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Screening of salinity and drought tolerance *Trichoderma* isolates for plant growth promotion traits and antagonistic against *Sclerotium rolfsii* and *Fusarium oxysporum* f. sp. *cubense*

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Trichoderma spp. are known biocontrol agents for many plant pathogens, especially against soil-borne pathogens. *Trichoderma* is also involved in salinity and drought tolerance of plants. The main objective of this study was to screen *Trichoderma* isolates to use them as potential biocontrol agents in agricultural fields under various salinity and drought conditions. For this purpose, screening of salinity and drought tolerance of *Trichoderma* isolates having plant growth promotion traits and antagonistic effects on *Sclerotium rolfsii* and *Fusarium oxysporum* f. sp. *cubense* were explored under *in vitro* conditions. In total, 36 *Trichoderma* isolates were isolated from various climatic zones in Sri Lanka. They were screened for salinity tolerance using different strengths of NaCl-amended PDA plates. *Trichoderma* Tmat2 was found to be the most salinity-tolerant isolate followed by T9 and T13. Drought tolerance was screened on KCl-amended PDA for osmotic potential and polyethylene glycol (PEG) for matric potential. Based on the results, Tmat2 and Tmaho4 isolates were found to be the best drought tolerance isolates whilst T9 and T13 were found as moderately drought tolerance isolates. All strains were screened for antagonistic activity by using *Sclerotium rolfsii* and *Fusarium oxysporum* f. sp. *cubense* as challenging fungal pathogens. Isolates T9, T13 and Tmat2 were found to be the most powerful antagonistic isolates and showed higher chitinolytic activity on plate assay. According to the IAA assay, Tmat2, Tkal1 and T13 showed the highest indole acetic acid production. However, in the phosphate solubilization assay T9, T13, Tmaho4 and Tuni2 showed the highest ability of phosphate solubilization. Accordingly, it can be concluded that *Trichoderma* T13 would be the best candidate to be developed as a biopesticide for field application under salinity and drought conditions considering the overall performances with IAA production, phosphate solubilzation and antagonistic potential.

Keywords: Antagonism, Drought, Plant growth promotion, Salinity, Trichoderma

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