



Journal

J. Biol. Chem.
Environ. Sci., 2018,
Vol. 13(2): 555-581
<http://biochemv.sci.eg>

GENETIC ANALYSIS OF ANTHER CULTURE RESPONSE IN SOME BREAD WHEAT CROSSES UNDER DROUGHT STRESS CONDITIONS.

El-Hennawy, M. A., E. I. Zaazaa, I. M.
Al-Ashkar and E. A. Eid

Agronomy Dept., Fac. of Agric., Al-Azhar Univ.
Cairo, Egypt.

ABSTRACT

Anther culture response of six genotypes of bread wheat and their 15 F_1 crosses using of a half diallel set of crosses was evaluated under drought stress conditions, which was induced by addition of Polyethylene glycol (PEG 6000) treatments (0, 10 and 20 g/l of PEG) in the medium. Results showed that there was reduction in callus induction ability, plant regeneration efficiency and green plantlet regeneration with increasing concentrations of PEG. Considerable genetic variation among studied genotypes was observed for all *in vitro* studied traits under the three drought stress treatments except albino plantlet regeneration at the stress level of 20g/l PEG. The highest frequencies of callus induction and green plantlet regeneration under the three stress treatments were recorded for the two crosses ($P_2 \times P_6$ and $P_3 \times P_6$). These crosses appeared to have significantly higher green plantlet yields than their good parents under the three stress levels, while the lowest ones were obtained in the two varieties; Sids 1 (P_5) and Giza 168 (P_1). Both general (GCA) and specific combining ability (SCA) variances were found to be highly significant for all *in vitro* studied traits under the three stress levels. High ratios of GCA/SCA mean squares were detected for all *in vitro* studied traits under the three stress levels except albino plantlet regeneration at the stress level of 10 g/l PEG, indicating that predominant role of additive gene action in the inheritance of all *in vitro* studied traits. It was found that the best general combiners for callus induction and plant regeneration were Gemmeiza 7 (P_2), Gemmeiza 11 (P_3) and Line -115 (P_6) under the three stress levels. The best promising crosses for green plantlet regeneration were the two crosses $P_2 \times P_6$ and $P_3 \times P_6$ under drought stress conditions.

Key words: Anther culture, bread wheat. combining ability, drought stress,