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## AN OVERVIEW OF MAJOR CLASSES OF PHYTOCHEMICALS: THEIR TYPES AND ROLE IN DISEASE PREVENTION

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**Abstract** The green belt of Mother Nature is the richest source of bioactive phytochemicals and natural nutraceuticals. Enormous work done during the past fifty years has shown that these phytochemicals play an important role in the routine healthcare systems worldwide. The major classes of phytochemicals like alkaloids, phenolics, terpenoids and tannins have potential to prevent diseases and act as anti-microbial, anti-inflammatory, anti-oxidant, anti-cancerous, detoxifying agent, immunity-potentiating agent and neuropharmacological agent. Each class of these functional agents consists of a wide range of chemicals with differing potency. Some of these phytochemicals are found to be multifunctional. There is, however, much scope for further systematic research in screening Indian medicinal plants for their phytochemicals and assessing their potentiality as crude drug or drug components.

**Keywords** phytochemicals, nutraceuticals, biological activities

**CYTOGENETIC REPORT ON TEN COENAGRIONID  
SPECIES (COENAGRIONIDAE: ZYGOPTERA: ODONATA)  
FROM HARIKE WETLAND, PUNJAB, INDIA**

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**Abstract:** Chromosomal analyses on ten commonly found damselfly species of family Coenagrionidae from Harike wetland have been done. These are *Agriocnemisfemina*, *Agriocnemispygmaea*, *Ceragrioncerinorubellum*, *Ceragrioncoromandelianum*, *Ischnura aurora*, *Ischnurasenegalensis*, *Pseudoagrion decorum*, *Pseudoagrionrubriceps*, *Pseudoagrionspencei* and *Rhodischnuranursei*. All the species possess  $2n (\delta) = 27m$  as the diploid chromosome number and XX-XO type sex determination. Size of X and m chromosomes vary in different species of same genus/ genera.

**Keywords:** Harike wetland, Odonata, Zygoptera, Coenagrionidae, chromosome number, sex determination.

## ISOLATION OF *CERCOSPORA* RESISTANT MUTANTS OF MUNGBEAN USING *IN VITRO* MUTAGENESIS

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**Abstract:** Three cultivars of mungbean (*Vigna radiata* (L.) Wilczek) viz. TARM-1, TARM-2 and TARM-18 were treated with 400, 600 and 800Gy of gamma ray. Multiple shooting was induced in the cotyledonary node explants obtained from the treated seeds. The induced microshoots were rooted and acclimatized. Later, the regenerated plants were transferred to the field where they flowered and set seeds. In RM<sub>2</sub> generation the population was screened to isolate putative mutants resistant to leaf spot disease caused by *Cercospora canescens*. All the putative mutants were confirmed to be resistant to the leaf spot disease in RM<sub>3</sub> generation. A few of the progenies of these mutants were either early flowering or high yielding.

**Keywords:** gamma ray, mutagen, *Vigna radiata*, leaf spot

## EFFECT OF FOLIAR APPLICATION OF CONTAF ON RHIZOSPHERE MYCOFLORA OF *BRASSICA JUNCEA*

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**Abstract:** Foliar application of systemic fungicide Contaf was given to population of *Brassica juncea* at the concentration 0.0055 and 0.011% at seedling, flowering and maturity stage. The application of contaf modified the rhizosphere mycoflora of the crop. Though, no quantitative differences were observed in rhizosphere of Varuna and EH-3 as the total cfu was more or less same in treated as well as in control plants but qualitative difference was clearly evident. Occurrence of *Aspergillus* sp. was comparatively higher in plants sprayed with Contaf as compared to the control plants.

**Keywords:** Rhizosphere, *Brassica juncea*, Varuna, EH-3, Contaf, foliar application



**THE MALE EXTERNAL GENITALIA OF THE DRAGONFLY,  
*BRACHYTHEMIS CONTAMINATA* (FABRICIUS 1793)  
(ODONATA: ANISOPTERA)**

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**Abstract:** In the dragonfly *Brachythemiscontaminata* male, there are two set of external genital organs, the primary male genitalia (PMG) and the secondary copulatory apparatus (SCA). The PMG consists of a pair of supra-anal appendages (SAA) and a median single infra-anal appendage (IAA). The supra-anal appendages are long hollow tubes covered with spines. At the base of SAA, a row of 6-8 marginal tubercles are evident. The infra-anal appendage is a large, broad triangular structure. A pair of black spots is closely situated together at the tip of the IAA tube. The male gonopore lies on the ventral side of the ninth abdominal segment. It is surrounded by a pair of pear shaped coxites. The anterior genital plates contains very few and small setae, while the posterior plate is robust, elevated and covered with a long setae. A very complex set of SCA develops on the ventral surface of the second and third abdominal segments. It consists of the anterior lamina, posterior lamina, genital lobe, genital fossa, supporting framework, hamules, penis sheath and the penis. The penis arises from the anterior end of the abdominal sternite. It is composed of four segments. The penis is bent at the middle bringing the penis head over the penis vesicle. The fourth segment of penis is oval shaped and terminates into a complex structure which includes of paired lateral and apical lobes. The penis head is flagellated.

**Keywords:** primary male genitalia, secondary copulatory apparatus, supra-anal appendages, infra-anal appendage, coxites.

## **EFFECT OF CULTURE MEDIA ON THE GROWTH PERFORMANCE OF *TRICHODERMA VIRIDE***

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**Abstract:** Trichoderma viride is an ecofriendly bio-pesticide and it does not affect the other beneficial microorganisms, Trichoderma is utilised for pest resistance. In this study we used various media like Potato Dextrose Agar (PDA), Malt Extract Agar and Peptone Dextrose Agar for finding the average linear growth of *T. viride*. Potato Dextrose Agar media was found to be more effective in promoting growth of *T. viride* followed by Malt extract agar and Peptone Dextrose Agar Media in that order. Potato Dextrose media was favourable for the aerial growth of *T. viride*. PDA proved to be better choice than Malt Extract Media and Peptone Dextrose Media because of the good response of growth in PDA over a small incubation period.

**Keywords:** biopesticides, Potato Dextrose Agar, Malt Extract Agar, Peptone Dextrose Agar

## **EFFECT OF SALT STRESS ON THE SHOOT TIP EXPLANT OF *OCIMUM BASILICUM* (LINN.)**

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**Abstract:** Although mineral nutrients are important for the plant growth; the excess soluble salts in the soil are deleterious to most plants. *Ocimum basilicum* was chosen to study salt stress under *in vitro* conditions. In the present study, seven day old shoot tip of *O. basilicum* were subjected to abiotic stress by culturing them over B5 medium with 5 mg/L of BAP and varying concentration of NaCl. It was observed that with the increase in the concentration of NaCl, there was decrease in the survival rate and but explants could tolerate maximum concentration of 0.6% of NaCl. At the higher concentrations explants showed necrosis and yellowing.

**Keywords:** abiotic stress, necrosis, explant, apical meristem, callus.

**RHIZOSPHERIC MYCOBIOTA ASSOCIATED WITH  
*VERNONIA CINEREA* L. AND *AGERATUM CONYZOIDES* L.  
(ASTERACEAE)**

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**Abstract:** Present investigation deals with the Rhizospheric mycobiota of the two plants of Asteraceae viz. *Vernonia cinerea* and *Ageratum conyzoides*. Rhizosphere of both the plants harbors the diversified mycobiota. The diversity was found to be in terms of overall 37 fungal species comprising 11 genera. The present study was carried out by Warcup and Waksman methods over the Potato Dextrose Agar Medium (PDA). The rhizospheric soils were collected from five different sites for both the plants. Present study reveals the dominant abundance of *Aspergillus* and *Penicillium* in the rhizosphere of both the plants. Simpson (1-D) diversity index was found to be 0.6 to 0.9 and Shannon (H') diversity index was found to be 1.2 to 2.8 for both the plants.

**Keywords:** rhizosphere, mycobiota, anamorphic fungi, *Aspergillus*, *Penicillium*.

## **JOB SATISFACTION IN LOCAL AND CORPORATE LEVEL INFORMATION TECHNOLOGY INDUSTRIES**

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**Abstract:** This study was conducted on two different levels of Computer Software Organisations from Nagpur, Maharashtra. Out of these the first organisation chosen for study was of Corporate Level having employee base of 5000- 10000 employees, while the second was Local Level Organisation with below 500 numbers of employees. The size of the sample was 60 employees, that is, 30 each from both the organisations. Their Job Satisfaction was calculated using questionnaire by Hackman & Oldham. Five facets of Job Satisfaction i.e. Pay, Security, Social, Supervisory and Growth Satisfaction were studied under. The study clearly shows that the Corporate Level Organisation has an edge over the Local Level Organisation as the work assignment and transparent employee policies led to more work satisfaction among employees which in turn has a positive effect on Performance Level. This study shows that, professional working style, good organisation structure, employee participation and good employee engagement practices were found to be the reason behind the higher Job Satisfaction in most of the areas of Corporate level organisation as compared to the Local level organisation.

**Keywords:** job satisfaction, performance level, local and corporate organisations

## ODONATE DIVERSITY AT BHIWAPUR MAHAVIDYALAYA CAMPUS, BHIWAPUR, INDIA

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**Abstract:** Odonate diversity at Bhiwapur Mahavidyalaya Campus, Bhiwapur was undertaken during the months of August-December, 2016. A total of 31 species and sub-species of odonates were recorded in the campus premises. The commonly observed species were *Coenagrion coromandelianum*, *Ischnura aurora* among Zygoptera and *Tramea basilaris burmeisteri*, *Tramea virginia*, *Anax guttatus*, *Ictinogomphus rapax*, *Diplocodes trivialis*, *Trithemis aurora*, *Rhyothemis variegata vaerlegata*, *Pantala flavescens* and *Brachythemis contaminata* of Anisoptera. The habitat ecology was examined for dragonflies since they need permanent water with a stable surrounding environment to reproduce, feed and roost. The pH and DO of the water of the seasonal and perennial ponds within and nearby BMB ranged from 5-8 and 6.8-7.6 respectively.

**Keywords:** dragonflies, habitat, Odonata, pond ecology, water body

**GROWTH RESPONSE WITH REFERENCE TO  
TEMPERATURE AND pH OF *SPOROTRICHUM  
THERMOPHILE* APINIS. ISOLATED FROM SOIL**

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**Abstract:** The thermophilic fungus *Sporotrichum thermophile* was isolated from soil of coal mines near Nagpur. The species was characterized with respect to the temperature and pH requirement. The radial mycellial growth and mycellial dry weight were used as parameters to study the effect of temperature and pH on the growth of the isolate. *Sporotrichum thermophile* showed rapid radial mycellia growth at 45° C. However, the maximum dry weight production was recorded at 30 – 55° C at the pH of 7-8.

**Keywords:** coal mines, temperature, mycellial dry weight, radial mycellial growth, pH, thermophilic fungus.

## IMPACT OF ANTHROPOGENIC ACTIVITIES ON THE PLANT DIVERSITY OF BAZARGAON-SATNAVARI FOREST

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**Abstract:** Bazargaon – Satnavari region is located in the Katol tehsil of Nagpur District. There are three paper mills (Apex Paper Mills 1 & 2 and Bazargaon Paper Mills) are located in this area. Besides paper mills, brick factories also are located in this area. Regular surveys were made to Bazargaon and Satnavari forests during all the flowering seasons of a year to study the impact anthropogenic activity on the plant diversity. Study area was divided into two parts *viz.* 1) area within the 1 km radius of paper mill zone (disturbed area) and 2) area outside 2kms radius of paper mill zone (undisturbed area). The vegetation was sampled by laying quadrates in both disturbed and undisturbed area. The data so generated was used to calculate diversity indices.

**Keywords:** anthropogenic activity, paper mill zone, biodiversity, reserve forest, diversity indices.



**SCANNING ELECTRON MICROSCOPIC STUDIES OF LAST  
ABDOMINAL SEGMENT IN WORKER OF *TETRAPONERA  
RUFONIGRA* (HYMENOPTERA: FORMICEDAE)**

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**Abstract:** In *Tetraponera rufonigra* the abdomen constricted and commences from the 2nd segment whereas the first segment fused with the metathorax and formed the propodeum. The region behind the propodeum is the gaster, which consist of the petiole, postpetiole and sting apparatus. A well sclerotized sting is located on the last abdominal segment. The sting shaft is long and tapered evenly but bifurcates apically. Light and scanning electron microscopic studies reveal the presence of various types of sensilla viz, sensilla trichoidea (ST), sensilla trichoidea curvata (STC) and sensilla basiconica (SB) on the last abdominal segment. The sensilla trichoidea are morphologically differentiated in three subtypes as ST-I, ST-II, ST-III. ST-I are long and curved anteriorly, while ST-II are smaller and arranged throughout the external surface of last abdominal segment. ST-III are smallest and located adjacent to ST-II.

**Keywords:** last abdominal segment, SEM, sensilla, sting, *Tetraponera rufonigra*