

Abstract

Study of *Wdhn5* gene expression in wild and cultivated wheat genotype under drought conditions

Growth of plants is strongly influenced by environmental stresses such as drought, high salinity, low or high temperatures and this is the basis for identifying the genes that are involved in the tolerance of tension, and especially the genes that are highly regulated. Dehydrins are cumulative genes that are expressed in response to dehydration, cold, wastewater and salinity stresses and express LEA proteins for resistance. dehydrin group proteins (Dehydrin: DHN) are a group of important proteins that are produced in plants in response to non-biological stresses such as cold, salinity and drought. These proteins are part of a group of proteins that protect other proteins. Accordingly, in order to examine the role of this regulatory factor and its gene expression pattern during stress in wheat plant as well as the physiological and morphological characteristics and expression of *wdhn5* gene under drought stress as a factorial experiment was carried out in completely randomized design in pot with three replications on The wheat cultivars including (Bolani, behrang, shabrang, sistani) and wild (urartu, tauschii, speltoides) were as the first factor and irrigation treatment with three levels consisted of normal (80% of water holding capacity of soil), mild stress (60%) and severe stress (40%) was as the second factor. Normal irrigation was continued in four leaf stage and then discontinued for plants under stress to achieve certain level of stress. Physiological studies include: chlorophyll a and b, total chlorophyll, carotenoids, Water Use Efficiency, Leaf Relative water content and the was morphological: dry matter production (dry weight of plants), stem dry weight, stem fresh weight, Root dry weight, Root fresh weight, stem length and Root length. Analysis of variance showed that simple effect of drought stress had a significant effect on the traits chlorophyll a and b, total, carotenoids, stem dry weight, plant dry weight of plant, leaf relative water content, water use efficiency and also on stem length, stem fresh weight characteristics and Root dry weight. The result of the mean comparison showed that the tolerant cultivars had the highest stem fresh weight, plant dry weight of plant, Leaf Relative water content and Water Use Efficiency. Comparison of cultivars and wild: cultivars of Bolani and tauschii wild life showed more resistance. The result of the quantitative expression of *wdhn5* gene expression by real time PCR showed that expression of this gene in tauschii and bolani tolerant wheates increased significantly which could indicate the importance of this gene in drought stress conditions.

Key words: drought stress, wheat, *wdhn5*, Real time-PCR



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