Screening and Classification of Maize Genotypes in Distinct Groups Based on Carotenoid Components

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Abstract—*Carotenoids are natural pigments act as chemical scavengers and also help to prevent degenerative disease in human including cancer. It includes components with provitamin A activity like β-carotene, β-cryptoxanthine whereas zeaxanthin is an essential component of macular component of eye. Vitamin A is not synthesized in human body which makes us dependent on external diet. Improved nutritional composition of maize grain, rich in carotenoid components will enhance its value. A set of 27 genotype of Indian and exotic origin were screened for β-carotene, β-cryptoxanthine, zeaxanthine and total carotenoid. Least variation was observed for β-carotene (0.32 to 2.08 μg/g) in comparison to β-cryptoxanthine (0.26 to 8.08 μg/g) and zeaxanthine (0.90 to 5.18 μg/g) whereas total carotenoid content varied from 15.99 to 42.36 μg/g with mean 29.74. Grouping of individuals into distinct clusters helps in identifying diverse germplasms which is a prerequisite for hybrid breeding in maize. Hierarchical cluster analysis classified 27 genotypes into three distinct groups; group 1 consist of 19 genotypes (DML-1, DML-3, DML-5, DML-7, DML-8, DDML-10-A, DML-12, DML-17, DML-18, DML-19, DML-22-A, DML-22-B, DML-22-C, DML-26-A, DML-26-C, DML-27-B,DML-30,DML-32, DML-33), group 3 consist of 7 genotypes (DML-9, DML-10-B, DML-13, DML-16, DML-20, DML-26-B, DML-27-A) whereas group 2 consist of only one genotype (DML-4). DML-4 and DML-26-B have recorded highest squared Euclidean distance (710.68) whereas DML-10-A and DML-32 are least distant (0.15) on dissimilarity matrix. Thus selected germplasm is having a diverse genetic base for carotenoid components and further can be utilize in breeding programme to obtain carotenoid rich hybrids.*

Keywords: *Maize, carotenoid, diversity.*