



## ***SIGNIFICANCE OF LACCASE BY RIGIDOPORUS MICROPORUS, THE CAUSE OF WHITE ROOT DISEASE OF RUBBER***

H.K.I. Madushani<sup>1</sup>, T.H.P.S. Fernando<sup>1</sup>, R.L.C. Wijesundara<sup>2</sup>, D. Siriwardane<sup>1</sup>

*1 Department of Plant Pathology & Microbiology, Rubber Research Institute of Sri Lanka, Dartonfield,  
Agalawatta, Sri Lanka.*

*2 Department of Plant Science, Faculty of Science, University of Colombo, Sri Lanka.*

Laccases are lignin degrading enzymes and distributed widely in a wide range of living organisms such as higher plants, insects, fungi and bacteria. Majority of laccases characterized so far have been derived from fungi, especially white rot Basidiomycetes that are efficient lignin degraders. *Rigidoporus microporus* has wide host range and is the causative agent of the most destructive white root disease. The pathogen has the ability to produce high level of laccase enzyme which causes wood-decaying. The laccases have been isolated from *R. microporus* which has potential applications such as degradation of lignin and phenolic compounds, bleach of pulps, removal of oxygen from oil products, detoxification of inhibitors in fermentation, protein treatment, medical analysis etc. In this study, the isolation and screening of *R. microporus* for laccase production were carried out with twelve isolates of *R. microporus* were isolated from symptomatic *Hevea brasiliensis* (R1, R4, R11, R12), *Mucuna bractiacta* (R2), *Cinnamomum zeylanicum* (R3), ***Camellia sinensis* (R5)**, *Artocarpus nobilis* (R6), *Murraya koenigii* (R7), *Salix babylonica* (R8), *Alstonia macrophylla* (R9), *Alstonia heterophyllus* (R10). The isolates were screened for laccase enzyme secretion on solid media containing colour indicator of guaiacol. Qualitative screening method for laccase production was carried out by inoculation of 0.5 cm diameter of mycelium from 7 days old cultures into 2% PDA plates supplemented with 0.2 % glucose as a laccase degrading substrate with 0.02 % Guaiacol (pH 5.5) and then incubated at 30 °C. The formation of reddish brown halo indicated a positive laccase secretion. After , an incubation period of 4 days, the enzyme activity was examined by scoring the decolorization intensity. Test was repeated twice. All the tested *R. microporus* isolates were laccase positive and R6 isolate produced higher intensity showing larger diameter of the reddish brown halo. Laccase is responsible for making a polyphenolic glue that sticks the hyphae together. Isolate R6 showed adpressed hyphae on culture plates which further confirmed the high level of laccase. Additional physiological functions of fungal laccase in fruit body formation and pathogenicity expression have also been suggested by various researchers and it tightly bound to the cell wall contributing to the resistance to fungicides. The pathogen of *R. microporus* has a great potential application in laccase production in environment protection.

**Keywords:** *Laccases, Rigidoporus microporus, Basidiomycete, Guaiacol*