عنوان مقاله:

Assessment of salicylic acid-induced resistance against Septoria tritici blotch disease on wheat using real-time PCR

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خلاصه مقاله:

Septoria tritici blotch (STB) caused by Zymoseptoria tritici is one of the most important wheat diseases in the world and causes significant annual damage to wheat crops around the globe. The use of resistant cultivars is the most effective method for the management of this disease. Recently, the use of acquired systemic induced resistance has been proposed to manage wheat leaf blotch. In this study, the effect of salicylic acid (SA) on the relative changes of PAL and PR۲ gene expression was investigated using qPCR technique. The expressions of catalase, peroxidase, and ascorbate peroxidase enzymes were also assessed in a sensitive wheat cultivar. Controlled and contaminated plants were sampled and compared at ۰, ۱۲, ۲۴, ۴۸, ۹۶, and ۲۴۰ hours after inoculation. The results showed that treatment with salicylic acid significantly reduced the level of disease compared to control plants. Comparison of gene expression patterns also showed that the expression of both PAL and PR۲ genes in control and SA pre-treated plants increased after fungal inoculation; however, their expression was significantly higher (۲.۶ and ۱.۳ folds respectively for PAL and PR۲) in plants treated with salicylic acid than the control. Moreover, treatment with salicylic acid significantly affected the activity of all three enzymes. It can be concluded that the high response of PAL and PR۲ genes to salicylic acid pre-treatment, as well as increased activity of peroxidase along with the reduced activity of catalase and ascorbate peroxidase enzymes indicate the effective role of SA in inducing wheat resistance against STB.

کلمات کلیدی:

Salicylic acid, Septoria leaf blotch, Real time PCR, Induced resistance