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GROWTH OF WHEAT MUTANTS UNDER DROUGHT STRESS

Hydroponic culture was performed to investigate the physiological responses of three mutant lines with their wild-type parent under drought stress. Mutants; Noor 5, Noor6 and Noor7 along with cv. Al Noor (parent) were subjected to 2 levels (0 and 10%) of polyethylene glycol (PEG-6000). Growth at the seedling stage was evaluated. Differential Display Reverse Transcriptase- DDRT was applied to study the genetic markers related with drought tolerance using 9 random primers (OPA-1, OPA-5, OPA-11, OPC-4, OPC-8, OPF-12, OPH16, OPO11 and OPR7). The mutants along with cv. Al Noor were also planted under rainfed conditions. Drought tolerance indices (Stress Tolerance Index, Mean Productivity, Geometric Mean Productivity, Stress Tolerance and Stress Susceptibility Index) were calculated. Correlations between stress indices under the hydroponics experiment and grain yield under rainfed conditions were investigated. Water stress reduced root length and fresh weight in all genotypes, but increased shoot length, fresh and dry weight in mutants Noor 5 and Noor 6. The results revealed that PEG treatment had positive affects in seedling shoot length, shoot fresh weight, root dry weight in the mutant genotypes, but not cv. Al Noor. All primers succeeded to amplify DNA fragments. The result of field experiment revealed that Noor6 surpassed all genotypes in the number of tillers m⁻¹ and grain yield. Grain yield under water stress had positive and significant correlations with major stress indices: shoot and root length, shoot and root fresh weight, shoot dry weight and malic enzyme under hydroponic experiment Based on these data, it can be concluded that seedling growth parameters could be used as selection criteria for drought tolerance in wheat. DDRT-PCR could differentiate the genotypes and maybe used in developing markers related to drought tolerance.

Country or International Organization

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