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Isolation, partial characterization, and cloning of an extracellular chitinase from the entomopathogenic fungus *Verticillium lecanii*

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ABSTRACT. The entomopathogenic fungus *Verticillium lecanii* is a well-known biocontrol agent of fungal phytopathogens, as well as insect pests. A 42-kDa chitinase belonging to family 18 of the glycosyl hydrolases was isolated and partially characterized. Chitinase was purified using successive column chromatography on phenyl-sepharose, DEAE-sepharose, and CM-sepharose. The enzyme showed the highest activity at 40°C and pH 4.6. Enzyme activity was strongly activated in the presence of Mg^{2+}. The purified enzyme showed inhibitory activity of spore germination against several plant pathogens, particularly *Fusarium moniliforme*. The genomic DNA and cDNA sequences were resolved by polymerase chain reaction amplification and sequencing. Protein modeling and comparative investigation of different chitinase amino acids showed that chitinases are conserved in parasitic fungi.

Key words: Acidic extracellular chitinase; Inhibitory effect; Protein modeling; *Verticillium lecanii*

