

### Short Communication

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## Laboratory Evaluation of Six Systemic Fungicides for the Control of Root-rot in *Duboisia Leichhardtii* F. Muell

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The two species of Australian genus *Duboisia*. *Duboisia leichhardtii* F. Muell and *D. myoporoides* R. Br. were introduced and cultivated successfully at PCSIR Laboratories, Karachi [1,2]. These shrubs have considerable prospects for replacing, or at least providing supplement to *Datura*, *Atropa* and *Hyoscyamus* as source of hyoscyine, scopolamine, hyoscyamine and atropine which are used extensively in pharmaceutical industry because of their mydriatic, anti-cholinergic and antispasmodic properties, Sulphate of *Duboisia* is also used as a substitute for atropine [3].

*Duboisia leichhardtii* is represented by typically peach-like tree which attains a height of 5m. The branches are thin and delicate (Fig. 1). It is a very temperamental plant and requires great attention and care for successful planting. *D. leichhardtii* is susceptible to water logging, even for a short period [4,5].

As a result of water logging, the plants started wilting in our experimental farm in the initial stage and subsequently drooping. Such plants finally died as a result of fungal root-rot.

Due to the loss of these newly introduced precious plants it was considered worthwhile to examine the infected material, the causal agent and its pathogenicity. The present studies deal with the laboratory evaluation of comparative efficacy of six different systemic fungicides used against the infective fungus *Fusarium solanii* (Mart.) Sacc.

The wilted and infected material of *D. leichhardtii* was collected in September from the experimental field of PCSIR Laboratories Complex (Fig. 2). The roots and shoots were preserved in the sterilized plastic bags. Lesions and discoloured portions were examined under dissecting microscope. Riesen and Siebers method was followed for isolation of endophytic fungi for cultural studies [6]. Three parts of each stem (two nodes and one internode) and roots were examined. The surface sterilization of root and shoot was done by immersing them in 95% ethyl alcohol for one minute after which it was immediately dipped in 50% solution of sodium hypochlorite followed by another washing in 95% ethyl alcohol for 30 secs. After surface sterilization small pieces of roots and shoots were cut with a sharp sterilized scalpel and embedded in Czepek's Dox Agar contained in petridishes in



Fig. 1. Showing a healthy plant of *Duboisia leichhardtii* F. Muell.



Fig. 2. Showing a wilted and dried plant in the experimental field.

quadruplicates. The dishes were incubated at temperature  $28^{\circ} \pm 1$  for a week.

After a week the pure cultures of fungi were obtained. As a result of microscopic studies only one fungus was found and

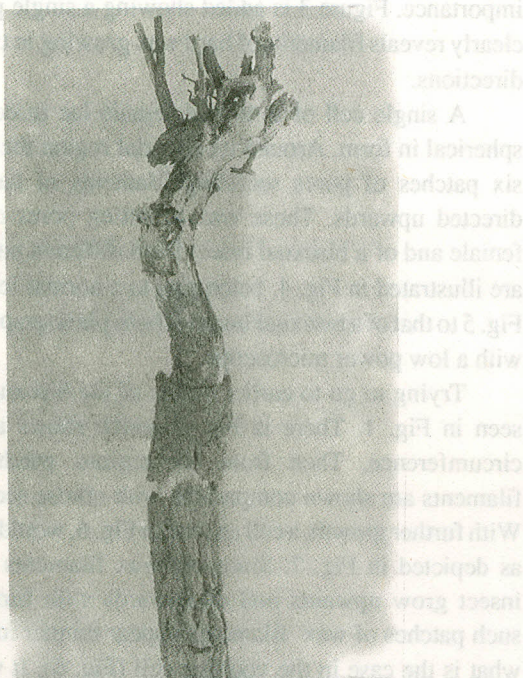


Fig. 3. Showing root and the adjoining parts of stem destroyed by root-rot.

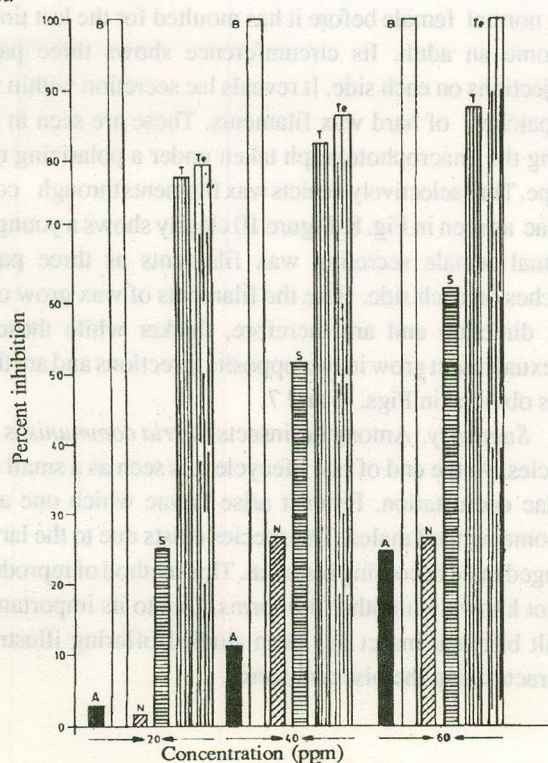


Fig. 4. Histogram showing the comparative efficacy of Afugan, Benlate, Nimrode, Saprol, Tecto and Topsin on *Fusarium solanii* (Mort.) sacc.

identified as *Fusarium solanii*, which was responsible for the root-rot. Pathogenecity tests were conducted according to Correll *et al.* method [10] to ascertain *Fusarium solanii* strain as a casual agent for the said root-rot (Fig.3).

Fungicides namely Afugan, Benlate, Nimrode, Saprol, Tecto and Topsin were used in our experiments. Young and Falck's procedure was followed for testing the fungicidal activity [8, 9].

The concentrations of commercial fungicides used were 20, 40 and 60 ppm. and were calculated by Abott formula [10]. Four petri-dishes of each concentration alongwith control were used. The dishes were inoculated with 4 mm discs of four days old culture of *Fusarium solanii* and kept for incubation for a week at temperature  $28^{\circ} \pm 1$ . Measurements of diameter of fungal growth in different concentrations of fungicides and control were taken after the incubation period. Percentages of inhibition calculated and histogram prepared (Fig. 4).

Looking at the histogram, it is evident that out of the six fungicides namely Afugan, Benlate, Nimrode, Saprol, Tecto and Tecto used on laboratory scale for the control of *F. solanii* Benlate (20 ppm) is the most effective. Since its efficacy is 100% even at the lowest concentration of 20 ppm, its use seems to be equally economical. Benlate is therefore, recommended for the control of root-rot caused by this strain of *Fusarium solanii* in *Duboisia leichhardtii*, an important newly introduced plant in Pakistan.

**Key words:** Fungicide, Root-rot, *Duboisia leichhardtii* and *Fusarium solanii*.

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