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Variability of *Trichoderma* Population Isolated from Rubber Growing Soils, Showing Antagonistic Ability against *Rigidoporus microporus*, the Cause of White Root Disease of Rubber

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Abstract

Natural rubber (*Hevea brasiliensis*) is a very significant crop to the global economy. Loss of production of rubber plantations can be caused due to plant pathogens. *Rigidoporus microporus*, the causative agent of white root disease is abundant in rubber plantations of Sri Lanka. Since control of the disease by applying fungicide is expensive, fungal species can be used as a biological control agent against white root disease. *Trichoderma* isolates obtained from rubber growing soils were found antagonistic against *R. microporus*. An attempt was taken to isolate various antagonistic *Trichoderma* isolates from different rubber growing soils. Soil samples were collected from Kalutara, Rathnapura, Ampara and Vavuniya in Sri Lanka. Soil pH and moisture contents were measured using standard methods and fungi were isolated using the dilution plate technique. After preparing pure cultures, antagonistic ability against *R. microporus* was tested using dual plate culture test. More than 65% inhibition showing fungi were selected to observe the cultural and reproductive morphology. According to the results, the dual plate culture test indicated that five *Trichoderma* species were effective to show more than 65% inhibition against *R. microporus*. These included *T. hamatum*, *T. koningii*, *T. spirale*, *T. ghanense* and the teleomorph of *T. harzianum* (*Hypocrea lixii*) in DNA sequencing data after processing from Macrogen, Korea. *Hypocrea lixii* showed the maximum inhibition of 80% over the control in *R. microporus* followed by *T. koningii*. *Trichoderma* species were able to grow in rubber growing soils with a range of pH from 4.0 to 6.8. *Hypocrea lixii* were isolated from the dry zone where showed comparatively higher pH and lower moisture values than the wet zone. *T. spirale* and *T. hamatum* were observed in both dry and wet zones. The isolates produced irregular or circular colonies with filiform or entire types of margin showing maximum growth rate of 4.08 cm/day. Therefore, these antagonistic fungi show a potential to control *R. microporus* under field conditions too.

Keywords: Rubber plantation, White root disease, *Trichoderma* sp.