Diallel cross analysis of plesiomorphic traits in *Triticum aestivum* L. genotypes

M. Shehzad[1], S.B. Hussain[1], M.K. Qureshi[1], M. Akbar[1], M. Javed[1], H.M. Imran[1] and S.A. Manzoor[2]

[1]Department of Plant Breeding and Genetics,
Faculty of Agricultural Sciences and Technology, Bahauddin Zakariya University, Multan, Punjab, Pakistan
[2]Department of Forestry and Range Management,
Faculty of Agricultural Sciences and Technology, Bahauddin Zakariya University, Multan, Punjab, Pakistan

Corresponding author: S.A. Manzoor
E-mail: amir.kzd@gmail.com

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ABSTRACT. We conducted a 5 x 5 complete diallel cross experiment in bread wheat (*Triticum aestivum*) with the genotypes 6309, Chkwal-50, Dhrabi, Bhkhar-02, and FS-08. Our objective was to evaluate the type of gene action and the general and specific combining abilities required for various morphological traits in wheat. The results of analysis of variance revealed highly significant differences among genotypes for all the investigated traits. The results of joint regression analysis showed that the data for all the investigated traits fitted a simple additive dominance model. Graphical representation of variance and covariance suggested that most of the investigated traits were controlled by overdominance gene action. However, the peduncle length and plant height were controlled by additive gene action. Variety 6309 carried the highest number of dominant genes for the number of spikelets per spike, number of tillers per plant, plant height, number of fertile tillers per plant, and grain yield per plant.

Chakwal-50 carried the highest number of recessive genes for grain yield per plant, number of tillers per plant, number of grains per spike, number of fertile tillers per plant, and plant height. Chakwal-50 and 6309 were the best general combiners for number of spikelets per spike, number of grains per spike, grain yield per plant, 1000-grain weight, number of fertile tillers per plant, and number of tillers per plant. On other hand, 6309 performed well in specific crosses with Chakwal-50, FS-08, and Bhakhar-02 for spike length and number of tillers per plant.

Key words: Diallel; Gene action; Genotypes; Morphological traits

