperature: 5 minutes, increase rate: 4°C/min. to 240°C, waiting time at final temperature: 10 min, split ratio: 1/10. To identify the peaks obtained after the injection, the C7-C30 alkane series were injected into the device respectively, GC-MS libraries were defined after the method parameters were

entered into the device as a method. The volatile aromatic compounds in the musts were determined on the carbon series similarity at 85% and above and 60 different volatile aromatic compounds such as ethyl acetate, isobutyl alcohol, ethanol, 3-methyl-1-butanol, 1-hexanol are determined in grape must samples.

**Key words:** Grape, Must, Aroma, GC-MS, SPME

### ***Modified Rhizobia in Bioremediation***

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One of the main methods for phytoremediation of soils, contaminated by heavy metals (HM), is the using of effective symbiotic plant-microbe systems. Transformation of the beneficial symbiotic soil bacteria with phytochelatin genes can improve the availability of HM for the plants. There is usually a gamma peptide bond in phytochelatin. This bond complicates synthesis of phytochelatin in bacterial cells. That is why synthetic pseudophytochelatin genes, that encode phytochelatin without gamma peptide bond, are promising for transformation of symbiotic bacteria. In this study we obtained the rhizobia *Rhizobium leguminosarum* 1078 modified with a genetic construct carrying pseudo-phytochelatin gene pph6 (the product of pph is capable of binding HM). Previously we obtained transgenic tomato plants with psl gene, characterized by high adhesion to the roots of *R. leguminosarum* 1078. Transgenic with psl gene and non-transgenic tomato (control) plants, growing on soil containing cadmium, were inoculated with either modified with pph6 or non-modified bacteria. In the case of inoculation plants with the modified strain, the amount of cadmium in plants increased significantly. The amount of cadmium was 2.7 times bigger in non-transgenic plants, inoculated by modified strain, compared to control plants, inoculated by the wild strain, and non-inoculated control plants. In transgenic plants with psl gene the amount of cadmium was 3,4 times bigger after treatment with modified strain, than in all the plants that were inoculated with wild strain, or were not inoculated at all. These results indicate that the complexes, that are formed between cadmium and the product of pseudo-phytochelatin gene pph by rhizobia, are excreted into the rhizosphere, which contributes to the accumulation of cadmium in plants. Undoubtedly, new symbiosis of transgenic plants with cadmium-binding bacteria can be used in phytoremediation. This study is supported by the Russian Foundation for Basic Research (projects № 16-04-00902 A and №18-34-00033)

**Key words:** Rhizobia, Phytoremediation, Heavy Metals, Lectin, Phytochelatin, Pseudo-Phytochelatin



### ***Influence of Dietary Supplemental Garlic (*Allium sativum*) on Liver Enzyme Values of Rainbow Trout (*Oncorhynchus mykiss*)***

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In this study, rainbow trout (*Oncorhynchus mykiss*) was fed for 120 days with feed containing garlic (*Allium sativum*) at different rates. The effects of garlic red rainbow trout on liver enzyme values were investigated. Research was established in cages placed in the concrete pond. In this investigation, garlic was added to the fish diet at the rate of 0.00% (G1-Control), 1.00% (G2), 1.50% (G3) and 2.00% (G4). In the experiment, 240 rainbow trout fry with an average live weight of 7.5 g were used. At the end of the feeding period, the live weights of the fishes reached  $171,35 \pm 1,52$  g,  $176,34 \pm 2,14$  g,  $181,97 \pm 1,9$  g, and  $186,45 \pm 2,5$  g respectively. The alanine aminotransferase (ALT), aspartate amino transferase (AST) and lactate dehydrogenase (LDH) levels were determined from the serum obtained from blood samples of the recipient. When the liver enzyme values are examined; alanine aminotransferase (ALT), aspartate amino transferase (AST) and lactate dehydrogenase (LDH) levels were highest in the control group and lowest in the group fed with 2% garlic supplemented diet. As a result of the research, it was determined that the rainbow trout of garlic added to the fish diet lowered the liver enzymes. Bu Çalışma Ç. Ü. Araştırma Projeleri Birimi Tarafından Desteklenmiştir. Proje No: FYL-2015-3781

**Key words:** Dietary, Garlic, Trout, Liver enzymes.

### ***Investigation of 8- hydroxydeoxyguanosine (8-OHdG) Levels as the Marker of Oxidative Stress in Glial Tumors***

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Gliomas are the most common primary brain tumor and the heterogeneous group of brain malignancies. Oxidative stress is defined as an imbalance between the production of free radical metabolites as reactive oxygen species (ROS) and the protective mechanisms against them. However, the association oxidative stress and the malignancy potentials of gliomas remain unclear, a few studies examined high levels of oxidative stress in patients with glioblastoma. This study we determined the level of oxidative stress using 8-hydroxydeoxyguanosine (8-OHdG) as the key marker for DNA damage caused by oxidative stress to display possible

relation between the 8-OHdG and glial tumors. Therapeutic strategies by modulating oxygen stress in glioblastoma. This study consist of 98 adult subjects that diagnosed with glioblastoma (n=41) and healthy controls (n=57). All of the participants were selected from the Neurosurgery Department of Yeditepe University. Serum 8-OHdG levels determined with ELISA method. According to results of our research, mean value of serum 8-OHdG levels were  $43,97 \pm 33,21$  ng/ml, while mean values of controls were  $5,24 \pm 4,52$  ng/ml. Statistical analysis revealed there were significant difference with regard to serum 8-OHdG levels, as mean values of glioblastoma group had significantly higher serum 8-OHdG levels ( $p < 0,0001$ ). Our study provides evidence that high levels of serum 8-OHdG is associated with glioblastoma risk. This results indicate the importance of DNA damage mechanism in the pathogenesis of gliomas. Furthermore 8-OHdG could be considered as promising marker of oxidative stress in Glial Tumors.

**Key words:** 8-OHdG, Glial Tumors

### ***Isolation of Capsanoid and Its Analogues from Pepper Wastes***

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Pepper, a member of the Capsicum genus of the nightshades (Solanaceae) family, is an annual, cultivated plant that grows in temperate climates. The species that grows in the East Mediterranean and Southeast Anatolia regions is known as Capsicum annuum L. The main analogues of capsanoids, which are the secondary metabolites of peppers, are capsaicin and dihydrocapsaicin. The amount of capsaicin is a little higher in comparison to other analogues and it is an important active ingredient used especially in food, pharmaceutical and cosmetic industries. The extraction of capsanoids from peppers, which play an important role in nutrition, is well-established. In this study, capsanoids were extracted from the peduncle and calyx parts, which are defined as waste, using suitable optimization and method. With this purpose, the green calyx and peduncle parts of peppers of 4 different genotypes belonging to Capsicum Annuum L. species were collected and dried in the shade. Extraction was performed in MeOH solution and extracts were analyzed using HPLC. This allowed quantifying capsaicin and dihydrocapsaicin content in each sample. As a result, capsanoid and its analogues were identified in all peppers that had different genotypes and pungency and their capsaicin and dihydrocapsaicin content was quantified. In conclusion, the highest amount of capsanoids was found in chili Samandağ pepper, whereas the lowest amount of capsanoids was found in sweet red pepper. In peppers of all genotypes, the amount of capsaicin was higher in comparison to dihydrocapsaicin.

**Key words:** Capsaicin, Capsicum Annuum L, HPLC

### *In Vitro Cytotoxic And Genotoxic Effects Of Newly Synthesized Boron Ionic Liquids*

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In this study, molecules containing new boron were added to the family of ionic organic compounds and boron's new ionic liquids with a cationic center were synthesized. Boron's cationic forms take shape in three distinct ways; as boronium, borenium and borinium. This study aimed to determine the cytotoxic and genetic effects of a total of four newly synthesized borenium and borinium compounds on human peripheral blood under in vitro conditions. All heparinized blood samples used in the genetic and cytotoxic studies were collected from healthy females aged between 29 and 32, who had not been exposed to any toxic agents before, and who do not smoke or consume alcohol. MTT 3-(4,5-dimethylthiazole-2-yl)-2,5-diphenyltetrazolium-bromide and lactate dehydrogenase (LDH) tests were conducted in order to determine the cytotoxicity following the application of the four boron compounds, which were the products of a new synthesis on the cell lines in different concentrations (1.56, 3.12, 6.25, 12.5, 25, 50, 100, 200 and 400mg/l). Micronucleus (MN) and sister chromatid exchange (SCE) tests were conducted for genotoxicity and the cytotoxic and genetic difference frequencies occurring in each dose of the boron compounds were calculated. While borenium compounds did not exhibit cytotoxic activity in the MTT and LDH tests even in high concentrations, the borinium compound did not exhibit cytotoxic effects in lower concentrations under in vitro conditions. The borenium compounds did not exhibit genotoxic effects in analyses concluded via SCE and MN. In addition, it was determined that applying a high concentration of borinium increased the micronucleus rate in comparison to the negative control group. As a result, it has been established that this new synthesis of cationic boron compounds can be used reliably, taking into consideration their types and concentrations.

**Key words:** Borenium, Borinium, MTT, LDH, MN, SCE

### *Characterization of immunodominant E2 gene regions of local strains from BVDV infected cattle*

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BVD virus is an enveloped RNA virus; located in the genus of Pestivirus, belongs to Flaviviridae family. BVDV is a ubiquitous infectious agent and economically important disease which causes reproductive disorders, abortion, stillbirths, weak calves, congenital anomalies, reduced milk production, neonatal mortality and persistently viremic calves. Genetic characterization studies are being carried on to investigate genetic relationships between BVDV isolates containing linear, single-stranded, positive-sense RNA. A total of 20 blood samples was detected positive by ELISA from persistent animals in a cattle herd where there were about 1000 animals in our country. With ELISA positive field strains, PCR reactions were carried out against the complete E2 gene region. Obtained PCR products were screened for endonuclease activity by BglII, KpnI, EcoRI, RsaI enzymes. The results of this study show that although the region of interest is the major envelope protein, this local RNA virus is thought to be different from the genetic structure of other BVDV strains on the globe that are introduced into the Genbank database. BVDV is still remaining an important infection on livestock industry worldwide and Turkey. It should be noted that the success of BVDV eradication programs requires the use of vaccines containing appropriate isolates, including new local strains.

**Key words:** BVDV, cattle, ELISA, PCR

### *A Novel Method for Detection of Complex Vertebral Malformation, Bovine Leukocyte Adhesion Deficiency, BRACHYSPINA SYNDROME, Bovine Citrullinemia, Deficiency Of Uridine Monophosphate Synthase and Factor XI Deficiency in Cattle*

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In breeding programs, it is very important to control and eradicate recessive hereditary defects from population. It requires taking out carrier animals with normal phenotype. At this point highly reliable analysis methods for genetic defects become crucial. Bovine leukocyte adhesion deficiency (BLAD), deficiency of uridine monophosphate synthase (DUMPS), complex vertebral malformation (CVM), bovine citrullinemia (BC), brachyspina (BY), factor XI deficiency (FXID) are autosomal recessive genetic defects and they cause economical losses. The aim of this study is to optimize multiplex PCR for detection of BLAD, CVM, BC, DUMPS, BY and FXID genetic defects. PCR, PCR-RFLP and RT-PCR methods were used for this aim and 24 bulls in the International Center for Livestock Research and Training were analyzed. It was found none of bulls to carry mutant alleles. We developed real-time PCR-based assays for identification of wild-type and mutant alleles of CVM,

BLAD, DUMPS and BC thus carriers can be detected. By this method, run time of analysis was shortened and results were of high reliability. Real-time PCR is a simple, rapid and reliable assay for BLAD, CVM, DUMPS and BC mutant allele identification. Since artificial insemination is widely used in dairy cattle breeding, carriers of BLAD, CVM, DUMPS, BC, BY and FXID in the population of cattle. Implementing a routine testing system is necessary to these mutant genes in order to avoid an unwanted spread within the population. This Study Supported By General Directorate Of Agricultural Research And Policies (Tagem)

**Key words:** BLAD, DUMPS, BC, BY, FXID, CVM, RT-PCR, RFLP-PCR

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### *Genes of Expansins and XTHs Enhance Productivity and Stress-Tolerance of Transgenic Tobacco Plants*

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One of the major problems of science and agriculture is the improvement of productivity and stress-tolerance of the plants. It is known that expansins and xyloglucan endotransglucosylase/hydrolases (XTHs) participate in cell expansion and, consequently, in plant growth and prevention of dehydration. Transgenic tobacco plants with expansin genes NtEXPA1, NtEXPA4 and NtEXPA5, and XTHs genes PnXTH1, NtEXGT and SIXTH10 were obtained through agrobacterium-mediated transformation of leaf disks. The size of the stems, leaves, roots, as well as raw and dry weight of control and transgenic plants were measured in normal conditions and under drought, cold and salinity stress. Under moderate stress transgenic plants showed better performance than control nontransgenic plants. However, under severe stress the advantage was lost. 35S::NtEXGT plants of tobacco showed higher rate of root growth under all types of stress. Constitutive expression of poplar gene PnXTH1 in tobacco resulted in an increase of leaf size and weight under normal conditions and better salinity tolerance. Estradiol-inducible expression of tomato gene SIXTH10 after estradiol treatment of transgenic tobacco plants resulted in weight enhancement under normal conditions, drought and salinity stress and better root growth under 50 mM NaCl. Constitutive expression of NtEXPA1 and NtEXPA5 genes in tobacco resulted in an increase of leaf and stem size under normal conditions. Under salinity stress only stem size increased. Under +12°C NtEXPA5 gene promoted the growth of whole plant, however NtEXPA1 promoted only root growth. The down-regulation of NtEXPA4 gene resulted in a decrease in stress-tolerance of transgenic plants. So, XTHs genes can be recommended to improve drought tolerance of the plants, and expansin genes – to improve cold tolerance. Overexpression of either expansins or XTHs gave the plants an advantage under salinity stress. Acknowledgement: The reported study was funded by Russian Foundation for Basic Research according to the research project № 18-04-00118

**Key words:** Nicotiana tabacum, expansins, XTHs, NtEXPA1, NtEXPA4, NtEXPA5, PnXTH1, NtEXGT, SIXTH10

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### *Endangered Species Trapa L. can Become a Valuable Food and Pharmaceutical Source Through Proper Aquaculture*

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The water caltrop (or water chestnut) *Trapa L.* is an aquatic plant of the family Lythraceae. On the territory of Russia it is relict and extinct. However, it is cultivated by men since the Neolithic times both for nutrition and forage. In the XX century there was a great decrease in the number of *Trapa L.* in Russia, mainly due to the intensification of economic activity. With the introduction of potato, the water chestnut has been undeservedly forgotten, whereas its properties significantly exceed the potato, in particular, it can contain 10 times more protein. The unique properties of the water chestnut, such as the ability of its roots to photosynthesize, as well as the high antibacterial and anti-fungal activity of the inner shell of its fruits, can also find practical application. It is most often suggested there is only one polymorphic species (*Trapa natans*), represented by two subspecies with four and two horns, respectively. However, in USSR there were differentiated more than 30 species. We gathered the fruits of water caltrop from the lake Upkankul which is situated in The republic of Bashkortostan (Russia) and germinated them in aquarium on putrid mud with 90% efficiency. We also introduced the plant to nearby lakes with proper pH level. In disk diffusion test the water and ethanolic extracts of the water chestnut were nearly as effective against bacteria as antibiotic cefotaxime. RAPD and ISSR analysis indicated genetic polymorphism between Russian populations of *Trapa L.* in Bashkortostan, Amur region and Primorye. We suppose there are many species of water caltrop in Russia, and the one in the lake Upkankul is, the most likely, *Trapa sibirica*.

**Key words:** *Trapa L.*, *Trapa sibirica*, Water Chestnut, Water Caltrop

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### *Vibrational Spectroscopic Monitoring of Cobalt Phosphate Nanoflower Formation for Biomolecule Immobilization*

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Investigation of formation mechanisms of nanoflower crystals is still a popular topic which gives critical information on many useful properties and functionality such as enhanced activities of immobilized enzymes on/in these nanostructures. Formation of flowerlike Co<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> nanocrystals has been monitored by vibrational spectroscopic measurements in certain time intervals to follow the developments of the cobalt phosphate nanoflower (CoPNF) in the sense of structural growth. In the next step, amino acid incorporated hybrid nanoflower (aminoacid@ CoPhNF) will be synthesized. CoPNF were prepared from aqueous cobalt sulfate solution by mixing phosphate buffer solution. The mixture was incubated at different time intervals changing from 1-72 hours. The purple precipitate formed were centrifuged and dried under vacuum before spectral recording. The SEM image and the IR spectra recorded successively at certain time intervals confirm the structural change of CoPNF nanostructure.

**Key words:** Copper phosphate, nanoflower, IR spectrum

### Use of Edible Bioactive Films in Kashar Cheese Coating

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In the food industry, pathogenic microorganisms cause food spoilage after packaging. In order to prevent spoilage, antimicrobial and antioxidant additives are used to protect the quality and safety of the food. In this respect, food packaging materials are generally synthetic based, while biodegradable and edible films and coatings have become more widespread in recent years. The use of bioactive films in packaging has many advantages. The use of inexpensive, environmentally friendly, soluble bioactive polymeric films significantly reduces the use of synthetic materials, thereby contributing to environmental pollution control. In this study, antimicrobial effects of cellulosic edible films against *Escherichia coli* were evaluated on real food matrix.  $\beta$ -carotene was extracted from oleaginous yeast *Rhodotorula glutinis* to obtain biological origin polymeric films. The extracted  $\beta$ -carotene is added to the composition of the films at 1-5%. Kashar cheese slices used as food matrix were contaminated with *E. coli* at 0.5 McFarland level. Artificially contaminated cheese samples were coated with prepared bioactive films and stored at 4°C for 15 days. The antimicrobial effectiveness of the films was evaluated by measuring the 1st, 5th, 10th and 15th days of the storage period. Antimicrobial activity of bioactive films against *E. coli* was determined. According to the control group, application of edible films to samples have resulted 1-3 Logs reduction in the count of *E. coli*. Characterization of the films was analyzed by FT-IR, DTA, TGA and DSC

instruments. Inonu University Scientific Research Projects Management Unit

**Key words:** Bioactive films, Cellulose,  $\beta$ -carotene, *Escherichia coli*, Kashar cheese

### First Comparison Report of The Genetic Based Polymorphism in *Leishmania infantum* Genome Sequences of Turkish Strain and Reference *Leishmania infantum* JPCM5 Strain

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Only a decade has passed since *Leishmania* whole genome sequence (WGS) was first sequenced. Today, several *Leishmania* species still have high quality and completed genomes such as *Leishmania infantum* JPCM5 (Reference Strain Sequence, RefSeq). The aim of this study is to generate that the WGS of *L. infantum* causing cutaneous leishmaniasis from Turkish isolate and compared RefSeq. Genomic sequencing was performed on the Illumina HiSeq 2500 platform. Bioinformatics analyses were performed web-based analysis system Genius 11.0.5. (www.genius.com) platform. *Leishmania infantum* Turkish strain WGS, which is named *Leishmania infantum* TR01 (Lin\_TR01), is submitted to the NCBI GenBank ([www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)). Sequences generated by this study are available from National Center for Biotechnology Information, USA, (NCBI) (accession numbers: CP027807, CP027810, CP027808, CP027811, CP027809, CP027812, CP027813, CP027814, CP027817, CP027818, CP027819, CP027815, CP027821, CP027816, CP027823, CP027820, CP027822, CP027824, CP027825, CP027826, CP027827, CP027828, CP027829, CP027830, CP027831, CP027832, CP027833, CP027834, CP027835, CP027836, CP027837, CP027838, CP027839, CP027840, CP027841, CP027842). As the result of Lin\_TR01 genome annotation was found 3153 polymorphisms of 36 chromosomes, 8324 Gene, 8199 CDS, 8109 mRNA, 67 tRNA, 11 rRNA and 58 ncRNA. Founded the 3153 polymorphism is included 799 deletion, 528 insertion, 511 substitution, and 1315 SNPs. In addition, the effects of these polymorphic changes on proteins were 3 deletion, 5 extension, 44 frame shift, 2 insertion, 299 substitution, 11 truncation and 102 (none). In the obtained 8199 CDS, 5278 hypothetical proteins (Hypothetical protein CDS) were found. Generated by this study Lin\_TR01 sequences is the first WGS from Turkey. In this study, is to explain the firstly comparison report of the genetic based polymorphism in *L. infantum* genome sequences of Turkish strain and reference *L. infantum* JPCM5 strain. There is a need for more advanced studies to understand that the meaning of the polymorphisms found in this genome.

**Key words:** CL-*Leishmania infantum*, Next Generation Sequencing Technology, Whole Genome Sequencing

### ***Leishmania infantum-Whole Genome Sequencing: The First Study Since The Reference Genome***

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*Leishmania* subgenus *Leishmania* is causing Leishmaniasis which is a chronic systemic disease in humans and animals can keep the skin and visceral organs. The disease generally constitute three different clinical table in humans [visceral (kala-azar, VL), cutaneous (CL) ve mucocutaneous leishmaniasis (MCL)]. According to World Health Organization (WHO), Leishmaniasis is still one of the world's most neglected diseases. It has been nearly 10 years since the completion of the first entire genome sequence of a *Leishmania* parasite. However, there are still many things in the dark for scientists such as the causes of differences in tissue tropism. The aim of this study is to remove that the whole genome sequencing with next generation sequencing technology of *L.infantum* causing cutaneous leishmaniasis from turkish isolate. Genomic sequencing was performed on the Illumina HiSeq 2500 platform. The "TruSeq Nano DNA Low Throughput Library Prep Kit" compatible with the "Illumina HiSeq 2500" platform was used to create the library. Synthesis sequencing (SBS) was performed with HiSeq Rapid SBS Kit v2 in the form of single fragment readings (2 x 150 bp; PE) with two fragment end-to-end assemblies. Bioinformatics analyzes were performed Genius 11.0.5. (www.genius.com) platform. The whole genome sequence of *L.infantum* Turkish strain was successfully obtained 32,009,138 bases total length. The Genome has been submitted to the NCBI GenBank (www.ncbi.nlm.nih.gov). The accession numbers of the 36 chromosome of the *L.infantum* genome available from the NCBI (BioProject PRJNA437593). There are no "whole genome sequence" studies or genomic studies conducted in *Leishmania* species in our country. Moreover, the fact that the study is carried out with the *L.infantum*, which has the causing-CL, makes this study more specific. We believe that the data obtained will provide a basis for *Leishmania* genomic studies in our country and contribute to global studies in this topic.

**Key words:** Next Generation Sequencing Technology, CL-*Leishmania infantum*, Whole Genome Sequencing

### ***Effect of Morphine Combination with Paclitaxel in Triple Negative Breast Cancer Cell Line***

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Breast cancer is the most commonly diagnosed cancer among women. Morphine is considered as one of the most effective analgesic drug available clinically for the management of severe pain associated with advanced cancer and also for cancer surgeries. Although morphine acts directly on the central nervous system to relieve pain, also appears to have important roles in the regulation of neoplastic tissue in the periphery; promotes angiogenesis and has immunosuppressive effects. Some studies have found that morphine can induce cell apoptosis or necrosis in human tumor cell lines in vitro and inhibit the growth of tumor cells, however, they applied morphine (100 µM) at much higher concentrations than clinical concentration. So we aimed to investigate the effects of morphine in the range of clinical concentrations (10 nM-1 µM) combined with widely used chemotherapeutic agent, paclitaxel on breast cancer cell line. We treated cells with morphine for 4 hours before paclitaxel treatment and examined the effects of morphine and combination with paclitaxel on viability of human triple negative breast cancer cell line MDA-MB 231 by MTT assay. Wound healing assay was performed for to evaluate the effect of morphine on migration. Additionally, we evaluated the effect of morphine on apoptosis induced by paclitaxel by Annexin V & Dead Cell assay. We found that morphine increased the viability of breast cancer cells and decreased the effect of paclitaxel on MTT assay. Morphine also increased the migration of cancer cells. Morphine has no effect on apoptosis alone, however, decreased the apoptosis induced by paclitaxel on Annexin V assay. Our data may suggest that morphine promotes cancer cell viability and decreased the apoptotic effect of paclitaxel. We need more studies for to evaluate the related mechanisms and also in vivo studies confirm our results. Erciyes University, Scientific Research Projects Funds

**Key words:** Morphine, breast cancer cell line, paclitaxel

### ***Investigation of the gene expression levels of NF-κB related genes IL-8, VEGF, Cox-2, MMP-2, and MMP-9 in gastric cancer tissue and non-tumorous tissue***

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Gastric cancer is the second most common cancer worldwide and it is the fourth most common cause of cancer-related death in the world. Chronic inflammation is important in the onset of gastrointestinal tract cancers and also in gastric carcinoma. *H. pylori* and autoimmune gastritis are the main cause of inflammation and lesions. Chronic inflammation promotes the epithelial cells of the gastrointestinal tract to malignant cancer cells. Nuclear factor κB (NF-κB) has been considered as the central mediator of the inflammation pathway. Phosphorylated NF-κB translocate to the nucleus and activate transcription of several pro-inflammatory mediators. There are too many efforts to determine the details

of this pathway. In this study, we aimed to assess the expression of genes that are regulated by NF- $\kappa$ B, in tumor and normal tissues of the same patients. Normal and tumor tissues of gastric cancer patients obtained during the surgical operation and stored in liquid nitrogen until study. Then, total RNA extracted from the normal and tumor tissues of same patients. After isolation of total RNA, cDNAs obtained from mRNAs by oligo dT primers. Gene expression levels of NF- $\kappa$ B and NF- $\kappa$ B related genes; IL-8, VEGF, Cox-2, MMP-2, and MMP-9 determined by Real Time PCR and GAPDH used for normalization. According to our results, we determined a correlation between the normal and tumor tissues in terms of gene expression of NF- $\kappa$ B and NF- $\kappa$ B related genes.

**Key words:** Gastric cancer, NF- $\kappa$ B, IL-8, VEGF, Cox-2 and matrix metalloproteinase

### *DFT Study of the Molecular Structure and Vibrational Analysis of Acadesine*

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Acadesine (5-aminoimidazole-4-carboxamide-1- $\beta$ -D-ribofuranoside, AICA-riboside, AICAR) is a ribonucleoside analog, and a nucleotide biosynthesis precursor with B cell pro-apoptotic activity. This compound is an AMP-activated protein kinase activator used for the treatment of acute lymphoblastic leukemia and has potential applications in treating other disorders such as diabetes. Theoretical analysis of this compound (AICAR) having biochemical importance has been made for the first time by the calculations including conformer, molecular structural, and vibrational analyses. The charge density distribution of the molecule has been studied by the molecular electrostatic potential map (MEP) as well. Frontier molecular orbital (HOMO-LUMO) analysis was also made additionally to determine the intra molecular charge transfers within the molecule and the kinetic stabilities. The calculations were performed using Density Functional Theory (DFT) with B3LYP functional and 6-311G+(d,p) basis set employing Gaussian 09 program. The conformational search has been made by scanning potential energy surfaces through critical dihedral angles. The calculated vibrational frequencies based on the most stable conformer were obtained and the fundamental modes of vibrational spectra were assigned by the aid of potential energy distribution (PED) using VEDA4xx program and by means of visual animation by GaussView 5.0 program. The results obtained from this theoretical analysis will be expected to give insight to scientists working in this field.

**Key words:** Acadesine, DFT/B3LYP, Vibrational analysis

### *Theoretical Analysis of a novel 18F PET renal tracer, Re(CO)3([18F]FEDA)*

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Diagnosis and management of patients with a renal disease can be done by means of radionuclide renography. <sup>99m</sup>Tc-based radiopharmaceuticals have been used widely for this purpose. Recently, a novel 18F PET renal tracer Re(CO)<sub>3</sub>([18F]FEDA) has been radiosynthesized and its preclinical evaluation has been done by Lipowska et al. 18F is a fluorine radioisotope which emits positron with a half-life 109.771 minutes. So, a complex including this isotope can be used for PET. In this study, Re(CO)<sub>3</sub>([18F]FEDA) and its Tc analog have been analysed comparatively. These complexes have been optimized by hybrid functional of Truhlar and Zhao with basis set of 6-31G(d,p) for C, H, O, F atoms. The basis set, LANL2TZ(f) was used for Re and Tc [3]. All the calculations in this study were performed by Gaussian 09 program package. Geometry of Re(CO)<sub>3</sub>([18F]FEDA) is shown in Figure 1. As seen from the figure, Re (Tc for the other molecule) is located at the center, several ligands are connected to this atom. One of the ligands include 18F. Charge distribution, dipole moment, frontier orbital energy levels were calculated using the optimized geometries. Additionally, NBO analysis has been performed to characterize the bonds of the molecules. Re(CO)<sub>3</sub>([18F]FEDA) and Tc(CO)<sub>3</sub>([18F]FEDA) have been compared using their calculated properties.

**Key words:** Radionuclide, Hybrid Functional, Radiopharmaceutical, Charge Distribution, Dipole Moment

### *Usage of Model Plants to Harness Plant-Endophytic Bacteria Interactions: A Case Study of Arabidopsis Thaliana*

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Plant Growth Promoting (PGP) bacteria is a special class of bacteria that can increase growth and productivity of plants. For this reason, they can help sustainable agriculture by improving plant health and biomass through various mechanisms, and can reduce fertilizer use. In this study recently isolated a PGP endophytic bacterium from long term in vitro cultured Fraser photinia microshoots is tested on Arabidopsis thaliana (A. thaliana) as it is a good model system for understanding plant-microbe interactions due to its short life span and well characterized genetic background. The surface sterilized-seed and seedlings were cultured on Murashige and Skoog nutrient medium at 22 °C with 16/8 h



photoperiod. The bacterial culture was inoculated to vertical agar plates on three different forms: active, inactive (with heat treatment) and their mix bacterial suspensions along with controls. After two weeks, the capability of endophyte on promotion of seed germination and plant growth were assessed in vitro by various physiological (i.e., shoot and root biomass production, shoot and root length) and biochemical parameters (i.e., chlorophyll and carotenoid content). Overall, it was found that this endophytic bacterium is beneficial in active and even more useful in inactive form for *A. thaliana* model plant if it is used in optimum concentrations and conditions. Hence, it has potential to be used as biofertilizers/bioinoculants for sustainable agriculture. Moreover, it can be a good candidate for construction of synthetic microbial communities with other endophytic or rhizospheric PGP bacteria.

**Key words:** Endophytic Bacteria, Plant-Bacteria Interactions, Arabidopsis Thaliana, Plant Growth Promoting Bacteria

### ***Determining Cytotoxic Effects of Fluorine Beared 3-tert-butylsalicylaldehyds on Lung Carcinoma Cell Line***

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Lung cancer is by far the leading cause of cancer death among both men and women and non-small cell lung cancer is the most common type of lung cancer. For the discovery of new lung cancer-molecular alterations contributes to effective therapies with forceful inhibitors for non-small cell lung cancer, fluorinated Schiff bases have been tested for anti-cancer properties on A549, non-small cell lung cancer, cell line. 9 fluorinated Schiff base synthesized on the basis of anilines and 3-tert butylsalicylaldehydes have been thoroughly screened for their cytotoxicity and apoptotic effects against human lung cancer (A549) cells under in vitro conditions. Cytotoxicity of chemicals was estimated by ATP assay as IC<sub>50</sub> values and induction of apoptosis was assessed by estimating the activity of cleaved caspase-3 with the immunofluorescent staining. Observation of morphological changes of apoptotic cells was performed according to the histopathological staining methods (giemza, hematoxylin&eosin and papanicolaou). Of these compounds, compound 2 displayed strong cytotoxic effect against A549 cells (F2,4-3TBS, IC<sub>50</sub>: 1,14 µM). By the apoptotic effect of fluorescent Schiff bases on A549 cells, cleaved caspase-3 expression was determined. By the histopathologic examination morphologic effects of apoptosis were cytoplasmic and nuclear condensation (pyknosis), nuclear fragmentation (caryorhexis), membrane blebbing, and the formation of apoptotic bodies in cells. Strong cytotoxic effect of compound 2 via apoptosis induction in A549 cells was

remarkable. The applicability of compound 2 as a new chemotherapeutic agent for lung cancers should be investigated in vivo.

**Key words:** Lung carcinoma, A549, 3-tert-butylsalicylaldehyds, Fluorine, IC<sub>50</sub>, Apoptosis

### ***Determining cytotoxic effects of polyfluorinated 3-tert-butyl salicylaldimines on TGP52 insulinoma cell line***

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In last decade, organic compounds, which are an integral part of structures containing Schiff bases, have received much attention due to the biological properties of these compounds. Numerous Schiff bases have been shown to exhibit a wide range of biological activities including antibacterial, fungicidal and antitumoral properties. In the study, the anticancer effects of fluorinated 3-tert-butyl salicylaldimines on TGP52, an insulinoma cell line, were investigated. The polyfluorinated 3-tert-butyl salicylaldimines (Compound 1-9) were plated on 96-well culture plates at 1 nM - 1 µM concentrations. The IC<sub>50</sub> values of the compounds were determined using the luminometric ATP assay. The antiproliferative effects of the compounds were determined using the CFSE method. The apoptosis induction of the compounds was determined by immunohistochemically using anti-caspase-3 and anti-annexin-V monoclonal antibodies. Morphological changes related to development of apoptosis were examined by histopathological methods (giemza, hematoxylin&eosin and papanicolaou). The most powerful cytotoxic effect on TGP52 cells was obtained with Compound 2 (F2,4-3TBS) bearing 2 fluorine atoms (IC<sub>50</sub>: 3.3 µM). The strongest antiproliferative effect on TGP52 cells was obtained with Compound 4 (F3,4-3TBS) carrying 2 fluorine atoms (PI: 12.8). Cleaved caspase-3 and annexin-V expressions on TGP52 cells indicate that Compound 2 has powerful cytotoxic effect in the cells by induction of apoptosis. The morphological changes observed in histopathologic examinations suggest that cytotoxic effect of Compound 2 is due to apoptosis induction. We concluded that compound 2 has remarkable anticancer potential on TGP52 insulinoma cells.

**Key words:** Pancreatic Cancer, Insulinoma, TGP52, Cytotoxic Effects, ATP Assay.

### Computer Aided Prediction of Cxcr3 Binding Site

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Chemokine receptors are one of the most popular topics under study due to their important roles in many autoimmune diseases such as rheumatoid arthritis, multiple sclerosis as well as causing allergic reactions such as celiac disease. Since chemokine receptors are associated with many inflammatory diseases, cancer and HIV, they are also under thorough investigation as target receptors in drug development. CXCR3 is one of these receptors, which is a G-protein coupled receptor, with 7 trans membrane helix, 53 amino acid N-terminus and 3 extracellular loop structures. It is difficult to detect the drug receptor interaction due to the dynamic nature of the extracellular lobes and N-terminus regions. Chemokine ligand-receptor interactions initiate some responses such as shape change, integrin activation, chemotaxis, degranulation, enzyme secretion and respiratory burst. PS372424 (C33H44N6O4) is specific CXCR3 receptor ligand and has been shown useful in the treatment of rheumatoid arthritis. In this study, firstly CXCR3 receptor is designed as homology-based with computer-aided prediction. Later, it was obtained possible drug binding sites between PS372424 and CXCR3 receptor by docking studies. In addition, we investigated geometry changes and stability of CXCR3- ligand complex by molecular dynamics (MD) simulations. All our results can use in drug target investigations on CXCR3.

**Key words:** CXCR3, PS372424, Docking, Simulation, Molecular Dynamics

### Effect of Cutting Shape on Drying Characteristics of Zucchini in Fluidized Bed Drying Systems

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Zucchini (Cucurbita pepo) is a traditionally dried vegetable and has an important role in exporting. This vegetable is rich in vitamin A, fiber and many minerals especially potassium. Fresh zucchini requires preservation because it has a short shelf life. Present work investigated the effect of cutting shape defined by the diameter: thickness ratio (1:1, 1.25:1, 1:2 and 1.25:2 cm) on drying characteristics that were defined by percentage of weight loss and rehydration capacity of zucchini samples cut in different diameter (1 and 1.25 cm) and thickness (1 and 2 cm) dried at 70°C and 2.5 m<sup>3</sup>/min air flow rate in fluidized bed drying system. Drying curves were determined from the sample weights recorded in

5 min intervals for the first 20 min of drying and 10 min intervals afterwards. Rehydration were conducted at room temperature for 10, 20, 30, 60 and 1440 min and rehydration capacity was calculated from weight gain of samples. Rehydration times to reach to constant weight for samples having diameter: thickness ratio of 1.25:1, 1:2 and 1.25:2 were 180, 250, 280 and 340 min while rehydration capacities were %84.80, 81.88, 81.77 and 75.83 respectively. In this study showed that the decrease in diameter and thickness decreased the drying time and increased the rehydration capacity.

**Key words:** Zucchini, fluidized bed dryer, drying characteristic, rehydration capacity.

### The Effect of MPTP and URB597 on Oxidative Stress and Behavior in Balb-C Mice

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In this study, effects of URB597 (selective fatty acid amide hydrolase (FAAH) enzyme inhibitor, cyclohexylcarbamic acid 3'-carbamoyl-biphenyl-3-yl ester) and MPTP (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine) on oxidative stress and behavior in BALB c mice were investigated. Mice were divided into 4 groups. The first group was hold as control group. MPTP (30 mg/kg/day, i.p.) was administered to the second group. In the third group URB597 (0.3 mg/kg/day, i.p.) and MPTP (1 hour after administration of URB597) and in the fourth group URB597 were administered. The mice were tested with open field test to measure locomotor activity (distance moved, velocity). The mice were sacrificed and brain tissues were removed with decapitation on day 5 after the first dose. Brain homogenates were prepared and then brain antioxidant enzymes [superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GSH-Px)] and malondialdehyde (MDA) levels were measured. As a result, the SOD, CAT, GSH-Px activities and MDA levels in brain homogenats of MPTP group, were seen increased when compared with control group, although these were not statistically significant. Also MPTP didn't cause a signifant change in parameters of open field test. When we compare URB97 group with control group, changes in the antioxidant enzyme activities and MDA levels in whole brain homogenates or in the open field test were not significant. On the other hand, combination URB597 with MPTP caused a significant reduction in locomotor activity however not significant changes in enzyme levels were thought us that URB597 may protect aganist oxidative damage in early stages of Parkinson's disease. We need further studies to assess the effect of URB597 in Parkinson's disease models. This study is supported by Erciyes University Scientific Research Projects Unit.

**Key words:** MPTP, URB597, BALB c, Oxidative Stress, Open Field Test

### **Synthesis and Cytotoxic Activity of Coumarin-Thymol Derivatives**

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Coumarins have a variety of pharmacological effects, they are mostly used in anticancer drug design and discovery. Both the natural and synthetic derivatives of the coumarin exhibit antiproliferative properties at a very good level. Recently, the recognition of the coumarin by the inhibition of carbonic anhydrase enzyme and the emergence of cancer-associated properties of CA-IX and XII enzymes have given a great impetus to this research. Bioactive natural compounds play a very important role in the field of medicinal chemistry. It has been observed that many natural compounds, especially monoterpenes, show different biological activity in the researches. Anti-cancer, anti-bacterial, antioxidant, anti-microbial, anti-hypertensive features are the main activities of these compounds. Thymol is a major natural terpenoid compound present in the essential oil fraction of various plants, such as *Thymus vulgaris* (Lamiaceae) and *Carum copticum* (Apiaceae). It has been reported that thymol possesses broad activities including antimicrobial, antioxidant, anticancer and antiinflammatory effects. 1,2,3-Triazole is a well-known scaffold that has a widespread occurrence in different compounds. The ability of the 1,2,3-triazole ring structure to function as a bioisoster for many molecules make it possible to mimic different functional groups for the synthesis of new active molecules. In this study new coumarin derivatives containing thymol were synthesized using the click reaction and their cytotoxicity properties were investigated. This study is supported by TÜBİTAK (PROJECT NUMBER: 116Z779).

**Key words:** Coumarin, Cytotoxicity, Thymol

### **Synthesis and Anticholinesterase Activity of Tacrine-Carbamate Derivatives**

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Alzheimer's disease (AD) is the most common neurodegenerative disease with symptoms of memory loss, cognition defect and behavioural impairment. AD is associated with a selective loss of cholinergic neurons in the

brain and decreasing levels of acetylcholine (ACh). Tacrine is a centrally active, non-competitive, reversible cholinesterase inhibitor with slightly selective butyrylcholinesterase (BChE, EC 3.1.1.8) from AChE. Carbamates have common biological and pharmacological properties. Additionally, carbamate-class of the AChEI is well known and used in the cure of a various illnesses involving AD. Carbamates, such as rivastigmine, neostigmine, physostigmine and physostigmine, easily pass the blood-brain barrier to inhibit cholinesterase in the central nervous system, spearheading advanced cognition in dementia. In this study, 13 new tacrine derivatives (6a-k) containing carbamate groups were synthesized and their effects on acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE) enzymes were evaluated. Firstly, 2-nitrobenzoic acid was reduced with tin chloride. 2-aminobenzoic acid was reacted with cyclohexanone at 140°C, and then it was mixture with POCl<sub>3</sub> to give 9-chloro-1,2,3,4-tetrahydroacridine. This compound was treated with aminoethanol and then reacted with isocyanate derivatives to obtain tacrine-carbamate derivatives 6a-k. Among the synthesized tacrine derivatives, ((1,2,3,4-tetrahydroacridin-9-yl)amino)ethyl(3-nitrophenyl) carbamate (6k) showed the best inhibitor activity against AChE and BuChE with IC<sub>50</sub> value of 22.15 nM and 16.96 nM, respectively. In addition, in regard to structure-activity relationship, it can be seen that the inhibitory activity depends on the electronegativity, polarizability and binding position of the substituent on phenyl ring.

**Key words:** Tacrine, Carbamate, Anticholinesterase

### **Effects of Dietary Garlic (*Allium sativum*) on Growth Performance of Hybrid Tilapia Fingerling under Greenhouse Conditions**

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Effects Of Dietary Garlic (*Allium sativum*) On Growth Performance Of Hybrid Tilapia Fingerling Under Greenhouse Conditions Experiment was carried out in fiber tanks, channel water and groundwater using out which placed in Faculty of Fisheries, Cukurova University. Nazmi Tekelioğlu Freshwater Production and Research Station Adana Turkey. The effect of different concentrations of garlic (*Allium sativum*) supplement in fish diet on growth parameters of hybrid tilapia (*Oreochromis niloticus* x *O. aureus*) fingerlings was investigated. Fish (2.57 ± 0.01 g) were divided into three experimental groups in the diet, 0% (control), 0.5% and 1% garlic concentrates and fed with satiation. At the end of the experimental feeding period, it was observed that garlic supplemented diet did not have any significant effect on weight gain of hybrid tilapia fingerlings when compared to fish in the control diet. However, final fish weight of high level garlic added group was higher (8.09±0.84g) than the others (7.41±0.64 and 7.44±0.30g) respectively (P>0.05). But Fish fed higher concentrations of garlic in diet showed significantly differences in FCR of among the groups



( $P < 0.05$ ). In conclusion %1 dietary supplementation of garlic in diet can be recommended for getting to better FCR in overwintering of hybrid tilapia fry under the greenhouse conditions.

**Key words:** Garlic, Overwintering Hybrid Tilapia, Aquaculture

### ***mRNA expression level of ADAMTS-8 and its Regulation in Peripheral Blood Mononuclear Cells of Patients with Psoriasis and Psoriatic Arthritis***

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Psoriatic arthritis (PsA) is an autoimmune disease associated with psoriasis (PS) that involves synovial tissue, enthesal sites, and skin resulting in significant joint damage. Although it has been revealed that genetic, environmental and immunological factors play important roles in PsA, the pathogenesis of disease is not fully understood. Revealing key molecular mechanism governing the pathogenesis of PsA will allow us to develop novel therapeutic targets. ADAMTS is a family of proteoglycanase enzymes shows proteolytic activity that causes articular cartilage loss by degrading extracellular matrix. ADAMTS expression level upregulated by pro-inflammatory cytokines in rheumatoid arthritis and osteoarthritis. We aimed to determine the expression level of the ADAMTS-8 and its regulator mechanism in PsA and PS. 20 PsA patients, 20 PS patients, and 20 healthy controls were recruited. PBMCs were isolated from venous blood. Isolated PBMCs were cultured and stimulated by  $Tnf-\alpha$  and IL-6 after treatment by MAPKs and STAT3 inhibitors. mRNA expression level of ADAMTS-8 was measured by qPCR. Our results demonstrated that mRNA expression level of ADAMTS-8 was significantly elevated in PS group compared to PsA and control groups.  $Tnf-\alpha$  stimulation led to a significant increase in mRNA expression level of ADAMTS-8 in PSA group. However,  $Tnf-\alpha$ -induced mRNA expression of ADAMTS-8 was suppressed by Erk1/2, p38 and JNK inhibitors in PsA group. In addition, inhibition of Erk1/2, p38 and JNK activity led to a significant decrease in mRNA expression of ADAMTS-8 in PS group. While IL-6 stimulation did not affect mRNA expression of ADAMTS-8 in all groups, the inhibition of STAT3 resulted in a significant increase in ADAMTS-8 mRNA expression level in both PS and PsA groups. Our study revealed that mRNA expression of ADAMTS-8 is upregulated in PS and MAPKs and STAT3 signaling pathways are involved in the regulation

of ADAMTS-8 expression in PS and PSA. Acknowledgement: This study was supported by the TÜBİTAK (Scientific and Technical Research Council of Turkey) under the grant 214S02

**Key words:** ADAMTS-8, MAPK, Psoriatic arthritis, Psoriasis, PBMCs, STAT3

### ***Association of SNP rs1042522 in TP53 gene with Premenopausal Breast Cancer in Turkish Population***

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Breast cancer is one of the most common diseases among women in the world. Although it is frequent in postmenopausal women, the presentation of disease is high in premenopausal women in developing countries. Previous studies have shown that premenopausal cancers have different gene expression profiles and different biological features from normal breast cancer cases. However, the investigation on early onset breast cancer is very limited. The absence of vital data about the younger patients avoids rapid improvements in diagnosis and treatment strategies focusing on these patients. Different types of genetic and epigenetic alterations, as well as polymorphisms, are significant in the stepwise development of breast neoplasms. The TP53 gene is the most frequently altered gene in human cancer, including breast carcinoma and codon 72 polymorphism (rs1042522) is the most common SNP in the gene. Codon 72 polymorphism has been associated with postmenopausal breast cancer patients in many populations but there is no research on the impact of rs1042522 on early onset breast cancer in the Turkish population. In our study, we investigated the association of rs1042522 with early onset breast cancer in Turkish women. Totally 94 patients under 40 years old with breast cancer and 96 women under 40 years of age who did not have history and family history of any type of cancer included in this study. Melting curve analysis was used for identification of amplicons via Light Cycler. Our results indicated that when the GG genotype was considered as the reference for the analysis for rs1042522, the calculated OR value for the CG genotype of rs1042522 was found to be 0.4196 (95% CI 0.1941-0.9067),  $p = 0.027$ . These findings indicate that the CG genotype can be accounted for as a protective factor against premenopausal breast cancer in the Turkish population. Acknowledgement: This work has been supported by Firat University Scientific Research Projects Unit (FÜBAP) with project number MF.16.31.

**Key words:** Premenopausal breast cancer, rs1042522, SNP, TP53, Turkish women

### **Investigation of the Effects of the Dietary Boric Acid on Some Biochemical Parameters of the Rainbow Trout (*Oncorhynchus Mykiss*)**

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In this study, boric acid was added to the rainbow trout diet at rates of 0.00, 0.01, 0.05, 0.10 and 0.20% and fed for 132 days. The effects of boric acid on the whole blood parameters of the rainbow trout have been investigated. The research was carried out in cages of 1 cubic meter placed in a concrete pond. At the start of the experiment, the juvenile trouts had  $20.14 \pm 1.21$  g live weight. At the end of the experiment the samples were live weighed out as  $184.12 \pm 3.14$ ,  $192.41 \pm 3.41$ ,  $207.54 \pm 3.49$ ,  $194.69 \pm 3.21$  and  $181.19 \pm 4.82$  gr, respectively. Total cholesterol and triglyceride levels have been investigated in serum from blood samples taken from fish for the purpose of monitoring the lipid profile. The results of total cholesterol were;  $140.97 \pm 1.30$ ,  $161.22 \pm 1.83$ ,  $179.11 \pm 2.70$ ,  $191.44 \pm 1.54$  and  $202.06 \pm 0.78$  mg/dL, respectively. Triglyceride amounts were;  $271, 12 \pm 5.61$ ,  $294.36 \pm 1.97$ ,  $308.67 \pm 3.29$ ,  $328.67 \pm 3.06$  and  $348.20 \pm 3.27$  mg/dL, respectively. In present study, the highest total cholesterol and triglyceride amounts were found in the group fed with feed containing 0.20% of boric acid, while the lowest total cholesterol and triglyceride amounts were found in the control group. As a result, changes in total cholesterol and triglyceride levels were observed depending on the amount of boric acid added to the fish diet and the obtained data were statistically significant ( $p < 0.05$ ). This study was supported by the Scientific Research Projects Unit of Aksaray University. Project No: 2017-049.

**Key words:** Rainbow trout, total cholesterol, triglyceride, boric acid

### **The Effect of Boric Acid Added into Fish Diet on the Hematological Parameters of the Rainbow Trout (*Oncorhynchus Mykiss*)**

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In this study, boric acid was added to the rainbow trout diet at rates of 0.00, 0.01, 0.05, 0.10 and 0.20% and fed for 132 days. The effects of boric acid on the whole blood parameters of the rainbow trout have been investigated. The research was carried out in cages of 1 cubic meter placed in a concrete pond. At the start of the experiment, the juvenile trouts had  $20.14 \pm 1.21$  g live weight. At the end of the experiment the samples were live weighed out as  $184.12 \pm 3.14$ ,  $192.41 \pm 3.41$ ,  $207.54 \pm 3.49$ ,  $194.69 \pm 3.21$  and  $181.19 \pm 4.82$  gr, respectively. After the feeding trials, from the blood samples taken; Plateletcrit (PCT) (%) values, which are the ratio of red blood cell distribution width (RDW), platelet (PLT), mean platelet volume (MPV), platelet distribution width (PDV) and platelet ratio to blood (PCT) were examined. Boric acid added to fish diet by 0.05% decreased the ratio of RDW (46.45-30.49%), PLT ( $48.46-20.53 \times 10^9 / L$ ) and PCT (0.027-0.011%). It was also found that boric acid added to the diet increased MPV (4.41-6.27) and PDV (16.15-18.42). The all hematological parameters analyzed were found to be statistically significant ( $p < 0.05$ ). As a result, it has been determined that the amount of boric acid added to the fish diet in order to stimulate growth and development in fish causes the blood parameters to change. This study was supported by the Scientific Research Projects Unit of Aksaray University. Project No: 2017-049.

**Key words:** Boric acid, rainbow trout, hematological parameters

### **Determination of Serum Nesfatin levels**

**Neşe Hayat Aksoy**

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Nesfatin-1 is an 82-amino-acid peptide from the post translational modification process of the N-terminal part of nucleobindin- 2 protein. Nesfatin-1 is recently discovered neuropeptide secreted by peripheral tissues, central and also peripheral nervous system. Nesfatin is related in the regulation of the energy homeostasis concerned with food regulation, hunger and fat storage, water intake, body temperature. Besides these effects of nesfatin, it's responsible for the regulation of body temperature, and that it also influences the sleeping system. Because of there is no literature knowledge is available about the level of the nesfatin in healthy ovines this study is eloquent. Quantities of nesfatin peptides in serum were studied by commercial quantification using the ELISA method. Kit's assay range was 0.05 ng/ml-30 ng/ml and the sensitivity was 0,022 ng/ml. When rams were considered, nesfatin values were found to be higher than the other groups. These results were found statistically significant at the same time ( $p < 0.05$ ). This study will be useful for future studies and It is strongly believed that, will help guide the other researches. This study was



supported by Aksaray University Scientific Research Projects Coordination Unit (Project No: 2015-084).

**Key words:** Sheep, Nesfatin, ram

### *Optical Nanobiosensors for Food Pathogen Detection*

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The number of foodborne illness outbreaks has increased due to poor food handling and sanitation practices over the past decades. Conventional methods rely on time consuming and laborious cultural techniques to monitor the overall hygiene in the food system. Therefore, rapid detection and identification techniques with a more time- and cost-effective manner are required to address and prevent foodborne epidemics. With the help of recent developments in nanotechnology, biosensors have gained enormous attention as an effective alternative method in the last decade. Among various sensing systems, optical biosensors offer simple, rapid, and cost effective analytical tools. Recently, nanotechnology-enabled optical biosensors (optical nanobiosensors) have been increasingly developed and used for the detection of pesticide, drug residues, heavy metals, toxic substances, and pathogens in the food systems. Integration of nanoparticles into sensing systems increases the performance of optical biosensors often through plasmonic effects. Up to now, the major focus has been on luminescent/fluorescent, colorimetric, and surface enhanced Raman scattering (SERS) based nanobiosensors. In this context, recent progress in optical nanobiosensors targeted to food applications will be reviewed and discussed here together with the major advantageous and challenges associated with each sensing platform. This talk will also cover briefly the different techniques used for the immobilization of biomolecules on optical nanosensor platforms.

**Key words:** Food pathogens, Biosensors, Optical, Nanotechnology

### *Early Differential Diagnosis in Parkinsonism Based on Speech Disorder Analysis*

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In this contribution I present the main lines and protocol of a major research project recently funded by the French research agency. This project consists in a pilot study to investigate early differential diagnosis between Parkinson's disease (PD) and atypical parkinsonian syndromes (APS) using voice and speech. The project federates 5 partners, 3 research institutes

and the neurology and ENT departments of 2 university hospitals. In early stages of the disease, PD and APS symptoms are very similar, particularly in APS patients where parkinsonism predominates. The differential diagnosis between APS and PD can be very challenging in early disease stages, while early diagnostic certitude is important for the patient because of the diverging prognosis. Indeed, despite recent efforts, no validated objective marker is currently available to guide the clinician in this differential diagnosis. The need of such markers is hence very high in the neurology community, particularly given the severity of the prognosis of APS. The main goal of our project is to develop a non-invasive objective digital marker to assist in the early differential diagnosis between PD and APS. Moreover, our ambition is to develop a very low cost and portable digital tool. In case of success, this would allow a large scale and world-wide use. Speech impairment is a common early symptom in these diseases and of different origin. Our approach is to use these impairments, through advanced digital processing of voice recordings of patients, as a vehicle to distinguish between PD and APS in early disease stages. I shall present our recent findings in discrimination between PD and two APS diseases, Progressive Supranuclear Palsy (PSP) and Multiple System Atrophy (MSA), as well as in discrimination between PSP and MSA.

**Key words:** Parkinsonism, Parkinson's disease, Atypical parkinsonian syndromes, Speech disorder, Differential diagnosis

### *Research of Serum Homocysteine Values in Healthy Ewes*

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Homocysteine is an intermediary metabolite in methionine metabolism and is a risk factor for many diseases. Homocysteine is an important parameter plays a unique role for characterize several metabolic diseases largely cardiovascular diseases. Blood total homocysteine amounts are known and adopted to be significant biochemical parameter as determinants of many metabolic diseases. These include possible cardiovascular conditions especially coronary-heart disease, and consequent mortality in patients with neuronal disorders, renal insufficiency, diabetes, systemic lupus erythematosus, venous thromboembolism, and even cancer. In this study, the main aim was to appoint serum homocysteine levels in healthy ovine. The measurements of serum homocysteine concentrations were performed with ELISA-HCY kit, commercial quantification (Shanghai Sunred, Biological Tech., China) using the ELISA method. HCY-ELISA-Plates were read on the ELISA-Plate Reader (450 nm) (ELx800 Absorbance Microplate Reader-Biotek). Kit's assay range was 0.6µmol/L→100µmol/L, and sensitivity was 0.31µmol/L. Homocysteine concentrations were calculated from standard curves. The level of serum homocysteine of ewes was detected lower than the other groups. The primary purpose of this research was to prove presence and then,

investigation and characterization the serum Homocysteine concentrations in healthy ovine. As a result, the serum homocysteine values that can constitute a reference value for healthy breeds of sheep were determined in this study. This work was supported by Aksaray University Scientific Research Projects Coordination Unit (Project No: 2015-084).

**Key words:** Sheep, Homocysteine, Ewe

### *The Effect of Cyclodextrins and Trehalose Complex on Ram Semen Cryopreservation*

*Muhammed Enes Inanc<sup>1</sup>, Sukru Gungor<sup>1</sup> and Caner Öztürk<sup>2</sup>*

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The experiment was conducted to determine the in vitro results of cholesterol loaded cyclodextrin (CLC) and 7-dehydrocholesterol loaded cyclodextrin compound (7-DCLC) with trehalose (T) addition to tris extenders for freezing ram semen. Five rams (1-3 years of age), belonging to the Bahri Dagdas International Agricultural Research Institute, Konya-Turkey, were maintained under uniform feeding, housing in non-breeding season. Ejaculates were collected from the rams using an artificial vagina, as 4 replicates (with an interval of 4 day) according to AI standard procedures. The ejaculates containing spermatozoa with >80% motility and concentrations higher than 1.5x10<sup>9</sup> spermatozoa/ml were used in the study. Ejaculates were pooled at 37°C, divided into eight equal aliquots and samples were extended with tris containing 0 mg (control), 1.5 mg, 2.5 mg and 3.5 mg/120x10<sup>6</sup> CLC+T (50mM), 7-DCLC+T (50mM) or T (50mM) and they were equilibrated to 4°C and frozen in mini straws then stored in liquid nitrogen. Straws were thawed at 37°C for 30 s in water bath for spermatological examination with Computer aided sperm analysis (CASA, SCA®). The extender supplemented CLC+T had higher result on non-progressive motility (%), progressive motility (%) and total motility (%) in compared to the control, T and 7-DCLC+T groups (P<0.05). Except ALH (µm) and hyperactivity (%), there was no statistically significant difference between groups in terms of CASA kinetic parameters. In conclusion, our data suggest that all CLC+T groups were more beneficial than control, T or 7-DCLC+T in Tris based extender for protecting the post-thawed sperm motilities in ram semen.

**Key words:** Cholesterol, 7-dehydrocholesterol, Trehalose, CASA motility, Ram semen

### *Synthesis of novel Schiff bases as potential antioxidant agents*

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Reactive oxygen species (ROS) play an important role in the formation of various serious diseases; such as cancer, heart diseases, diabetes, arteriosclerosis and cataracts. The harmful effects of free radicals that cause potential biological damage are called oxidative stress. Free radicals in the human body play a pathogenic role in the formation of many chronic degenerative diseases such as cancer, autoimmune, inflammatory and cardiovascular neurodegenerative diseases. Schiff bases are another important class of organic compounds. It is also known that Schiff bases have various pharmacological activities; such as antibacterial, antifungal, antimalarial, anti-inflammatory and antipyretic as well as their use as dyes, pigments, starting materials, organic synthesis intermediates, catalysts and polymer stabilizers. The imine group present in the Schiff bases is responsible for biological activities and these activities can be modulated in general by modifying the substituent groups in the molecules. In this study, 21 Schiff bases were synthesized and their DPPH, CUPRAC and ABTS cation radical scavenging abilities were investigated for antioxidant activity. The results showed that all the synthesized compounds exhibited antioxidant activity for each assay. 5-(2,3-dihydroxybenzylideneamino) spiro dioxolane-2,3' indoline]-2-on (5c) (IC<sub>50</sub>=4.49 µM, for DPPH; IC<sub>50</sub>=0.39 µM, for ABTS.+; and A<sub>0.50</sub>=0.42 µM, for CUPRAC) showed significantly better ABTS, CUPRAC and DPPH radical scavenging ability than quercetin (IC<sub>50</sub>=8.69 µM, for DPPH; IC<sub>50</sub>=15.49 µM, for ABTS.+; and A<sub>0.50</sub>=18.47 µM, for CUPRAC), which is used as a standard.

**Key words:** ABTS, CUPRAC, DPPH, Schiff base

### *Bioethanol production Using Pretreated Waste Wheat Straw*

*Meltem Sarioğlu Cebeci and Cansel Koç*

Environmental Engineering, Cumhuriyet University

Consumption of fossil fuels has resulted in generation of high levels of pollution. They cause global warming, mainly caused by greenhouse gas formation, the increase of methane and carbon dioxide gas especially in the atmosphere. Therefore renewable energy sources (wind, water, sun, biomass, geothermal heat) might be as an alternative. Bioethanol has been getting important all over the world. Bioethanol production, which is mainly used for motor vehicles and for different purposes, is preferred due to its high energy capacity and low cost. Bioethanol is a renewable energy resource used in the whole world. In this context, bioethanol production in Turkey becomes a major alternative to petroleum. Pretreatment methods are physical, chemical and biological. In this study, acid and alkaline pretreatment will be achieved using dilute H<sub>2</sub>SO<sub>4</sub> at 121 °C for 75

minutes and 2% NaOH for a week at 25 °C. Fermentation has been applied to produce ethanol from the pretreated substrate using yeast (*Saccharomyces cerevisiae*) and finally maximum ethanol production has been achieved. As a conclusion agriculture waste or materials can be used for bioethanol production. Benefit cost analysis will be carried out on the results obtained and /or literature values and the effect of these wastes assessed in the Central Anatolia Region on the regional and country economies will be calculated and a pilot scale will be considered for the university if possible. This study is supported by Scientific Research Program of Cumhuriyet University for project number of M-727

**Key words:** Bioethanol, Wheat, Pretreatment, Yeast, Energy

### *Pesticide Residues from Different Commodities*

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Turkey is important producer of fruits and vegetables in Europe and almost half of the production is exported to those countries. The plant pathogens, pests and weeds are controlled mainly by pesticide application which results pesticide residues in many commodities. Pesticides pose risk for human health and can cause eye irritation, headache, loss of consciousness and also many non-reversible diseases. This aim of the study was to follow the pesticide residues and calculate the possible risk for human during last 5 years. Food consumption data were taken from WHO which collected the average consumption cluster from diets for different commodities. The EDI was estimated Daily intake for pesticides and the long term chronic dietary risk (HQ) was calculated with EDI and ADI values. The risk calculation The samples from different commodities were collected and extracted for pesticide residues in laboratory and then analysis was performed on GC/MS and LC/MS/MS. More than sixty different pesticide residues were detected and more than 10% of commodities contained pesticide residues over MRL level. The EDI values and the HQ value were not very high in comparison to other studies. According to the results, calculations made based on relatively high pesticide residues appear to be a serious health problem. Nevertheless, it is necessary to carry out detailed studies and take precautions in the products which are sold to the internal market, not in the products which are mainly exported.

**Key words:** Pesticide, Residues, Commodities

### *The investigation of removal of toxic compound (azo dye) from wastewater using nanomaterial*

*Meltem Sarioğlu Cebeci*

Environmental Engineering, Cumhuriyet University

The overall reduction of organic pollution is a main scientific problem in water treatment field. Azo dyes are the class of dye characterized by the presence of highly stable -N=N- group and are one of the widely used dye in various sectors like textile, leather, rubber, plastic, food industries etc. The colored wastewater not only damages the aesthetic nature of water and but is also capable of potentially destroying the ecological balance of the water system. Effluent of azo dyes and their breakdown products into the environment is harmful, due to toxic, mutagenic and carcinogenic carcinogenic characteristics of these dyes. Removal of colored dyes from wastewaters is thus a major environmental issue. Color removal has been extensively studied and various techniques have been explored such as photo-oxidation and photocatalytic reaction. In this study, photocatalytic reaction was performed with lab.-scale experiments using UV reactor with addition of nanomaterial (titanium as catalyst) inside the reactor in order to remove toxic substance (azo dye: maxilon red(MR)) and it was found that MR dye was removed with efficiency of 100% at different pH and 25 mg/lof initial maxilon red dye concentration. The titanium catalyst was kept constant at 1 g / L. At pH = 3, the time-dependent removal values for dye concentrations of 25 mg / L reached to 100% at 90 min, respectively. Such systems can be used for treatment of industrial wastewaters such as textile, widely used in Turkey and reuse of wastewater for the process is possible.

**Key words:** Ecosystem, toxicity, azo dye, UV reactor, nanomaterial

### *Cloning and Recombinant Production of the Thermophilic Cytochrome P450 CYP119*

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Recent advances in recombinant DNA technology and protein design have led to increased demands for biocatalysts as an alternative to chemical catalysis in synthesis of drug products and agrochemicals. Biocatalysts are especially sought after in the synthesis of enantiopure products due to the high regioselectivity and enantioselectivity observed in enzymes. Among biocatalysts, cytochrome P450 (P450) oxygenases are an attractive target since they catalyze oxidation of "unactivated" carbon-hydrogen bonds with high efficiency and selectivity. P450 enzymes are currently used in synthesis of steroids and statins. However, the practical use of P450s as biocatalysts is very limited due to their poor stability, and difficulty in expression and isolation of large quantities of these enzymes. The aim of this project is to optimize expression and isolation of a thermophilic P450 to increase its utilization in industry. CYP119, is a P450 from *Sulfolobus acidocaldarius*, which is tolerant to high temperatures. Here, CYP119 with N-terminal and C-terminal histidine tag were cloned into expression vectors to improve the efficiency of protein isolation. The recombinant production and purification of heat-tolerant CYP119 with N-



terminal and C-terminal histidine tag was carried out under optimum conditions. CYP119 expression was induced in *Escherichia coli* BL21 (DE3) cells with isopropyl  $\beta$ -D-1-thiogalactopyranoside (IPTG). The heme precursor  $\delta$ -aminolevulinic acid (ALA) was also added to cell cultures to increase heme biosynthesis and incorporation in CYP119. Recombinant protein expression was optimized by monitoring expression at different IPTG and ALA concentrations. In addition, expression temperature and duration were optimized. CYP119 was isolated and purified using the Ni-NTA affinity chromatography. The optimum conditions were identified as 0.5 mM ALA and 1 mM IPTG at 30°C for 16-hour expression. IPTG and ALA concentrations, expression temperature, and duration are important factors in expression of CYP119. Efficient production of CYP119 will increase the utilization of these enzymes in the industry. Acknowledgement: This study is supported by Scientific and Technological Research Council of Turkey (TÜBİTAK) grant number 116Z380.

**Key words:** Cytochrome P450, recombinant DNA technology, thermophilic enzyme

### *The Biodiversity and Biomass Changes of the Aquatic Invertebrates in the Iskenderun Bay*

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In the world, aquatic invertebrate fisheries have created tremendous economic value in recent years. This study was carried out to determine the biodiversity and biomass changes of the economically important aquatic invertebrates (shrimp, skulls, etc.) in the Iskenderun Bay. The samples were obtained seasonally from April 2005 to December 2017 on the west coast of Iskenderun Bay between Yumurtalik and Botas. The samples were caught by using a commercial bottom trawl net with 44 mm mesh at 10 m and 20 m depth. Subsampling was performed as recommended by Holden & Raitt (1974), and the samples were brought to the Cukurova University Fisheries Faculty laboratory in ice chests. During the study period, a total of 84 taxa were identified in which 29 of them were molluscs, 24 of them were crustaceans and 17 of them were classed under the other invertebrate groups. CPUE values of total invertebrates did not significantly changed between depth contours (Wilcoxon W=10118, p=0.80 for CPUEN; Wilcoxon W=10151, p=0.76 for CPUew) whereas the changes were significant among seasons for both abundance and biomass ( $\chi^2=30.70$ , p<0.001 for CPUEN;  $\chi^2=18.50$ , p<0.001 for CPUew). Base on Mann-Kendall correlation analyze, the trend of both abundance and biomass were not found to be significant ( $\chi^2=$

-0.165; p=0.44 for CPUEN;  $\chi^2=0.143$ ; p=0.51 for CPUew). This study is supported by Research and Project Unit (FBA-2017-7982) of Cukurova University

**Key words:** Biodiversity, Biomass, Aquatic invertebrates, Iskenderun Bay

### *A statistical assessment study on Feline Infectious Peritonitis (FIP) and Feline Panleukopenia Virus (FPV)*

*Bahattin Taylan Koç<sup>1</sup>, Zeynep Akkutay Yoldar<sup>2</sup> and Onur Ulgentalp<sup>2</sup>, Tuba Çiğdem Oğuzoğlu<sup>2</sup>*

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Feline Infectious Peritonitis (FIP) and Feline Panleukopenia Virus (FPV) are both of the most significant viral agents which affect negatively to the domestic cats' health. In this regards, we aimed to elucidate the prevalence status of FIP and FPV in domestic cats. With this aim, mentioned infections have been investigated by using molecular techniques. During one year the domestic cats have been sampled and their gender, age, breed, vaccination status from owners have been recorded for each sampled cat in our study. 11 out of 68 (16.1 %), and 13 out of 68 (19.1%) samples were detected as positive for FIP and FPV infections, respectively. Also, four of them were positive in terms of both infections. Multivariate statistical assessment was performed according to information belong to infected cats. As a result, both infections were detected more prevalent in male, clinical signed and mix breed cats. In conclusion, this study has indicated that both FIP and FPV in-door domestic cat significantly seemed and it should be not forgotten to investigate these mentioned infections in domestic cats.

**Key words:** Feline Infectious Peritonitis (FIP), Feline Panleukopenia Virus (FPV), Statistical assessment, Chi-square test, domestic cats.

### *Detection and Characterization of BPV Type from an Infected Cattle with Papillomas on Mammary Gland*

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Papillomaviruses are non-enveloped, double stranded, DNA viruses with an icosahedral capsid and induce formation of benign skin tumors, known as papillomas, warts, and fibropapillomas in cattle. All BPVs have a circular DNA genome of 7.3-8.0 kilobase (kb). Currently have been characterized six types of BPV in cattle, which are divided into three (Delta, Xi and Epsilon) broad subgroups. Bovine papillomaviruses may indirectly affect mastitis due to papillomas localized on udder. BPV infection is very common in dairy cattle worldwide and an important disease that causes economic losses by reducing milk production. In this study, a papillomavirus has been detected from epithelial papillomas of the bovine udder. PCR method was performed by using a high-fidelity DNA polymerase. Genomic DNA of the virus showed close homology to BPV type 1 sequences obtained from GenBank database. There is no treatment for Bovine Papillomaviruses, but vaccines against some BPV types have been developed in some countries. Genetic characterization of local/field papillomaviruses circulating in countries are important for choosing the vaccine which is going to be used in struggle against the bovine papillomavirus infection. Results of this study will serve to further vaccine development studies by providing detailed genetic information belongs to local BPV strains.

**Key words:** BPV-1, cattle, PCR, sequence

### *Investigation of Multiple Viral Infections in Domestic Dogs with Diarrhoea*

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Canine parvovirus (CPV), canine coronavirus (CCoV), canine adenovirus (CAV) and canine distemper virus (CDV); are the main pathogens that need to be diagnosed in dogs with gastroenteritis. CPV causes mostly hemorrhagic gastroenteritis in puppies. Canine coronavirus rarely causes a fatal disease but is usually asymptomatic or with a mild gastroenteritis in dogs. Other mentioned gastroenteritis agent CDV, is a major problem for domestic dogs and a worldwide deadly infectious disease. CAV, another agent that was screened in this study, is an infectious agent which can cause vomiting and diarrhea, and at the same time hepatitis. In this study, isolation of RNA and DNA from blood and rectal swab samples were obtained from three different dogs with diarrhoea and vomiting symptoms was performed. RNAs of rectal swabs for CCoV and CDV were amplified by an RT-PCR method. PCR reactions were carried out by using DNA for CPV and CAV. All sampled dogs (n=3) have been found positive both for CDV and CPV infections. The animals in this study that are multiply infected with these agents (CDV and CPV) showed more severe symptoms and hospitalized with a long treatment period. Our diagnosis about these infections in sick dogs provided help to this treatment period. Additionally, to prevent and reduce the incidence of viral infections, it is important to know the circulation of viruses in the field. Findings from this study are essential for struggling against and preventing viral infections in domestic dogs.

**Key words:** CDV, CPV, CAV, CCoV, diagnosis

### *Effect of Additives on Semen Quality in Rams*

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The aim of this study was to investigate the effects of arginine, methionine and raffinose on sperm parameters after the freeze-thawing of Merino ram sperm. Five merino rams (1-3 years of age), belonging to the Bahri Dagdas International Agricultural Research Institute, Konya-Turkey were used in the study. Samples were diluted with a Tris-based extender containing arginine (1,2,4 mM), methionine (1,2,4 mM) and raffinose (1,2,4 mM), no additive (control), Diluted samples were equilibrated for 2 h at 5 °C and frozen in 0.25 ml French straws then stored in liquid nitrogen. Frozen straws were thawed individually at 37 °C for 25 s in a water bath for evaluation. Sperm subjective motility was performed microscopically using a 3-5 µl aliquots. The proportion of live-dead spermatozoa was determined using the eosin-nigrosin conventional dyeing method in frozen-thawed spermatozoa. The addition of methionine (2 and 4 mM) led to higher percentages of subjective motility (51.25±10.31, 53.75±8.54%) compared to control (41.25±4.79%, P<0.05). Methionine 2 mM led to higher live sperm percentages (68%±7.79), compared to control group (57%±2.45 P<0.05). In conclusion, findings of this study showed that methionine (2,4 mM) supplementation in semen extenders provided a better protection of sperm parameters against cryopreservation injury, in comparison to the control group.

**Key words:** Eoin-nigrosin stain, Methionine, Ram sperm, Semen freezing

### *The Effect of Different Seafood Forms on the Consumption Structure in Adana Province*

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This study was carried out around the shopping centers in Adana province. A face-to-face survey was conducted with 407 individuals in the study. It was determined that 60 of the participants did not consume seafood and 347 of them consumed. Questions were asked about the effects of

consumption forms (fresh, frozen, canned, smoked ...) to these 347 individuals. Individuals were clustered into 3 consumption groups according to their consumption frequencies. The first group consists of 0-500 gr, the second 501-4000 gr and the third group 4000 gr> consumption of seafood monthly. Kruskal Wallis test was used for nonparametric tests and spearman correlation analysis was used for testing the relationship between consumption patterns. The Kruskal Wallis analysis showed significant difference between frozen, salted and canned food consumption ( $p < 0.05$ ). It has been determined that groups consuming between 0-500 gr, which is a low consumption form, have the lowest average, that is, they prefer less. Moreover, there was no statistically significant difference between the fresh fish selections of these 3 consumption groups and the preference of fresh fish preference came to the forefront. Furthermore, sperm analysis showed that other consumption patterns are inversely related to fresh consumption and they do not prefer other processed products as long as they reach fresh products. As a result, consumers of low consumption groups are less likely to consume frozen, salted and canned foods. It has also been found that consumption of other processed products falls as long as it is fresh.

**Key words:** Kruskal Wallis test, Spearman Correlation, Seafood, consumption form, consumption level.

#### *Pine Bark Extract as Feed Additive; In Vitro Nutrient Digestibility and Rumen VFA*

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Proanthocyanidins are condensed tannins and are plant phenolic polymers. They increase the protein utilization efficiency in ruminants by inhibiting degradation of proteins in the rumen, thereby boosting the protein passing through the intestines. Pine bark extract (PBE) contains Pycnogenol, proanthocyanidins (OPC), phenolic acids, taxifolin, catechin and epicatechin. The aim of this study was to evaluate the PBE which is an important antioxidant and condensed tannin resources as an alternative feed additive for ruminants by in vitro screening and subsequent in vivo study. Therefore effect of 0 (control), 100, 200, 300, 400, 500, 600 and 1000 ppm doses of PBE on in vitro nutrient digestibility of barley (B), soybean meal (SBM), and alfalfa hay (AAH) were evaluated to find out appropriate doses for in vivo use. According to in vitro study results, 300 and 600 ppm doses of PBE were added into the ration of 3 cannulated Holstein Frisian cows to evaluate rumen VFA's. According to in vitro digestibility results; doses of 500, 600 and 1000 ppm increased the degradability of NDF in AAH ( $56.32 \pm 0.886$  %,  $55.38 \pm 0.385$  % and  $49.11 \pm 2.630$  % respectively;  $P < 0.001$ ) compare to control ( $34.43 \pm 2.269$  %) but decreased the dry matter degradability of barley ( $P < 0.001$ ). The lowest protein degradability was found in the 1000 ppm group ( $39.96 \pm 3.846$  %;  $P < 0.001$ ) compared to the control group ( $60.83 \pm 2.174$  %).

There was not any significant difference between the different hours after feeding in terms of pH, propionic acid, acetic acid except the significant difference in the acetic acid content of dose 300 ppm in 4th hour after feeding ( $P < 0.05$ ). As a conclusion, there were no significant differences in terms of pH and propionic acid and acetic acid concentrations between PBE doses that would be effective on the energy utilization of animal and it is possible to use PBE as an additive in the ruminant feed. This study is supported by Scientific Activities Support Program of the General Directorate of Agricultural Research and Policie

**Key words:** Pine Bark Extract, In Vitro Digestibility, In Vivo Digestibility, Volatile Fatty Acids

#### *The Conditions for Non-Consumption of Seafood: A Case Study in Adana Province of Turkey*

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The present study was designed for determining the reasons for not consuming the seafood. The research was conducted by using face-to-face survey method to individuals around the shopping centers in Adana city. 407 people participated in the survey and it was determined that 60 of them were not consuming seafood and 347 individuals consumed seafood regularly. Among all factors taste and odor has the highest average of the reasons for not consuming seafood. Mann Whitney U test was performed when comparing two groups and to compare more than two groups Kruskal Wallis test was performed to determine the demographic reasons (Gender, age, income, occupation, education) effective on not consuming seafood. As a result of the mann whitney U test and the kruskal wallis test to test the reasons for not consuming the aquatic products according to their demographic characteristics there was no significant difference in demographic characteristics ( $p > 0.05$ ). In addition, as a result of the Principal Component analysis performed, consumers' reasons for not consuming seafood are explained with 4 variables with 74% variance. The first component is mainly composed of allergy and vegetarian factors. All the data obtained was analyzed on SPSS 21.0 software programme.

**Key words:** Aquaculture, Consumption, PCA, Mann Whitney U and Kruskal Wallis test.

### ***A novel Approach for Identification of Food-borne Yeasts: Multi-Fragment Melting Analysis System (MFMAS)***

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Yeasts represent a part of microbial communities in foods and play a central role in producing a variety of fermented foods and beverages such as bread, beer and wine. However, sometimes their excessive growth in foods may cause spoilage characterized by undesirable sensorial changes. For this reason, a rapid and exact identification of yeast species have a critical importance for accurate assessment of product quality and effective control of process line. For this reason, we aimed to develop a novel approach named as multi fragment melting analysis system (MFMAS) for rapid and reliable identification of the yeast species isolated from foods and other environments. MFMAS-yeast based on concurrent analysis of characteristic melting behaviour of at least 8 target DNA fragments showing interspecific heterogeneity. MFMAS-yeast is equipped with a software which allow visualizing, storing and analysing data obtained from the melting analysis of multi-target DNA fragments. Species-level identification is performed by comparing of characteristic melting data of yeast isolates analyzed with the data of known species stored in the database. In this study, applicability of the yeast version of the MFMAS (MFMAS-yeast) was evaluated for the identification of food-associated yeast species. For this purpose, in this study, a total of 250 yeast strains originated from foods and 19 standard yeast strains were tested. It has been observed that MFMAS system allows an identification almost in 95-100% accuracy for all tested yeast strains. As a result, the MFMAS-yeast offers a highly promising identification system that allows one-step identification of the yeasts isolated from foods and process environments. This study was supported by The Scientific and Technological Research Council of Turkey (TÜBİTAK)

**Key words:** Multi-Fragment Melting Analysis System (MFMAS), Yeast, Species Identification, Food

### ***Association Rule Mining from Gene Expression Data: An Application to Oral Cancer Cell Data***

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Detecting genetic markers from microarray gene expression data has been actively studied in biomedical science. Identifying informative genes involved in cancer diseases helps to understand the interaction mechanism of genes on disease phenotypes. Association rule mining is a machine

learning tool, which extracts widespread associations among attributes such as genes. Association rules can discover how the expression of a gene is associated with the expression of a set of genes. A rule can be stated as "if genes g<sub>1</sub> and g<sub>2</sub> are up-regulated, it is likely that gene g<sub>3</sub> will be down-regulated". Given that such an association exists, these links are added into the gene network. However, it should be noted that an association rule does not mean a cause and effect relationship. In this study, we worked on the gene expression profile of oral cancer cell data obtained from National Center for Biotechnology Information (NCBI). The oral cancer cell data includes both gene expression and DNA methylation data. In order to determine differentially expressed genes, we performed a statistical significance test. Then, a well-known association rule mining algorithm called the A priori algorithm is used to find frequent relations among significantly apparent genes in the oral cancer cell data. We performed all analyses by using R programming language, Weka and Minitab softwares.

**Key words:** Gene expression, Association rule mining, Data mining, Biostatistics

### ***Early Degradation Problem of Biodegradable Stents***

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Intravascular stents used in clinics today are primarily made of stainless-steel, CoCr-alloy and NiTi-alloys known as intelligent materials. Additionally, drug-eluting-stents have been developed with drug-impregnated-polymer-coating on the metal substrate. Even though stents made of such materials function for a while, it is seen that they cause problems in long-term. Since they are interacting with corrosive body fluids, stents cause occlusion of the vessel when they are broken by corrosion. Additionally, researches have been continuing in recent years to overcome late restenosis caused by problems such as atherosclerosis and thrombosis. In Biodegradable Stents (BS); problems which come up in permanent bare-metal or polymer-types will not be encountered. It is known that magnesium, poly-L-lactic-acid (PLLA), polyglycolic-acid (PGA), poly (D, L-lactide / glycolide) copolymer (PDLA) and polycaprolactone (PCL) are soluble in the body. Stents made of BS are called as "Biodegradable Stents". They begin to corrode and disappear in a few months in the vessel and leave no residue as other stents. Therefore, it is stated that they will cause no late-restenosis-risk which is seen in other stents. Thanks to the materials they contain, they do not create any obstacles to imaging with tomography and MR devices. However, early degradation risk of bioabsorbable stents is a problem must be solved. Since these stents are thick braided, their flexibility is low and grabbing the vessel is not as sufficient as metals yet. Therefore, it is not appropriate that placing such stents in complicated structures. In order to prevent restenosis risk, corroding in 12-18 months is expected from BS. However, this feature has not been accessed yet. Therefore, BS have not



received approval for routine clinical use. As of 2017, they are only in use for clinical research in EU countries. Our researches are still continuing to bring the BS's corroding time to ideal values.

**Key words:** Biodegradable materials, stents, restenosis, degradable stents, bio-corrosion

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***Isolation and Identification of Rhizobium spp. from Sugar Beet under Ecological Conditions of Mus, Turkey***

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The aim of this study is to isolate rhizobium spp. from the sugar beet root produced in the ecological conditions of Mus and to identify these bacteria at the species level. In July 2017, a sugar beet sample was taken from the beet planting areas of Mus, and various bacterial isolates were made from these samples. In order to isolate the bacteria found in the beet (especially in the grooves and fringes) the stem-body was washed with the aid of a sterile swap and 50 ml of sterile physiological saline solution (0.85 % NaCl solution). The washing fluid was collected in 50 ml falcon tubes and used as stock solution for bacterial isolation. 10-fold dilutions (10-1, 10-2, 10-3, 10-4 and 10-5) of this liquid were prepared in 10 ml sterile physiological saline solution (0.85 % NaCl solution). 100 µl were taken from each dilution tube and 7 % sheep blood agar was transferred and seeded by spreading plate method. The sieved petri dish was incubated for 24-48 hours at 37 °C in aerobic medium. After the incubation, the morphological characteristics (size, color, odor, hemolysis status etc.) of the colonies formed in the petri dishes belonging to each dilution were studied in detail and then 7% sheep blood agar was passaged in order to obtain pure cultures of each colony with different characteristics. The passaged petri-dish was incubated for 24-48 hours at 37 °C in aerobic media. The pure cultures obtained after the incubation were collected with sterile plastic essence and transferred into cryotubes containing 1 ml of 10 % sterile glycerin in Brucella Broth and stored at -80 °C. DNA extraction from the obtained isolates was performed using DNA Isolation Kit. 16S rRNA sequence analysis was performed to identify the isolates obtained at the genus and species level. According to the analysis results, *Bacillus safensis*, *Pantoea agglomerans*, *Enterobacter kobei*, *Achromobacter* sp., *Bacillus subtilis*, *Brevibacterium halotolerans*, *Bacillus mojavensis*, *Paenibacillus polymyxa*, *Achromobacter mucicolens*, *Pantoea agglomerans*, *Serratia ficaria*, *Bacillus atrophaeus*, *Paenibacillus apiaries* and *Salmonella* sp. have been identified. It is thought that these isolates obtained in this study can be used for the purpose of increasing yield and quality in sugar beet production.

**Key words:** Rhizobium, Sugar Beet, Bacteria, 16S rRNA sequencing

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***Secondary Metabolites for Prunus spinosa L. in Ganos Mount, Tekirdag, Turkey***

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Blackthorn (*Prunus spinosa* L.) is a fruit of the genus *Prunus* from the family Rosaceae. It grows wild in various regions in central, north, west, and south Anatolia of Turkey. It has numerous stems covered in dark bark with young twigs pubescent. The fruit has color as cherry black, blueish. It is commonly known as sloe, blackthorn, prunellier, or endrino. The fruits are popularly called "sloes." Although they look succulent, they are far too bitter for human consumption and are only used as flavoring in home-made liqueurs. Sloes are blueish black, bloomy, globular drupe, 10-15 mm with green astringent flesh. Blackthorn fruits also possess purgative properties. Sloes are too bitter to eat but can be made into home-made wine. More commonly, they are used to flavor sloe gin. In this study, It was determined the secondary metabolites in fruits of *Prunus spinosa* in 6 different locations of Ganos Mount, Tekirdag, Turkey in 2014. The fruits were collected in different harvest time and analyzed different secondary metabolites using HPLC-DAD-ESI/MS. According to the results, It has been contained the highest concentration as 3-Ocaffeoylquinic acid (41.57 mg/100 g dw) and the highest concentration for flavone/ols as Quercetin-3-in Orutinosi (22.49 mg/100 g) for phenolic compounds. These data showed significant changes to different locations and harvest times.

**Key words:** *Prunus spinosa*, Secondary Metabolites, Ganos Mount, Tekirdag

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***Influence of Ethanolic Extract of Propolis in Maintaining the Microbiological and Sensory Quality of Rainbow Trout Fillet***

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Rainbow trout (*Oncorhynchus mykiss*) is a cold-water fish species and is one of the major aquaculture fish species worldwide. However, it is highly susceptible to both microbiological and chemical deterioration due to its high water activity, neutral pH, relatively large quantities of free amino acids, high amount of polyunsaturated fatty acids, and presence of autolytic enzymes. Rainbow trout is typically stored and transferred on ice, but, it spoils in a very short time and making the extension of its shelf life is very



important. Cold storage and freezing cannot prevent the spoilage of fish alone. In recent years, there has been an increasing interest in extraction of antioxidants antimicrobials from natural sources and their effectiveness in prolonging the shelf-life of food. The aim of this study was to evaluate the effects of propolis extract (PE), on the microbiological and sensory quality of rainbow trout fillets under chilled storage at  $4 \pm 1$  °C for 14 days. Fish fillets were soaked into the PE and one batch was left as untreated (control). All fillets were placed into straws plates and covered with stretch film. Initially total viable count, psychrotrophic viable count, and enterobacteriaceae cells were determined as 1.48, 2.47 and 1.60 log cfu/g, respectively. During the storage period, samples treated with PE showed lower values than the control samples. Yeast and mould was observed in control samples on 8th day of the storage, while there was no growth in samples treated with PE. According to the sensory evaluation, PE treated group was acceptable until the end of the storage period, however, control group was rejected on the 6th day of the storage. The present study showed that PE can be recommended as a natural source of antimicrobial and preservative in order to maintain the microbial and sensory quality of trout fillets.

**Key words:** Propolis extract, rainbow trout, microbiological quality, sensory quality, cold storage

### *A Novel Compound Calcium Fructoborate in the Cancer Therapy*

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**Objectives:** Inflammation has a complex role in the initiation, development, malignant transformation and metastasis of the tumor in skin cancers. IL-6, TNF $\alpha$ , IL-1 $\beta$  are multifunctional cytokines produced by various cells, regulating inflammation and immune response. IL-6, IL-1 $\beta$  and TNF $\alpha$  have been reported to play an important role in cancer development and proliferation. The incidence of those cytokines increases in skin disease such as melanoma and skin cancers. Because of these properties, TNF $\alpha$ , IL-1 $\beta$  and IL-6 can be targeted in cancer treatments. The aim of the study was to evaluate anti-inflammatory effects of CaFB in skin cancer. **Materials and methods:** Eight week-old 92 female Balb-c mice were randomly divided into 6 groups. Groups were named as Control, CaFB, DMBA+TPA, CaFB+DMBA+TPA, DMBA+CaFB+TPA, DMBA+TPA+CaFB. At the end of 22 weeks the mice were sacrificed. Skin and tumor tissues were collected. IL-6, IL-1 $\beta$  and TNF $\alpha$  levels in these tissues were determined by ELISA. **Result:** In the present study, a significant increase in IL-1 $\beta$  levels was observed in the DMBA +TPA group compared to the other groups, but no significant difference was found between the CaFB+DMBA+TPA, DMBA+CaFB+TPA,

DMBA+TPA+CaFB groups. There was a significant increase in IL-6 levels in the DMBA+TPA and DMBA+CaFB+TPA groups compared to the other groups. The decrease of IL-6 levels in CaFB+DMBA+TPA and DMBA+TPA+CaFB groups was significant compared to the DMBA+TPA group whereas in the DMBA+CaFB+TPA group was statistically insignificant compared to the DMBA+TPA group. There was a significant increase in TNF $\alpha$  levels in the DMBA+TPA and DMBA+TPA+CaFB groups compared to the other groups. The decrease of TNF $\alpha$  levels in the CaFB+DMBA+TPA and DMBA+CaFB+TPA groups was significant compared to the DMBA+TPA group whereas in the DMBA+TPA+CaFB group was statistically insignificant compared to the DMBA+TPA group. **Conclusion:** These results suggest that CaFB may decrease the pro-inflammatory cytokines levels and may have positive effects on tumor formation and thus prognosis of the disease.

**Key words:** Skin Cancer, TNF $\alpha$ , IL-1 $\beta$ , IL-6, Calcium Fructoborate

### *Green Synthesis Silver Nanoparticles Using Fruit of Viscum album L.*

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Viscum L., a species belonging to the family Santalaceae, is represented by 3 subspecies belonging to this species in our country and it is commonly found in the family of Santalaceae family and it is commonly found in fir trees such as fir, pine cones, fruit trees such as aphid, hawthorn, pear, quince, apple, apricot, like a popular, is a parasitic bush that grows on trees or shrubs while it leaves its leaves in the winter. Viscum album L. is a hemiparasite on several species of trees, from which it draws water and nutrients. 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. Our study using different type extraction (alcoholic, boiling water) fruit of Viscum album L., silver nanoparticles were synthesized. In our work, the synthesis took place very quickly. This process was also understood by the fact that the color change was immediate. This reaction did not require energy, temperature or the use of toxic chemical reagents. The biosynthesized nanoparticles were characterized using UV-Vis spectrophotometer, light scattering method for particle size analysis, TEM for morphology studies, energy dispersive X-ray analysis for element determination. The size of the nanoparticles varies from about 20 to 50 nm. Thus, green synthesis has multiple advantages, for instance, it is cost effective and eco-friendly.

**Key words:** Green synthesis, Nanoparticle, Silver, Viscum album L.

### **The Effect of GnRH Application in Transition Period on Middle Anatolian Merino Sheep without Fertility in Season**

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This study, was aimed to reduce the number of infertile cattle in operation and increase the profitability of the enterprise. Middle Anatolian Merino sheep that were inseminated at least three times in the breeding season and not pregnant, application (GnRH) group (Group I, n = 43) and control group (Group II, n = 26) were divided into two groups. Sponge containing progesterone was placed in the application group for nine days. While administering 250 IU PMSG + 125 µg PGF2α concurrently with sponge removal, no application was made to the control group. Estrus induced sheeps were mated with fertile rams by hand mating method. The diagnosis of pregnancy was made with USG 30-45 days after the initial insemination. In the study, oestrus, conception, pregnancy, birth, lamb yield, multiple birth rates and average number of lambs at one birth were investigated. In the GnRH and control groups, respectively, 55.8 (24/43), 26.9 (7/26); 87.5 (21/24), 3.5 (1/26); 90.5 (19/21), 0 (0/1); 62.8 (27/43), 0 (0/26); 31.6 (6/19), 0 (0/0) ve 1.42 (27/19), 0 (0/0). All properties except for the estrus ratio were found to be significant in favor of GnRH (p = 0.001). As a result, progesterone-containing sponge (9 days) + 250 IU PMSG + PGF2α + GnRH application was found to be beneficial in sheep that were inseminated at least three times in the breeding season and not pregnant.

**Key Words:** Breeding season, Middle Anatolian Merino sheep, GnRH

### **Leishmania infantum-Whole Genome Sequencing: The First Study Since the Reference Genome**

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*Leishmania* subgenus *Leishmania* is causing Leishmaniosis which is a chronic systemic disease in humans and animals can keep the skin and visceral organs. The disease generally constitute three different clinical table in humans [visceral (kala-azar, VL), cutaneous (CL) ve mucocutaneous

leishmaniosis (MCL)]. According to World Health Organization (WHO), Leishmaniasis is still one of the world's most neglected diseases. It has been nearly 10 years since the completion of the first entire genome sequence of a *Leishmania* parasite. However, there are still many things in the dark for scientists such as the causes of differences in tissue tropism. The aim of this study is to remove that the whole genome sequencing with next generation sequencing technology of *L.infantum* causing cutaneous leishmaniasis from turkish isolate. Genomic sequencing was performed on the Illumina HiSeq 2500 platform. The "TruSeq Nano DNA Low Throughput Library Prep Kit" compatible with the "Illumina HiSeq 2500" platform was used to create the library. Synthesis sequencing (SBS) was performed with HiSeq Rapid SBS Kit v2 in the form of single fragment readings (2 x 150 bp; PE) with two fragment end-to-end assemblies. Bioinformatics analyzes were performed Genius 11.0.5. (www.genius.com) platform. The whole genome sequence of *L.infantum* Turkish strain was successfully obtained 32,009,138 bases total length. The Genome has been submitted to the NCBI GenBank ([www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)). The accession numbers of the 36 chromosome of the *L.infantum* genome available from the NCBI (BioProject PRJNA437593). There are no "whole genome sequence" studies or genomic studies conducted in *Leishmania* species in our country. Moreover, the fact that the study is carried out with the *L.infantum*, which has the causing-CL, makes this study more specific. We believe that the data obtained will provide a basis for *Leishmania* genomic studies in our country and contribute to global studies in this topic.

**Keywords:** CL-*Leishmania infantum*, Next Generation Sequencing Technology, Whole Genome Sequencing

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***The Ecologic Importance of Co-occurring Viruses  
of *Emiliana Huxleyi* in Marmara Sea***

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Although viruses in the marine environment have many ecological roles, the major one that has been attributed is their role as “viral lubricators” of biogeochemical cycling through the Viral Shunt. This process refers to the retainment of nutrients at lower trophic levels in the marine food web. Sequestration of materials in viruses, bacteria and dissolved matter may lead to better retention of nutrients in the euphotic zone in virus-infected systems, because more material remains in these small non-sinking forms. The important question that has been difficult to address is the range of host species (in particular phytoplankton) and the scale of infection by viruses. The aim of this study is to provide an overview of marine viruses, in particular the coccolithoviruses, and to indicate their role and importance in the Marmara Sea marine ecosystem. Coccolithoviruses infect the cosmopolitan and ecologically important coccolithophore *Emiliana huxleyi* (Ehux), a tiny (5 µm diameter) marine alga that floats freely in the sea. Viruses are instrumental in the collapse of Ehux blooms and allow succession of different microalgae following rapid bacterial remineralization of organic matter. With its regular Ehux blooms in the Marmara region in particular, coccolithoviruses are likely to exert significant control on marine bacterial and phytoplankton communities in Turkish waters, with respect to both biological production and species composition, influencing the pathways of matter and energy transfer in the marine ecosystem. This study provides an important first step and a framework for Turkish marine researches of ecological and functional biodiversity in a marine algal-virus system of ecological significance and importance. Indeed, phylogenetic and functional diversity studies of coccolithoviruses need to be expanded to other geographical locations, as currently there is no data available on coccolithoviruses in vast majority of the world's seas where they are likely to persist; i.e. Mediterranean Sea, Marmara Sea and Black Sea. In this matter, Turkish seas should be monitored after Ehux blooms for understanding algae-virus interaction.

**Key words:** *E. huxleyi*, Coccolithoviruses, phytoplankton, algae-virus interaction, Turkish Seas, Türkiye.

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***Effect of Biochar on Plant Growth in Heavy  
Metal Contaminated Soil***

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Due to the heavy metal threatening the ecosystem, the concern for heavy metal contamination of soils has increased. Soil remediation by on in situ and ex-situ remediation techniques from heavy metals is urgent to rehabilitate the polluted soils for safe food production. Biochar is a pyrogenic carbon-rich material which is produced from waste biomass through pyrolysis under oxygen-limited condition and it is increasingly being used as a soil amendment to improve soil properties and reduce greenhouse gas emissions. Many published articles indicated that the application of biochar to the soil decrease the heavy metal transfer to the plants. Biochar has an aromatic structure that makes it stable and highly resistant to chemical and biological degradation in soil. Due to its functional and sorptive characteristic of biochar, it has been suggested to be an effective sorbent for various hazardous inorganic and organic contaminants. The use of biochar for soil rehabilitation is depending on its quality, various factors such as the soil and metal types, the amount of biochar applied to the soil etc. Additionally, the biochar plays a critical role in increasing retention of nutrients and thereby reducing nutrient leaching. In this review study, effects of the biochar on the heavy metal transfer from the soil and irrigation water to the plant and growth are investigated.

**Key words:** Biochar, heavy metal

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***Rapid Detection Methods for *Listeria*  
*Monocytogenes****

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*Listeria monocytogenes* is a foodborne pathogen of great concern due to the high fatality rates of listeriosis, and capability to survive stress conditions commonly encountered in foods such as high salt concentration, low temperature and low pH. Although foodborne listeriosis outbreaks are mainly linked to poultry, beef, dairy products and ready-to-eat foods, vegetables have also been identified as vehicles of transmission. The risk groups for listeriosis are pregnant women, infants, the elderly, and people with weak immune systems. Rapid methods used for the detection of *L. monocytogenes* in food are presented, especially in the context of the production environment and finished products. Classic cultural methods are designed to enable the detection of a single target cell in a sample, and this is also the desired characteristic of any rapid method intended to replace a

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culture-based one. Rapid methods may mean a shorter time, but can also refer to better flow-through or handling of multiple samples for greater convenience and automation of work. The rapid methods often combine various technologies (culture, immunoassays, nucleic acids). Some rapid methods are mentioned below. These are immunological methods (lateral flow immunoassay, enzyme-linked immunosorbent assay, enzyme-linked fluorescent assay, and immunomagnetic separation), biosensors, bacteriophage-based detection methods, fluorescent in situ hybridization (FISH), amplification methods (quantitative PCR or real-time PCR, isothermal amplification and nucleic acid sequence-based amplification). In conclusion, compared to the other techniques, nucleic acid-based methods are more specific, using DNA or RNA sequences as targets. RNA instead of DNA provides more sensitivity and information about the viability of the bacteria.

**Key words:** *Listeria monocytogenes*, listeriosis, rapid method, foodborne pathogen

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***Innovation Perspective of Detecting of  
Foodborne Pathogens: Biosensors***

***Pınar Şanlıbaba<sup>1</sup> and Yalçın Güçer<sup>2</sup>***

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Numerous cases of foodborne illness among humans are caused by pathogens delivered with foods. The most common foodborne infections are caused by *Staphylococcus aureus*, *Campylobacter* spp., *Salmonella* spp., *Listeria monocytogenes*, and *Escherichia coli* O157:H7. Raw meat, milk, seeds and vegetables may be the source of these bacteria. They are transferred through cross-contamination during food preparation, reaching the food supply chain. The standard microbiological methods in food pathogen detection are based on colony counting on an agar plate. This procedure requires several days for revealing the presence of a pathogen. Biosensor-based methods are an update on alternative molecular methods to nucleic acid-based detection for species identification. Biosensors offer advantages over current analytical methods. Besides their good selectivity and low cost, they are portable to use in working sites and have the ability of measuring samples with minimal sample preparation. In fact, for the availability of fresh products in the food industry, biosensor research has been focused on the contaminant detection, content verification, monitoring of raw materials conversion and product freshness. The biosensor is an analytical device, which converts a biological response into an electrical signal. It consists of two main components: a bioreceptor or biorecognition element, which recognizes the target analyte and a transducer, for converting the recognition event into a measurable electrical signal. A bioreceptor can be a tissue, microorganism, organelle, cell, enzyme, antibody, nucleic acid and biomimic etc. Biosensors are categorized into various groups according to the basic principles of signal transduction and biorecognition elements. Some of the most commonly used biosensor systems based

on their transducer properties, which include optical, surface plasmon resonance (SPR), amperometric, potentiometric, whole-cell, electrochemical, impedimetric, piezoelectric and their applications for the rapid detection of pathogens in food. The best amongst all is multi-array biosensor system which detects multiple pathogens in very short period of time. The suitable biorecognition element (enzymes, antibodies or nucleic acids) is the better judge for the type of biosensor configuration used in food borne pathogen detection.

**Key words:** Foodborne pathogen, detect, biosensor

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***Biotechnological Approaches to Enhance Wine  
Aroma***

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Wine aroma is classified according to the sources of the different aromatic compounds as primary-varietal aroma that comes from grape, secondary-fermentative aroma that is produced by yeast and bacteria during alcoholic and malolactic fermentation and tertiary-post-fermentative aroma that appears during the ageing process. Aroma compounds in wine are found both as “free” and “bound” forms and a large proportion of aroma compounds in wine are found in the bound form mostly as glycosides. Increasing wine quality by enhancing aromatic profile is an important topic for biotechnological researches about wine nowadays. *Lactobacillus* sp. can possibly hydrolyze aroma precursors and so influence wine aroma because of having catalytic enzymes that can set free the grape-derived aroma compounds from bounded glycosides. Also wine properties such as low pH, ethanol content or residual sugar content won't be the optimum conditions for that, commercial biotechnological production of glycosidases by *Aspergillus* sp., can be used to ensure more aromatic compounds in the wine. An alternative approach to prepare an extract of glycosidases for wine is to express the specific enzyme gene in *S. cerevisiae*. For example, the *rbaA* gene ( $\alpha$ -L-rhamnosidase) from *Aspergillus aculeatus* has been successfully expressed in conjunction with the *Candida molischiana*  $\beta$ -D-glucosidase in an industrial wine yeast strain to increase the pool of linalool, nerol and  $\alpha$ -terpineol in Muscat wine.

**Key words:** Wine, Aroma, Biotechnology, Fermentation, Wine Quality



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***Preparation and Analysis of Alginate-Dextran  
Based Controlled Release Fertilizers***

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With the increase in population, the need for agricultural products has increased. Chemical fertilization in plant production has taken an important place in this direction. Increasing use of fertilizers disrupts soil quality and causes some environmental problems. For this reason, scientists have concentrated on an alternative method of biological fertilization and their controlled release to prevent environmental problems. Controlled-release biological fertilizer causes long-lasting and desired release of any useful microorganism or necessary minerals for soil in order to provide the nutrients needed by agricultural plants or to improve the physical, chemical and biological properties of agricultural land. The controlled release was developed to provide a more stable use for a longer period of time in biological fertilization. In this study, alginate-dextran hydrogels were prepared at different concentrations 19-31% and 0.7-1.5%, respectively. Hydrogels were obtained by adding CaCl<sub>2</sub> to the polymers. KNO<sub>3</sub> was added at the time of polymerization in order to investigate the release performance of the hydrogels. The release efficiency of the resulted hydrogels were analyzed by potentiometric sensors developed in our laboratory. The sensors used were ion-selective PVC membrane sensors specific to K<sup>+</sup> and NO<sub>3</sub><sup>-</sup> ions. The results showed that the desired long-term release of hydrogels were obtained with Na-alginate, dextran, KNO<sub>3</sub>, CaCl<sub>2</sub> and HEPES at different ratios. The best result of potentiometric measurements was obtained using 9.1% Na-alginate and 0.13% CaCl<sub>2</sub> and release was lasted in 2 weeks. In addition, the daily potassium release performance is 126.31 mV faster than a daily release performance of nitrate. This study is supported by Yildiz Technical University Scientific Research Projects Coordinatorship Project No: 2016-07-04-GEP01

**Key words:** Controlled release fertilizer, sensor, alginate-dextran hydrogel, potentiometric measurement.

***The Use of Taurine In The Aquatic Feed Industry***

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Aquaculture industry continues to expand gradually from traditional, low cost semi-intensive systems to more expensive ones, where the processed feed is an important component for condensed systems. As a result, total industrial processed feed production reached 35 million tons in 2010, an annual average growth rate of 11%, from 7.6 million tons in 1995. It is also expected that this growth will

continue and the production of aquatic feed will reach 70 million tons by 2020. The aquaculture sector consumed 73% of total global fishmeal production and 80% of total global fishmeal production in 2010. Today, costly and limited availability of fishmeal, the primary protein source in the aquatic feed industry, has emerged. Meanwhile, plant-based protein sources, particularly sources of fatty plants, have received great interest in the last fifteen to twenty years as a partial or total fish substitute for the aquatic feed industry. However, vegetable protein sources do not fully meet the requirements of many carnivorous fish species due to their low taurine synthesis. On the other hand, many plant-derived nutrients contain taurine, which is required for optimum performance and metabolism activities of livestock and especially carnivorous fish, only in restricted levels. Taurine is a neutral  $\beta$ -amino acid derived from the metabolism of sulphur containing amino acids. It is present in high concentrations in animal tissues, especially heart, retina, skeletal muscle, brain, large intestines, plasma, blood cells and leucocytes. In the past, taurine has not been considered as a essential nutrient for fish. Current investigations have revealed that taurine synthesis varies greatly among fish species and that freshwater and marine fish and shrimps play an important role in aquaculture and nutrition.

**Key words:** Taurine, Aquaculture, Aquatic Feeds, Nutrition

***A Biochemical Factor that Significantly Disrupt  
the Wheat Quality: Insect Enzyme Salivary***

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Damage to wheat and its baking quality due to bug attack has been reported from many countries e.g. Germany, Russia, Spain, Hungary, Czechoslovakia, Yugoslavia, Italy, Turkey, Iran, Iraq, and New Zealand. Bug damage is usually associated with insects of the genera Eurygaster, Aelia, and Nysius. All these insects are sucking insects, piercing the developing grain with stylets. During feeding they inject saliva (proteinases) in to wheat kernel to disrupted protein structure, especially gluten proteins and cause important losses to millers, bakers, and country economies. These bugs reduce both wheat yield and quality so bug-damaged wheat causes reduction of flour quality, giving a softer dough and subsequently flat bread with low volume, rough crust surface, sharp edges to loaf and unsatisfactory texture. There have been various studies in the literature on the percentage of bug-damaged kernels in wheat necessary to seriously affect the product and baking quality. Different researchers reported very different bug damage ratios in the range of 0.3 to 10%, which can lead to confusion on the determination of the level of destroying the technological quality (bread and pasta making) of wheat. These differences between the studies may be explained by the different insects found to infest wheat cultivars, population density of the insect, weather conditions, water availability, duration of the crop growing period, occurring stage of insect damage, sucking degree,

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sucking number on a kernel by insect, and wheat cultivar characteristics. In this subject, it has been well documented that when damaged kernels ratio increases in wheat mass, quality characteristics of wheat's decrease. The deterioration of the flour quality of wheat damaged by insect can be demonstrated by physical, biological, chemical, biochemical (enzymatically), technological and rheological analysis, however, applying bread making experiments by using a standard method and to determine the obtained bread characteristics is the best way.

**Key words:** Wheat, Wheat quality, Insect, Protein, Biochemical

***Preparation of Bentonite and Clay Based  
Controlled Release Fertilizers and Analysis by  
Ion-Selective Potentiometric Sensors***

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The production of slow and controlled releasing economical fertilizers by macroencapsulation was the goal of this study. Amount of released and remained potassium and nitrate ions in the capsule was measured in certain intervals by potentiometric analyses using ion-sensitive PVC membrane sensors developed in our laboratory. The detection of nutrient release duration and rate were also examined. The low cost and biocompatible bentonite and ball clay were used as ingredient in different ratios due to provide controlling and decelerating the release rate, because of their good swelling properties as a carrier. A fixed proportion of plant nutrient was encapsulated in different combinations of bentonite-alginate or clay-alginate matrix, and macromolecular capsule fertilizers were obtained. Release rate of obtained bentonite and ball clay matrices that were polymerized with alginate containing plant nutrients were compared with previously reported encapsulated fertilizers in the literature. The required elements for plant growth was encapsulated in matrices that are produced using combinations of 1.5, 2, 2.5% alginate with 2, 4, 6% bentonite/clay solutions. Potassium nitrate (KNO<sub>3</sub>) was used as plant nutrient and the release period of the obtained macrocapsules were monitored by using potentiometric ion-selective sensors which are sensitive to K<sup>+</sup> and NO<sub>3</sub><sup>-</sup>. According to the electrochemical analyses the slowest releasing capsules were consisted of 2.5% alginate + 2% bentonite; therefore, the best controlled release behavior was selected using bentonite. As a result, the developed fertilizer has been found that it provides nutrients to the plant continuously and adequately which enhances crop productivity.

**Key words:** Controlled Release Fertilizer, Ion-Selective Sensor, Alginate-Bentonite Capsules, Alginate-Clay Capsules, Potentiometric Measure

***Bioactive Properties of Myrtus communis L.***

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*Myrtus communis* L. (Myrtaceae) is an annual plant that has been used since ancient times for medicinal, food and spices purposes. The leaves of it contain tannins, flavonoids such as quercetin, catechin and myricetin derivatives and volatile oils. The fruits of this plant are mostly composed of volatile oils, tannins, sugars, flavonoids and organic acids such as citric and malic acids. In traditional medicine, myrtle (*Myrtus communis* L. ) is frequently consumed as an infusion and decoction. An infusion from the leaves and young branches is stimulant, antiseptic, astringent, and hypoglycemic, and was considered to be a health remedy for eczema, psoriasis, asthma, gastrointestinal disorders, urinary infections, and diarrhea. The leaf decoction is still used for enemas, and against respiratory diseases. A decoction from the fruits was used as antidiarrheal, antihemorrhoidal agents, and to treat mouth and eyes disease. Flowers, traditionally used against varicose veins, were mixed with other aromatic herbs such as *Origanum majorana* to prepare capillary lotions. Little is known about the phytochemical composition and biological activities of myrtle infusion, since this is the most common form of using the species and it may constitute an interesting dietary source of health-protective compounds. Accordingly, the aims of the present review were to discuss: (i) bioactive properties such as antioxidant activity, phenolic content etc (ii) the effect of health. This study (FBA-2017-8231) was supported by the Commission for the Scientific Research Projects of University of Cukurova, Turkey

**Key words:** *Myrtus communis* L., Bioactivity, Antioxidant, Health

***Determination of Thermal Inactivation  
Parameters of Pectin methylesterase from  
Alyanak Apricot***

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Turkey is the leading apricot producer in the world with annual production of 695364 tons in 2009 according to which amounted to 13 % of the world production. Malatya region of Turkey is particularly important for cultivation, production, and processing of apricots, as around 50 % of the fresh apricots and 90 % of the dried apricots in Turkey are produced in this region. The most cultivated apricot varieties in Malatya region are, Hacıhaliloğlu, Hasanbey, Soğançı,

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Kabaası, Alyanak, Çataloğlu, and Çöloğlu . Pectin methylesterases are cell wall-bound enzymes which catalyze the hydrolytic cleavage of the methylester moieties on pectin molecules, resulting in the release of methanol and partially de-esterified pectin. Research on non-thermally treated products demonstrated that cloud loss in fruit juices is mainly due to the cooperative action of pectin methylesterase (PME) and polygalacturonase (PG). PMEs play an important role in determining the extent to which demethylesterified pectic polysaccharides are accessible to degradation by PG. Demethylation of pectin results in a juice that separates in clear serum and a sediment, which arises from low methoxyl pectin that complexes with calcium ions. Therefore, control of PME activity is crucial for the cloud stability of juices. Cloud loss problem can be easily overcome with thermal processes. The aim of this study was to partial purification and determination thermal inactivation parameters of pectin methylesterase from Alyanak apricot. In conclusion Energy of activation (Ea) and Z values were found to be 206.1 kJ mol<sup>-1</sup> (r<sup>2</sup>=0.993) and 10.62 °C (r<sup>2</sup>=0.992), respectively.

**Key words:** Apricot, Purification, Pectin Methylesterase, Thermal Inactivation

***Improvement of rheological properties of Fish (Oncorhynchus mykiss) Gelatin by Addition of Gellan Gum***

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Gelatin is an important thickening agent widely used in the food and pharmaceutical industry. It is mostly obtained from mammalian by-products. Nevertheless, the outbreak of mad cow disease (bovine spongiform encephalopathy), foot-and-mouth disease (FMD) and some religious restrictions in some countries have increased the gelatin demand from alternative sources. Fish processing wastes including skin, bone or scale are alternative sources for gelatin production. Considerable amount of bones and skins (around 22% of the total fish weight) is wasted during processing of fish and fish skins are a potent source of gelatin. Fish gelatin has much lower gelation temperature and melting point than gelatin derived from other sources. The aim of this research was to strengthening the rheological properties of fish (*Oncorhynchus mykiss*) gelatin by adding gellan gum. For this purpose 0%, 0.1% and 0.2% gellan gum was added into the prepared solutions of fish gelatin at a fixed concentration of 6.67% (w/v). Rheological measurements were used to characterise the gelling and melting temperatures and the gel modulus. Gellan gum addition positively affected the gelation, thermal and rheological properties of the gelatin. Notably, gel strength increased from 1126,47 Pa to 3369,7 Pa and 4681,3 Pa with the addition of 0.1% and 0.2% gellan gum, respectively. In conclusion the addition of gellan gum even at low concentrations prevented the melting of the fish gelatin.

**Key words:** Fish Gelatin, Gellan Gum, Rheological Properties

***The effect of Extraction Methods on Gelatin Production from Buffalo Leather and Determination of Rheological Properties of Buffalo Gelatin***

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Industrial wastes are one of the most important problems in leather industry. By evaluating these wastes, it is very important to solve the environmental problems as well as to contribute to economy by producing high value added products. Leather solid wastes are of economical value due to their proteinaceous properties, fibrous character and high natural fat content, and are also suitable for gelatin production. While more heavy leather wastes are used in the production of gelatin, due to the lack of production of buffalo, buffalo skin wastes are mixed with others. In this study, it was aimed to determine the best extraction method for the production of gelatin from buffalo leather wastes. In the first method, the buffalo skin were kept in 0.5 M sodium chloride at 5 °C for 5 min and then extracted with 0.1 N sodium hydroxide and 0.1 N acetic acid (1: 5 w / v). In second method, skins were extracted with %1,9 NaOH (1:8 w/v) and 6 N HCl (1: 5 w / v). In method three, extraction was carried out at different temperatures; skin: water mixture (1: 5 w / v) was extracted in turn at 50 °C, at 60 °C, at 70 °C and at 80 °C for 3 hours. Lastly in method four, the buffalo skin were extracted with 0.5 M NaOH (1:4 w/v) and 1.2 M HCl (1:4 w/v). Among these methods, the highest yield (Method 3) was determined as 13.02 g/100 g. The other extraction yields were determined as 1,14 g/100 g (method 1), 4,17 g/100 g (Method 2) and 5,19 g/100 g (Method 4), respectively. Gel strength ranged between 0,8746 Pa and 7739,87 Pa. It was determined that the gelatin produced by Method 3 showed the best rheological properties.

**Key words:** Gelatin, Buffalo Leather, Trim Wastes, Rheological Properties

***Interesting structures of microorganisms that have big potential in biotechnological processes***

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Microbiology is the study of microscopic organisms and it is regarded as an important branch of biology. Microorganisms



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are classified on the basis of their morphology, physiology, structure of cell wall, cell division and proliferation of cells. Major microscopic organisms are viruses, bacteria, yeasts, molds, algae and protozoa. Microbiology initially focused on the causes of infectious diseases, but now it is in the practical application of science. Use of microbiology in practice is expressed in different terms such as applied microbiology, bioprocess, microbial biotechnology and so on. Biotechnology is defined as the using of biological organisms or parts of them in industrial processes. Biotechnology is an interdisciplinary field that manages biology and chemistry applications in engineering sciences. Microbial biotechnology is a technological application in which microbiological systems, microbial organisms or their derivatives are used to modify the product or processes for specific use. It handles the use of microorganisms in the production of important and sensitive products. Producing these products in other ways is extremely difficult. These bio-based products are spread as safe food additives, medicines, cosmetics and so on. The interesting structures in microorganisms are capsids in viruses, plasmids and glycocalyxes in bacteria, cytoplasm in yeasts, cell walls and forms of asexual reproduction in molds, forms of cell that they change during proliferation and adaptation for changing environmental conditions in protozoa, distinctive cell nuclei and chloroplasts in algae. These are structures commonly used in biotechnological applications or have potential to use. The interesting structures in microorganisms and the possibilities for using them in biotechnological applications are undoubtedly much more. Subjects described here are entirely designed by the author. In this study, the usefulness of interesting structures of microorganisms and the potentials of them in biotechnology will be explained.

**Key words:** Microorganisms, microbial structures, microbial biotechnology

### *Biology and Technology of Caseins*

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Milk, which provides immunological protection and nutrition for newborns as primary functions in accordance with its unique composition and properties, is now used as an important raw material in many industries, particularly in the food industry. The most important component that gives the technological qualities is undoubtedly the casein. Casein biology includes topics such as the sequence of amino acids in the polypeptide chain, secondary, tertiary and quaternary structures, post-translational modifications, genetic variation and micelle structures. The biological structure of caseins is designed according to the functions to be performed in living environment, as in other proteins. Once synthesized in the organism, the proteins can not demonstrate their functions without gaining specific geometric shapes. Caseins are found in the normal milk in the form of stable colloidal micelles. The acidic conditions of the stomach and chymosin enzymes

are capable of destroying this stability. We can say that the technological properties of caseins are in the direction of biological and chemical structures. When cheese, yoghurt and caseins are produced by conventional methods, biochemical events that actually occur in the stomach, have been imitated. As the facts of the caseins become clearer, they have begun to be used to obtain further products. These are ingredients in the food industry, adhesive products, sizing ingredients in the textile industry, bioactive peptides in the pharmaceutical industry and so on. In this study, the biological and chemical properties of caseins will be described, then the technological aspects and obtained products will be explained.

**Key words:** Casein biology, casein technology, bioactive peptides

### *Interactions between the Lessepsian and the Native Fishes in the Northeastern Mediterranean*

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In the studies dealing with the transitions of lessepsian fishes through Mediterranean, it has been reported that; these transitions has been increasing by the time. Especially, since the number of these fish species is too high; it has been reported that the number of these species has increased to 107 in 2017. As a result of these transitions, there have been interactions between the native species of Mediterranean and lessepsians. Abiotic environmental factors such as temperature, salinity etc. shows similarities between Mediterranean and the Red Sea. These mentioned similarities have a major effect on the transitions of Lessepsian species through Mediterranean. Lessepsian fishes have formed denser populations through northeastern Mediterranean due to the decrease in the salinity where Nile River reaches Mediterranean, and additionally by the way of coastal cyclonic currents in the region. Both in the settlement phase and after the population growth, it has been observed that the major interaction between lessepsians and native species have been habitat sharing, and food and feeding. Some lessepsian species have utilized the ecological niches, which have not been adequately assessed by native Mediterranean species; resulting higher population density in their own species. Consequently, it has been reported that in recent years 80% of the fishes, which are caught via fishing nets in İskenderun Bay are originated from the Red Sea. Even though some economically valuable lessepsians have not been evaluated yet, and some have not been counted as economically valuable due to their small sizes; recent studies have reported that 11 over 107 fish species penetrated through Mediterranean have been counted as economically valuable;



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also resulting an increase in the number of economically valuable fish species in the Mediterranean.

**Key words:** Lessepsian, Teleost Fish, Interaction, Red Sea, Noertheastern Mediterranean

***A molecular imaging method in the evaluation of oncology patients; positron emission tomography / computed tomography***

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Positron emission tomography/computed tomography (PET/CT) is a 'molecular imaging' method that intersects molecular biology and in vivo imaging. Biologic molecules that indicate parameters such as DNA synthesis, membrane synthesis and glucose metabolism are attached with positron-emitting radionuclides to provide molecular imaging. F-18 fluoro-2-deoxyglucose (FDG), the most commonly used radiopharmaceutical in PET/CT imaging, is a glucose analog. The FDG molecule, like glucose, is taken up into the cells and phosphorylated by hexokinase. However, because a hydroxyl group is missing, it cannot proceed to the glycolysis steps. Accordingly, FDG accumulates and a higher count will be obtained in imaging than in normal tissues because malignant cells use more glucose than normal tissue. PET/CT imaging in the Necmettin Erbakan University Faculty of Medicine started in March 2008. Until January 2018, 18,509 PETs were performed. When 1000 consecutive PET images screened in the period of a year were examined, the distribution of indications for patients was determined as follows: lung carcinoma (Ca) 25.3%, breast Ca 21.9%, lymphoma 16%, colorectal Ca 7.6%, prostate Ca 3.2%, gastric Ca 3%, ovary Ca 2.8%, kidney tumor (tm), 2.8%, bladder tm 2.8%, multiple myeloma 2.1%, malignant melanoma 2.1%, head and neck tm 1.7%, pancreatic Ca 1.5%, endometrium Ca 1.1%, testicular Ca 1%, thyroid Ca 1%, and others 4.1%. As a result, FDG-PET/CT has become an indispensable standard imaging method in practice in oncology. Radiopharmaceuticals, which are being developed with new biologic agents, open new horizons in the diagnosis and treatment of patients with cancer.

**Key words:** PET/CT, 18F-FDG, molecular imaging, oncology

***Glutathione and malondialdehyde level at Tulipa luanica, T. kosovarica and T. albanica from different soil types in natural conditions***

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The genus *Tulipa* in Kosovo is represented with six plant species, including *T. kosovarica* and *T. luanica* that are new plant species, which have been discovered in recent years, while in Albania is *T. albanica* as a new plant species. *T. luanica* appears to grow exclusively on limestone, while *T. kosovarica* and *T. albanica* only on serpentine. The present study has been carried out to evaluate the effect of different habitat types on eventually oxidative stress of *T. kosovarica* and *T. albanica* from serpentine soil and *T. luanica* from limestone soil. The plant samples (leaves) were collected from their natural sites: *Tulipa albanica* at Surroi locality (Albania), *Tulipa kosovarica* at Mrasor locality (Kosovo) and *Tulipa luanica* at Pashtrik locality (Kosovo). The research showed that glutathione (GSH) and malondialdehyde (MDA) levels were significantly higher in leaves of *T. luanica* compared with *T. kosovarica* and *T. albanica*. The lowest contents of MDA and GSH were observed at *T. kosovarica* in comparison with other two species. However, the higher level of GSH at *T. luanica* indicates the level of oxidative stress and may be a consequence of higher lipid peroxidation in this plant species. Our findings show that level of oxidative stress was higher at *T. luanica* in comparison with *T. kosovarica* and *T. albanica*.

**Key words:** *Tulipa*, malondialdehyde, glutathione, serpentine, limestone

***Principle and cost analysis of MALDI-TOF MS microbial identification: an emerging and rapid technology***

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Rapid and accurate identification of pathogens is essential for appropriate antimicrobial therapy. But conventional methods take days, automated systems require at least 8-12 hours and molecular methods are not practical for routine identification. Matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) has been introduced as a rapid, reliable alternative for microbial identification. This new technology is based on the principle of protein fingerprinting of specific protein structures according to their flight time and can identify the microorganisms in only minutes. MALDI-TOF MS is known as an inexpensive method when the device price and maintenance fees are excluded. The price of the device is around 1 million TRY and annual maintenance fees are about a hundred thousand TRY/year. We calculated approximate cost per test for MALDI-TOF MS for laboratories with annual testing numbers of 5 000, 10 000, 20 000, 50 000 and 100 000, taking into account the appliance price, annual maintenance fee and consumable materials costs. Device life was considered as ten years. The consumable material cost was accepted about 5

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TRY for each test. Test costs were found as 45 TRY, 25 TRY, 15 TRY, 9 TRY and 7 TRY respectively. Accordingly, contrary to what is claimed, the MALDI-TOF MS system is very expensive method in terms of total cost. Test costs are of great importance in routine microbiology laboratories in selecting methods. So this rapid technology may be appropriate to use only in certain university hospitals with a high number of annual tests, considering scientific study purposes.

**Key words:** MALDI-TOF MS, microbial identification, cost analysis

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**Effect of Fishing Net Material on Size Selectivity**

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There are a number of factors that affect the size selectivity of fishing gears. While some of these factors are related to characteristics of species (body shape, length distribution, spawning period etc.), some of them are related with the technical features of the fishing gears (mesh size, material, hanging ratio etc.). In the characteristics related to the fishing gear, the mesh width and the material are two important parameters affecting size selectivity. In this study, the selection of monofilament and multifilament gillnets used in the fishing of whiting has been examined to determine whether the material has an effect on size selectivity. In order to provide samples, 22 operations were carried out between December 2016 and December 2017, in the Akçaabat region, between 36-78m depth contours. In these operations, 5 panels monofilament with 5 different mesh size (28, 30, 32, 34 and 36 mm) and 5 panels multifilament gillnets were used. Total length, total weight and gonad weights of whiting individuals were measured in the laboratory studies, and the sex determination was made macroscopically. In the study, a total of 8513 individuals were caught (female: 5106, male: 2706, juvenile: 701), including 4156 in monofilament nets and 4357 in multifilament nets. The SELECT method was used to calculate the selectivity parameters. In this method, 5 different probability distribution models were tried (Normal Scale, Normal Location, Gamma, Log Normal, Bi-Modal) and the lowest variance and degree of freedom were obtained in Bi-Modal distribution. Using this distribution, the optimum length values calculated for monofilament nets (13.65, 14.63, 15.60, 16.58, 17.55 cm for 28,30,32,34 and 36 mm respectively) were determined to be higher than from the optimum length values calculated for multifilament nets

(13.26, 14.21, 15.15, 16.10, 17.05 cm respectively). Observation of this difference in each mesh size gave the idea that the material affects the size selectivity.

**Key words:** Size Selectivity, whiting, monofilament, multifilament, Black Sea.

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**Isolation of leuconostoc pseudomesenteroides in the lungs in simental cattle with pneumonia**

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**Objectives:** To emphasize the importance of isolation of Leuconostoc pseudomesenteroides in lung material in pneumonia occurring in imported beef cattle. **Research methods:** Clinical observations; macro view of the lungs in necropsy; Analysis of the presence of IBR, PI3 and BVD in blood, by ELISA method, and isolation and identification of bacteria by both classical method and VITEK II in lung material. **Results:** In a farm where 400 Simental beef cattle were imported from abroad and were 4-10 months old; 2 days after being brought to the farm, complaints about respiratory system in 5-10 of cattle started to be seen; the disease spreads of 3-5 new cattle every day; In the 30 days, 88 cattle in the herd died. In cattle, high body temperature, nasal discharge, respiratory distress and bubbling in the mouth are observed; antibiotics (enrofloxacin, florfenicol) and corticosteroid were used in the treatment, and deaths occurred within 2-5 days of the first symptoms. At necropsy; in the lungs; dark red, liver-colored regions; a pseudomembrane-like structure between the lung and the thoracic wall and the presence of pus were reported. Analysis of blood samples showed negative results for IBR, PI3 and BVD. It was reported that Leuconostoc pseudomesenteroides was isolated and identified. **Conclusions:** In pneumonia epidemic in beef cattle; in lung material, it has been concluded for the first time that the observation of the isolation of Leuconostoc pseudomesenteroides and the effect of this microorganism on the pathogenesis of the disease is interesting and important.

**Key words:** Beef cattle, Leuconostoc pseudomesenteroides, Pneumonia

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***Keratoconjunctivitis in sheep, environmental conditions, and the presence of pantoea agglomerans in conjunctival swab***

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**Objectives:** It was aimed to evaluate the isolated and identified Pantoea agglomerans in conjunctival swabs from sheep with keratoconjunctivitis in terms of epidemiologic features and management of infection. **Research methods:** Clinical examination and bacterial isolation and identification were performed in the conjunctival swab samples by both classical and VITEK II methods. **Results:** In the farm; sheep breeding, cattle breeding and bee breeding are together being done. In anamnesis; the redness in the conjunctiva and tear flow were noticed in part of the sheep in the herd; the number of sick sheep in the herd increased day by day; the first patients in the herd developed blurriness in the eyes; the disease was treated with insufficient doses of oxytetracycline and the disease was transmitted to other sheep in the herd within 20 days. Redness of the conjunctiva and presence of blurring in the cornea were the clinical findings in some sick sheep. Pantoea agglomerans was isolated and identified in the conjunctival swab specimens. **Conclusions:** In the sheep with keratoconjunctivitis; isolating and identifying only Pantoea agglomerans in the bacteriological examination of the conjunctival swab sample but not isolating Mycoplasma and Chlamydia agents; the location of the sheep breeding site and the weather and vegetation conditions are in accordance with the conditions of Pantoea agglomerans in nature; presence of bee farming adjacent to sheep breeding; and inadequate doses of oxytetracycline application to the sheep; revealed the reasons for isolating and identifying Pantoea agglomerans.

**Key words:** Keratoconjunctivitis, Pantoea agglomerans, Sheep

***Antioxidant and in vitro enzyme inhibitory effects of Ornithogalum oligophyllum***

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Ornithogalum (Asparagaceae) species are used in traditionally in many countries, also consumed in Turkey both as food and for therapeutic purposes. The aim of this study was to assess the phenolic content and in vitro antioxidant, antidiabetic and anti-Alzheimer effects of Ornithogalum oligophyllum. For this purpose, methanol and water extracts were prepared from the aerial parts and bulb of the plant. Antioxidant capacities of the extracts were evaluated by determination DPPH radical scavenging activity and ferric reducing antioxidant power. Quercetin was used as a standard antioxidant. Antidiabetic activities of the extracts were investigated by measuring inhibition rate of  $\alpha$ -glucosidase and  $\alpha$ -amylase activities. For the determination of anti-Alzheimer effect, acetylcholinesterase inhibitory activity of the extracts were evaluated and galantamine was used as a standard. The methanol extract from aerial parts of O. oligophyllum have the strongest antioxidant activity and the highest total phenolic content. On the other hand, the water extract from the bulb of the plant did not possess any antioxidant activity. The methanol extract from bulb had  $\alpha$ -glucosidase inhibitory activity as effective as the pharmaceutical inhibitor, acarbose. However, the extracts from aerial parts and bulb were found to have no inhibitory activity on acetylcholinesterase and  $\alpha$ -amylase. Finally, in this study, in vitro antioxidant, antidiabetic and anti-Alzheimer effects of O. oligophyllum were examined for the first time and the data shows that, the plant may be a good source of natural antioxidant and antidiabetic compounds. **Acknowledgements:** This work was supported by Scientific Research Projects Coordination Unit of Istanbul University. Project Number: 55216. Gozde Hasbal thanks to The Scientific and Technological Research Council of Turkey (TUBITAK) for PhD Scholarship Programme (BIDEB 2211-C).

**Key words:**  $\alpha$ -amylase,  $\alpha$ -glucosidase, Acetylcholinesterase, Antioxidant, Ornithogalum oligophyllum

***The cytotoxic and apoptotic effects of Thymus vulgaris plant extracts on MDA-MB-231 breast cancer cell line***

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The Thymus genus is considered to be the Mediterranean center, but it is widely found in the world. It is known that these plants have been used from past to present in various diseases. Breast cancer is the type of cancer that causes the most deaths in women. In this study, we aimed to investigate the cytotoxic and apoptotic effects of *Thymus vulgaris* plant extracts on MDA-MB-231 breast cancer cell line. The petroleum ether and ethanol extracts obtained from the *Thymus vulgaris* plant were applied to the MDA-MB-231



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breast cancer cell line, cytotoxicity and apoptosis were determined. Cytotoxicity determination was performed as a result of observing impedance-dependent changes using the iCelligence device. DAPI immunofluorescence staining and TUNEL method were used for apoptosis detection. Cytotoxicity assays showed that the IC50 values on the MDAMB-231 breast cancer cells of the PE and EtOH extracts were determined as 0.067 mg/mL and 0.068 mg/mL, respectively ( $p < 0.05$ ). In contrast, IC50 values of Pcs 201-012 healthy fibroblast cells used as a control group were 2163.68 g/mL and 1983.77 g/mL for PE and EtOH extracts, respectively ( $p < 0.05$ ). Apoptotic index values were found to be 96.88% and 93.87% for the PE and EtOH extracts, respectively ( $p < 0.0001$ ) in the TUNEL method. The results of the DAPI staining overlap with the TUNEL method, and apoptotic nucleus specific structures have been observed. There are no publications on the effects of *Thymus vulgaris* plant on the MDA-MB-231 breast cancer cell line. Our study showed that *Thymus vulgaris* plant extracts cause significant changes in cytotoxicity and apoptosis on MDA-MB-231 breast cancer cell line. However, plant extracts did not appear to have a cytotoxic effect on IC50 values in healthy control cells. Our results suggest that extracts of *Thymus vulgaris* plant may have properties that can be used in the treatment of breast cancer. **Acknowledgement:** The present work was supported by the Research Fund of Istanbul University. Project No: 53695

**Key words:** Apoptosis, Cytotoxicity, MDA-MB-231 breast cancer cell line, *Thymus vulgaris*.

**Cultivation of Suspended BHK 21 Cells in Batch Production Process by Using Serum-Free and Serum-Containing Media**

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Serum is a common supplement in animal cell culture media. But it also has many drawbacks such as a potential source of bacterial, mycoplasma and viral contamination, batch to batch variability, complex downstream processing to remove serum from the final product, limited supply and a substantial cost. For these reasons, current biotechnological approaches to cell culture avoid the use of serum and the conversion to serum-free alternatives is promoted by regulatory authorities. The aim of this study is to establish the adaptation conditions of BHK-21 suspension cells to serum-free media and scaling up from 20 L to 30,000 L in bioreactors. In this study, the BHK-21 cells were initially maintained with commercial (SFM) with 1 % Adult Bovine Serum (ABS) and sequentially adapted to grow in SFM without using serum up to 3000-liter scale as the parallel classical 6M medium with 10 % ABS. The growth ratio and viability of the cultures were determined with trypan blue dye exclusion technique.

Apoptosis rate was determined with Annexin V and series of growth and development steps were estimated with cell cycle assay. Our results indicate there were no significant difference between classical 6M medium with 10 % ABS and SFM medium during scaling up process. In conclusion, SFM can be used to large scale BHK-21 cell production instead of 6M medium with 10% ABS up to 3.000 L capacity in stirred tank bioreactors. Acknowledgement: This study is by General Directorate Of Agricultural Research And Policies (TAGEM).

**Key words:** Apoptosis, BHK-21 cell, cell cycle, serum-free medium.

**Comparision of Montanide Adjuvants to Freund's Adjuvant for Anti-KDN Polyclonal Antibody Production**

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KDN (2-keto-3-deoxy-D-glycine-D-galacto-nononic acid) is a hapten structured monosaccharide with a low molecular weight and specific to the sialic acid family. Hapten structured molecules don't show immunogenic properties when they are not used with carrier proteins even though they show antigenic characteristics. In the scope of the study, Montanide ISA 61 VG, Montanide ISA 201 VG and Montanide IMS 1313 VG NPR adjuvants were used as KDN carriers compared to Freund's adjuvant. Immunization was performed at 8 different times in total with 4 Balb/c mice for each adjuvant groups and control group without any immunization. Indirect ELISA was applied to the serum samples. Obtained data were analyzed comparatively to determine the efficacy of different adjuvant systems in response to polyclonal antibody against KDN. The highest amount of antibody was achieved with Montanide ISA 61 VG (oil-in-water form). Anti-KDN polyclonal antibody levels were 1.4 times higher in the Montanide ISA 61 VG than Freund's adjuvant on day 83 in accordance to twoway variance analysis (ANOVA) ( $P < 0.0001$ ). Antibody titer decreased on the 125th day due to aging. Desired antibody level can be obtained by using the appropriate adjuvant without any carrier protein conjugation of carbohydrate molecule such as hapten structured KDN. This work was supported through research grants from TUBITAK-2209B (1139B411502819). Thanks to Seppic for supplying Montanide adjuvants. This study is already accepted for publication in EJTB with DOI: 10.5152/EJTB.2018.400.

**Key words:** KDN, polyclonal antibody, oil adjuvants, Montanide ISA 61 VG, Freund's adjuvant.



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***A low-cost smart phone based edible sensor for food freshness monitoring***

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Traditional food packaging mainly offers protection and convenience while it does not provide much information regarding the condition and environment of the food. In recent years, various intelligent packaging technologies have been developed to monitor the food quality at the point of consumption. However, integration of these technologies to packaging systems is still challenging due to the cost and the complexity of fabrication. Therefore, here a low-cost edible sensor scheme, which can be integrated to packaging systems later, was investigated to overcome the aforementioned problems. Thin sensor films were prepared using fish gelatin and anthocyanin with the help of ultraviolet light (UV) induced photopolymerization reaction. In the sensing scheme, anthocyanins, natural food pigments, were used as the recognition molecules with the ability to change color upon exposure to amines emitted from food during spoilage. The smartphone camera acquired the images of the food samples, and the app installed in smartphone for colorimetric measurements converted the image colors into the RGB values. The response of the sensor film against gaseous amines and thereby, food spoilage was monitored through the change in RGB values over time. The low-cost, nontoxic and facile method developed here for sensor fabrication can be used to inform consumers about the food quality at the time of consumption with the help of smartphone.

**Key words:** Intelligent Packaging, Photo Polymerization, Smartphone, Thin Sensor Film

***Effects of structural and physiological conditions on volumetric swelling degrees and diclofenac sodium release kinetics of P(DMAPMAAm-co-NIPAAm) hydrogels***

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Temperature-sensitive hydrogels containing cationic comonomers have a great importance for developing drug delivery systems in an acidic environment, such as cancer therapy (1). N-[3-(dimethylamino)propyl] methacrylamide (DMAPMAAm) is a water soluble monomer containing tertiary amino groups. PDMAPMAAm hydrogels transform nonionic in neutral solutions to cationic structures ( $pK_a \approx 8.8$ ) in acid solutions. In this work we report the dynamic swelling behaviours of (DMAPMAAm-co-NIPAAm) hydrogels at 25°C in DDW and PBS. To evaluate time-dependent volumetric swelling process of their disc-shaped

samples, image analysis system was used for the first time. Its accuracy was controlled by traditional gravimetric swelling experiments. Their controlled-release kinetics were also investigated by using diclofenac sodium (DFNa) as an anionic model drug ( $pK_a \approx 4.0$ ) because protonated amino functional groups on DMAPMAAm units could have significant effects on the release rate of diclofenac sodium (DFNa) due to the opposite charge interactions at 37°C in PBS ( $pH \approx 7.4$ ). To understand the mechanism of water diffusion into and DFNa release from P(DMAPMAAm-co-NIPAAm) hydrogels, the data of water absorption at 25°C and drug release at 37°C were fitted with zero order, first order, Higuchi and Korsmayer-Peppas kinetic models. In the case of non-Fickian release and swelling processes, contributions of diffusional and relaxational parts were calculated by fitting the data to Peppas-Sahlin model.

**Key words:** Drug Delivery, Dmapmaam, Hydrogels, Volumetric Swelling Degree

***Experimental study of the potency and efficacy of Bakirkoy sheep and goat pox vaccine strain and Neethling lumpy skin disease attenuated strain for the protection of cattle against Lumpy Skin Disease***

***Nilay Ünal, Yaser Vaser and Ismail Duman***

Dollvet Veterinary Vaccine Production Company

Lumpy skin disease (LSD) is a viral disease of cattle and buffalo, caused by a Capripox virus. LSD was firstly recorded in Turkey in 2013, in 2015 was spread all over the country with 510 outbreaks. Sheep and goat pox vaccine Bakirköy strain was firstly used for controlling LSD in Turkey. In this study LSD antibody-free 6-8 months old 8 calves, which haven't been vaccinated and non infected with LSD, were used. 3 animals were vaccinated with five sheep doses, 5x 102.5 TCID<sub>50</sub> Poxdoll (SGPV Bakirkoy strain), 3 animals were vaccinated with a single dose 103.5 TCID<sub>50</sub> LSD-NDOLL (LSD Neethling vaccine), the others kept as unvaccinated control group. 28 days after vaccination all animals were challenged with 7 tenfold dilutions of virulent LSD virus. Animals were observed for 14 days after challenge and the infective titer of virulent virus on animals was calculated. As a result, both vaccines were save, no unusual reaction was observed. According to the challenge study the difference in viral infectious titer of control and vaccinated animals was more than 2.5 log, which indicates the protective activity of both vaccines against LSD, according the applied doses. Control animals developed LSD clinical signs up to slaughtering date (21 days after challenging). We concluded that SGP Bakirkoy strain protects cattle against LSD by vaccination with 5 sheep and goat doses, as well LSD Neethling vaccine strain protective dose for cattle is 103.5 TCID<sub>50</sub>.

**Key words:** Lumpy Skin Disease, Sheep And Pox Vaccine, Efficiency, Bakirkoy Strain

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***Production of Xanthan gum from Xanthomonas campestris DSM 19000 by fermentation of grape pomace***

***Deniz Damla, Altan Kamer, Didem Sözeri Atik,  
Ahmet Şükrü Demirci and Tuncay Gümüş***

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Xanthan gum is a microbial polysaccharide produced by *Xanthomonas campestris* and it has commercial significance. Because of its physical properties, it is used as a thickener or viscosifier in food and other industries. Xanthan gum is also used as a stabilizer for a wide variety of suspensions, emulsions. Fermentation conditions, substrates that used for xanthan gum production are factors that influence yield and properties of gum. Grapes contain a large amount of different phenolic compounds in skins, pulp and seeds. Grape pomace is an abundant by-product from the wine industry, which consists of the remaining skin, seeds and stalks and represents around 25% of total grape weight. The aim of the present study was to determine gum productivity of grape pomace and yield of xanthan gum that produced from grape pomace. Grape pomace was diluted to % 2 glucose ratio and then used. Xanthan gum was produced in a 1000-mL Erlenmeyer flasks containing 500 mL medium that composed of % 2 glucose and % 5 inoculum volume for *Xanthomonas campestris* (DSM 19000) and pH was adjusted to 7.0. The system conditions were maintained at 28 °C and 180 rpm agitation rate for 72 h. The highest concentration of xanthan gum was found 5.32 g/L and it has red colour. This study showed that glucose can commercial be replaced by inexpensive grape pomace in the process of fermentative xanthan production. This xanthan gum can be used for food products like puddings, ice cream etc.

**Key words:** *Xanthomonas Campestris, Xanthan Gum, Grape Pomac*

***Applications of natural preservatives on food products***

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Generally food preservation, which is affect quality and nutritional value of foods during shelf life, is important subject in food processing. When the product reach the end of its shelf life or is exposed to unfavorable conditions, some spoilages can come to existence and moreover they can cause food poisoning. The characteristic properties of foods must be defined from field to fork to decide proper preservation method for the products. For this purpose, several methods can be used for prevent food spoilage like thermal processes such as pasteurization, sterilization, drying, irradiation etc.

Moreover natural preservation methods also draw great interest for food preservation because of their effective properties and various sources can be used for biopreservation like plant extracts, bacteria, fungi, bacteriophages. Although the basic knowledge on the antimicrobial potential of various components, there is still little information about their applicability for food matrix. A few researchs were carried out to determine usage of biopreservatives in foods such as rosemary extract, garlic were used to protect meat products by some researchers. Application of antimicrobials which is produced by bacteria were performed on dairy products, fruit juices. The aim of the present study was to review application of natural preservatives on food products.

**Key words:** Biopreservation, Plant Extract, Foods

***Molecular Docking, Molecular Dynamics, Optimization and Characterization of GHK-loaded Poly( $\epsilon$ -caprolactone) Nanoparticles as Potential Anti-Cancerogenic Effect on Glioblastoma Cancer Cells***

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Glycyl-Histidyl-Lysine (GHK) is a human plasma copper-binding peptide that declines during aging. It naturally occurs in human plasma, saliva, and urine. In this paper, Poly( $\epsilon$ -caprolactone) (PCL) and GHK loaded PCL nanoparticles were prepared by a double emission-precipitation method with different parameters. The characterization of the optimum nanoparticles were performed with Zeta-Sizer, UV-Vis, FT-IR (transmittance and reflectance) and Raman spectroscopy, and Transmission Electron Microscopy methods. The optimum size of the GHK loaded PCL nanoparticle was prepared with a 232.5 nm average particle size, -10 mV zeta potential, and a 0.029 polydispersity index, 82.3% of encapsulation efficiency and 82.3% of loaded efficiency. In vitro cytotoxicity test revealed the drug concentration dependent on the cell viability against L929 cells and after 24 h co-incubation. In vitro release study showed the sustained release behavior of GHK from nanoparticles during the period of 10 days study. In vitro cell uptake study was showed that PCL encapsulated GHK nanoparticles may be use effectively glioblastoma cancer cells. Molecular dynamic and molecular docking calculations were also implemented to identify the potential binding conformations of GHK when forming a stable complex with protein and the effect of the substituents on the activities for

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illuminating a new rational drug design. Briefly, the result of our study, GHK loaded PCL nanoparticles might be a promising drug candidate for treatment of glioblastoma cancer cells.

**Key words:** Glycyl-Histidyl-Lysine, Poly(E-Caprolactone), Glioblastoma, Molecular Docking, Molecular Dynamic

**Identification of the association between  
BHMT, CHDH and PEMT polymorphisms and  
rectal cancer in a Turkish population**

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Choline is a crucial nutrient required for methyl group metabolism and may be associated with carcinogenesis in a manner similar to that of folate. Betaine-homocysteine S-methyltransferase (BHMT), choline dehydrogenase (CHDH) and phosphatidylethanolamine N-methyltransferase (PEMT) are the key enzymes involved in choline metabolism. In this study, possible associations between genetic variabilities in BHMT, CHDH and PEMT, and susceptibility to rectal cancer were investigated in a Turkish population. A case-control study with 171 rectal cancer cases and 218 non-cancer controls was conducted. DNA was extracted from leukocytes using high pure polymerase chain reaction (PCR) template preparation kit. BHMT 742G>A (rs3733890), CHDH 432G>T (rs12676), PEMT 523G>A (rs7946) genotypes were determined by using polymorphism chain reaction-restriction fragment length polymorphism (PCR-RFLP) assay. The genotype and haplotype analyses of these polymorphisms were performed using SPSS 21 and HaploView 4.2, respectively. Significant association was found between PEMT 523A allele and rectal cancer (p: 0.038). Besides, the same allele was found associated with high alcohol consumption and cigarette smoking in cases (p: 0.021, p: 0.005, respectively). The distribution of BHMT 742 G>A and CHDH 432 G>T genotype frequencies were similar in cases and controls. In conclusion, the present study suggests association between the PEMT gene polymorphism and rectal cancer risk in a Turkish population. Acknowledge: This work was supported by Scientific Research Projects Coordination Unit of Istanbul University. Project number: 43798.

**Key words:** BHMT, CHDH, Choline metabolism, PEMT, Polymorphism, Rectal cancer

**Investigation of the Asp299GLY polymorphism  
of TLR4 gene in Rheumatoid Arthritis**

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Although the pathophysiology of Rheumatoid Arthritis (RA) is not clear, evidence suggests that RA is influenced by both genetic and environmental factors. In the onset of RA, an interaction between the resident cells of synovium and cells of the innate and adaptive immune system reported. Fibroblast-like synoviocytes (FLS) are one of the resident cells and they play a central role, with a tumor-like behavior, in joint destruction and development of chronic inflammation. During chronic inflammation, FLS migrate to healthy tissue and invade to the extracellular matrix and lead to joint damage by contributing to the destruction of the cartilage and bone tissues. There are some studies that report an association between the activation of FLS and the cytokine environment, cell-to-cell contacts, or the activation of TLR2, TLR4, and TLR3. TLRs and especially TLR4 is involved in the recognition of endogenous molecules released by injured tissues and necrotic cells. rs4986790, an SNP was also known as Asp299Gly (896A/G) in the TLR4 gene involved in a wide variety of both infectious and non-infectious diseases. There are conflicting or even contradictory results about this SNP and we aimed to determine the distribution the allele frequencies of this SNP and compare the result of RA patients with healthy subjects. For this, DNA extraction was realized by salting out method from peripheral blood lymphocytes of 112 RA patients and 97 healthy controls. Polymorphisms detected by the cleavage of amplicons with NcoI restriction endonuclease enzyme after PCR amplification. According to the results obtained from patients and healthy controls, there is no any differences between genotype and allele distribution of RA patients and healthy controls. As mentioned above, TLR4 is an important player of inflammation that related to the tissue injury. Studying the other polymorphic site may give more information about the relationship between RA and TLR4.

**Key words:** Rheumatoid Arthritis, Asp299GLY polymorphism, TLR4 gene

**Antiproliferative effects of fluorine beared 3-  
tert-butylsalicylaldehyds (3DTB) on lung  
carcinoma cell line**

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Human cell models are available for a variety of malignancies, serving as suitable platforms for exploring antiproliferative and cytotoxic effects of schiff bases. Data from cancer cell models and schiff bases exposure are valuable or guiding and designing in vivo testing and, potentially, for developing new anticancer threatment strategies. Carboxyfluorescein diacetate, succinimidyl ester (CFDA-SE) is a cell-tracking dye used to label cells for examining their proliferative activity. This study investigated the effects and possible mechanisms of 9 fluorine beared 3-tert-butylsalisilaldehyts (compound 1-9) on A549 cells, a lung cancer cell line, were observed in terms of inhibition of cell proliferation. Cells were stained with CFSE, a green fluorescent dye, and analyzed by flow cytometry immediately after staining the cells. The maximum green fluorescence intensity of the cells was analyzed in the FL1 histogram. CFSE stained cells were incubate with the compounds for 72 h under normal cell culture conditions (37 °C, humidified atmosphere with 5% CO<sub>2</sub>). CFSE-stained cells were subjected to flow cytometry analysis again and the green fluorescence levels of the cells were recorded using the FL1 histogram. The FCS Express 4 program was used to calculate proliferative index (PI) values from cell division numbers using flow cytometric data. The most potent antiproliferative effect on A549 cells was found to be compound 2 (4-FphH<sub>3</sub>, 5DTBS, PI: 8.33). The weakest antiproliferative effect among the compounds was obtained with compound 1 (F2,3-3TBS, PI: 15.10), while the strongest antiproliferative effect on A549 cells was found to be with compound 2 (F2,4-3TBS, PI: 9.59). As an important goal of cancer treatment is to prevent the reproduction of rapidly dividing cancer cells, the antiproliverative power of a compound significantly affects the success of chemotherapy. Therefore, we think that the strong antiproliferative effect of compound 2 is remarkable for its anticancer power.

**Key words:** Lung cancer, A549 cell line, 3-tert-butylsalisilaldehyts, 3DTB, Antiproliferative effects

***The effects of environmental lead exposure on the blood lead level and δ-Aminolevulinic acid dehydratase activity in urban Feral pigeons (Columba livia)***

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The objective of this study was the evaluation of lead contamination and its effects on the blood lead level (BLL) and δ-Aminolevulinic acid dehydratase activity (ALA-D) in

urban Feral pigeons (*Columba livia*) from Peja town and Lukine village - rural area. BLL was measured by Graphite Furnace Atomic Absorbtion Spectrophotometry (ASS) method, with atomic absorber Varian spectra AA 640Z Zeeman AAS, equipped with a GTA 100 graphite furnace (Varian, USA) and PSD 100 auto sampler (Varian, USA). Erythrocyte δ-aminolevulinic acid dehydratase activity was measured according to the CEC standardized method. Blood lead level in Feral pigeons from Peja town was significantly higher ( $P < 0.001$ ), compared with the BLL in that in the pigeons from rural area. The BLL in birds from Peja town was 1.5 fold higher compared with that in rural area. The blood ALA-D activity of pigeons from Peja town was significantly inhibited ( $P < 0.001$ ), compared with ALA-D activity in the blood of rural area. The ALA-D activity of Feral pigeons from Peja town was 64 % inhibited compared with ALAD activity in the pigeons form rural area. It is suggested that the feral pigeon may be used both to monitor urban lead contamination and as a model for chronic lead toxicity, and blood ALA-D activity as a very sensitive biomarker of subclinical lead effects. The ability of Feral pigeon to accumulate lead concentrations draws attention to the potential hazard of children ingesting street dust from such urban areas.

**Key words:** Urban area, Feral pigeon, Lead, ALA-D

***Effects of polyfluorinated 3-tert-butyl salicyldimines on P-glycoprotein expression of TGP52 insulinoma cell line***

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Cancer cells can develop resistance to chemotherapeutic agents in cancer treatments and lead to decrease anticancer effect of chemotherapeutic drugs. Multiple drug resistance (multidrug resistance; MDR) acquired resistance to cytotoxic chemotherapy continues to be a major obstacle to more effective treatment of human cancers. In the study, the effects of polyfluorinated 3-tert-butyl salicyldimines on P-glycoprotein (P-gp) expression on TGP52 cells, derived from insulinoma, and the risk of developing MDR in these cells were investigated. The effects of 3-tert-butyl salicyldimines (Compound 1-9) on P-gp expression of TGP52 cells were examined using FITC labeled anti P-gp in flow cytometry. After the compounds were added to the 96 well culture plates at predetermined IC<sub>50</sub> doses, TGP52 cells were added to the wells at a dose of 106 cells / ml and incubated for 72 h at 37 °C in 5 % CO<sub>2</sub> humidified environment. Nonspecific staining discarded by using FITC labeled isotypic control antibody. Control group cells and the Schiff base treated cells were examined in the flow cytometry by using FL1 histogram. P-gp expressions of TGP52 cells ranged from 13.9 to 38.6%. P-



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gp expression was observed at the lowest level in cells treated with Compound 9 (F5-3 TBS). In conclusion, identification of P-gp expression on a cancer cells can gives us important information about the development of drug resistance risk against to anticancer agents. Thus Compound 9 seems to be a good chemotherapeutic agent candidate to TGP52 cells for multidrug resistance.

**Key words:** Pancreatic cancer, TGP52, 3-tert-butyl Salicyldimines, P-glycoprotein, Multidrug resistance

*Influence of different inoculation methods on Arabidopsis thaliana and Pseudomonas putida interaction*

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Plant-microbial interactions encompass a broad range of relationships in which one or both of the organisms may have beneficial, neutral or negative effects on the other partner. Only a small number of useful plant-bacterial interactions have been well studied, and is understood in considerable detail. However, there is a large reservoir that has the potential to be used to optimize plant production, with less or no investigated. Here, experiments aim to search for the effect of *Pseudomonas putida* (P. putida)-*Arabidopsis thaliana* (A. thaliana) interaction on the plant growth and development during the life cycle of plant. The first step in searching these interactions is the optimal inoculation of plants with bacteria. For this aim, A. thaliana plants were inoculated with P. putida by using three different inoculation techniques with various concentrations (102-106 cfu/ml) and the plant response to this rhizobacteria-plant interaction was investigated at different times (3-21 days) after seed/seedling inoculation with bacteria in in vitro tissue culture. According to our result, the spreading of different concentrations of bacterial suspension on the agar plates provided the most homogeneous and consistent results in terms of seed germination and seedling growth. Moreover, bacterial localization in the root tissue was assayed by confocal microscopy of Green Fluoresans Protein (GFP) labeled bacterium. This optimization protocol could be used for development of rhizoremediation system based on utilization of single bacterial strain or an artificial consortium consisting of plant growth-promoting rhizobacteria. In this regard, this study will provide fundamental information on influence of P. putida on A. thaliana seed germination and seedling growth-the initial step for the development of rhizoremediation systems.

**Key words:** Plant-bacteria interactions, bacterial inoculation, Arabidopsis thaliana

*The Importance of Method Preference to Investigate the Toxic Effects of Antibiotics in Hospital Wastewater*

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Hospital wastewater contains a major discharge of chemicals such as antibiotics, X-ray contrast agents, disinfectants and pharmaceuticals. Discharged wastewater from hospitals is commonly treated by an on-site treatment system prior to being discharged to the central domestic sewer system, on the other hand there are still some residues of pharmaceutical products in domestic wastewater. Antibiotics are excreted via patient excreta largely in the urine and feces and are discharged into a hospital sewer system. In regards to seasonal distribution of pharmaceutical products usage in Turkey, differences can be observed. For example, the concentration of antibiotic agent sulfamethoxazole changed between 6,7 and 14,0 ng/L in winter months at coastal area of Istanbul. Therefore, the presence of antibiotics can affect water quality of surface water, and ultimately cause adverse impact on coastal areas and naturally, biodiversity. The aim of the study was to determine the toxicity of amoxicillin and tetracycline, which have been antibiotics widely used in Turkey, with bacteria and crustacean to identify whether it has the same test result. Therefore, synthetic hospital wastewater on different concentration were prepared with two antibiotics. Acute toxicity tests of *Daphnia magna* from the primary consumer trophic level and *Vibrio fischeri* from decomposer trophic level were used. EC50 values were read at 5th, 15th and 30th minutes in bioluminescent bacteria (*Vibrio fischeri*) acute toxicity test for revealing the importance of inhibition time. It was found that the most sensitive values were obtained from bioluminescent bacteria (*Vibrio fischeri*) acute toxicity test and tetracycline was highly toxic. It can be stated that both acute toxicity tests can be used in determination of antibiotic toxicities in different sensitivities. Consequently, negative effects of antibiotics on bacteria/crustaceans may cause irreversible damage to the food chain over time.

**Key words:** Micropollutants, hospital wastewater, antibiotics, acute toxicity, *Daphnia magna*, *Vibrio fischeri*.

*Conformational and Vibrational Spectroscopic Analysis of Elafibranor by DFT*

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Elafibranor (2-[2,6 Dimethyl-4-[3-[4-(methylthio)phenyl]-3-oxo-1(E)-propenyl]phenoxy]-2-methylpropanoic acid) is an important medication for the treatment of cardiometabolic

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diseases including diabetes, insulin resistance, dyslipidemia, and non-alcoholic fatty liver disease. Elafibranor is an agonist of the peroxisome proliferator-activated receptor- $\alpha$  and peroxisome proliferator-activated receptor- $\delta$ . It improves glucose homeostasis, insulin sensitivity and lipid metabolism and reduces inflammation. Theoretical investigation of this drug is important due to its biomedical applications and this study is the first report on the structural and vibrational spectroscopic investigation of Elafibranor by means of theoretical approach. The theoretical analysis including the structural and vibrational (IR&Raman) spectroscopic features of the compound have been performed employing Gaussian 09 program package. The molecular electrostatic potential map (MEP) has been plotted and HOMO-LUMO analysis has been performed, additionally. All the calculations were made using Density Functional Theory (DFT) method with B3LYP functional and 6-31G+(d) basis set. The rotational barrier analysis has been carried out in order to obtain all possible conformations. The vibrational wavenumbers were computed for the most stable conformer. The potential energy distribution (PED) was obtained by means of VEDA4xx program and used to assign the normal vibrations by using GaussView 5.0 program. Thus an elaborate study of the title compound will be expected to give insight to the researchers for the future studies in this field.

**Key words:** Elafibranor, DFT, Vibrational analysis, MESP, HOMO-LUMO

### *Viral Etiology in Neonatal Calf Diarrhea*

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Diarrhea of newborns causes severe economic and breeding losses in cattle breeding enterprises. Factors that are not infectious (adverse environmental factors, inappropriate herd management, inadequate colostrum intake) and infectious (various pathogens) play an important role. Viral pathogens are discussed in this review. The most common viral agents are bovine rotavirus (BRV), bovine coronavirus (BCoV), bovine viral diarrhoea virus (BVDV), bovine torovirus (BToV) and caliciviruses (bovine norovirus and Nebovirus). Rotaviruses are the most important viral agent. Usually the first two weeks of calves are affected by the agent. The virus multiplies in epithelial cells at the end of small intestine, causing severe atrophy and loss of intestinal villi. Virus-infected cells die. The result is absorption of axillary, fecal mucoid and yellow color. Enteric coronavirus infections usually occur at 1-2 weeks of age. The virus begins to proliferate proximal to the small intestine, then spread along the entire intestine and into the colon. Virus targets crypt cells. Toroviruses affect the under 3-weeks of age. The intestinal villi and crypt cells are affected. Necrosis of the colon is observed. Bovine viral diarrhoea virus rarely causes

diarrhoea as a result of persistent infection in the calves, and severe destruction of the intestinal cells. Caliciviruses cause clinical signs by affecting the intestinal villi and crypt cells. As a result, viral etiology should be emphasized, a good diagnostic organization should be maintained and the herd management system should be constantly updated to prevent diarrhoea-related economic and breeding losses.

**Key words:** Calf Diarrhoea, Bovine Rotavirus, Bovine Coronavirus, Bovine Viral Diarrhoea Virus, Bovine Torovirus and Calicivirus

### *Procoagulant activity and d-dimer levels in Canine Visceral Leishmaniasis*

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In the present reserach the aim was to detect procoagulant activity as detected by D-dimer levels in different stages of Canine Visceral Leishmaniasis (CVL). The animal material of the study consisted of a total 30 dogs, enrolled into five groups, 24 of which were naturally infected with CVL and 6 other healthy ones from January 2018 to May 2018. Rapid ELISA test kits and IFAT analyses were deemed relevant diagnostic approach for CVL diagnosis All enrolled cases diagnosed with CVL were classified into 4 different groups (n=7 in each group) as follows: I. Group: Stage I (Mild Cases), II. Group: Stage II (Moderate Cases), III. Group: Stage III (Severe Cases), IV. Group: Stage IV (Very Severe Cases), and comperatively V. Group: Healthy Control was also enrolled. D-dimer concentrations were analyzed by use of Wondfo Finecare Immunoassay meter. Regarding D-dimer levels, there was a statistically significant difference determined among healthy group within stage III and stage IV infected dogs (p  $\square$  0.005). In summary procoagulant activity must be taken into consideration in CVL, which should promptly change therapy protocols.

**Key words:** Canine Visceral Leishmaniasis, procoagulation, D-dimer

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***Antifungal Activity of Various Weak Organic Acids and Effects of Their Combinations Against Saccharomyces Cerevisiae***

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Weak organic acids have been extensively used as preservatives in food, beverage industries and also medical areas against *Saccharomyces cerevisiae*. However, yeast strains may sometimes become resistant to these preservatives, therefore understanding the essence of their inhibitory mechanisms is significant. Moreover, development of effective and simple ways to inhibit yeast is an important necessity and in this context, more effective usage of weak organic acids should be investigated. In this study, antifungal activity of four weak organic acids against *S. cerevisiae* cells were examined. Antifungal effects of fatty acids that are hexanoic/caproic (C6), octanoic/caprylic (C8) and decanoic/capric (C10), and benzoic acid as weak organic acid were determined through Minimum Inhibitory Concentration (MIC), and inhibition zone measurements. The most effective weak acid was decanoic acid (MIC: 0.2-0.3 mM) since it is more liposoluble causing an increase in cell permeability. After that, extracellular pH measurement of hydrochloric acid (HCl) giving the same amount of drop in extracellular pH was performed to compare efficiency of organic acids to have some insight in the inhibition mechanism of these weak acids. According to pH measurement, inhibition of yeast cells by weak acids is not simply due to acidity, however insertion of the weak acids inside the cellular membrane may have role during inhibition of cells because of disruption of cell membrane integrity. Moreover, synergistic effects of weak acids were investigated, and it has been demonstrated that combinations of weak acids are more effective than usage of weak acids alone. As conclusion, combinations of weak acids increase their potential usage of antifungal agents with minimum amount in various areas. Additionally, results enrich our knowledge about the mechanism of weak acids that can be related to disruption of cell membrane of *S. cerevisiae* cells.

**Key words:** Weak Organic Acids, Antifungal Activity, Cell Membrane, Combinations, *Saccharomyces Cerevisiae*.

***Aflatoxin contamination of figs from Turkey***

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Aflatoxin is seem as a danger in food safety nowadays. Aflatoxin is produced by *Aspergillus flavus*, *A. parasiticus* and *A. nomius* and is counted as carcinogenic substances to human health. Aflatoxin B1, B2, G1 and G2 are produced

directly by molds. Apart from these four main groups, there are two other important aflatoxin derivatives, M1 and M2, which are hydroxy derivatives of aflatoxin B1 and B2. Especially nuts such as pistachio, peanuts, almonds, hazelnuts, dried fruits such as figs, grains such as wheat, barley, rice can contain aflatoxin. Dried figs, which have a great economic value in terms of Turkey and in some cases, high level of aflatoxin can be detected. The fig fruit is high in carbohydrate content and is suitable for the formation of mycotoxins with high water activity during the first ripening and brittle fruit period. In relation to the aflatoxin problem in Turkey, 60 of the total of 75 samples (72 pieces of dried figs, 3 pieces of fig-paste figs) were handled with border rejection, 12 samples with information with attention and 3 samples with alert according to RASFF (Rapid Alert System for Food and Feed) between 2015 and 2018. The main problem of aflatoxin occurrence in figs are improper storage conditions, harvesting and prolonged drying period. Also to obtain healthy dried figs, precautions should be taken such as the use of healthy bunches, gathering of the finished bunches from trees, trapping struggle with berry beetles, avoiding "nail and polish" at harvest, and arranging the exhibits by collecting the figs which fall by itself. The most efficient method for selecting aflatoxin free figs are selecting and removing aflatoxin contained figs under UV light.

**Key words:** Aflatoxin, Fig, Risk

***Evaluation of Trace Element Level, Thiol-Disulfide Balance, Intracellular Oxide and Reducing Glutathione Levels in Epileptic Patients***

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Objectives: Epilepsy is a clinical disease caused by an abnormal electrical discharge in the central nervous system. Epilepsy is one of the most common chronic disorders in the world. The underlying pathophysiology of the disease is not clear, but it is thought that oxidative stress and trace elements may have a role in the pathogenesis. The aim of this study is to measure and compare serum copper, zinc, selenium levels, thiol disulphide homeostasis and oxidized- reduced glutathione levels in erythrocytes between patients with epilepsy and healthy control group. Materials and Methods: Whole blood and serum samples were taken from 38 patients with epilepsy who applied to the neurology polyclinic. Serum copper, zinc and selenium levels were measured in atomic absorption spectroscopy; oxidized and reduced glutathione levels in erythrocytes and thiol disulphide homeostasis in serum were measured in autoanalyzer. Results: When we compare the trace element levels between patient and control groups, serum copper levels are significantly higher



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(127±31.2 µg/dL, 102.9±16.4 µg/dL p <0.001, respectively), serum zinc levels are significantly lower in patients (90.9±28.8 µg/dL, 104.7±29.5 µg/dL p<0.034, respectively), however there is no significant difference in selenium levels between these groups (p=0.733). There is also no difference in thiol and disulphide levels in serum (p>0.05). Reduced glutathione levels in erythrocytes in patients are significantly lower compared to control group (584.4±141.3 µmol/L, 858.3±243.9 µmol/L, p<0.001, respectively), but oxidized glutathione levels are significantly higher (811.8±156.3 µmol/L, 84.9±27.3 µmol/L p<0.001, respectively). Conclusion: There is no significant difference in thiol and disulphide levels in serum, however there is a significant disparity in oxidized-reduced glutathione levels between control and patient groups. For this reason, we thought that oxidative stress parameters within cells must be evaluated during follow-up of the patients with epilepsy.

**Key words:** Epilepsy, Trace Elements, Oxidative Stress

**Evaluation of Vitamin B12 Deficiency with Homocysteine and Methyl Malonic Acid Levels**

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**Objective:** B12 is an animal originated essential vitamin that is necessary for hematopoiesis and normal neuronal functions. B12 deficiency results in megaloblastic anemia, peripheral neuropathy, dementia. Serum b12 measurement doesn't give the correct result everytime in detecting the deficiency because of its storage form. Deficiency symptoms have been reported even at normal serum levels of B12. A rise in homocysteine and methyl malonic acid levels at the same time is regarded as the gold standard for confirming the low vitamin B12 level. The aim of this study is to evaluate B12 levels according to homocysteine and methyl malonic acid levels. **Materials and Methods:** In this study, Ankara Atatürk Training and Research Hospital data of the information system was screened retrospectively from 2015 to 2018. Data of 200 subjects, whose all serum vitamin B12, homocysteine and methyl malonic acid tests were performed at the same time were incorporated into the study. **Results:** In this study, the mean value of vitamin B12 level was 449,11 pg/mL (reference range: 197-771pg/mL), the mean value of homocysteine was 13,0115 µmol/L (reference range: 0-15µmol/L), the mean value of methyl malonic acid was 24,42 ng/mL (reference range: 0-46,6 ng/mL). The number of individuals with homocysteine level above the reference range was 42 and the number of individuals above the mean level of methyl malonic acid was 30 among the subjects included in the study. There were 10 patients with both homocysteine and methyl malonic acid levels elevated together, In this group the mean value of B12 was 405,33 pg/mL. Only 2 of these 10 patients were detected under reference range of B12. **Conclusion:** High levels of homocysteine and methyl malonic acid are the most

important criterias used to assess and confirm B12 deficiency so caution should be exercised when assessing the low B12 level by immunoassay.

**Key words:** Vitamin B12, Homocysteine, Methyl Malonic Acid

**Papain Loaded Polycaprolacton Nanoparticles: In-silico and In-vitro Studies**

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Papaya proteinase is a protease enzyme which is isolated from the plant, Carica papaya. It has therapeutic properties such as anti-inflammatory, antibacterial and antioxidant effects, these are very valuable for medical applications. It is also known that papain plays important roles in many biological functions such as proteins cleaving, cells dissociation, necrotic tissue and skin treatments due to the reduced activity of its thiol groups. The delivery and targeting of various drugs, proteins and enzymes with polymeric nanostructure systems are of great interest. Polycaprolactone (PCL) is an ideal polymeric carrier for controlled drug delivery systems because it has extremely low rate biodegradability, good solubility and low melting point. It is also known that PCL is highly biocompatible and can be completely removed from body. The molecular docking methods are used for determining the highest possible binding poses that a molecule may prefer when forming a stable complex with another molecule. They are also used to determine the identity of small drug candidate molecules to the interaction and activity of their target receptors. In this study, novel insights into three-dimensional structure and action mechanism of papain were investigated by in vitro and in silico experiments such as molecular dynamics (MD) and molecular docking methods to shed light on biological functions. The results showed that sizes of papain-loaded PCL nanoparticles (NPs) and polydispersity index (PDI) of the NPs were 242.9 nm and 0.074, respectively. Encapsulation efficiency and loading efficiency were found as 80.4% and 27.2%, respectively. Human embryonic kidney cells (HEK-293) was used for determine cytotoxicity of papain-loaded PCL and PCL nanoparticles. In vitro cell culture used for showed that nanoparticles have not toxicity in lower concentration, while toxicity has slightly increased with higher concentrations. In silico studies which were carried out with MD simulations and Molecular docking-ADME analysis also showed that the strong hydrogen bonds between the ligand and the papain provide



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stability and indicate the regions in which the interaction takes place.

**Key words:** Papain, Carica papaya, PCL, HEK-293, Molecular Docking, Molecular dynamic.

**Effect of Wundesil Solution on Malondialdehyde (MDA) and Catalase (CAT) Levels in Wound Treatment in Rats**

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Wound is the deterioration of normal integrity in the body. A physical agent can cause to a wound formation. A better understanding of the wound healing mechanism has led to an increase in treatment options in recent years. The research is an experimental and analytical study in preclinical and in vivo. An ischemic wound was formed in experimental animals. Twenty-one Sprague Dawley rats were used in the study [7 negative control (no dressing), 7 positive control groups (wound dressing made with saline), 7 experiments (wound dressing made with wundesil)]. The experimental period was 21 days. Blood of the rats that were sacrificed on day 21 were taken. Catalase (CAT) is one of the most studied classes of enzymes. Catalase shows its antioxidant action via dismutation of hydrogen peroxide. Malondialdehyde (MDA), a highly reactive compound, is one of the many reactive electrophile species that cause toxic stress in cells and form covalent protein adducts, called advanced lipoxidation end products. CAT and MDA measurements were performed spectrophotometrically. According to the results of the research, MDA levels were significantly lower ( $p < 0.001$ ) in the experimental group. Catalase levels were significantly higher ( $p < 0.001$ ) in the experimental group. These results suggest that the wundesil solution (Mixture of licorice, sage, thyme, and chamomile) may reduce oxidative stress in rats.

**Key words:** Oksidatif Stress, Wound Dressing, Wundesil.

**The benefit of a prescription urinary diet in cavalier king charles spaniel dog with recurrent hematuria, dysuria and pollakuria for five years**

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**Objectives:** It was aimed to emphasize the role of prescription urinary diet in the treatment of a dog with chronic recurrent hematuria, dysuria and pollakuria. Research methods: Anamnesis was obtained, physical examination, urinalysis, bacteriological culture of urine, cystoscopy and abdominal ultrasonography were performed. Results: The case was a seven-year-old Cavalier King Charles Spaniel female dog, who had recurrent hematuria, dysuria and pollakuria and was treated with different antibiotics and supportive medicines for short/long-term for five years. The patient was diagnosed with hemorrhagic cystitis, resulting from struvite urolithiasis and Proteus mirabilis infection. Based on the previous therapeutic history of the dog, it was decided to use amoxicillin as an antibiotic and to use only prescription urinary diet as food. After starting this treatment, it was observed that the severity of the clinical findings decreased within a few days and were completely recovered after one week. It was suggested that the dog continue to feed on only the prescription urinary diet as food. Conclusions: In dogs with recurrent hematuria, dysuria, and pollakuria, where struvite uroliths and Proteus mirabilis were detected in the urine; for the recurring lower urinary system complaints not to appear; it was concluded that the combination of prescription urinary diet that reduce urine pH and the amount and size of struvite uroliths and/or prevent their recurrence, and amoxicillin, a potent antibiotic of Proteus mirabilis, would provide a long-term and successful treatment.

**Key words:** Dog, Prescription urinary diet, Recurrent chronic hematuria.

**Interpretation of serum 25 hydroxy vitamin D3 levels among dogs with scabies**

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Scabies, a well-recognized and contagious dermatological disease of humans and other species of mammals, has been linked to altered balance between the Th1 and Th2 immune responses, which might have an influence with the prognosis in a sensitized host. On the other hand, vitamin D3 has an association with cytokines belonging to Th1/Th2 family and inflammatory cells. In the present study the authors hypothesized that serum hydroxy vitamin D3 levels might have alterations among dogs with scabies. Thus a total of 0.5 ml blood was withdrawn and centrifuged, which were then forwarded to lab for fluorescent immunoassay meter (Savant,

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China) for analysis. Min-max (ng/mL) values deemed between 5.3-47, whereas age matched healthy controls presented values as 51-119.7. It may be safely concluded that preliminary results indicated vitamin D3 deficiency among dogs with scabies. The authors would like to thank Adnan Menderes University Research Funding Unit (ADU-BAP with Project no: VTF-17058) for financial support for MS thesis)

**Key Words:** 25 hydroxy vitamin D3, dogs, scabies

**Allergen specific in vitro IgE analysis in feline head and neck dermatitis**

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In the present article the present authors retrospectively collected relevant results regarding in vitro allergy tests for feline head and neck dermatitis (Fhnd). To those of cats presenting head and neck excoriations (crusting, alopecia/pruritus), previously not treated, were precisely diagnosed by in vitro allergy tests (Polycheck, Germany; RDA Group, Turkish side distributor). In vitro Polycheck test kits included IgE concentrations (kU/L) against Dermatophagoides farina, Dermatophagoides pteronyssinus, Malassezia, Lepidoglyphus, Aspergillus/ Penicillium, Alternaria/ Cladosporium, Ragweed (Ambrosia) pollen, Birch/ Alder/ Hazel pollen, Plantane/ Willow/ Poplar pollen, Parietaria (Wall pellitory) pollen, Rye pollen, 6 Grass-Mix, Stinging nettle pollen, Lambs quarter pollen, Plantain pollen, Mugwort pollen, Sorrel pollen, Acarus siro, Tyrophagus, Flea (Ctenoceph.). To those of Fhnd, Ig E against Flea, Acarus siro, malassezia, tyrophagus and sorrel were predominantly overrepresented. Ig E concentrations for D. pteronyssinus (P = 0,0017), Malassezia (P < 0,001), birch/alder/hazel (P < 0,001), grass mix (P < 0,001), stinging nettle (P < 0,005), mugwort pollen (P = 0,014), Wall pelitory (P < 0,000), plantain pollen (P < 0,001), lambs quarter (P < 0,000), Acarus siro (P < 0,000), Tyrophagus (P < 0,000) and flea (P < 0,000). Based on preliminary results it should not be unwise to draw conclusion that different allergens must be taken into consideration for underlying allergy in Fhnd. The authors would like to thank Adnan Menderes University Research Funding Unit (ADU-BAP with Project no: VTF-17057) for financial support for MS thesis)

**Key words:** Feline, head and neck dermatitis, allergy, IgE

**Serum Neopterin value as a biomarker of cell-mediated immunity among different stages of Canine Visceral Leishmaniasis**

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Neopterin has long been denoted as an early biomarker of the cellular immunity. The latter low molecular mass compound has been involved within the class of pteridine, a guanosine triphosphate metabolite, which might be produced via activated macrophages/dendritic cells after stimulation with  $\gamma$ -interferon. In the present study the authors investigated serum neopterin values to those of dogs with leishmaniasis (according to different stages of the infection). Neopterin values, as detected by sandwich ELISA by use of commercially available kits, among different stages of the infection min-max values were as follows: stage I 0.4-1.33; stage II 0.24-2.27, stage III 0.88-3.83, stage IV 1.30-96.79 and control group (healthy dogs) 0.06-1.65. Those results suggested activated cell immunity at advanced stage (IV) of CVL, in which there was a statistical significance ( $p \leq 0.05$ ). Acknowledgement: The authors would like to thank Adnan Menderes University Research Funding Unit (ADU-BAP with Project no: VTF-17001) for financial support for MS thesis)

**Key Words:** Neopterin, CVL, Dog

**Serum 25 hydroxy vitamin D3 levels in dogs with visceral Leishmaniasis**

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As low vitamin 25 (OH) D has been detected in infectious or chronic inflammatory diseases, assessing vitamin D levels in sarcoptic mange among sheep might be helpful for determining the severity of the disease. 25 (OH) D vitamin levels might change in infectious or chronic inflammatory diseases, detection of Vitamin D levels in Canine Visceral Leishmaniasis (CVL) may be a change in the treatment

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protocols and information on the disease stages. Although there has been a recent literature on the relationship between infectious disease and vitamin D, no staging has been identified. In this study, it was aimed to evaluate the level of 25 hydroxy vitamin D3 in naturally occurring CVL and to determine its relation with disease activity. In this study, CVL was evaluated in 4 different stage groups and healthy control group without any other disease. Total of 2 ml blood samples were withdrawn from vena cephalica antebrachii to plain tubes and 25 hydroxy vitamin D3 levels were determined by radioimmunoassay using Savant brand immunoassay device. Vitamin D levels were found in Stage I (70.39-98.26), II (68.34-90.97), III (46.20-71.09) and IV (27.08-45.54), whereas 75.38-120 ng/mL in healthy control group. In conclusion, it can be said that there are significant differences in dogs with advanced stages (stage III and IV) CVL.

**Key words:** 25 Hidroksi vit. D3, CVL, Dog

**Key words:** Oxidative Stress Marker, Animals, Thiol/Disulphide Homeostasis.

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***A Novel Oxidative Stress Marker in Animals;  
Thiol/ Disulphide Homeostasis***

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**and İlker Camkerten<sup>1</sup>**

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**Introduction:** As is known, thiols are a class of organic compounds that contain a sulfhydryl group (-SH), which is composed of a hydrogen and a sulphur atom attached to a carbon atom. Those disulphide bonds can be reduced back to thiol groups; therefore, thiol/disulphide homeostasis is maintained. Thiols contribute the major portion of the total antioxidants present in the body and play an important role in defense against reactive oxygen species and also play critical roles in programmed cell death, detoxification, antioxidant protection, and regulation of cellular enzymatic activity. Recently, it is known that an abnormal thiol/disulfide homeostasis state is involved in the pathogenesis of various acute and chronic diseases. Measuring thiols in serum provides an indirect reflection of the antioxidative defense. The measurement of dynamic thiol/disulphide first started by a new automated method developed by Erel and Neselioglu. This study aimed to explain the status of dynamic thiol/disulphide homeostasis by this new method in some animal diseases (Özyazıcı et al., 2016). We investigate that thiol/disulfide homeostasis in sheep with giardiasis, in dogs with leishmaniasis, in dogs with ehrlichiosis and in calves with horn cutting stress. **Results and Discussion:** As far as we know these results are early reports in the animals. It was observed that the thiol levels on the different stage of leishmaniasis were low. It was also observed that the thiol levels in the giardiasis and ehrlichiosis were high. we are still working on data. Furthermore, in calves with diarrhea and calves after dehorning processes had low thiol levels, respectively.

## ICABB 2018 SCIENCE AWARDS

### The researcher of the year

#### Nur Başak Sürmeli

*"Cloning and Recombinant Production of the Thermophilic Cytochrome P450  
CYP119"*

#### Best Oral Presentations:

1. Gülay Sezer

*"Bone Marrow Derived Mesenchymal Stem Cells Alleviate Cisplatin  
Induced Neuropathic Pain in Rats"*

2. Otilia Bobis

*"Beehive products and their antioxidant and biotechnological potential"*

3. Esra Göçmen

*"Influence of dietary supplemental garlic (*Allium sativum*) on liver  
enzyme values of rainbow trout (*Oncorhynchus mykiss*)"*

#### Best Visual presentations:

1. Nükhet Sivri

*"The ecologic importance of co-occurring viruses of *Emiliana huxleyi* in  
Marmara Sea"*

2. H.A. Zafer Sak

*"Antiproliferative effects of fluorine beared 3-tert-butylsalicylaldehyds  
(3DTB) on lung carcinoma cell line"*

3. Mirsade Osmani

*"Glutathione and malondialdehyde level at *Tulipa luanica*, *T. kosovarica*  
and *T. albanica* from different soil types in natural conditions"*



Mentions:

**Levent Sangün**

*"The effect of different seafood forms on the consumption structure in Adana province"*

**Sükrü Aslan**

*"Effect of Nickel on Biological Heterotrophic Denitrification in Batch Units"*

**Caner Öztürk**

*"Effect of additives on semen quality in rams"*

**Talat Özpozan**

*"Vibrational Spectroscopic Monitoring of Cobalt Phosphate Nanoflower Formation for Biomolecule Immobilization"*

**Özlem Şahin**

*"Posterior layering of 18F-fluorodeoxyglucose in the bladder on positron emission tomography/computed tomography"*

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