



RESEARCH PAPER

# Discrimination of maize (*Zea mays* L.) inbreds for morpho-physiological and yield traits by D<sup>2</sup> statistics and principal component analysis (PCA)

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To discriminate maize inbred lines based on morpho-physiological and yield traits using D<sup>2</sup> statistics and principal component analysis (PCA), fifty five genotypes available at Department of Genetics and Plant breeding, Sam Higginbottom Institute of Agriculture Science and Technology, Allahabad were tested during *Rabi* 2013-14 under irrigation condition in Randomized Block Design with three replications. Analysis of variance revealed significant differences for 18 characters studied among the genotypes. The D<sup>2</sup> statistics displayed that cluster I, being largest group, comprises 37 maize genotypes followed by cluster II (13), III (3), IV (1) and V (1). The maximum intra-cluster distance was obtained for cluster I (624.35) while cluster IV and V showed Null values for it indicating homogeneous nature of the genotypes within the cluster. Further more, maximum inter-cluster distance was recorded between cluster IV and V (22331.82) followed by clusters III and V (15174.83) and clusters II and IV 14480.99). D<sup>2</sup> statistics and principal component analysis (PCA) emphasized that days to 50 per cent tasseling, silking and maturity, anthesis-silking interval, seed fill duration, cob weight, 100 seed weight and grain yield/plant were major contributing traits for total genetic diversity. Research results indicated that the inbreds under study are highly diversified and hence, high heterotic hybrids would be resulted through the crossing of diverse lines clubbed under different clusters as parent in any breeding programme aimed to enhance grain yield.

**Key words** : D<sup>2</sup> statistics, Heritability, Genetic advance, PCA

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