IN VITRO EVALUATION OF THE ANTAGONISTIC ACTIVITY OF ENDOPHYTIC BACTERIA AGAINST MAJOR LEAF PATHOGENS OF *HEVEA BRASILIENSIS*

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Phytophthora meadii and *Corynespora cassiicola* cause severe leaf infection leading to leaf fall in *Hevea brasiliensis*. At present, growers resort to spraying of chemical fungicides to control these pathogens in rubber plantations. Biocontrol measures are not yet practiced for the management of these diseases in rubber plantations as they were not proved effective. In this study, isolation and selection of endophytic bacteria ware made from rubber that exhibit significant antifungal activity against these two fungal pathogens. A total of 154 bacterial isolates were collected from leaves, petioles, barks and tender stems of three *Hevea* clones, *viz*. RRII 105, GT 1 and RRIM 600. These isolates were screened for *in vitro* antagonistic activity against the two pathogens. Isolates showing more than 3 cm inhibition zone on the growth of pathogens in dual culturing were selected. These antagonists produced antipathogenic volatile compounds and siderophores. *In vitro* salicylic acid production by the antagonistic bacteria was also estimated. Seven isolates showing more antagonism and production of antifungal metabolites were selected for further studies. Bioassay using the detached leaves of endophyte treated plants showed reduction in lesion size upon inoculation with the pathogens. The inoculated plants also showed increase in PR proteins - chitinase, peroxidase and phenylalanine ammonia lyase activity that give systemic resistance to plants. Antagonistic isolates were identified as *Bacillus* spp. by 16S rDNA sequencing.

Keywords: Antagonist, *Corynespora cassiicola*, Endophyte, *Phytophthora meadii*

One of the major constrains in rubber (*Hevea brasiliensis*) cultivation is the occurrence of diseases, causing considerable loss of trees and yield. Almost all parts of rubber trees are attacked by various fungal pathogens. One of the major diseases of rubber in India is abnormal leaf fall (ALF) caused by *Phytophthora* spp. (Jacob *et al*., 1989). *Phytophthora* also causes shoot rot, pod rot, bark rot and patch canker diseases of rubber. *P. meadii* is the most common species in the traditional rubber cultivated areas in India (Mc Rae, 1918). The ALF disease occurs annually during southwest monsoon months of June to August and results in considerable yield loss (Jacob *et al*., 2006)

Corynespora leaf fall (CLF) is also another major disease of *H. brasiliensis*

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