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Short Communication

Occurrence of *Staphylococcus aureus* in Milk Based Sweet Products Consumed in Karachi, Pakistan

**Korish Hasnain Sahir, Zulfiqar Ali Mirani, Muhamamd Naseem Khan,
Shagufta Naz and Seema Ismat Khan**

Entomophily, Ornithophily and Anemochory in the Highly Self-incompatible *Boswellia ovalifoliolata* Bal. & Henry (Burseraceae), an Endemic and Endangered Medicinal Tree Species

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(received September 14, 2010; revised January 16, 2012; accepted February 25, 2012)

Abstract. *Boswellia ovalifoliolata* (Burseraceae) has been investigated for its reproductive biology. Its flowering, fruiting and seed dispersal events occur in leafless state during dry season. The flowers are small, bisexual, mildly odoriferous and actinomorphic; weakly protandrous but strictly self-incompatible. Insects and sunbirds pollinate the flowers but floral characteristics suggest that entomophily is the principal mode. Bud and flower feeding by a weevil and flower and fruit feeding by the Palm Squirrel have been found to be greatly affecting the success of sexual reproduction. The garden lizard serves as a predator of pollinating insects, especially bees and wasps; while acting so it affects the pollination rate in this tree species. Fruit set in open-pollination is below 10% while it is up to 34% in manual cross-pollination. The study suggests that limitation of cross-pollination, space constraint for seed production from all ovules of the flower and availability of limited resources to the tree with rocky, dry and limited litter in the floor of the forest seem to be the constraints for higher fruit set. Mature fruits dehisce and disseminate their light weight, papery and winged seeds with the aid of wind. The study site being windy provides the necessary driving force for effective dispersal of seeds away from parental trees. Seed germination occurs following rainfall but the growth and development of seedlings depends on soil water and nutritional status. Field observations indicate that the success rate of seedling recruitment is highly limited and it could be due to nutrient-poor soil and water stress resulting from dry spells during rainy season.

Keywords: *Boswellia ovalifoliolata*, self-incompatibility, entomophily, ornithophily, anemochory

Prospects of Using Gypsum to Conserve Water and Improve Wheat Yield in Rainfed Aridisols

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(received August 30, 2011; revised November 19, 2012; accepted November 27, 2012)

Abstract. A long term field study (2005-10) was carried out at the farmer's field to evaluate the residual effect of gypsum on soil moisture conservation and wheat production under rainfed conditions. The treatments included application of gypsum @ 0, 1 and 2 t/ha, and its comparison with farmer practice (F.P). The basal dose of fertilizers NPK was applied @ 120, 80, 60 kg/ha every year before the sowing of wheat. Soil samples were collected before the sowing of wheat every year for soil moisture determination. Gypsum application not only resulted in an increase in soil moisture contents (up to 41%) but also improved grain yield up to 23% and straw yield up to 19%. The effect of gypsum was noticeable during low rainfall years compared to control (0 t/ha gypsum). The results showed that the gypsum could be an effective additive for soil amendment, enhancing wheat yield in rainfed areas by conserving soil moisture and nutrients.

Keywords: gypsum, wheat, moisture, rainfed, soil moisture

Genetic Divergence Analysis in Pumpkin

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(received June 9, 2011; revised January 5, 2012; accepted January 30, 2012)

Abstract. Genetic divergence among 18 pumpkin genotypes was estimated using Mahalanobis's D^2 statistic. Altogether four clusters were formed where cluster I contained the highest number of genotypes (8) and cluster II contained the lowest (1). The highest intra-cluster distance was observed for cluster I (0.831) and the lowest for cluster IV (0.651). The highest inter-cluster distance was observed between cluster I and II (24.346). Cluster II recorded the highest mean for fruit number/plant, TSS, fruit yield and minimum in cavity length and cavity diameter. Cluster III had the second highest mean for fruit diameter, fruit number/plant, individual fruit weight, fruit yield and the fewest number of days to 1st female flowering, earliness being a desirable trait. These crosses may produce new recombinants with desirable traits.

Keywords: genetic diversity, pumpkin, cluster analysis

Poisoning by Plants in the Taza-Al Hoceima-Taounate Region in Morocco

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(received September 20, 2011; revised September 7, 2012; accepted September 12, 2012)

Abstract. A descriptive retrospective-study was carried out on poisoning cases by plants in Taza-Al Hoceima-Taounate region in Morocco, reported between 1984 and 2007 to the Moroccan Poison Control Centre. During this period, 104 cases of poisoning were recorded. *Atractylis gummifera* was the most incriminated plant. The average age of poisoned patients was 11 ± 7.8 years. The sex ratio (M/F) was 0.9. According to the data, poisoning by plants was primarily responsible for gastrointestinal system disorders, nervous system attacks, visual disorders and heart failure. A lethality rate of 33.65% was recorded, with a total of thirty-five deaths.

Keywords: poisoning plants, *Atractylis gummifera*, Morocco, lethal effect

High-Performance Liquid Chromatographic Quantification of Rifampicin in Human Plasma: Method for Therapeutic Drug Monitoring

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(received January 11, 2012; revised March 28, 2012; accepted June 11, 2012)

Abstract. A high performance liquid chromatography (HPLC) method has been developed that allows quantification of Rifampicin in human plasma. The method is based on the precipitation of proteins in human plasma with methanol. Optimal assay conditions were found with a C18 column and a simple mobile phase consisting of 0.05 M dipotassic hydrogen phosphate buffer and acetonitrile (53/47, V/V) with 0.086 % diethylamin, pH = 4.46. The flow-rate was 0.6 mL/min and the drug was monitored at 340 nm. Results from the HPLC analyses showed that the assay method is linear in the concentration range of 1-40 µg/mL ($r^2 > 0.99$). The limit of quantification and limit of detection of Rifampicin were 0.632 µg/mL and 0.208 µg/mL, respectively. Intraday and interday coefficient of variation and bias were below 10% for all samples, suggesting good precision and accuracy of the method. Recoveries were greater than 90% in a plasma sample volume of 100 µL. The method is being successfully applied to therapeutic drug monitoring of Rifampicin in plasma samples of tuberculosis and staphylococcal infections patients.

Keywords: rifampicin, liquid chromatography, therapeutic drug monitoring

Determination of Limonin and Nomilin Contents in Different Citrus Cultivars Using High Performance Liquid Chromatography

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(received April 5, 2012; revised October 31, 2012; accepted November 18, 2012)

Abstract. High performance liquid chromatography (HPLC) analysis was done to quantify the amount of limonoids (limonin and nomilin) in seven selected citrus cultivars. According to the HPLC analysis red blood orange (*Citrus sinensis* var *red blood orange*) had maximum amount of limonin (479.77 µg/mL), while rough lemon (*Citrus jambhiri*) had no limonin content. In case of nomilin, rough lemon (*Citrus jambhiri*) had maximum amount of nomilin (54.23 µg/mL), while succari (*Citrus sinensis* var *succari*) had very low amount of nomilin (0.37 µg/mL).

Keywords: limonin, nomilin, HPLC, citrus fruits

Susceptibility of Multidrug Resistant Enterotoxigenic *Escherichia coli* to Saponin Extract from *Phyllanthus niruri*

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(received January 31, 2012; revised June 6, 2012; accepted June 7, 2012)

Abstract. *Escherichia coli* were isolated from 140 samples of blood, urine, stool and water made up of 15.7%, 42.9%, 30.0% and 25.7%, respectively. From the samples, 71.9% enterotoxigenic *E. coli* (ETEC), 14.3% enteropathogenic *E. coli* (EPEC), 7.1% enterohemorrhagic *E. coli* (EHEC) and 7.1% enteroinvasive *E. coli* (EIEC) occurred as diarrheagenic *E. coli*. Of the ETEC (240) isolates tested for susceptibility to eight conventional antibiotics, 110 (46.0%) showed resistance to all the tested antimicrobial agents. However, of the resistant strains; 24 (22.0%) were multidrug resistant. These were tested against 3.0 mg/mL of saponin extract from *Phyllanthus niruri* and 13 (55.0%) of these were susceptible to the saponin. The antimicrobial activities of saponin from *P. niruri* are of interest since the crude extract was effective at concentration of 3.0 mg/mL to multiple resistant isolates of ETEC.

Keywords: diarrheogenic *E. coli*, multidrug resistant, *E. coli* pathotypes, saponin, *Phyllanthus niruri*

Heavy Metals Contamination in Fish and Shrimp from Coastal Regions of Karachi, Pakistan

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(received April 26, 2012; revised October 11, 2012; accepted November 13, 2012)

Abstract. In the present study, the heavy metals (Pb, Cu, Cd, Fe, Zn) concentration was determined by using atomic absorption spectrophotometer (AAS) in 5 species of fish and 3 species of shrimp commonly taken by locals at the coastal regions of Karachi, Pakistan. Concentrations of Cd and Pb studied in tissues of Mushka (*Otolithes ruber*; 0.120 and 1.018 µg/g wet weight) and *Palaemon longirostris* shrimp (2.457 and 0.480 µg/g wet weight) were found near to safe level for human consumption. Mullet, Tarli, Surmai, Dohtar fishes and Blacktiger shrimp were found contaminated by Cd and Pb but still within the limits fit for and human consumption. The distribution of trace metals detected in all fish and shrimp species followed the order of Zn > Pb > Fe > Cu > Cd and Cd > Fe > Zn > Cu > Pb, respectively. Metal concentration exhibited significant species variation and followed the order in fishes as *Otolithes ruber* > *Liza vaigiensis* > *Sardinella albella* > *Scomberomorus guttatus* > *Pomadasy olivaecum* and in shrimp as *Palaemon longirostris* > *Penaeus monodon* > *Penaeus penicillatu*.

Keywords: heavy metals, fish, shrimp, tissues, Karachi coast

Study of Human Cystic Echinococcosis in Hyderabad, Pakistan

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(received January 31, 2012; revised April 4, 2012; accepted June 21, 2012)

Abstract. In order to determine the zoonotic importance of cystic echinococcosis (CE) problem in the humans, a study was conducted of patients record available at the Department of Histopathology, Liaquat University of Medical and Health Sciences, Jamshoro. Data was recorded from 1998 to 2008 by using pre-designed proforma. During that period 44 cases of hydatid cysts were recorded out of 43656 registered cases. Highest prevalence of hydatid cysts was recorded in 1999 (0.21%) and the lowest in 2002 (0.02%), whereas no case was registered in 2003 (0%), respectively. Cystic echinococcosis was more efficiently recorded in females (68.18%) as compared to males (31.81%). To calculate the age wise CE in the population; the total population was divided into four age groups **A** (5-20 years), **B** (21-40 years), **C** (41-60 years) and **D** (61 years - onward). The occurrence of CE was highest recorded in age group **B** (50%) and lowest in-group **D** (4.54%).

Keywords: cystic echinococcosis, Zoonotic disease, dogs

Short Communication

Occurrence of *Staphylococcus aureus* in Milk Based Sweet Products Consumed in Karachi, Pakistan

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(received June 13, 2011; revised July 31, 2012; accepted September 26, 2012)

Abstract. A total of 290 samples of milk-based products of Khoya (75), Qalaqand (75), Rabri (65) and Rusmalai (75) were tested for occurrence of *Staphylococcus aureus*. The total staphylococcal counts ranged from 1.0×10^3 to 5.7×10^4 cfu/g, 1.0×10^2 to 6.0×10^3 cfu/g, 1.0×10^3 to 3.1×10^4 cfu/g and 1.3×10^3 to 4.0×10^3 cfu/g in Khoya, Qalaqand, Rabri and Rusmalai samples, respectively. All the samples tested were found contaminated with staphylococci, however, the percentage of *S. aureus* was low as compared to coagulase -ve staphylococci. Only 6.7% of Rusmalai samples (only 1.72% of all the samples tested) were found free of coagulase +ve *S. aureus*. About 8% of Khoya (6 out of 75), 28% of Qalaqand (21 out of 75), and 40% of Rabri (26 out of 65) samples were found to be hazardous for human health as they contained coagulase +ve *S. aureus* whereas, none of the Rusmalai samples was found contaminated with coagulase +ve *S. aureus*.

Keywords: *Staphylococcus aureus*, Staphylococci, khoya, qalaqand, rabri, rusmalai
