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## **Genetic Relationship Among *Tephrosia* Species as Revealed by RAPD Analysis**

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In the present study, an attempt has been made to assess the genotypic variability among twelve species of the genus *Tephrosia*, distributed in Andhra Pradesh, through DNA fingerprinting using RAPD technique. Twenty OPC (Operon Biotechnologies GmbH, Germany) primers were used. The cluster analysis based on the similarity matrix was performed using the Unweighted Pair Group Method with Arithmetic Average (UPGMA) with the help of PHYLIP software ver. 3.65 pooled from all the six primers. Present study has justified to a great extent co-relating with the classification based on the morphological traits. However a distinction between some members of the genus *Tephrosia* is still a matter of debate. Hence further analyses are needed to determine the correct intrageneric taxonomic treatment of *Tephrosia*, since it represents one of the largest and most complex groups in the core tribe Millettieae of the family Fabaceae. This study represents the first approach in using nuclear DNA finger print markers as a tool to study molecular systematics of the genus *Tephrosia*. (*Asian Journal of Biological Sciences* 1 (1): 1-10, 2008; **Doi:** 10.3923/ajbs.2008.1.10)

## **Effect of Oral Administration of a Functional Synbiotic Syrup on Libido, Semen Characteristics, Serum Testosterone and Liver and Kidney Function of Goat's Bucks**

K.A. Al-Sobayil, M.M. Zeitoun, M.H. Khalil and A.M. Abdel-Salam

The present study aimed at investigating the biological evaluation of a synbiotic fermented milk synergistic with some active ingredients of herbal hydrosols and honey on the sexual activity, semen characteristics and testosterone levels in Aradhi and Damascus goat's bucks. A synbiotic syrup was prepared by mixing fermented cow's milk containing some probiotic strains and natural antioxidants isolated from functional food and herbal hydrosols. Fifteen Damascus and Aradhi bucks were utilized in the experiment. Two bucks served as control (given no synbiotic), 7 bucks were designed to be orally given twenty ml of the mixture three times per week for 8 consecutive weeks (Low dose, Aradhi-Low = AL, Damascus-Low = DL) and 6 bucks were orally given 40 mL of the mixture (High dose, Aradhi-High = AH, Damascus-High = DH) by the same regime. Bucks were tested for the libido and semen ejaculates were collected once a week

for testing the physical characteristics. A jugular blood sample was taken once a week in a non-heparinized tube for the determinations of serum testosterone, alanine and aspartate amino transaminases (ALT and AST), urea and creatinine levels. Results indicated a significant enhancement of the libido due to the breed of the buck; Aradhi bucks exhibited less reaction time than Damascus bucks ( $p < 0.01$ ). The high dose of the mixture enhanced ( $p < 0.01$ ) the libido in both breeds. Testosterone levels were significantly ( $p < 0.01$ ) higher in Aradhi than Damascus bucks. There found significant increase in testosterone concentrations in treated Aradhi than in Damascus bucks. There were no differences between low and high mixture dose. Administration of the mixture resulted in an increased ( $p < 0.01$ ) ejaculate volume, gross and individual motility, sperm concentration, total motile sperm in the ejaculate than in control. Additionally, lower dead and abnormal sperm numbers were obtained with bucks given the mixture. Treatment slightly increased AST and urea but significantly increased ALT and creatinine in both breeds. In conclusion, giving goat bucks a mixture of a synbiotic functional syrup enhanced the metabolic activity resulting in improvements in their reproductive performance. (*Asian Journal of Biological Sciences 1 (1): 11-18, 2008; Doi: 10.3923/ajbs.2008.11.18*)

### **Variation of High-Molecular-Weight Glutenin Subunits and Gliadin in *T. aestivum* ssp. *macha***

Li-Juan Xiong, Wei Li, Yu-Ming Wei and You-Liang Zheng

In order to exploit new genetic resources and provide fundamental materials for the breeding improvement of bread wheat quality, genetic variation of high-molecular-weight glutenin subunits and gliadin in 29 *macha* wheat accessions were observed by acidic polyacrylamide-gel electrophoresis and sodium dodecyl sulphate polyacrylamide-gel electrophoresis. Nine HMW-glutenin subunits alleles and 9 combinations were identified. Subunit null (82.8%), 7+8 (53.3%) and 2+12 (82.8%) scored the highest frequency at *Glu-A1*, *Glu-B1* and *Glu-D1* loci, respectively. In addition, subunits 7+9 (23.3%) was also found at higher frequency. A total of 49 gliadin bands and 28 patterns were detected and the polymorph among all accessions was identified in most of bands (97.96%). Furthermore, all materials could be clustered into three major groups based on genetic similarity coefficient. The results indicated that the variations of gliadin among *macha* accessions were not associated with their geographic origins. (*Asian Journal of Biological Sciences 1 (1): 19-25, 2008; Doi: 10.3923/ajbs.2008.19.25*)

## **Involvement of Ca<sup>2+</sup> in Alleviation of Cd<sup>2+</sup> Toxicity in Common Bean (*Phaseolus vulgaris* L.) Plants**

Mona A. Ismail

In common bean plants, Cd caused significant growth retardation in stem length, stem fresh weight, stem dry weight and number of pods per plant by both concentrations (100 and 200  $\mu\text{M}$ ) of CdCl<sub>2</sub>; while, the number of leaves and number of flowers per plant were reduced at high concentration of CdCl<sub>2</sub>. The root growth parameters were not significantly responding to Cd toxicity. The addition of CaCl<sub>2</sub> (100  $\mu\text{M}$ ) to Cd-stressed (100  $\mu\text{M}$  CdCl<sub>2</sub>) plants improved the stem fresh weight, root length, number of flowers and number of pods per plant. The contents of chlorophyll a, chlorophyll b and total chlorophyll were reduced with increasing concentrations of CdCl<sub>2</sub>; while, carotenoids were higher in Cd-treated plants. The addition of CaCl<sub>2</sub> increased the content of chlorophyll a and total chlorophyll, but not chlorophyll b. The total number of protein bands in SDS-PAGE protein profile was reduced in plants treated with CdCl<sub>2</sub>. However, addition of CaCl<sub>2</sub> (100 mM) did not correct the changes in the number of protein bands caused by Cd stress. The synthesis of high molecular weight proteins (116 and 85.54 kDa) was completely inhibited by 200  $\mu\text{M}$  CdCl<sub>2</sub>; while, the synthesis of low molecular weight protein (26.11 kDa) was totally blocked by both CdCl<sub>2</sub> treatments. The addition of 100 mM CaCl<sub>2</sub> restored the synthesis of a 28.57 kDa protein. The synthesis of a molecular weight polypeptide of 101 kDa was induced by the high concentration of CdCl<sub>2</sub>. Progressive collapsing; disruption and browning of outer root tissues followed by cell death were noticed after CdCl<sub>2</sub> treatments. Addition of CaCl<sub>2</sub> relatively corrected the browning and collapsing of tissues caused by CdCl<sub>2</sub>. (*Asian Journal of Biological Sciences 1 (1): 26-32, 2008; Doi: 10.3923/ajbs.2008.26.32*)

## **Resistance Mechanisms of Whitefly *Bemisia tabaci* (Homoptera: Aleyrodidae) to Thiamethoxam and Profenofos**

Mohamed A. Kandil, Amal Y. Saleh, Wafaa H. El Dieb and Sayeda F. Farghaly

An investigation was performed to determine the possible role of metabolism in two resistant strains to thiomethoxam and profenofos by whitefly *Bemisia tabaci*. Selective synergists were used to study the involvement of hydrolytic or oxidative enzymes in the resistance mechanism of the resistant strains. Resistance level was decreased markedly when DEF (S,S,S-tributyl phosphotithioate) synergized thiamethoxam, suggesting the involvement of increased detoxication by esterases

as a part of resistance mechanism. In addition thiamethoxam was synergized moderately when mixed with 25 ppm from TCP (tricresylphosphate) confirming the role of nonspecific esterases in thiamethoxam resistance. Piperonyl Butoxide (PB) synergized profenofos toxicity in resistant strain especially when profenofos mixed with 50 ppm PB which gave synergistic ratio 24.08. The role of diethylmaleate (DM) as inhibitor for glutathione transferases was clear in the case of profenofos resistant strain. However, it exhibited slightly synergistic action in the case of thiamethoxam resistant strain. (*Asian Journal of Biological Sciences 1 (1): 33-38, 2008; Doi: 10.3923/ajbs.2008.33.38*)

### **Determining the Best Form Factor Formula for Zarbin (*Cupressus sempervirence* var. *horizontalis*) in North of Iran**

Ardalan Ahmadi, Asghar Fallah, Hamid Jalilvand and Yahya Kooch

In order to determine the best form factor formula for Zarbin (*Cupressus sempervirence* var. *horizontalis*) in Kordkoy region (Golestan province-North of Iran), a number 54 trees were selected based on their distribution in diameter classes, from 8 to 28 cm (in a 2 cm diameter interval). First, several quantitative factors including diameter at breast height, diameter at 0.65 m of height and diameter at stump were measured using diameter tape, just before the trees being felled. After cutting the trees, the heights and diameter from breast height up to the height where diameter is 5 cm was measured using a diameter tape in a two meter interval. Finally, diameter at 0.1, 0.3, 0.5, 0.7 and 0.9 m of the total height was measured, respectively. As a consequent, each trees volume was precisely calculated as the real volume. Next, the real form factor ( $f_r$ ) was calculated and its average was statistically compared to the averages of natural ( $f_{0.1}$ ), artificial ( $f_{0.5}$ ) and hohenedel's ( $f_h$ ) form factors using pair sample t-test. Results showed that there is no significant difference between the averages of Real and Natural form factors (at = 0.05 level). Hence, just Natural form factor is capable to replace the real form factor of Zarbin over the study area. (*Asian Journal of Biological Sciences 1 (1): 39-44, 2008; Doi: 10.3923/ajbs.2008.39.44*)

### **Pollen Morphology of Six Aquatic Angiosperms from Saudi Arabia**

Hussien M. Alwadie

The pollen morphology of six species of aquatic angiosperms from Saudi Arabia belonging to five genera distributed in five families was examined using both light

and scanning electron microscopy. Based on apertural type, three distinct pollen types are recognized. Pollen Type-I is characterized by its non-aperturate pollen such as *Elodea canadensis*, *Potamogeton crispus*, *P. pectinatus* and *Ruppia maritima*. Pollen Type-II is easily recognized by having porate pollen such as *Lemna gibba*. Pollen Type-III is readily delimited by having colpate pollen such as *Myriophyllum spicatum*. The correlation between pollen morphology and pollination mechanism is discussed. (*Asian Journal of Biological Sciences 1 (1): 45-50, 2008; Doi: 10.3923/ajbs.2008.45.50*)

### **Antibacterial Activity of *Prunus mahaleb* and Parsley (*Petroselinum crispum*) Against Some Pathogen**

S.M. Seyyednejad, S. Maleki, N. Mirzaei Damab and H. Motamedi

The antibacterial activity of parsley (*Petroselinum crispum*) and *Prunus mahaleb* seed ethanolic extracts were examined using agar disc diffusion method against eleven bacteria (*Bacillus anthracis*, *Bacillus subtilis*, *Bacillus pumilus*, *Staphylococcus aureus*, *Bacillus licheniformis*, *Brucella melitensis*, *Escherichia coli*, *Salmonella typhi*, *Proteus mirabilis*, *Bordetella bronchiseptica*, *Pseudomonas aeruginosa*). These extracts had inhibitory effect at various concentrations (0.1, 0.2, 0.3 and 0.4 g mL<sup>-1</sup>) against Gram-positive and Gram-negative bacteria. *Prunus mahaleb* ethanolic extract had antibacterial activity against *P. mirabilis*, *B. anthracis* and *S. aureus*. *B. licheniformis* was the most sensitive organism to the parsley ethanolic extract. Both of the extracts had inhibitory effect against *Br. melitensis*, *E. coli* and *B. licheniformis* in low concentrations (0.1 and 0.2 g mL<sup>-1</sup>). Based on the results of this study, both plants could be considered as disinfectants or antiseptics, thus confirming their use in folk medicine. (*Asian Journal of Biological Sciences 1 (1): 51-55, 2008; Doi: 10.3923/ajbs.2008.51.55*)

### **Effect of Crude Oil on Invertase and Amylase Activities in Cassava Leaf Extract and Germinating Cowpea Seedlings**

Akpovwehwee A. Anigboro and Nyerhovwo J. Tonukari

The effect of crude petroleum oil on invertase and amylase activities was determined directly in the assay medium using a crude extract of cassava (*Manihot esculenta*) leaf as source of invertase and amylase as well as in germinating cowpea (*Vigna unguiculata* L. Walp.) seedlings. There was a decreasing cowpea seedling invertase and amylase activities with increasing crude

oil concentration in the soil. After three days of germination, the invertase and amylase activities in seedlings from 5.9% crude oil-treated soil decrease to 42 and 15%, respectively, compared to the control. A similar profile was obtained with invertase and amylase activities when crude oil was added directly to cassava extract enzyme assay. Addition of 10% crude oil in the assay inhibits invertase and amylase activities by 5.1 and 29.6%, respectively. (*Asian Journal of Biological Sciences 1 (1): 56-60, 2008; Doi: 10.3923/ajbs.2008.56.60*)

### **Correlation, Path Coefficient and Factor Analysis of Some Quantitative and Agronomic Traits in Cotton (*Gossypium hirsutum* L.)**

O. Alishah, M.B. Bagherieh-Najjar and L. Fahmideh

The present study was carried out to elucidate the nature of interrelationships among various traits affecting cotton yield. Twelve cotton advanced lines were evaluated in Hashemabad cotton research station located at North of Iran, with four replication using RCBD. Data was recorded on 14 quantitative and agronomic traits. The analysis of explanatory statistics revealed presence of substantial variability for most traits. The path analysis revealed that highest direct effect on seed cotton yield was exhibited by First Picking Yield (FPY) followed by Length of Sympodial Branches (LSB). Factor analysis insists importance of yield components and bringing out four latent factors affecting on cotton yield. First four independent factors compose 83.58% values should represented of total variation. Factor 1, which accounted for about 39% of the variation consists of second harvested seed cotton yield, boll weight, boll No., No. of monopodial branches, length of monopodial branches, No. of sympodial branches, length of sympodial branches, length of pedicel, total seed cotton yield and earliness. Factor analysis decreased numerous correlated variables to few main factors. The inference of present study and possible implications in cotton breeding has been discussed. (*Asian Journal of Biological Sciences 1 (2): 61-68, 2008; Doi: 10.3923/ajbs.2008.61.68*)

### **Age, Growth and Mortality of Hilsa Shad, *Tenualosa ilisha* in the River Meghna, Bangladesh**

M.S. Ahmed, A.S.M. Sharif and G.A. Latifa

The anadromous shad *Tenualosa ilisha* (hilsa) is one of the most important species in coastal and estuarine waters, which contributes over 13% of the total

fish production of Bangladesh. Age and growth of this valuable species from the River Meghna Bangladesh, were studied with transverse sections of otoliths. Otoliths opaque zones that formed every year were thought to be annual rings. Growth of this species was rapid during the first two years, reaching 37.0 cm in fork length. Most of the specimens were 2-4 years old and accounted for 90% in total. The maximum age recorded was 6 years with 52.5 cm in fork length. The von Bertalanffy growth parameters  $L_{\infty}$  and K for this species were 52.0 cm and 0.71 for year<sup>-1</sup>, respectively. The total, natural and fishing mortality were  $Z = 2.61 \text{ year}^{-1}$ ,  $M = 1.22 \text{ year}^{-1}$  and  $F = 1.39 \text{ year}^{-1}$ , respectively. The exploitation rate,  $E = 0.53$ , revealed a high fishing pressure on the stock. The estimated length-weight relationship for the combined sexes was found to be  $W = 0.0225 * FL^{2.880}$ . The study indicated that age and growth of *T. ilisha* can be determined using its sectioned otolith and process needs to be validated. (*Asian Journal of Biological Sciences* 1 (2): 69-76, 2008; **Doi:** 10.3923/ajbs.2008.69.76)

### **Development of an Elisa Test for Serological Diagnosis of Coccidial Infections and Studying of Resistance against Coccidiostats Based on Flock History**

R. Kiani and H.H. Farhang

With soluble antigens prepared from sporulated oocysts of *E. tenella*, a sensitive enzyme linked immunosorbent assay was developed to survey broiler chickens' sera related to 20 broiler flocks for coccidiosis. Sera were taken at random from non-vaccinated 6 and 7 week-old-broiler chickens against coccidiosis. All flocks had not natural outbreak of coccidiosis and some of them had history of prophylactic in-feed medication with currently-used coccidiostates. All sera had absorbance values very above the detection level. There was no significant difference between prophylactic in-feed medicated groups to non-medicated groups. (*Asian Journal of Biological Sciences* 1 (2): 77-83, 2008; **Doi:** 10.3923/ajbs.2008.77.83)

### **Haematological and Histopathological Studies of *Jatropha tanjorensis* (J.L. Ellis and Soroja) Leaves in Rabbits**

E.S. Orhue, M. Idu, J.E. Ataman and L.E. Ebite

This study investigated the possible toxicity of consumption of the leaf by determining a variety of serum biochemical parameters in liver and renal function



tests, haematological and physical parameters. A 5 week repeated dose toxicity of *Jatropha tanjorensis* leave powder was carried out in rabbits. Forty animals, male and female, were administered feed mash plus ground *J. tanjorensis* leaf powder in graded concentrations of 0, 5, 10 and 25%. All rabbits survived at the end of the study and results showed no significant alteration in average body weight in the treatment groups when compared with the control group. The haemoglobin, hematocrit, platelets and platelet cell distribution width in the female group, showed significant increase between the control and the treated groups. This is an indication of an improved bone marrow function. No severe histopathologic indicator was recorded. (*Asian Journal of Biological Sciences 1 (2): 84-89, 2008; Doi: 10.3923/ajbs.2008.84.89*)

### **Histomorphometric Study of Sheep Fetal Testis**

A. Parchami and R.H. Fatahian Dehkordi

The aim of this study was to determine sheep fetal testis developmental aspect. Histomorphometric investigation was carried out on 21 sheep fetal testis aging from 41 to 86 days of age. Foeti were collected from Shahrekord abattoir, Iran and allocated into 4 age groups according to measured CRL. Tissue sections of the organs showed that morphological characteristics of interatubular and intertubular cells of ovine fetal testis are similar to those in other ruminates such as bovine and buffalo fetal testis. Morphometric values showed that with increasing age the number of gonocytes and indifferent supporting cells increases, Leydig cell numbers increases from the first to the third group but decreases suddenly in forth group. The number of pre-Sertoli cells in cross-sectioned cord remains always predominant in all four age groups. (*Asian Journal of Biological Sciences 1 (2): 90-93, 2008; Doi: 10.3923/ajbs.2008.90.93*)

### **Chronic Lung Disease of the Malaysian Premature Neonates is not Associated with *Ureaplasma urealyticum* and *Mycoplasma***

Kek Heng Chua, Suzita Mohd Noor, Ching Hoong Chew and Chin Theam Lim

Mortality rate in the preterm neonate is believed to be associated with the chronic lung disease (CLD) and CLD is mainly caused by the infections of either *Ureaplasma urealyticum* or *Mycoplasma hominis* based on other studies. Therefore in this research, endotracheal aspirates of 57 intubated Malaysian

premature neonates were used to study the association between colonization of *Ureaplasma urealyticum* or *Mycoplasma* in the respiratory tract of preterm neonates with subsequent development of chronic lung disease using Mycofast® screening kit and nested PCR approaches. Overall, only 1 out of 57 samples was detected to have a mixture of 2 different *Mycoplasma* species using the later approach. Therefore, we conclude that development of chronic lung disease in Malaysian premature neonates is not due to colonization of *Ureaplasma urealyticum* or *Mycoplasma* but other factors. (*Asian Journal of Biological Sciences* 1 (2): 94-99, 2008; **Doi:** 10.3923/ajbs.2008.94.99)

### **Studies on Foetal Testicular Development in Sheep**

R.F. Dehkordi, A. Parchami and P. Kheibari

The aim of this study was to determine sheep fetal testis developmental aspects. Twenty clinically healthy prenatal Lori Bakhtiyari sheep foeti, ranging from 41 to 86 days of intra-uterine life were studied. Foeti were collected from Shahrekord abattoir, Iran and allocated into 4 age groups according to measured CRL. Tissue sections of the organs showed that the TA and tubular diameter and the No. of testicular tubules per any microscopic field increase progressively with age especially between the first and the second group than the other groups. A trend of absolute growth of the foetal testes on biometry regarding length, width and thickness was noticed as per the advancement of gestation period. The biometry of the right and left testis were different in all four age groups between right and left testes. (*Asian Journal of Biological Sciences* 1 (2): 100-102, 2008; **Doi:** 10.3923/ajbs.2008.100.102)

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

M. Azimi, A.A. Pourmirza, M.H. Safaralizadeh and G. Mohitazar

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**

O.L. Adebayo, B.O. Adegbesan and G.A. Adenuga

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.)<sup>-1</sup> PB, 75 mg (kg b.wt.)<sup>-1</sup> DDT and 100  $\mu$  mole (kg b.wt.)<sup>-1</sup> Pb(NO<sub>3</sub>)<sub>2</sub>, 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(NO<sub>3</sub>)<sub>2</sub> 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  $0.4 \text{ mg L}^{-1}$  Pb whilst for the herbicide 2, 4-D at  $0.1 \text{ mg L}^{-1}$ . 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  $20 \times 20 \text{ m}$ ). 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  $81 \text{ m}^2$  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**

S.H. Hosseini and M. Karkhaneh Yousefi

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**

A. Abbasi, A. Tobeh, M. Shiri-e-Janagrad, Sh. Jamaati-e-Somarin, M. Hassanzadeh and S. Hokmalipour

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<sup>-1</sup> 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<sup>-1</sup> nitrogen. With increasing nitrogen levels, number of tubers larger than 55 mm was increased. The rate of 160 kg ha<sup>-1</sup> 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<sup>-1</sup>, 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<sup>-1</sup> 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**

Ghanya N. Al-Naqeep, Maznah M. Ismail, Adel S. Al-Zubairi and Norhaizan M. Esa

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±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±1.06%, IDF 27.10±0.55, 20.56±1.16, 22.40±1.40% and SDF 8.90±1.17, 6.50±0.60, 8.13±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**

D. Puangpronpitag and C. Sittiwet

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<sup>-1</sup>, 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**

S.A. Wemedo, N.P. Akani and C.E. Eke

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<sup>1</sup> to 8.8×10<sup>1</sup> cfu mL<sup>-1</sup> for Total Heterotrophic Fungi (THF) and from 0.0×10<sup>1</sup> to 2.4×10<sup>1</sup> cfu mL<sup>-1</sup> 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 verrucosum* 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**

F. Fakharzadeh, J. Darvish, F. Ghassemzadeh and H.G. Kami

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 Tibad. Totally, 100 samples were collected in these regions from April to November, which were transferred alive to the lab. In the laboratory, the vimnoblantin 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**

S. Ghorbani, B.N. Khiabani, I. Amini, M.R. Ardakani, H. Pirdashti and S.R. Moakhar

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, <sup>1</sup>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<sup>-1</sup>) and three cultivars (Satina (V<sub>1</sub>), Draga (V<sub>2</sub>) and Agria (V<sub>3</sub>)). Results showed that with the increase in N level up to 160 kg ha<sup>-1</sup>, fresh tuber yield significantly increased in cv. Agria. At final harvest, late-maturity cultivar had the highest fresh tuber yield (51.75 t ha<sup>-1</sup>) under the N level of 160 kg ha<sup>-1</sup>. With further increase in N level up to 240 kg ha<sup>-1</sup>, 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<sup>-1</sup> and cv. Draga (mid-maturity) had the lowest one with applying 240 kg N ha<sup>-1</sup>. 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<sup>-1</sup> 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<sup>-1</sup> 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 $\gamma$ -Sitosterol from Petroleum Ether Extract of Woody Stem of *Abelmoschus manihot***

P.S. Jain, S.B. Bari and S.J. Surana

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  $\delta$  3.62 and H-6 olefinic proton showed a multiplet at  $\delta$  5.14. Two olefinic protons appeared downfield at  $\delta$  4.16 (m) and  $\delta$  4.14 (m) and in the  $^1H$ -NMR data of PEA-3, H-3 proton appeared at  $\delta$  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  $\delta$  5.10. From the physical, chemical and spectral characteristics, PEA-2 and PEA-3 were concluded as stigmasterol and  $\gamma$ -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**

A.K. Kumar, M. Chalamaiah, R.R. Kumar and K.N. Babu

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)