

***Trichoderma citrinoviride* as a Potential Biocontrol Agent for *Fusarium* and *Colleotrichum* Species, a Causative Agent of Onion Leaf Curl and Anthracnose Disease**

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Abstract

Red onion cultivation has become more challenging since 2020 due to the prevalence of onion anthracnose and leaf curl disease primarily caused by fungal pathogens *Colleotrichum* and *Fusarium* spp. This study aimed to identify the causative agents of onion leaf curl and anthracnose disease (muul azhugal) in vedhaalam onion variety collected from Jaffna district farms and to assess the potential of *Trichoderma citrinoviride* for disease suppression both in-vitro and under greenhouse conditions. Isolated organisms were tested for the infectivity using healthy onion plants, and the pathogens were re-isolated from the similar symptomatic plants. Pathogens were molecularly identified by nucleotide sequencing of internal transcribed region 1 (ITSS1). The *in vitro* antagonistic assay was performed in triplicate in dual culture assay. Greenhouse experiment trials were conducted in a Completely Randomized Design with three treatments (control, both pathogen and *Trichoderma*, and *Trichoderma* only) with five replicates each. Observations included the appearance of symptoms (chlorosis, twisting, and bulb rot) and time taken for the symptoms to appear was recorded. Results from *in vitro* antagonistic assay demonstrated the complete inhibition of pathogens by the *Trichoderma citrinoviride*. Under greenhouse conditions the disease symptoms emerged 14 days after inoculation of pathogen. Notably around 60% reduction in disease incidence was achieved when *Trichoderma citrinoviride* was treated to pathogen inoculated soil. Ongoing field trials aim to validate the results further. In conclusion the study highlights the efficacy of *Trichoderma citrinoviride* in suppressing onion anthracnose and leaf twister disease, offering a promising avenue for disease control in onion cultivation.

Keywords: *Trichoderma citrinoviride*, *Onion anthracnose*, *Leaf twist*, *Biocontrol*