

Suppression of Causal Agents of Damping Off Disease in Tomato Using Cellulolytic Fungi

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Abstract

Cellulolytic fungi have shown potential applications in a wide range of industries particularly in agriculture where they have been used in suppression of plant pathogens, towards sustainable agriculture. Damping off disease caused by a group of plant pathogens namely *Pythium* sp., *Phytophthora* sp., *Rhizoctonia solani* and *Fusarium oxysporum* is considered as the most severe nursery disease in tomato (*Solanum lycopersicum*) that accounts for heavy crop losses. The antagonistic effect of five selected cellulolytic fungi namely *Talaromyces* sp., *Trichoderma* sp., *Aspergillus niger*, *Aspergillus* sp. and *Penicillium oxalicum* against damping off disease causing fungi in tomato was investigated in the current study. Crude extracts obtained from *Trichoderma* sp. and *Aspergillus* sp. resulted growth inhibition zones of a mean diameter of 17.5 mm and 15 mm, respectively against *Phytophthora* sp. The crude extracts of the highest cellulase producing co-culture (*Talaromyces* sp., *Aspergillus* sp., *Penicillium oxalicum*) when used as a seed treatment agent against those fungal pathogens, it resulted the highest mean seedling emergence percentage against *Phytophthora* sp. The same crude extract was effective in enhancing emergence percentage of tomato seedlings against *F. oxysporum* (t value = 0.0056), *Phytophthora* sp. (t value = 0.0280), and group of all four pathogens (t value = 0.0201). Paired interaction tests between fungal pathogens revealed that *Rhizoctonia solani* was inhibitive towards other three pathogens while *Phytophthora* sp. was dominant against the growth of *F. oxysporum*. *Trichoderma* sp. shows competition effect against *Pythium* sp., *Phytophthora* sp. and *Rhizoctonia solani* while both *Aspergillus niger* and *Aspergillus* sp. showed competition effect against *Pythium* sp. and *Phytophthora* sp. This study concludes that *Trichoderma* sp. and *Aspergillus* sp. has the potential for suppressing *Phytophthora* sp.

Key words: Cellulolytic fungi, *Pythium* sp., *Phytophthora* sp., *Fusarium oxysporum*, *Rhizoctonia solani*

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