Ultrastructure of Mycoparasitism of *Trichoderma koningiopsis* 4.24 and Effects of its Metabolic Products on Pathogenic Fungi

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Mycoparasitism can be found among all groups of fungi from the chytrids to the higher Basidiomycetes and, the genus *Trichoderma* has been the most prominent and extensively studied with very broad host range. Several species have the potential in producing different classes of antibiotics. One prerequisite for rational utilization of the biological properties of an antagonist is an understanding of the mechanisms underlying the mycoparasitic process. This study was initiated to investigate in detail the mycoparasitic activity of a new strain of *T. koningiopsis* 4.24, isolated from the rhizosphere of citrus, against *Sclerotium rolfsii*, *Sclerotinia sclerotiorum*, *Rhizoctonia solani*, *Fusarium oxysporum* and *Pythium aphanidermatum*. Inhibitory effects of extracts obtained with dichloromethane, in acidic pH, were investigated. *T. koningiopsis* 4.24 colonizes hyphae as well as sclerotia of *S. rolfsii*, *S. sclerotiorum* and *R. solani*. The antagonist inhibits the sclerotial germination of *S. rolfsii* in 65%. Infected mycelia of *S. sclerotiorum* when inoculated on carrot segments caused typical symptoms of white mold compared with non-treated mycelia. Light and electron microscopic observations revealed that *T. koningiopsis* 4.24 made hyphal contact with *R. solani* within 2 days after inoculation. The antagonist penetrated hyphal cells of *R. solani* and *F. oxysporum* and colonized the zoospores of *Pythium*. It is proposed that *T. koningiopsis* 4.24 produces lytic enzymes which caused wrinkling and collapsing of *Sclerotium* sclerotia. Growth of the antagonist in the rind layer of *S. sclerotiorum* was mainly intracellular. The crude extracts of *Trichoderma* were found to have antifungal properties, inhibiting the mycelial growth of *P. aphanidermatum*, *R. solani*, *S. sclerotiorum*, *S. rolfsii* and *F. oxysporum* in 44,5%; 28,3%; 10,7%; 41,7% and 47%, respectively. The results indicate that mycoparasitism and antibiotic production are the modes of action by which *T. koningiopsis* 4.24 controls its hosts.

Key works: antifungal compounds, *Trichoderma koningiopsis*, mycoparasitism.