

## **Abstract**

Grapevine is an important fruit in Iran. Therefore it is necessary some studies to evaluate different aspects related to early ripening in grape. In this study, the genes related to signal transduction in early ripening were investigated, firstly; then two genes, MYBA and STE20, and GAPDH (as reference genes) were selected to more study. The expression of these genes were evaluated in different phenological growth stages and different early and late ripening genotypes of Sistan grape. The results indicated that expression of STE20 has been up-regulated highly in late-ripened genotypes (Fakhri and Cheshm-Gavi) during ripening stage. Also, there was significant difference between ripening and berry filling phenological growth stages as expression of STE20. On the other hand, this gene was down-regulated in early ripened Red-Yaghouti and White-Yaghouti genotypes. Also the results indicated that expression of MYBA has up-regulated in early ripened Red-Yaghouti genotype of berry filling stage, while the expression of this gene was increased significantly in the late-ripened Chesm-Gavi genotype of ripening stage.

**Key words:** Early ripening, Quantitative Real Time PCR, RNA, Signaling pathway, Sistan cultivars of grapes, *Vitis vinifera*



University of Zabol  
Faculty of Agriculture  
Department of Plant Breeding and Biotechnology

**The Thesis Submitted For The Degree of Master of Science  
(In The Field of Agricultural Biotechnology)**

**Title:**

**Studying of genes expression related to signal transduction in  
early ripening of Sistan yaghouti grape**

**Supervisors:**

Dr. Abbasali Emamjomeh  
Dr. Mahmood Solouki

**Advisor:**

Forouzan Heydari

**By:**

Sajjad noroozi

Autumn 2018