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Contents

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ISOLATON, BIOCHEMICAL CHARACTERIZATION AND PREPARATION OF BIOFERTILIZER USING *RHIZOBIUM* STRAINS *(VIGNA MUNGO)* FOR FARMERS USE

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Abstract: A pot experiment was conducted at Sardar VallabhBhai Patel University of Agriculture & Technology, Meerut (U.P.) to evaluate the effect of *Rhizobium* as a biofertilizers on different plant parameters related to yield performance of Black gram (*Vigna mungo*) cv.urd shekhar-2 during the period from March to June 2013. The trial composed of four treatments such as T_1=control, T_2=DAP, T_3=IARI (Urd 10B) and T_4=Native strain. Irrespective of treatment differences the black gram plant as a pulse crop showed a lag phase for slow dry matter production in early growth stage that decrease upto harvest. This greater dry matter production eventually partitioned to root length, seed number, seed weight, dry pod weight, number of pods, number of nodules and microbial count. The results revealed that biofertilization perform significant improvement in plant productivity and quality. The maximum germination and increase in plant root length, seed number, seed weight, dry weight, number of pods and microbial count was increased progressively in treatments treated with *Rhizobium*.

Keywords: Isolation, biofertilizer, *Rhizobium*

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SYNTHESIS AND CHARACTERIZATION OF NOVEL FUNCTIONALIZED CHALCONES AS POTENT ANTIMICROBIAL AGENTS

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Abstract: Two series of novel chalcones (6a-6g and 7a-7g) have been synthesized by solution phase Claisen-Schmidt condensation. All the new final products have been purified by silica gel column chromatograpgy and characterized on the basis of their infrared (IR) and proton nuclear magnetic resonance (^{1}H NMR) spectroscopic data, and elemental analysis. All the final compounds (6-7) were exploited for their antimicrobial activity by the cup-plate method. From the antibacterial screening it was observed that the compounds, 6 (a, b, e and f) and 7 (b, c and g) shows good antibacterial activity against *Staphylococcus aureus* (zone of inhibition,10-16 mm) as compared to standard streptomycin (zone of inhibition, 18 mm) whereas compounds 6 (a, b, d, e and g) and 7 (b, c and g) showed good antibacterial activity against *Escherichia coli* (zone of inhibition,10-18 mm) as compared to streptomycin (zone of inhibition, 22 mm). Fungicidal screening data also revealed that compounds 6 (a and b) and 7 (d and e) imparted maximum activity against *Aspergillus niger* (zone of inhibition, 10-15

mm) as compared to standard griesofulvin (zone of inhibition, 17 mm), whereas compounds 6 (a, c, e and f) and 7 (e and g) showed good activity against *Candida albicans* (zone of inhibition, 10-16 mm) as compared to griesofulvin (zone of inhibition, 20 mm).

Keywords: Chalcones, Claisen-Schmidt Condensation, Antimicrobial activity, IR, ^{1}H NMR

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EFFECT OF SALINITY ON SEEDLING PARAMETERS OF INDIAN WHEAT VARIETIES

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Abstract: Salinity is one of the most important abiotic stress conditions. Wheat (*Triticum aestivum* L.) is major cereal crop of world; it's grown in worldwide under different agro climatic, environmental condition and geographical condition as well as in tremendous heterogeneity of saline soil. Response of salt stress under four salinity concentrations levels 0 (only distilled water: control), 1.227, 2.629 and 5.550 g l^{-1}) on five varieties of wheat *viz.*, U 2594, K-816, Sujata, HD-2733 and PBW 373 were conducted The data showed that reduced significantly with subsequent treatment affected the growth attributes such as germination percentage (%), plumule and redical length, fresh and dry weight of root and shoot for all varieties. Number of germinated seeds was finally recorded after seven days. Results showed significant decreases in germination percentage of Indian wheat varieties due to increasing salinity. Among the wheat varieties Sujata showed that tolerable against salinity while UP 2594 most susceptible variety.). Any impairment in seed germination or seedling development due to salt stress can cause significant depressions in yield formation. It appears that the bread wheat genotypes Sujata can perform well on saline soils, at least during the early growth stages. The existence of such impressive genotypic variation in tolerance to NaCl could be very useful for the development of high-yielding salt-tolerant genotypes and better understanding of the physiological and molecular mechanisms contributing to salt-stress tolerance in wheat. This study showed the existence of an impressive variation in tolerance to increasing NaCl treatments during the early growth stage.

Keywords: Abiotic stress, salinity, seed germination and variety

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STUDY OF TRICHOME MORPHOLOGY ON FLORAL PARTS OF SOME MEMBERS OF ERICACEAE

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Abstract: A detailed study of trichome morphology was carried out in floral parts of eight members of Ericaceae viz. *Enkianthus deflexus* Schneider, *Gaultheria hookeri Clarke, Lyonia villosa* Hand- Mazz, *Pieris formosa* Don, *Agapetes serpens* Sleumer, *Vaccinium retusum* Hook and *Vaccinium vacciniaceum* Slemer. The present investigation dealt with the structure, development and distribution of tricromes on the floral parts. They are of different sizes and shape. Glandular head and a stalk is only observed in *Agapetes serpens.* In rest of the members they are non- glandular type which are unicellular papillate hook type, thorn type filamentous type, filamentous brached type and uniseriate 2 called and 5-6 celled trichromes. They serve as important parameter for taxonomic purpose.

Keywords : Trichomes, floral parts, Ericaceae

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GENETIC VARIABILITY STUDIES IN *ALOE VERA* USING RAPD MARKERS

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Abstract: Studies were conducted to evaluate the genetic diversity among twenty genotypes of Aloe vera using the RAPD markers. RAPD analysis with ten primers generated all polymorphic bands and no monomorphic band was observed. The number of polymorphic allele ranged from 2 to 6 with different primers. Genetic diversity of twenty genotypes as estimated

by polymorphic information content (PIC) value ranged from 0.52 to 0.96. The cluster dendrogram of RAPD showed similarity values from 0.65 to 0.92. Dandrogram generated using RAPD data showed two major clusters. Cluster I consist of two genotypes however, cluster II included eighteen genotypes. Dendrogram revealed that Rishekesh Aloe-1 was distinctly related with home Aloe at a similarity coefficient 0.54. PIC values of RAPD primers namely MAP-4, MAP-1and MAP-9 were 0.96, 0.88, 0.86, respectively and provides maximum accessions coverage in the aloe vera genome. These RAPD primers are useful for genetic variability studies in aloe vera.

Keywords: RAPD, *Aloe vera*, Genetic variability

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TEMPERATURE STRESS AT DIFFERENT STAGES OF GROWTH AND ITS EFFECT ON PHENOPHASE IN TWO VARIETIES OF MUNG BEAN GROWN DURING SUMMER SEASON

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Abstract: Two varieties of mung beansvizPusa 9531 and Pusa Vishal were used in the present investigation under pot culture conditions.The plants were grown under natural and temperature elevated conditions throughout the season.To know the critical stage, plants were exposed for 15 days at elevated temperature at early vegetative stage (0-15) days, (15-30)days ,(30-45) days , and (45-60)days stage. For the rest of the period, plants were grown under natural conditions. The results revealed that phenophase was altered due to elevated temperature.It enhanced flower initiation but decreased total number of flowers, pod numbers and pod setting percentage. The seed number per pod and seed weight decreased affecting the grain yield of the plant in both the varieties. The critical stage was found during pod development stage (45-60) days followed by flower initiation and grain development stage (30-45)days .However the plants exposed to high temperature (15-30)days stage showed the recovery after exposure to natural conditions.

Keywords: Phenophase**,** elevated temperature,Summer mung bean, pod setting, grain yield

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HETEROSIS AND GENETIC VARIABILITY FOR 6-PARENT HALF DIALLEL CROSS IN LATHYRUS

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Abstract: Fifteen F_1 hybrids of grasspea and their parents were evaluated in randomized complete block design to estimate heterosis and variability of seed yield and neurotoxin content. The magnitude of heterosis varied significantly between hybrids. Heterosis over mid parent in seed yield per plant and neurotoxin content ranged from 6.95% to 161.33% and 1.47% to 41.10% respectively. Heterotic effect for 100 seed weight, protein content, and biological yield per plant respectively varied from 0.86% to 24.05%, 10.36% to 93.14% and 3.33% to 87.85%. Pusa-24 x Ratan exhibited maximum heterosis and heterobeltiosis for seed yield per plant, whereas, Mahateora x RLS-3004 expressed maximum heterobeltiosis and heterosis for ODAP content. Analysis of variance indicated significant differences due to genotypes for all the characters except plant height (cm), pod length (cm), no. of seeds pod^{-1}, biological yield $plant^{-1}$ and harvest index (%). High heritability coupled with high genetic advance was observed for only protein content.

Keywords: Heterosis, *Lathyrus*, genetic variability, grasspea

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EFFECTS OF HEAVY METAL (Cd) STRESS ON ENZYME ACTIVITY OF *VIGNA RADIATA* L. SEEDLINGS

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Abstract: An experiment was conducted to see the impacts of heavy metal stress as it is main cause in soil and water disorders in agricultural field crops, specially *Vigna radiata* L. cv. MH98-6 on enzyme activity and yield attributes. Surface sterilized seeds of *Vigna radiata* L. cv. MH98-6 L. were exposed to various concentrations of cadmium chloride solution (10^{-2} M, 10^{-4} M, 10^{-5} M, 10^{-8} M and control) at room temperature and these seeds were transferred to petriplates and polythene bags in triplicate. Increase in heavy metal stress (10^{-2} M) conc. was found to have deleterious effects on pollen growth, plant height, phytomass, number of branches, leaf area, chlorophyll contents and yield attiributes while 10^{-8} M revealed slightly promotory effects. Nitrate and nitrite reductase activity was markedly inhibited at higher conc. and same trend was observed in amylase activity. Low dose of cadmium (10^{-8} M) did not affect soluble sugar contents of seeds but it induced a significant increase at higher conc (10^{-2} M). It however, did not affect protein contents of seeds, catalase (CAT) and peroxidase(POD) activity of 15 days old seedlings except at higher concentration.

Keywords: *Vigna radiata*, Cadmium, enzyme activity, sugar, yield attributes

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QUALITY AND COST ANALYSIS OF COMPOST UNDER DIFFERENT COMPOSTING TECHNIQUE

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Abstract: The experiment was carried out during the December 2007 to March 2008, at instructional farm of Indira Gandhi Krishi Vishwavidyalaya, Raipur. Different composting techniques are used. Treatment under aerobic decomposition of paddy straw, soybean straw and fresh cow dung and soil were taken into 5:2 ratios for each pit. The progressive decrease in total organic carbon, and C/N ratio, cellulose, were found under the NADEP method of composting. Ash percent increased with days of decomposition progresses and maximum increase was found at 120 days. The significant increase in CEC was observed in all the methods under aeration and it was maximum [90.66 C mol (p+) kg^{-1}] under NADEP method of composting followed by turning method and three perforated pipe method of composting. The highest L/N ratio was recorded in NADEP method of composting (T_7) (6.95, 11.43, 12.56 and 14.64) at progressive days. While lowest ratio was recorded in traditional method (T_6) (7.10, 8.86, 10.66 and 10.78) at progressive days, respectively. The maximum CEC/TOC ratio was observed (2.55) in NADEP method of composting at 120 days. The maximum cost of production (553.75 Rs/pit) with NADEP method and minimum (212.00 Rs/pit) with traditional method of composting were estimated the frequency of NADEP method was recorded highest with preparation of composting within 4 months followed by turning method of composting.

Keywords: Cellulose %, nitrogen, organic carbon, lignin%

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ASSESSMENT OF GENETIC DIVERSITY IN GARLIC (*ALLIUM SATIVUM* L.) GERMPLASM

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Abstract: An investigation was carried out to identify the extent of genetic divergence that exist for the yield and yield contributing characters of fifteen genotypes of garlic using Mahalanobis D^2 analysis. All the 15 genotypes of garlic (*Allium sativum* L.) were grouped into three clusters on the basis of the morphological diversity. Maximum intra-cluster distance was observed in cluster III (5.654) whereas, maximum inter-cluster distance was observed between cluster II and I (6.294). The analysis of divergence indicated significant differences among parental lines for all the agro-morphological characters. On the basis of results obtained in the present investigation, it was concluded that the allelic diversity can be used for future breeding program. The traits under study are also major yield contributing traits and are largely associated with each other. Therefore, these traits should be taken into consideration either simultaneously or alone for selecting a high yielding garlic genotype.

Keywords: Garlic, investigation, plant, *Allium*

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GENETIC EVALUATION OF QTLS AND CORRELATION STUDIES FOR YIELD AND RELATED TRAITS IN RICE (*ORYZA SATIVA* L.) FOR IRRIGATED AND DROUGHT CONDITION

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Abstract: Drought stress is the predominant cause for rice yield reduction and production stability in rain fed and poorly irrigated rice ecosystems. Development of cultivars with improved drought tolerance is thus an important element in increasing productivity and alleviating poverty of communities depends on rain fed ecosystem. Identification of QTLs and molecular markers linked to drought tolerance can substantially improve selection efficiency. 45 lines of F_3 population of two *indica* genotypes, SWARNA and IR86931-B-6 were evaluated under Irrigated, Rainout shelter I and Rainout shelter II condition at Research cum Instructional Farm of College of Agriculture, IGKV, Raipur, to generate phenotypic data and SSR and HvSSR based genotypic data of population was generated. The phenotypic and genotypic data was analyzed for genetic evaluation of QTLs and correlation studies for yield and related traits in rice for irrigated and drought condition. The yield under irrigated condition exhibited non significant weak correlation with grain yield under both rainout shelter I as well as rainout shelter II, 100 SSR and HvSSR primers were screened for detecting parental polymorphism, out of which 37 showed polymorphisms. 37 SSR and HvSSR markers were further used for developing genotypic data. QTLs for DSI were identified on chromosome 3 and chromosome 5 under rain out shelter II condition.

Keywords: Rice, DSI, QTLs, SSR, ROSI, ROSII, Correlation

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PHYSIOLOGICAL AND BIOCHEMICAL MANIFESTATIONS OF SALICYLIC ACID IN RICE UNDER WATER STRESS CONDITION

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Abstract: Salicylic acid (SA) is a naturally occurring plant hormone of phenolic nature that has diverse effects on tolerance to abiotic stresses. It may act as endogenous signal molecule responsible for inducing abiotic stress tolerance in plants, especially water stress. An experiment was therefore, conducted with an aim to assess the role of exogenously applied SA in water stress tolerance of four different rice varieties. The pot culture was laid out in a completely randomized design (CRD) with three replications. Varieties were subjected to water stress at vegetative stage by withholding water application. The study revealed that moisture stress at vegetative stage is highly detrimental to most of the physiological and biochemical traits investigated in the current research. Drought caused a massive reduction in the basic physiological processes measured in terms of photosynthetic rate, stomatal conductance, transpiration rate, and chlorophyll stability index, but contrastingly, caused noticeable increase in proline accumulation. Foliar application of 100 ppm SA improved the plant growth by increasing the above stated parameters which were reduced due to moisture stress and helped the plants to overcome the adverse effects of water stress. The present finding envisaged that SA improved the drought tolerance of all the four rice cultivars particularly the sensitive ones. Therefore, it may be used as an ameliorant to alleviate the negative effect of drought injury in rice.

Key words: Rice, vegetative stage, water stress, physiological and biochemical traits

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GENETIC VARIABILITY AND COMBINING ABILITY ANALYSIS FOR 6-PARENT HALF DIALLEL CROSS IN LATHYRUS

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Abstract: Fifteen F_1 hybrids of grasspea and their parents were evaluated in randomized complete block design to estimate variability and combining ability of seed yield and neurotoxin content. Analysis of variance indicated significant differences due to genotypes for all the characters except plant height (cm), pod length (cm), no. of seeds pod^{-1}, biological yield plant^{-1} and harvest index (%). High heritability coupled with high genetic advance was observed for only protein content. Analysis of combining ability revealed the existence of highly significant variation among crosses for all characters in F_1 generation. Combining ability analysis indicating predominance of additive gene action in the expression of pod length (cm) and harvest index (%). The parent Mahateora, Pusa-24, RLS-3004 and Siraha Local appeared to be good general combiners. The cross Pusa-24 x RLS-3004 proves the best combination for early maturity; Prateek x Siraha Local and Pusa-24 x Ratan proves the best combination for seed yield plant^{-1}; Pusa-24 x Ratan and Mahateora x RLS-3004 proves the best specific combination for ODAP content.

Keywords: Grasspea, hybrid, seed, *Lathyrus*

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IMPACT OF ELEVATED TEMPERATURE ON GROWTH, YIELD, GRAIN QUALITY IN SUMMER MUNG BEAN AND ITS MITIGATION THROUGH USE OF BIOFERTILSERS

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Abstract: Two varieties of mung bean *viz.* Pusa 9531 and Pusa Vishal were raised under pot culture conditions during summer season.These plants were grown under natural and elevated temperature(normal±5°C)conditions.The result revealed that the elevated temperature had the adverse effect on nodulation,leaf area,total dry matter and grain yield as compared to natural conditions.The use of *Rhizobium*and AM fungi either alone or in combination had mitigated the adverse effect of elevated temperature in both the varieties.The dual inoculation was found better than individual application in terms of dry matter production, pod number, seed number, seed size, grain yield and quality. VarietyPusa 9531 proved better than Pusa Vishal.

Keywords: Elevated temperature, Summer mungbean, AM Fungi, *Rhizobium*, nodulation, grain yield, quality

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NEED OF AGROFORESTRY AND IMPACT ON ECOSYSTEM

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Abstract: Agroforestry is a modern and scientific farming practice. It is a sustainable land use system under which food crops (annuals) with tree crops (perennials) and/or livestock are maintain simultaneously on the same piece of land to increase the total yield and this management practices are economically and ecologically sound. It is just a compromise between these two resources of forest trees and agricultural crops to maintain the need of forest cover upto 33% as per given national forest policy. Agroforestry has the potential to alter the microclimate under the tree canopy. It plays a major role in enhancement of overall farm productivity, soil fertility through addition of litter and organic matter, climate change mitigation through carbon sequestration, phytoremediation, watershed protection and biodiversity conservation. Upto some extent biodrainage plantation might have improve the soil aeration, sulphide toxicity and nutrient use efficiency. Moreover, it reduces the water logging condition and maintains the soil aeration property. Under the agroforestry system multipurpose and N_2-fixing trees are played a valuable and significant role for upliftment of productivity and combating the soil health problem. Generally, farmers are used N_2-fixing trees like some leguminosae family comprises *Acacia spp., Dalbergia sissoo* etc. on their farmland for enhancement productivity with better soil health and generating incomes through employment. Therefore, scope and potential of agroforestry are envitable.

Keywords: Agroforestry, biodrainage, biodiversity, carbon-sequestration, farming system.

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DIVERGENCE STUDIES IN GLADIOLUS (*GLADIOLUS HYBRIDUS* L.) GERMPLASM

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Abstract: An investigation was carried out to identify the extent of genetic divergence that exist for the flower yield and yield contributing characters of fifteen genotypes of gladiolus. Multivariate analysis was performed on field data using Mahalanobis's D^2-statistics, Tochers method of clustering and combined analysis of variance. Analysis of variance revealed considerable differences among the genotypes for all the morphological traits studied. All the 15 genotypes of gladiolus (*Gladiolus hybridus* L.) were grouped into three clusters on the basis of the morphological diversity. Maximum intra-cluster distance was observed in cluster III (4.544) was recorded between cluster III and I. whereas the minimum average inter cluster D^2 value (3.699) was recorded between clusters III and II. The analysis of divergence indicated significant differences among parental lines for all the agro-morphological characters. On the basis of results obtained in the present investigation, it was concluded that the allelic diversity can be used for future breeding program. The traits under study are also major flower and corm yield contributing traits and are largely associated with each other. Therefore, these traits should be taken into consideration either simultaneously or alone for selecting a high yielding gladiolus genotype.

Keywords: Gladiolus, investigation, germplasm, Iridaceae

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SOIL FERTILITY STATUS OF MAJOR NUTRIENT IN *VERTISOL* OF DHAMTARI BLOCK

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Abstract: The present investigation entitled "Evaluation of soil fertility status in *Vertisol* of Dhamtari block, under Dhamtari district in chhattisgarh." was carried out for soil fertility evaluation during 2009-10 and analyzed for nitrogen, phosphorus and potassium content for delineation the fertility status in *Vertisols* in relation to salient physicochemical characteristics. There was Grid based surface (0-15 cm) soil samples by systematic survey were collected from 69 villages in Dhamtari block where 516 samples were identified from *Vertisol.* The available phosphorus and potassium was negative but non-significant correlation showed with soil pH and the positive but no significant correlation with nitrogen, the pH was positively and significant correlated with electrical conductivity. The positive and significant correlation observed between organic carbon and nitrogen. The organic carbon showed the negative and non–significant correlation with phosphorus and potassium. The nitrogen, phosphorus and potassium showed no significant correlation among them. After evaluation found as the status of available nitrogen in *Vertisols* were found to be low nitrogen status, available phosphorus found low to high and available potassium content generally found medium to high and only 1.75 percent soil samples tested low in available potassium. The nutrient index with respect to available nitrogen, phosphorus and potassium were also calculated on village basis. Four categories of soil fertility viz. Low- Low- Low (LLL), Low-Low-Medium (LLM), Low-Medium-Medium (LMM) and Low-Medium-High (LMH) were observed in *Vertisol* of Dhamtari Block.

Keywords: fertility status, major nutrients, *Vertisol*
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URGINEA INDICA – IMPORTANCE AND NEED FOR AWARENESS

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Abstract: *Urginea indica* (Roxb.) Kunth. is a bulbous perennial herb belonging to family Liliaceae. The species is distributed abundantly on Rocky Mountains and on dry sandy soils near the sea. It is also found growing in J & K in different habitats. The bulbs are of immense medicinal importance and used in the treatments of many ailments, though locals of J & K consider them as a best remedy for joint pains and for removing thorns. While extensive literature is available on its phytochemistry, tissue culture, taxonomy and systematic, little is known about its cytology, reproductive biology, breeding system and genetics. The species is increasingly becoming threatened in few regions due to non-awareness and habitat degradation. The present communication attempts to bring forth the amount of work already done on the species and its importance. It is aimed to motivate the researchers and explorers to undertake more work on the species before it is lost to ruthless traders and urbanization.

Keywords: Bulbs, Diploid, Morphological variants, Phytochemicals, Polyploidy, *Urginea indica*

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CORRELATION AND PATH ANALYSIS FOR YIELD AND YIELD ATTRIBUTING CHARACTERS IN SOYBEAN (*GLYCINE MAX* L.)

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Abstract: A study was conducted atfield experimentcenter of department of Genetics and Plant Breeding, Allahabad School of Agricultural, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, U.P. during kharif 2010 on 42 genotypes of soybean to determine the correlation and path analysis of yield and its components. Genotypic correlations were higher than the phenotypic and environmental ones for most of the characters exhibiting high degrees of genetic association among traits under consideration. Correlation coefficient for plant height, number of pods/plant, number of branches/ plant, biological yield /plant, seed index, harvest index and days to 50 % flowering showing positive significant correlation with grains yield per plant whereas days to maturity and number of grains per pod showing positive non-significant correlation with grain yield per plant at genotypic level.
Path coefficient analysis revealed that biological yield had maximum positive direct effect on grains yield per plant followed by harvest index, pod length, plant height, days to maturity and number of branches per plant.

Keywords: Soybean,correlation coefficient, path analysis

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KNOWLEDGE LEVEL OF SYSTEM OF RICE INTENSIFICATION (SRI) TECHNOLOGY AMONG FARMERS OF DHAMTARI DISTRICT OF CHHATTISGARH

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Abstract: Efficient transfer of innovation and their practical application to the field situation is the key to economic development of Chhattisgarh and India also. Still there is a wide gap between the development of innovation and their application at field level or farmers level. An attempt has been made to know the knowledge level of SRI technology. The present study was conducted in Dhamtari district of Chhattisgarh. The study revealed that majority of the respondents (80.16%) had high level of knowledge followed by 17.46 per cent of the respondents who have medium level of knowledge. Only 2.38 per cent of the respondents had low knowledge level. Out of eighteen recommended practices of SRI technology, maximum knowledge level was found towards Seeds soaked for 24 hours before raising nursery and minimum knowledge level was found towards No inundation to be done, field should be at saturation level.

Keywords: SRI technology, Knowledge and Paddy crop nutrients

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ECONOMICS OF OKRA CULTIVATION IN KORBA DISTRICT OF CHHATTISGARH

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Abstract: An attempt has been made in this study to examine the economics of okra cultivation in korba district of Chhattisgarh. The presented study was conducted in the korba district of Chhattisgarh. Hundred twenty (120) farmers were selected randomly from six villages of two selected blocks of the district. Primary were collected through well prepared personal interview methods with the help of pretested questionnaire and schedule for the year 2013-14. The sample mean and average method was adopted to calculate of the cost of cultivation. The major findings relevant that the average cost of cultivation were estimated as Rs. 34701.49 per ha. and it was found highest at large farms (Rs. 40197.25/ha) at the sample farms in the district. Cost of manure, fertilizer and seed was observed to be highest 43.61 per cent and 35.57 per cent respectively of the total input cost of okra calculated. The average yield was observed to be 98.45 qt/ha and varied from 123.39 qt/ha at large farms to 90.20 qt/ha at marginal farms. The average net income was calculated as Rs. 36379.41/ha while the figure was observed as Rs. 39640.11/ha and Rs. 44152.93 /ha for family labour income and family business income from okra cultivation. The input output ratio varied from 1:1.99 at marginal farms to 1:2.22 at large farms along with an average of 1:2.05 at different farms. Study suggested that the horticultural crop producer's co-operative societies should be formed for better performance and achievement of assured prices to vegetable growers. It is also suggested that varieties capable for resisting insect pest and disease should be provided and to be grown by the vegetable growers of the study area.

Keywords: Cultivation, economics, cost concepts, Chhattisgarh

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EVALUATION OF SWEET POTATO (*IPOMOEA BATATAS* (L.) LAM.) GENOTYPES FOR YIELD AND YIELD ATTRIBUTING CHARACTERS UNDER AGRO-CLIMATIC CONDITION OF CHHATTISGARH

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Abstract: An experiment was conducted at Research and Instructional Farm of Department of Horticulture, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) during the *rabi* season of 2013-2014 with an objective to find out sweet potato genotypes suitable for Chhattisgarh plains. The experiment was laid out in randomized block design in three replications with twelve genotypes of sweet potato. Observations in respect of growth yield and quality parameters were recorded on five competitive random plants from each replication. According to mean performance of the sweet potato genotypes in respect to tuber yield per hectare, IGSP-20 (37.33 t/ha) was found significantly superior than the other genotypes evaluated.

Keywords: Sweet potato, genotypes, yield, characters

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ADOPTION OF PLANT PROTECTION MEASURES BY GROUNDNUT GROWERS

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Abstract: The study was conducted in 20 selected villages of four blocks of Raigarh district of Chhattisgarh with sample size of 160 respondents to assess the extent of adoption of plant protection measures in groundnut crop and farmers perception regarding yield losses due to various insect pests and diseases in groundnut crop. The finding revealed that

majority of the groundnut growers fell under medium adoption category (59.37 %). In case of practice wise level of adoption none of the groundnut growers adopted the insect tolerant variety, whereas 63.12 per cent of the groundnut growers were partial adopted the 'use of insecticides', while 49.38 per cent growers were complete adopted the crop rotation for control of insect pests and diseases in the crop. The study indicated that among the selected independents variables, eight variables i.e. education, caste, land holding, annual income, source of information, knowledge about plant protection measures, attitude and scientific orientation were found significant and positively correlated with extent of adoption of plant protection measures and in multiple regression analysis only 4 variables i.e. land holding, annual income, knowledge and scientific orientation had significantly contributed in adoption of plant protection measures in groundnut crop.

Keyword: Adoption, Plant protection measures, Groundnut and Groundnut growers

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EFFECT OF DRIP FERTIGATION ON QUALITY OF GUAVA (*PSIDIUM GUAJAVA* L.)

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Abstract: The study on 'Effect of drip fertigation was conducted in the Experimental Farm, Department of Horticulture, Assam Agricultural University, Jorhat during 2009-2010 with Split – Split – Plot Design. The quality parameters were significantly influenced by varieties, drip level and fertigation level. The highest TSS (11.210Brix), total sugar (11.03%), pectin (3.56%) were recorded in T_{17} ($V_2D_2F_1$) and highest ascorbic acid (196.55 mg/100g pulp) was recorded in T_1 ($V_1D_1F_1$). Considering the positive effect on quality parameters, T_{17} ($V_2D_2F_1$) is considered to be the best, but from economic point of view T_{19} ($V_2D_2F_3$) is preferable.

Keywords: Drip fertigation, quality, Guava
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DISTRIBUTION OF DTPA-EXTRACTABLE MICRONUTRINENT IN *VERTISOL* OF DHAMTARI BLOCK UNDER DHAMTARI DISTRICT IN CHHATTISGARH

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Abstract: Evaluation of the soil fertility status of *Vertisol* group of Dhamtari block of Dhamtari district in Chhattisgarh was undertaken during 2009-10. Grid based (GPS) surface (0-15 cm) soil samples by systematic survey were collected from 69 villages in Dhamtari block in such that each 10 ha area represented one sampling point and total 1450 soil samples covering all soil types out of this, 516 samples were identified from *Vertisol.* These samples were analyzed for pH, EC, organic C and DTPA-extractable Zn, Cu, Fe, Mn. The pH (soil reaction) varied from 4.70 to 7.50 with the mean value 5.89, EC ranged from 0.05 to 0.37 with the mean value 0.13 dS m^{-1}. The variation in organic C content in sampled soils was from 0.23 to 0.83 with the mean value 0.44 %. DTPA-extractable Fe, Mn, Cu and Zn status were recorded as 4.54 to 68.70 (30.18 mg Fe kg^{-1}), 3.72 to 59.58 (26.08 mg Mn kg^{-1}), 0.2 to 8.78 (2.79 mg Cu kg^{-1}) and 0.06 to 3.34 (0.68 mg Zn kg^{-1}), respectively. Soil pH showed significant and negative correlations with DTPA-extractable Fe, Mn, Cu and Zn. EC exhibited significant and negative correlated with DTPA-extractable Mn, Cu and Zn. The organic C showed negative relationship with DTPA-extractable Fe, Mn, Cu and Zn.

Keyword: DTPA-Extractable Micronutrient, *Vertisol* and Fertility status
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ASSESSMENT OF FLORAL DIVERSITY IN DHAMTARI DISTRICT OF CHHATTISGARH

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Abstract: The central India forms one of the major ecosystems of the Indian subcontinent and constitutes a large tract of tropical dry deciduous and tropical moist deciduous forest type. The Dugali and Nagari is a small patch of forest which is near the Dhamtari district and exists in Chhattisgarh a newly formed state. These forest areas conserve a variety of flora and fauna. The present paper gives an account of assessing the floral diversity in the vicinity of Dhamtari district. A study of the floristic composition and its use by the rural people is also in corporate. The present articles describe the species diversity and structural variation of a tropical dry deciduous and tropical moist deciduous forest type of central India. In the present study 7 climber species, 3 shrubs, 4 herbs species and 40 trees are reported.

Keywords: Biodiversity, ecosystem, endangered, flora, sanctuary

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STUDY OF ALLELOCHEMICALS AND ALLELOPATHY EFFECT OF WEED AND RICE EXTRACTS ON RICE GENOTYPES

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Abstract: The present investigation was carried out during kharif 2006-07 at instructional farm of indira Gandhi krishi vishwavidalaya,Raipur .The experiment was conducted in split plot design in field and CRD in laboratory condition replication in twice. The stem extract was of *Echinochloa colona* was most effective and root extract in least effective on germination and seedling growth of rice genotype. Maximum reduction in seedlings growth was observed in R-1060-1674-1-1 ,Danteshwari and R-1037-649-1-1.While minimum impact was observed on R-548-89-6,Safri-17 and Dubraj.The minimum chlorophyll content in *Echinochloa colona* was observed in Dubraj.In Ischaemum rugosum maximum chlorophyll was observed in Danteshwari. Overall more phenol content was estimated in vasumati ,dubraj and Safri 17 .Minimum phenol content was observed in R-1182-167-2-157-1 and danteshwari.Minimum adverse effect on ∝ amylase activity was observed in *Echinochloa colona* was due to shoot extract of rice genotypes Vasumati followed by R-548-89-6 and Safri-17 and maximum adverse effect was due to indira sugandhit dhan .

Keywords: Allelopathy, ∝ amylase,Phenol content, Rice extract, Weed extract

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NIGER (*GUIZOTIA ABYSSINICA* CASS.): A HIGH QUALITY OILSEED CROP FOR TRIBAL & HILLY AREAS OF INDIA

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Abstracts: Niger is the most important oilseed crop in Ethiopia and a minor crop in India that has been cultivated for approximately 5000 years which is not involved in the world wide oilseed trade. India is considered to be the chief niger producing country in the world with an area of 5 lakh hectares. It is cultivated mainly in the states of Orissa, Maharashtra, Madhya Pradesh, Bihar, Karnataka and Andhra Pradesh and to some extent in hilly areas of Rajasthan, Uttar Pradesh, Gujarat, Tamilnadu, Assam, and also in some parts of North Eastern Hills states of the Country. Niger seed belongs to the same botanical family as sunflower and safflower (*Compositae*). There are six species of *Guizotia* with *G. abyssinica* being the only the cultivated species It is a dicotyledonous herb, moderately to well branched, and grows up to 2 meter in height. The crop grows best on poorly drained, heavy clay soils without much more irrigation.

Keywords: Tribal, oil, health, fatty acid, Niger

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STUDY THE DECOMPOSITION RATE OF COMPOST UNDER DIFFERENT COMPOSTING TECHNIQUE

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Abstract: The experiment was carried out during the December 2007 to March 2008, at instructional farm of Indira Gandhi Krishi Vishwavidyalaya, Raipur.Different composting techniques were used - 1, one perforated pipe method 2. two perforated pipe method 3. Three perforated pipe method. 4. U shape perforated pipe method 5, turning method 6, traditional method 7. NADEP method, the changes in different physical, chemical and biological parameters was studied at 30, 60, 90 and 120 days after filling. Treatment under aerobic decomposition of paddy straw, soybean straw and fresh cow dung and soil were taken into5:2 ratios for each pit. EC and moisture content were found under the NADEP method of composting. The bulk density, ash percent increased with days of decomposition progresses and maximum increase was found at 120 days. The highest pH recorded in NADEP method of compost (7.0, 9.0, 8.2 and 7.7) at 30, 60, 90, and 120 days respectively, while the lowest pH was recorded on the traditional method of composting (5.56, 7.1, 6.7 and 7.0). The highest EC was recorded in traditional method of compost (1.4 dS m^{-1}) at 120 days.

Keywords: Bulk density, EC, moisture, pH, temperature

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STUDY OF WEED SPECIES AND ITS GROWTH ON DIFFERENT STAGES OF PADDY UNDER TRANSPLANTING AND SRI METHODS

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Abstract: The present investigation was carried out during kharif 2006-07 at instructional farm of indira Gandhi Krishi Vishwavidalaya,Raipur .The experiment was conducted in split plot design in field and CRD in laboratory condition replication in twice. It was observed that the rice genotypes Dubraj ,indira sugandhit dhan and R- 1182-167-2-157 -1 possessed minimum weed densities of major weed species (*cyperus rotundus, Borreria hispida ,Echinochoa colona* **,***Croton banplandianum, ischaemum rugosum* **,***Eclipta alba***)** in both transplanted and SRI method ,while R-548-89-6 and safri -17 and Danteshwari possessed more weeds. The number of leaves were maximum in *Eclipta alba* followed by *Borreria hispida,* **,***Croton banplandianum, ischaemum rugosum* **,** *Echinochoa colona* and *cyperus rotundus* in both transplanted and SRI condition.The number of leaves in all the weed species was slightly higher in SRI method as compared to transplanting .

Keyword: Leaves, Plant height SRI, Transplanting

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STUDY THE IMPACT OF WEED ON RICE GENOTYPES YIELD UNDER TRANSPLANTING AND SRI CONDITION

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Abstract: The present investigation was carried out during kharif 2006-07 at instructional farm of indira Gandhi krishi vishwavidalaya,Raipur .The experiment was conducted in split plot design in field and CRD in laboratory condition replication in twice. It was observed that the yield was higher in SRI method in almost all genotypes of rice as compared to control. The higher yield was recorded in R-548-89-6 followed by Safri-17 and Vasumati.While genotype safri -17, R-1060-1674-1-1 and R-1072-360-1, were found suitable in SRI method .While, Dubraj , Danteshwari,and indira sugandhit dhan were found more suitable for transplanted situation for yield improvement . Indira sugandhit dhan ,Dubraj and R-1182-167-2-157-1 have shown allelopathy potential less difference in yield under unweeded and hand weeding twice condition. Maximum loss due to weed was observed in R-548-89-6 followed by R-1060-1674-1-1 R-1249-1196-2-1 and R-979-1528-2-1.

Keyword: Rice genotype, SRI, transplanting, yield
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SIGNIFICANCE OF PLANT BASED PHYTOEXTRACTS AGAINST SOFT ROT BACTERIA OF POTATO CAUSED BY *ERWINIA CAROTOVORA* SUBSP. *CAROTOVORA* UNDER *IN VITRO* TEST

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Abstract: Potato (*Solanum tuberosum* L.) is one of the most nutritious sources of food in the world. It has been recognized as a wholesome food and the richest source of energy in most of the countries of the world where, it forms an important part of the human diet. Among the various diseases of potato, soft rot caused by *Erwinia carotovora* subsp. *carotovora* is the major potato tuber rot disease. Result revealed against *Erwinia carotovora*, that the extract of Garlic bulb @ 10 per cent produced maximum growth inhibition (60.60%) followed by Mahendi (54.54%) and Lantana leaf extracts (48.10%) respectively.

Keywords: Potato, bacteria, seed

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ECONOMICS OF FISH PRODUCTION UNDER DIFFERENT MANAGEMENT REGIMES IN VILLAGE POND OF DHAMTARI DISTRICT OF CHHATTISGARH

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Abstract: The present study is based on sample unit was 2, 2 and 2 individual, self help group and fish co-operative society management regimes, respectively selected from four village of Kurud block namely, Marod, Nawagaon, Bagdehi and G.Jamgaon The study revealed that among different management regimes of fish production and marketing. The extent of material input use and the efforts for pond preparation and production package received significant attention in the case of fish co-operative society and self help group fishermen. The cost, returns and yield level were found highest in case of fish co-operative regimes and lowest for individual fishermen. Total cost of individual fisherman is 18379.16 Rs./ha., fish co-operative is 24997.56 Rs./ha. and self-help group is 20076.24 Rs./ha. Total cost of individual fisherman is 18379.16 Rs./ha., fish co-operative is 24997.56 Rs./ha. And self-help group is 20076.24 Rs./ha. Table reveals that the highest fish yield level was achieved by the fish co-operative fish farmer to the level of 28.80 quintal per hectare and lowest (20.59 quintal) while the figure of gross return from fish were estimated as Rs.61755.15, Rs.86400.00 and Rs.68326.27, respectively at these regims. Net return per hectare was Rs.43375.98 in case of individual fisherman as against Rs.48250.03 and 61402.44 earned by fish co-operative, which was much higher, then the individual fisherman and self help group regimes. The benefit-cost ratio ranged from 2.36 to 2.46 under the case of all the regimes.

Keywords: Fish, pond, Chhattishgarh

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WEED INTENSITY AND ONION BULB YIELD AS INFLUENCED BY DIFFERENT WEED MANAGEMENT PRACTICES

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Abstract: Weeds are serious problem in all vegetable crops but they are even more so in *kharif* season crops. The problem of controlling weeds has been taken by studying various cultural and chemical method to the extent of different degrees of success by workers all over the world. In this chapter, a brief review of various experimental findings of different

experiments covering important aspect of weed flora, losses caused by weeds and effect of weed management practices on crops, yield and yield attributes, use of chemical and cultural methods of weed management and economics is given below.

Keywords: Weed management practices, oxyfluorfen, pendimethalin, Onion

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STUDY ON BIO-EFFICACY OF NEW POST EMERGENCE HERBICIDES FOR ENERGETICS AND GRAIN YIELD IN TRANSPLANTED RICE (*ORYZA SATIVA* L.)

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Abstract : The present investigation was carried out during *kharif*, of 2011 at the research-cum-instructional farm, indira gandhi krishi vishwavidyalaya, raipur (c.g.). Results revealed that higher plant height, total tillers, dry matter accumulation, yield attributes, grain yield and straw yield, crop growth rate, leaf area index were obtained under two hand weedings (20 and 40 dat) (t_{11}), followed by ae 1887196+aef 095404 @ 45 + 22.5 g ha^{-1} (t_3) and minimum was obtained under unweeded check (t_{12}). The maximum energy input and output were obtained under two hand weedings (20 and 40 dat) whereas energy use efficiency and energy output-input ratio were noted under ae 1887196+aef 095404 @ 45 + 22.5 g ha^{-1}(t_3) followed by bispyribac sodium @ 20 g ha^{-1} (t_{10}). The lowest energy parameters were obtained with unweeded check (t_{12}).

Keywords: Bio-efficacy, post emergence herbicides, energetics