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STUDY OF ROLE OF *AbreAtr$_1$* GENE IN PROTECTIVE MECHANISM AND PATHOGENICITY OF *Alternaria brassicae*, THE CAUSAL AGENT OF LEAF SPOT IN CANOLA, USING REAL TIME PCR*

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Abstract

Alternaria brassicae is one of the most important seed borne pathogens and causal agents of canola leaf spot. In pathogenicity process of *A. brassicae*, *AbreAtr$_1$* genes correspond to pathogenicity cluster NRPS-ABC transporter and have been introduced as an encoding of pathogenicity factor. The presence of these proteins in organisms prevents the accumulation of toxic compounds caused by them, and protects them against toxins, thus enhancing the growth of pathogen. The role of this gene in growth of *A. brassicae* and amount of pathogenicity of this fungus has not yet been considered. In order to study this role, the amount of *AbreAtr$_1$* transcription in six isolates of *A. brassicae* was compared by Real time PCR method. The daily growth rate in each isolate in PDA medium and the amount of pathogeniciy was also studied. There was a significant difference among isolates at 1% level in the growth rate and amount of pathogenicity. Also, there was a significant difference among isolates in the amount of *AbreAtr$_1$* transcription. The role of *AbreAtr$_1$* in protective mechanism of *A. brassicae* against the produced phytotoxins, the correlation between the growth rate, amount of pathogenicity and transcription pattern of *AbreAtr$_1$* were determined in each isolate. There was a positive relation between growth rate, amount of pathogenicity and transcription pattern of *AbreAtr$_1$* at 1% level. It is thought that growth and pathogenicity of *A. brassicae* is affected by the ABC transporter encoded by the *AbreAtr$_1$*. Over-expression of *AbreAtr$_1$* can lead to reduce toxic effect of secondary metabolites in this pathogen, thus giving more pathogenicity in the isolate.

Keywords: *Alternaria brassicae*, *AbreAtr$_1$*, ABC transporter, Pathogenicity, Hyphal growth, Canola.

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