

EFFICACY ASSESSMENT OF *Trichoderma virens* BASED SOLID FORMULATION FOR THE MANAGEMENT OF FUSARIUM WILT CAUSED BY *Fusarium oxysporum* IN COWPEA

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Fusarium oxysporum is an economically important phytopathogenic fungus causing Fusarium wilt in cowpea. This study was conducted to determine the practical feasibility of using a solid-based formulation of *Trichoderma virens*, as a potential biological control agent for *Fusarium oxysporum* and to study the impact of plant growth promotion in cowpea plants. The pathogen was isolated from symptomatic cowpea plants collected from multiple field locations within the Anuradhapura district. The isolated pathogen was identified by morphological characteristics and confirmed with molecular biological tools using ITS1 and ITS4 universal primers. In dual culture plate assays, *T. virens* exhibited an 89.74% inhibition of mycelial growth against *F. oxysporum*. Soil multiplication of *T. virens* was observed under laboratory conditions for 14 consecutive days. The efficacy of *T. virens* formulation was tested in a pot experiment under shade house conditions. A suspension of *F. oxysporum* spores (1.0×10^5 spores mL⁻¹) was applied as a soil drench to the base of plants at the seedling stage. Plant growth and disease incidence were monitored, and data were analysed using a repeated mixed effect model and logistic regression in SAS studio version 9.0 software. The highest spore production was observed between 6–8 days after spore application (1.8×10^6 spores mL⁻¹) at $28 \pm 1^\circ\text{C}$. The application of *T. virens* exhibited zero-disease incidence under shade house conditions ($28 \pm 1^\circ\text{C}$ and 70% RH). Treatment with *T. virens* significantly enhanced ($p < 0.05$) plant height, flower number, pod number and root length of cowpea plants compared to untreated controls. The results revealed the spores of *T. virens* were viable and multiplied throughout the experimental period. The present study concludes *T. virens* is a promising plant growth promoter and bio-control agent against *Fusarium oxysporum*.

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