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Genetic variability and divergence studies in maize (*Zea mays L.*) inbreds under moisture stress condition

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ABSTRACT : The current study was conducted during summer 2015, at Dept. of GPB, UASD. Aim of the experiment was to assess the amount of genetic variability and divergence found in 98 maize inbreds under moisture stress situation in comparison with four tolerant checks. Occurrence of wide range of statistically significant variability has been confirmed by the analysis of variance. Traits associated with moisture stress tolerance such as, ASI, Chlorophyll content, RWC and yield parameters had exhibited high heritability combined with high GAM thus, selection based on these parameters could be recommended to improve stress tolerance. ASI, PHT, CHT, CLN and kernel rows per cob exhibited Positive and significant correlations with grain yield in stress. While, Kernals per row followed by Shelling percentage and Fodder yield per plant had showed direct and positive effect on grain yield in stress environment. Diversity analysis using Mahalanobi's statistics, has clustered the study material into eight clusters of which Cluster I was the largest with 55 inbreds and Cluster V, VII & VIII were solitary, inferring the existence of wide range of diversity in the materials considered for the study. Large inter cluster distance was observed between the Cluster IV and Cluster VI suggesting crossing between the members of such clusters to exploit maximum heterosis in terms moisture stress tolerance. Among the eight different clusters, mean values favorable to enhance yield in stress environment were found in Cluster II for the traits ASI, CWT, KRPC and SP and Cluster V for PHT, CLN, CGR and kernals per row. Lines from these two clusters can be selected for improvement of respective traits. The current study has found out the prevalence of huge variability and diversity required for initiating any crop improvement programme. Therefore, it would be recommended to utilize some of the better inbreds like PDM 6529, PDM4641, PDM6549, PDM6563, PDM 6541 and few others in enhancing stress tolerance.

Key Words: Variability, diversity, path coefficients, moisture stress, yield, maize.