Research Article

Biological Control Agents for the Management of Basal Stem Rot Disease in Coconut

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Abstract

Ten isolates of each antagonistic *Pseudomonas* and *Trichoderma* were isolated from coconut roots and rhizospheric soil and their inhibitory potential against *Ganoderma lucidum* was ascertained through dual culture method. Among the isolates, P10 of *Pseudomonas* and T5 of *Trichoderma* exhibited the maximum inhibition to mycelial growth of fungus. The isolates exhibiting maximum inhibition were compatible with each other. The isolates P10 of *Pseudomonas* sp and T5 of *Trichoderma* were identified as *Pseudomonas fluorescens* and *Trichoderma reesei*. Further, these two isolates were evaluated under field conditions for their efficacy against basal stem rot disease of coconut. It was observed that soil application of 125 g of each *Trichoderma reesei* and *Pseudomonas* sp along with neem cake 5 kg per palm per year reduced the disease incidence and increased the nut yield of coconut.

Key words: Coconut, neem cake, *Pseudomonas fluorescens,* and *Trichoderma reesei*

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Coconut is primarily a small holder's crop cultivated throughout the humid tropics. It provides nutritious drink, many edible nutritious products, oil for edible and non edible uses, and fibre of commercial value, shell for fuel and a variety of miscellaneous products. The crop is aptly associated with Indian culture and heritage and hence, looking its multifarious usages, it is described as Kalpatharu. Indian subcontinent is in third place with respect to acreage and first in production and productivity accounting for 22.34 per cent of the world's coconut production and is one of the major players in the world's coconut trade. More than 90 per cent of coconut grown in India is seen in four Sothern states *viz*., Karnataka, Kerala, Tamil Nadu and Andhra Pradesh (CDB, 2017).

The palm though is hardy in nature; it is being debilitated by an array of plant pathogens. Of the pathogens inciting variety of diseases in coconut, Basal stem rot disease caused by a fungus *Ganoderma lucidum* (Leys) Karst is a major limiting factor in coconut production in India. This disease is also known as “Thanjavur wilt” in Tamil Nadu, "Ganoderma Wilt" in Andhra Pradesh and "Anabe Roga" in Karnataka. It is the most serious disease limiting coconut production in Tamil Nadu, Andhra Pradesh and Karnataka. It is also reported from Kerala, Maharashtra, Gujarat and Orissa. This disease was first reported on palms in India by Butler (1906). Venkatarayan (1936) studied the disease which affected both coconut and arecanut in Karnataka. The fungus has a wide host range infecting both monocots and dicots (Bhaskaran and Ramanathan, 1984).

Despite decades of research towards its management, basal stem rot (BSR) disease has remained and continued to be as a challenge for plant pathologists. Many methods comprising host resistance, chemical and biological approaches have been practiced from time immemorial. However, among several methods deployed for the control of the disease, chemical control has been widely practiced in many countries. Since, introduction of Calixin, a vast number of fungicides have appeared in the market and their potential has