

عنوان مقاله:

Positive correlation between PAL mRNA expression and enzyme activity is relation to wheat resistance induction

محل انتشار:

چهارمین کنگره بین المللی و شانزدهمین کنگره ملی ژنتیک (سال: 1399)

تعداد صفحات اصل مقاله: 1

نویسندگان:

Mona Sorahinobar - *Department of Plant Sciences, Faculty of Biological Sciences, Alzahra University, Tehran, Iran*

Hassan Soltanloo - *Department of Plant Breeding and Biotechnology, Faculty of Plant Production, Gorgan University of Agricultural Science and Natural Resources, Gorgan, Golestan, Iran*

Babak Moradi - *Department of Plant Biology, Faculty of Biological Science, Tarbiat Modares University, Tehran, Iran*

خلاصه مقاله:

Background and Aim: PAL as a key enzyme of the phenylpropanoid pathway plays crucial role in plant response to biotic and a biotic stress. PAL involves in the plant defense system through biosynthesis of active metabolites, such as phytoalexins, phenolics, lignins and salicylic acid. It is believed that pathogen-associated molecular pattern (PAMP) can initiate PAMP-triggered immunity (PTI) in plants. **Methods:** Hence, here we investigated the response of phenylalanine ammonia lyase gene expression and enzyme activity to the treatment of mycotoxins in two wheat genotype at seedling and flowering stage to elucidate its role in resistance to pathogen. *Fusarium graminearum* crude extract was prepared as source of mycotoxins. Methanolic extract of *F. graminearum* macroconidia cultured on rice was used as a source of PAMP. Wheat seeds were cultured on the main culture medium amended with the toxic extract in treatments. In addition, wheat spikelets at flowering were point inoculated with crude extract between the palea and lemma at anthesis stage. **Results:** Three resistance levels were observed in response of these two wheat cultivars treated with *F. graminearum* inoculation: resistant (Sumai³ at anthesis), susceptible (Falat at anthesis, Sumai³ at seedling), semi susceptible (Falat in seedling). Mycotoxin extract inoculated Sumai³ showed 1.75 ± 0.01 and 1.85 ± 0.03 fold increase of PAL transcript level and enzyme activity as compared to their mock treated control at anthesis respectively. While this cultivar showed 3 ± 0.01 fold increase of PAL gene expression in response to mycotoxin treatment only 1.83 ± 0.04 increase of its respective enzyme activity was observed at seedling as compared to their control. On the other hand while PAL gene expressions in spikelet of Falat down-regulated in response to crude extract treatment a slight increase of its activity was observed. Falat seedlings treated with mycotoxin extract showed 14 ± 0.05 fold induction of PAL and 1.83 ± 0.02 increase PAL enzyme activity as compared to their mock treated control. **Conclusion:** We observed differences in responses between Falat and Sumai³ in response to *F. graminearum* crude extract. Positive correlation between PAL mRNA expression and enzyme activity is relation to wheat resistance to *F. graminearum* was observed.

کلمات کلیدی:

Mycotoxins, PAL, Pathogen, Plant resistance

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