

A Novel Protein Elicitor Extracted From *Lecanicillium lecanii* Induced Resistance Against Whitefly, *Bemisia tabaci* in Cotton

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Abstract : Background: Protein elicitors play a key role in signaling or displaying plant defense mechanisms and emerging as vital tools for bio-control of insects. This study was aimed at the characterization of the novel protein elicitor isolated from entomopathogenic fungi *Lecanicillium lecanii* (V3) strain and its activity against Whitefly, *Bemisia tabaci* in cotton. The sequence of purified elicitor protein showed 100% similarity with hypothetical protein LEL_00878 [*Cordyceps confragosa* RCEF 1005], GenBank no (OAA81333.1). This novel protein elicitor has 253 amino acid residues and 762bp with a molecular mass of 29 kDa. The protein recombinant was expressed in *Escherichia coli* using pET-28a (+) plasmid. Effects of purified novel protein elicitor on *Bemisia tabaci* were determined at three concentrations of protein (i.e., 58.32, 41.22, 35.41 $\mu\text{g mL}^{-1}$) on cotton plants and were exposed to newly molted adult *B.tabaci*. Bioassay results showed a significant effect of the exogenous application of novel protein elicitor on *B. tabaci* in cotton. In addition, the gene expression analysis found a significant up-regulation of the major genes associated with salicylic acid (SA) and jasmonic acid (JA) linked plant defense pathways in elicitor protein-treated plants. Our results suggested the potential application of a novel protein elicitor derived from *Lecanicillium lecanii* as a future bio-intensive controlling approach against the whitefly, *Bemisia tabaci*.

Keywords : resistance, *Lecanicillium lecanii*, secondary metabolites, whitefly

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