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Cow Manure Composting by Microbial Treatment for Using as Potting Material: An Overview

Waleed S. Alwaneen

Abstract

Dairy industry is flourishing in Saudi Arabia for the last two decades producing milk and milk products to meet the population needs. Simultaneously, it is also producing large amount of dairy waste (animal manure) posing a serious environmental issues. Vermicomposting (conversion of animal manure into compost by bacterial treatments) is considered as one of the safest means for efficient management and to mitigate environmental pollution issues resulting from land disposal of raw dairy wastes. The main objective of this study was to summarize different processes of vermicomposting and identified the most important bacteria species suitable for vermicomposting using animal manure especially the cow dung. The review showed that among the different bacteria species, *Eisenia fetida* is the most efficient and commonly used bacteria for vermicomposting to develop compost using cow dung (dairy manure). Overall, this review has highlighted the various vermicomposting technologies, various bacteria species involved in vermicomposting, effect on soil and plant growth as well as the benefits of using compost prepared by way of vermicomposting. The study showed a lot of potential for the production of compost by vermicomposting technology using appropriate bacteria species which is safe, friendly and is associated with minimum environmental issues for safe land disposal of dairy waste (animal manure) with minimum possible environmental issues for the adjacent population.

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Mold-Ripened Soft Cheeses Fortified with Date Palm Fruit Product as Functional Dairy Products

Mutlag M. Al-Otaibi, Jamal S. Haddadin and Malik S.Y. Haddadin

Abstract

Date fruit based products are gaining popularity among the consumers in almost all date growing countries due to its added nutritional value. Therefore, novel products were developed by combining two types of foods i.e., soft ripened cheeses and date fruit syrups or date powder. This study is the first to report the surface mold-ripened cheese production with date syrup and date powder. Model cheeses were prepared from pasteurized milk inoculated with *Streptococcus thermophilus*, *Penicillium camemberti* and *Geotrichum candidum*. Date syrup-1, date syrup-2, date powder or the date mixture were added at the stage of curdling. Based on the kinetic growth of the microbial groups in all the treatments, there was no change in the growth of these in various date palm product. On the contrary It may be said that addition of the date fruit product supports their growth. After 35 days, the amounts of total poly phenols were $128.3\pm1.01, 81.8\pm1.11, 33.5\pm2.19, 156.23\pm1.27$ mg GAE/100 g in the cheeses support with date syrup-1, date syrup-2, date powder or the date fruits ranged from 80.13 IC₅₀ (date syrup-1). Based on the chemical characteristics and sensory analysis, the study results showed the potential for innovative application of date products for developing new functional dairy products as an ideal medium for the delivery of biological active compounds with beneficial health effects over.

How to cite this article:

Mutlag M. Al-Otaibi, Jamal S. Haddadin and Malik S.Y. Haddadin, 2016. Mold-ripened Soft Cheeses Fortified with Date Palm Fruit Product as Functional Dairy Products. Pak. J. Biol. Sci., 19: 11-25. (DOI: 10.3923/pjbs.2016.11.25)

Experimental Studies on Some Immunotoxicological Aspects of Aflatoxins Containing Diet and Protective Effect of Bee Pollen Dietary Supplement

Badr E. El-Bialy, Eman E. Abdeen, Nermeen B. El-Borai and Eman M. El-Diasty

Abstract

Aflatoxins (AFs), widely distributed food-borne mycotoxins, affect quality and safety of food and cause economic losses in livestock. In this study, the protective effect of Bee Pollen (BP) against some immunotoxic hazards elucidated from eating of AFs-

containing diet was investigated in Wistar rats. Rats were randomly classified into four groups and treated for 30 days, Group 1; control negative, Group 2; Total AFs (3 mg kg⁻¹ basal diet), Group 3; BP (20 g kg⁻¹ basal diet) and Group 4; AFs+BP in basal diet. The immunoprotective effect of BP was revealed in terms of increasing (relative to levels seen in Group 2 rats that consumed the AFs diet) serum total protein and globulin levels, restored normal neutrophil (PMN)/lymphocyte ratio, increased PMN phagocytic activity and increased lymphocyte proliferative capacity. Also, the use of the BP reduced spleen H_2O_2 levels and increased GSH content while maintaining normal levels of NO formation. Histopathologic analysis showed that the AFs caused lymphocytic depletion in the spleen; however, BP induced lymphocytic hyperplasia and reduced the levels of AFs-inducible cellular exhaustion or depletion. These results provide evidence of a protective effect of BP against some immunotoxic actions induced *in situ* by consumption of AFs.

How to cite this article:

Badr E. El-Bialy, Eman E. Abdeen, Nermeen B. El-Borai and Eman M. El-Diasty, 2016. Experimental Studies on Some Immunotoxicological Aspects of Aflatoxins Containing Diet and Protective Effect of Bee Pollen Dietary Supplement. Pak. J. Biol. Sci., 19: 26-35. (DOI: 10.3923/pjbs.2016.26.35)

Propagation by Cutting of Grewia coriacea Mast. (Malvaceae)

Bita Alain Mercier, Attibayéba, Kampé Jean Pierre, Ngantsoué Léon and Mialoundama Fidèle

Abstract

Congolese forests contain important spontaneous food plants. Among these plants, there is the *Grewia coriacea* Mast., called in the national language «Tsui-téké», which is a tree of 4-25 m high and of 12-40 cm in diameter. Its fruits are used in several drinks making (juice, sparkling wine, syrup) and lollipops. Grewia's barks are used in pharmacopoeia to cure of stomach aches, syphilis. However, the fruits harvesting method based on branches or trees cutting as well as swidden agriculture by local people dangerously threatens the Grewia in the natural ecosystems of Congo. To insure the longevity of this species, we undertook trials of vegetative reproduction of the plant by means of propagation by cuttings for its domestication. Less woody leafless cuttings of 30 cm in length provided best results with a resumption rate of 63.3%, a good rooting production and an average duration of the apparent plastochrone of three days from the second to the fifth leaf. The study shows that domestication of the *Grewia coriacea* Mast. is possible today by cuttings. Its culture might allow the diversification of species which can be used in orchards.

How to cite this article:

Bita Alain Mercier, Attibayéba, Kampé Jean Pierre, Ngantsoué Léon and Mialoundama Fidèle, 2016. Propagation by Cutting of *Grewia coriacea* Mast. (Malvaceae). Pak. J. Biol. Sci., 19: 36-42. (DOI: 10.3923/pjbs.2016.36.42)

Effects of Prepubertal Acute Immobilization Stress on Serum Kisspeptin Level and Testis Histology in Rats

Mehrnoosh Maalhagh, Abdolreza Sotoodeh Jahromi, Alireza Yusefi, Ali Razeghi, Hassan Zabetiyan, Mohammad Yasin Karami and Abdol Hossein Madani

Abstract

Stress has inhibitory effect on HPG axis through increasing cortisol serum level. In this study, the effect of acute prepubertal stress on kisspeptin, which plays essential role in puberty achievement is assessed. To do this experimental study thirty immature healthy male wistar rats of 4 weeks old and without any symptoms of puberty were selected randomly. These rats were divided into three groups, randomly. Two groups were chosen as control and pretest and one as stress (test) group. Immobilization stress was applied for 10 days and serum level of cortisol, testosterone and kisspeptin were measured. Primary and secondary spermatocyte and sertoli cell evaluated and compared among groups. Mean serum level of kisspeptin in pretest group, control group and stress (test) group were 0.0381 ± 0.0079 , 91.0500 ± 4.87430 and 15.2156 ± 3.88135 pg mL⁻¹ respectively. Serum level of kisspeptin had significant differences between three groups (p<0.001). Acute prepubertal immobilization stress led to decrease in serum level of kisspeptin and testosterone in stress (test) group compared to control groups. Also stress caused a significant decrease in the numbers of secondary spermatocytes of the test group.

How to cite this article:

Mehrnoosh Maalhagh, Abdolreza Sotoodeh Jahromi, Alireza Yusefi, Ali Razeghi, Hassan Zabetiyan, Mohammad Yasin Karami and Abdol Hossein Madani, 2016. Effects of Prepubertal Acute Immobilization Stress on Serum Kisspeptin Level and Testis Histology in Rats. Pak. J. Biol. Sci., 19: 43-48. (DOI: 10.3923/pjbs.2016.43.48)

Molecular Epidemiology of High-Risk Human Papillomavirus in High-Grade Cervical Intraepithelial Neoplasia and in Cervical Cancer in Parakou, Republic of Benin

T.M. Zohoncon, T.C. Ouédraogo, L.V.C. Brun, D. Obiri-Yeboah, W.F. Djigma, S. Kabibou, S. Ouattara, M. Gomina, A.T. Yonli, V.J.T.E. Bazié, C. Ouédraogo, O. Lompo, S.A. Akpona and J. Simpore

Abstract

Human papilloma virus (HPV) infection remains a worldwide concern, especially in Sub-Saharan Africa where cervical cancer is the leading cause of cancer death in women. The aim of the study was to determine the prevalence and genotypic distribution of High-Risk HPV (HR-HPV) involved in Cervical Intraepithelial Neoplasia (CIN) II and III and in cervical cancer in Parakou. Out of a total of 149 samples of cervical tissues archived, fixed and paraffin-embedded, 78 samples with histological diagnosis of CIN-II, CIN-III and cervical cancer went through deparaffinization with xylene, followed by an extraction of HPV DNA and the detection of HR-HPV by real-time multiplex PCR. The average age of the women was 40.05±13.99 years. The samples were positive to at least one HR-HPV genotype in 76.92% (50/65) of cases. The HR-HPV genotypes which are most common in the cervical cancer and in CIN-II and III were, respectively HPV-39 (38 and 37.50%), HPV-18 (35 and 31.30%), HPV-45 (35 and 31.30%), HPV-52 (9 and 12.50%). The HPV-16 was absent. This study helped to detect (in samples archived, fixed and paraffin-embedded tissues) HR-HPV involved in high-grade precancerous lesions and in cervical cancer in Parakou, some of which are not covered by currently available vaccines.

How to cite this article:

T.M. Zohoncon, T.C. Ouédraogo, L.V.C. Brun, D. Obiri-Yeboah, W.F. Djigma, S. Kabibou, S. Ouattara, M. Gomina, A.T. Yonli, V.J.T.E. Bazié, C. Ouédraogo, O. Lompo, S.A. Akpona and J. Simpore, 2016. Molecular Epidemiology of High-risk Human Papillomavirus in High-grade Cervical Intraepithelial Neoplasia and in Cervical Cancer in Parakou, Republic of Benin. Pak. J. Biol. Sci., 19: 49-56. (DOI: 10.3923/pjbs.2016.49.56)

Effects of Feeding Rates on Growth Performance, Feed Utilization and Body Composition of Asian Red Tail Catfish (*Hemibagrus wyckioides*), Cultured in Northeast Thailand

Nisarat Tippayadara, Sompong Doolgindachbaporn and Amnuaysilpa Suksri

Abstract

Two experiments were carried out at the Khon Kaen University, Nong Khai Campus, Thailand during November, 2011 to May, 2012 to search for the most appropriate rates of feeding rations for fingerling and juvenile Asian redtail catfish (*Hemibagrus wyckioides*). A Completely Randomized Design (CRD) with three replications was used for both experiments. Experiment 1 had four treatments, i.e., T1 (2%), T2 (3%), T3 (4%, control), and T4 (5%). The same experimental design was used for the experiment 2, where four treatments were used, i.e., T1 (1%), T2 (2%), T3 (3%, control) and T4 (4%). The percentages of the amounts of rations used for Experiments 1 and 2 were based on body-live weight per day. Fingerling and juvenile fish were used for the experiment 4 arate of 5% body live weight per day for fingerling fish of T4 of experiment 1 is the most appropriate rate for the fingerling fish. An increase in ration rate highly increased final body live weight. For juvenile fish of the experiment 2, it was found that there were no significant differences in live weights amongst the treated fish yet weight gained and specific growth rates between T1 and the rest were highly significant, whereas the results of the juvenile fish of T2 up to T4 were similar hence, 2% body live weight per day of T2 is the most appropriate rate for juvenile fish.

How to cite this article:

Nisarat Tippayadara, Sompong Doolgindachbaporn and Amnuaysilpa Suksri, 2016. Effects of Feeding Rates on Growth Performance, Feed Utilization and Body Composition of Asian Red Tail Catfish (*Hemibagrus wyckioides*), Cultured in Northeast Thailand. Pak. J. Biol. Sci., 19: 57-64. (DOI: 10.3923/pjbs.2016.57.64)

DNA Barcoding Uncover Cryptic Diversity in Goat Fishes (Family: Mullidae) Across the Egyptian Coastal Waters

Mohammed I. Ahmed, Manal M. Sabrah, Rasha A. Heneish and Magdy El-Alwany

Abstract

Despite ongoing efforts to protect species and ecosystems in the Egyptian costs of the Red Sea and Mediterranean Sea, habitat degradation, overfishing and pollution have posed serious challenges to marine natural resources. In spite of the accumulated knowledge on the systematics of commercial fishes in Egypt recent results suggested that we are far from having a complete picture of Egyptian fish diversity. The accurate identification of species is a very important component in many fields of biological research and conservation efforts. The high level of expertise and time consuming process needed means a loss in biodiversity. Successful species identification is now frequently based on a combination of approaches including morphometrics and the sequencing of the mitochondrial COI gene known as the DNA barcoding. This study employed COI sequencing alongside traditional taxonomic identification methods and uncovered cryptic diversity within the goat fish species of Family Mullidae, four species collected from both the Red Sea and the Mediterranean Sea. *Upeneus pori, Upeneus vittatus, Mullus surmuletus* and *Mullus barbatus* samples from the Red Sea and the Mediterranean were clustered separately in a NJ tree indicating the possibility of the presence of cryptic species complex. All species could be differentiated by their COI sequence.

How to cite this article:

Mohammed I. Ahmed, Manal M. Sabrah, Rasha A. Heneish and Magdy El-Alwany, 2016. DNA Barcoding Uncover Cryptic Diversity in Goat Fishes (Family: Mullidae) Across the Egyptian Coastal Waters. Pak. J. Biol. Sci., 19: 65-70. (DOI: 10.3923/pjbs.2016.65.70)

Alteration Expression of Bax, Bcl-2 and VDAC1 Genes in Oligozoospermic and Fertile Subjects

Arni Amir, Yanwirasti, Asmarinah and Fadil Oenzil

Abstract

One of factors causing oligozoospermic circumstances is excessive apoptosis during spermatogenesis. Spermatogenesis known involves Bcl-2 family proteins in cytoplasm and Voltage Dependent Anion Channel 1 (VDAC1) in outer mitochondrial membrane to facilitate releasing of apoptosis factor such as cytochrome-c from inter-membrane space into cytoplasm. The study was aimed to analyze the mRNA expression of pro-apoptotic Bax, anti-apoptotic Bcl-2 and VDAC1 genes derived from 45 oligozoospermic subjects and 20 fertile subjects as control. Analysis of transcript expression was performed by two-steps real-time (PCR) and calculating by standard curve method. Stages of works were followed: Analysis of sperm basal characterization, isolation of spermatozoa to separate it from cement and resulted pellets. Pellets were saturated with PBS to obtain mRNA and reversed into cDNA. The cDNA were sequenced to investigate SNP of Bax, Bcl-2 and VDAC1 genes. Results showed that comparison of log mRNA copy number of Bax, Bcl-2 and VDAC1 genes for oligospermic and fertile subjects varied. The Bax, Bcl-2 and VDAC1 were significantly different between oligozoospermic and normozoospermic subjects (p = 0.000, p = 0.041, p = 0.000, respectively). It was suggested that oligozoospermia may be occurred by inducing the increase of Bax pro-apoptotic and VDAC1 genes expression and decreasing of Bcl-2 expression to lead the excessive of apoptosis.

How to cite this article:

Arni Amir, Yanwirasti, Asmarinah and Fadil Oenzil, 2016. Alteration Expression of Bax, Bcl-2 and VDAC1 Genes in Oligozoospermic and Fertile Subjects. Pak. J. Biol. Sci., 19: 71-76. (DOI: 10.3923/pjbs.2016.71.76)

Characterization of α-Amylase from Soursop (Annona muricata Linn.) Fruits Degraded by Rhizopus stolonifer

O.M. Atolagbe, A.A. Ajayi and O. Edegbo

Abstract

Rhizopus stolonifer is a fungus and one of the most common species of the genus Rhizopus. The organism has been a very important microbe used in the field of industrial microbiology. It has been used in the production of many hydrolytic and extracellular enzymes among which is the α -amylase. This enzyme has found various uses in the industry. Fruit juices are important sources of nutrients and they contain several important therapeutic properties that may reduce the risk of various diseases. An investigation on α -amylase extracted from soursop fruits deteriorated by *R. stolonifer* and the effect of the enzyme on soursop juice clarification was carried out in this study. The results obtained shows that the soursop juice with low concentration of extracted enzyme and less incubation time was more viscous and cloudy compared with the juice with high concentrations of amylase and higher incubation time which was clearer and less viscous. The results of this research will be very useful in soursop juice producing companies.

How to cite this article:

O.M. Atolagbe, A.A. Ajayi and O. Edegbo, 2016. Characterization of α-Amylase from Soursop (*Annona muricata* Linn.) Fruits Degraded by *Rhizopus stolonifer*. Pak. J. Biol. Sci., 19: 77-81. (DOI: 10.3923/pjbs.2016.77.81)

Competitive and Allelopathic Effects of Wild Rice Accessions (*Oryza longistaminata*) at Different Growth Stages

Shicai Shen, Gaofeng Xu, David Roy Clements, Guimei Jin, Fudou Zhang, Dayun Tao and Peng Xu

Abstract

The competitive and allelopathic effects of wild rice (*Oryza longistaminata*) accessions on barnyard grass at different growth stages determined by days after sowing (0, 30, 60 and 90 days) were studied in greenhouse pot experiments. Wild rice accession RL159 exhibited the greatest height and tillering. The weed suppression rates of wild rice accessions OL and F_1 on barnyard grass were significantly higher than for other rice accessions, with the lowest being *O. sativa* cultivar RD23. The highest suppression rates of OL and F_1 were 80.23 and 73.96% at barnyard grass growth stages of 90 days and 60 days. At a 90 growth stage, wild rice accessions RL159 and RL169 caused 61.33 and 54.51% inhibition in barnyard grass growth, respectively. Under the same conditions, the competitive inhibition rates of OL, F_1 , RL159, RL169 and RL219 against barnyard grass were markedly lower than their weed suppressive effects, but were relatively similar for RD23. The allelopathic inhibition of OL and F_1 on barnyard grass was significantly higher than other rice accessions. The highest allelopathic rates of OL and F_1 were 60.61 and 56.87% at the 0 day growth stage. It is concluded that wild rice accessions OL and F_1 exhibited the highest allelopathic activity along with moderate competitive ability against barnyard grass; wild rice accession RL159 had the highest competitive ability and moderate allelopathic activity on barnyard grass. Thus, the three wild rice accessions OL, F_1 and RL159 could be used as ideal breeding materials for cultivated rice improvement.

How to cite this article:

Shicai Shen, Gaofeng Xu, David Roy Clements, Guimei Jin, Fudou Zhang, Dayun Tao and Peng Xu, 2016. Competitive and Allelopathic Effects of Wild Rice Accessions (*Oryza longistaminata*) at Different Growth Stages. Pak. J. Biol. Sci., 19: 82-88. (DOI: 10.3923/pjbs.2016.82.88)

Acute Toxicity of Cashew Nut Shell Extract (Anacardium occidentale L.) in Albino Rat (Rattus norvegicus Berkenhout 1769)

Harlita, N.H. Niken Satuti, Mammed Sagi and Pudji Astuti

Abstract

Cashew plant (*Anacardium occidentale* L.) is a crop producing cashew nut shell that contain phenolic compounds such as lacquer oil (cashew nut shell liquid) which can be used for many studies. This study was conducted to determine the potency of acute toxicity (LD_{50}) of cashew nut shell extract on female albino Wistar rats using Weil method. Twenty rats used in this study. The rats was divided into five groups, each consist of four rats after acclimatization. Each group was given the extract of cashew nut shell orally (force-fed). The amount of cashew nut shell extract that were given to group I, II, III and IV were 2.5, 25, 250 and 2,500 mg kg⁻¹ b.wt., respectively, while group V were given 0.5% sodium carboxyl methyl cellulose (CMCNa) solution. Clinical symptoms were observed 24 h after the administration of extract include behavioral changes i.e., licking, scratching, twitching, tremors, wrihing, reactivity to stimuli, cerebral and spinal reflexes, secretions, breath, skin, hair and death. Probit analysis using Weil method was used as an effective dose. The results showed that the potency for acute toxicity (LD_{50}) of cashew nut shell extract was 2,018 mg kg⁻¹ which classified as moderately toxic category. The administration of extract also causes behavioral changes in animal including passivity and mucus secretion. All doses of the extract did not affect the development body weight and the weight of organs (spleen, liver, heart, kidneys and lungs) in female rats.

How to cite this article:

Harlita, N.H. Niken Satuti, Mammed Sagi and Pudji Astuti, 2016. Acute toxicity of cashew nut shell extract (*Anacardium occidentale* L.) in albino rat (*Rattus norvegicus* Berkenhout 1769). Pak. J. Biol. Sci., 19: 89-94. (DOI: 10.3923/pjbs.2016.89.94)

Assessment of Pesticide Residues in Human Blood and Effects of Occupational Exposure on Hematological and Hormonal Qualities

Atef M.K. Nassar, Yehia M. Salim and Farag M. Malhat

Abstract

Pesticides are the first choice by farmers for use against plant pathogens, nevertheless their adverse effects to the environment. Current study was designed to measure pesticides residues in blood of spray farmers and to assess their possible effects. Blood indices and thyroid and reproductive hormones were evaluated in blood of adult male volunteers (20-48 years old). Volunteers were divided to three groups; spray-workers (directly-exposed), farmers who live in the country area (indirectly-exposed) and city inhabitants (not exposed). Spray workers had significantly decreased platelet number (PLT, 33%), ratio of large platelet (P-LCR%, 42%), average platelet volume (MPV, 70%), relative width of the distribution of erythrocytes (PDW, 56%), relative content of monocytes, basophils and eosinophils (MXD, 100%) compared to control group. In addition, blood samples of the exposed group showed significantly decreased PLT (30%), P-LCR (40%), MPV (65%) and PDW (50%) compared to the farmers. Furthermore, levels of testosterone, triiodothyronine and thyroxine hormones of spray workers were significantly low compared with the country residents. Then results were further subjected to canonical discriminant analysis to visualize the interrelationships among variables. Results highlighted the critical need for enforced official interventions that reduce overexposure of spray workers throughout Egypt.

How to cite this article:

Atef M.K. Nassar, Yehia M. Salim and Farag M. Malhat, 2016. Assessment of pesticide residues in human blood and effects of occupational exposure on hematological and hormonal qualities. Pak. J. Biol. Sci., 19: 95-105. (DOI: 10.3923/pjbs.2016.95.105)

Recombinant Engineering of L-Methioninase Using Two Different Promoter and Expression Systems and *in vitro* Analysis of Its Anticancer Efficacy on Different Human Cancer Cell Lines

M.M. Muharram

Abstract

Recombinant methioninase (rMETase) is an enzyme that has antitumor activity. In this work, METase gene from *Pseudomonas putida* ATTCC 8209 was cloned to pT7-7 plasmid (yielded, PT7-METase-R7 clone) and expressed in *E. coli* strain BL21 (DE3). A protein band with a molecular mass of 42 kDa was visualized by SDS-PAGE. The applied protocol yielded a total protein of 3.13 g with a recovery of 66.89% and a specific activity of 18.59 U mg⁻¹ which considered as a low yield. However, when the METase gene was cloned to the vector (pTrc99A, clone: pTrc99A-MET-3) cells of *E. coli* JM109 yielded a total protein of 32.63 g with a recovery of 41.62% and a specific activity of 54.86 U mg⁻¹ which revealed that the enhancement of METase gene expression by *trc* promoter was more than the T7 RNA polymerase promoter. The $t_{1/2}$ of the rMETase was 2 h as analyzed in mice by IV injection. Antitumor efficacy of rMETase was studied in five human cancer cell lines. At 1 U mL⁻¹ the growth rate of treated colon cancer cell lines, Colo205 and SW620, with rMETase was 46 and 32% relative to control, respectively. With the ovarian cancer cell line (A2780) rMETase produced an inhibition effect of 54% at 1.5 U mL⁻¹. In addition, the growth rate was reduced to 45 and 53% with the skin cancer cell line (A375) and the breast cancer cell line (MCF-7), respectively. These results indicate the feasibility of rMETase for use as a potent antitumor agent.

How to cite this article:

M.M. Muharram, 2016. Recombinant engineering of L-methioninase using two different promoter and expression systems and *in vitro* analysis of its anticancer efficacy on different human cancer cell lines. Pak. J. Biol. Sci., 19: 106-114. (DOI: 10.3923/pjbs.2016.106.114)

Level of Heavy Metals in Two Highly Consumed Fish Species at District Lower Dir, Khyber Pakhtunkhwa, Pakistan

Sana Ullah, Said Hassan and Kuldeep Dhama

Abstract

The current study was designed to assess heavy metals' concentration in muscle tissues of two Chinese carps, common carp (*Cyprinus carpio*) and silver carp (*Hypophthalmichthys molitrix*), available to consumers in markets at district Lower Dir, Khyber Pakhtunkhwa, Pakistan. Fish specimens were collected from three main markets in the study area namely; Chakdara, Timergara and Khall. Heavy metals including; manganese (Mn), lead (Pb), iron (Fe), copper (Cu), zinc (Zn), cadmium (Cd) and cobalt (Co) were investigated using atomic absorption spectrophotometer. Cobalt was not detected in any of the fish specimens while the rest of the metals were lying within the permissible limits suggested by FAO/WHO and ITS for food/fish consumption. The results showed a statistically significant (p<0.05) difference between both species with respect to the concentration of the accumulated heavy metals. In common carp, the heavy metal accumulation was in order of Fe>Mn>Zn>Pb>Cd>Cu. Higher concentration of Pb, Mn, Zn, Cu and Cd was recorded in muscle of common carp while the concentration of Fe was higher in silver carp, indicating higher potential of accumulation of heavy metals in common carp. Statistically significant (p<0.05) correlation was observed between Pb and Zn in common carp while between Cu and Cd in silver carp. The concentration of heavy metals was in the suggested permissible limits and poses no threat if consumed. In order to maintain the heavy metals level within permissible limits, proper care should be taken along with regular assessment.

How to cite this article:

Sana Ullah, Said Hassan and Kuldeep Dhama, 2016. Level of heavy metals in two highly consumed fish species at district Lower Dir, Khyber Pakhtunkhwa, Pakistan. Pak. J. Biol. Sci., 19: 115-121. (DOI: 10.3923/pjbs.2016.115.121)

Study of Genetic Marker of Cuscuses (Marsupialia: Phalangeridae) from Maluku and Papua Based on Cytochrome b Gene Sequences

Rony Marsyal Kunda, Niken Satuti Nur Handayani, Hery Wijayanto and Rini Widayanti

Abstract

Cuscuses is marsupials animal (Phalangeridae) which has limited spread in eastern Indonesia (Sulawesi, Maluku, Papua and Timor islands), Australia and Papua New Guinea. The *ex-situ* and *in-situ* conservation of cuscuses under captivating condition is an alternative solution to protect from extinction. This study aimed to determine nucleotide sequences and genetic marker on cyt b gene with sequencing method of each species on two provinces. Whole genome DNA was extracted from 22 samples of cuscuses obtained from different habitats, Maluku (13 individuals) and Papua (8 individuals) according to the protocol of Qiamp DNA Blood Mini Kit (Qiagen) and then it was used as template for amplification of cyt b gene by using PCR method. The PCR product were then purified using column chromatography and were used as template for sequencing reaction. Results sequencing of cyt b gene were analyzed using MEGA program versions 6.0. The PCR product gives results nucleotides of 982 bp according to database GeneBank and sequencing product gives results nucleotides of 771 bp. Nucleotides alignment of Phalanger members was found 24 nucleotides distinguishing and Spilocuscus members was found 11 nucleotides distinguishing, which can be used as genetic marker between Phalanger and Spilocuscus members from Papua and Maluku.

How to cite this article:

Rony Marsyal Kunda, Niken Satuti Nur Handayani, Hery Wijayanto and Rini Widayanti, 2016. Study of genetic marker of cuscuses (Marsupialia: Phalangeridae) from Maluku and Papua based on cytochrome b gene sequences. Pak. J. Biol. Sci., 19: 122-135. (DOI: 10.3923/pjbs.2016.122.135)

Molecular Diagnosis of Clinical Isolates of Cutaneous Leishmaniasis Using ITS1 and KDNA Genes and Genetic Polymorphism of Leishmania in Kashan, Iran

Hadi Ghasemloo, Sima Rasti, Mahdi Delavari and Abbas Doroodgar

Abstract

Cutaneous leishmaniasis is a common skin disease caused by leishmania parasite. An accurate diagnosis of parasites species is possible using molecular techniques. This study was carried out to compare internal transcribed spacer (ITS1) and kinetoplast deoxyribonucleic acid (KDNA) genes for identifying Leishmania species by Polymerase Chain Reaction (PCR), furthermore, genetic diversity of isolates was studied. This research examined 130 patients who were suspected of cutaneous leishmaniasis and referred to Kashan's health centers from 2011-2014. After DNA extraction from serosity, PCR were performed using ITS1 and KDNA primers. Cutaneous Leishmaniasis was diagnosed by the observation of 320 bp band in the ITS1-PCR. The PCR products were digested with restriction enzyme HaeIII and then leishmania species were identified by patterns of enzymatic digestion. The diagnostic criteria of Cutaneous Leishmaniasis (CL) in KDNA-PCR were based on the observation of 760 and 650 bp for *Leishmaniasis tropica* and *Leishmaniasis major*, respectively. Twelve isolates of leishmania were sequenced and the phylogenetic tree was traced using the results of sequencing by Mega 4 software. Out of 130 suspected patients to CL, 70 (53.8%) and 98 (75.4%) isolates were positive by Restriction Fragment Length Polymorphism (RFLP) of ITS1 and KDNA, respectively. Using ITS1 PCR, 60 samples (85.7%) and 10 samples (14.3%) were identified as *L. tropica* and *L. major*, respectively, ITS1-PCR had 25.3% false negative, compare to microscopy. While, microscopy had false negative in 13 cases compare to KDNA-PCR. Due to the lower sensitivity of the PCR-RFLP of ITS1, KDNA-PCR is recommended for diagnosis of CL. The *L. tropica* and *L. major* are the causative agents of CL.

How to cite this article:

Hadi Ghasemloo, Sima Rasti, Mahdi Delavari and Abbas Doroodgar, 2016. Molecular diagnosis of clinical isolates of cutaneous leishmaniasis using ITS1 and KDNA genes and genetic polymorphism of leishmania in kashan, Iran. Pak. J. Biol. Sci., 19: 136-142. (DOI: 10.3923/pjbs.2016.136.142)

Characterization of *Cladosporium* Species by Internal Transcribed Spacer-PCR and Microsatellites-PCR

Mohammed S. Alhussaini, Mohamed Adbo Moslem, Mohammed I. Alghonaim, Abdullah A. Al-Ghanayem, Abdulrahman A.I. AL-Yahya, Hamido M. Hefny and Adbul Moneam Saadabi

Abstract

Background: This investigation compared genetic similarities and diversities within and among *Cladosporium* species populations using the two PCR-based markers; Internal Transcribed Spacer (ITS)-PCR and microsatellite-PCR. **Methodology:** Nuclear ribosomal DNA internal transcribed spacers have been used to analyze intraspecific and interspecific relationships in various fungi. In the present study, the internal transcribed spacer (ITS)-PCR and microsatellite-PCR were used to identify the genetic diversities in *Cladosporium* species. **Results:** The Internal Transcribed Spacer (ITS) was amplified using polymerase chain reaction combining primers ITS4 and ITS5. The PCR products were digested with three restriction enzymes and separated by agarose gel electrophoresis. Restriction patterns generated by *CfoI* and *MspI* and *RsaI* were unique for most species assayed. The ITS-PCR fingerprinting methods led to a clear differentiation of the isolates at the species level. Fingerprinting profiles generated readily discriminated between each of the 6 species. Cluster analysis further supported this observation and clusters corresponding to each species were readily identified in the dendrograms. Seven microsatellite primers out of eight primers were unable to generate visible DNA fingerprints. **Conclusion:** Amplification experiments demonstrated that microsatellite primer, T3B and (GTG)₅ are technically simple tools for assaying genetic variability in *Cladosporium* spp.

How to cite this article:

Mohammed S. Alhussaini, Mohamed Adbo Moslem, Mohammed I. Alghonaim, Abdullah A. Al-Ghanayem, Abdulrahman A.I. AL-Yahya, Hamido M. Hefny and Adbul Moneam Saadabi, 2016. Characterization of *Cladosporium* species by internal transcribed spacer-PCR and microsatellites-PCR. Pak. J. Biol. Sci., 19: 143-157. (DOI: 10.3923/pjbs.2016.143.157)

Growth and Nutrient Status of Kayu Kuku [*Pericopsis mooniana* (Thw.) Thw] with Mycorrhiza in Soil Media of Nickel Post Mining Site

Husna, R. Sri Wilarso Budi, Irdika Mansur and Cecep Kusmana

Abstract

Background: Arbuscular Mycorrhizal Fungi are categorized as phytoremediant and increase the tolerance of plants under condition of heavy metal pollution. Effectiveness of AMF is determined very much by species of AMF, plant species and environmental condition. Therefore, testing the effect of local AMF on growth and absorption of nutrients and metal by *Pericopsis mooniana* planting stocks in growing media which are heavily polluted by heavy metal, need to be conducted. **Methodology:** There were testing of 6 inoculums of local AMF which were isolated from rhizosphere of *P. mooniana*, namely AMF from district of Kolaka (Lamedai Nature Reserve, Tanggetada Natural Forest, Bali Jaya Village Plantation Forest and PT. Vale Indonesia Tbk) and from Kendari town (Campus environment of Halu Oleo University and Office of Southeast Sulawesi Governor). Besides the 6 local AMF, there were treatment without AMF (control) and treatment with mycofer as comparison. **Results:** Results showed that local AMF were effective in increasing growth and biomass of plant; absorption of C, N, P and K in three parts of the plants; Ca in stems and leaves and of Mg in leaf tissues; increasing formation of plant's root nodules and were able to reduce Ni content in tissues of kayu kuku planting stocks. Effects of local AMF from Lamedai nature reserve and AMF from PT. Vale Indonesia were greater as compared with those of mycofer IPB. Content of Ni in kayu kuku plant tissue was found more in roots as shown by the value of TF<1. **Conclusion:** Based on this study, kayu kuku is categorized as excluder species (TF<1) and moderate species toward Ni (>50 mg Ni/kg of plant dry weight) and possessed very high dependence on AMF (MIE >75%). Local AMF are potential to be developed as biological fertilizer to improve planting stocks for rehabilitation of degraded land.

How to cite this article:

Husna, R. Sri Wilarso Budi, Irdika Mansur and Cecep Kusmana, 2016. Growth and nutrient status of kayu kuku [*Pericopsis mooniana* (Thw.) Thw] with mycorrhiza in soil media of nickel post mining site. Pak. J. Biol. Sci., 19: 158-170. (DOI: 10.3923/pjbs.2016.158.170)

Evaluation of the Antiplasmodial Activity and Lethality of the Leaf Extract of *Cassia alata* L. (Fabaceae)

O. Da, R.S. Yerbanga, M. Traore/Coulibaly, B.K. Koama, Z. Kabre, S. Tamboura, Z.P. Dakuyo, M.P. Sekhoacha, M.G. Matsabisa, J.B. Nikièma, J.B. Ouedraogo and G.A. Ouedraogo

Abstract

Objective: *Cassia alata* L. (Fabaceae), one of the three plants contained in Saye, a polyherbal antimalarial remedy was assessed for its antimalarial potential and safety in mice. **Methodology:** Organic extracts were prepared from the leaves and tested on the D_{10} chloroquine-sensitive strain of *Plasmodium falciparum* using the parasite lactate dehydrogenase assay. The 4 days suppressive test using *Plasmodium berghei* in mice was used to evaluate the *in vivo* antiplasmodial activity of the extracts. Animals were treated by oral route, once a day with 50, 100, 250 and 400 mg kg⁻¹ b.wt., of the extracts. The acute toxicity of the extracts was assessed in mice according to Thompson and Weil method. The lethal effects of the extracts on animal's body weight, tissues, biochemical and haematological parameters were determined at 823.5, 1235.5, 1853 and 2779.5 mg kg⁻¹ b.wt., respectively. **Results:** The dichloromethane/methane (1:1, v/v) extract of *Cassia alata* was the most active against *Plasmodium falciparum*. The mean percent suppression of parasitemia in mice was equal to 22.5, 41.8 and 45.2% at 50, 250 and 400 mg kg⁻¹ b.wt., respectively. No death and no clinically significant changes were recorded in mice. The maximum non-lethal dose was more than 16875 mg kg⁻¹ in animals. No significant changes were observed in body weight, tissues morphology, biochemical and hematological parameters at doses above or equal to 2779.5 mg kg⁻¹ b.wt. **Conclusion:** The dichloromethane/methane/methanol leaf extract of *Cassia alata* had a good to moderate *in vitro* and *in vivo* antiplasmodial activity and was found to have low toxicity at high doses in tested animals.

How to cite this article:

O. Da, R.S. Yerbanga, M. Traore/Coulibaly, B.K. Koama, Z. Kabre, S. Tamboura, Z.P. Dakuyo, M.P. Sekhoacha, M.G. Matsabisa, J.B. Nikièma, J.B. Ouedraogo and G.A. Ouedraogo, 2016. Evaluation of the antiplasmodial activity and lethality of the leaf extract of *Cassia alata* L. (Fabaceae). Pak. J. Biol. Sci., 19: 171-178. (DOI: 10.3923/pjbs.2016.171.178)

Evaluation of Hematological and Biochemical Activity of Ethanolic Extract of *Zygophyllum simplex* **Linn. in Wistar Rats**

Haytham M. Daradka

Abstract

Background and Objective: *Zygophyllum simplex* is commonly used in Saudi Arabia for the treatment of horny patches of skin and as an anthelmintic, analgesic and anti-inflammatory. The experiment was to aimed at to evaluate the constituents of *Zygophyllum simplex* extract and their effect on blood biochemical parameters in Wistar male rats. **Methodology:** The plant extract was orally administered to the rats (n = 10) at two doses of 250 and 500 mg kg⁻¹ b.wt., for 30 days. Its effects on glucose, total cholesterol, triglycerides, aspartate aminotransferase (AST), alanine aminotransferase (ALT), serum creatinine kinase (CK), total protein, total bilirubin and blood urea were investigated. **Results:** The results showed a significant decrease in total serum cholesterol, blood glucose and CK levels. However, levels of AST, ALT, triglycerides, total bilirubin, total protein and blood urea were unaltered. **Conclusion:** In conclusion, the ethanolic extract of *Z. simplex* may act as hypoglycemic and hypolipidimic in rats.

How to cite this article:

Haytham M. Daradka, 2016. Evaluation of hematological and biochemical activity of ethanolic extract of *Zygophyllum simplex* Linn. in wistar rats. Pak. J. Biol. Sci., 19: 179-184. (DOI: 10.3923/pjbs.2016.179.184)

Measurement of Interleukin-6 in Cerebrospinal Fluid for the Diagnosis of Bacterial Meningitis

Ibrahim Dan Dano, Hassimi Sadou, Bassira Issaka and Odile Ouwe Missi Oukem-Boyer

Abstract

Objective: It is assessed whether the measurement of interleukin-6 in the cerebrospinal fluid can serve as a biomarker for the diagnosis of bacterial meningitis. **Methodology:** Cerebrospinal fluid was obtained from 152 patients aged 0-15 years suspected of having meningitis. These patients were classified into the following groups: Bacterial meningitis (n = 85), aseptic meningitis (n = 35) and non-meningitis/control (n = 32) based on leukocyte count and bacterial identification by culture and molecular biology. Interleukin-6 concentrations in cerebrospinal fluid were measured by enzyme-linked immunosorbent assay. **Results:** This study found a significant difference of the mean cerebrospinal fluid interleukin-6 level (p<0.01) between patients with bacterial meningitis (3,538.69±2,560.78 pg mL⁻¹) and patients with aseptic meningitis (332.51±470.69 pg mL⁻¹) or those of the control group (205.83±79.39 pg mL⁻¹). There was also a significant difference of the mean cerebrospinal fluid glucose and total protein. At a cut-off value of 1,065.96 pg mL⁻¹, interleukin-6 had a sensitivity of 76.2% and specificity of 100%. **Conclusion:** Interleukin-6 is a potential biomarker for the differential diagnosis of meningitis.

How to cite this article:

Ibrahim Dan Dano, Hassimi Sadou, Bassira Issaka and Odile Ouwe Missi Oukem-Boyer, 2016. Measurement of interleukin-6 in cerebrospinal fluid for the diagnosis of bacterial meningitis. Pak. J. Biol. Sci., 19: 185-190. (DOI: 10.3923/pjbs.2016.185.190)

Isolation, Purification and Characterization of Antimicrobial Agent Antagonistic to *Escherichia coli* ATCC 10536 Produced by *Bacillus pumilus SAFR-032* Isolated from the Soil of Unaizah, Al Qassim Province of Saudi Arabia

Abdurrahman S. Alanazi, Kamal Ahmad Qureshi, Gamal Osman Elhassan and Elsayed I. El-Agamy

Abstract

Background: Escherichia coli is one of the most common pathogenic bacteria, which cause urinary tract infections in infants as well as in adult human beings. Due to the emergence of antibiotic resistance in E. coli, there is a great demand of new antimicrobial agent for the treatment of infections caused by such E. coli. This study aims to isolate, identify and characterize the native soil-bacterial strains predominate in the soil of Unaizah city, which produce antimicrobial agent antagonistic to E. coli ATCC 10536, followed by isolation, purification and characterization of antimicrobial agent, Materials and Methods: Pour plate, spread plate and 16S rRNA sequence analysis methods were followed for the isolation and identification of soil bacteria. Ammonium sulphate and dialysis (MWCO-8 KD) methods were followed for the isolation and partial purification of antimicrobial agent from the cell free broths. The characterization of antimicrobial agent was carried out by determining the minimum inhibitory concentration and effects of temperature and pH on the antimicrobial stability. Results: Out of the twenty five soil samples, only one soil-bacterial strain was found to produce antimicrobial agent antagonistic to E. coli ATCC 10536. The isolated soil bacterium was identified as Bacillus pumilus SAFR-032. The soil isolate was characterized and results suggest that 30°C temperature and pH 7.0 were the optimum growth parameters and soybean casein digest broth was the best fermentation medium, whereas the highest production of antimicrobial agent was at 35°C temperature, pH 7.0, shaking at 150-220 rpm and at 60th h of incubation. The maximum yield of antimicrobial agent was obtained at 60% of $(NH_d)_2SO_4$ The results of characterization of antimicrobial agent suggest that the maximum and minimum antimicrobial activities were at pH 3.0 and 8.0, respectively, whereas antimicrobial activity was unaffected by temperature. The antimicrobial agent was highly stable at varying range of temperature 50-120°C. Minimum inhibitory concentration of antimicrobial agent was found to be 64 μ g mL⁻¹. Conclusion: In conclusion, this study might be a great endeavor for the healthcare industry in order to treatment of different infections caused by E. coli and that warrants further investigations to fully standardized and establish the antimicrobial profile of effect(s) of this isolate.

How to cite this article:

Abdurrahman S. Alanazi, Kamal Ahmad Qureshi, Gamal Osman Elhassan and Elsayed I. El-Agamy, 2016. Isolation, purification and characterization of antimicrobial agent antagonistic to *Escherichia coli* ATCC 10536 produced by *Bacillus pumilus* SAFR-032 isolated from the soil of Unaizah, Al Qassim province of Saudi Arabia. Pak. J. Biol. Sci., 19: 191-201. (DOI: 10.3923/pjbs.2016.191.201)

Diversity of Butterflies (Lepidoptera) in Manembo-Nembo Wildlife Reserve, North Sulawesi, Indonesia

Roni Koneri and Pience V. Maabuat

Abstract

Background and Objective: The degradation of a habitat will affect the population of butterflies living in it. This study aims to analyse the diversity of butterflies in the area of Manembo-Nembo Wildlife Reserve, North Sulawesi. **Materials and Methods:** Employing purposive sampling, the study was conducted for five months. The collection of butterflies was done by using the sweeping technique, following the transect line applied randomly along 1000 m to three types of habitat (the primary forest, riverside in the forest and agricultural land). The species diversity was determined by using diversity index (Shannon-Wiener). **Results:** The study identified 4 families, 44 species and 748 individual butterflies. Nymphalidae was a family predominantly found (71.12%), while the species mostly found was *Ideopsis juventa tontoliensis* (10.16%). Abundance (76.50), richness (20.25), diversity (2.66) and species evenness (0.88) were mostly found in riverside habitats in the forest, while the lowest was found in the primary forest. The similarities of butterfly communities in the different types of habitat indicate that the highest similarity index of butterfly communities is in the habitats of the primary forest and riverside. **Main conclusion:** The high diversity of butterflies in all types of habitats found in riverside. **Main conclusion:** The high diversity of butterflies in the river is strongly influenced by the presence of vegetation as food and host plants of butterflies and this habitat should be conserved for the survival of the butterfly in a wildlife reserve Manembo-Nembo, North Sulawesi. It is expected that the results of this study could become important data of the diversity of butterflies and effects of changes of habitats on the diversity of butterflies in Manembo-Nembo Wildlife Reserve, North Sulawesi.

How to cite this article:

Roni Koneri and Pience V. Maabuat, 2016. Diversity of butterflies (Lepidoptera) in Manembo-Nembo Wildlife Reserve, North Sulawesi, Indonesia. Pak. J. Biol. Sci., 19: 202-210. (DOI: 10.3923/pjbs.2016.202.210)

Hypoglycemic and Hypolipidemic Effects of Seed Extract from *Antidesma bunius* (L.) Spreng in Streptozotocin-induced Diabetic Rats

Pichaya Chowtivannakul, Buavaroon Srichaikul and Chusri Talubmook

Abstract

Background: *Antidesma bunius* (L.) Spreng has been reported to possess various beneficial medicinal properties. Scientific information about this plant is limited. This study was therefore, designed to determine hypoglycaemic and hypolipidemic effects of ethanol seed extract from *A. bunius* (ABSE). Antioxidant activity and also acute toxicity were conducted. **Methodology:** The hypoglycaemic and hypolipidemic effects were studied by oral giving ABSE at a dose of 250 mg kg⁻¹ to streptozotocin-induced diabetic rats daily for 6 weeks. Antioxidant activity was studied using DPPH assay. The ABSE at the doses of 500, 1000, 1500 and 2000 mg kg⁻¹ were employed in the acute toxicity study. **Results:** The results revealed that ABSE significantly (p<0.05) reduced the blood glucose level and recovered the pathology of hematological values, but significantly (p<0.05) increased the body weight and slightly increased serum insulin of the diabetic rats. However, ABSE recovered pathology of hematological values, but affected renal and hepatic functions in the treated rats by producing an alteration of creatinine, albumin, total protein, BUN and ALP. Interestingly, ABSE increased WBC and HDL, but reduced CHOL, LDL and TG both in normal and diabetic

ABSE treated rats. The ABSE possessed relatively low antioxidant activity with IC_{50} of 2174±14.24 mg mL⁻¹ compared to vitamin C (1.48±0.07 µg mL⁻¹). Fortunately, ABSE did not produce any symptoms of acute toxicity and mortality in the rats. **Conclusion:** The ethanol seed extract from *A. bunius* possesses hypoglycemic and hypolipidemic effects. The ABSE also recovered the pathology of the hematology but may cause renal dysfunction in the diabetic rats. The hypoglycemic and hypolipidemic effects are likely due to its antioxidant and insulin secretion activities.

How to cite this article:

Pichaya Chowtivannakul, Buavaroon Srichaikul and Chusri Talubmook, 2016. Hypoglycemic and hypolipidemic effects of seed extract from *Antidesma bunius* (L.) Spreng in streptozotocin-induced diabetic rats. Pak. J. Biol. Sci., 19: 211-218. (DOI: 10.3923/pjbs.2016.211.218)

Effect of Water Salinity on the External Morphology of Ovarian Maturation Stages of Orange Mud Crab, *Scylla olivacea* (Herbst, 1796) in Captivity

A. Amin-Safwan, H. Muhd-Farouk, M. Nadirah and M. Ikhwanuddin

Abstract

Background and Objective: Mud crab from the genus *Scylla* are considered as one of the most demanded seafood items nowadays as their flesh has high quality, tasty and higher growth rate thus support and boosted expansion in aquaculture sector especially in Malaysia. Present study was designed to focus on the effect of water salinity on the ovarian maturation of orange mud crab, *Scylla olivacea* based on morphological characteristics. **Methodology:** Samples were collected from Setiu wetlands, Terengganu, Malaysia from July-September, 2015. Ovarian maturation of *S. olivacea* was classified into four stages based on previous study which were: Immature (Stage 1), early mature (Stage 2), late mature (Stage 3) and fully mature (Stage 4). **Results:** Morphologically as the ovary develop the colouration start to change from translucent or whitish in colour and sometimes creamy to pale yellow, follow by light orange and lastly reddish orange. Stage 1 ovary was translucent and whitish in colour, stage 2 ovary was pale yellow in colour, stage 3 was light orange and stage 4 ovary was reddish orange in colour. Gonad Somatic Index (GSI) of *S. olivacea* remained low at stage 1 and 2 and began to increase started at stage 3. This present study involved three different salinities treatments, which treatment 1 (10 ppt), treatment 2 (20 ppt) and treatment 3 (30 ppt). Treatment 2 produce the highest number of stage 4 ovarian maturation based on colouration and the highest GSI recorded, follow by treatment 1 and lastly treatment 3. **Conclusion:** This present study proved that salinity does affected the ovarian maturation of *S. olivacea* in captivity and provides important information regarding the effect of water salinity on ovarian maturation for further studies on reproductive biology of this species.

How to cite this article:

A. Amin-Safwan, H. Muhd-Farouk, M. Nadirah and M. Ikhwanuddin, 2016. Effect of water salinity on the external morphology of ovarian maturation stages of orange mud crab, *Scylla olivacea* (Herbst, 1796) in captivity. Pak. J. Biol. Sci., 19: 219-226. (DOI: 10.3923/pjbs.2016.219.226)

Influence of L-carnitine on the Expression Level of Adipose Tissue miRNAs Related to Weight Changes in Obese Rats

Maryam Nazari, Alihossein Saberi, Majid Karandish, Niloofar Neisi, Mohammad Taha Jalali and Manoochehr Makvandi

Abstract

Background and Objective: Molecular mechanisms of most anti-obesity drugs are remained to be clear. MicroRNAs that are noncoding RNA molecules supposed to regulate biological processes concomitant to obesity and have attracted a lot of attention to themselves. The *miR-27a* and *miR-143* expression levels in obese and non-obese rats during weight changes and L-carnitine (LC) effects on them was investigated in this study. **Materials and Methods:** In the present study 12 male Wistar rats were

randomly divided into normal fat diet and high fat diet groups to develop obesity. After 8 weeks rats were weighted and half of diet induced obese rats were randomly selected to receive 200 mg LC kg⁻¹ b.wt. for 4 weeks. At the end epididymal fat was isolated to investigate expression level of microRNAs by real-time PCR. **Results:** After 12 weeks, high fat diet in comparison with normal fat diet mediated significant decrease and increase in expression levels of *miR-27a* and *miR-143*, respectively. These changes were modified in groups, which had received LC in a 4 weeks period. Furthermore, rats in this group gained less weight. **Conclusion:** Findings of this study suggest that the changes of microRNAs expression probably play a role in pathogenesis of obesity, might be modulated by means of dietary agents and supplements and modify weight gain trend.

How to cite this article:

Maryam Nazari, Alihossein Saberi, Majid Karandish, Niloofar Neisi, Mohammad Taha Jalali and Manoochehr Makvandi, 2016. Influence of L-carnitine on the expression level of adipose tissue miRNAs related to weight changes in obese rats. Pak. J. Biol. Sci., 19: 227-232. (DOI: 10.3923/pjbs.2016.227.232)

Methicillin-resistant *Staphylococcus aureus* Nasal Carriage Among Patients Admitted at Shaqra General Hospital in Saudi Arabia

Mohammed S. Alhussaini

Abstract

Background and Objective: Methicillin-resistant *Staphylococcus aureus* (MRSA) have been causing increasing problems in hospitals and nursing homes worldwide. Limited number of studies in Saudi Arabia has attempted to investigate infection and risk factors associated with nosocomial acquired MRSA. The present study was undertaken to determine the occurrence, prevalence, antibiotic susceptibility pattern and genetic characteristics of MRSA among admitted cases at Shaqra General Hospital (Saudi Arabia). **Methodology:** This study was conducted from October, 2014 to March, 2015. Nasal swabs were taken from 220 patients (105 males and 115 females) admitted at Shaqra General Hospital. The isolates were identified as *S. aureus* based on morphology, Gram stain, catalase test, coagulase test and mannitol salt agar fermentation. Antibiotic susceptibility testing of MRSA was performed with standard disk diffusion method. All methicillin-resistant isolates were examined for the existence of the *mecA* gene by PCR technique. **Results:** Of the 220 patients, 90 (40.91%) were found to be nasal carriers of *S. aureus*. Among these 90 *S. aureus* isolates, 48 (21.82%) were MRSA. A statistically significant difference was only found for antibiotics usage between those with and without MRSA colonization. Antibiotic susceptibility pattern of isolated MRSA showed high susceptibility to vancomycin, linezolid, rifampicin, teicoplanin, complete resistance to penicillin, ampicillin, oxacillin and cefoxitin and intermediate resistance to amikacin, ciprofloxacin, teicoplanin, tetracycline and vancomycin. **Conclusion:** A high prevalence of multidrug-resistant MRSA nasal carriage was found. The identification of MRSA carriers is a step towards establishing a control policy for MRSA and helps to identify measures needed to reduce colonization pressure.

How to cite this article:

Mohammed S. Alhussaini, 2016. Methicillin-resistant *Staphylococcus aureus* nasal carriage among patients admitted at shaqra general hospital in Saudi Arabia. Pak. J. Biol. Sci., 19: 233-238. (DOI: 10.3923/pjbs.2016.233.238)