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INTERACTION OF CERTAIN ANTAGONISTS OF RUBBER PATHOGENS WITH FUNGICIDES USED IN RUBBER CULTIVATION

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The antagonistic activity of 77 bacterial isolates collected from the rhizosphere and non rhizosphere soil and tissues of different clones of rubber was tested against the five major pathogens of rubber, *viz. Phytophthora meadii, Corynespora cassiicola, Colletotrichum acutatum, Corticium salmonicolor* and *Phellinus noxius* by dual inoculation and selected five isolates showing larger zone of inhibition of each of the pathogens. *Pseudomonas* spp. and *Bacillus* spp. were the main antagonistic bacterial groups which included the endophytes and rhizosphere colonizers. They produced various antipathogenic and plant growth promoting metabolites. The compatibility of the antagonists with four systemic fungicides *viz.* tridemorph (Calixin), hexaconazole (Contaf), propiconazole (Tilt) and carbendazim (Bavistin) and two contact fungicides *viz.* mancozeb (Indofil M-45) and wettable sulphur (Sulfex) commonly used in rubber plantations was studied at different concentrations under *in vitro* conditions. Carbendazim was the only systemic fungicide tested which was safe to all the isolates studied. The contact fungicide mancozeb was inhibiting the growth of all the antagonists even at the lowest level studied while wettable sulphur was not harmful to most of the isolates even at double the recommended level. *Pseudomonas* spp. in this study were more tolerant than *Bacillus* spp., to the fungicides used in rubber cultivation.

Keywords: Antagonists, Fungicides, *Hevea* pathogens, Interaction

INTRODUCTION

Pesticide application is an inevitable operation in agricultural practices for crop protection and for maintaining high crop productivity. The excessive dependence on chemical pesticides have many limitations such as the development of resistance in pathogens and outbreak of secondary pathogens/biotypes, high cost, environmental pollution and health hazard problems (Bagyaraj, 2011). The lethal effects of pesticides are not usually confined to target pathogen alone but in the course the beneficial non target organisms also get affected. Systemic fungicides are readily translocated by plants and affect the pathogens as well as the microbial population in the rhizosphere (Dar, 2010) and the plant endophytes and their activities. Considering these limitations, there has been a growing awareness to develop such management practices, which alone or in combination with other practices could bring about a reasonably good reduction of disease incidence. Biological

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