

Abstract:

Drought is one of the most important constraining environmental stresses for agricultural products that is dominated in significant areas of Iranian farmlands (agricultural lands). Drought tolerance morphological recognition plays an important role in improving problems caused under drought conditions. In fact, the genetic relationship of these processes and their precise relationship with the efficiency level of plant seed are important and unknown. Therefore, in order to investigate morphological characteristics Physiological attributes measured included: photosynthetic pigments (chlorophylls a, b, carotenoid and total), antioxidant enzymes (catalase, ascorbate peroxidase, guaiacol peroxidase, and poly-phenol oxidase) and expression of *TaMYB73* gene under drought stress two studies were performed using three varieties of bread wheat (Chamran2, Afghani calk, Sistan, Arg and Ofogh). In order to investigate morphological characteristics related to drought tolerance, in the first study five varieties of bread wheat, including Chamran2, Afghani calk, Sistan, Arg and Ofogh were evaluated using a Factorial test and in a completely randomized design with five replicates. Drought had an significant effect on some study traits (stem length, leaf length, leaf width, shoot fresh weight, shoot dry weight, rootlet number, . root number) and interaction of drought. Cultivar was significant for rootlet dry weight and stem length. Thus, varieties showed different reaction in different irrigation regims for characteristics. The second test was performed in order to investigate the expression pattern of *TaMYB73* gene which is of the effective regulatory genes in response to stresses. sampling was performed randomly for leaves in each pot. Leaves were frozen in liquid nitrogen, then finally kept in freezer at -80 °C. After RNA extraction and synthesis of cDNA, the expression of *TaMYB73* gene, which is a gene related to transcription factor, was compared and evaluated using Real-time PCR in three varieties of wheat under drought conditions. The *18s* house keeping gene was used to normalize the data. The results revealed an increase in gene expression in *TaMYB73* under drought stress and the effect of stress and species in both genes in the 1 level percent displayed a meaningful difference, which in turn shows the impact of drought stress on these genes expressions. In this study, Chamran2 and Arg species, especially Chamran2, in regards with all the examined attributes, in drought conditions compared to the base line returned the most favorable results, identifying them as drought tolerant species.

Key words: *Triticum aestivum*, Real-time PCR, Physiological characteristics, *MYB* gene



**University of zabol
Graduat school
Department of Biotechnology
A Thesis Submitted for the Degree of Master of Science in Biotechnology
(M.Sc.)**

**Study of *MYB* gene expression in 5 sistan bread wheat
cultivars under drought stress**

**Supervisor:
Leila fahmideh**

**Advisors:
Ziba fooladvand**

**Prepared by:
Hadis tabaraki**

August 2016