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**Endophytic Bacteria and Fungi as the Bio Controlling Agents against the Pathogens of Common Diseases in Sri Lankan Rubber Plantations**

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**Abstract**

Natural rubber (*Hevea brasiliensis*) plantation industry plays a major role in the economy of Sri Lanka. However, latex production of rubber plantations can be reduced due to many biotic and abiotic reasons such as seasonal changes, nutrient deficiencies and diseases. Among them, diseases play a significant role. *H. brasiliensis* can be affected by a wide range of leaf, stem and root diseases which are mainly caused by fungal pathogens. Among them, Corynespora Leaf Fall Disease caused by *Corynespora cassiicola*, Phytophthora Leaf Fall disease caused by *Phytophthora* spp., Colletotrichum Leaf Disease caused by *Colletotrichum* spp., White Root Disease caused by *Rigidoporus microporus*, Brown Root Disease caused by *Phellinus noxius* cause significant reduction of rubber yields reducing the income of the growers. Management of these economically important diseases is mainly done using the resistant rubber clones. Chemical controlling is also considered as the most popular method for disease control. Other than using the recommended level of chemical fungicides, usage of bio controlling agents are important for the integrated pest management strategies to make the process eco-friendly. This attempt was taken to select the effective antagonists to control the pathogens of major rubber diseases. Pathogens were selected from the culture collection of Plant Pathology and Microbiology Department, Rubber Research Institute of Sri Lanka. One bacteria and two fungi labeled as AKB1, AKF1 and AKF2 respectively were isolated from healthy leaves in severely affected rubber plantations. Pure cultures of each isolate were obtained. Inhibition of the growth of test pathogens against each bio controlling agent was tested on Potato Dextrose Agar using the direct opposition method. Percentage inhibition was calculated. More than 60% inhibition was shown by AKF1 against *Phytophthora* spp, *P. noxius* and *R. microporus*. And also, AKF2 showed 64.21% inhibition against *R. microporus*. Study of bio controlling agents are critical for the formulation of bio pesticides which will lead to reduce the usage of chemical fungicides and thereby reducing the economical and environmental impacts. The highly effective antagonists; AKF1 and AKF2 were selected and multiplied in artificial media and will be tested under field conditions for the effective management of the diseases.

**Keywords:** Endophytic bacteria, Endophytic fungi, Natural rubber, Common pathogens