

Dağüstü N (2008) Diallel analysis of anther culture response in wheat (*Triticum aestivum* L.). African Journal of Biotechnology 7(19): 3419-3423.

Abstract

The four wheat (*Triticum aestivum* L.) genotypes differing in their ability to produce embryogenic callus from anther culture were reciprocally crossed and inheritance of anther culture response [callus induction frequency (CIF, %), embryogenic callus induction frequency (ECIF, %), regeneration capacity of callus (RCC, %), plantlet regeneration frequency (PRF, %), green plantlet proportion (GPP, %) and green plantlet yield (GPY, %)] was investigated. The 12 F₁ hybrids and their parents were grown in field. It was analysed in the completely randomised design with 4 replications, each replication consisted of one petri dish with 100 anthers.

Genotype significantly affected anther culture response for all the traits except GPP. General (GCA) and specific (SCA) combining ability effects were highly significant for CIF, ECIF and GPY, and indicated the existence of variability due to both additive and dominance epistasis gene effects. GCA/SCA ratio for CIF, ECIF, and GPY was higher than 1.0, pointing out the importance of additive genetic variation in this genetic material. GCA effects among the parental lines were highest for Golia and lowest for Basribey. High x low responding crosses generated F₁'s that were intermediate in response. Reciprocal effects (RE) were highly significant for CIF, ECIF and PRF, but generally less effective than additive and non-additive gene effects. The results from this study indicate that parents which give rise to highly responsive hybrids can be identified and that genetic improvement of hexaploid wheat is possible through selection.