

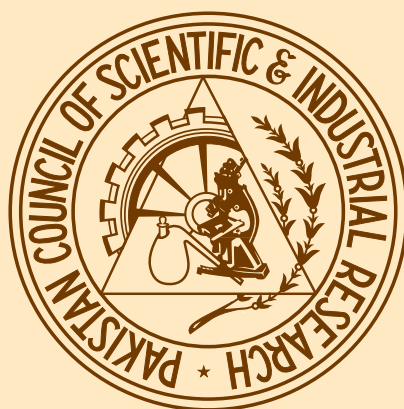
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**Vol. 54, No.3, November - December, 2011**

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## **Efficient Method of Choosing Potential Parents and Hybrids: Line × Tester Analysis of Spring Wheat (*Triticum aestivum* L.) Cultivars**

**Muhammad Jurial Baloch\*, Inayat Ali Mallano, Abdul Wahid Baloch, Wajid Ali Jatoi and  
Nasreen Fatima Veesar**

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(received May 19, 2010; revised July 30, 2011; accepted August 17, 2011)

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**Abstract.** The study was conducted to estimate the general combining ability (GCA) and specific combining ability (SCA) of wheat genotypes crossed in a line × tester fashion. The mean squares due to F<sub>1</sub> hybrids, female lines, male testers/pollinators and lines × tester interaction were significant for majority of the characters studied. The significance of GCA and SCA variances thus suggested that both additive and non-additive genes were controlling majority of the characters, yet additive genes were more prominent because variances due to GCA by and large were higher than due to SCA. Among the three female lines evaluated, Khirman displayed maximum positive GCA effects for spike length (0.08) and seeds/spike (0.67), while other female lines which showed maximum positive GCA effects were Mehran for plant height (3.05), number of tillers/plant (1.00), spikelets/spike (1.92) and seed index (3.42) and Kiran for seeds/spike (0.67) and yield/plant (1.86). From the male testers, TD-1 exhibited greater GCA effects for number of tillers/plant (2.96), spikelets/spike (0.25), seed index (0.61) and yield/plant (2.22), whereas, Marvi displayed highest positive GCA effects for plant height (2.88), spike length (0.37) and seeds/spike (6.41). The specific combining ability estimates indicated, if hybrid crop development is feasible then, crosses Mehran × TD-1 for spike length; Kiran × TD-1 for plant height and seeds/spike and Khirman × Marvi for number of tillers/plant, spikelets/spike, seed index and yield/plant may be the hybrids of choice.

**Keywords:** combining ability, line × tester analysis, quantitative traits, *Triticum aestivum* L. additive genes, non-additive genes

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## **Sulphur Supply Enhances Wheat Growth and Yield on Saline-Sodic Soil**

**Muhammad Arshadullah\*, Syed Ishtiaq Hyder and Arshad Ali**

Land Resources Research Institute, National Agricultural Research Centre, Islamabad, Pakistan

(received November 10, 2010; revised June 15, 2011; accepted June 20, 2011)

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**Abstract.** The effect of different S levels (0, 25, 50 and 75 kg S/ha) on growth and ionic concentration of wheat variety Inqilab-91 directly sown on saline-sodic soil ( $EC_e=5.65$  dS/m,  $pH=8.57$  and  $SAR=17.38$ ) was evaluated in a field experiment. Treatments were arranged using randomized complete block design (RCBD) with three replications. The crop was harvested at maturity, data on tillering, plant height, spike length, number of grains/spike, 1000- grain weight and yields (grain and straw) were recorded. Na, K, Ca and S concentrations in grain and straw were estimated using atomic absorption spectroscopy. Tillering, number of grains/spike, 1000- grain weight and grain yield significantly ( $p \leq 0.05$ ) increased by enhancing the S application. Maximum wheat yield (4.66 t/ha) was recorded when S was applied at 75 kg/ha, which was 43% more than the control treatment. Maximum number of tillers/plant (161) and number of grains/spike (56) were recorded with sulphur applied at 75 kg/ha. Positive correlation ( $r = 0.85$ ), ( $r = 0.88$ ) between calcium, potassium and negative correlation ( $r = -0.84$ ) between grain sodium content and wheat grain yield was recorded. It indicates that presence of significantly higher Ca and K contents of grain receiving S application might possibly help plants to attain more Ca and K and avoided sodium uptake to alleviate salinity/sodicity stress. Economical analysis showed that maximum value cost ratio (5.5:1) was achieved with the application of 25 kg S/ha.

**Keywords:** wheat growth, gypsum application, salt affected soil, sulphur levels

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## Effect of Growth Regulators for *in-vitro* Mass Multiplication of Marigold

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Karachi-75280, Pakistan

(received May 11, 2010; revised October 27, 2010; accepted December 22, 2010)

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**Abstract.** This study describes an effective and reproducible protocol for the mass multiplication of marigold (*Tagetes erecta* L.) for commercial purpose. Twenty five different combinations of BAP, IAA, GA<sub>3</sub> and AgNO<sub>3</sub> were added to the basal MS medium to culture marigold explants. The highest mean number (4.83±0.49) and length (5.28 cm ±1.06) of healthy shoots per explant was observed in media supplemented with 2 mg/L BAP along with 2 mg/L IAA. When these shoots were sub-cultured for root development, the maximum number (17.08±2.44) and length (13.67 cm ±0.98) of roots were produced in media supplemented with 4mg/L BAP and 2 mg/L IAA. Addition of gibberellic acid and AgNO<sub>3</sub> did not have any significant effect on shoot proliferation and root development of marigold.

**Keywords:** tissue culture, marigold, shoot proliferation, root proliferation, *Tagetes erecta* L.

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## **High Density Culture of a Cladoceran *Moina micrura* (Kruz, 1874) by Using Poultry Manure**

**Mehraj Ud Din War and Kareem Altaff**

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The New College, Chennai-600 014, India

(received October 21, 2010; revised March 7, 2011; accepted April 28, 2011)

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**Abstract.** The branchipod *Moina micrura* was mass cultured using three different concentrations (250 ppm, 500 ppm, and 1000 ppm) of chicken manure in the medium for 21 days. In the first concentration (250 ppm), the maximum density ( $1694.44 \pm 9.68$ ) of *M. micrura* was obtained on the 9<sup>th</sup> day of inoculation and the number of plankton declined gradually afterwards. In the second concentration (500 ppm), the maximum density ( $7296.88 \pm 54.35$ ) appeared on the 11<sup>th</sup> day while in the third concentration (1000 ppm), the maximum density ( $1510 \pm 15.27$ ) was obtained on the 14<sup>th</sup> day of inoculation. Temperature range of 27-31 °C and pH of 6-7 was conducive for optimal growth of *M. micrura*.

**Keywords:** live feed, *Moina micrura*, mass culture, poultry manure

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# The Composition and Relative Abundance of Fish Species in a Mangrove Creek in the Niger Delta, Nigeria, Based on Different Types of Gear

Blessing Julius Oribhabor<sup>a\*</sup>, Mfon Timothy Udo<sup>a</sup>, Lawrence Etim<sup>a</sup> and  
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(received May 5, 2010; revised September 12, 2010; accepted October 2, 2010)

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**Abstract.** The composition and relative abundance of fish species assemblage of a mangrove creek in the Niger Delta, Nigeria based on different types of gear was assessed at four stations between November 2004 and June 2006. The overall community structure was made up of 25 species of 16 families. Visual observation showed that tilapia species comprising of *Sarotherodon melanotheron* and *Tilapia guineensis* were the most dominant species. Samples from baited entrance traps indicated that *S. melanotheron* dominated *T. guineensis*. Samples from baited hook and line, and cast net showed dominance of *P. elongatus* followed by *P. quadrifilis*. (The baited hook and line is commonly used by the fishers because it is effective in catching diversity of species, except that it is unable to catch bottom feeders such as mullets and tilapia species). Funnel entrance trap had the highest species selectivity, catching only tilapia species. Cast net was more selective in species catch than baited hook and line, but it was effective in catching both pelagic and benthic species. Among the fish species, members of the families: Sciaenidae, Polynemidae, Ariidae, Monodactylidae and Cichlidae were permanent residents; Carangidae, Luthjanidae and Serranidae were temporary residents; while Elopidae, Gobiidae, Dasyatidae, Cynoglossidae, Sphyrnidae and Trichiuridae were rare species.

**Keywords:** composition, fish species, mangrove creek, Niger delta

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# Effect of Different Temperatures and Host Plants on the Biology of the Long-Tailed Mealy Bug *Pseudococcus longispinus* (Targioni and Tozzetti) (Homoptera: Pseudococcidae)

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(received July 2, 2010; revised April 7, 2011; accepted April 30, 2011)

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**Abstract.** Experiments were done to determine the effects of different temperature levels and three host plants namely, *Cucurbita moschata* (butternut squashes), *Solanum tuberosum* var. Desiree (red potato), and *Solanum tuberosum* var. Cara (white potato) on the biology of mealy bug *Pseudococcus longispinus* (Targioni and Tozzetti). It was found that the temperature had a significant effect on the development period of both male and female mealy bugs. For males the period decreased with increasing temperatures up to 28 °C, but increased thereafter and host plant had no effect, except at 24 °C. All the aspects of females including total pre-adult, prelarviposition, larviposition period, life span, fecundity and sex ratio were affected by the fluctuating temperatures, but host plant produced no effect on fecundity and sex ratio.

**Keywords:** mealy bug, temperature, host plants, life span, sex ratio

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## Laboratory Evaluation of Toxic and Repellent Properties of *Dracaena arborea* Against *Sitophilus zeamais* and *Callosobruchus maculatus*

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(received August 11, 2010; revised September 5, 2011; accepted September 17, 2011)

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**Abstract.** Laboratory evaluation of ethanolic extract of *Dracaena arborea* leaves partitioned between equal volumes of chloroform, ethyl acetate, *n*-hexane and *n*-butanol to obtain various fractions was carried out to assess contact toxicity on filter paper and by topical application, toxicity of extracts applied on grains and repellent action against *Sitophilus zeamais* (Mots.) and *Callosobruchus maculatus* Fabricius on stored grains. Insects were exposed to both treated and untreated surfaces and mortality was scored at different times after treatment. Results obtained from the study showed the extract fractions causing significant mortality of both insects exposed to treatments. A contact toxicity of over 80% was recorded against *S. zeamais* from ethyl acetate fraction. Similarly, 100% mortality was recorded against *C. maculatus* from ethyl acetate fraction after 96 h of treatment. Results obtained from grain treatment produced a significant mortality of over 60% against *C. maculatus* from *n*-hexane fraction while the aqueous fraction significantly killed *S. zeamais* by over 15% compared with the control treatment. A strong repellent action was evoked against *S. zeamais* while moderate action was recorded against *C. maculatus*. An overall repellency of 40% and 24% was recorded from various extract fractions against *S. zeamais* and *C. maculatus*, respectively. The results obtained suggest a promising alternative to synthetic insecticides and the incorporation of *D. arborea* into storage pest management system is advised.

**Keywords:** toxicity, *Sitophilus zeamais*, *Dracaena arborea*, stored grains, extract fractions *maculatus*, *Callosobruchus*, repellency

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## **Evaluation of Neutralizing Efficacy of *Acorus calamus* and *Withania somnifera* Root Extracts Against *Bangarus caeruleus* Venom**

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<sup>b</sup>Department of Microbiology, Ayya Nadar Janaki Ammal College (Autonomous), Sivakasi, India

(received February 14, 2011; revised May 19, 2011; accepted June 18, 2011)

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**Abstract.** *Acorus calamus* and *Withania somnifera* root extracts when tested against *Bangarus caeruleus* venom, both the plant extracts neutralized various pharmacological activities induced by *B. caeruleus* venom. About 0.12 mg of *A. calamus* and 0.15 mg of *W. somnifera* root extracts completely neutralized the lethal activity of 2LD<sub>50</sub> of *B. caeruleus* venom. Various pharmacological activities like haemorrhagic, coagulance, edematic, fibrinolytic and phospholipase activities were effectively neutralized by both the extracts.

**Keywords:** venoms, plant extracts, lethality, *Acorus calamus*, *Withania somnifera*, *Bangarus caeruleus*

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## Fungi Isolated from Produced Water and Water-Soluble Fraction of Crude Oil

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(received September 5, 2010; revised June 3, 2011; accepted August 15, 2011)

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**Abstract.** This study was sought to determine the fungi present in the produced water (PW) and water-soluble fraction (WSF) of crude oil as a preliminary approach to determining that fungi can survive in crude oil polluted water and their possible use in bioremediation. Different concentrations of PW and WSF of crude oil samples from Ughelli East Flow Station in Delta State of Nigeria were exposed to onion (*Allium cepa*) primordial cells at different concentrations for twelve days. Thereafter, samples of the PW and WSF were cultured on Potato Dextrose Agar. Isolates of *Thamnidium* sp, *Gelasinospora* sp, *Zygorhynchus* sp and *Colletotrichum* sp were found. *Zygorhynchus* and *Colletotrichum* were associated with PW while *Thamnidium* and *Gelasinospora* associated with the WSF. There were changes in the pH and turbidity of the PW and WSF before and after exposure to *Allium cepa* cells. At 25% level of treatments there were significant differences in pH and turbidity values of the PW and WSF at  $P < 0.05$  and  $P > 0.01$  before and after exposure to the plant.

**Keywords:** bioremediation, crude oil, fungi, water soluble fraction, produced water, pollution

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## The Effect of Preservation Methods on the Nutritional Quality of Fluted Pumpkin (*Telfairia occidentalis*) Leaves

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(received July 8, 2010; revised July 26, 2011; accepted August 4, 2011)

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**Abstract.** The present research was undertaken to investigate the effect of various blanching and drying treatments on the vitamin C,  $\beta$ -carotene, iron, protein content and drying time of fluted pumpkin (*Telfairia occidentalis* Hook) leaves. The leaves were subjected to sun or oven drying alone or after blanching in boiling water, dilute citric acid (0.3%) or dilute potassium meta-bisulphite (0.5%). In the absence of blanching pre-treatment, oven drying resulted in shorter drying time for the leaves and a higher vitamin C content of the dried product than sun drying and there was no significant difference ( $p>0.01$ ) between the protein,  $\beta$ -carotene and iron content of the oven and sun dried products. Leaves blanched in boiling water, dilute citric acid, or dilute potassium meta-bisulphite solution, followed by sun or oven drying had less vitamin C, iron, protein and  $\beta$ -carotene than leaves dried without blanching. Compared with the use of boiling water, blanching in boiling potassium meta-bisulphite reduced the loss of  $\beta$ -carotene, protein and iron; blanching in dilute citric acid reduced the loss of iron. Except for citric acid pre-treatment, blanching prior to drying shortened drying time.

**Keywords:** fluted pumpkin leaves, blanching, citric acid, potassium metabisulphite, drying, nutrients

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## Short Communication

# Biochemical and Molecular Genetic Studies on Some Cyanobacterial Isolates

**Ehab Abdel-Razik Kamel<sup>\*a</sup>, Samier Abdel-Aziz Ebrahim<sup>b</sup>, Rabea Abdel-Tawab Thabet<sup>c</sup>  
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(received September 26, 2010; revised June 10, 2011; accepted June 15, 2011)

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**Abstract.** In the present study, the isolation and purification of a set of Cyanobacteria strains belonging to genus *Oscillatoria* was undertaken, followed by the analyses of phylogenetic relationships using different biochemical and molecular genetic techniques (SDS-PAGE and RAPD-PCR). A total of 45 protein bands were observed within the studied *Oscillatoria* isolates by SDS-PAGE (only three unique bands, eight monomorphic bands and 37 polymorphic bands). On the other hand, extracted DNA from isolates was used to identify the molecular fingerprints. A sum of 94 polymorphic bands was generated by these primers in the *Oscillatoria* genotypes under study. A total of 20 unique bands were identified out of the polymorphic ones. These unique bands were used to discriminate among the studied *Oscillatoria* isolates. Most isolates of *Oscillatoria* genotypes were discriminated by one or more unique bands. Numerical taxonomic using 45 protein attributes of 19 isolates and RAPD markers on five isolates. Two methods - Clustering (UPGMA) and Principal Component Analysis (PCA) were used for these analyses. The similarities and clusters produced between the studied isolates were discussed.

**Keywords:** cyanobacteria strains, protein banding pattern (SDS-PAGE), RAPD-PCR, numerical analysis, phylogenetic relationships, *Oscillatoria*

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