Genetic divergence studies among inbred lines of maize (*Zea mays* L.)

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ABSTRACT

The field experiment was conducted at Agricultural Research Station, Peddapuram, Kakinada during *rabi,* 2022-23 to study the genetic divergence among 112 maize inbred lines in alpha lattice design with two replications. The analysis of variance revealed significant genetic differences among the inbred lines for 18 characters under study. D^2 analysis highlighted the significant contribution of kernel yield per plant, ear yield per plant, kernel rows per ear, number of kernels per row, ear height, days to 50% silking, ear position, tassel extrusion and tassel size towards overall divergence. This emphasizes the importance of these traits in selecting appropriate parents for hybridization programs. It was found that inbred lines from clusters III (CML 451), VI (PI 415, PI 424), VII (CL 02450) and VIII (PI 416) could be vital for such programs. The inbred lines PI 403, PL22398, PI 415, PI 424, PI 426, CML 451, CL 02450 are far apart from each other in the two dimension and three-dimension diagrams of principal component analysis. Hence, CML 451, PI 415, PI 424 and CL 02450 were found to be with sufficient genetic diversity in the studied lines as they have shown high inter cluster distances in D^2 and they are also far apart from each other in the two-dimensional and three-dimensional graphs based on PCA scores may result in good F_1 combinations to explore the heterosis or to produce transgressive segregants in their respective F_2 and subsequent segregation generation.

Key words: *Cluster means, D^2 Analysis, Genetic divergence, PCA*