Abstract

The MAP30 gene is important because of its multifunctional properties, including anti-AIDS, anti-diabetes and anti-pituitary properties. The purpose of this study was to investigate the stresses of silver nanoparticles as a non-biological elicitor and Alternaria alternata as a biological elicitor on the expression of this gene in Bitter melon with a scientific name of Momordica charantia. First, Bitter melon seed was planted in a completely randomized design with four levels and three replications. After passing the 4-leaf stage, silver stress was performed at four concentrations of 0, 20, 60 and 100 PPM and fungal stress at four concentrations of 0, 10^5, 10^6 and 10^7 spores per ml. Extraction of RNA from plant leaves was performed at three time interval of 24, 48, and 72 hours after treatment. To normalize the data, *18S rRNA* control gene was used. Gene expression was investigated using Real Time PCR technique. Data analysis was done using SPSS software and One way-Anova test, $P < 0.05$. The results of Real Time PCR data analysis indicated that in separated intervals, the lowest concentration of silver nanoparticles, 20 ppm, has the highest increase in the expression of the gene, and the highest concentration of the nanoparticle, 100 ppm, reduces its expression. The concentration of 60 ppm also increased the expression, which was significant compared to the control. Generally, the concentration of 20 ppm is the effective concentration in increasing the expression of the MAP30 gene and concentration of 100 ppm over three time intervals reduces gene expression which showed a significant reduction over a time interval of 72 hours. In fungal stress, concentrations of 107 and 106 spore per ml increased the expression of the gene significantly. And at concentration of 105 on the third day, increased genes expression significantly. In the fungal stress, increased expression of MAP30 gene was observed with increasing concentrations and also increasing the time interval.

Keywords: *MAP30* gene, bitter melon, gene expression, Alternaria alternate, silver nanoparticle

University of Zabol
Graduate school
Faculty of Science
Department of Biology

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Effect of *Alternaria alternata* fungi and Cobalt nanoparticle stresses on *MAP30* gene expression in *Momordica charantia* plant

Supervisors:
Dr. H. Kamaladdini
Dr. F. Haddadi

By:
Maryam Etemadi

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