

Ph.D Thesis entitled
**Studies on Biological Control of Fruit Rot of Arecanut
(*Areca catechu* L.) Caused by *Phytophthora meadii* McRae**

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Abstract

Fruit rot of arecanut caused by *Phytophthora meadii* is a major constraint in arecanut production. It causes substantial loss in yield. Use of biocontrol agents is an ecofriendly and nonhazardous possibility for fruit rot management. In the present study, mycoparasites and bacterial antagonists were isolated from aerial plant parts like areca green leaves, nut and inflorescence. Precolonised plate method was adopted for the isolation of mycoparasites, whereas serial dilution method was used for the isolation of bacterial antagonists. Prescreening of mycoparasites and bacterial isolates was done by using dual culture method, precolonised plate method and bioassay experiment. Further the antagonistic microorganisms were screened for the antagonistic property like antibiosis, aggressiveness towards different *P. meadii* isolates and mycoparasitism. Mycoparasitism of the fungal antagonists were studied by water agar technique. Thus four mycoparasites (all are *Trichoderma viride* isolates) and three bacterial isolates (*Bacillus polymyxa*, *B. cereus* and *B. licheniformis*) were selected. *In vivo* screening was done with tender green arecanuts and in this experiment all the four *T. viride* isolates showed less disease incidence when compared with Bordeaux mixture. Different carrier material was evaluated for the mass multiplication of antagonistic microorganism. Coir pith compost and coffee husk was found to be effective for the growth of mycoparasites. Molecular characterization of four *T. viride* isolates was done based on rDNA gene repeats and RFLPs. It was found that no ITS variation was detected by restriction analysis among the isolates studied. The findings are useful for farmers in managing the fruit rot disease of arecanut.

Key words: Arecanut, Fruit Rot, *Phytophthora meadii*, Mycoparasites, *Trichoderma viride*, *Bacillus cereus*, *B. polymyxa*, *B. licheniformis*, PCR technique, Biological Control