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Biocontrol Potential of Trichoderma sp. against Macrophomina phaseolina

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Abstract : Forty two strains of Trichoderma sp. were isolated from cultivated lands around Bangalore and analyzed for their antagonistic potential against Macrophomina phaseolina. The potential of biocontrol agents ultimately lies in their capacity to control pathogens in vivo. Bioefficacy studies were hence conducted using chickpea (Cicer arientum c.v. Annigeri) as an experimental plant by the roll paper towel method. Overall the isolates T6, T35, T30, and T25 showed better antagonistic potential in addition to enhancing plant growth. The production of chitinases to break down the mycelial cell walls of fungal plant pathogens has been implicated as a major cause of biocontrol activity. In order to study the mechanism of biocontrol against Macrophomina phaseolina, ten better performing strains were plated on media, amended with colloidal chitin and Sclerotium rolfsii cell wall extract. All the isolates showed chitinolytic activity on day three as well as day five. Production of endochitinase and exochitinase were assayed in liquid media using colloidal chitin amended broth. Strains T35 and T6 displayed maximum endochitinase and exochitinase activity. Although all strains exhibited cellulase activity, the quantum of enzyme produced was higher in T35 and T6. The results also indicate a positive correlation between enzyme production and bioefficacy.

Keywords : biocontrol, bioefficacy, cellulase, chitinase
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