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Association analysis of yield related-traits in barley (*Hordeum vulgare* L.) under salt and drought stresses

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Increased food costs goods are the initial indication of strong edible yield-loss; therefore, crop productivity is irreversibly inhibited by environmental stresses. One of the most important abiotic stresses affecting agricultural crops is high soil salinity and act as a major obstacle to increasing them production in growing areas worldwide, particularly in the dry region. This situation has compelled plant scientists to develop climate change-resilient crops, which can withstand broad-spectrum of stresses. With the increasing demand for barley, an emphasis on developing elite barley cultivars conferring greater tolerant to relevant stress is needed in order to meet the current and future demands of this grain crop. Elite inbred and advanced breeding lines are highly adapted and have been subjected to numerous recombinations. The main purpose of this study was to implement association analysis for eighteen-traits using 111-elite barley lines. The genotypes have been developed by the ear-to-row selection method at, Agricultural Research Center (ARC), Egypt. Effects of stress were induced at the seedling stage for drought stress using polyethylene glycol (PEG) and salinity stress using sodium chloride (NaCl). A total of 261 SSRs and SNPs polymorphic specific alleles were used to characterize the panel for linkage disequilibrium (LD), population structure and kinship. Preliminary results show that broad-sense heritability (H^2) of the agronomic traits was high (> 0.65), highly significant marker-traits associations were identified for most traits. Our results show the potential of an elite inbred panel in association studies in targeting agronomic traits for drought and salinity stress.

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