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Studies on the Lethal Effects of Spinosad on Adults of *Leptinotarsa decemlineata* (Say) (Coleoptera: Chrysomelidae) with Two Bioassay Methods

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Lethal impacts of spinosad were determined against adults of *Leptinotarsa decemlineata* (Say), with two bioassay methods. Adult insects were exposed to different concentrations of spinosad for 24, 48 and 72 h. After the exposure intervals, mortality was scored in both bioassay techniques. Complete mortality was obtained 3 days post-exposure in contact and dipping bioassay methods at 240 and 7920 ppm of test chemical, respectively. A significant linear relationship between spinosad concentrations and mortality rates was detected. The estimated LC_{50} values were 6.59 and 12.50 ppm by contact and dipping methods at 72 h post-treatment, respectively. Overall, results indicated that CPB adults were highly susceptible to spinosad. Contact method, however, exhibited less variability in LC_{50} estimates and showed a higher degree of sensitivity than the dipping method. Contact method is simple and sensitive test bioassay technique for measuring susceptibility of CPB adults to spinosad. (*Asian Journal of Biological Sciences* 2 (1): 1-6, 2009; *doi*: 10.3923/ajbs.2009.1.6)

Comparison of the Effects of Low Protein Diet Versus Chemical Neurotoxins on Brain Weight, Brain Lipid Peroxidation and Antioxidant Status of Rats

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The comparative effect of Protein-Undernutrition (PU) and well-known neurotoxins on brain weight, lipid peroxidation and cellular antioxidants were investigated. The animals were randomly assigned to ten groups: A, B, C, D, E, F, G, H, I and J with five rats per group. Group A were placed on 16% casein diet while group B were placed on low protein diet (5% casein). Animals in groups C, E, G and I, received 200 ppm KCN, 80 mg (kg b.wt.)⁻¹ PB, 75 mg (kg b.wt.)⁻¹ DDT and 100 μ mole (kg b.wt.)⁻¹ Pb(NO₃)₂, respectively while groups D, F, H and J, served as their respective controls. Results show that KCN induced significant reduction in brain weight and SOD activity and significant increase ($p < 0.05$) in CAT but no effect was observed in Lipid Peroxidation (LP) and GSH. DDT induced significant reduction ($p < 0.05$) in CAT activity but did not affect other parameters investigated. Pb(NO₃)₂, however, caused significant increase in LP and GSH and significant reduction ($p < 0.05$) in brain weight but has

no effect on the antioxidants. PB induced significant reduction in brain weight and significant increase ($p < 0.05$) in LP, CAT and GSH whereas it has no effect on SOD. PU induced significant reduction in brain weight and CAT while it induced significant increase ($p < 0.05$) in LP but has no effect on GSH level. In conclusion, these results have demonstrated that PU and all the chemical neurotoxins investigated in this study except DDT induced brain damage (measured as reduced brain weight) in some cases as a consequence of oxidative stress and in some other cases by some unknown mechanisms. PU like some of these chemical neurotoxins induced brain damage presumably as a consequence of oxidative stress. (*Asian Journal of Biological Sciences 2 (1): 7-13, 2009; doi: 10.3923/ajbs.2009.7.13*)

The Behavior of Immobilized Cyanobacteria *Anabaena torulosa* as an Electrochemical Toxicity Biosensor

Tay Chia Chay, Salmijah Surif and Lee Yook Heng

The cyanobacteria *Anabaena torulosa* was immobilized onto an oxygen electrode using a poly (2-hydroxyethyl methacrylate) matrix. The behavior of the organism towards some toxicants was investigated via inhibition of its photosynthetic activity, which could be monitored by the changes of photosynthetic oxygen release. Using lead and 2, 4-dichlorophenoxyacetic acid (2, 4-D) as the toxicants, it was shown that the cyanobacteria response was not affected by cell age or phase of cell growth. But repetitive exposures to a toxicant such as Pb altered the inhibition behavior of the cyanobacteria ($p < 0.05$). The 50% inhibition of the cyanobacteria by Pb occurred at a concentration of 0.4 mg L^{-1} Pb whilst for the herbicide 2, 4-D at 0.1 mg L^{-1} . The results showed that the immobilized organism can be used as a toxicity biosensor for the assessment of Pb toxicity in river water samples. (*Asian Journal of Biological Sciences 2 (1): 14-20, 2009; doi: 10.3923/ajbs.2009.14.20*)

Pattern of Plant Species Diversity in Related to Physiographic Factors in Melah Gavan Protected Area, Iran

M. Heydari and A. Mahdavi

The aim was to study biodiversity of plant species including trees, shrubs and grasses in related to physiographic factors (aspect, elevation above sea level and slope percentage) in Melah Gavan protected area from northwestern Ilam province, Iran. The field data were collected using a number of 67 field plots in a

systematic randomized design (each covering 20×20 m). The characters including tree and shrub species type, number and canopy coverage were recorded by measuring their small/large diameters in each plot. In order to record the herbaceous species, the Whitaker's snail plot method was applied and the minimum plot area 81 m² was determined. Based on the results, there are two tree species, one Shrub and 74 Grasses (belonging to 71 genus and 29 families) in the study area. The family Poaceae and the genus *Euphorbia* sp. form the most existing plants as well as *Therophytes* cover (51%) the most vegetative form in the area. The results obtained from multivariate Duncan test showed that the biodiversity is maximum in southern aspect and minimum in eastern aspect. Moreover, plant richness was the most in southern aspect while it was not significantly different in the other aspects. Investigation of biodiversity and richness amongst the altitude classes showed that the low altitudes (1400-1500 and 1500-1600 m ranges) have the most, while the upper altitudes (1800-1900 and 1900-2000 m ranges) have the least diversity. The ANOVA results also showed that the slope percentage had a significant effect on biodiversity and richness of plants. The results obtained from multivariate Duncan test showed that the biodiversity and richness are maximum in 0 - 25 slope percentage. (*Asian Journal of Biological Sciences* 2 (1): 21-28, 2009; doi: 10.3923/ajbs.2009.21.28)

Quality of Life and Global Functioning Among Chronic Type I Bipolar Disorder Patients in Comparison With a General Population in Iran

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Current psychiatry research is focused on various aspects of Quality Of Life (QOL) in different disorders especially bipolar disorder. Frequent depressive episodes, coupled with being a chronic disease causes less satisfaction with quality of life among bipolar patients. The purpose of this study was to assess the QOL and general functioning among chronic type I bipolar disorder patients. One hundred patients who had bipolar-I disorder according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) for 10 years, were selected. Besides demographic characteristics, number of manic-depressive episodes, drug consumption and substance dependency, quality of life questionnaire [Short Form Health Survey (SF-36)] including bodily pain, physical function, role limitation-physical, general health, vitality, social function, role limitation-emotional and mental health, were completed and global functioning of the patients were evaluated by Global Assessment Functioning (GAF) scales. Of 100 patients, 50% were women. Family history of bipolar disorder was positive in 35% of studied patients. Cigarette smoking was seen in 26% patients,

while 73% of the patients reported use of drugs regularly. The patients had significantly lower scores than the general population on all scales except role limitation-physical and role limitation-emotional that was significant statistically ($p < 0.05$). In patients with substance abuse, the mean of general functioning level, social function and role limitation-physical was better than non-drug user patients ($p < 0.001$). Bipolar disorder is a chronic psychological disease influenced all aspects of QOL. Social, occupational and financial support of the patients and their family are necessary. (*Asian Journal of Biological Sciences* 2 (1): 29-34, 2009; **doi**: 10.3923/ajbs.2009.29.34)

Response of Growth and Yield of Potato Crop Cultivars to Nitrogen Levels

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In order to evaluate responses of two potato cultivars to different nitrogen levels, a split-plot design based on randomized complete block design with four replications was conducted at agricultural research field, Ardabil, Iran in 2008. Main-plots included nitrogen levels: 0, 80, 160 and 200 kg ha⁻¹ nitrogen and sub-plots were assigned to Agria and Satina cultivars. Measured traits were mean tuber weight, tuber yield and number of tuber were sorted according to size and harvest index. Results showed that cultivar Agria in all traits was superior to Satina except for the number of small size tubers. The highest mean tuber weight and tuber yield was observed using 160 and 200 kg ha⁻¹ nitrogen. With increasing nitrogen levels, number of tubers larger than 55 mm was increased. The rate of 160 kg ha⁻¹ nitrogen resulted in the tubers ranged between 28 and 55 mm. Agria cultivar gained more leaf biomass during the season than Satina cultivar 160 kg ha⁻¹, N produced the highest and control, produced the lowest biomass, respectively. The highest leaf biomass was obtained 83 DAP and finally decreased because of senescence and falling of leaves. Impact of nitrogen was not significant on small size tubers. Also, cultivar Agria had the highest values for most traits in treatment of 160 kg ha⁻¹ nitrogen. (*Asian Journal of Biological Sciences* 2 (2): 35-42, 2009; **doi**: 10.3923/ajbs.2009.35.42)

Nutrients Composition and Minerals Content of Three Different Samples of *Nigella sativa* L. Cultivated in Yemen

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This study was carried out to investigate the nutrients composition of *Nigella sativa* seed and its minerals content, cultivated in three different regions in Yemen,

namely Marib, Sadah and Taiz. Proximate analysis, Total Dietary Fiber (TDF), Insoluble Dietary Fiber (IDF) and Soluble Dietary Fiber (SDF) were determined using the Association of Official Analytical Chemists methods. Minerals content of *N. sativa* seeds was determined by the Atomic Absorption Spectrophotometry (AAS). The proximate analysis of *N. sativa* seeds showed that moisture content was 6.8 ± 0.3 , 4.6 ± 0.1 and $7.2\pm 0.14\%$ for Marib, Sadah and Taiz samples, respectively. The seeds showed to have high content of TDF which was 36.88 ± 1.44 , 26.50 ± 1.05 , $30.40\pm 1.06\%$, IDF 27.10 ± 0.55 , 20.56 ± 1.16 , $22.40\pm 1.40\%$ and SDF 8.90 ± 1.17 , 6.50 ± 0.60 , $8.13\pm 0.71\%$ for Marib, Sadah and Taiz samples, respectively. Minerals content analysis of *N. sativa* seeds showed the seeds to be a rich source of calcium, magnesium, potassium, phosphorus and iron. Present results revealed that *N. sativa* seeds contain several nutrients with potential value. (*Asian Journal of Biological Sciences* 2 (2): 43-48, 2009; doi: 10.3923/ajbs.2009.43.48)

Antimicrobial Properties of *Cinnamomum verum* Aqueous Extract

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The aim of this study is to determine the antimicrobial activity of *Cinnamomum verum* stem bark aqueous extract against food-borne pathogen bacteria, nosocomial infection bacteria and normal flora. Extraction with an aqueous system from the dried stem barks of *C. verum* yielded 2.5% of the dried plant. Among 10 test strains of bacteria, *C. verum* showed inhibitory effect on the growth of *Krebsilla pneumoniae* ATCC 10031, *Straphylococcus epidermidis* ATCC 12228 and *E.coli* ATCC 25922 in an agar diffusion test. The Minimal Inhibitory Concentrations (MICs) and the Minimal Bactericidal Concentrations (MBCs) were in the range of 4-16 and 16-32 g L⁻¹, respectively. In conclusion, *C. verum* stem bark aqueous extract showed interesting inhibitory effect on the growth of *S. epidermidis*, *K. pneumoniae* and *E. coli* at low minimum concentration. This may give additional information of antimicrobial activity of *C. verum* stem bark aqueous extract. (*Asian Journal of Biological Sciences* 2 (2): 49-53, 2009; doi: 10.3923/ajbs.2009.49.53)

Fungi in an Oilfield Wastewater in Nigeria

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Occurrence of fungi in produced water of an oilfield location was investigated by cultivation of the organisms on Potato Dextrose Agar (PDA) and Oil Agar (OA)

media. Counts of heterotrophic and hydrocarbon-utilizing fungi were relatively low. Mean counts ranged from 0.3×10^1 to 8.8×10^1 cfu mL⁻¹ for Total Heterotrophic Fungi (THF) and from 0.0×10^1 to 2.4×10^1 cfu mL⁻¹ for Hydrocarbon-Utilizing Fungi (HUF). Fungal species were isolated from the wastewater and in varying frequencies (percentage ratio of THF: HUF), which include *Aspergillus fumigatus* (10:0%), *A. niger* (15:10%), *Fusarium* sp. (27:0%), *Mucor* sp. (5:2%), *Penicillium* sp. (10:0%), *Rhizopus* sp. (7:7%) and *Saccharomyces* sp. (0:5%). Growth of *Saccharomyces* sp. (yeast) was suppressed in PDA while *A. fumigatus*, *Fusarium* sp. and *Penicillium* sp., which grew on PDA, were suppressed on OA medium. The study confirmed that fungi can thrive in produced water but in low number. Also, the hydrocarbon-utilizing fungi (*A. niger*, *Mucor* sp., *Rhizopus* sp. and *Saccharomyces* sp.), can be used for crude oil clean-up. (*Asian Journal of Biological Sciences* 2 (2): 54-57, 2009; doi: 10.3923/ajbs.2009.54.57)

Dermatophytosis in Western Part of Iran, Khorramabad

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This study was carried out with the purpose of determining the genus and species of regional dermatophytes and its importance in providing the ways for preventing these diseases. The study was established as census during a one year period (from 2007 through 2008). Questionnaires were completed for recording necessary information by 294 patients suspected of dermatophytosis and then samples from skin, nail and hair were obtained. All of the specimens were assessed by two methods, direct and culture. The obtained results were analyzed by SPSS 15 software. One hundred and seventy two patients showed different kinds of dermatophytosis. The age average was 23.5 years and the number of affected men was more than that of women. Only *Tinea manuum* in women was more than in men. Most kinds of dermatophytosis were *Tinea corporis* (25.6%) and *Tinea cruris* (25%). *Epidermophyton floccosum* and *Trichophyton verrocosum* were the most common dermatophytes of the region. Control and prevention of these diseases and also preclusion of the economic losses in regional husbandry industry will be fulfilled. Moreover, definitive diagnosis of dermatophytosis before initiating the therapy and public education concerning this disease can be very effective in reducing the infection rates. (*Asian Journal of Biological Sciences* 2 (3): 58-65, 2009; doi: 10.3923/ajbs.2009.58.65)

Anuran Karyological Study of Khorasan Province

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In addition to the morphological, skeletal and biometric characteristics, karyological study is the key to the animal identification and classification. Due to the insufficient studies on amphibians in Khorasan Province (Iran), this research studies five areas of this province, namely Mashhad, Sarakhs, Bojnoord, Shirvan and Tbad. Totally, 100 samples were collected in these regions from April to November, which were transferred alive to the lab. In the laboratory, the vimnoblazin was injected to the samples proportional to their weights and consequently, the bone marrows were extracted. The obtained solution was dropped from a height of 60 to 70 cm on the frozen slides placed on an inclined surface. Prepared slides were stained and photographed to study the chromosomes. Relative length and arms ratio of the chromosomes were used to recognize the centromere position and chromosomal type. Finally, based on the above studies the related idiograms were derived. This research illustrates that all frogs have a set of 26 ($2n = 26$) chromosomes and all toads have a set of 22 chromosomes. It is concluded that all collected frogs and toads from the different stations are *Rana ridibunda* and *Bufo viridis* species, respectively. This research shows no sex dimorphism in all samples. (*Asian Journal of Biological Sciences* 2 (3): 66-73, 2009; doi: 10.3923/ajbs.2009.66.73)

Effect of Iron and Zinc on Yield and Yield Components of Mutant Line's Wheat

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In order to study the influence of iron and zinc elements on yield and yield components of wheat mutant lines during 2006-2007, an experiment was conducted in form of factorial based on complete randomized block design with four replications. Factors include genotype (Tabasi, T-65-7-1, T-65-5-1, T-66-67-60, T-65-58-8) and fertilizer [N, N+Fe, N+Zn, N+Fe+Zn]. Results showed that genotype had high significant effect on GY, by, HI, grain number per spike and spike number per square meter. Iron and zinc fertilizers had significant effect on grain yield and harvest index. Biological yield was not significantly different by imposing of mentioned fertilizer applications. Seed number in spike correlated with seed weight in per spike. Spike number in plant had correlation with spike number in m^2 , straw yield and hectoliter seed weight. Seed weight in per spike had relationship with grain yield, harvest index and thousand seed weight. (*Asian Journal of Biological Sciences* 2 (3): 74-80, 2009; doi: 10.3923/ajbs.2009.74.80)

Assessment of Acute Toxicity of Abamectin, Spinosad and Chlorpyrifos to *Thrips tabaci* Lindeman (Thysanoptera: Thripidae) on Sweet Pepper by using Two Bioassay Techniques

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The onion thrips, *Thrips tabaci* (Thysanoptera: Thripidae), is one of the major greenhouse pest on sweet pepper in Iran. Lethal effects of abamectin, spinosad and chlorpyrifos were evaluated on three life stages (1st, 2nd larval instars and adult) by using two bioassay techniques, leaf dipping method and Thrips Insecticides Bioassay System (TIBS). All insecticides were significantly more toxic to first instar than 2nd instar larvae and adult but there were not significant difference between 2nd instar of larvae and adult. Comparison between two methods showed that abamectin was the most toxic insecticide in TIBS method and its lethal concentration values were significantly less than leaf-dipping method. Chlorpyrifos has the least toxicity in both methods and its toxicity in TIBS was higher than leaf dipping method. Spinosad was the most toxic among the tested insecticides in leaf dipping method and its toxicity was not significantly different in two methods. Results indicated that TIBS is an appropriate method for estimating spinosad toxicity. But this method can not be used for abamectin and chlorpyrifos toxicity evaluation. (*Asian Journal of Biological Sciences* 2 (3): 81-87, 2009; doi: 10.3923/ajbs.2009.81.87)

Seroepidemiological Study of *Toxoplasma gondii* in Women Referred to Khorramabad Laboratory of Health Center for Medical Examination before Marriage, Lorestan Province, Iran, 2008

Sh. Fallahi, E. Badparva, M. Mohammadi, F. Ebrahimzadeh and Y. Pournia

Infection by *Toxoplasma gondii* is widely prevalent in humans and other warm-blooded animals. Symptomatic disease is usually uncommon and most of the infections are asymptomatic. The important aspect of this parasitic infection is the probable danger of congenital transmission and its severing effects on the fetus. This cross-sectional study was conducted to determine the seroprevalence of *Toxoplasma gondii* IgG antibodies among women referred to Khorramabad central laboratory of health center for pre-marriage medical examinations in 2008. A total of 465 serum samples were examined for detection of specific *Toxoplasma gondii* IgG antibodies by Enzyme-linked immunosorbent assay (ELISA). Various information about participants was collected via.,

questionnaires. The SPSS 15.0 software was utilized to analyze the data from experiments. In order to check for statistical differences, Chi-square test and Fisher's exact test were used. The results indicated that 97.2% (452 out of 465) of the women's sera had anti-*Toxoplasma gondii* IgG antibodies. However, no statistically significant differences were observed between age group, level of education, rural or urban residence and job in the seroprevalence of *Toxoplasma gondii* IgG antibodies. Regarding the results of this study, Khorramabad city has relatively hyperseropositivity for *Toxoplasma gondii* antibodies in women who intend to get married. However, a low number of these women were seronegative for Toxoplasmosis and susceptible to infection with *Toxoplasma gondii* and after it to congenital Toxoplasmosis in their pregnancy. Women infected with *Toxoplasma gondii* in pregnancy period have an abortion or baby's burn with mental retardation, hydrocephaly and macrocephaly, joundice and blindness symptoms; therefore, health education especially in women who are going to marry and also during pregnancy is necessary. (*Asian Journal of Biological Sciences* 2 (3): 88-94, 2009; doi: 10.3923/ajbs.2009.88.94)

Nitrogen Use Efficiency and Nitrate Accumulation in Tubers as Affected by Four Fertilization Levels in Three Potatoes (*Solanum tuberosum* L.) Cultivars

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To study Nitrogen (N) agronomic use efficiency and nitrate accumulation in potato (*Solanum tuberosum* L.) tubers as affected by cultivar and N fertilizer level, an experiment was carried out in Ardabil Agriculture Research Station, Iran in 2008. It was based on a completely Randomized Block Design with four replications. The factors included N fertilizer with four levels (0, 80, 160 and 240 kg pure N ha⁻¹) and three cultivars (Satina (V₁), Draga (V₂) and Agria (V₃)). Results showed that with the increase in N level up to 160 kg ha⁻¹, fresh tuber yield significantly increased in cv. Agria. At final harvest, late-maturity cultivar had the highest fresh tuber yield (51.75 t ha⁻¹) under the N level of 160 kg ha⁻¹. With further increase in N level up to 240 kg ha⁻¹, fresh tuber yield and tuber number of late-maturity cv. Agria started to fall. Cv. Agria had the highest N agronomic use efficiency with applying 160 kg N ha⁻¹ and cv. Draga (mid-maturity) had the lowest one with applying 240 kg N ha⁻¹. With the increase in N level, nitrate content of tuber fresh matter and dry matter significantly increased. Cv. Agria, which produced the highest tuber yield, had the lowest nitrate content. Early-maturity cultivars (e.g., Satina) were more prone to accumulate nitrate than late-maturity ones (e.g., Agria). With the increase in N over the optimum level, in addition to yield drop, nitrate content excessively increased. Therefore, fertilizer

level of 160 kg N ha⁻¹ was the best level for cv. Agria to produce a high level, but Satina and Draga did not show statistically significant difference in their yields under different fertilizer levels. In group 2, however, under all N levels, Satina had significantly higher tuber yield than Draga. This study proposes fertilizer level of 160 kg N ha⁻¹ as the most optimum fertilizer level for cv. Agria to realize a high yield while Satina and Draga did not show statistically significant difference in their yields at different fertilizer levels. (*Asian Journal of Biological Sciences* 2 (4): 95-104, 2009; doi: 10.3923/ajbs.2009.95.104)

Prevalence of Intestinal Parasites in the Rural Regions of Kouhdasht, Lorestan Province, Iran, 2008

E. Badparva, Sh. Fallahi, M. Birjandi, Y. Pournia and M.H. Kayedi

The major aim of this study was determinate of prevalence of intestinal parasites in the rural regions of Kouhdasht, Lorestan Province of Iran. Parasites are living creatures which have to be dependent on other living creatures including plants and animals as their hosts to survive. Those parasites which choose human beings as their hosts are divided into two groups of protozoan and multi-cellular parasites in terms of their appearance. Additionally, they are able to live in various tissues of human beings in terms of the parasite type. However, those which live in the digestive system are called intestinal parasites and have infected a large number of people all over the world. Four hundred and sixty two stool samples were collected from the rural families serviced by the health centers of Kouhdasht using multi-step clustered methods and were examined using direct methods including physiologic serum and Lugol, as well as formalin-ether concentrated method to diagnose all intestinal parasites. In addition, all the stool samples were examined using agar culture method and Harada-Mori to diagnose *Strongyloides stercoralis*. Out of the 462 stool samples collected by concentrated method, 150 ones (32.5%) were infected with intestinal parasites while no positive cases were reported for *Strongyloides stercoralis* larva despite administering various diagnostic methods. The results showed that 32.5%, or one-third, of the studied population were found to be infected with intestinal parasites while the tests were administered only once. Definitely, if the tests and sample collecting methods had been repeated three times, the prevalence rate would have been more than this relatively high one. Therefore, providing actions and facilities on the part of responsible officials and organizations are required to enhance health facilities and to eradicate these troublesome creatures. In addition, in this study significant relationships were found between the prevalence rate of the parasites and the population density as well as regular soap using. (*Asian Journal of Biological Sciences* 2 (4): 105-111, 2009; doi: 10.3923/ajbs.2009.105.111)

Isolation of Stigmasterol and γ -Sitosterol from Petroleum Ether Extract of Woody Stem of *Abelmoschus manihot*

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The aim of this study is to identify and characterize the bioactive principles from the woody stem of *Abelmoschus manihot*. It has wide folk medicinal use. For isolation of the compounds, the dried woody stem's powder of *Abelmoschus manihot* was subjected to hot extraction with petroleum ether, this extract was saponified with alcoholic KOH and subjected to chromatography. Two compounds (PEA-2 and PEA-3) were isolated and purified by chloroform. Mass spectrum of PEA-2 and PEA-3 showed a parent molecular ion [M^+] peak at mlz 412 which corresponds to the molecular formula $C_{29}H_{48}O$ and 414 corresponds to $C_{29}H_{50}O$. In 1H -NMR spectrum of PEA-2, H-3 proton appeared as a triplet of a double doublet (tdd) at δ 3.62 and H-6 olefinic proton showed a multiplet at δ 5.14. Two olefinic protons appeared downfield at δ 4.16 (m) and δ 4.14 (m) and in the 1H -NMR data of PEA-3, H-3 proton appeared at δ 3.51 as a triplet of a double doublet with a J value of 4.5 and 1.1 MHz and H-6 olefinic proton showed a multiplet at δ 5.10. From the physical, chemical and spectral characteristics, PEA-2 and PEA-3 were concluded as stigmasterol and γ -sitosterol. (*Asian Journal of Biological Sciences* 2 (4): 112-117, 2009; doi: 10.3923/ajbs.2009.112.117)

Preliminary Studies on Biotransformation of Drumstick (*Moringa oleifera*) and Watermelon (*Citrullus lanatus*) Seed Oils using Baker's Yeast

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In this study, preliminary investigations on biotransformation of under utilized *Moringa oleifera* and *Citrullus lanatus* seed oils were carried out using baker's yeast (*Saccharomyces cerevisiae*). Biotransformation reactions were performed for 48 h using baker's yeast with *M. oleifera* or *C. lanatus* seed oil (experimental) and without yeast (control) in nutrient broth medium. After 48 h, products were extracted with hexane. The transformation of *Moringa oleifera* and *Citrullus lanatus* seed oils was identified by High Performance Thin Layer Chromatography (HPTLC). The HPTLC peaks demonstrated that the baker's yeast transformed the *M. oleifera* and *C. lanatus* seed oils into other metabolites. These results reveal that the drumstick and watermelon seed oils can be used to transform into other metabolites, which may be useful as starting materials for the synthesis of other specialty chemicals. (*Asian Journal of Biological Sciences* 2 (4): 118-123, 2009; doi: 10.3923/ajbs.2009.118.123)

An *in vitro* Ovule Culture Technique for Producing Interspecific Hybrid Between Tartary Buckwheat and Common Buckwheat

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An interspecific hybrid of the *Fagopyrum* species *F. tataricum* cv. CT-1 (2x and 4x) and *F. esculentum* cv. Botansoba (2x) and GreatRuby (4x) was obtained through *in vitro* ovule culture. Seven to ten days old ovules were excised and cultured on 1/2 MS and MS media and rescued ovules were subjected to different combinations and concentrations of BA, NAA, IAA and zeatin added individually and in various combinations along with sucrose. Effects of the hormones were used to evaluate their potentialities for direct regenerations, callus induction and callus regeneration through ovule culture in interspecific cross between tartary and common buckwheat. Interspecific hybridization in *Fagopyrum* used ovule culture two methods development in this study. The result showed that no single medium was adequate to ensure complete development of the fertilized ovules to plantlets, thus necessitating a sequential three step transfer to different media. RAPD-PCR analysis confirmed hybridity of the regenerated plant. (*Journal of Biological Sciences* 9 (1): 1-11, 2009; doi: 10.3923/jbs.2009.1.11)

Molecular Analysis of *Ganoderma* species from Different Hosts in Peninsula Malaysia

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Ganoderma isolates from different hosts namely, *G. boninense* from oil palm (*Elaeis guineensis*), *G. philippii* from rubber (*Hevea brasiliensis*) and *G. australe* from forest trees were characterized using RAPD and PCR-RFLP of ITS+5.8S regions. RAPD primers of high G+C content of 80-100% [CRL-1 (5'CCAGCGCCCC), CRL-2 (5'CTGCCGCCGC), CRL-7 (5'GCCCCGCCGCC3'), CRL-11 (5'CCACCGCGCC) and CRL-34 (5'GACCGCGCCC)] showed that the banding patterns from the same species generated similar patterns. Like RAPD, restriction analysis of ITS+5.8S regions using six restriction enzymes (*MspI*, *Bsu151*, *Hin61*, *HindIII*, *Hinfi* and *TaqI*) also showed that restriction patterns from the same species generated similar patterns. From UPGMA cluster analysis of RAPD and PCR-RFLP of ITS+5.8S regions, *Ganoderma* species from the same host were clustered together. The results from the present study showed that RAPD and PCR-RFLP of ITS+5.8S regions could be used in characterization and taxonomic analysis of *Ganoderma* species from

different hosts. Both techniques could also provide rapid procedure for differentiation of *Ganoderma* species in Peninsula Malaysia. (*Journal of Biological Sciences* 9 (1): 12-20, 2009; doi: 10.3923/jbs.2009.12.20)

A Derived Pentaploid Hybrid from *Solanum macrocarpon* L. (Solanaceae) and its Induced Multiploid Mutant

O.A. Oyelana and K.O. Ogunwenmo

Incorporation of novel genes into crop plants could be enhanced by a combination of mutation breeding and hybridization. The backcross between *Solanum macrocarpon* L. and its induced multiploid mutant yielded a vigorous hybrid. The hybrid was erect (105 cm high) with larger expanded leaves (35×21 cm) than either the natural (75 cm high, 27×15 cm leaf size) or the mutant (21 cm, 14×11 cm) parent. Inflorescence was umbellate as in both parents but eight flowered in hybrid and 1-4 in the parents. Pollen sizes nearly doubled (52.5 µm) in the hybrid with 85.7% viability and respectively 97.3 and 58.2% in the maternal-natural and paternal-mutant parent. Self-pollination failed in the hybrid but an F₂ fruit was obtained through repeated hand pollination. Fruit was light brown and contained 78 seeds but yellow in both parents with 107 and 67 seeds. Whereas meiotic chromosomes segregated normally into n = 12 gametes, the mutant produced varied, n = 11-18, gametes. Exceptionally, the hybrid polyploidized into 2n = 60. Possible mechanism through endoduplication and the conferment of vigour and gigas morphological features on the hybrid were expatiated. (*Journal of Biological Sciences* 9 (1): 21-28, 2009; doi: 10.3923/jbs.2009.21.28)

Theonellapeptolide Id: Structure Identification of Cytotoxic Constituent from *Kaliopsis* sp. Sponge (Bowerbank) Collected from West Bali Sea Indonesia

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Structure identification of cytotoxic of isolated compound from *Kaliopsis* sp. sponge collected from North west Bali sea was conducted. The identity of the structure was analyzed based on physical and spectral data, namely, ultraviolet, MS, one- and two-dimensional ¹H-NMR and ¹³C-NMR and comparison to published values. The isolated compound was confirmed as Theonellapeptolide Id. (*Journal of Biological Sciences* 9 (1): 29-36, 2009; doi: 10.3923/jbs.2009.29.36)

Use of Microbiological and Chemical Methods for Assessment of Enhanced Hydrocarbon Bioremediation

Saad A. Alamri

A suite of microbiological tools, complementing the standard chemical analysis, was used for evaluating the effect of steam and surfactant on the rate of hydrocarbon biodegradation. The microbiological monitoring tools were soil microbial counts, soil microbial respiration and microbial toxicity biosensor. The correlations between these parameters and with the levels of hydrocarbon residues were investigated. The overall assessment showed that bioremediation was an effective method for reducing hydrocarbon concentration. However, the monitoring tools used showed that the steam and surfactant had no significant effect in increasing the rate of hydrocarbon bioremediation or the toxicity reduction comparing with the control. Consequently, alternative techniques for enhancing hydrocarbon bioavailability must be investigated in order to establish a successful bioremediation of heavy hydrocarbons in soil. This study also demonstrated that the combination of different classes of biological and chemical tools would be more effective in monitoring hydrocarbon bioremediation than any single approach. (*Journal of Biological Sciences* 9 (1): 37-43, 2009; doi: 10.3923/jbs.2009.37.43)

Activity of Antioxidant Enzymes in Response to Cadmium in *Arabidopsis thaliana*

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The effects of the heavy metal cadmium (Cd^{+2}) on growth and activities of the antioxidant enzymes, catalase (CAT), peroxidase (POD) and polyphenol oxidase (PPO) have been investigated in *Arabidopsis thaliana* L. seedlings. The concentration of 50 and 100 μM CdCl_2 was shown to strongly inhibit the growth of roots and lipid peroxidation. Lipid peroxidation of seedlings shoots rose with increasing concentrations of Cd^{+2} as indicated by malondialdehyde (MDA) concentration. As Cd^{+2} concentration increased, catalase (CAT) activity declined progressively, while peroxidase and polyphenol oxidase activity increased when compared to the untreated plants. Close correlations between increased MDA formation and decreased root growth as well as CAT activity suggests that lipid peroxidation might be caused by cell damage and death proposing that applied concentrations of Cd^{+2} could be toxic to cells. It was also noted that Cd^{+2} -induced cell injury and lipid peroxidation correlated with increased peroxidase and

polyphenol oxidase activities, two antioxidant enzymes involved in polyphenol peroxidation as lignification substrates. Together, the results suggest that in *Arabidopsis thaliana* reactive oxygen species (ROS) could be induced by phytotoxic concentrations of Cd⁺² leading to increased POD and PPO activities which play a crucial role in detoxification of elevated concentrations of Cd⁺² possibly via lignifications and physical barrier formation. (*Journal of Biological Sciences* 9 (1): 44-50, 2009; doi: 10.3923/jbs.2009.44.50)

Genetic Relationships of Cercopithecidae in Thailand as Inferred from rDNA ITS Regions

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Genetic relationships of cercopithecoid species in Thailand are determined based on sequence analysis of the internal transcribed spacer (ITS) regions of ribosomal DNA (rDNA). Aligned sequences of the complete ITS regions obtained from the six taxa and an outgroup, *Pan paniscus* resulted in 634 characters. Within the Cercopithecidae, ITS sequences are highly conserved with 97.48% homology. The resulting comparisons of ITS sequences were used for analysis of genetic distance and a dendrogram was constructed based on the Neighbor Joining Method. From the dendrogram, *Pan paniscus* is solely separated. The Colobinae species, *Trachypithecus cristatus*, *T. phayrei*, *T. obscurus*, were placed inside the Cercopithecinae species, *Macca arctoides*, *M. mulatta*, *M. nemestrina*. The dendrogram of these species does not completely match the former classification based on morphological characters. Genetic distances are very low (0.002 to 0.013) among Thai cercopithecoid species. The results suggest that the ITS regions of rDNA is highly conserved in Thai cercopithecoids. (*Journal of Biological Sciences* 9 (1): 51-56, 2009; doi: 10.3923/jbs.2009.51.56)

Paracetamol Hepatotoxicity in Rats Treated With Crude Extract of *Alpinia galanga*

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This study was conducted to observe the hepatoprotective effect of the crude extract of *Alpinia galanga* at 200 and 400 mg kg⁻¹ against paracetamol induced hepatotoxicity in rats. Forty male Sprague-Dawley rats were divided into groups of four consisting of a control, 3000 mg kg⁻¹ paracetamol as well as 200 and

400 mg kg⁻¹ *Alpinia galanga*. The control group was orally fed with distilled water for eight days while the 3000 mg kg⁻¹ paracetamol group was fed with distilled water for seven days followed by 3000 mg kg⁻¹ paracetamol on day eight. The extract of *Alpinia galanga* was fed for seven days based on the respective doses followed by 3000 mg kg⁻¹ paracetamol on day eight. Blood and liver samples were obtained from all the animals on the ninth day for biochemical analysis that includes total protein, aminotransferase enzymes (AST and ALT), malondialdehyde (MDA) and superoxide dismutase (SOD) as well as histological analysis (H and E staining). The results obtained showed that paracetamol given at the dose of 3000 mg kg⁻¹ induced hepatotoxicity with significant decrease in serum protein levels and significant increase in serum AST and ALT levels as well as liver MDA levels at p<0.05. Supplementation with the extract of *Alpinia galanga* maintained serum protein and liver SOD levels similar to that of the normal control group. Significant decrease (p<0.05) in liver MDA levels as compared with the group treated with 3000 mg kg⁻¹ paracetamol was observed in groups treated with the extract. Significant changes in MDA levels was also noted in group treated with 400 mg kg⁻¹ *Alpinia galanga* against the group treated with 200 mg kg⁻¹ *Alpinia galanga*. Histological analysis showed significant reduction in number of necrotic cells in both groups supplemented with the extract at p<0.05. The findings from the study showed that the crude extract of *Alpinia galanga* has protective effects against paracetamol induced hepatotoxicity. (*Journal of Biological Sciences* 9 (1): 57-62, 2009; doi: 10.3923/jbs.2009.57.62)

Phytochemical Analysis and Antibacterial Activity of *Khaya grandifoliola* Stem Bark

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The powdered crude sample of *Khaya grandifoliola* was subjected to phytochemical analysis using standard experimental procedures. The phytochemical evaluation revealed the presence of alkaloids, tannins, saponins and flavonoids. The methanolic extract of *Khaya grandifoliola* stem bark was screened for antimicrobial activity against bacterial isolates MRSA, *Bacillus subtilis*, *Klebsiella pneumonia* and *Proteus mirabilis* at different concentrations. The isolates showed a minimum inhibitory concentrations (MIC) of 0.4 mg mL⁻¹ except *B. subtilis* of 0.002 g mL⁻¹. (*Journal of Biological Sciences* 9 (1): 63-67, 2009; doi: 10.3923/jbs.2009.63.67)

Evaluation of the Effects of Aqueous Extracts of *Hibiscus sabdariffa* Calyces on Cadmium-Induced Oxidative Damage in Rats

A.A. Omonkhua, C.A. Adesunloro, O.O. Osaloni and S.O. Olubodun

The effects of aqueous extracts of *Hibiscus sabdariffa* L. calyces in cadmium-induced oxidative damage in serum and tissues of rats were evaluated in this study. Twenty eight male Wister rats (170-200 g) in four groups, {control (I), *Hibiscus sabdariffa* (II), Cadmium (III) and *H. sabdariffa*+Cd (IV)}, were used. Groups II and IV were given a daily dose of 0.2 g kg⁻¹ body weight of *H. sabdariffa* extracts for four weeks, while groups III and IV (the Cd groups) were injected sub-cutaneously with 0.002 g Cd (as CdSO₄.8H₂O) kg⁻¹ body weight once a week for four weeks. Liver protein levels significantly (p<0.05) decreased for all test groups relative to control, while the kidney and testis protein levels significantly (p<0.05) increased. There was a general increase in serum and tissue malondialdehyde (MDA) levels of tests groups relative to control while a general decrease was observed in serum and tissue catalase activities. Serum SOD of tests groups significantly (p<0.05) decreased while tissue SOD significantly (p<0.05) increased compared to control. The results showed, for some parameters evaluated, that *H. sabdariffa* appeared to play a protective role against Cd-induced oxidative damage. Paradoxically, however, *H. sabdariffa* alone also appeared to exert some measure of oxidative damage. (*Journal of Biological Sciences* 9 (1): 68-72, 2009; doi: 10.3923/jbs.2009.68.72)

The Physiological Changes in Blood Coagulation Parameters Induced by the Therapeutic Doses of the Chinese Danshen Plant (*Salvia miltiorrhiza*) in Male Guinea Pigs (*Cavia porcellus*)

Ameen Saleh Ahmed Bin Bisher

The present experimental physiological study on male Guinea pigs aims to examine the effects of the Chinese Danshen roots aqueous extract on the blood coagulation parameters. Animals in two treated groups (G₂) and (G₃) were given daily two therapeutic doses for 15 days (21 and 43 mg kg⁻¹, respectively). The current results of the haematological measurements showed that Danshen roots extract induced marked significant inhibitory effects on the blood coagulation parameters, mainly under the influence of the high therapeutic dose (43 mg kg⁻¹). Under this

dose, significant increases were recorded in the means of Prothrombin time, INR and APTT (66.80 ± 1.8 sec, 11 and 56.60 ± 2.7 sec, respectively) compared to the control group. On the other hand, significant decreases were recorded in means of serum Fibrinogen level and Fibrin degraded products (1.65 ± 0.12 g L⁻¹ and 0.63 ± 0.05 mg L⁻¹, respectively) compared to the control group. Similarly, significant decreases were observed in the means of the following coagulation parameters:- Factor (IX), Factor (VIII), Anti-thrombin (III), Protein C and protein S (29, 46, 57, 61 and 24%, respectively) compared to control group. In conclusion, the results can be considered as an indicator proving the hypocoagulative effect of the active compounds of Danshen roots on blood coagulation process. Hence, this useful therapeutic effect can be used in the treatment of thrombosis cases in human patients. But, further pharmacological and toxicological studies should be performed to examine the therapeutic safety of Danshen roots. (*Journal of Biological Sciences* 9 (1): 73-77, 2009; doi: 10.3923/jbs.2009.73.77)

Effect of Lysis Strategy in Accuracy and Repeatability of Sex Determination by Single Cell Polymerase Chain Reaction Method

F. Farzaneh Dehkordi, A.M. Ahadi, A. Shirazi and M. Sadeghizade

The main objective of this study was to evaluating of different methods applicable to the single cell DNA preparation for embryos sex determination in the early stages. In this study, we have introduced an efficient protocol for DNA extraction step in the single cell PCR method. We compared three different lysis methods including; one physical (nitrogen freezing and thaw) and two chemicals (potassium hydroxide/dithiothreitol; KOH/DTT lysis protocol) and (Nonidet P40/Proteinase K protocol) for utilizing in the single cell PCR procedure. The results of multiplex nested single cell PCR using NP40/PK protocol was eminently more repeatable and efficient for routine applications in the laboratory in compared with the other protocols analyzed in this study. Present results showed that the efficiency of amplification of the target genes in the single blastomer PCR was 94% with NP40/PK protocol, 88% for KOH/DTT lysis protocol and 64% by using of freeze and thaw protocol. We concluded that the NP40/PK protocol was the most efficient method for extracting DNA from a single cell and could be particularly useful for sexing of bovine embryos in the early stages. (*Journal of Biological Sciences* 9 (1): 78-82, 2009; doi: 10.3923/jbs.2009.78.82)

Laccase Activity from Fresh Fruiting Bodies of *Ganoderma* sp. MK05: Purification and Remazol Brilliant Blue R Decolorization

Saranyu Khammuang and Rakrudee Sarnthima

The primary aim of this study was to screen for laccase activity from various mushroom fruiting bodies found in Maha Sarakham and nearby provinces of Northeast of Thailand. The enzyme activity was followed by a spectroscopic property of an oxidized product of 2, 2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) at 420 nm. The results found that crude water extract of mushroom *Ganoderma* sp. MK05 gave the highest specific activity of laccase. Consequence aim was to partial purification of the crude water extract of the selected mushroom and to evaluate the dye decolorization activity. The crude enzyme was partial purified by ammonium sulfate fractionation in the range of 40-70% saturation and followed with DEAE-cellulose anion exchange column to 1.34 and 3.07 purification folds, respectively. Native gel electrophoresis result showed one protein band with laccase activity. The partial purified laccase from this mushroom showed a high efficient decolorization ability of anthraquinone dye, Remazol Brilliant Blue R with above 80% within 5 h at 30°C. (*Journal of Biological Sciences* 9 (1): 83-87, 2009; doi: 10.3923/jbs.2009.83.87)

Hypolipidaemic Effects of *Euphorbia prostrata* in Rabbits

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The aim of this research was to study the effect of 70% ethanol extract of *Euphorbia prostrata* on lipid profile in rabbits. The plant extract was orally administered to the atherogenic rabbits (atherogenic diet + cholesterol powder supplement at 400 mg/kg/body weight/day dissolved in 5 mL coconut oil) at dose of 0.0012 kg body weight/day. During the hall period of the experiment blood samples were collected and serum was analyzed for lipid profile. At the end of the experiment the animals were sacrificed; the heart and the liver were collected and stored at -20°C until assayed. Biochemical analysis of blood serum and tissue (liver and heart muscle) were performed for cholesterol, phospholipids and triglycerides. In addition blood serum was analyzed further for HDL-cholesterol. All the results were statistically analyzed using students t-test. Hypolipidaemic nature of *Euphorbia prostrata* extract was studied in hyperlipidaemic rabbits. The increased cholesterol levels were brought to normal by administration of *Euphorbia prostrata*. Serum cholesterol levels dropped from 940.7 to 230.41 (75.55%) and further to 119.2 (87.32%) by the end of the experiment. Similarly,

phospholipids and triglycerides levels were reduced. The tissues lipids profiles of liver and heart muscle showed similar changes in those noticed in serum lipids. We can conclude from these results that *Euphorbia prostrata* possesses active hypolipidaemic constituents. The results suggest the validity of *Euphorbia prostrata* clinical use in hypolipidaemic control, after their toxicological investigation. (*Journal of Biological Sciences* 9 (1): 88-91, 2009; doi: 10.3923/jbs.2009.88.91)

Fumigant Toxicity of *Ziziphora clinopodioides* (Boiss.) (Lamiaceae) Against Adults and Eggs of *Callosobruchus maculatus* (Fab.) (Coleoptera: Bruchidae)

F.A. Lolestani and N. Shayesteh

The insecticidal and ovicidal effects of essential oil extracted from *Ziziphora clinopodioides* (Boiss.) (Lamiaceae) were tested on adults and eggs of *Callosobruchus maculatus* (Fab.). Oil concentrations of 9, 12.5, 17.6, 24.5 and 34.2 $\mu\text{l L}^{-1}$ air were tested on adults while concentrations of 3.5, 5.8, 9.7, 16.1 and 26.7 $\mu\text{l L}^{-1}$ air were tested on eggs. Adults and eggs were exposed for 24, 48 and 72 h. After each exposure, insecticide effect was estimated by counting the number of dead adults of *C. maculatus* while ovicidal effect was estimated by counting the number of unhatched eggs. Results showed that the oil had high fumigant action against adults and eggs, the adults being more susceptible than the eggs. After 72 h of exposure to an oil concentration of 34.2 $\mu\text{l L}^{-1}$ air, the adult mortality was 94.65% while the egg mortality was 61.10% for an oil concentration of 26.7 $\mu\text{l L}^{-1}$ air. The lowest values after 72 h were observed on adults of *C. maculatus* (Fab.) (4.01). The LC_{50} amount for eggs at this time was 16.98 $\mu\text{l L}^{-1}$ air. Progeny was reduced by 57.76% after a 72 h exposure of oil at a concentration of 34.2 $\mu\text{l L}^{-1}$ air. Fumigant effects of this essential oil were considered to warrant further research into their potential for commercial use. (*Journal of Biological Sciences* 9 (1): 92-95, 2009; doi: 10.3923/jbs.2009.92.95)

The Scorpion Fauna of Al-Baha and Hail Regions, Saudi Arabia

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This is an additional contribution to the comprehensive study of the scorpion sting syndrome in Saudi Arabia, which was collected from two regions (Al-Baha and

Hail). It deals with identification of the existing and newly discovered species and their medical importance. The survey covered the major sites of Al-Baha, (Al-Queed, Al-Qura, Al-Mandig, Al-Makhwaa, Galwaa, Al-Baha and Baljurashy) and Hail, (Hail city, Baqaa, Al-Shenan, Al-Ghazala). There were 2421 specimens collected from Al-Baha Region. There were 1281 (52.9%) specimens *Scorpio maurus fuscus* belonged to Scorpionidae, in addition to the family Diplocentridae (Abolished and changed to Scorpionidae, recently), which was represented by the species *Nebo hierichonticus* (38, 1.58%). Four species of scorpions that belonged to the Buthidae family were *Leiurus quinquestriatus* (1052, 43.5%), *Compsobuthus werneri* (23, 0.95%), *Orthochirus innesi* (11, 0.46%) and *Vachoniolus minipectinibus* (16, 0.66%). A total of 1921 specimens were collected from Hail Region, The most common subspecies from this region that belonged to the family Scorpionidae was *Scorpio maurus kruglovi* (1522, 79.23%). The next common species was *Androctonus crassicauda* (120, 6.25%) *Androctonus bicolor* (180, 9.37%), *Leiurus quinquestriatus* (18, 0.94%), *Buthacus leptochelys* (35, 1.82%), *Compsobuthus werneri* (37, 1.93%), *Orthochirus innesi* (4, 0.21%) and *Apistobuthus pterygocercus* (5, 0.26%) all belonging to the family Buthidae. *Androctonus crassicauda* and *Leiurus quinquestriatus*, which are highly venomous, are endemic in Hail and Al-Baha regions, respectively, in addition to the newly recorded species of *Androctonus bicolor* for the first time in Hail region, without previous records in Saudi Arabia. Further studies are warranted to identify more scorpion species in these regions. (*Journal of Biological Sciences* 9 (2): 96-108, 2009; doi: 10.3923/jbs.2009.96.108)

Foliar Application with Riboflavin (Vitamin B₂) Enhancing the Resistance of *Hibiscus sabdariffa* L. (Deep Red Sepals Variety) to Salinity Stress

M.M. Azooz

The effect of salinity stress alone and with foliar application with 100 ppm riboflavin (vit. B₂) on seedling growth, organic solutes accumulation, ion uptake and the activity of antioxidant enzymes in *Hibiscus sabdariffa* L. was investigated. Analysis of data (ANOVA) revealed that, growth of *Hibiscus sabdariffa* L. seedlings was reduced with increasing NaCl concentration, while water content and dry matter were not changed significantly at the low levels of salinity. Soluble carbohydrate, protein and proline were found to be increased significantly. The content of Na⁺ was significantly increased, while K⁺ as well as K⁺/Na⁺ and Ca⁺⁺/Na⁺ ratios were decreased as salinity levels increased. Calcium and total cations were slightly affected. Foliar application with vit. B₂ induced stimulatory effects on almost measured parameters. On the other hand, Na⁺ content decreased

significantly. Further, salinity induced marked increases in lipid peroxidation and the activity of antioxidant enzymes (CAT, POD, APX and GR), while membrane stability index was significantly decreased. Spraying of salinized seedlings with vit. B₂ induced a marked increase in MSI and antioxidant enzymes, whereas the content of lipid peroxidation was decreased in comparing with salinized seedlings. Results suggest that, vit. B₂ may have a potential role as an effective antioxidant by regulating osmotic and ionic balance and enhancing the resistance of *H. sabdariffa* L. seedlings to salinity stress. (*Journal of Biological Sciences* 9 (2): 109-118, 2009; doi: 10.3923/jbs.2009.109.118)

Field Efficacy of *Exserohilum prolatum*-A Potential Mycoherbicide for Biological Control of Itchgrass (*Rottboellia cochinchinensis*)

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The experiments were conducted to evaluate the potential of the *Exserohilum prolatum* as a mycoherbicide for the itchgrass (*Rottboellia cochinchinensis*) control under natural conditions in two field experiments in a non crop situation and in association with a maize crop. Three doses were (single, double and triple) applied to the main plots with 2 week intervals. The sub-plot treatments were distilled water solution (check), the *Exserohilum prolatum* conidial concentration of 2×10^7 , 2×10^8 and 2×10^9 conidial mL⁻¹ or glyphosate (N-(phosphonomethyl) glycine) herbicide as control check. Disease severity was rated at 5 day intervals after application and the area under disease progress curve (AUDPC) was calculated for each treatment. The above ground parts of the itchgrass and maize were recorded at the end of the experiment. The results showed that application frequency and inoculum concentration greatly influence the itchgrass control. Significantly higher percentage control of the itchgrass were recorded from triple application frequencies (90.4%) compared to single (62.4%) and double (70.4%) applications. Within the three frequencies of application, increasing inoculum concentration increased the itchgrass control from between 53 to 90.4% compared to untreated check. The results indicate that the *E. prolatum* has a good potential as a biocontrol agent for the itchgrass. (*Journal of Biological Sciences* 9 (2): 119-127, 2009; doi: 10.3923/jbs.2009.119.127)

Temporal and Spatial Expression Pattern of Four Laminin Alpha Chains in *Xenopus laevis*

N. Ahmad

The spatial and temporal expression of laminin $\alpha 1$, $\alpha 3$, $\alpha 4$ and $\alpha 5$ -chain in the developing *Xenopus laevis* embryos was characterized using RT-PCR and

whole-mount *in situ* hybridization. RT-PCR analysis shows varying developmental timings of expression of the laminin α -chain mRNA. The α 1-chain mRNA was detected from stage 6 embryo and levels increase as the embryo develops to stage 41. α 3 and α 5-chain mRNA was found to be expressed maternally and also in the developing zygote. There was no maternal expression of the α 4-chain and in the zygote, α 4-chain mRNA was first detected at stage 14. Whole-mount *in situ* hybridization on embryos at stage 15, 25 and 33 showed that the α 1, α 3, α 4 and α 5-chain transcripts produced similar pattern of localisation. Transcripts were observed in the outer epithelia, somites, developing neural tube and pronephros. (*Journal of Biological Sciences* 9 (2): 128-136, 2009; doi: 10.3923/jbs.2009.128.136)

Characterization of Interspecific Hybrid Between *F. tataricum* and *F. esculentum*

M. Asaduzzaman, M. Minami, K. Matsushima and K. Nemoto

Cultivated tartary buckwheat (*Fagopyrum tataricum*) was successfully hybridized with cultivated common buckwheat (*Fagopyrum esculentum*). Both diploid ($2n = 16$) and tetraploid ($2n = 32$) and hybrids were produced from interspecific crosses using ovule rescue method. The produced hybrid was confirmed using plant morphological characters, cytological characters and DNA analysis. The morphological characteristics of the hybrids and parent species are described along with estimation of genetic variation of the hybrids. Self-compatibility together with homomorphism has been introduced from *F. tataricum* to *F. esculentum*. Inheritance of flower color in the hybrids was found to be intermediate, whereas pin-style flowers and round shape seeds were found to be dominant over homomorphism and non-winged seeds. There were no obvious differences between the two species in efficiency of pollination. The meiotic observations were accorded with high seed fertility of F_1 hybrids and produced normal seeds. These observations indicated that the genetic resemblance and chromosome affinity in the hybrids and parental chromosome supported the fertility of the hybrids. (*Journal of Biological Sciences* 9 (2): 137-144, 2009; doi: 10.3923/jbs.2009.137.144)

The Study of Whey Protein Supplementation on Plasma Essential Amino Acids Concentrations after Resistance Exercise in Healthy Young Athletes

S. Eslami, M. Karandish, S.M. Marandi and A. Zand-Moghaddam

Physical activity increases protein catabolism and decreases plasma essential amino acids concentrations. Determining plasma amino acids concentrations is the

method of choice for assessment of amino acids requirements of body organs. Few researches have been published about the effect of protein supplements, containing amino acids and other useful substances, on plasma essential amino acids concentrations in resistance athletes. This study was carried out to investigate the effect of whey protein supplementation on plasma essential amino acids concentrations, after resistance exercise in healthy athletes. In this clinical trial, changes of plasma essential amino acids concentrations were studied after 1 h exercise training and whey protein supplementation in 32 healthy volunteers (16 in each of supplement and placebo groups). Each day, whey protein supplement (20 g) and placebo (the same amount of starch) were consumed after training. Participants exercised with 80% 1 RM, basically on stationary circuit principal, for 1 h. Blood specimens were taken in fasting state, immediately after exercise and 1 h after supplement consumption. Essential amino acids concentrations were analyzed by HPLC. Statistical analysis were carried out using Student t-test and paired t-test. Treonine concentration increased significantly after exercise ($p < 0.05$), but there was no difference between the two study groups. After supplementation, histidine concentration was unchanged in both groups. Treonine, arginine, methionine, valine, isoleucine and leucine concentrations increased significantly and phenylalanine concentration increased nonsignificantly in the supplement group. Treonine, methionine, valine, phenylalanine, isoleucine and leucine concentrations decreased significantly, but downward trend of arginine was not significant. Differences between the two groups were significant. The present study showed that 20 g day⁻¹ of whey protein supplement is effective on plasma essential amino acids concentrations and compensated for their post exercise decrease. (*Journal of Biological Sciences* 9 (2): 145-151, 2009; doi: 10.3923/jbs.2009.145.151)

Somaclonal Variation in *in vitro* Regenerated *Ledebouria graminifolia* (Hyacinthaceae), an Indigenous Bulb in Botswana and its Potential Exploitation as an Ornamental Plant

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The aim of this study is to report on the occurrence of somaclonal variation in *in vitro* regenerated *Ledebouria graminifolia* an indigenous bulb in Botswana and assess its potential use as an ornamental plant. Plants that were regenerated using tissue culture were planted in a mixture of garden soil and potting soil in the greenhouse and also grown in the field under natural conditions without additional resources supplied to the plants. Morphological features and tolerance to drought were used to assess somaclonal variation among clones. *In vitro* propagated

plants grew well in the greenhouse, they produced large attractive leaves and many flowered continuously. Field grown plants acclimatized well and survived periods of droughts and high temperatures. Morphological evaluation of the plants showed five visually distinct variants. Morphotype 1 consisted of prostrate plants with large, fewer, bright green leaves. Morphotype 2 consisted of prostrate plants with large, less bright green lanceolate leaves. Morphotype 3 consisted of plants with medium aristate, grayish green, curly leaves with rubbery appearance. Morphotype 4 had intermediate characteristics between 2 and 3 with grayish, lanceolate leaves. Morphotype 5 typically represented the parental phenotype of wild plants, consisted of very erect plants with curly, linear leaves with rubbery appearance. The variants also showed differences in their tolerance to drought with morphotypes 3 and 5 being most tolerant and morphotypes 1 and 2 the least tolerant. The bulb could be mass propagated and exploited for ornamental purposes in Botswana to complement or as alternatives to popular exotic plants currently dominating the floriculture industry. (*Journal of Biological Sciences* 9 (2): 152-158, 2009; doi: 10.3923/jbs.2009.152.158)

Investigated Antispasmodic Effect of *Ruta chalepensis* Leaf on Rat's Ileum at Present of KCl and Different Concentrations of Calcium Chloride

A.A. Moazedi, N. Dabir, M.K. Gharib Naseri and M.R. Zadkarami

In this study, the effect of *Ruta chalepensis* on rat's ileum contraction has been investigated because the hydroalcoholic extract of the leave of *Ruta chalepensis*, grown in Iran were investigated for pharmacological properties. *Ruta chalepensis* (Rue) is annual herb is used in the traditional medicine in Iran for intestinal disorder. In this study the effect of hydroalcoholic extract of Rue on isolated rat's ileum contraction was investigated by KCl (60 mM). A segment of ileum was removed and suspended in 10 mL organ bath containing aerated Tyrode solution (37°C, pH = 7.4). The responses were determined and recorded on isotonic transducer and Harvard Universal Oscillograph. The result demonstrate that the extract significantly reduced the ileum contraction induced by KCl (60 mM) in a dose dependent manner (n = 7, p<0.001). Also, adding extract before influence of KCl, cause reduce effect of KCl (n = 7, p<0.001). In another study, in high potassium Ca²⁺-free tyrode solution, cumulative concentrations of CaCl₂ induced ileal contraction, however, the extract reduced these contractions in a dose dependently (n = 7, p<0.001). Therefore, the results suggest that relaxatory effect of rue on the ileum may be due to blocking of voltage gated calcium channels. (*Journal of Biological Sciences* 9 (2): 159-164, 2009; doi: 10.3923/jbs.2009.159.164)

Eosinophil-Derived Neurotoxin Versus Immunoglobulin E as Biomarkers for Evaluation of Bronchial Asthma

N. El-Helaly, A. El-Wan, Y. Kamel, M. Nabih, H. Mahmoud, M. Almasry and H. Hussein

The aim of this research was to assess the clinical utility of Eosinophil Derived Neurotoxin (EDN) and immunoglobulin E (IgE) as biomarkers for bronchial asthma evaluation as regard type (atopic vs non atopic) and severity. The study included 39 atopic asthmatic patients (group 1), 31 non atopic asthmatic patients (group 2) and 20 age and sex matched controls (group 3) with their age ranged from 7-17 years. Eosinophil count, serum level of immunoglobulin E (IgE), EDN and spirometry were done for all cases. A positive correlation between EDN and eosinophil count was found ($r = 0.423$ and $p < 0.01$) and between serum EDN and IgE ($r = 0.401$ and $p < 0.03$). Serum EDN and IgE levels showed statistically significant difference between group 1 and 2 ($p < 0.001$ and 0.01 , respectively) and between group 1 and 3 ($p < 0.001$ and 0.003 , respectively), but no statistically significant difference was found between group 2 and 3 for both parameters. No correlations were found between EDN or IgE and FEV_1 (%) predicted. EDN level showed a statistically significant difference between groups when patients classified into 4 groups based on symptoms and drug use in comparison to IgE which showed no statistically significant difference between the same groups. The study suggests that serum EDN may be superior to IgE as a biomarker for evaluation of asthma regarding its type and severity. (*Journal of Biological Sciences* 9 (2): 165-169, 2009; doi: 10.3923/jbs.2009.165.169)

Study on the Efficacy of Iranian Isolates of *Beauveria bassiana* (Balsamo) Vuillemin and *Metarhizium anisopliae* (Metsch.) Sorokin Against *Rhyzopertha dominica* F. (Coleoptera: Bostrichidae)

Z. Mahdneshtin, M. Hassan Safaralizadah and Y. Ghosta

Laboratory bioassays were conducted in order to evaluate the efficacy of Iranian isolates of entomopathogenic fungi *Beauveria bassiana* (Balsamo) Vuillemin and *Metarhizium anisopliae* (Metsch.) Sorokin against adults of the lesser grain borer, *Rhyzopertha dominica* (F.) on stored wheat. All the isolates tested were pathogenic to the beetle although mortality rates were different between them. The cumulative mortality after treatment varied from 14.78% in *M. anisopliae* DEMI001 at low concentration (1.5×10^4 conidia mL^{-1}) to 89.35% in *B. bassiana*

Iran 441C at the highest concentration (1×10^{10} conidia mL⁻¹). Probit analysis showed that the lowest LC₅₀ values were 9.6×10^5 and 1.9×10^7 (conidia mL⁻¹) for *B. bassiana* Iran 187C and *M. anisopliae* DEMI001, respectively. The values of LT₅₀ varied from 6.77 to 9.28 days for *B. bassiana* isolates and from 7.48 to 8.25 days for *M. anisopliae* isolates. (*Journal of Biological Sciences* 9 (2): 170-174, 2009; doi: 10.3923/jbs.2009.170.174)

Insecticidal Efficacy of Castor and Hazelnut Oils in Stored Cowpea Against *Callosobruchus maculatus* (F.) (Coleoptera: Bruchidae)

N. Haghtalab, N. Shayesteh and S. Aramideh

Callosobruchus maculatus (F.) (Coleoptera: Bruchidae) is a primary pest of cowpea and other legumes worldwide, both in fields and in stored seeds. Castor oil at 5, 6, 7, 8 and 9 mL kg⁻¹ and Hazelnut at 2.8, 4.4, 6, 7.6 and 9.2 mL kg⁻¹ were tested against *C. maculatus* in cowpea. All bioassays were conducted at 27±1°C and 65±5% r.h and mortality was counted after 24, 48 and 72 h of exposure. After the 72 h mortality count, all adults were removed and the vials were left at the same conditions for further 35 days to assess progeny production. The increase of dose and exposure interval increased mortality. After 72 h of exposure, mortality received to 80.83% on Hazelnut oil at high rate (9.2 mL kg⁻¹). Mortality in the case of Castor oil was higher than Hazelnut and received to 86.66% at 9 mL kg⁻¹. The lowest LC₅₀ value on 72 h was observed in the Hazelnut (6.57 mL kg⁻¹). In contrast, the lowest LC₉₅ value on 72 h was observed in the Castor (10.94 mL kg⁻¹). Complete suppression in progeny production was achieved on cowpea treated with Castor oil at 9 mL kg⁻¹ but in the all case, the percentage of reduced progeny received up to 90%. In conclusion, treatment of grain with vegetable oil could have important practical implications for parts of the world where pesticides are expensive or in short supply. (*Journal of Biological Sciences* 9 (2): 175-179, 2009; doi: 10.3923/jbs.2009.175.179)

Soil Organic Matter Particle and Presence of Earthworm Under Different Tillage Systems

Hortensia Brito-Vega, David Espinosa-Victoria, Carlos Fragoso, Daniel Mendoza, Nancy De la Cruz Landero and Angel Alderete-Chavez

The objective of the present research was to study the particle of organic matter and the presence of earthworm under conservation and traditional tillage during

winter and spring seasons. The sampling site was experimental field of FIRA in Villadiego, Guanajuato. The soil and earthworm sampling was carried out in monoliths of 25×25×30 cm (side×side×depth), dividing the depth into strata: 0-10, 10-20 and 20-30 cm. An earthworm species was identified namely *Phoenicodrilus taste* under conservation and conventional tillage. *P. taste* showed a population of 328 individuals m⁻² during the spring season under conservation tillage. This data coincided with the particle of soil organic matter in the 2 µm category, high organic carbon content (5, 3 y 2%), total nitrogen (0.3, 0.2 y 0.1%) and the depths of 0-10, 10-20 and 20-30 cm, respectively. (*Journal of Biological Sciences* 9 (2): 180-183, 2009; doi: 10.3923/jbs.2009.180.183)

New Observation of Three Species of Sea Cucumbers from Chabahar Bay (Southeast Coasts of Iran)

A. Shakouri, T. Aminrad, M.B. Nabavi, P. Kochanian, A. Savari and A. Safahiye

Three species of sea cucumber (2 species belong to genus *Holothuria* and one species of *Stichopus*) were collected on subtidal zone of Chabahar Bay in the late of 2007. The literature review on the distribution was revealed that this is the first report of *H. leucospilota*, *H. arenicula* and *S. variegatus* from Chabahar Bay (Sea of Oman). The species identification was done through morphological keys and review of their ossicles. This study is revealed the special characteristics of the presented species in order to just identification of them. (*Journal of Biological Sciences* 9 (2): 184-187, 2009; doi: 10.3923/jbs.2009.184.187)

Effect of Different Sodium Chloride Concentrations on Early Seedlings Growth of Wheat Cultivar (*Triticum aestivum* L.)

M. Haidarizadeh and M.A. Zarei

This study conducted in order to determine how application of seedlings with NaCl increases the long-term salinity resistance of wheat (*Triticum aestivum* L.) and whether the adaptive response to salinity accompanied by physiological changes throughout the plant-growth cycle at seedling stage. In this experiment the effects of 10, 50, 75, 100 and 200 mM NaCl on total weight, radicle weight, leaf weight and leaf length of 6 days Sardari cultivar seedlings was evaluated. Results indicated that among total weight, radicle weight, leaf weight and leaf length of 6 days Sardari cultivar seedlings, leaf length is more influenced by salinity condition and radicle weight show the lowest difference among the groups. By using of growth physiological parameters in compare with using biochemical parameters

instrument and methodic errors significantly decrease and results evaluation is very tangible. (*Journal of Biological Sciences* 9 (2): 188-191, 2009; **doi:** 10.3923/jbs.2009.188.191)

Bacterial Diversity in the Digestive Tract of Earthworms (Oligochaeta)

Hortensia Brito-Vega and David Espinosa-Victoria

Anecic, epigeous and endogeous earthworms stimulate or inhibit the growth of bacteria of agricultural importance inside their digestive tracts. It is possible that these bacteria establish a mutual symbiosis within the digestive tract of the earthworm. The bacterial species reported within the intestines of the earthworms belong to the genera *Bacillus*, *Aeromonas*, *Pseudomonas*, *Flavobacterium*, *Nocardia*, *Gordonia*, *Vibrio*, *Clostridium*, *Proteus*, *Serratia*, *Mycobacterium*, *Klebsiella*, *Azotobacte* and *Enterobacter*. These bacteria inhabit the soil and develop considerably when there are easily degradable organic soil nutrients. The bacterial community inside the digestive tract of earthworms pertains to at least four physiological groups: plant growth promoters, free-living nitrogen fixers, biocides and phosphate solubilizers. The diversity of bacterial communities within the digestive tracts of earthworms depends on climate, soil type and organic matter. The objective of this present study was to analyze the state of art on the bacterial diversity within the digestive tracts of earthworms. (*Journal of Biological Sciences* 9 (3): 192-199, 2009; **doi:** 10.3923/jbs.2009.192.199)

Statistical Analysis of Different Cancers in Kermanshah Province

M.H. Mirmomeni, F. Mohammadi, S. Sisakhtnezhad, R. Hashemi and Gh. Nazari

In this study, which was performed in 2007 a statistical investigation has been performed on the occurrence frequency, type of cancer and the relevance of this disease with age and sex in Kermanshah Province. Gathering the information of patient's medical reports between 2002 and 2006 and analyzing those using SPSS software showed that in this province after skin cancer, bladder cancer has the highest rate of occurrence unlike the world statistics. This analysis indicated that urban cancer rate is nearly twice rural rate and also showed that approximately 60% of infections are spotted among men and 40% among women. However in the age of 17 till 50, women are attacked more than men. The highest shown figures are in men at the age of 70 and women at the age of 60. (*Journal of Biological Sciences* 9 (3): 200-216, 2009; **doi:** 10.3923/jbs.2009.200.216)

Investigating Geographical Distribution of Crimean-Congo Hemorrhagic Fever in Tokat County of Turkey

Hakan Mete Doğan, İlhan Çetin and Mücahit Eğri

In this study, we investigated the spatial distribution of CCHF incidences of Tokat Province within the frame of Geographic Information Systems (GIS). For this purpose, we evaluated the public health data collected between 2003 and 2006. Frequency data that belongs to 133 settlements was joined to the referenced point database of Turkey in GIS and interpolated to raster maps by employing Kriging method with Spherical variogram model. Produced raster maps of each year and combination of all years were interpreted visually. Relationships between incidence and other available variables (population, elevation, cattle number, sheep and goat number) were investigated by employing bi-variety correlation analysis (Pearson coefficients). According to the results, CCHF events in Tokat increased from 50 to 100 within the 4 years and showed the tendency to spread in certain geographic locations of the province. CCHF incidence and elevation showed significant (positive) correlation (0.687) at 0.05 level under an altitude threshold (1340 m). (*Journal of Biological Sciences* 9 (3): 217-223, 2009; doi: 10.3923/jbs.2009.217.223)

***In vitro* Antibacterial Activity of Methanol Extract of A Sponge, *Geodia* sp. Against Oxytetracycline-Resistant *Vibrio harveyi* and its Toxicity**

A. Isnansetyo, Trijoko, E.P. Setyowati and H.H. Anshory

In this study, the extract was tested for *in vitro* activity against oxytetracycline-resistant *V. harveyi*. Toxicity of the methanolic extract was evaluated by Brain Shrimp Lethality test. *Geodia* sp. was characterized by three spicula types (oxeas, trianes and oxyaster euaster), encrusting growth formation, hispid surface features and skeletal structure of paratangential ectosome. The methanolic extract of *Geodia* sp. exhibited anti-oxytetracycline-resistant *V. harveyi* activity with MIC of 31.25 µg mL⁻¹. The extract also was able to inhibit the growth of oxytetracycline-resistant *V. harveyi* in broth culture at concentrations of 1 and 2×MICs and able to kill almost *V. harveyi* cells at 4×MIC. Interestingly, the extract did not show any toxic effect in *Artemia salina* up to 125 µg mL⁻¹. It is the first report for the antibacterial activity of methanolic extract of *Geodia* sp. against oxytetracycline-resistant *V. harveyi*, a pathogenic bacterium in marine aquaculture. This results suggest that *Geodia* sp. might be

used as a source of alternative compound to control marine bacterial pathogen especially oxytetracycline-resistant *V. harveyi*. (*Journal of Biological Sciences* 9 (3): 224-230, 2009; **doi**: 10.3923/jbs.2009.224.230)

Combination of Microwaves Radiation and Cold Storage for Control of *Oryzaephilus surinamensis* (L.) (Col. Silvanidae)

O. Valizadegan, A.A. Pourmirza and M.H. Safaralizadeh

The effect of microwaves radiation and cold storage against adults of sawtoothed grain beetle, *Oryzaephilus surinamensis* (L.) over various exposure times and cold storage period was evaluated. The insects were exposed to 2450 MHz at five different power levels of 0, 100, 200, 300 and 400 W for five exposure times of 0, 3, 6, 9 and 12 min. A complete mortality was achieved for tested insect at 400 W power level for exposure time of 12 min and 72 h cold storage period. At a given time, a direct positive relationship between mortality rates and microwaves radiation power level was obtained. For instance at 100, 200, 300 and 400 W power levels and 24 h cold storage for 3 min exposure period, the mortality rates were 40, 50, 55 and 72%, respectively. Similar trend was obtained for LT_{50} values. Considerable variation in the susceptibility of tested insect to microwaves power levels and cold storage periods was apparent in the fiducial limits of the LD_{50} values. In the analysis of variance (ANOVA) the R^2 value revealed that 90.8% of variability in the susceptibility of *O. surinamensis* could be explained by the microwaves power, cold storage period and exposure duration. Combinations of microwaves radiation and cold storage were found highly compatible and synergistic. This was more significant for the insects which were exposed to the highest level of microwaves radiation and cold storage period. Synergistic interaction indicates that microwaves radiation can be used with cold storage for management of *O. surinamensis*. This treatment could provide an effective and friendly environmental treatment technique in IPM program. (*Journal of Biological Sciences* 9 (3): 231-236, 2009; **doi**: 10.3923/jbs.2009.231.236)

Vegetarianism among Jordan University Students

Ahmad A. Suleiman, Omar K. Alboqai, Sameer Kofahi, Adib A. Aughsteen and Khader El Masri

To determine the prevalence rate and reasons of vegetarianism as well as its relationship with selected demographic and lifestyle characteristics among Jordan University students. A cross-sectional survey was carried out at Jordan University,

Amman, Jordan from March to September 2005. The survey included 1209 students aged 17-28 years. A multistage stratified sampling technique was used to recruit the participants from different majors at Jordan University. A self-administered questionnaire included information about demographic, lifestyle characteristics and vegetarian status. The response rate was 80.6%. The overall prevalence of vegetarianism among university students was 23.9%. Vegetarianism was statistically significant ($p < 0.05$) with being female, younger age, lower family monthly income, nonsmoker, physically active, vitamin-mineral supplement user and normal BMI. The main important reasons for being vegetarian were weight control 39.2% and economic reasons 35.8%. A significant proportion of Jordan University students are interested in vegetarianism because of weight control and economic reasons. Vegetarians are more likely to be: females, younger age, with lower family monthly income, nonsmokers, physically active, vitamin-mineral supplement users and with normal BMI. (*Journal of Biological Sciences* 9 (3): 237-242, 2009; doi: 10.3923/jbs.2009.237.242)

Study the Plantlet Age Effect and Planting Beds on Agria Potato Mini-Tuber Production under *in vivo* Condition

Davoud Hassanpanah and Mohsen Khodadadi

This experiment was done about suitable composition of planting bed and plantlet age in greenhouse for increasing mini-tubers number and weight per plant. This research was conducted in Ardabil in 2007 and 2008. Plantlets of potato Agria cultivar were grown under *in vitro* condition. Then plantlets were transferred to greenhouse in four ages of plantlets (20, 30, 40 and 50 days) on a randomized complete blocks design with four replications in greenhouse. During growth period in greenhouse, were measured the traits as plant height, main stem per plant, mini-tuber number, weight and average weight per plant and uniformity per plantlets. The results of combine analysis of variance showed that there were significant differences between years as mini-tubers weight per plant, mini-tubers average weight per plant, between plantlet age as mini-tubers number and weight per plant, mini-tubers average weight per plant and stem number per plant. Interaction of years and plantlet age were significant on mini-tubers weight per plant. Plantlets, which transferred to greenhouse after 20 and 30 days, showed higher mini-tubers number and weight per plant in compare with other ages. There was positive significant correlation between mini-tubers number with mini-tubers weight per plant and mini-tubers average weight per plant. After, the better plantlet age selected in greenhouse and plantlets age of 30 days cultured in 12 different planting beds prepared from Iran and Finland reigns on the basis of ten replications

completely randomized blocks. Statistical analysis showed that the maximum number and average weight of mini-tuber per plant produced by use of three planting beds of Iran (Ardabil Neogen soil and forest peat mass with large Zeolite) and Finland (Biolan peat mass with large Zeolite). (*Journal of Biological Sciences* 9 (3): 243-248, 2009; doi: 10.3923/jbs.2009.243.248)

Study of Prevalence and Antimicrobial Susceptibility Pattern of Bacteria Isolated from Blood Cultures

M. Mehdinejad, A.D. Khosravi and A. Morvaridi

The aim of present study was to investigate the type of bacteria isolated from blood cultures and determination of their antibiotic susceptibility pattern. During 18 months, 2790 blood culture samples were screened. The positive blood cultures were examined and the organisms were identified as per standard procedures. Antimicrobial susceptibility testing was performed for all isolates by use of disk diffusion technique, according to CLSI guidelines. From total blood culture samples, 155 (5.6%) were positive. The most common isolated gram negative bacilli were *Klebsiella pneumoniae* 52 (33.5%), *Eschericia coli* 32 (20.6%) and *Enterobacter* sp. 15 (9.7%) and coagulase negative staphylococci (CONS) as predominant gram positive cocci, all the isolated bacteria showed the highest degree of resistance to ampicillin (98.7%), cefalexin (70.3%) and trimethoprim- sulfamethoxazole (69.7%). Gram positive cocci were also fully resistant to penicillin. In conclusion, present study revealed that both gram positive and gram negative bacteria were responsible for bloodstream infections and most of the strains were multi-drug resistant. The most common isolated bacteria from blood cultures were *Klebsiella pneumoniae* and *E. coli*. Ciproflexacin was the most effective antibiotic against gram negative bacilli, while vancomycin was mostly effective against gram positive cocci. (*Journal of Biological Sciences* 9 (3): 249-253, 2009; doi: 10.3923/jbs.2009.249.253)

Estimates of Additive and Non-Additive Genetic Variances with Varying Levels of Inbreeding

D. Norris, W. Ngambi and C.A. Mbajjorgu

In this study, two populations with varying percentages of animals in full-sib families were simulated. For each population, two combinations of additive and dominance genetic variances of different relative magnitudes were considered thereby creating 4 sub-populations. For each sub-population, a further 3

populations (I1, I2, I3) were created with varying degree of inbreeding level (0, 0.02 and 0.05) resulting in a total of 12 populations. Constant residual variance was used in all populations. Variance components were estimated using the tilde-hat approximation to REML based on sire-dam model. Both additive and dominance genetic variances were estimated with high degree of accuracy and the level of inbreeding did not seem to result in changes in the magnitudes of the genetic variances. At low levels of inbreeding, accounting for inbreeding in genetic evaluations may not be necessary. (*Journal of Biological Sciences* 9 (3): 254-258, 2009; *doi*: 10.3923/jbs.2009.254.258)

Childhood Obesity and Asthma Severity: Is There a Link?

N. El Helaly, Y. Kamel, E. Abd Elaziz, A. Elwan and M. Nabih

The aim of this study was to prove the relation between childhood obesity and asthma severity and that weight reduction improves asthma outcome. The study included 40 children with age range of 6-12 years divided into two groups; group I included 20 overweight moderate persistent asthmatics who will follow a weight reduction diet for 6 months and group II including 20 non obese moderate persistent asthmatics. All patients were assessed initially and after 6 months clinically and by Spirometric examination. Comparing both groups I and II at the beginning of the study as regards their spirometric results; group II had higher values in all parameters (FVC, FEV1, PEF and FEF 25-75) with p values of 0.001, 0.004, 0.001 and 0.001, respectively. There was also a marked statistically significant difference between all parameters of spirometry in group I before and after weight loss with a p-value of 0.001 in all parameters. Obesity is a cause of poor asthma control and weight reduction can be used as an adjunctive to decrease the need for medications and improve quality of life in obese children with persistent asthma. (*Journal of Biological Sciences* 9 (3): 259-263, 2009; *doi*: 10.3923/jbs.2009.259.263)

Persistence of Different Geographical Isolates of *Helicoverpa armigera* Nucleopolyhedrovirus in Two Types of Soils under Different Conditions

A. Mehrvar

An experiment was conducted to evaluate the persistence of *Helicoverpa armigera* NPV after 6 months of storage in two types of soil viz., black soil and red soil under different conditions to screen the relatively persistent HearNPV

geographical isolate. The isolates of the virus used in this study were CMB (Coimbatore), NGM (Negamum) and OTY (Ooty) all collected from Tamil Nadu, India. Two types of soils viz., black soil and red soil were selected to study the persistence of HearNPV. Each virus isolate (1×10^9 OB mL⁻¹) was added to 2 kg of each soil and kept in indoor and outdoor conditions in plastic troughs for 6 months. Assays were carried out with extracted viruses from each soil at monthly intervals against early second instar larvae of *H. armigera*. Results indicated that as the period of storage of virus in soil was advanced the mean mortality percentage declined. Also, the comparison of results showed that the virus treated black soil kept indoor could relatively retain its infectivity (52.66, 58.56 and 54.35% OAR with CMB, NGM and OTY isolates, respectively) longer period compared to the soil kept outdoor. Similar kind of trend was also noticed with red soil. However, the infectivity was relatively more in the case of HearNPV stored in red soil compared to those stored in black soil. This high amount of persistence in red soil may be due to the fact that adsorption rate was higher in red soil than black soil. However, among the isolates evaluated in this study, NGM isolate was found to be the most relatively tolerant to inactivation through the storage time. (*Journal of Biological Sciences* 9 (3): 264-267, 2009; **doi:** 10.3923/jbs.2009.264.267)

Phytoplasmas Associated to Diseases of Ornamental Cacti in Mexico

K. Aviña-Padilla, F. Parra-Cota, J.C. Ochoa-Sánchez, C. Perales-Segovia and J.P. Martínez-Soriano

This study was aimed to elucidate the putative causal agents. Healthy and diseased *Echinopsis* sp. and *Opuntia* sp. plants were collected from several Mexican nurseries. DNA was extracted from proliferating buds or stems and used in Polymerase Chain Reactions (PCR) to detect phytoplasmas. Two universal phytoplasma primer pairs were tested in nested PCR, initially with primer pair P1/tint followed by primer pair R16F2/R16R2 in a sequential test. The amplified DNA fragments were cloned and sequenced. Two different 16S rDNA partial operons were determined. One of present sequences was always associated to yellow mosaics in *Echinopsis* while the other to witches-broom syndromes in *Opuntia*. The comparative analysis of the sequences against the GenBank indicated that they were highly but not 100% homologous to phytoplasmas of group 16SrII. This is of major importance since this is the first report of finding representatives of this group affecting cacti in the Americas; all other reports of this kind of phytoplasmas have been detected in mainly in Asia. (*Journal of Biological Sciences* 9 (3): 268-271, 2009; **doi:** 10.3923/jbs.2009.268.271)

Bioaccumulation of Heavy Metals in *Euryglossa orientalis* from the Hendijan Seaport (Coastal of Persian Gulf), Iran

M.T. Ronagh, A. Savari, F. Papahn and M.A. Hesni

In this study, we quantified bioaccumulation of lead and copper in gill, liver and muscle of three length groups (A, B and C) of *Euryglossa orientalis* and sediments from the Hendijan Seaport at South coastal of Iran from October 2006 to July 2007, seasonally. The concentrations of heavy metals were determined by using flame atomic absorption spectrophotometry (FLAAS) after wet digestion method. The average sediment concentration was taken into account for metal exposure: 25.63 mg Pb kg⁻¹ and 12.79 mg Cu kg⁻¹. No significant differences were found between different seasons ($p>0.05$). Concentrations of Pb and Cu in the liver, gills and muscle were significantly different ($p<0.05$). Muscle, generally, accumulated the lowest levels of metals in every season and also the highest metal concentrations were observed in the liver (386.72 ± 11.72 mg Cu kg⁻¹) and gills (14.97 ± 0.22 mg Pb kg⁻¹) in summer. The results showed that the metal accumulation in summer season was higher than in the other seasons and also in a group was higher than other groups in all seasons. Generally, there were significant seasonal changes for Pb and Cu concentrations in all tissues ($p<0.05$) and concentrations of Pb and Cu in three groups were significantly different ($p<0.05$). These results suggest that Cu-liver and Pb gill accumulation can be good environmental indicators of metal stress in *Euryglossa orientalis*. (*Journal of Biological Sciences* 9 (3): 272-275, 2009; **doi:** 10.3923/jbs.2009.272.275)

In vitro* Anti-Bacterial Activity of Sweet Basil Fractions Against *Helicobacter pylori

Mahboobeh Nakhaei Moghaddam, Mehr-angiz Khajeh Karamoddin and Mohammad Ramezani

In this study, the effect of sweet basil fractions on growth of *H. pylori* was studied by filter paper Disc Diffusion Method (DDM) on egg yolk emulsion agar. Aqueous fraction had no activity against nine tested clinical isolates. Methanol, n-hexane and butanol fractions showed *in vitro* anti *Helicobacter pylori* effects. There are no differences ($p>0.05$) among anti *Helicobacter pylori* activity of methanol, n-hexane and butanol fractions at concentration of 1 mg, but in lower concentrations, methanol and n-hexane fractions had more antibacterial activity than butanol fraction based on Duncan test. Minimum Inhibitory Concentrations (MICs) of methanol, n-hexane and butanol fractions from leaves of sweet basil

were 39.1, 41 and 117.2 $\mu\text{g disc}^{-1}$, respectively. This study demonstrated that methanol, n-hexane and butanol fractions of sweet basil inhibited the growth of *H. pylori* strains *in vitro*. (*Journal of Biological Sciences* 9 (3): 276-279, 2009; *doi*: 10.3923/jbs.2009.276.279)

Antibacterial Assay of *Cinnamomum cassia* (Nees and Th. Nees) Nees ex Blume Bark and *Thymus vulgaris* L. Leaf Extracts against Five Pathogens

Mohannad G. AL-Saghir

In this study we investigate the antibacterial activities of the *Cinnamomum cassia* (Nees and Th. Nees) Nees ex Blume Bark and *Thymus vulgaris* L. leaf extracts. Five strains of bacteria, including *Bacillus subtilis*, *Enterobacter aeruginosa*, *Escherichia coli*, *Staphylococcus aureus* and *Staphylococcus epidermidis* were used in the antibacterial tests. Results from the antibacterial tests demonstrated that both plant extracts had an excellent inhibitory effect. The MICs (Minimum Inhibitory Concentrations) of the both plant extracts were 250 $\mu\text{g mL}^{-1}$ against all tested strains. These results suggest that *Cinnamomum cassia* and *Thymus vulgaris* are beneficial to human health, having the potential to be used for medical purposes and to be utilized as anti-bacterial additives in food products. (*Journal of Biological Sciences* 9 (3): 280-282, 2009; *doi*: 10.3923/jbs.2009.280.282)

Investigation on the Possibility of Foodstuff Pest Control Using Radiofrequency Based on Dielectric Heating (Case Study: Rice and Wheat Flour Pests)

S.M.H. Mirhoseini, M. Heydari, A. Shoulaie and A.R. Seidavi

In order to test the effect of radio frequencies in rice and wheat flour pest control, the samples were dirtied by *Tribolium confusum* flour pest and *Sitophilus oryzae* rice pest. The wheat flour pests were radiated at 13.56 MHz in 10, 20, 30, 40, 45 and 60 sec, at 27.12 MHz in 5, 10, 20, 25, 30, 35 and 60 sec and at 40.68 MHz in 5, 10, 20, 12, 15 and 60 sec. The rice samples were heated at 13.56 and 27.12 MHz in 60, 75, 85, 95 and 105 sec. After above mentioned times, the number of died insects were counted. Quality test of treated flour and rice samples were done after treatments. Based on the results, the mortality of wheat flour pests after 45 sec at 13.56 MHz reaching 45°C, after 35 sec at 27.12 MHz reaching 46°C and after 15 sec at 40.68 MHz reaching 47°C was 100%. Temperature sensitivity of *Tribolium confusum* at 13.56, 27.12 and

40.68 MHz frequencies were 40, 38 and 43°C, consequently. Also, the results demonstrated that the mortality of rice pests after 105 sec at 13.56 MHz, reaching 57°C and after 95 seconds at 27.12 MHz, reaching 58°C was 100%. Temperature sensitivity of *Sitophilus oryzae* at 13.56 and 27.12 MHz frequencies were 48 and 50°C, in order. The combination of the results showed that pest control potency and intensity increases as frequency rises. (*Journal of Biological Sciences* 9 (3): 283-287, 2009; doi: 10.3923/jbs.2009.283.287)

Prevalence of Haemoglobin Variants in Malaria Endemic Northeast India

S.K. Sharma and J. Mahanta

The present study is an attempt to evaluate the relationship of haemoglobinopathies, particularly Hb E and *Plasmodium falciparum* malaria in northeastern region of India. The diverse autochthonous inhabitant of this part of India exhibits variable gene frequency for β^E -globin gene. The geo-climatic condition of the region supports transmission of *Plasmodium falciparum* malaria in northeastern parts of India. The study revealed that HbE is predominant with a variable gene frequencies in ethnic groups affiliated to Tibeto-Burman linguistic families. Prevalence of Hb E is also associated with the linguistic affiliation of various Tibeto-Burman linguistic families inhabiting in malaria endemic northeast India. We have also observed a positive correlation ($R^2 = 0.703$) of β^E -globin gene frequency and mean incidence of *Plasmodium falciparum* infection (Pf%) in malaria endemic zones. (*Journal of Biological Sciences* 9 (3): 288-291, 2009; doi: 10.3923/jbs.2009.288.291)

Analysis of Primary Human Keratinocytes using Polyclonal Antibodies

O. Spichkina and Yu. Petrov

In the present research, the surface properties of keratinocytes have been studied for detection of stem cells subpopulation in epidermis. To reveal all surface properties of the cells the polyclonal antibodies against antigens of their surface have been used. The cell images were analyzed using Image J v.1.41. Area and average staining intensity of the every marked cell were counted. At least 500-1000 cells were analyzed per each sample. Analysis of the results showed that no independent cluster (subpopulation) of the cells among basal keratinocytes *in vitro* was present. However, it was revealed that at transition from basal

keratinocytes to differentiating ones all antigenic determinants on a cell surface remain permanent. It is plausible that there is a mechanism of equivalent replacement (exposure-burying) of the antigens of one type by other antigens. Results of this study show that the presence in epidermis of stem cells as autonomous subpopulation is not verified experimentally. Most possibly, the entry of the cells into differentiation is a stochastic process in which all basal keratinocytes participate. (*Journal of Biological Sciences* 9 (4): 292-301, 2009; doi: 10.3923/jbs.2009.292.301)

Antihyperglycemic and Pancreas-Protective Effects of *Crocus sativus* L. (Saffron) Stigma Ethanolic Extract on Rats with Alloxan-Induced Diabetes

Daryoush Mohajeri, Ghafour Mousavi and Yousef Doustar

Adequate characterization of hypoglycemic effect of ethanolic saffron extract has not been yet done, though the activity has been reported. The scientific evaluation of its hypoglycemic activity was, therefore, explored and compared with the effect of a standard hypoglycemic drug, tolbutamide. In this study, we also report on alteration in patterns of pancreatic islet cells using histopathology and immunohistochemistry of alloxanized diabetic rats treated with ethanolic saffron extract. The ethanolic extract of *Crocus sativus* L. stigma was administered orally and intraperitoneally at different doses (20, 40 and 80 mg kg⁻¹) to normal rats for finding the more effective hypoglycemic dose and administration route. Acute hypoglycemic effects produced by more effective dose of ethanolic saffron extract on the Fasting Blood Glucose (FBG) levels and effects of the same dose of ethanolic saffron extract on the FBG and plasma insulin levels in alloxanized Mild Diabetic (MD) and Severely Diabetic (SD) rats were assayed. Histopathological and immunohistochemical studies were also carried out on pancreatic islet cells of control and diabetic rats. The dose of 40 mg kg⁻¹ was found to be more effective dose in intraperitoneally (i.p.) route for decreasing Blood Glucose Level (BGL). The extract administered by i.p. route at more effective dose showed an acute hypoglycemic effect in MD and SD rats. Treatment of MD and SD rats for 14 days with the more effective dose significantly reduced the FBG levels in these animals (41.4% MD, 30.7% SD). Serum insulin level showed significant increase in diabetic rats (33.3% MD, 27.3% SD) after 14 days. The histopathological studies of pancreas in ethanolic extract treated diabetic groups showed a reversed damage caused by alloxan to the pancreatic islets as almost normal appearance. In addition, diabetic (MD and SD) rats showed obvious decreases in insulin immunoreactivity and the number of β -cells in pancreas, but the pancreas of

extract-treated diabetic rats was improved and the number of immunoreactive β -cells was significantly increased. The control group given saffron extract was not different from the other intact control group considering the insulin immunoreactivity in β -cells. The findings of present study indicate the hypoglycemic and potential antihyperglycemic nature of the extract, helping in regeneration of damaged pancreas in experimental diabetes. Thus, after randomized clinical trials, saffron extract may be implicated as a preventive or therapeutic agent against diabetes mellitus. (*Journal of Biological Sciences* 9 (4): 302-310, 2009; doi: 10.3923/jbs.2009.302.310)

Responses of Grapevines to Two-Spotted Spider Mite Mediated Biotic Stress

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The effect of feeding damage by two-spotted spider mite (*Tetranychus urticae* Koch.) on leaf-level physiological characteristics of grapevines was investigated. Uniform plants (*Vitis vinifera* L., cvs. Muskule and Sultana) with unbranched solitary shoot having about five fully expanded mature leaves were artificially infested with the mites (100 mites per leaf). After seven days of infestation, grapevine cultivars significantly differed in their support to mite density. Muskule showed sensitive characteristics by supporting a higher population density (240.75 mites per leaf) than Sultana (192.59 mites per leaf). Hence, the percentage of electrolyte leakage and cell membrane injury was much higher in the infested leaves of Muskule as compared to Sultana. In addition, mite feeding induced lipid peroxidation and protein degradation was observed only in Muskule. The relative chlorophyll content and photosynthetic activity in infested leaves of each cultivar was significantly lower than that of uninfested ones. Although, transpiration was not significantly altered in the infested leaves of grapevine, mite feeding caused a significant reduction in the leaf water content of both cultivars. There was a significant decrease in the levels of soluble sugar of the infested leaves in both cultivars as compared to the uninfested ones. When comparing the two cultivars, mite damage concerning above parameters was more striking in the leaves of Muskule than that of Sultana ones. Thus, proline, as a sensitive indicator signaling biotic stress intensity, accumulated in the infested leaves of both cultivars, especially in Muskule. Although, no change was observed in Ca, Mg, Mn and Fe concentrations, Na concentration of infested leaves significantly rose in both cultivars. In addition, mite attack significantly increased K, Zn and Cu uptake only in the leaves of Muskule plants. (*Journal of Biological Sciences* 9 (4): 311-318, 2009; doi: 10.3923/jbs.2009.311.318)

Purification and Characterization of a D-Galactoside-Binding Lectin Purified from Bladder Moon Shell (*Glossaulax didyma* Röding)

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To find novel carbohydrate-binding proteins (lectins) from marine invertebrates to understand the binding mechanism of the protein and to apply it for glycan-dependent diagnostics and/or glycoconjugates capture technology. A D-galactoside-binding lectin was purified from foot of bladder moon shell, *Glossaulax didyma* by lactosyl-agarose affinity chromatography. The crude supernatant by Tris-buffered saline had strong hemagglutination activity against trypsinized and glutaraldehyde-fixed human erythrocyte. However, the activity was not inhibited by any tested saccharides and chilete reagents. On the other hand, the dialyzed crude supernatant obtained from the precipitates with 100 mM lactose in Tris-buffered saline had also hemagglutination activity inhibited by β -galactoside and D-galactose. The lectin was purified with lactosyl-agarose affinity chromatography. The molecular mass of the lectin was determined to be 60 kDa by SDS-PAGE under reducing and non-reducing conditions and being a 60 kDa polypeptide monomer by gel permeation chromatography. The association-rate constant (k_{ass}) and dissociation-rate constant (k_{diss}) determined for the lectin against asialofetuin was determined as $5.4 \times 10^4 \text{ M}^{-1} \text{ sec}^{-1}$ and $7.2 \times 10^{-3} \text{ sec}^{-1}$, respectively. Lectin-conjugated Sepharose gel captured asialofetuin and eluted it by lactose-containing buffer from the gel, indicating that the lectin could catch the asialoglycoprotein. It was concluded that a many amount of a D-galactoside-binding lectin which can catch asialoglycoprotein presents in foot of the bladder moon shell. (*Journal of Biological Sciences* 9 (4): 319-325, 2009; doi: 10.3923/jbs.2009.319.325)

Effect of Rhizobia Inoculation, Farm Yard Manure and Nitrogen Fertilizer on Nodulation and Yield of Food Grain Legumes

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Field experiments were conducted to investigate the response of grain legumes to rhizobia inoculation, farmyard manure and inorganic fertilizer nitrogen. The grain legumes were common bean (*Phaseolus vulgaris* L. var GLP 2), lima bean (*Phaseolus lunatus* L.), green gram (*Vigna radiate* L.) and lablab (*Lablab purpureus* L.). The experimental design was a randomized complete block design with split plot arrangement and replicated thrice. Parameters determined were the number of nodules and nodule dry weight per plant, seed yield and yield

components. Nitrogen fertilizer application significantly reduced the number of nodules in most of the legume species. In contrast, rhizobia inoculation increased number of nodules and nodule dry matter in most species but this was not translated into increase in plant growth or grain yield. Application of manure improved nodulation and grain yield only in the short rains. However, fertilizer application significantly increased dry matter in both seasons and total grain yield during short rains. The study indicated that the effect of rhizobia inoculation, farmyard manure and nitrogen fertilizer on grain legumes is variable depending on species, parameter being measured and other environmental factors. (*Journal of Biological Sciences* 9 (4): 326-332, 2009; **doi**: 10.3923/jbs.2009.326.332)

Grading in Canine Mammary Gland Carcinoma

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Objectives of this study were to describe classification and grading in canine mammary carcinoma. The histological diagnosis was made on the basis of the current WHO classification for canine mammary tumors and then tumors were graded histologically in accordance with the Elston and Ellis method for human breast tumors and based on the assessment of three morphological features: tubule formation, nuclear pleomorphism and mitotic counts. The mammary carcinomas of 33 cases were classified to 17 (51.5%) simple carcinoma, 12 (36.4%) complex carcinoma and 4 (12.1%) carcinoma arising in benign tumor. The histological grade of these cases were as follows: grade I, 11 (33.3%); grade II, 7 (21.2%); Grade III, 15 (45.5%). Present results illustrated good relationship between tumors grading and histological type also revealed that most grade II and III of these tumors were classified as simple one. Despite of many methods for grading such as Gilbertson and Misdorp method used in this research was less complicated and more comparable with human medicine. So, this routine use of this method would help the pathologist and clinician for more accurate prognosis and treatment in canine mammary carcinoma and facilitate comparative studies of canine and human researches. (*Journal of Biological Sciences* 9 (4): 333-338, 2009; **doi**: 10.3923/jbs.2009.333.338)

Biochemical and Pathological Study of Protective Effect of Vitamin E in Azathioprine-Induced Hepatotoxicity in Rat

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In the present research, we decided to study about the protective effect of vitamin E against Azathioprine-induced toxicity. In this study, 40 male Wistar rats were

divided to 4 groups (each group contains 10 rats). For the first group, as the control one, normal saline was given. The second and third groups received 20 mg kg⁻¹ of vitamin E daily and for 7 days by Intra Muscular (IM) injection. The fourth group, that had similar state with three others, normal saline was injected for 7 days. On the seventh day, both 3 and 4 group treated by 15 mg kg⁻¹ Azathioprine as a single dose and Intra Peritoneal (IP) form. Two other groups only received the dissolvent of Azathioprine in the same dose and manner. Twenty four hours after Azathioprine injection, the animals after being weighted were anesthetized by ether and blood sample were taken via., the tail vein and pathological sample was got from liver. The samples were allowed to clot and then their serum was separated by centrifuge machine of 2500 rpm for 10 min. This study showed that Azathioprine-induced damage on liver in group 3 is less than group 4 and function of organ in group 3 is nearly same with control group. Results of this study demonstrated that vitamin E decrease Azathioprine-induced hepatotoxicity in rat. According to surveys that have done, the necrotic regions and hepatic cellular death in liver was so lesser in the group that treated together with Azathioprine and vitamin E than the group that treated only by Azathioprine and was so similar to control group. Generally, the pathological results of this study confirm the biochemical results. (*Journal of Biological Sciences* 9 (4): 339-344, 2009; *doi*: 10.3923/jbs.2009.339.344)

Role of Urban Environment on Conservation of Birds Diversity in Java, Indonesia

Satyawan Pudyatmoko, Kaharuddin and Sandy Nurvianto

This research investigated the effects of urbanization on bird communities, in which bird assemblages of different land use, namely urban and suburban, agroforestry and forest areas were compared. Point counts were applied to record all birds within a radius of 50 m and all birds detected visually and acoustically within 15 min were recorded. Although, the different of number of species among land use types was negligible, results showed that the diversity of bird communities were highly different. Bird diversity in urban environment was lower than those in forest but higher than in agroforestry. Urban environment with high landscape heterogeneity promoted by human supported a diverse bird species. The composition of bird communities was also very different among the land uses, because each species has different ranges of habitat optimal for them. Surprisingly, the value of conservation index of urban environment was the highest, because all of three endemic bird species can survive in urban environment. The evidence that urban area can have high conservation value must be considered by urban planner. (*Journal of Biological Sciences* 9 (4): 345-350, 2009; *doi*: 10.3923/jbs.2009.345.350)

Hepatoprotective and Antioxidant Effect of *Andrographis echioides* N. against Acetaminophen Induced Hepatotoxicity in Rats

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In this study, the methanolic extract of *Andrographis echioides* (MEAE) was investigated for its hepatoprotective and antioxidant effects against acetaminophen induced hepatotoxicity in Wistar albino rats. The plant extract (200 and 400 mg kg⁻¹, p.o./day for 10 days) showed a remarkable hepatoprotective and antioxidant activity. Hepatotoxicity was induced by acetaminophen at the dose of 750 mg kg⁻¹ p.o. for 10 days. The serum marker enzymes such as aspartate amino transferase (AST), alanine amino transferase (ALT), alkaline phosphates (ALP), total bilirubin and liver gamma glutamate transpeptidase (GGTP), lipid peroxidase (LPO) were significantly increased with a reduction of liver total protein, superoxide dismutase (SOD), catalase, glutathione peroxidase (GPx) and glutathione-S-transferase (GST) in acetaminophen induced rats. Treatment of rats with different doses of plant extract (200 and 400 mg kg⁻¹, p.o.) significantly ($p < 0.001$) altered serum marker enzymes and antioxidant levels to near normal against acetaminophen-treated rats. The activity of the extract at the different dose was comparable to the standard drug, silymarin (50 mg kg⁻¹, p.o.). Extensive vascular degenerative changes and centrilobular necrosis in hepatocytes was produced by acetaminophen. Treatment with different doses of aerial parts of methanol extract of *A. echioides* produced only mild degenerative changes and absence of centrilobular necrosis, indicating its hepatoprotective efficiency. Results indicate that *A. echioides* possesses hepatoprotective and antioxidant effects against acetaminophen induced hepatotoxicity in rats. Thus, the study substantiates the hepatoprotective and antioxidant potential of methanol extract of *A. echioides*. (*Journal of Biological Sciences* 9 (4): 351-356, 2009; doi: 10.3923/jbs.2009.351.356)

Length-Weight Relationship and Growth Pattern of *Sepioteuthis lessoniana* Lesson 1830 (Cephalopoda:Teuthida) from the Jaffna Lagoon, Sri Lanka

K. Sivashanthini, G.A. Charles and W.S. Thulasitha

In the present study, length-weight regression equations were derived for male and female *S. lessoniana* collected from the Jaffna lagoon, Sri Lanka in order to find

out the regression parameters and growth pattern of this species. *Sepioteuthis lessoniana* (Lesson 1830) are one of the commercially important group of cuttlefishes and becoming an important model system for neurobiological and behavioral research. It appears to be the most adaptable species to the laboratory environment and there exist a need for detail study on length-weight relationship for this species. Such a mathematical equation enables conversion of one parameter in to another as is often required during monitoring field measurements. Regression coefficients were estimated by using the logarithms of the mantle lengths and the corresponding weights and the growth pattern of the species was also noticed. The curvilinear relationships of mantle length-weight relationships for male and female were $TW = 0.200 * ML^{2.477}$ and $TW = 0.229 * ML^{2.437}$, respectively. Covariance analysis for mantle length-weight relationships of males and females revealed that there is no significant difference ($p > 0.05$) between male and female and hence a common formulae of $TW = 0.213 * TL^{2.459}$ was derived for *S. lessoniana*. The 'b' values 2.477 and 2.4347 obtained for male and female, respectively indicate that the growth rate significantly differ from the ideal value '3' and its growth said to be negative allometry. (*Journal of Biological Sciences* 9 (4): 357-361, 2009; doi: 10.3923/jbs.2009.357.361)

Spread of Extended-Spectrum Beta-Lactamase Producing *Escherichia coli* Clinical Isolates in Sanandaj Hospitals

M. Mansouri and R. Ramazanzadeh

The aim of this study was to determine the prevalence of Extended-Spectrum Beta-Lactamase (ESBL) producing *Escherichia coli* and antimicrobial susceptibility pattern of ESBL-producing and non producing strains. We evaluated 158 *E. coli* strains isolated from various clinical specimens. The double-disk synergy test was performed on the isolates for the detection of ESBL. These genes were confirmed by PCR methods. The prevalence of ESBL-producing *E. coli* was found as 16.8%. The ESBL-producing isolate rates were 22.2% (6/27) in intensive care units, 22.2% (6/27) in wards and 44.6% (15/27) in outpatients. This study, present the existence of ESBL-producing isolates and high rate of resistance to antibiotics. Clinicians should be familiar with the clinical importance of these enzymes and potential strategies for dealing with them. The results of the study suggest that community acquired control of ESBL-producing *E. coli* has great importance. (*Journal of Biological Sciences* 9 (4): 362-366, 2009; doi: 10.3923/jbs.2009.362.366)

The Effects of Exposure and Bale Storage on Water Potential and Field Performance in Anatolian Black Pine

Ayşe Deligoz

Effects of exposure, watering and storage in bale after lifting on water relations and field performance in Anatolian Black Pine (*Pinus nigra* Arn subsp. *pallasiana* (Lamb.) Holmboe) seedlings were examined in the study. Two-year-old bare root seedlings were lifted at end of March, 2005. Some of seedlings were planted after one, two and three days of storage in bale (cloth sacks filled with peat moss). Baled seedlings were watered with filter pail in lifting-planting process. A part of the seedlings were watered immediately after lifting and fully exposed for 30, 60 and 90 min indoors and then planted. Others were planted immediately after lifting without watering. Plant water potentials of all the seedlings were measured using the pressure chamber technique after lifting and before planting. The effects of desiccation and storage in bale on Plant Water Potential (PWP), survival, stem diameter and height growth were evaluated. PWP of the seedlings was increased with time desiccation and storage in bale. Desiccation and storage in bales treatments affected significantly on plant water potential stem diameter, height growth and bud length. However, there were no significant differences among the treatments for survival of first year, It was opposite for second year. Best survival and growth were obtained from seedlings fully exposed for 30 min indoors and watering after lifting. Besides, survival and growth of seedlings planted after one and two days of storage in bale were good as seedlings exposed for 30 min. Therefore, it could be recommended that Anatolian black pine seedling should be immediately sprayed water after lifting. (*Journal of Biological Sciences* 9 (4): 367-371, 2009; doi: 10.3923/jbs.2009.367.371)

The Combined Effects of Fungicides and Arbuscular Mycorrhiza on Corn (*Zea mays* L.) Growth and Yield under Field Conditions

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With respect to the significance of the combined effects of fungicides application and Arbuscular Mycorrhizal fungi on the growth and yield of different crop plants such as corn (*Zea mays* L.) a field experiment was conducted. The objectives were to determine: (1) the combined effects of different fungicides and different arbuscular mycorrhiza (AM) species on the growth and yield of corn and (2) the

efficiency of different AM species in symbiosis with corn plants, treated by different fungicides, under field conditions. Four AM treatments including control (M_0), *Glomus mosseae* (M_1), *G. etunicatum* (M_2) and *G. intraradices* (M_3) and four fungicide treatments including control (F_0), benomyl (F_1), vitavax (F_2) and captan (F_3) were tested in a factorial fashion on the basis of a completely randomized block design in three replicates in 2006. Different species of AM significantly affected corn growth and yield when subjected to different fungicides treatments. *G. mosseae* and corn plants established the most efficient symbiosis. In addition, fungicide benomyl had the least unfavorable effects on the colonization of corn roots by AM species. Determination of the appropriate rates of fungicides for treating seeds to alleviate the unfavorable effects of fungicides on plant growth, especially when in symbiosis with AM species, is of great significance. (*Journal of Biological Sciences* 9 (4): 372-376, 2009; doi: 10.3923/jbs.2009.372.376)

Nutritional and Antimicrobial Properties of *Ocimum gratissimum* Leaves

Fred O.J. Oboh, Honeybell I. Masodje and Stephen A. Enabulele

Fresh green *Ocimum gratissimum* leaves were analysed for protein content, moisture, ash, minerals and antimicrobial activity. The fresh leaves had a moisture content of 81.35%, a protein content of 1.21% and an ash content of 0.57%. On a fresh weight basis mineral content was as follows: phosphorus 52.4, selenium 0.007, iron 7.9 and zinc $1.5 \mu\text{g g}^{-1}$. An aqueous extract of the leaves inhibited the growth of the gram positive bacterium *Staphylococcus aureus* and the gram negative bacterium *Escherichia coli*. The nutritional implications of the results are discussed. (*Journal of Biological Sciences* 9 (4): 377-380, 2009; doi: 10.3923/jbs.2009.377.380)

A Comparison Study of Effects of Vitamin E and Silymarin on Phenytoin-Induced Cleft Palate in Rats

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In this study, the prophylactic effects of vitamin E and silymarin on teratogenic effects of phenytoin was compared. This study was performed on 32 pregnant rats that were divided into four groups. The first group (control group) received normal saline intraperitoneally and the other groups (test groups) received phenytoin ($75 \text{ mg kg}^{-1} \text{ b.wt.}$) intraperitoneally at 10-11th day of gestation. Vitamin E and silymarin were administrated at dose of $100 \text{ mg kg}^{-1} \text{ b.wt.}$ intraperitoneally,

respectively, in along with, in two groups. Fetuses were carried out in 20th day of gestation and after determination of weight and length; they were stained by Alizarin Red-Alcian Blue method. Cleft palate incidence was 16.66, 5.55 and 2.77% in fetuses of rats that received only phenytoin, phenytoin with silymarin and phenytoin with vitamin E, respectively. Mean weight and length of fetuses of animals that received normal saline was significantly greater than those received vitamin E and silymarin. It is concluded that vitamin E can decrease oxidative stress more than silymarin and has better prophylactic effect on incidence of phenytoin- induced cleft palate. (*Journal of Biological Sciences* 9 (4): 381-384, 2009; doi: 10.3923/jbs.2009.381.384)

Geographical Races of Old World Screw-Worm Fly, *Chrysomya bezziana* Villeneuve, 1914, in South-Western Iran

S.H. Navidpour, M. Abdi Goudarzi, A. Gholamiyan and E. Jahanifard

A morphological analysis was undertaken with objective of identifying markers for geographical population of Old World screw worm flies, *Chrysomya bezziana* Villeneuve (Diptera: Calliphoridae) in Khoozestan province, South Western Iran. During May 2006 to August 2007 the larvae of *Chrysomya* collected from infested animals (Mostly sheep) and were incubated under suitable substratum in the Entomology laboratory. Totally 986 specimens were examined and geographical races of screw-worm fly were identified based on morphological characters by using diagnosis key. The study of morphological characters of the Old World screw worm flies population of South western Iran suggested that specimens are the same with Arabian race characters and demonstrates that the outbreak of *C. bezziana* in Iran related to populations that originated from Arab countries of the Persian Gulf like United Arab Emirates. (*Journal of Biological Sciences* 9 (4): 385-388, 2009; doi: 10.3923/jbs.2009.385.388)

Evaluation of Urinary Riboflavin Levels of Primary School Children in Rafsanjan, Iran

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Riboflavin deficiency is one of the most common nutritional deficiencies, which has detrimental effects on physical growth of children. In the present study, the nutritional status of this vitamin in primary school children in Rafsanjan was investigated. In this cross-sectional study, the subjects were selected using

multistage cluster random sampling and the general demographic data, including age and gender were collected by questionnaires. Urinary riboflavin level was measured as the indicator of riboflavin status. A moderate to severe riboflavin deficiency was found in half of the participants with a higher prevalence of severe deficiency in girls ($p < 0.005$). Mean \pm SD of urinary riboflavin in male and female students were 392 ± 381 and 421 ± 546 $\mu\text{g g}^{-1}$ creatinine, respectively. Based on findings of this cross-sectional study, riboflavin deficiency is a serious nutritional problem in primary school children, especially among female students. (*Journal of Biological Sciences* 9 (4): 389-391, 2009; **doi**: 10.3923/jbs.2009.389.391)