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EXPLORING MORPHOLOGICAL DETERMINANTS AND PHYTOCHEMICAL VARIATIONS IN *PLUMBAGO ZEYLANICA* L. ACROSS FOUR DISTRICTS OF WEST BENGAL

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Abstract: *Plumbago zeylanica* L. (Family: Plumbaginaceae) is known for its immense therapeutic potential. This study aims to find a relationship between the morphological characters and phytochemical contents of naturally grown four accessions of *P. zeylanica* from different districts of West Bengal. Different plant descriptors were studied for their morphological variations. The phytochemical contents from various plant parts demonstrated the superiority of the root. Morphological parameters and root phytochemicals revealed a strong correlation between total tannin content (TTCR) and leaf characters and between total phenolic content (TPCR) with stem diameter and petiole base width. The plumbagin content correlated with root fresh weight, petiole base width, and salt gland index. The studied environmental parameters showed an influence on the morphological and phytochemical spectrum. Principal component and cluster analysis distinguished the four accessions to identify an elite chemotype of *P. zeylanica*.

Keywords: Correlation, Morphology, Multivariate analysis, Phytochemical, *Plumbago zeylanica*

TAXONOMIC ACCOUNT OF THE GENUS *CATENELLA* GREV. (FAMILY CAULACANTHACEAE: RHODOPHYTA) IN INDIA

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Abstract: The genus *Catenella* Grev. belongs to the family Caulacanthaceae of the order Gigartinales under the division Rhodophyta. The generic name *Catenella* is derived from a Latin word *Catena*, means 'chain'. The members of this genus are usually found in the marine and the estuarine regions. The genus is currently represented by five taxa in the world and three taxa in India. Based on the comprehensive study, a detailed taxonomic account of this genus of red seaweed in India is described.

Keywords: Indian coast, *Catenella*, Rhodophyta, Taxonomy, Marine

HERBAGE CARRYING CAPACITY OF SILVIPASTORAL SYSTEMS IN HIMACHAL PRADESH, NORTH WESTERN HIMALAYA, INDIA

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Abstract: The present study was conducted on herbage carrying capacity of silvipastoral systems in 12 representative villages in all four agro-climatic zones of Himachal Pradesh. The study revealed that there is a great disparity between the carrying capacity and stocking rate of existing silvipastoral systems in Himachal Pradesh. The mean carrying capacity (ACU ha¹ year¹) and stocking density (ACU ha¹ year¹) in agroclimatic zone I, II, III and IV of Himachal Pradesh were 0.40 and 1.52, 0.57 and 2.17, 0.17 and 6.99, and 0.50 and 1.90 respectively. The higher stocking density of silvipastoral land than carrying capacity in long-term will significantly affect if this pattern continues, it will lead to overgrazing and land degradation. Thus, the study suggested introduction or integration of fast-growing multipurpose leguminous trees and high-yielding nutritive grasses, along with the development of climatically suitable silvicultural models.

Keywords: Agroforestry system, Carrying capacity, Himachal Pradesh, Productivity, Silvicultural system

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COMPARISON OF VARIOUS APPROACHES TO ESTIMATE CROP EVAPOTRANSPIRATION OF VEGETABLE CROPS

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Abstract: The estimation of crop evapotranspiration is very crucial to understand crop water requirement. There are many empirical methods are being adopted to calculate the crop evapotranspiration. A study was conducted at Indian Agricultural Research Institute, New Delhi to determine crop evapotranspiration of vegetable crops with two different approaches like percentage shaded area approach and crop co-efficient approach. In this study, the irrigation was scheduled according to real time soil moisture measurement based on tensiometer reading. The reference evapotranspiration (ET_o) was calculated and compared with the crop evapotranspiration (ET_c) of greenpea and okra. The estimated crop evapotranspiration (ET_c) was less compared to reference evapotranspiration in both approaches. The estimated average ET_o and ET_c during green pea cultivation was 2.8 and 2.5 mm/day respectively. Similarly, the estimated average ET_o and ET_c during okra cultivation was 5.4 and 4.3 mm/day respectively. The crop evapotranspiration estimated by percentage area method was less compared to ET_c calculated by crop coefficient approach.

Keywords: Crop evapotranspiration, Crop coefficient, Soil moisture, Tensiometer

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GENETIC VARIABILITY FOR VARIOUS ECONOMIC TRAITS IN CHILLI (*CAPSICUM ANNUUM* L.) GERMPLASM

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Abstract: India's chilli production, essential for both domestic and export markets, depends on genetic diversity. This study assessed the variability among 24 chilli genotypes. The analysis of variance revealed significant differences among all genotypes for various traits. Notably, parameters related to growth, yield and biochemical attributes displayed substantial Phenotypic Coefficient of Variation (PCV) and Genotypic Coefficient of Variation (GCV), indicating considerable genetic diversity. Interestingly, PCV slightly exceeded GCV, suggesting a relatively lower impact of the environment on these traits. Crucially, high values of both phenotypic and genetic coefficients of variation highlighted significant potential for improvement through selective breeding. Traits exhibited high heritability, coupled with high to moderate genetic gains, except for the number of pickings. This indicated the prominence of additive gene action, emphasizing the effectiveness of

selection processes. In essence, the study shows substantial potential for enhancing chilli genotypes via selection, due to the notable genetic diversity in crucial traits.

Keywords: Chilli, Genetic advance, Genetic variability, Heritability

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GENETIC ASSESSMENT AND ASSOCIATION ANALYSIS OF TRADITIONAL RICE (*ORYZA SATIVA* L.) GENOTYPES OF BASTAR REGION

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Abstract: An experiment titled "Genetic assessment and association analysis of traditional rice (*Oryza sativa* L.) genotypes of Bastar Region" was conducted in *Kharif* 2023 at the Research cum Instructional Farm of S.G. College of Agriculture and Research Station at Jagdalpur, Bastar, IGKV, Raipur (C.G.). An augmented complete block design was used for genetic evaluation. ANOVA analysis found all the values are significant at 1% level of significance. Genetic variability analysis identified days to 50% flowering with the highest heritability (44.46%), while plant height showed the highest genetic advance as a percentage of the mean (6.19). Correlation studies indicated that grain yield per plant had a positive significant correlation with traits such as number of effective tillers per plant, harvest index, number of filled grains per panicle, biological yield and test weight. Selection for these traits could be beneficial in improving grain yield.

Keywords: Rice, Heritability, Genetic advance, GCV, PCV, Association analysis, Correlation