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Contents

REVIEW ARTICLE

- Andrographis paniculata*: A review on ethnomedicinal potential and biological activities
— **Nirlep Kour** -----1-6

RESEARCH ARTICLES

- Seasonal profile of soil spore bank of ferns in a semi-natural forest of Hooghly district, West Bengal, India and its implication in conservation
— **Madhuparna Hore, Aninda Mandal, Subikash Biswas, Suwendu Dey, Jayita Biswas, Mithun Biswas and Sudha Gupta** ----- 7-10

- Screening of sugarcane germplasm for traits related to diversified uses
— **K. Praveen, M. Hemanth Kumar, D.M. Reddy and K. Hariprasad Reddy** -----11-18

- Result of diverse storage structures on potato tuber rots and weight loss in potato (*Solanum tuberosum* L.) var. Kufri badshah
— **Prashant B. Sandipan, Shanadre, C.M., Rathod, N.K., Nital N. Patel and D.T. Chaudhari** -----19-22

- Influence of plant extracts on larval and pupal development of *Elicoverpa armigera* (Hubner)
— **P.K. Bhagat and G.P. Painkra**-----23-27

- Growth response in *Lycopersicon esculentum* Mill. on exposure to Endosulfan and Malathion
— **Manisha Gautam, Shefali Poonia and Purushottam**-----29-32

- Evaluation of site-specific nutrient management approach in transplanted rice under sub-humid condition of southern Rajasthan
— **Hargilas**-----33-36

- PGPR: An alternative in sustainable agriculture
— **Madhu Malik and Minu Gupta** -----37-40

- Effect of organic and inorganic sources of nutrient on productivity, nutrient uptake and economics of rice (*Oryza sativa* L.)
— **Suresh Kumar, Ram Bharose, Alok Kumar and S.F.A. Zaidi**-----41-44

RESEARCH COMMUNICATIONS

- Performance of combination of herbicides on growth factors, yield and energetics of transplanted rice (*Oryza sativa* L.)
— **Bharati Sahu, G.K. Shrivastava and A.P. Singh** -----45-47

- Effects of phosphorus levels and weed management on grain yield and phosphorus content in Pigeonpea and Soybean intercropping system
— **G.P. Banjara, Ambika Tandon, Bhumika Banjara and S.S. Porte** -----49-50

ANDROGRAPHIS PANICULATA: A REVIEW ON ETHNOMEDICINAL POTENTIAL AND BIOLOGICAL ACTIVITIES

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Received-19.12.2015, Revised-30.12.2015

Abstract: *Andrographis paniculata* Nees (Acanthaceae) the 'Kalmegh' of Ayurveda is an erect annual herb extremely bitter in taste. It is also known as 'BhuiNeem', since the plant though much smaller in size shows similar appearance and has bitter taste as that of Neem. Present review reflects its ethnomedicinal uses. Since ancient times, *A. paniculata* is used as a wonder drug in traditional Siddha, ayurvedic systems of medicine as well as in tribal medicine in India. The plant extract exhibits antityphoid and antifungal activities. Kalmegh is also reported to possess antihepatotoxic, antibiotic, antimalarial, antithrombogenic, antiinflammatory, antisnakevenom and antipyretic, anti HIV activity. As the dependence on herbal medication is increasing day by day, this review may be helpful for further research on this wonderful medicinal plant.

Keywords: *Andrographis*, Kalmegh, Antihepatotoxic, Antithrombogenic, Antiinflammatory

SEASONAL PROFILE OF SOIL SPORE BANK OF FERNS IN A SEMI-NATURAL FOREST OF HOOGHLY DISTRICT, WEST BENGAL, INDIA AND ITS IMPLICATION IN CONSERVATION

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Abstract: The vertical structures of live and total fern spore banks were studied during summer, rainy, and winter seasons in a semi-natural forest situated at Mankundu region (22.885877, 88.391903 and 22.848333, 88.342603) of Hooghly District, West Bengal, India. A reservoir of vertically distributed live fern spore bank (LFSB) is established in the region. However, not all the spores present in soil samples could retain their viability for germination to establish gametophytic generation and subsequently sporophyte formation. The best reservoirs are 0-5 cm soil depth in summer and rainy seasons; while, 5-10 cm in winter. The sporophytic plants developed from gametophytes through *in vitro* soil culturing have adapted successfully in natural environment, and fulfilled the objective for establishing fern conservation through natural soil spore bank study.

Keywords: Mankundu, Spore germination, Prothallial development, Sporophytic generation, *Ex situ* conservation

SCREENING OF SUGARCANE GERmplasm FOR TRAITS RELATED TO DIVERSIFIED USES

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Abstract: Sugarcane has diversified uses; apart from sugar and jaggery extraction, it is being used for cogeneration and ethanol production. Germplasm is the basic raw material with repository of beneficial traits. Constant evaluation and characterization of the existent, yet uncharacterized germplasm is useful and is the cornerstone for the development of new and better varieties. A systematic study was conducted to evaluate one hundred and thirty one germplasm accessions including four checks for quality and yield attributes. All the varieties varied greatly for different traits. Germplasm accessions possessing traits related to diversified uses were grouped and elucidated. The accessions; 2003T129, 2005T16, 2005T50, 86V96, 2003T123, 95V74, 2006T36 and 2006T3 were found to possess characters that are considered for promotion of varieties for improving cane and CCS production and the accessions; 85R186, 97R383, BO91, 93R113, 97R7, 83V288, 97R424, 2000A213, 2002V2, 94A73, and 2005T89 were observed as reservoirs for production of promising sugarcane varieties suitable for cogeneration and paper making purpose. The genotypes, 2006T3, 2005T50, 93A145, 97R272, Co1148, 87A298, 2005T52 and 2004T68 can be exploited in breeding programmes for production of ethanol efficient varieties.

Keywords: Sugarcane, Germplasm, Cogeneration, Paper making, Ethanol

Journal of Plant Development Sciences Vol. 8(1)

RESULT OF DIVERSE STORAGE STRUCTURES ON POTATO TUBER ROTS AND WEIGHT LOSS IN POTATO (*SOLANUM TUBEROSUM* L.) VAR. KUFRI BADSHAH

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Abstract: Four different storage structures were evaluated viz., cold storage, country cold storage, heap method and rustic cum diffuse light storage. After 100 days of storage period, rottage incidence and weight loss were recorded. Minimum rottage incidence and weight loss was found in cold storage that is 16.31 % and 8.30 % followed by rustic cum diffuse light method 33.75 % and 12.35 %, country cold storage having 46.99 % and 20.70 % and maximum rottage incidence and weight loss was found in heap method 62.71 % and 27.45 % respectively.

Keywords: Cold storage, Country cold storage, Heap method, Rustic cum diffuse light storage

Journal of Plant Development Sciences Vol. 8(1)

INFLUENCE OF PLANT EXTRACTS ON LARVAL AND PUPAL DEVELOPMENT OF *ELICOVERPA ARMIGERA* (HUBNER)

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Abstract: Fourteen plant extracts namely mango ginger rhizome, bergera leaf, calotropis leaf, tulsi leaf, thusa leaf, dhatura leaf, ipomia leaf, neem leaf, garlic leaf, ginger rhizome, bel leaf, harsingar leaf, neem cake and turmeric rhizome were tested for their toxic effect against the gram pod borer, *Helicoverpa armigera* (Hubner). Each extract was tested in three concentrations (100, 500 and 1000 ppm) incorporated in the semisynthetic diet. The weight of larval and pupal development were observed on different concentration in different interval.

Keywords: Plant, Extract, Mango, Leaf

Journal of Plant Development Sciences Vol. 8(1)

GROWTH RESPONSE IN *LYCOPERSICON ESCULENTUM* MILL. ON EXPOSURE TO ENDOSULFAN AND MALATHION

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Abstract: The effect of three different concentrations (0.05%, 0.15% and 0.25%) of endosulfan and malathion was observed on the growth of two varieties of tomato, viz. Pusa Ruby and Pusa Early Dwarf. The length and weight of root and shoot were studied on treatment with the two pesticides. It was observed that at low concentration of malathion the growth was stimulated in both root and shoot of both the varieties. On the other hand growth was reduced at high concentrations with both endosulfan and malathion. Reduction was more in root than shoot. Root weight ratio, shoot weight ratio and root shoot ratio were also analyzed. A significant effect was observed with endosulfan and the effect with malathion were less deleterious.

Keywords: Endosulfan, Malathion, Tomato, Growth, Root, Shoot

Journal of Plant Development Sciences Vol. 8(1)

EVALUATION OF SITE-SPECIFIC NUTRIENT MANAGEMENT APPROACH IN TRANSPLANTED RICE UNDER SUB-HUMID CONDITION OF SOUTHERN RAJASTHAN

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Abstract: Site-specific nutrient management (SSNM) is a new approach that provides the proper quantity and timely supply of nutrients to the crop plants according to its requirement in the existing soil and climate. With this background, a field experiment was conducted on a fixed site at Agriculture Research Station (MPUAT), Banswara, Rajasthan, during two consecutive *khariif* seasons of 2008 and 2009 to evaluate the plant based SSNM strategy for rice crop. The experiment consisted of seven treatments with the application of different category of nutrients, including control and State Fertilizer Recommendation (SFR). SSNM treatment (T₄) gave a maximum grain yield (74.00q ha⁻¹) which was recorded significantly 10, 12, 30, 55 and 58% higher compared to the Improved fertilizer recommendation (T₃), State fertilizers recommendation (T₂), SSNM-P (T₆), SSNM-N (T₅), and absolute control (T₁), respectively. The grain yield increased in T₄ could be recorded the maximum tillers (352 m⁻²), Panicles (340 m⁻²), grains (150.30 panicle⁻¹). The maximum B: C ratio (3.54) was also recorded with SSNM (T₄). The yield lower in N and P omission from SSNM treatments indicated that there is large response to added N but low response to added P due to variation in indigenous soil nutrient supply. Hence, high variability to applied N, P, K suggests the necessity of SSNM to improve the productivity of rice crop.

Keywords: Rice, SSNM, Grains yield, Nutrient

Journal of Plant Development Sciences Vol. 8(1)

PGPR: AN ALTERNATIVE IN SUSTAINABLE AGRICULTURE

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Abstract: In the current farming practices, the use of PGPR as an alternative is likely to increase the soil fertility and produce better crop yield than the conventional mode of farming. This type of agriculture uses special farming techniques. Sustainable agriculture is vital in today's world as it offers the potential to meet our agricultural needs. In the present farming practice, PGPR and environmental resources can be fully utilized. The alternative scientific technologies are productive, economic, resource serving and appropriate to many farming situations all over India. Thus the technique is ecofriendly and ensures safe and healthy agricultural products. Microbial populations are instrumental to fundamental processes that drive stability and productivity of agro-ecosystems.

Keywords: PGPR, Sustainable agriculture, Conventional method, Biological farming, Mineralization

Journal of Plant Development Sciences Vol. 8(1)

EFFECT OF ORGANIC AND INORGANIC SOURCES OF NUTRIENT ON PRODUCTIVITY, NUTRIENT UPTAKE AND ECONOMICS OF RICE (*ORYZA SATIVA* L.)

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Abstract: A field experiment was conducted at Instructional Farm of Narendra Deva University of Agriculture and Technology, Kumarganj, Faizabad (U.P.) during the *Kharif* 2013 to evaluate the Effect of Organic and inorganic sources of nutrient on productivity and nutrient uptake of rice (*Oryza sativa* L.). Twelve treatments comprised with different integrated modules of organic, inorganic and biofertilizer combinations. The various integrated nutrient management modules significantly influenced the yield, economic and nutrient uptake by rice. Among integrated modules the application of 100% RDF received maximum yield (60.61 grain and 78.86 straw q ha⁻¹) and nutrient uptake followed by 75% RDF+ 25% N (FYM+GM+BGA). The highest net return (78,409.00) and benefit: cost ratio (2.80) was computed under treatment T₂-100% RDF which was closely followed by 75% RDF+ 25% N (FYM+GM+BGA).

Keywords: INM yield, Economic and nutrient uptake of rice

Journal of Plant Development Sciences Vol. 8(1)

PERFORMANCE OF COMBINATION OF HERBICIDES ON GROWTH FACTORS, YIELD AND ENERGETICS OF TRANSPLANTED RICE (*ORYZA SATIVA* L.)

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Abstract: A field experiment was carried out during *Kharif* 2013-2014 at the Instructional-Cum Research Farm, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.). The soil of the experimental field was sandy loam in texture. The soil was neutral in pH low in low in nitrogen, medium in phosphorus and potassium content. The experiment was laid out in randomized block design, comprising three replications and twelve treatments. The results revealed that hand weeding at 25 and 45 DAT registered maximum growth characters of rice like dry matter, number of tillers hill⁻¹, yield and energetics. It was followed by treatments bispyribac-Na + (chlorimuron-ethyl+ metsulfuron-methyl) @ 20 + 4 g ha⁻¹ at 25 DAT (T₅) and bispyribac-Na+ ethoxysulfuron @ 25 + 18.75 g ha⁻¹ at 25 DAT (T₄) and minimum was observed under weedy check (T₁₂).

Keywords: Ethoxysulfuron, Number of tillers, Transplanted rice, Grain yield, Energetics

Journal of Plant Development Sciences Vol. 8(1)

EFFECTS OF PHOSPHORUS LEVELS AND WEED MANAGEMENT ON GRAIN YIELD AND PHOSPHORUS CONTENT IN PIGEONPEA AND SOYBEAN INTERCROPPING SYSTEM

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Abstracts: The intercropping systems have opened up new horizons to augment pulse crop productivity per unit area per unit time. In case of pigeonpea the vegetative growth in initial stages is very slow; therefore, the intercrop should be selected in such a way which could complete its grand growth period before attaining the peak growth of pigeonpea. Seeding soybean as intercrop with pigeonpea may serve this requirement (Saraf *et al.*, 1975).

Keywords: Pigeonpea, Phosphorus, Soyabean, Weed