

Abstract

One of the most important diseases of wheat is wheat blight caused by *Fusarium graminearum*. In this study the possible effects of application of chitosan and silicon on induction of systemic resistance against these pathogens were investigated in laboratory and greenhouse conditions. The effectiveness of chitosan concentrations (100,200,500mg/liter) and silicon (2,4,6 mM) on growth *F. graminearum* was tested in vitro. The results showed that all concentrations of chitosan and silicon on fungal mycelial growth had directly a negative effect. In greenhouse experiments, foliar sprays with chitosan and silicon in the soil drench were used. The results showed that wheat plants treated by chitosan and silicon as plant defense elicitors, caused reduce diseases index as compared to infected control. The other aims of this research were to study the effect of chitosan and silicon on the induced resistance index contains phenylalanine ammonia lyase, peroxidase, polyphenol oxidase enzymes, total phenol content and also genes involved in disease resistance including β -glucanase and oxalate oxidase in the tissues of treated plants. The evaluation of total phenol content and enzymes activity and genes involved in the resistance in elicited plants compared to the control plants healthy and infected was increased. Maximum level of these compounds were observed at the third and fifth days after elicitor's application. Based on these results, it is suggested that chitosan and silicon as chemical elicitors of plant defense which can be used against wheat head blight.

Keywords: chitosan, silicon, peroxidase, polyphenol oxidase, phenylalanine ammonia lyase, total phenolics, β -glucanase, oxalate oxidase, wheat *Fusarium*.



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**Study of effect of chitosan on resistance induction to
wheat head blight disease**

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