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Effect of a local *Trichoderma* isolate on the onion basal rot pathogen in Sri Lanka

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As onion (*Allium cepa*) is an important component in the daily diet of Sri Lankans, there is a great consumer demand for onions throughout the year. However, its production in Sri Lanka is limited due to various reasons. One important reason is crop loss due to diseases. Basal rot disease, caused by *Fusarium oxysporum* f. sp. *cepae*, accounts for 10 – 50% of crop loss. To control the pathogen, the most widely used method is application of chemicals in spite of their adverse effects on the environment.

Biological control has been identified as an alternative for chemicals, as it does not cause damage to the environment and if the control agent is isolated locally, it causes minimal damage to the ecosystem. *Trichoderma* species are commercially used as biological control agents in controlling fungal pathogens amongst others.

In this study, basal rot pathogen of onion was isolated from diseased onion bulbs grown in farmer fields in Sigiriya and a *Trichoderma* species was isolated from the soil of the same fields. Dual culture of the pathogen with the *Trichoderma* isolate on Potato dextrose Agar (PDA) plates and slides indicated that the *Trichoderma* isolate was capable of controlling the growth of the onion basal rot pathogen isolated, i.e. *F. oxysporum*, *in vitro*.

The isolated *Trichoderma* species produced loops and clamps around the pathogen hyphae restricting the growth of the pathogenic fungus. This indicated the use of mycoparasitism as a mechanism of controlling the growth of pathogen hyphae. In addition, the *Trichoderma* isolate was able to utilize chitin and glucan as the sole C source when grown on modified Czapek – Dox Agar medium indicating the involvement of extracellular enzymes i.e. chitinase and glucanase in controlling the pathogenic fungus.

However, presence of secondary metabolites with a toxic activity towards the pathogen was not observed in the *Trichoderma* culture filtrates tested.

Therefore, formation of myco-parasitic structures such as loops, clamps and formation of coils around the pathogen is used by the isolated *Trichoderma* species for controlling the growth of the pathogen *F. oxysporum*. The *Trichoderma* isolate was able to grow in modified Czapek – Dox medium containing chitin or 1, 6 – β -glucan as a sole C source indicating synthesis and secretion of extracellular enzymes.