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MEIOTIC NOVELTY IN *RHOEO SPATHACEA* VAR. *BICOLOR* (SWARTZ) STEARN (COMMELINACEAE)

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Abstract: Cytological novelty (natural population) was recorded from two (P_1 and P_2) plants of *Rhoeo spathacea* var. *bicolor* (Swartz) Stearn (Commelinaceae) in the form of numerical variations in chromosome number (predominantly hypoploidy) both at metaphase I (P_1 – 28.80%, P_2 – 13.67%; $2n = 4, 5, 6, 7, 8, 9, 10, 11, 14, 16$ and 24 apart from normal 12) and anaphase I (P_1 – 63.16%, P_2 – 47.03%; types - $9 : 2 : 13, 7 : 7, 6 : 7, 3 : 1 : 7, 3 : 3 : 4, 5 : 5, 4 : 6, 3 : 4, 0 : 7, 3 : 1 : 3, 2 : 3 : 2, 0 : 6, 3 : 3$ and $2 : 4$ apart from $6 : 6, 5 : 7, 5 : 2 : 5, 4 : 8, 5 : 1 : 6$ and $0 : 12$) along with partial to total breakdown of conventional meiotic system, strong desynapsis (P_1 - bivalents 0.84/cell, univalents 8.06/cell; P_2 - bivalents 0.47/cell, univalents 8.41/cell), chromosomal abnormalities (differential condensation of chromosomes, asynchrony, bridge formation, tripolarity and trispory) and high sterility (P_1 - pollen fertility 8.14%, viability 3.80%; P_2 - pollen fertility 13.12%, viability 3.90%). The ‘elite’ plants described in *Rhoeo* may generate academic interest in performing cytological preparations, which seems to be a lost art.

Keywords: Breakdown of meiotic system, Cytological novelty, Desynapsis, Numerical variations in chromosome number, Sterility.

HEPATOGENIC EFFECT OF OPTILIV ON ESTROGEN INDUCED LIVER DAMAGE IN FEMALE ALBINO RAT

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Abstract: The present study was taken to evaluate the hepatogenic effect of OptiLiv (a polyherbal formulation) on estrogen induced liver damage in female albino rat. The rats of groups 2 and 3 were administered with ethinyl oestradiol (EO, a semi-synthetic estrogen) @ 500 µg/kg body weight, orally, weekly for 8 weeks. The rats of group 1 were given saline to serve as normal. From the 9th week, the rats of group 3 were administered with OptiLiv @

100 mg/kg, orally, daily for 3 weeks; while the rats of group 2 were kept without treatment of OptiLiv for 3 weeks after EO administration. The rats were sacrificed after the experimental periods, and the histopathological study of livers was performed. On the 12th week, the hepatic tissues of group 2 revealed congestion, cellular swelling and focal areas of hydropic changes (vacuolization). The blood vessels, including central veins were also congested. At places, the sinusoids were dilated. Hepatocytes showed nuclear granularity of cytoplasm, indicating the degenerative changes in between the hepatic lobules. However, the hepatic tissues of group 3 showed very mild changes, and regeneration and normalization of many hepatocytes were observed. The results suggest that estrogen (EO) caused the liver damage, which was subsided and repaired to a great extent by OptiLiv.

Keywords: Ethinyl oestradiol (EO, estrogen), Liver damage, OptiLiv, Hepatogenic effect, Female Rat.

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PHYTOCHEMICAL AND ACUTE TOXICITY STUDIES OF THE AQUEOUS AND METHANOL EXTRACTS OF *EMILIA COCCINEA* (SIMS) G. DON

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Abstract: *Emilia coccinea* serves various indigenous medicinal uses in traditional settings without much consideration about the possible adverse effects of the consumption of its crude extracts. The present study examined the possible acute toxic effects of the oral administration of the aqueous and methanol extracts of *E. coccinea* leaves in mice. Graded doses (1, 2, 4, 6 and 8 g/kg) of the extracts were administered to 6 groups of mice and their responses observed for 2 hrs and 24 hrs for behavioural changes and mortality respectively. The results showed that the administration of a single dose of the extracts did not produce any harmful effect or death in the animals and the mice had no negative behavioural changes. The LD₅₀ was found to be greater than 8 g/kg since up to this dose no death was recorded. There was no significant change ($P>0.05$) in the mean body weight of the test and control mice. The phytochemical screening using qualitative standards revealed the presence of alkaloids, flavonoids, cardiac glycosides and terpenoids in both extracts. The results of this study suggest that the aqueous and methanol extracts of the leaf of *E. coccinea* can be considered safe within the administered doses.

Keywords: Acute toxicity, Aqueous, Methanol extracts, *Emilia coccinea*, Ethnomedicine and Phytochemistry

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FIELD STATUS OF MEDICINAL PLANT *ARTEMISIA MARITIMA* L. IN KASHMIR HIMALAYA

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Abstract: In India, the state of Jammu & Kashmir is endowed with a valuable and fascinating variety of plant resources including the medicinal plants which have attracted people since earlier time's .The potential and importance of these medicinal plants has gone unrecognized and even mistaken for cheap resources and consequently its unsystematic exploitation has increased. This paper discusses economic aspects and field status of *Artemisia maritima* L. and how this important medicinal plant has been exploited and the need to conserve it.

Keywords: Field status, Medicinal Plant, *Artemisia maritima*

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SCREENING OF DIFFERENT ONION VARIETIES FOR RESISTANCE AGAINST BLACK MOLD ROT OF ONION CAUSED BY *ASPERGILLUS NIGER* VAN TIEGHEM

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Abstract: *Aspergillus niger* van Tieghem is the causal agent of black mold rot of onion, primarily a post-harvest disease. Four isolates of *Aspergillus niger* i.e., An-1, An-2, An-3 and An-4 isolated from rotting onion, rotting garlic, rotting ginger and soil respectively were examined for their ability to cause rotting in bulbs of 13 different varieties of onion i.e., Agrifound dark red, Agrifound light red, Agrifound rose, N-2-4-1, Baswant-780, Pusa red, Line-28, N-53 and Punjab red (red coloured), Agrifound white, Pusa white round, N-257-9-1 (white coloured) and Early grano (yellow coloured). Agrifound white, Agrifound dark red and Pusa white round varieties were found to be most promising since these varieties suffered from the rot to the extent of 3.27%, 7.37% and 8.21% only respectively. The varieties Pusa red, Agrifound rose, Agrifound light red, N-257-9-1 and N-2-4-1 were found to be moderately resistant, while two varieties i.e. Baswant-780 and Punjab red were moderately susceptible. Two varieties viz. Line-28 and N-53 exhibited 44.20% and 41.80% rot respectively. One variety of onion i.e., Early grano was found to be highly susceptible having maximum percentage rot of 71.25%. White coloured varieties exhibited minimum mean percentage rot and were found to be more resistant. The results would be useful for delineating the onion germ plasm to be utilized as a source of onion gene(s) which could confer resistance against black mold rot through conventional breeding or molecular engineering for the management of bulb mold rot.

Keywords: Black mold rot, *Aspergillus niger*, Onion (*Allium cepa* L.), Resistance, Varieties.

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PLANT GROWTH AND NODULATION OF MUCUNA (*MUCUNA PRURIENS*) IN RESPONSE TO *RHIZOBIUM* INOCULATION

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Abstract: A total 20 *Rhizobium* strains were isolated from nodules of *Pisum sativum*. Isolated strains were characterized on the basis of cultural staining and biochemical tests by standard methods. Further, Plant growth activities of characterized twenty *Rhizobium* strains were analysed. Only nine *Rhizobium* i.e. *Rhizobium* PMR-2, *Rhizobium* PMR-3, *Rhizobium* PMR-7, *Rhizobium* PMR-9, *Rhizobium* PMR-12, *Rhizobium* PMR-13, *Rhizobium* PMR-15, *Rhizobium* PMR-17, *Rhizobium* PMR-19 produced siderophore, HCN, IAA and solubilized phosphorous. *Mucuna pruriens* has some medicinal value as well as food –feed crop and selected for present study. Pot experiment had done to analyzed PGPR activity of *Rhizobium* strains. *Mucuna* seeds were surface-sterilized and bacterized with *Rhizobium* strain of density of 10^8 cfu ml⁻¹. Sterile earthen pots (24 cm × 12 cm × 12 cm) were filled with sterilized sandy loam soil. Total 10 treatment were prepared and these are *Rhizobium* PMR-2 + Seed; *Rhizobium* PMR-3 + Seed; *Rhizobium* PMR-7 + Seed; *Rhizobium* PMR-9 + Seed; *Rhizobium* PMR-12 + Seed; *Rhizobium* PMR-13 + Seed; *Rhizobium* PMR-15+ Seed; *Rhizobium* PMR-17 + Seed; *Rhizobium* PMR-19 + Seed and uninoculated seed (control). All bacterized *Rhizobium* strains produced more dry weight and plant height as compared to uninoculated seed (control). *Rhizobium* PMR-13 and PMR-19 increased plant dry weight by 181.7 and 181.9% respectively as compared to control. Maximum height has been observed in *Rhizobium* PMR-19 bacterized seed treatment and it was 122% as compared to control. *Rhizobium* PMR-13 bacterized seeds showed 52 nodules per plant. We concluded that use of rhizobia inoculant enhanced plant growth in *Mucuna* plant.

Keywords: *Rhizobium*, Siderophore, HCN, IAA, P-solubilization

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PHYTOCHEMICAL STUDIES ON THE LEAVES OF *SOLANUM NIGRUM* LINN.AND *DATURA STRAMONIUM* LINN.

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Abstract: Green plants synthesize and preserve a variety of biochemical products many of which are extractable and used as chemical feed stocks or as raw material for various scientific investigation. The present paper deals with the phytochemical screening of two plants of Solanaceae – *Solanum nigrum* Linn. and *Datura stramonium* Linn. Studies were carried out to explore the active constituents of leaves of both the plants which are very significant in Drug development and widely used in the traditional and folk medicines. Many plants from the Solanaceae family are considered as medicinal plants.

Keywords: Phytochemical, *Solanum nigrum* Linn., *Datura stramonium* Linn., Medicinal plants

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EFFECT OF PLANT GROWTH REGULATORS ON NODULATION, NITROGEN FIXATION, PHOTOSYNTHETIC RATE AND NUTRIENT UPTAKE IN PARANODULATED WHEAT

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Abstract: Nodule like outgrowths were introduced under laboratory condition using plant growth regulators 2, 4-D, IBA and NAA in nitrogen free Hoagland solution in wheat variety C-306. These were then inoculated with bacterial cultures of *Azorhizobium caulinodans* (ORS 571) and *Nostoc*. After induction of nodules and bacterial inoculation seedlings were transferred to pots (50 x 50 x 50 cm) under natural conditions. The nodule induction with 2, 4-D (0.5 ppm) was better than I B A (8 ppm) and NAA (8 ppm). The nitrogenase activity was relatively more in 2, 4-D + *Azorhizobium* in nitrogen free Hoagland solution than any other treatments. The colonization of nodule by *Azorhizobium caulinodans* was more than *Nostoc*. After transplanting to pots the IBA treated plants showed higher chlorophyll content, photosynthetic rate and stomatal conductance. Treatment with IBA + *Azorhizobium* showed more growth than treated with 2,4-D and NAA. However the protein content was more in 2,4-D treated with *Azorhizobium*. The enhanced NPK content in grain and straw due to inoculation confirms the nitrogen fixation and its remobilizations to different plant parts.

Keywords: Synthetic auxin, *Azorhizobium caulinodans*, *Nostoc*, Nodulation, Photosynthesis

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BIOCHEMICAL IMPACT OF COFFEE EXTRACT ON SENESCENCE IN PRIMARY LEAVES OF *VIGNA MUNGO* (L.) HEPPER.

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Abstract: Ageing phenomenon in Primary leaves of *Vigna mungo* (L.) Hepper has been point of study in present investigation. For proper growth of a plant, freshness is the primary condition. This is possible if senescence is checked in some way. In present experimentation, biochemical impact of coffee extract on senescence has been studied. Aqueous coffee extract at various concentrations viz. W/V – 1:200, 1:250, 1:500 and 1:1000 was taken to see its effect on senescence and compared with control. The experiments were performed both in light (diffused day light) and in dark in laboratory conditions. The biochemical impact of coffee extract on senescence in primary leaves of *Vigna mungo* (L.) Hepper showed that in light coffee extract caused senescence and was more so at concentrations W/V – 1:200 and 1:250 but more senescence was observed in excised leaves.

Keywords: Ageing phenomenon, senescence, biochemical impact, coffee extract, primary leaves, intact leaves, excised leaves

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GENETIC EVALUATION OF POLY-CROSS HYBRIDS OF SWEET POTATOES [*Ipomoea batatas* (L.) LAM.]

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ABSTRACT: Sweet potato is an important staple crop in case of tribal place. Evaluation of poly cross hybrids of sweet potato to identify tuber bearing progenies was conducted at Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur, farm between March and April 2009. Sweet potato seeds were obtained from a polycross nursery of nine sweet potato clones adopted to Raipur. Nine hundred and eight seeds were scarified and sown out of 689 germinated and established seedlings 77 mature plants (11%) were selected as having the potential to produce tuberous roots. These selected progenies were advanced into these first clonal generations for further yield evaluation. The highest yielding half sib progeny was obtained from a hybrid parent Indira Madhur. Heritability values for tuber yield, tuber number and vine weight were 0.80, 0.62 and 0.10, respectively. Parental clones IGSP-C-15, IGSP-C-16 and I-9 showed good general system in improving sweet potato in the low lands of Raipur farm.

Keywords: Polycross hybrids, sweet potato

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PRELIMINARY PHYTOCHEMICALS INVESTIGATIONS ON INDIAN GINSENG *WITHANIA SOMNIFERA* DUNAL.

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Abstract: The interest in medicinal and aromatic plants has been shown all over the world because of safe and effective constituents of plant products and in particularly the presence of active principles of medicinal plants. Medicinal plants at present are largely being used in pharmaceuticals, cosmetic, agricultural and food industry. The developing countries mostly rely on traditional medicines. This traditional medicine involves the use of different plant extracts or the bioactive constituents. This study such as ethnomedicine keenly represents one of the best avenues in searching new economic plants for medicine. In keeping this view in mind the present investigation is carried out on the plant material of *Withania somnifera* Dunal. The result suggest that the phytochemical properties of plant material for curing various ailments.

Keywords: *Withania Somnifera*, Preliminary Phytochemical, Traditional medicine, Withanolides.

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BALANCED INCOMPLETE BLOCK DESIGN – A REVIEW AND ITS ANALYSIS IN COMPLETE DATA AND WITH ONE MISSING OBSERVATION

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Abstract: When the size of the experimental material is not sufficient to accommodate all the treatments, we require incomplete block designs to test various treatments under study in agricultural and biological sciences. The author of the present paper has discussed one of the incomplete block design, namely, Balanced Incomplete Block Design (BIBD). He has tried to present the review of the available literature on BIBD in brief, its analysis in case of complete data, and in case of one missing observation as well. The subject matter discussed here is not entirely new, but its presentation is new. However, the method for the analysis of BIBD in presence of one missing observation has been developed by him in 1992 in his unpublished Ph. D thesis. The Complex mathematical expressions are avoided in the present paper, and only simple expressions are provided to analyze the data. The methods are also supported by suitable examples. This will be of great help to the investigators engaged in agriculture and biological sciences.

Keywords: Adjusted treatment total, Adjusted treatment mean, Bias, Varietal trials

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ROLE OF VEGETATION IN LANDSLIDE DISASTER MITIGATION

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Abstract: Heightened human activity and urbanisation in hills has increased the incidence of active landslides, mudflows and erosion in general in the fragile Himalayas. The housing system and construction of the roads in this region needs to be changed. Structures must be light with minimum possible use of concrete and stone dumping excavated soil into rivers should be made punitive offence and all construction activity must be regulated by the strictest of laws. Simultaneously, State Governments may start to restore / rehabilitate the deforested or bare lands by planting the multipurpose trees and grasses scientifically tested (under agro or social forestry programme) along with the help of local people or community (Panchayats) in the fragile Himalayan regions. For this purpose the Govts. of State and Central must prepare a solid policy cum planning to mitigate the problem of landslide disaster in the Himalayas which almost occurred every year.

Keywords: Disaster, Landslide, Vegetation

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SOME TRADITIONALLY CULTIVATED VEGETABLES OF LEH, LADAKH (JAMMU AND KASHMIR)

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Abstract: The present paper enumerates various types of vegetables cultivated by the local people of Leh, Ladakh. Observations show that due to the harsh climate and very short growth season the cultivation of only a few numbers of vegetables is possible in the region.

Keywords: Agriculture, Cold-desert, Ladakh, Vegetables

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STUDY OF THE CHANGES IN JUICE QUALITY OF RESISTANT AND SUSCEPTIBLE CULTIVARS OF KINNOW (*C. RETICULATA*) IN TERMS OF TSS AND ACIDITY UNDER THE EFFECT OF CRSV (CITRUS RING SPOT VIRUS)

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Abstract: Total Soluble Solids (TSS) was found to be lowered in the fruit juice of Kinnow after infection very significantly. The maximum percent drop in TSS i.e. by 14.29% was observed with the susceptible variety and by 10.29% in the resistant variety. Total acidity in fruit juice was observed to be increased after infection very significantly which first goes on increasing with the advancement of days of sampling and decreases afterwards. The maximum percent increase in acidity of fruit juice ranges from 69.67% to 75.36% in resistant variety whereas it ranges from 74.52% to 88.13% in the susceptible variety concluding the fact that acidity and TSS are most affected in the susceptible variety after infection of CRSV (Citrus ring spot virus) in Kinnow.

Keywords: *Citrus reticulata*, Susceptible, Resistant

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ALLELOPATHIC EFFECT OF PLANT EXTRACTS ON SEED GERMINATION IN *VIGNA MUNGO* (L.) HEPPER

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Abstract: Allelopathic effect of plant extracts on seed germination was studied in *Vigna mungo* (L.) Hepper. Plant extracts taken were aqueous extracts of *Eucalyptus* leaves and of roasted coffee beans of *coffee arabica*. Allelopathic effect studied showed hormonal effect. The plant extract concentrations taken in both the cases were concentrations W/V-1:200; 1:250; 1:500 and 1:1000; alongwith water control. Germination percentage was observed for 5 days in each plant extract concentrations and in control. The studies were made in light and dark in each case. In case of light conditions diffuse day light was provided in lab conditions. In *Eucalyptus* leaf extract in

light, germinations was promoted at all concentrations except at concentration W/V – 1:500. In dark it increased germination at high concentration, W/V-1:200 and decreased at dilute concentration, W/V-1:1000. Coffee extract in light increased seed germination at concentrations, W/V-1:250 & W/V - 1:500 but inhibited at high concentration W/V-1:200. In dark, the effect was same as in control. Decrease in germination was observed at low concentration, W/V-1:1000.

Mortality among germinants has also been studied. Mortality may be due to phytotoxicity. Since out of all germinants some showed tendency to abort or perish and the word ‘abort’ has been used here in boarder sense. Besides abortive seedling percentage, surviving seedling percentage has also been observed. A higher percentage of surviving seedling indicated control over phytotoxicity.

Keywords: Plant extracts, Seed germination, Allelopathic effect, Abortive seedling percentage, Surviving seedling percentage, Phytotoxicity

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CHARACTER ASSOCIATION STUDY IN *LINUM USITATISSIMUM* L.

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Abstract: The economic yield showed highly significant positive correlation coefficient with flower length, flower breadth, seed length and pollen grain number per anther per flower. The pollen tube length showed highly significant and positive correlation coefficient with male and female reproductive organ length.

Keywords: Linseed, Character association

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EFFECT OF BIOFERTILIZER INOCULATIONS ON BIOCHEMICAL CHARACTERISTICS OF SUNFLOWER (*Helianthus annuus* L.) KBSH-41

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Abstract: Bacterial strains of *Azospirillum*, *Azolla* and Seaweed liquid fertilizer (SLF) were used to inoculate the seeds of sunflower hybrid KBSH-41. Inoculated and control seeds were germinated and the biochemical parameters of the seedlings were observed until maturity. The biochemical parameters of protein, carbohydrate and total chlorophyll were observed. The protein content showed higher value on the 40th day which gradually decreased on the 60th day as against this it was observed a gradual increase on 80th day. The carbohydrate showed significantly decrease throughout the study period, but we noticed the chlorophyll showed contrary to the carbohydrate content.

Keywords: Biofertilizers, biochemical parameters, Sunflower.

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NEED OF SECOND GREEN REVOLUTION FOR PULSES IN INDIA

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Abstract: Our country India was totally dependent on food imports to feed its population. India today is not only self-sufficient in grain production but also has a substantial reserve. The progress made by agriculture in the last four decades has been one of the biggest success stories of free India. Agriculture and allied activities constitute the single largest contributor to the Gross Domestic Product, almost 33 percent of it. Agriculture is the means of livelihood of about two-thirds of the workforce in the country.

Keywords: Pulses, Wheat, Green revolution, Gross Cropped Area percentage, Statistical data.

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AN ASSESSMENT OF THE PHYSICO-CHEMICAL PARAMETERS OF PUTHALAM SALTPAN WATER OF KANYAKUMARI DISTRICT, TAMIL NADU, INDIA

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Abstract: An attempt has been made to determine the water quality in Puthalam saltpan during 2010. Water samples were collected and the physico-chemical parameters were analyzed. Throughout the observation period the pH was alkaline. The temperature ranges from 21°C to 28.8°C. High salinity was observed and it attributed to the low amount of rainfall in that season and low salinity was observed in winter. TDS and calcium content was higher in summer and low in autumn. High concentration of sodium and potassium observed in spring. Sulphate attains

high value in summer and it was low in spring. Chloride expressed minimum value in winter but maximum in autumn. This study provides baseline information of the physico-chemical parameters for further assessment and monitoring of this type of ecosystems.

Keywords: Physico-chemical parameters, Puthalam, Saltpan

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THE AM (*ARBUSCULAR MYCORRHIZAL*) FUNGI, A NEW BIOLOGICAL TOOL

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Abstract: The AM Fungi has emerged as a new biological tool. An arbuscular mycorrhiza (plural mycorrhizae or mycorrhizas) is a type of mycorrhiza in which the fungus penetrates the cortical cells of the roots of a vascular plant. Arbuscular mycorrhizae (AMs) are characterized by the formation of unique structures such as arbuscules and vesicles by fungi of the phylum Glomero-mycota (AM fungi). AM fungi (AMF) help plants to absorb nutrients such as phosphorus and micronutrients from the soil. It is believed that the development of the arbuscular mycorrhizal symbiosis played a crucial role in the initial colonisation of land by plants and in the evolution of the vascular plants (Brundrett, 2002).

Keywords: AM Fungi, VAM Fungi, Arbuscules, Phosphorus uptake, Derived benefits

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EFFECT OF MAGNETISM ON SEEDLING GROWTH OF *HORDEUM VULGARE*

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Abstract: Present research study deals with the effects of magnetism on the seedling growth and germination of barley (Joan). In this study ninety barley seeds were selected for uniformity (criteria being size and color) and then seed were sterilized in 1% mercuric chloride solution and then after proper washing with distilled water, placed in Petri plates. One set of Petri plates was placed in between two bar magnet with there north ends facing the seeds. Similarly in another Petri plates sets magnet was placed with south ends facing the plate. Side by side a control *set also* maintained observation done at 3rd, 5th, & 7th day of radicle emergence. Result shows that bar magnets can influence the seed germination and seedling growth of barley. Results show that N-N bar magnet promotes more growth as compared to S-S bar magnet and control.

Keywords: *Hordeum vulgare*, Magnetism, Seedling growth

**RESPONSE OF BIOFERTILIZERS ON ENZYMATIC ACTIVITIES OF GROUNDNUT
(*ARACHIS HYPOGAEA* L. VAR TMV-7)**

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Abstract: The field experiment was carried out the response of biofertilizers on enzymatic activities of groundnut. The present study revealed that the combined effect of biofertilizers (*Azotobacter* + *Mycorrhizae* + *Rhizobium*) showed significant effect than the control and other mono and dual inoculations. The enzyme activities such as peroxidase, polyphenol oxidase and catalase were gradually decrease from 0-35th day and then increase up to 56th day in all the inoculations.

Keywords: *Azotobacter*, Biofertilizers, Groundnut, *Mycorrhizae*, *Rhizobium*.