

***In-vitro* efficacy of fungicides against the growth of leaf spot pathogen [*Cordana musae* (Zimm.) Hohn.] of Banana**

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ABSTRACT

In-vitro efficacy of two fungicides captasul (captan-50) and ridomil gold were evaluated at different concentrations i.e. 50, 100, 150, 200, 250 and 300 ppm against *Cordana musae* (Zimm.) Hohn. Causing sigatoka disease in banana. Fungicide captasul was highly toxic to pathogen. Fungicides at 300 ppm concentration were highly reduced the growth of pathogenic fungus tested.

Key words: Fungicides, leaf spot pathogen, banana

INTRODUCTION

Banana is the most important fruit crop commonly grown worldwide countries for its utilization as staple food. Banana is the second most important fruit crop in India next to mango. Banana occupies 20% of area among the total area in India. Maharashtra ranks second in area and fruit production. It is the most important crop in international trade for earning the foreign exchange. The common cultivars grown in Maharashtra are Safed Velchi, Basrai, Ardhapuri (Nanded), Grandanine and Shreemati. In Nanded, Ardhapuri is most favoured. Banana production however is reduced due to various diseases infesting all stages of growth from seedling to full plant growth. The crop is suffered due to fungi, bacteria and viruses. These become measure limiting factors in successful quality production of banana. Almost all the commercial cultivars of banana are highly susceptible to certain deadly diseases. The leaf spot or sigatoka pathogen [*Cordana musae* (Zimm.) Hohn.] has left limited options to growers to grow quality exportable fruits. An interested approach appears to be feasible in management of banana diseases that includes use of resistant varieties and disease free planting material, judicious use of pesticides, irrigated water, removed of diseased plants and plant parts. Chemical control measures have been tested and found effective (Ogundana and Denis, 1981; Plumbley, 1985; Mogle and Maske, 2012). In the present study *in-vitro* efficacy of two fungicides against *C.musae* was studied.

MATERIALS AND METHODS

Isolation of pathogen: The heavily infected leaf materials were collected in a paper bag from a farmer's field of Pawdewadi village, Dist. Nanded (M.S.), brought to laboratory and pathogenic fungus was isolated from infected leaf tissue (Aneja, 2007) on Czapek, dox agar (CDA) medium. After 7 days of incubation the colonies were identified as *C. musae* and pure cultures were maintained on CDA slants.

***In-vitro* efficacy of fungicides against *C. musae*:**

Two different fungicides such as Captasul (Captan-50) and Ridomil Gold at different concentration *viz.* 50, 100, 150, 200, 250 and 300 ppm were evaluated against the pathogen by poisoned food technique (Nene and Thaplial, 1993). Double strength CDA (Czapek's dox agar) medium was prepared and sterilized. To this medium different fungicide concentration solutions (prepared in sterilized distilled water in aseptic condition) were added and mixed thoroughly by stirring to get 1:1 final concentration. The medium was then poured into sterilized petri-plates. A small disc (5 mm) of the actively growing fungus culture grown on CDA medium for seven days was cut with a sterile cork borer and transferred aseptically in the center of the petri-plate containing CDA medium with fungicide concentrations. Suitable controls were kept, where the culture discs were grown under same condition of CDA medium without fungicide. Percent inhibition was calculated by using formula.

$$\text{Percent inhibition} = \frac{\text{Control} - \text{Treatment}}{\text{Control}} \times 100$$

RESULTS AND DISCUSSION

The data presented in table. 1 & 2 revealed that, the two fungicides reduced the pathogenic fungus growth significantly as compared to control. Fungicide captasul was highly toxic to the pathogen tested as compared to ridomil gold. The pathogenic

fungus growth was reduced with increasing concentration level of fungicide from 50 to 300 ppm. Highest % of inhibition was recorded at high concentration level i.e. 300 ppm. in both the fungicides.

Table 1: *In-vitro* effect of fungicide captasul (captan-50) on the growth of *Cordana musae* (Zimm.) Hohn. leaf spot pathogen of banana.

Sr. No.	Fungicide Conc. (ppm)	3 rd day		5 th day		7 th day	
		Colony diameter (mm)	% of inhibition	Colony diameter (mm)	% of inhibition	Colony diameter (mm)	% of inhibition
01	50	14.80	15.42	22.10	16.60	24.30	20.32
02	100	13.30	24.00	18.00	32.07	19.60	35.73
03	150	12.20	30.28	13.20	50.18	15.00	50.81
04	200	08.50	51.42	10.00	62.26	13.30	56.39
05	250	06.50	62.85	08.00	69.81	10.20	66.55
06	300	06.20	64.57	07.80	70.50	08.10	73.44
07	Control	17.50	00.00	26.50	00.00	30.50	00.00
C.D. ($p=0.05$)		18.5616	-	23.8484	-	27.0665	-

Table 2: *In-vitro* effect of fungicide ridomilgold on the growth of *Cordana musae* (Zimm.) Hohn. leaf spot pathogen of banana

Sr. No.	Fungicide Conc. (ppm)	3 rd day		5 th day		7 th day	
		Colony diameter (mm)	% of inhibition	Colony diameter (mm)	% of inhibition	Colony diameter (mm)	% of inhibition
01	50	16.20	24.65	20.80	17.46	25.20	16.55
02	100	15.80	26.51	17.50	30.55	22.20	26.49
03	150	14.00	34.88	16.20	35.71	20.10	33.44
04	200	12.50	41.86	15.00	40.47	18.40	39.07
05	250	10.20	52.55	13.00	48.41	15.20	49.66
06	300	06.50	69.76	08.50	65.49	10.00	66.88
07	Control	21.50	00.00	25.20	00.00	30.20	00.00
C.D. ($p=0.05$)		20.6894	-	24.5558	-	29.9666	-

The similar results were reported by Malhan *et al.*, (1975), they were tested effect of benomyl against eleven pathogenic fungi, of which it was more toxic to *Rhizoctonia solani*, *R. bataticola*, *Colletotrichum falcatum*, *Cladosporium cladosporoides*, *C. oxysporum*, *Elsinoe ampelina*, *Pestalotia theae*,

Phoma destructiva and *Aspergillus flavus*. Saraswathi and Mahendra (1986) reported that, captan 83 WDP was effective in reducing the growth of *Sclerotium rolfsii* collar rot pathogen of pigeonpea in laboratory conditions.

David *et al.*, (2012) reported that carbendazim, fluazinam, tebuconazole, and prothioconazole were effective at inhibiting mycelial growth of different Diatrypaceae spp. associated with grapevine trunk disease.

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