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BLACK CUMIN (*NIGELLA SATIVA* L.) – A REVIEW

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Abstract: Black cumin (*Nigella sativa* L., Family: Ranunculaceae) is an annual herb possessing wide range of medicinal uses apart from its commercial significance as a spice yielding plant. Black cumin seeds are used in folk (herbal) medicine all over the world for the treatment and prevention of a number of diseases. Prophet Mohammad (Peace be Upon Him) said: "Use this Black Seed; it has a cure for every disease except death" (Sahih Bukhari). The plant species is also important cytogenetically and may be used as a model plant for better understanding of gene and chromosome relationship. Despite the major advancement of modern medicine in human health-care, it is still intangible and beyond reach to ailing humanity, especially the destitute and therefore in recent years plant based system has been utilized for traditional medicine and phytotherapy. 'Medicinal plants are gift of nature' and black cumin is one such plant with potential uses, which can be explored for safe and effective herbal medicine for human benefit. Considering nearly all essential aspects of the species (synonym(s), common names, origin of the name, distribution, varieties, plant description, floral biology, pollination biology, scanning electron microscopy of seed surfaces, cultivation, economy, diseases, pest, microscopical and powdered characteristics, biochemical constituents, extraction methods of essential oils, therapeutic uses, insecticidal activity, other uses, clinical trials, biosafety, tissue culture and patents), a monograph is prepared on the laid formulation of WHO (World Health Organization) as well as on other significant parameters (cytogenetics and molecular genetics) with the following objectives: to provide an unabridged repository of references regarding the species for its effective and safe utilization as a 'Potential Medicinal Herb'; for creating awareness regarding the use of plant based medicine; understanding economic status, biosafety and patents for regulating herbal medicinal market Nationally and Internationally and exploration of cytogenetical and genetical aspects.

Keywords: Black cumin, Herbal medicine, *Nigella sativa*

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SEED BIOLOGY OF *ARTEMISIA MARITIMA* L. AN OVEREXPLOITED MEDICINALLY IMPORTANT SPECIES IN NORTH WEST HIMALAYAS

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Abstract: *Artemisia maritima* of family Compositae is an endangered perennial shrub with localized distribution because of its being highly habitat specific (Parihar *et al.*, 2011). Plants forming natural populations in Kishtwar Himalayas in J&K state, India, show high fruit and seed set in open fields ($x = 83.7\%$). Details of floral structure and events of floral biology reveal the species to be outcrossed, although it has the capacity to set seeds by selfing also. The same is accomplished through geitonogamy and by self pollen germinating at the point of nectary capping the ovary (Parihar *et al.* 2009). Seeds of the species, one per fruit, is with straight embryo and unique in being of two different colors, grey and brown. Both types are alike morphologically but differ in weight. On a moist filter paper, the %age of seeds germinating averages 34.33% for grey seeds and 47.5% for brown seeds. Most of the seedlings emerging out of these seeds however fail to establish. These observations reveal the manifestation of inbreeding depression in the species. This outcrossed species is supposedly forced to set seed by selfing due to squeezing of populations due to overexploitation and by a single individual occupying considerable area due to perennation for several years.

Keywords: *Artemisia maritima*, Seed

REGENERATION STATUS AND SPECIES DIVERSITY ALONG THE FIRE GRADIENTS IN TROPICAL DECIDUOUS FOREST OF CHHATTISGARH

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Abstract: The present work aimed to study the impact or behavior of forest fire on regeneration status and diversity indices. Four sites were selected; in each of these sites pre-fire and post-fire observation were taken for measuring varying degree of disturbances. A total of 19 seedlings species were recorded during pre-fire season and 14 seedlings species were recorded during post-fire season, respectively. Along the fire gradients the tree species exhibited highest density of seedlings in low fire zone. It showed that non-fire zone contained more species as compared to burnt areas. The diversity pattern showed that the medium fire zone had maximum diversity followed by non-fire zone, whereas low fire zone had minimum Shannon index. Seedling density drastically reduced after post-fire (27.63%). In the high fire zone the seedling layer was much affected which will result discontinuation of conversion into sapling with the progress of time and ultimately the gap in the regeneration status.

Keywords: Diversity, Forest fire, Pre-fire, Post-fire, Regeneration

TREE LAYER COMPOSITION AND CARBON CONTENT OF OAK AND PINE IN LOHAGHAT FORESTS OF KUMAUN HIMALAYA

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Abstract: Present study deals with composition of tree species, biomass and carbon content of forests in Lohaghat (Champawat) in Kumaun Himalaya. Total 06 tree species were reported from the study forest sites i.e. *Quercus leucotrichophora*, *Pinus roxburghii*, *Cedrus deodara*, *Myrica esculenta*, *Prunus cerasoides* and *Xanthoxylum alatum*. The *Quercus leucotrichophora* was dominant tree (82.7%) in the study forest site. Oak tree shared maximum basal area (24.96m²ha⁻¹) and important value index (210.72). Total density of trees, seedlings and saplings was 2860 ind ha⁻¹. Of this, tree, seedling and sapling shared 46.5, 21.0 and 32.5 percent. The biomass and carbon content of oak and pine was 128.10 t ha⁻¹ and 72.87 t ha⁻¹, respectively. Of these, oak trees shared 79.19 % biomass and 81.5 % carbon, respectively. The findings of density, basal area, biomass and carbon content depicted that forest is in young stage with less number of tree species, needs a proper management and conservation so that tree layer species composition, biomass and carbon stocks could be increased.

Keywords: Basal area, Biomass, Carbon content, Density, Tree species

MORPHOLOGICAL AND CYTOLOGICAL STUDIES IN *NIGELLA SATIVA* L. AND *N. DAMASCENA* L. (RANUNCULACEAE)

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Abstract: *Nigella sativa* L. (black cumin; potential herb with immense therapeutic uses apart from its spice yielding property; cultivated variety – *Persian Jewels*) and *Nigella damascena* L. (commonly known as ‘love-in-a-mist’, grown in gardens throughout temperate region of the world; cultivated variety – *Miss Jekyll blue* obtained from Sutton and Sons’, Kolkata and an accession 0016287 obtained from Royal Botanical Garden, Kew, London) members of the family Ranunculaceae were grown in the Experimental field plots of Department of Botany, Kalyani University (Nadia, West Bengal plains, latitude 22°50’ to 24°11’ N, longitude 88°09’ to 88°48’ E, elevation 48 ft. above sea level, sandy loamy soil) for three consecutive years as rabi crop. The plant types were described and Kew accession was found to be unique and better adaptive than that of Sutton samples of *N. damascena*. Morphometric (plant height, primary and total branches/plant, capsule/plant, capsule length, seta/capsule, filled seeds/capsule, seed weight/plant as well as capsule and flower sterilities) and meiotic (mean chromosome association/cell at metaphase I, bivalent configurations, chiasma/nucleus, anaphase I segregation and pollen fertility) parameters were assessed in the plant types and statistical analysis (χ^2 -test of heterogeneity and Student t-test) of the accumulated data revealed significant variations among/between plant types for most of the traits. Results indicated the possibility of efficient breeding between species/accessions for enhancing gene pool of *Nigella*.

Keywords: Efficient breeding, Meiosis, Morphometric traits, *Nigella damascena*, *Nigella sativa*.

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MYCORRHIZAL INOCULATION EFFECT ON GROWTH RESPONSES AND DRY MASS PRODUCTION OF *MIMOSA HIMALAYANA* GAMBLE SEEDLINGS

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Abstract: *Mimosa himalayana* is a nitrogen fixing shrub of Central Himalayan region. In the present study, effect of mycorrhizal inoculation was observed on the seedlings of *M. himalayana*. For this, seedlings of *M. himalayana* were raised in polyethylene bags containing sterilized mixture of soil and commercial sand. The seedlings of *M. himalayana* became colonized when inoculated with vesicular-arbuscular mycorrhizal fungi. When compared with uninoculated seedlings, inoculated seedlings showed increased root and shoot length with 48% to 58% mycorrhizal dependency for total seedling biomass. Present study suggested that the vesicular arbuscular mycorrhizal fungi act as an important biological factor that contributes to the efficiency of nutrient uptake and use.

Keywords: Colonization, Inoculation, *Mimosa himalayana*, Mycorrhiza, Production

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ANALYSIS OF QUALITATIVE TRAITS IN OKRA [*ABELMOSCHUS ESCULENTUS* (L.) MOENCH] GROWN UNDER TWO ENVIRONMENTS

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Abstract: Besides Okra is a potential fibre yielding crop as because the bast fibre is strong, hygroscopic and resistant to rot, thus suitable to meet the global demand as an additional source of ecofriendly fibre. Fifteen genotypes of Okra were evaluated for morphological and yield related traits. Estimation of biochemical constituents i.e. total soluble solids, crude fibre, total carotenoids, calcium and phosphorus were also performed.

Keywords: *Abelmoschus esculentus*, Analysis, Okara

ADOPTION OF ECO-FRIENDLY MANAGEMENT PRACTICES BY VEGETABLE GROWERS

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Abstract: The investigation was undertaken during the year 2008-09 in purposively selected Indore block of Indore district of Madhya Pradesh in terms of socio-personal, economic and communication profile of vegetable growers. Regarding the knowledge about eco-friendly management practices most of the respondents possessed medium to high level of knowledge. Higher percentage of the respondents (61.25%) had medium adoption of eco-friendly management practices.. About 88.22 per cent variation in level of knowledge was contributed by all eleven antecedent variables related to socio-personal, economic and communication characteristics of vegetable growers. Education, mass media exposure, extension participation and information seeking behaviour were positively and significantly influenced the knowledge to the extent of 87.05 per cent. Education showed its superiority over remaining variables in respect of influencing knowledge level. Education had recorded highest percentile contribution (28.93) followed by mass media exposure (24.80), information seeking behaviour (21.50) and extension participation (13.83). About 83 per cent variation in extent of adoption was explained by all eleven antecedent variables. Education, mass media exposure, information seeking behaviour and land holding significantly influenced the adoption of eco-friendly management practices by the vegetable growers to the extent of 80.83 per cent. Education recorded highest percentile contribution (54.70) followed by mass media exposure (34.98) and information seeking behaviour (21.59). Extent of adoption was negatively and significantly influenced by size of land holding to the extent of -2.53 per cent in terms of percentile contribution towards multiple R² value.

Keywords: Adoption, Management practices, Vegetable

SOME STUDIES ON PHYSICAL AND CHEMICAL PROPERTIES OF TAMARIND AT DIFFERENT MOISTURE CONTENT

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Abstract: Tamarind (*Tamarindus indica* L) is an economically important fruit of India as well as Chhattisgarh. The knowledge about physical and chemical properties like size, weight, moisture content, protein content, carbohydrate content etc. of any biomaterial is essential to designing its equipment for processing, storage, transportation and for the value addition. In the present investigation, some studies on physical and chemical properties of tamarind at different moisture content were carried out. For the experiment physical and chemical properties were determined at three different moisture- Initial 22.0%(wb), After sun drying 17.90%(wb), After hot air drying 15.80% (wb). physical properties of Tamarind fruit like size, length, breadth, thickness and weight of fruit (pulp weight, seed weight, shell weight etc) followed a declining trend with decrease in moisture content of the tamarind fruit. The chemical properties like total soluble solids, protein content, carbohydrate content, fat and ash content followed an increasing trend but the titratable acidity is decrease with decreasing the moisture content of the fruits and the color of tamarind pulp was clearly observed that it became darker, redder and yellower than the initial and the total color (ΔE) difference at different treatments is 0, 5.807 and 6.458 under normal, sun dried and hot air dried condition respectively.

Keywords: Tamarind, Physical & chemical properties

DISTRIBUTION OF TRACE METALS IN DRINKING WATER OF SOME RURAL HABITATIONS IN WESTERN UTTAR PRADESH, INDIA AND THEIR SUITABILITY FOR DRINKING PURPOSE

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Abstract: A study was conducted to assess the distribution of manganese, copper zinc and iron in drinking water in some part of western Uttar Pradesh. Ground water in the study area is neutral to moderately in nature. It was observed that the ground water in the study area is having higher concentration of iron and zinc which is vulnerable to drink. Iron was much higher than the acceptable limit in approximately 59% of water sample as per guide line of (WHO) However, the concentration of zinc were permissible limit but it was much higher than acceptable limit as per EPA guideline. The concentration of copper and manganese was within the limit. The suitability of ground water for drinking purpose were examined using WHO and EPA classification, which indicate that ground water, was unsuitable for drinking purpose in few location.

Keywords: Trace metals, Drinking water, Manganese, Copper, Zinc, Iron

EFFECT OF TREATMENT WITH LEAD SULPHATE ON SOIL MYCOBIOTA

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Abstract: Nineteen species of fungi were isolated from control soils and that treated with lead sulphate solutions (20ppm, 40ppm, 100ppm and 250ppm) for 90 days. Treatment with lead sulphate did not result in substantial decrease in the number of species isolated. Greater number of isolates was obtained from Pb-treated soils except in general. The species which could tolerate higher concentration of lead sulphate for 90 days included *Aspergillus flavus*, *Aspergillus ustus*, *Aspergillus niger* and *Trichoderma lignorum*. *Aspergillus fumigatus* and *Botryotrichum piluliferum* exhibited remarkable resistance to lead as these dominated the soil treated with lead sulphate solution for 90 days.

Keywords: Heavy metals, Lead pollution, Metal tolerant fungi, Soil microflora.

STRUCTURE AND PHENOLOGY OF AN ALPINE MEADOW AS AFFECTED BY NOMADIC GRAZING

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Abstract: Data were collected for structure and phenology of alpine grassland at Rudranath in Uttarakhand, India. A large number of species of the area are dwarf cushion herbs and most are distributed in mid alpine tract. A total of 21 and 16 species were recorded at control (S1) and grazed (S2) plot respectively. At control or ungrazed site maximum density (211.0

pl/m²) and basal cover (121.6 pl/m²) was recorded for *Danthonia cachaemymeriana* and for grazed plot maximum density (146.0 pl/m²) and basal cover (170.9 pl/m²) was for *Oxygraphis polypatela*. In most of the cases, the various species completes their life cycle within 4-5 months. Germination of various species starts during April-May with luxuriant vegetative growth. Majority of species bear flowers during July and August. Some species bear flowers during later part of June. Seed formation begins in later part of August and increase sharply up to September. Senescence at community level is gradual from September and increases quickly due to lower temperature. Thereafter different phenophases succeeded one after the other and completed their life history up to November.

Keywords: Phenophases, Phenology, Sprouting, Senescence, Vegetative

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EVALUATION OF THE ANTIBACTERIAL ACTIVITY OF BARK OF *LITCHI CHINENSIS* AGAINST *ESCHERICHIA COLI*, A UTI CAUSING ORGANISM

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Abstract: Main focus of present study was to screen the UTI patients, classification of patient on the basis of sex, age and antimicrobial activity of different ethanol, aqueous extracts of bark of *Litchi chinensis* L. against *Escherichia coli*. Agar well diffusion method was used to evaluate antibacterial activity against *E. coli*. Result suggested that Ethanol extract of *Litchi chinensis* shows more antibacterial activity as compared to aqueous extract, and norfloxacin against *E. coli*. On the basis of microbial count in urine sample, 30 out of 97 suspects were UTI positive. 70% females were UTI positive. Most infections were seen in age group of 16-30yr in both male (13.3%) as well as female (30%). Ethanol extract (30mg/ml) showed 31.86% more inhibition zone as compared to norfloxacin (30mg/ml). Aqueous extract (30mg/ml) also showed 23.56% more inhibition zone as compared to norfloxacin (30mg/ml)

Keywords: *Litchi chinensis*, Antibacterial, *E. coli*, UTI

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EFFICIENCY OF UNTREATED AND TREATED DAIRY EFFLUENT ON PHYSICO-CHEMICAL PROPERTIES OF THE SOIL

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Abstract : Samples of untreated and treated dairy effluent were collected from Parag milk plant, Meerut. Three concentrations (25, 50 and 100%) were used in this study. Tap water served as control. It was observed that soil pH decreased non-significantly in all the treatments with effluent application as compared to control. However, Nitrogen, Phosphorus and Potassium content of the soil increased significantly. Thus soil fertility improved in Integrated Nutrient Management System (I.N.M.S.) and agro-ecosystem.

Keywords : *Brassica juncea*, Meerut, Nitrogen, Phosphorus, Potassium

ETHNOVETERINARY VALUES OF SOME PLANTS USED AGAINST SNAKE BITE IN POONCH DISTRICT OF JAMMU AND KASHMIR (INDIA)

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Abstract: Poonch district of Jammu and Kashmir state possesses a rich history and culture of tribal society which have a great wisdom of traditional knowledge with regard to medicinal plants for the treatment of their livestock. Survey was conducted from January 2009 to December 2010 for the documentation of ethno veterinary plants used for snake bite particularly to cows, Buffaloes and Horse with the help of village elders, key informants and local healers which indicated that inhabitants of the valley utilize 22 species belonging to 16 genera and 12 families. The primary objective of the study was to explore the floristic diversity and valuable folk medicinal plants because the knowledge is confined to only local healers and it is important to record this knowledge for future generations which otherwise will be lost forever. Family name, botanical name with local name in bract, parts used, method of preparation and mode of use is presented here.

Keywords: Against snake bite, Traditional knowledge

Report

BIOPROSPECTING ANTICARCINOGENIC POTENTIAL OF PLANTS IN RAJASTHAN, INDIA

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Abstract: Purpose of this communication is to report on the present status of anticarcinogenic plants of Rajasthan based on folk lores, ethnobotanical, pharmacological and biochemical studies meant for more fruitful and directed future studies and projects. An up to date account of antioxidants, antimutagens, detoxicants anti-inflammatory, antiproliferative, antimetastasis and antiangiogenic plants has been given.

Keywords: Bioprospecting, Anticarcinogenic, Antioxidant plants, Rajasthan

Short Communication

ROLE OF BIO-FERTILIZERS IN HORTICULTURAL CROPS

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Abstract: The term bio-fertilizer is made up of two words "Bio" means living and "Fertilizer" means a product that provides nutrients in usable form. But as a product Bio-fertilizer does not contain any significant quantity of nutrients

itself. It contains mainly live bacterial or fungal cells, which on application helps in fixing or solubilizing the nutrients present in air or in soil. These are natural fertilizers.

Keywords : Bio-fertilizers, Horticultural crops

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Short Communication

PROBLEMS EXPERIENCED BY RURAL WOMEN ENTREPRENEURS

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Abstract: The study was conducted in purposively selected block of Indore district of Madhya Pradesh during 2009-10 in order to know the entrepreneurial behaviour of rural women in terms of their socio-economic, psychological and family background attributes. The results of the study revealed that dual responsibility, lack of resources, poor family support, and late payment by clients, mobility and marketing constraints were the major constraints perceived by majority of the rural woman entrepreneurs.

Keywords : Indore, Rural women, Rural population

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Short Communication

POST HARVEST LIFE OF TUBEROSE AS INFLUENCE BY GA₃ AND VARIETIES

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Abstract: An experiment was conducted to evaluate the influence of GA₃ and varieties on post harvest life of tuberose. GA₃ was applied to plants at two concentrations (GA₃ 100 and 200 ppm) along with control (distilled water). Varieties comprised of two single cultivars namely Sikkim Selection, Phule Rajani and two double cultivars namely Vaibhav and Calcutta Double. GA₃ 200 ppm produced pronounced affect on post harvest characters of tuberose. All the varieties exhibited significant differences for all the attributes.

Keywords: Tuberose, GA₃, Cultivar, Growth, Yield.

Short Communication

SCREENING OF OKRA GENOTYPES BASED ON LEAF SHAPE INDEX

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Abstract: Okra [*Abelmoschus esculentus* (L.) Moench] is an important vegetable crop in the tropics and the subtropics. For characterization of diverse okra genotypes morphological characters play an important role.

Keywords: *Abelmoschus esculentus*, Genotypes, Okra