

Journal of Plant Development Sciences

(An International Monthly Peer Reviewed Journal)

Volume 15

Number 7

July 2023

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DEVELOPMENT OF BREEDING POPULATIONS IN *MELIA* AND *EUCALYPTUS* THROUGH GRAFTING

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Received-01.07.2023, Revised-12.07.2023, Accepted-21.07.2023

Abstract: Grafting for several species of genus melia and eucalyptus are carried out to produce new varieties through interspecific hybridization. Grafting is a horticultural technique whereby tissues of plants are joined so as to continue their growth together. The upper part of the combined plant is called the scion, while the lower part is called the rootstock. The success of this joining requires that the vascular tissues grow together. The study successfully established controlled clones deploying *Melia dubia*, *Melia composita* and *Melia azedarach*, these are established in the form of clone based breeding populations to develop hybrids with specific industrial utility similarly clonal plants were also established in eucalyptus deploying superior clones namely EH 02, EH05, and DF 97 which act as a breeding population to develop superior hybrids both for productivity and root quality. From this study, we observed that *Melia dubia* subjected to 47.16% mortality and *Melia azedarach* showed good survival with only 20% mortality. *Melia composita* showed very poor result with 88% mortality. Among the genus Eucalyptus, EH 02 showed very poor results with 95% mortality. EH 05 was successful with 53.3% mortality and DF 97 showed 40% mortality. The success rate of *Melia dubia* was 52.84% and *Melia azedarach* was the highest with 80%. *Meliacomposita* was very poor in survival with only 12% survival rate due to compatibility issues. EH 02 had problems in survival and showed only 5% survival. EH 05 showed convincing performance with 46.7% survival. DF 97 also showed good performance with 60% survival rate. The study is to mainly fulfill the objective of developing breeding populations in melia and eucalyptus to produce new varieties through grafting. Interspecific hybridization is the tool used to develop varieties which can meet up the current trends in demand and also improves the tree in terms of industrial utility.

Keywords: Melia, Eucalyptus, Grafting, Root stock, Scion

POLLINATORS/VISITORS DIVERSITY IN PEACH (*PRUNUS PERSICA*) AT BARIMA, MAINPAT BLOCK OF SURGUJA DISTRICT OF CHHATTISHGARH

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Received-05.07.2023, Revised-16.07.2023, Accepted-28.07.2023

Abstract: Studies on the diversity of pollinators/visitors on peach (*Prunus persica*) flowers total 7 species of insects were observed visiting on peach (*Prunus persica*). The *Apis mellifera* was found dominant bee species among other main pollinators like *Apis dorsata*, *Tetragonula iridipennis* and *Apis cerana indica*. Some other pollinators/visitors were also recorded like *Musca domestica*, *Pantala flavescens* and *Eurema brigitta* visiting on peach flowers. Peach flowers were visited by seven species of insect pollinators, of which four species of insect pollinators belong to order Hymenoptera, one species to Diptera, Odonata and Lepidoptera respectively. Honeybee species viz., *Apis mellifera*, *Apis dorsata*, *Tetragonula iridipennis* and *Apis cerana indica* constituted about 76.76 percent of the total insect pollinators visiting peach compared to 23.24 percent of other insect pollinators. Timely fluctuations in the populations of major insect pollinators/visitors revealed that the peak activity was observed between 12.00 - 1.00 P.M. and 3.00 - 4.00 P.M.

Keywords: *Apis mellifera*, Diversity, Honey bee, Pollinator, Visitors, *Prunus persica*

IN VITRO EVALUATION OF PLANT EXTRACTS, BIO AGENTS AND FUNGICIDES AGAINST *ALTERNARIA ALTERNATA* INCITANT OF BROWN LEAF SPOT OF POTATO

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Received-02.07.2023, Revised-14.07.2023, Accepted-25.07.2023

Abstract: Brown leaf spot disease of potato caused by *Alternaria alternata* has been known as one of the destructive and common diseases of potato and occurred worldwide. *In vitro* evaluation of plant extracts, *Euphorbia tithymaloides* (Nagdon) was found most effective followed by *Jasminum* spp (Jasmine) and *Eclipta prostrate* (Bhringraj). Highest mycelial growth inhibition (71.86%) was recorded at 10% concentration of *Trichoderma viride* culture filtrate followed by *Trichoderma viride* (60.74% reduction) and *Pseudomonas fluorescens* (34.81% growth reduction) over to control. Among the different fungicides, Hexaconazole 4% + Zineb 68% WP at 0.3% concentration exhibited nearly 100% reduction in mycelial growth over to control treatment (90.00 mm radial growth) at par with Hexaconazole 5% EC at 0.2%, Captan 70% + Hexaconazole 5% WP at 0.3% followed by Fluopyram 17.7% + Tebuconazole 17.7% SC at 0.2% with 92.59% mycelial growth reduction and Tebuconazole 50% + Trifloxystrobin 25% SC at 0.2% with 91.48% reduction over to control at 7 DAI.

Keywords: Potato, *Alternaria alternata*, Plant extract, Bio agents, Fungicide, *In vitro*

SEASONAL INCIDENCE OF APHID AND THRIPS IN RELATION TO WEATHER PARAMETERS ON GROUNDNUT (*ARACHIS HYPOGAEA* L.)

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Received-02.07.2023, Revised-13.07.2023, Accepted-23.07.2023

Abstract: The current study was undertaken on Seasonal incidence and management of major insect-pests of groundnut during 07 July 2022 to 20 October 2022 at the experimental area Research cum Instructional Farm at RMD, CARS, Ambikapur (C. G.). The groundnut aphid, and thrips populations were found in field. Aphid and thrips population the first emergence of the pest incidence was recorded during second week of August (32nd SMW) with (0.73 aphid three leaves /plant and 0.27 thrips/top bud leaves) . The population of aphid and thrips reached to its peak in 36th SMW (05 Sep.-11 Sep.) with 8.62 aphid three leaves /plant and 4.80 thrips/top bud leaves in first week of September. The correlation between aphid population and meteorological parameters, the population of aphids had a positive relationship with temperature (maximum and minimum) and relative humidity (morning) while there is a negative association between evening relative humidity and rainfall. The correlation was significant with minimum temperature.

Keywords: Aphid, Groundnut, Thrips, Weather parameters.

EVALUATION OF PHENOTYPIC TRAITS RELATED TO GRAIN YIELD AND ADAPTABILITY STUDIES TO LOCAL CLIMATIC CONDITIONS OF BASTER PLATEAUIN FINGER MILLET (*ELEUSINE CORACANA* L. GAERTN) GENOTYPE

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Received-02.07.2023, Revised-14.07.2023, Accepted-25.07.2023

Abstract: The current point of inquiry is named “Trait specific evaluation of advance generation genotypes for grain yield in finger millet (*Eleusine coracana* L. Gaertn)” took place at the New Upland Research Cum Instructional Farm, Lamker Under the S.G. College of Agriculture and Research Station, Jagdalpur, Bastar (C.G.) India, during *kharif* 2022. In Randomized Complete Block Design (RCBD). The experiment was conducted to phenotypically evaluate characteristics associated with grain yield. Total of 29 finger millet genotypes including 1 local check (CG Ragi 02) were examined for 4 qualitative characters and 12 quantitative traits, during *Kharif*-2022 and 16 descriptors were examined to establish the genotypes of finger millet as being morphologically different from one another. Descriptors are selected in accordance with the guidance for conducting DUS characterisation on finger millet, using PPV and FRA. The following descriptors were analysed for the research. The analysis of variance revealed very substantial differences between the 29 genotypes for each trait. A semi-compact ear is one of the genotypes which were looked at (49%), copper-coloured seeds (31%), pigmentation absent at the leaf juncture (69%), and seed shape round shape seeds (59%) were seen to be commonplace. In contrast, late span for days to 50% blooming is a quantitative feature (97%), Medium maturation (52%), medium range of plant height (90%), long range of flag leaf length (72%), medium leaf width (93%), medium finger length (59%), medium finger width (97%), medium finger number (100%), moderate test weight (97%) genotypes, high range harvest index (59%) genotypes, and high yield grain (38%) genotypes are all recorded.

Keywords: *Eleusine coracana*, Genotype, Qualitative traits

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GENETIC VARIABILITY FOR SEED AND SEEDLING VIGOUR TRAITS IN LENTIL (*LENS CULINARIS* MEDIKUS) GENOTYPES

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Received-06.07.2023, Revised-17.07.2023, Accepted-27.07.2023

Abstract: The present study encompassed 22 lentil genotypes, examining seed and seedling vigor traits during Kharif-2021 employing a completely randomized design (CRD) with three replications at the laboratory of Department of Genetics and Plant Breeding, School of Agricultural Sciences, Nagaland University. ANOVA highlighted significant variability in lentil genotypes for seed and seedling vigor traits at 1% and 5% probabilities. Analyzing these genotypes across eleven vigor-related traits revealed characteristic diversity, emphasizing genetic heterogeneity and substantial variability. Coefficient of Variation (C.V.) indicated dispersion, notably in root length (102.41%) and seedling vigor index II (78.21%). Standard Error (S.E.) signaled precision, while Critical Difference (C.D.) facilitated trait differentiation. Genotypic and phenotypic variances were highest for fresh shoot weight ($\sigma^2g = 1937.37$, $\sigma^2p = 6711.47$), followed by fresh root weight ($\sigma^2g = 332.54$, $\sigma^2p = 654.11$), and shoot length at 20th day ($\sigma^2g = 193.93$, $\sigma^2p = 465.05$). Seedling vigor index I ($\sigma^2g = 182.97$, $\sigma^2p = 579.91$), germination percentage ($\sigma^2g = 100.79$, $\sigma^2p = 399.35$), and others also exhibited notable variance. This study unveiled diverse PCV and GCV values across traits. PCV ranged from 13.12% to 109.27%, with root length at 20th day exhibiting the highest (109.27%). GCV ranged from 8.34% to 65.41%, with fresh root weight displaying the highest GCV (65.41%). Heritability ranged from 11.32% to 50.84%, with traits showing moderate heritability and substantial genetic advance including shoot length, fresh root weight, and seedling vigor indices. Traits with low heritability and high genetic advance comprised germination percentage and shoot weight.

Keywords: Lentil, Genetic variability, Heritability, Genetic advance, Correlation

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QUALITY ASSESSMENT OF THE MARKET SAMPLES OF WILD TURMERIC (*CURCUMA AROMATIC* SALISB.) POWDER

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Received-08.07.2023, Revised-19.07.2023, Accepted-28.07.2023

Abstract: *Curcuma aromatica* Salisb. commonly known as wild turmeric, is a medicinal plant of the family Zingiberaceae widely used in traditional medicine systems for its therapeutic properties and in cosmetic industry due to its skin caring properties. In Hindi it is called as Jangli haldi and as Kasthurimanjal in Malayalam. The plant rhizomes are valued for its plant secondary metabolites like alkaloids, terpenoids, flavonoids, saponins, tannins, phenols, phytosterols, glycosides, volatile oils and curcuminoids. These compounds contribute to the plant's various therapeutic properties, such as antioxidant, anti-inflammatory, and antimicrobial activities. In herbal market wild turmeric powder of different brands are available targeting on the increased consumer demand for its beauty care usages. This study aimed to perform the quality analysis of *Curcuma aromatic* powder samples of different brands collected from the herbal market of Kerala using High Performance Thin Layer Chromatographic (HPTLC) tool. HPTLC is a widely employed technique for qualitative analysis and authentication of plant samples. In this study the HPTLC chromatogram of the genuine plant powder samples were compared with that of market samples. The HPTLC profile of the methanol extract of genuine plant material gave a specific fingerprint which can be well differentiated from spurious samples by cross matching. When matched with the profile of *Curcuma longa* powder sample, it was found that most of the samples are either of turmeric or mixed with turmeric and sold as pure wild turmeric powder. This HPTLC method can be effectively utilized for checking the market samples for ensuring the quality. The study revealed that only 18 percent of the market samples tested were pure *Curcuma aromatica* powder; the rest were spurious.

Keywords: *Curcuma aromatica*, HPTLC, Powder, Wild turmeric

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PROPAGATION OF WHITE SANDAL WOOD: *SANTALUM ALBUM* L.

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Received-04.07.2023, Revised-16.07.2023, Accepted-27.07.2023

Abstract: *Santalum album* L. is native to India and a member of the Santalaceae family. The Red Data Book classifies it as a vulnerable species. Sandalwood is in high demand due to the high value of its essential oil and wood. The oil derived from sandal's heartwood is used as a fragrance enhancer and in the creation of expensive fragrances. It was closely linked to Indian religion and culture. *Santalum album* is the most attracted species and they exhibited wider variations in its natural range of occurrence. So clonal selection and vegetative propagation through rooted cuttings is a greater potential for commercial exploitation of the species. But the root formation of cutting is a complex mechanism and influenced by physiological, environmental and genetic factors. Within this, experiments which consist of three different rooting media viz., Standard nursery mixture 1:1:1 ratio of soil, sand & FYM, Soil: Sand (1: 1) and Sand + Silt were tried with the hormonal treatments of IAA (1000 to 10000 ppm), IBA (1000 to 10000 ppm) and NAA (1000 to 10000 ppm) at different concentrations and two types formulation viz., powder and liquid formulation of rooting media. Among these treatments, IBA 8000 ppm and NAA 8000 ppm treated cuttings showed slow response in shoot induction. The rooting percentage of cuttings is Zero. Therefore it is necessary to find combination of some factors that will support root cutting formation and produce new seedlings with root induction.

Keywords: Sandal, Cuttings, Rooting induction, Growth hormones