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Reproductive Effort of Some Annual and Perennial Plant Species: Impact of Successional Sequence, Habitat Conditions and Plant Size

Syed Shahid Shaukat^a, Moazzam Ali Khan^{a*}, Sahar Zaidi^b, Muhammad Faheem Siddiqui^b, Nasarullah Khan^b and Hina Zafar^b

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(received November 11, 2012; revised May 14, 2013; accepted June 26, 2013)

Abstract. The reproductive effort of some annual and perennial plant species was investigated with respect to successional sequence, habitat conditions and plant size. In the psammose succession (dune succession), the reproductive effort (RE) of *Cressa cretica* and *Atriplex griffithii* was significantly greater in the early stage compared to that in late succession. Likewise, in relation to lithosere succession, *Sporobolus arabicus*, *Pluchea lanceolata* and *Vernonia cinerescens* all showed high reproductive effort in early part of succession compared to that of late succession. The annuals (*S. arabicus* and *P. lanceolata*) exhibited greater reproductive effort compared to the perennial species *Vernonia cinerescens*. Examination of the impact of site differences on reproductive effort showed that four grasses including *Setaria intermedia*, *Chloris barbata*, *Cenchrus biflorus*, and *Eragrostis pilosa* were found to have significantly ($P < 0.05$) greater reproductive effort in site 1 (near cultivated field), compared to site 2 (a vacant lot), which had low nutrient level compared to site 1. The reproductive effort of *Sonchus asper* (a composite) did not exhibit significant difference between sites. The investigation of relationships between plant size (volume) and reproductive effort of *Solanum forskalii*, *Senna holosericea* and *Heliotropium ophioglossum* showed positive correlations between plant size and reproductive effort. *Solanum forskalii* and *Senna holosericea*, in particular, exhibited a close association in this respect. It is concluded that: 1) RE is greater in early compared to late succession, 2) RE changes with the habitat and 3) there seems to be a direct relationship between RE and plant size.

Keywords: reproductive efforts, succession, sand dunes, soil analysis, plant-size

Amino Acids Profile of the Fancy Meats of the African Giant Pouch Rat (*Cricetomys gambianus*)

Emmanuel Ilesanmi Adeyeye

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(received November 23, 2011; revised March 27, 2013; accepted May 14, 2013)

Abstract. The levels of amino acids were determined in the tongue, liver, kidney and heart (fancy meats) of African Giant pouch rat (*Cricetomys gambianus*) on dry weight basis. The results showed that the total essential amino acids ranged from 40.2-43.8 g/100 g crude protein or 46.4-48.4% of the total amino acids. The amino acid scores showed that Lys ranged from 0.97-1.12 (on whole hen's egg comparison), 1.10-1.27 (on provisional essential amino acid scoring pattern), and 1.04-1.20 (on suggested requirement of the essential amino acid of a pre-school child). The predicted protein efficiency ratio was 2.15-2.62, the essential amino acid index range was 1.14-1.31 and the calculated isoelectric point range was 4.82-5.22. The chi square (X^2) test was low and none of the parameters were significantly different at $\alpha = 0.05$ on all the comparisons made. Results had good comparison with whole hen's egg protein and other standard proteins.

Keywords: red viscera, amino acids profile, *Cricetomys gambianus*

Enhancement of the Nutritional Value of Whey Drink by Supplementing with Leaves of *Moringa oleifera*

Muhammad Nadeem*, Imtiaz Hussain, Muhammad Abdullah and Fazal Rehman

Department of Dairy Technology, University of Veterinary and Animal Science, Lahore, Pakistan

(received April 16, 2012; revised April 10, 2013; accepted April 11, 2013)

Abstract: The effect of supplementing *Moringa oleifera* leaf powder (MOLP) on the nutritional and sensory characteristics of whey drink was investigated. Whey drink was supplemented with MOLP at four different concentrations i.e., 1% MOLP (T₁), 2% MOLP (T₂), 3% MOLP (T₃), 4% MOLP (T₄) and compared with a control (T₀). The addition of MOLP at any level did not have a negative effect on pH and acidity of whey drink. Iron content of T₄ increased from 0.17 to 115 mg/100 mL, total phenolic content of MOLP was 7.4 g/100 g on dry weight basis (gallic acid). Vitamin C increased from 1.46 to 2.20 mg/100 g in T₄. The overall acceptability score of T₄ was 6.9 out 9 (total score) which was more than 76%. These results suggest that nutritional value of whey can be increased by supplementing with 4% dry leaves of *M. oleifera* in the form of a whey based drink with acceptable sensory characteristics.

Keywords: *Moringa oleifera*, leaf powder, whey drink, iron, malnutrition

Evaluation of the Functional Food Potential of Bamirad (a Ginger-Spiced) Cheese Produced in the Western Highlands of Cameroon

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(received July 2, 2012; revised May 4, 2013; accepted May 6, 2013)

Abstract. In this study, cheese was modified to enhance its functional characteristics thereby encouraging its consumption. Consequently, a ginger-spiced cheese (Bamirad) was produced and the effects of feed supplementation with cheese on blood lipid profile were evaluated using 36 male Wistar rats in four groups. Total cholesterol, high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol and triacylglycerols were determined. There were significant ($P < 0.05$) changes indicating: weekly increases of triacylglycerols for all treatments, higher total cholesterol for the 0.0 % ginger treatment, and a decline of low-density lipoprotein for 1.0 % ginger treatment. The LDL/HDL ratio was very low, indicating that this cheese is a functional food, a potential exploitable for the well-being of the consumer.

Keywords: Bamirad cheese, functional food, lipid profile.

Prevalence and Diagnostic Test Comparison of Brucellosis in Cattle in Pabna and Mymensingh Districts of Bangladesh

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(received June 1, 2012; revised March 1, 2013; accepted March 21, 2013)

Abstract. Present study was undertaken to determine the seroprevalence of brucellosis in cattle of Pabna and Mymensingh districts in Bangladesh. A total of 260 cattle sera samples were collected from Pabna and Mymensingh districts. The epidemiological data were collected by structured questionnaire. RBT and SAT were used as screening tests and further confirmed by I-ELISA. The seroprevalence of *Brucella* in cattle was estimated to be 4.23%, 3.07% and 2.31% by RBT, SAT and I-ELISA, respectively. The comparison of the serological tests result revealed the highest prevalence in RBT than SAT and I-ELISA. The prevalence of *Brucella* was 2.5% in Pabna and 2.14% in Mymensingh. It was observed that, a higher prevalence of *Brucella* was found in female (2.67%) than in male (1.82%), natural breeding (2.67%) than artificial breeding (1.81%), in aged animals (3.33%) than young (1.25%). But these differences were not statistically significant. There exists significant difference between prevalence of *Brucella* in cattle with history of abortion than without history of abortion (P value=0.013).

Keywords: brucellosis, cattle, diagnosis, epidemiology, Bangladesh

Effects of Temperature Variation and Pellet Dimension on Settling Velocity of Fish Feed Pellets

Mohammad Shoaib*, Aasia Karim, Samreen Imtiaz and Saima Naz

Department of Zoology, University of Karachi, Karachi 75270, Pakistan

(received May 22, 2012; revised March 1, 2013; accepted April 22, 2013)

Abstract. In the present research, investigation was carried out for variation in settling velocity of some pelletized fish pellets in relation to floating time (T_f), diameter of pellets and temperature along with their water absorption properties under defined laboratory conditions. Among two diets of different ingredients DI and DII, it was observed that time for float (T_f) were greater at high range of temperature than lower range of temperature, for all tested pellets dimension (3 mm, 6 mm, 9 mm) of both diets DI and DII, while in case of settling velocity against high temperature range, lower values of settling velocities were recorded which shows an inverse relationship between them. On the other hand percent weight increments for diet DI were noted maximum for pellets size of 3,6 and 9 mm after 10 min of immersion i.e., 33.33, 55.55 and 38.46%, respectively, when compared to dry pellets.

Keywords: artificial fish feed, settling velocity, floating time, water absorption, water dispersion

Short Communication

Antagonistic Activity of Bacterial Strains Isolated from Human Producing Biological Control Agents

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Muzaffarabad, Azad Kashmir, Pakistan

(received November 19, 2012; revised April 16, 2013; accepted April 19, 2013)

Abstract. In present research the antagonistic activity of human bacterial pathogens *viz.*, *Streptococcus pyogenes*, *Staphylococcus epidermidis*, *Klebsiella pneumonia*, *Staphylococcus aureus*, *Serratia marcescens*, *Escherichia coli* and *Pseudomonas aeruginosa* were analysed. Significant amount of lactic acid production was shown by *S. pyogenes*, *S. epidermidis* and *P. aeruginosa* (63 mg/mL, 54 mg/mL, and 54 mg/mL), while *S. pyogenes* and *S. epidermidis* also produced significant quantity of hydrogen peroxide (1.70 mg/mL and 1.605 mg/mL). An impressive diversity of spots of chemical constituents was also obtained through thin layer chromatography (TLC) from broth culture of bacterial strains. The antagonistic activity may be indicated the potency of lactic acid and hydrogen peroxide production to inhibit the microbes.

Keywords: lactic acid, hydrogen peroxide, antagonistic activity, biological control agent

Short Communication

Effect of Arthropods Abundance on the Red Junglefowl Population in Oil Palm Plantation Habitat

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(received May 16, 2011; revised February 30, 2013; accepted March 21, 2013)

Abstract. The study was conducted for one year in the 4-year and 8-year old oil palm plantation at Sungai Sedu Estate, Selangor, Malaysia, to observe whether the abundance of arthropods affects the density of red junglefowl (*Gallus gallus spadiceus*). The arthropods were collected by three methods i.e., litter, pitfall and sweep net. The results indicated that the arthropods abundance in both the study areas was found to be almost similar. It is suggested that arthropods abundance has little effect on the density of red junglefowl in oil palm plantation.

Keywords: arthropods, red junglefowl density, oil palm plantation, *Gallus gallus spadiceus*

Review

Nitrogen Fertilizer Management Strategies for Rice Production in Bangladesh

Abu Turab Mohammad Ali Choudhury^{ab*}, Mohammad Abu Saleque^a, Shafiuddin Kaisar Zaman^a, Nurul Islam Bhuiyan^a, Abdul Latif Shah^a and Mohammad Shamsur Rahman^a

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(received November 22, 2012; revised December 31, 2012; accepted January 4, 2013)

Abstract. Various ways of increasing nitrogen (N) fertilizer use efficiency in rice culture has been evaluated by conducting field experiments at Bangladesh Rice Research Institute (BRRI). Nitrogen fertilizer use efficiency in rice culture can be increased by root-zone application of modified forms of urea like urea large granule (ULG) and urea super granule (USG). The efficiency of urea-N can be increased to some extent even by injection of the conventional prilled urea (PU) into the root-zone of the rice plant by the instrument "Pneumatic Urea Injector". Application of sulphur (S) along with N increases N use efficiency in rice culture in S deficient soils. Modern rice varieties having relatively taller plant stature can exploit more soil N for grain production compared to short statured varieties. Different varieties require different amounts of N for maximum grain yield and it is important to note it to avoid indiscriminate application of a single N rate for all the varieties.

Keywords: nitrogen fertilizer, rice production, environmental pollution control

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