



Field evaluation and molecular analysis of some bread wheat gametoclones and somaclones under natural heat stress

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Abstract:

Extra new wheat cultivars will be required to face the challenges which caused by climate change and unusual increasing of temperature in Egypt. Therefore, in this study, fourteen wheat (*Triticum aestivum* L.) gametoclone and somaclones in addition to one check variety (Giza 168) were evaluated for their ability to heat stress tolerance and genetic variability, via field performance and inter simple sequence repeat (ISSR) molecular marker analysis. Five agronomic characters were evaluated for heat tolerance under normal and late sowing (stress) conditions. The results showed high significant differences among genotypes in both normal and heat stress conditions. High temperature decreased most of traits in most of the genotypes. Based on heat tolerance index, the genotypes were distributed into, high, moderate and low tolerant genotypes. The nine primers of ISSR markers amplified a total 71 bands out of them 33 were polymorphic (with 43.9% of polymorphism). The similarity values ranged from 0.77 to 1.00. The dendrogram separated the genotypes in two main clusters, high and moderate heat tolerant genotypes were distributed among the clusters, while the low heat tolerant genotypes restricted in one group. Superiority of some genotypes under heat stress conditions suggests that gametoclonal and somaclonal variation could be beneficial tool for genetic improvement of heat stress tolerance in wheat.

Keywords:

Key words: gametoclonal variation , somaclonal variation, genetic improvement, ISSR, field trials, dendrogram, polymorphism

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