

Management Of Die- Back Of Bottle Brush (*Callistemon Citrinus*) – An Integrated Approach

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ABSTRACT

Bottle brush, an exotic ornamental plant of the family Myrtaceae and an adorable for its beautiful floral design was observed to suffer from die back caused by *Botryodiplodia theobromae* Pat. Several antagonists, biocides and fungicides were tested against the pathogen to screen the most effective ones and to have an integrated combination for better understanding of the management of the disease. Antagonists like *Trichoderma viride*, *T. harzianum*, *T. reesei* and *T. lignorum* were challenged against the pathogen. *T. harzianum* was proved to be the most efficient one to control the pathogen with 75.33% inhibition followed by *T. viride* and *T. lignorum* with 71.11% and 53.11% inhibition potential. Several plant extracts were treated against the pathogen and found that Garlic preparation exhibited best result, which was followed by Neem. Among the fungicides used, Bavistin and Tridemorph, were able to check the pathogen under *in vitro* condition with 92.64% & 75.32% efficiency respectively. A combined trial with effective agents like *T. harzianum*, *T. viride*, Bavistin, Tridemorph, Garlic and Neem extracts were made which exhibited that a combination of *T. harzianum*, Garlic extract and Bavistin (0.001%) was found to be the most potent integrated combination providing the cent percent growth inhibition of the pathogen, *B.theobromae*.

Key words: *Botryodiplodia theobromae*, Die back, antagonists, *Trichoderma* sp, biocides.

INTRODUCTION

Bottle brush (*Callistemon citrinus* Staph), an exotic ornamental plant belonging to the family Myrtaceae is adorable for its beautiful floral pattern and showy, bright red coloured inflorescence which very much look like a 'bottle brush' or 'test tube brush'. But its beauty goes in vain because of the attack by the pathogen, *Botryodiplodia theobromae* Pat, causing die-back. Though the disease happens to be sporadic in Burdwan district, West Bengal, but is a serious and dreadful one giving a sight of forest-fire. The disease is characterized by its symptom expressions as dyeing back of tip downwards, drying of leaves all over the plant, corky and fibrousness of barks. The die-back stem takes grey colour and is sharply demarcated from the healthy green bark by black lines traversing along the greyish area that ultimately leads to the death of the plant.

The possibility of applying the antagonistic fungi against the pathogen was first recognized by Weindling (1935). Successful application of biocontrol agents has been reported in agriculture, horticulture and forestry (Campbell, 1989). Fungi have got maximum importance to serve as potential biocontrol agents of which several species of *Trichoderma*, are well known (Chet et al., 1981). Various workers have

studied fungicidal and fungistatic nature of several plant extracts (Gohil and Vala, 1996).

In the present communication, attempts have been made to control the pathogen under *in vitro* condition by applying several antagonists, biocides and fungicides. Trials have also been made to search the suitable, compatible combinations of antagonists, biocides and fungicides in an integrated way for inhibition of the growth of the pathogen.

MATERIALS AND METHODS

Botryodiplodia theobromae was isolated from various diseased parts of Bottle brush plants and pathogenecity was tested following Koch's postulates. It was then maintained in pureline on potato dextrose agar (PDA) medium at 4°C till used. The identification of the pathogen was confirmed by Indian Agricultural Research Institution, New Delhi (ITCC No. 4200.2K). The antagonists used were isolated from rhizosphere soil of Bottle brush except *T. harzianum* which was procured from the Indian Type Culture Collection Centre, IARI, New Delhi.

To study the effects of different antagonists (*Trichoderma harzianum*, *T. viride*, *T. lignorum* and *T. reesei*)

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