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STUDY ON DENSITY AND BIOMASS OF SEAWEEDS AT PORT OKHA, GUJARAT-A CASE STUDY

R.N. Nakar, N. H. Joshi¹ and B.A. Jadeja²

Department of Agriculture Botany, Junagadh Agricultural University, Junagadh.

¹*Fisheries Research Station, Junagadh Agricultural University, Okha.*

²*Department of Botany, M.D.Science college, Porbandar.*

Abstract: The species diversity, density and biomass of seaweeds were measured by transect method quadrat using one m² quadrat during August-2007 to February-2008 at Okha coast in the year 2007-08. 36 species of seaweeds were recorded from the coast. Rhodophyceae and Chlorophyceae were found to be dominant with 16 and 14 species respectively. Phaeophyceae were very few in numbers with 7 species. The mean density and biomass of algal species were described and discussed. Density of all three classes Chlorophyceae, Phaeophyceae and Rhodophyceae were maximum in Jan- Feb, 2008.

Keywords: Biomass, density, okha, seaweeds, port

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PRELIMINARY ANTIMICROBIAL AND PHYTOCHEMICAL STUDY OF THE AQUEOUS, ETHANOL, METHANOL AND CHLOROFORM EXTRACTS OF THE LEAVES OF *NAPOLEONAEA IMPERIALIS* P. BEAUV. (LECYTHIDIACEAE)

*Macdonald Idu., Asowata, I. and Erhabor, J.O.

*Department of Plant Biology and Biotechnology,
Faculty of Life Sciences, University of Benin,
Benin City, Edo State, Nigeria.*

Abstract: The antimicrobial activity and phytochemical analysis of *Napoleonaea imperialis* P. Beauv. (Lecythidiaceae) was done using aqueous, ethanol, methanol and chloroform leaf extracts to determine its antimicrobial and phytochemical constituents. The antimicrobial activities of the extracts were tested against bacteria and fungi isolates using the agar well diffusion method. Commercial antibiotics were used as positive reference standards to determine the sensitivity of the isolates. The leaf extract was subjected to phytochemical analysis using standard experimental procedures. The extracts showed significant inhibitory activity against the bacterial and fungal isolate (Bacterial isolates- *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Proteus mirabilis*, *Pseudomonas aeruginosa*; fungal isolates- *Penicillium notatum*, *Aspergillus niger*, *Fusarium oxysporum*, *Saccharomyces cerevisiae*, and *Candida albicans*). The MIC values obtained using the Agar-dilution test ranged from 0.5-10mg/ml. The results showed that the extract of *N. imperialis* plant leaves have broad spectrum of antimicrobial activity. These results suggest that it will be useful in the treatment of microbial infections.

Keywords: Aqueous extract, antimicrobial activity, chloroform extract, ethanol extract, methanol extract, *Napoleonaea imperialis*, phytochemical analysis

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MITOTIC AND MEIOTIC CONSEQUENCES OF GAMMA IRRADIATIONS ON DRY SEEDS OF *NIGELLA SATIVA* L. (BLACK CUMIN)

Suchetana Mukherjee and Animesh K. Datta*

*Department of Botany, Cytogenetics and Plant Breeding Section, Kalyani University,
Kalyani 741235, West Bengal, India*

*Corresponding author e-mail: dattaanimesh@gmail.com

Abstract: Dry seeds (moisture content :19.04%) of *Nigella sativa* L. (Family: Ranunculaceae; common name - black cumin, spice of commerce) were gamma irradiated (50, 100,150, and 200 Gray doses) and M₁ (germination frequency, seedling length, lethality, injury, mitotic index, mitotic aberration frequency; meiotic abnormalities, pollen fertility and seed sterility) parameter and M₂ mutation (macromutants) frequency were studied with an objective to assess mutagenic sensitivity as a

pre-requisite for mutation breeding experiment. LD₅₀ was found to be between 50 Gy and 100 Gy. Results obtained are discussed.

Keywords: Gamma irradiations, M₁ parameters, mitotic & meiotic aberrations, *Nigella sativa*.

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RESPONSE OF POTATO CULTIVARS TO VARYING LEVELS OF NITROGEN UNDER CHHATTISGARH PLAINS IN DORSA SOIL

Eshu Sahu, P.C.Chaurasia, K.C. Rajhansa, D. A. Sarnaik and Kunti Banjare

*Department of Horticulture
Indira Gandhi Krishi Vishwavidyalaya , Raipur- 492006 (C.G.)
Correspondence address: keshavrajhansa@gmail.com*

Abstract: The field experiment was conducted during Rabi 2009-10 at the Research cum Instructional Farm, Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) to study the response of potato cultivars to varying levels of nitrogen under Chhattisgarh plains in dorsa soil. The experiment consisted of nine treatments comprising three varieties viz. Kufri Pukhraj, Kufri Jawahar and Kufri Khyati with three nitrogen levels 150, 187 and 225 kg N/ha. Variety Kufri Pukhraj was found significantly superior from the other two varieties for growth parameters and yield parameters. The interaction between Kufri Pukhraj combined with 225 kg/ha N was found remarkably superior to all the other treatment combinations as regards to number of leaves per plant.

Keywords: Fertilizers, potato cultivars, yield

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EFFECT OF BIOFERTILIZERS, RHIZOBIUM & PHOSPHATE IN COMBINATION OF DIFFERENT LEVEL OF Ca, Mg & S ON THE PRODUCTIVITY OF CHICKPEA (*CICER ARIETINUM* L.) CULTIVAR AVRODHI

Nazo Bi and Abha Agarwal

*Department of Botany, Bareilly College, Bareilly
Uttar Pradesh, India*

Abstract: A field experiment was conducted in Bareilly, Uttar Pradesh, India, during the 2006-07 rabi season to study the effect of biofertilizer (*Rhizobium* & *Phosphate*) in combination of different level Ca, Mg & S on the productivity of chickpea (*Cicer arietinum*) cultivar "Avrodhi". Experimental units were arranged in split-split plot based on randomized complete blocks with three replication. The treatments consisted of nitrogen, phosphorus, potassium (N: P: K 20:60:30 Kg/ha), calcium/magnesium & sulphur (Ca, Mg & S 38Kg/ha) and seed inoculation with *Rhizobium* or Phosphate solubilizing bacteria (PSB), both *Rhizobium* and PSB, or uninoculated control. The results revealed that application of N: P: K 20:60:30 Kg/ha + Ca, Mg & S 38Kg/ha + dual inoculation with *Bradyrhizobium japonicum* and *Pseudomonas striata* (200 gm/ha) significantly increased the growth characters (Plant height, no of nodules, nodules dry weight & dry matter accumulation) of chickpea. The increase dry matter accumulation gm/plant (16.64). Height of plant cm (45.78), no of nodules/plant (35.18), nodules dry weight Mg/plant (90.47).

Keywords: *Cicer arietinum*, *Rhizobium*, productivity

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IMPACT OF SEWAGE WATER OF MEERUT CITY ON THE GROWTH AND YIELD COMPONENTS OF WHEAT (*TRITICUM AESTIVUM* L.)

Sudhir Kumar and Sarita

*Department of Botany, Kisan (P.G.) College, Simbhaoli-245207, India
E-mail: sainsarita87@gmail.com*

Abstract: A pot experiment was conducted in the winter season 2008-09 to evaluate the suitability of sewage wastewater of Meerut city as a source of irrigation due to some essential plant nutrients and its impact on growth and yield components of three wheat cultivars viz. PBW 343, PBW 373 and UP 2338. The test crop was raised with different concentrations of sewage water (T₁ : 10 %, T₂ : 25 %, T₃ : 50 %, T₄ : 75 %, T₅ : 100 %) compared to control plants (T₀) receiving normal ground water. Wastewater promoted growth, number of tillers, number of ears, total chlorophyll, 1000 seed weight, seed yield, biological yield and harvest index as compared to control. Physicochemical characteristics of sewage water met the prescribed irrigation quality requirement and were within the permissible limit of Indian standard. 50 % sewage water was found most suitable for the measured growth parameters while higher concentration proved inhibitory. Sewage water may be considered as an alternative of fresh water for irrigation purpose improving yield and quality of wheat crop.

Keywords: Chlorophyll content, growth, sewage water, yield and harvest index

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PESTICIDAL EFFECT ON RICE FIELD CYANOBACTERIA IN PERAMBALUR, TAMIL NADU

B. Sadhana¹ and N. Panneerselvam²

¹Centre for Research and P.G Department of Botany, Thiagarajar College, Madurai-625009, Tamil Nadu, India..E.mail:sadhanakararthik2004@yahoo.co.in

²Centre for Research and P.G Department of Botany, The Madura College, Madurai, Tamil Nadu, India.E.mail:npanneerselvam1958@gmail.com

Abstract: Pesticidal effect was studied on rice field Cyanobacteria - *Anabaena cylindrica* in Perambalur, Tamil Nadu. In the present study lower concentrations of Dithane M45 and Malathion (5 ppm, 10 ppm and 15 ppm) stimulated the algal growth and their higher concentrations inhibited the algal growth when compared to control. It was clearly observed in chlorophyll a and phycobilin content of pesticides treated cells. But the increase in concentrations of both Pesticide did not affect the nitrogen fixing activity, because there was no significant decrease in nitrogen contents of cells in different treatments. Ammonia excretion by the algae was gradually decreased in 5ppm - 50ppm of Dithane M45 treated cells when compared to control. While maximum ammonia excretion was observed in 5ppm of Malathion treated cells when compared to other concentrations. The application of Cyanobacteria in rice field can increase the soil fertility and reduce the use of chemical pesticides for crop improvement.

Keywords: Ammonia excretion, cyanobacteria, chlorophyll a, nitrogen fixation, rice field, pesticides, phycobilins

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PRELIMINARY SURVEY ON THE LIVERWORT FLORA OF NAGBANI, JAMMU (NORTH - WESTERN HIMALAYAS).

Anil Sharma*, Madhu Bhagat and Anima Langer

Department of Botany, University of Jammu, Jammu - 180 006.

*e - mail: asanilsharma3@gmail.com

Abstract: This paper deals with the distribution of liverwort taxa in Nagbani. It includes 9 species belonging to 6 genera, 4 families and 2 orders. The most prominent order is Marchantiales. District Jammu, a part of Jammu and Kashmir State (North- West Himalayas), exhibit remarkable topographic and edaphic diversity and therefore, offers congenial climatic conditions for the luxuriant growth of liverworts. Out of these, three taxa are either endemic or threatened. These are *Asterella angusta* (Steph.) Kachroo, *A. pathankotensis* (Kash.) Kachroo (endemic) and *Reboulia hemispherica* (L.) Raddi (threatened).

Keywords: Liverworts, NW Himalayas, nagbani

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PERFORMANCE EVALUATION STUDIES ON TAMARIND DEHULLER-CUM-DESEEDER

Amit Kumar Sinha¹, S. Patel² and Ajay Verma²

¹*Bhartiya College of Agricultural Engineering, Durg (C.G.)*

²*Faculty of Agricultural Engineering, IGKV Raipur (C.G.)*

Abstract: The performance of machine was evaluated at 3 different rings clearance i.e. 3, 4, & 5 cm for dehulling and 3, 3.5 & 4mm machine clearance for deseeding. Similarly different feed rate was taken for dehulling and deseeding operations i.e., 4, 5 & 6 and 1, 1.5 & 2 kg/min respectively. The result from the above process show that for dehulling operation the optimum ring clearance and feed rate was 4 cm and 5 kg/min respectively, as the output obtained from them was more than the other two parameters i.e. 239.97 kg/h and 251.94 kg/h for before sun drying and after sun dried tamarind fruits. Similarly 3.5 mm machine clearance and 1.5 kg/min feed rate was optimum for deseeding with output of 48.6 kg/h and 52.02 kg/h before and after sun drying respectively. Hence we conclude that for dehulling the optimum rings clearance and feed rate is 4 cm and 5 kg/h with dehulling efficiency of 79.99 % before sun drying and 83.98 % after sun drying and for deseeding machine clearance of 3.5 mm and feed rate of 1.5 kg/min is best with deseeding efficiency 54.23 % & 57.8 % for before sun drying and after sun drying respectively.

Keywords: Dehuller-cum-deseeder, tamarind

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ECOLOGICAL ANALYSIS AND ISOLATION SAPROPHYTIC THERMOPHILES FROM SUNDERBAN MANGROVE FOREST

Priya Srivastava* and A.K. Jaitly

Microbiology Lab. Department of plant science, M.J.P.Rohilkhand University, Bareilly-243001

**priyasrivastava051@gmail.com*

Abstract: Thirty five saprophytic fungi were isolated from mud, wood debris and leaf litter samples taken from Sunderban mangrove forest, West Bengal, in India. Of the medium used, yeast powder soluble starch agar supports better fungal growth. Among the isolated fungi, eight *Aspergillus* species were most frequent. The highest fungi species were found from Sajnakhali site because the presence of the highest organic matter and moisture content.

Keyword: Ecological condition, sunderban mangrove forest, saprophytic fungi

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A NOTE ON THE OCCURRENCE OF DESYNAPSIS IN *CORCHORUS PSEUDO-OLITORIUS* I. AND Z. (TILIACEAE)

Aninda Mandal and Animesh K. Datta*

Department of Botany, Cytogenetics and Plant Breeding Section, Kalyani University, Kalyani – 741235, West Bengal, India

**Corresponding author e-mail: dattaanimesh@gmail.com*

Abstract: Two desynaptic plants of *Corchorus pseudo-olitorius* I. and Z. (Family: Tiliaceae; important genetic resource of Jute) showing no phenotypic variations than standard normal plants were identified from the natural population (2 out of 4 plants; 4 plants germinated from 100 seeds) of *Corchorus* spp. (the wild species are under acclimatization, 3rd year) following male meiotic analysis. Compared to normal plants, the spontaneous desynaptic plants (ds₁: 'weak type'; ds₂: 'medium strong type') demonstrated enhanced univalent frequency per cell, reduced number of chiasma and bivalent per nucleus (ds₁: 5.57II+1.63I/cell- diplotene, 6.38II+1.23I/cell- MI, chiasma 6.93±0.16/cell; ds₂: 4.56II+4.88I/cell- diplotene, 5.06II+3.89I/cell- MI, chiasma 5.41±0.20/cell; normal: 6.81II+0.38I/cell- diplotene, 6.75II+0.25I/cell- MI, chiasma 7.81±0.28/cell). Univalents were randomly distributed at MI irrespective of bivalent frequency in a meiocyte. Although variable chromosomal associations were noted in the plant types (ds₁: 7II to 1II+12I, ds₂: 7II to 14I; normal: 7II to 5II+4I at

diplotene, 7II and 5II+4I at MI) 7II formation was the most predominant type. Occurrence of 14I in both diplotene (13.75%) and MI (11.81%) was only recorded in ds_2 . Mostly (ds_1 : 93.62%, ds_2 : 86.84%, normal: 100.00%), AI cells were cytologically (7:7) balanced (rare often unequal distribution like 6:1:7, 7:9 and 5:9 were observed; ds_2 showed failure of cytokinesis- 2.63%). All AII cells were also cytologically normal. Pollen fertility (ds_1 : 72.49%, ds_2 : 65.35%), viability (ds_1 : 72.06%, ds_2 : 57.48%) and size (ds_1 : $40.78 \pm 0.9 \times 30.76 \pm 1.5$, ds_2 : $41.08 \pm 0.7 \times 32.23 \pm 0.9$) and seed set per capsule (ds_1 : 88.81 ± 2.1 , ds_2 : 87.50 ± 1.2) were nearly in accordance to standard normal plants (pollen fertility: 76.48%, pollen viability: 74.48%, pollen size: $40.21 \pm 0.1 \times 30.74 \pm 0.1$, seed set/capsule: 88.02 ± 1.8).

Keywords: *Corchorus pseudo-olitorius*, desynapsis, fertility, spontaneous, weak and medium strong types

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EFFECT OF RHIZOBIUM AND AM INTERACTION ON GROWTH AND YIELD OF URD BEAN CULTIVARS UNDER RAIN FED CONDITION.

Preeti, Sudhir Kumar and J.D.S. Panwar²

Deptt. Of Botany, J.V. College, Baraut, Baghpat.

²*Ex Head, Division of Plant Physiology, IARI, New Delhi-110012.*

Abstract: Two varieties of urd bean (PU-35, T-9) inoculated with *Rhizobium* and arbuscular mycorrhiza fungi (applied through layering technique) were raised under rain fed field conditions. The interaction enhanced the morphological characters *i.e.*, plant height, number of leaves, branch number per plant, dry matter production, grain yield straw yield and harvest index also increased in the arbuscular mycorrhizal inoculated plants, however, it was higher when *Rhizobium* and arbuscular mycorrhizal fungi were applied together.

Keywords: Arbuscular mycorrhiza, Growth and Yield, Harvest index, *Rhizobium*, Urd bean

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STUDIES ON GENETIC DIVERGENCE IN OKRA (*ABELMOSCHUS ESCULENTUS* (L.) MOENCH.)

P.C. Chaurasia¹, Murlee Yadav¹ and S. C. Ghosh²

¹*Department of Horticulture*

Allahabad Agricultural Institute-Deemed University, Allahabad (UP) - 211007

²*Department of Genetics and Plant Breeding, IGKV, Raipur (C.G.) – 492006*

Correspondence Address¹: pcsagri@yahoo.co.in

Abstract: An experiment was conducted on genetic diversity in Okra (*Abelmoschus esculentus* (L.) Moench.) with 25 genotypes during the year 2006-07 at Department of Horticulture, Allahabad Agricultural Institute –Deemed University, Allahabad. On the basis of divergence, 25 genotypes were grouped into 6 cluster having 7 genotypes in the cluster I, 5 genotypes in cluster II, 6 genotypes in cluster III, 3 genotypes in cluster IV, 3 genotypes in cluster V and 1 genotype in cluster VI. However, minimum intra cluster distance was found between the genotypes falling in cluster II and maximum was observed between the genotypes falling in cluster VI, followed by V, IV and III. Maximum inter cluster distance and their genetic distance was recorded in between the cluster number V and VI followed by I and VI, II and IV, II and III, II and V, respectively. Highest cluster means for plant height, leaf per plant, number of branches per plant, days to first flowering, fruit per plant, fruit yield per hectare were recorded in the cluster number IV. However, maximum values of cluster means for fruit length and weight of green fruit were found in the cluster number V. Maximum values of cluster means for percentage plant affected by milibug were recorded in the cluster I, II, and VI, respectively. Similarly, a maximum value for percentage plant for ascorbic acid, fruit diameter was also recorded in cluster I, II & VI respectively.

Keywords: Genetic diversity, okra

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EXTRACTION OF COLOR FROM INDIGENOUS PLANTS AND TO STUDY THE EFFECT OF THESE EXTRACT ON RTS (READY TO SERVE) BEVERAGE

Ajay Singh¹, Ajay Kumar², Manju Nehra³, Manoj Kr. Sharma and Sanjay Kumar

¹ Deptt of Food Sc. & Technology, BFIT (Dehradun)

² Deptt of Botany, BFIT (Dehradun)

³ Deptt of Food Sc. & Tech. Ch. Devi Lal University, Sirsa
Dept. of Botany, J.V. College, Baraut (Baghpat)

Abstract: Food color is one of the classes of food additives added to food products for improvement of sensory quality. It is not only the sensory quality improved rather it supplies the nutrients in many cases of food pigments. The *Marua* has Rosmarinic acid as an antioxidant and the beverage was found to be acceptable for 2-4 days after its addition. The color intensity after incorporating into the beverage was good but shows a declination after a short period of time. The color of papaya beverage after adding *Marua* extract was much better than curry leaves extract. The appeal of banana beverage increased a lot after addition of *Marua* extract & it seems much more appetizing than before. While the incorporation of the curry leaves extract changes color to a great extent that looks attractive but the flavor imparts by the extract is not so acceptable. The addition imparts aromatic smell and slightly bitterness to the RTS which was not liked by the judges. In an average shelf life in an incubator at about 37°C it lasts for about a 2-4 days. The essential oils from *Marua* also contain d-limonene that has anti carcinogenic properties. It also contains vitamin B₆ and magnesium the vitamin B₆ prevents the formation of harmful compounds in the body such as homocysteine and magnesium makes the cardiac muscles and blood vessels healthy so that blood flows without any interruption.

Keywords: Extraction, Effect, Indigenous plants

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EFFECT OF IRON TOXICITY ON GROWTH OF FENUGREEK

Neelesh Kapoor^{1*}, Devendra K. Awasthi² and Y. Vimala³

Department of Biotechnology, Meerut Institute of Engineering and Technology (MIET), Meerut.

² Department of Botany, M.M. (P.G.) College, Modinagar.

³ Department of Botany, C.C.S. University, Meerut.

*Corresponding Author Email: kapoor_nk2005@rediffmail.com.

Abstract: Effect of iron stress on fenugreek (*Trigonella foenum-graecum* L.) was investigated to understand the basis of metal tolerance. Growth parameters such as root and shoot length, germination percentage, moisture percentage, fresh and dry weight were analyzed. Seeds were cultured on blotting paper in petri dishes at 22°C and supplemented with 0 (control), 100, 200, 300, 400 and 500µM concentrations of FeCl₃. All the parameters were recorded at regular intervals of 5 days. A significant reduction from 92 to 44% was observed in seed germination percentage. Simultaneously, a significant reduction in shoot and root length was observed with increase in iron concentration. The maximum and minimum shoot length were 3.56cm (control) and 1.37cm (500µM FeCl₃) respectively. Root length exhibits a variable pattern. At low iron concentration (200µM) root length increased whereas it decreased significantly at higher concentrations, thus, indicating that low concentrations can enhance root growth. The root length ranges from 0.38cm (500µM FeCl₃) to 0.85 cm (control). Similar decrease was observed in fresh and dry weight with respect to increased iron concentrations. No significant increase was observed in moisture percentage. On the basis of present investigation it is concluded that fenugreek is iron sensitive as it exhibited a decline in all the growth parameters studied.

Keywords: Biomass, germination percentage, growth parameters, metal stress, *Trigonella foenum-graecum*

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ECO-PHYSIOLOGICAL EFFECTS OF DAIRY EFFLUENT ON SEED GERMINATION AND SEEDLING GROWTH OF *BRASSICA JUNCEA* (L.) CZERN. & COSS.

Gulfam Ali and M.K. Abdulla

Environmental Science Lab., Department of Botany, Kisan (P.G.) College, Simbhaoli-245207
(Panchsheel Nagar), U.P., INDIA
E-mail: gulfamali2010@gmail.com, dr.mkabdulla@gmail.com

Abstract: Samples of dairy effluent were collected from Parag Milk Plant, Meerut. The different concentrations (25, 50 and 100%) of treated and untreated effluent were used in this experiment. Tap water served as control. Effects of dairy effluent were studied on *Brassica juncea* L., which is grown as oil crop in India. It was observed that 25% conc. of dairy effluent increased the germination percentage, seedling growth, dry weight of root and shoot, chlorophyll content and seed yield as compared to control.

Keywords: *Brassica juncea*, dairy effluent, germination, Meerut, pH, seedling growth

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INHIBITION OF MYCELIAL GROWTH OF SOME SEED-BORNE MYCOFLORA ASSOCIATED WITH BITTER GOURD USING SOME CHEMICAL FUNGICIDES

Jyoti Chauhan¹ and Geeta Singh²

¹Department of Botany, Meerut College, Meerut (U.P.)

²Department of Botany, R.G. (P.G.) College, Meerut (U.P.)

Abstract: Two chemical fungicides were tested against some seed-borne fungi viz. *Alternaria alternata*, *Aspergillus flavus*, *A.nige*, *Fusarium solani*, *Myrothecium roridum* and *Rhizopus spp.* for the evaluation of inhibition of mycelial growth. Of the three fungicides used, Ridomil gave good results at all the concentrations against all the test fungi compared with Bavistin.

Keywords: Bitter gourd, chemical fungicides, mycelial growth, seed-borne mycoflora

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CYTOPATHOLOGICALLY STUDY OF *JATROPHA CURCAS* INFECTED WITH *JATROPHA* MOSAIC DISEASE

Sanjay Kumar, Rajeshwari Sharma, A.K. Sharma and Manoj Kr. Sharma

Department of Botany J.V. College, Baraut (Baghpat) U.P

Abstract: Plant of *Jatropha curcas* infected with *Jatropha* mosaic disease by the whitefly (*Bemisia tabaci*), were studied cytopathologically. Plant leaves with typical symptoms exhibited the nucleopathic effects that are the characteristic of known whitefly-transmitted geminiviruses. Electron-dense fibrillar bodies occurred at an early stage of infection and were closely associated with virus like particles at a late stage of infection. Cytoplasmic inclusions which have membrane bound oval bodies containing granular or fibrillar material were also observed. Presence of fibrillar bodies suggested that *Jatropha* mosaic disease caused by a whitefly-transmitted geminivirus.

Keywords: Electronmicroscopy, cytopathology, *Jatropha curcas*

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PLANT GROWTH PROMOTING *RHIZOBIUM* R7, R10, R14 ENHANCE PRODUCTIVITY IN RICE CROP

Vishal Kumar Deshwal* and Kavita Vig

Department of Microbiology, Doon (PG) Paramedical College, Dehradun (Uttarakhand) (India)

*Correspondence author and email id: vishal_deshwal@rediffmail.com

Abstract: *Rhizobium* R7, R10 and R14 was selected for present study. These strains were already, characterized and produced HCN, Siderophore, IAA and P-solubilizing and enhanced the plant growth in *Mucuna pruriens* (Deshwal et al., 2011a). Field experiment was conducted and four sets of treatment were prepared i.e. treatment I – *Rhizobium* R7; treatment II – *Rhizobium* R10; treatment III – *Rhizobium* R14; treatment IV- Non-bacterized seed. Data showed that all *Rhizobium* strains improved plant growth and productivity. Maximum seed germination was observed in *Rhizobium* R7 which was 122.78% as compared to control. Maximum shoot length was observed in *Rhizobium* R7 but maximum root length was observed in *Rhizobium* R14. Bacterized *Rhizobium* R7, R10 and R14 increased by 193.61, 187.23, 159.57% respectively as compared to control plant.

Keywords: Plant growth promoting *Rhizobacteria*, *Rhizobium*, rice crop

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SCREENING OF IN VITRO ANTIFUNGAL ACTIVITY OF PLANT EXTRACT OF *DATURA STRAMONIUM*, *SOLANUM NIGRUM* AND *WITHANIA SOMNIFERA*

P.C. Pande and Jyoti Chauhan

Department of Botany, Meerut College, Meerut (U.P.)

Abstract: Number of plants has been found to possess antifungal properties, which are able to control certain fungal diseases of crops. Present paper deals with the effect of *Datura stramonium* Linn. *Solanum nigrum* Linn. and *Withania somnifera* (L.) Dunal. Extract in *in-vitro* by poisoned food technique to know their inhibitory effect on the growth of *Alternaria alternata* (Fr.) Keissler. Extracts of *Withania somnifera* leaves were found significantly superior in inhibiting the mycelial growth 33.98%, 52.82% and 74.28% of *A. alternata* at 5 percent, 10 percent and 15 percent respectively, followed by *D. stramonium*. The extracts of *S. nigrum* were least effective in growth inhibition as compared to other plant extracts at all the three concentrations tried.

Keywords: Antifungal activity, *Alternaria alternata*, plant extract and *in-vitro* inhibition

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GROWTH PATTERN AND BIOMASS YIELD OF *STEVIA REBAUDIANA* (BERT.) GROWN UNDER POLYHOUSE CONDITIONS IN RELATION TO CLIMATE CHANGE.

Pradeep Kumar Jena¹, Ashwani Kumar Goyal² and Arvind Bhardwaj³

¹*Deptt. of Botany, Govt. P.G. College, Noida¹*

²*Km. Mayawati Rajakiya Mahila Snatkottar Mahavidyalaya, Badal Pur*

³*Natural Drugs & Botanicals, Ghaziabad³*

Corresponding author email: pradeepherbs@gmail.com

Abstract: Climate change affects the earth's temperature, precipitation, hydrological cycles, frequency and intensity of heat waves and many extreme events, which has a great impact on agricultural production. On the wake of the climatic change, polyhouse farming is the only way to protect crops and manage a better yield than in normal climatic condition. It protects crops from wind, rain, radiation, and precipitation, etc again it facilitates the farmers not to depend on the monsoon for the cultivation but allow scheduling of the production according to the market needs.

A polyhouse experiment was conducted during winter season of 2011 at Government P.G College, Noida to study the effect of polyhouse condition on the growth pattern and biomass yield in *Stevia rebaudiana* (Bert.). The experiment was laid out in two different environmental conditions as Polyhouse environment and the other one is Control (open field) environment. Forty five days old *Stevia* seedlings are planted with row spacing 40-45 cm and between each plant 25 cm in well prepared field of both the environments in the month of January-2011 and the crop was established successfully. The studies on growth pattern, leaf area and biomass yield were made after an interval of 15 days from the date of transplantation till four month stage. In the present study it is revealed that polyhouse environment trigger the production of plant material especially leaf numbers, leaf fresh weight, plant height and total biomass considerably over open climatic condition, where the growth of the plant is ceased in the January as crop was frost-susceptible.

Keywords: Climate change, market needs, polyhouse, protect crops, *Stevia rebaudiana*

IMPACT OF DISTILLERY SPENT WASH ON SOIL CHARACTERISTICS IN DISTRICT MEERUT

Prashant Kumar, R.C. Arya and N.P. Singh

Deptt. of Botany, Meerut College, Meerut (U.P.) India
Corresponding Author: prashantks09@rediffmail.com

Abstract: Increasing number of industries including distilleries in India has resulted in substantial increase in industrial pollutant load. Untreated distillery affluent or spent wash is well known to cause pollution in natural streams by lowering pH value, increasing inorganic load, depletion of oxygen content & destruction of aquatic habitat. Distillery spent wash is considered as a very high strength waste water having high COD & BOD with low pH and dark brown colour. Despite containing some heavy metals, the distillery spent wash is used as irrigation water for various crops and natural vegetation as it contains all the essential elements required for growth. The discharge permissible limit of total N, Mg and metals like Cd, Cr, Ni, Pb, Cu, Fe, Mn, and Zn is 25.00, 0.20, 0.01, 0.05, 0.10, 0.05, 0.50, 2.00, 0.20, and 2.00 mg/L respectively. It was found that concentration of total nitrogen, Mg, Fe and trace elements such as Cu, Cr, Pb, Cd, Zn & Ni were higher than the said limit in discharge irrigated soil of Daurala distillery, Central distillery and Bajaj Hindustan distillery of Meerut district. The concentration of metals decreases at increasing depth of soil. These metals are present in spent wash as a result of smelting of metalliferous ores, application of fertilizers, pesticides & municipal wastes.

Keywords: COD & BOD, Distillery Spent Wash (DSW), municipal wastes, fertilizers, pesticides

FLORAL BIODIVERSITY OF LILY FAMILY IN BAGESHWAR DISTRICT OF UTTARAKHAND

A. K. Paliwal, Beena Kumari¹, Veena Dixit, Chandrakanta and Usha Yadav²

Department of Botany, Govt. P. G. College, Bageshwar (U. K.)-263642, India

¹ Department of Botany, Hindu P. G. College, Moradabad (U. P.)- India

² Department of Botany, Govt. P. G. College, Khatima, Udham Singh Nagar (U. K.)- India

Abstract: Floral biodiversity is regulated by climate, altitudinal variation, soil types and rainfall. The present paper describes an account of Lily family species, which are used for various purposes including medicinal found in Bageshwar district of Kumaon region of Uttarakhand. Uttarakhand is one of the smaller hilly states, which is situated in the northern side of India. It includes 13 important angiospermic Ranunculaceae species like *Allium cepa* Linn., *A. sativum* Linn., *Asparagus curillus* Buch.-Ham., *A. racemosus* Willd. L.N. Satawar, *Disporum cantoniense* (Lour.) Merrill., *Fritillaria roylei* Hook. F., *Gloriosa superba* Linn., *Polygonatum cirrhifolium* Royle. L.N. Ameda, *P. multiflorum* All., *P. verticillatum* All. L.N. Mahameda etc. This paper records 04 species which have not been reported by Rao (1960), while 02 species have not been reported by R. Strachey (1906).

Keywords: Biodiversity, Bageshwar, Lily family

EFFECT ON BENLATE ON THE PHYLLOPLANE MYCOFLORA OF *SOLANUM NIGRUM* L.

Jyoti Chauhan and D.K Jain

Department of Botany, Meerut College, Meerut (U.P.)

Abstract: Phylloplane fungal population of *Solanum nigrum* L. were examined after foliar application of fungicide –Benlate. There was qualitative and quantitative difference in the fungal population after treatment with the fungicide. The fungal population increased as the leaves matured. Benlate reduced the population of *Nigrospora sp.* and *Cladosporium sp.* The population of *Aspergillus flavus*, *A. niger* and *Tetracoccusporium sp.* was increased after the foliar spray of benlate.

Keywords: Effect of benlate, Phylloplane Microflora, *Solanum nigrum* L.