PRINCIPAL COMPONENT ANALYSIS FOR CARBON ISOTOPE DISCRIMINATION-RELATED TRAITS IN RECOMBINANT INBRED LINES OF SUNFLOWER

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ABSTRACT

We used principal component analysis (PCA) as statistical method to analyze and grouping genetic diversity in sunflower. To utilize PCA, carbon isotope discrimination (CID) and its related traits were measured on a population of 148 F8 recombinant inbred lines (RILs) of sunflower. The RILs were treated in water-stressed as a randomized block design with two replicates. The result of Bartlett's sphericity test showed the significant value was less than alpha level. Correlations among CID-related traits were determined. The CID was negatively correlated with water use efficiency (WUE), biomass (BM) and cumulative water transpired (CWT) expressed in the biplot diagram. The first two components showed 69.28% of the cumulative variability. Based on the biplot diagram, three distinct groups could be differentiated including high WUE genotypes, high BM genotypes and high WUE-BM genotypes. The correlation between CID and the related traits and distribution of the RILs groups among the traits allow in understanding the genetic diversity of the RILs which could be used as a basic consideration before applying selection program in plant breeding.

Key Words : PCA, CID, RILs, Sunflower