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EFFECTIVE MANAGEMENT OF *COLLETOTRICHUM DEMATIUM* CAUSING LEAF BLIGHT OF SAFED MUSLI

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ABSTRACT

Leaf blight caused by *Colletotrichum dematium* is one of the serious diseases which causes quantitative as well as qualitative losses. Effect of various diseases management tools were tested as a part of suitable option for managements of leaf blight of safed musli. Eight fungicides viz., propiconazole (0.1%), mancozeb (0.25%), penconazole (0.1%), carbendazim (0.1%), copper hydroxide (0.2%), curzate M8 (0.2%), chlorothalonil (0.2%), thiophanate M (0.2%) and seven botanicals viz., Bael *(Aegle marmelos),* Ghaneri *(Lantena camera),* Karanj *(Pongamia pinnata),* Kanher *(Nerium oleander),* Mehandi *(Lawsonia innermis),* Nilgiri *(Eucalyptus* spp.) and Neem *(Azadirachta Mica)* tested at 5 and 10 percent concentration, respectively. Among fungicides propiconazole and penconazole showing 100 percent inhibition as against control. Among botanicals at 5 and 10 percent concentration the extracts of *Eucalyptus* spp. showed maximum growth inhibition (78.90%, 84.07%) followed by *Aegle marmelos* (77.04%, 82.47%), respectively. The *Lawsonia innermis* was found least effective against test pathogen at both level of concentrations.

Key words: Leaf blight, Fungicides, Botanicals.

INTRODUCTION

Safed musli *(Chlorophytum borivilianum,* Santapau and Fernades) is an important traditional medicinal plant. It can be successfully cultivated as a highly remunerable crop in the states of Uttar Pradesh, Madhya Pradesh, Tamilnadu, Kerala, Karnataka, Rajasthan, Gujrat, Maharashtra and foot hills of Uttarakhand and Himachal Pradesh. In Maharashtra, Akola district contribute about 160 ha. area under safed musli especially in Akot and Telhara Tehsils and majority of the farmers have raised Safed musli (*Chlorophytum borivilianum*) average yield of dry tubers was 343 Kg/acre[1]. Due to increased area there may arise pathological problems and the crop may be succumb to diseases which are detrimental for production as well as qualitative reduction in phytochemical ingradidients. Safed musli

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suffers from many diseases like leaf spot, leaf blight, root rot but among these leaf blight disease intensity of about 18.67 percent[2]. Therefore, the attempts are required to find out with some remedial measures to minimize the disease by adopting effective management strategies.

EXPERIMENTAL

Materials and methods

Poisoned food technique was used to test the fungicides and botanicals against test pathogen *Colletotrichum dematium*[3]. The principle involved in this technique was to make the nutrient medium toxic with a toxicant and allow the test fungi to grow on medium and study the mycelial inhibition in laboratory.

100 mL of liquified potato dextrose agar medium was taken in 250 mL flask, plugged with cotton and sterilized. Requisite quantities of fungicides were added as per desired concentration. Melted toxic PDA, 20 mL/plate was poured in sterilized petriplates and allowed to solidify. These petriplates were then inoculated by test organisms, separately. Six mm discs of 10 days old *Colletotrichum dematium* was cut with sterilized cork borer and transferred, aseptically in the centre of petriplates containing the poisoned medium.

The surface of inoculum disc was kept in inverted position with agar surface in plates. All these operation were carried out under aseptic condition in Laminar air flow cabinet. Three plates were inoculated for each fungicide. Plates were incubated at room temperature at 27 ± 2^{o}C and observations on radial mycelial growth were recorded on 9th day after inoculation.

Plant (Leaf) extracts

Leaf extracts of Bael *(Aegle marmelos),* Ghaneri *(Lantena camera),* Karanj *(Pongamia pinnata),* Kanher *(Nerium oleander),* Mehandi *(Lawsonia innermis),* Nilgiri *(Eucalyptus* spp.) and Neem *(Azadirachta Mica)* were evaluated against *Colletotrichum dematium.* The leaves were washed with sterilized distilled water and air dried, leaf extract was prepared by macerating tissues in distilled water (1 : 1 W/V) using a electric blender to homogenize the mixture and was filtered through double layered muslin cloth and later passed through Whatman filter paper No. 1, under aseptic conditions. The resultant extracts were considered as 100 percent stock solution. Above seven plant extracts were evaluated at 5 and 10% against C. *dematium.* The pathogen inoculated medium without fungicides and plant extracts served as a control.

The colony diameter of the fungal pathogen on medium was recorded and percent inhibition was calculated by using the following formula[4].

$$\text{Percent Growth inhibition} = \frac{C - T}{C} \times 100$$

Where,

C = Mycelial growth (mm) in control plate

T = Mycelial growth (mm) in treatment plate

RESULTS AND DISCUSSION

Complete growth inhibition of the pathogen (100 %) was observed in propiconazole 0.1 percent and penconazole 0.1 percent[2,5]. Mancozeb 0.25 percent was the next best fungicide which showed 89.40 percent growth inhibition, followed by carbendazim 0.1 percent, copper hydroxide 0.2 percent, thiophanate M 0.2 percent and chlorothalonil 0.2 percent. Curzate M 8 0.2 percent (60.5%) was found to be least effective against *Colletotrichum dematiu* (Table 1).

Table 1: Efficacy of fungicides against *Colletotrichum dematium (in vitro)*

Treatment No.	Fungicides	Conc. (%)	Mean colony diameter (mm)	Percent growth inhibition
T1	Propiconazole	0.1	00.00	100.0
T2	Mancozeb	0.25	09.53	89.4
T3	Penconazole	0.1	00.00	100.0
T4	Carbendazim	0.1	17.33	80.7
T5	Copper hydroxide	0.2	16.33	81.8
T6	Curzate M8	0.2	35.53	60.5
T7	Chlorothalonil	0.2	25,76	71.4
T8	Thiophanate M	0.2	21,50	76.1
T9	Control		90.00	
	F test		Sig.	
	SE (m) ±		0.55	
	CD (P = 0.01)		2.91	

Table 2: Efficacy of botanicals at 5% and 10% concentration against *Colletotrichum dematium (in vitro)*

Treatment No.	Treatments	Concentration (5%)		Concentration (10%)	
		Mean colony diameter (mm)	Percent growth Inhibition	Mean colony diameter (mm)	Percent growth Inhibition
T1	Aegle marmelos	20.66	77.04	15.77	82.47
T2	Lantena camera	29.10	67.66	20.88	76.80
T3	Pongamia pinnata	25.33	71.85	19.55	78.27
T4	Nerium oleander	26.66	70.37	20.55	77.16
T5	Lawsonia innermis	37.77	58.03	32.77	63.58
T6	Eucalyptus spp.	18.99	78.90	14.33	84.07
T7	Azadirachta indica	22.44	75.06	19.11	78.76
T8	Control	90.00		90.00	
	Ftest	Sig.		Sig.	
	SE (m) ±	0.59		0.43	
	CD (P = 0.01)	2.35		1,72	

Among botanicals, *Eucalyptus* spp. showed maximum growth inhibition (78.90%, 84.07%) followed by *Aegle marmelos* (71.04%, 82.47%), *Azadirachta indica* (75.06%, 78.76%), *Pongamia pinnata* (71.85%, 78.27%), *Nerium oleander* (70.37%, 77.16%) and *Lantena camera* (67.66%, 76.80%) at 5 and 10 percent concentrations, respectively. The *Lawsonia innermis* was found least effective against test pathogen at both level of concentration. Shivpuri et al.[6] found that *Azadirachta indica* showed fungi toxic properties against C. *dematium*, high dose of few plant extracts was relatively more efficient. Plant extracts could restrict the vegetative growth, sporulation and conidial germination of *Colletothchum* spp.[7] The growth inhibition of pathogen by the botanicals may be because of toxins available in the plant extract.

Thus, all the botanicals evaluated (at 5 and 10%) were found inhibitory against C. *dematium* and significantly inhibited the growth of the test pathogen over untreated control.

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