

**Abstract:**

Essential oil of Basil is mainly include phenylpropanoids compounds. Phenylalanine ammonia Lyase (PAL) is one of the key enzymes in the pathway of phenylpropanoids compounds. Identifying methods to increasing the expression of PAL gene and amount increasing of phenylpropanoids compounds in plant tissues would be of great help in the production of plant secondary metabolites and drugs. In this study, we evaluated gene expression of phenylalanine ammonia Lyase by external use spray hormones in samples treated with gibberellic acid, Jasmonic acid and salicylic acid at a concentration of 0/1 mM L for 24 hours on basil in a completely randomized design. The purpose of examining the effect of various hormones and growth three stages of the plant: the effects of growth hormone and growth stages of the plant-specific gene expression in plants. PCR was performed in three replications for the PAL and tubulin genes and data analysis was done by using Livak law formula " $2^{-\Delta\Delta CT}$ ". Differences in the target gene expression levels between treatments and control groups were analyzed by Duncan method and calculated at 1% and 5% significance level. All analyzes were done by using the software SAS v9. The results showed an increasing in the PAL gene expression in hormone-treated Jasmonic acid in the flowering stage. There were statistically significant differences in gene expression between the treated and control samples in PAL 1% significance level. Respectively Jasmonic acid, gibberellic acid and salicylic acid increased the expression of PAL gene.

**Key words:** *Ocimum basilicum* L, Gene expression, Phenyl alanine ammonia-lyase, Hormone



University of zabol

Graduate schoola

Faculty of agriculture

Department of plant breeding and biotechnology

**The Thesis submitted for the Degree of M.Sc  
(in the field of Biotechnology)**

**The effects of gibberellic acid, jasmonic acid and salicylic acid  
hormones on phenyl alanine ammonia-lyase (PAL) gene expression  
levels in Sweet basil (*Ocimum basilicum L*) using Real Time PCR  
method**

**Supervisor:**

**Dr. M. solouki**

**Advisor:**

**M.S.c. Y. Shiri**

**By:**

**S. Abdekhani**

**Sep 2014**