

**Evaluation of the Antagonistic Effect of the Diethyl Ether Extracts of Local Plant Species on *Rigidoporus microporus*: the Causal Organism of White Root Disease of Rubber****Silva M.K.R.\* , Fernando T.H.P.S., Umesha B.V.A.***Rubber Research Institute of Sri Lanka**\*keshanisilva@yahoo.com***Abstract**

With the objective of finding out the effectiveness of the diethyl ether extracts of local plant species on *Rigidoporus microporus* (Fr.) Overeem, the causal organism of white root disease of rubber, four different plant species were tested. The freshly uprooted rhizomes/ under-ground parts were ground into fine powder after surface sterilization and oven drying for 48 hours at 45° C. Afterwards the solvent extracts were obtained by shaking the powder in the solvent, centrifugation and rotary evaporation. In each of the extract, the particle concentration of the dried powder was kept constant. The presence of the white root-inhibiting compounds in the final extract was tested by Poison Food Technique (PFT), Soil Fungicide Screening Test (SFST) and colony growth in liquid medium. In each experiment, three concentrations of the botanicals i.e. 5%, 10% and 25% (V/V%) were tested in five replicates. Sterilised distilled water and diethyl ether were substituted for the extract in the control experiments. In each treatment, the percent inhibition of growth with respect to the control was calculated using a standard equation. Analysis of variance was carried out for the percentage inhibition-over the control and the means were compared. According to both PFT and SFST results, increasing the concentration from 5% to 25%, increased the inhibition percentage with all four species. For the concentration levels of 5% and 10%, the inhibitory effect of the four species was significantly different from each other. At those two concentrations, wild ginger (*Curcuma xanthorrhiza*) had the highest inhibition rate at both tests and its inhibitory effect was significantly higher than those of the other three species. However, at the 25% concentration level, wild ginger and galangale (*Alpinia galanga*) showed insignificant difference in the inhibitory action. Garlic (*Allium cepa*) followed by ginger (*Zingiber officinale*) showed the lowest inhibition rate compared to other species in all concentrations. The results of the liquid medium experiment did not show linearity with the results of the other two tests because, in this test method, a formation of rhizomorphs on the mycelial disc and a subsequent increase in the mycelial dry weight had been resulted as a defense reaction for the stress condition. The results of the study confirm the presence of effective compound/(s) especially in Galangale, Wild ginger and Ginger and suggest the potential of using diethyl ether extracts of these plant species for the further studies towards the identification of effective botanical compound/(s) against white root disease of rubber.

**Keywords:** White root disease, Antagonistic plants, Growth inhibition