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In-vitro efficacy of various fungicides against the pathogen of margin leaf blight disease of mango

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Abstract
The laboratory experiment has been conducted for two years to check the *In-vitro* efficacy of various fungicides against the pathogen of margin leaf blight disease of mango. the treatments of Metalyxyl 4% + Mancozeb 64% WP @ 0.2%, Tebuconazole 50% + Trifloxystrobin 25% WG @ 0.1%, Mancozeb 75% WP @ 0.2%, Hexaconaxole 5% SC @ 0.05%, Carbendazim 12% + Mancozeb 63%WP @ 0.15%, Propineb 70% WP @ 0.2% and Bordeaux mixture at 1% concentration are significantly superior in inhibiting cent per cent mycelial growth of fungal pathogen *Colletotrichum gloeosporides*.

Keywords: Various fungicides, pathogen of margin, *Colletotrichum gloeosporides*

Introduction
In India, the different fungicides has been extensively used to control the different diseases of different crops. However it is necessary to study there *In vitro* efficacy against the pathogen of different disease in order to know their capacity to control the mycelial growth of pathogen. (Muhammad N *et al.*, 2017) [4]. In view of this the efforts has been made to study *in vitro* efficacy of various locally available fungicides against the isolated pathogen of margin leaf blight disease of mango. The present study will help the farmers to select the better chemical fungicide so as to most fungicide for the control the margin leaf blight disease of mango.

Materials and Methods
An experiment was conducted for the two years 2020-21 and 2021-22 at four lab, Regional Fruit Research Station Vengurle Dist. Sindhudurg. The naturally infected samples of margin leaf blight disease of mango under nursery condition were collected from various nurseries as well as from mango orchards in Sindhudurg district. The fungal pathogen was isolated on Potato Dextrose Agar (PDA) by tissue isolation technique. The pure culture was maintained and its pathogenecity was proved. The causal organism was get identified as *Colletotrichum gloeosporioides* from ITCC, New Delhi.
The *in-vitro* management study of *C. gloesporides* strain was re-conducted at RFRS, Vengurla during this season. Following fungicides were evaluated by Poisoned Food Technique, using PDA as basal culture medium. The experiment was planned in CRD and all the treatments be replicated thrice. The fungal discs (7 mm diameter) was cut with the help of sterilized corn borer from week old pure culture of the test pathogen and transferred aseptically in center of each petri plate containing poisoned PDA medium. The suitable control of PDA medium without fungicide and inoculated with fungal disc be maintained as untreated control.
The plates were then incubated at room temperature (28± 1 °C) and observations on colony diameter was recorded until the in control plate gets fully covered with mycelial growth. Per cent inhibition of growth for the test fungi was calculated by the following formula.

$$X = \frac{Y - Z}{Y} X\ 100$$

Where,
X = Percent inhibition
Y = Growth of fungus in control (mm)
Z = Growth of fungus in treatment (mm).

Results and Discussion

The causal organism was isolated and proved its pathogenicity and identified as *Colletotrichum gloeosporides* from ITCC, New Delhi. The pathogen took 26 days to prove its pathogenecity. The results are also in accordance with Min Xu *et al.* (2017) [3]

Further, the *In-vitro* efficacy of various fungicides was tested for two year by Poison Food Technique and pooled results are presented in Table 1. It was revealed from the data that the treatments of Metalyxyl 4% + Mancozeb 64% WP @ 0.2%, Tebuconazole 50% + Trifloxystrobin 25% WG @ 0.1%, Mancozeb 75% WP @ 0.2%, Hexaconaxole 5% SC @ 0.05%, Carbendazim 12% + Mancozeb 63%WP @ 0.15%, Propineb 70% WP @ 0.2% and Bordeaux mixture at 1% concentration were found significantly superior over rest of the fungicidal treatment with 100 per cent inhibition of mycelial growth.

These were followed by the treatments of Thiophanate Methyl 70% WP @ 0.1% Carbendazim 50% WP @ 0.1%, Copper oxychloride 50% WP @ 0.2% and Carbendazim 46.27% @ 0.1% with 85.08, 81.33, 80.09 and 78.14 per cent inhibition over control. The treatment of Azoxystrobin 23% SC at 0.1%, Sulphur 80% WDG @ 0.2% and Sulphur 55.16% SC @ 0.1% were found least effective in controlling mycelial growth of the pathogen. The results of present investigation are in close conformity with the results obtained by Mahesh M *et al.*, (2020) who reported that the combination of fungicides (Mancozeb 50 WP and Fenamidon 10) has completly inhibited mycelial growth.The results are also in accordance with Vinod *et al.*, (2009) [5] and Aselkar U.A. *et al.*, 2019 [1] reported the combination of fungicides (Mancozeb and Carbendezim) has completely inhibited mycelia growth

Table 1: Efficacy of different fungicides against margin blight fungal pathogen (Pooled)

Tr. No.	Fungicides	Conc. (%)	Mycelial growth		Pooled Mean (mm)	% inhibition over Control
			2020-21 (mm)	2021-22 (mm)		
T_1	Sulphur 80% WDG	0.2	84.33	82.33	83.33	07.41
T_2	Copper Oxychloride 50%WP	0.2	15.00	20.83	17.92	80.09
T_3	Metalaxyl 4% + Mancozeb 64% WP	0.2	00.00	00.00	00.00	00.00
T_4	Azoxytrobin 23% SC	0.1	43.83	41.67	42.75	52.50
T_5	Tebuconazole 50% + Trifloxystrobin 25%	0.1	00.00	00.00	00.00	00.00
T_6	Carbendazim 50%WP	0.1	16.83	16.83	16.83	81.33
T_7	Mancozeb 75% WP	0.2	00.00	00.00	00.00	00.00
T_8	Carbendazim 46.27%	0.1	21.83	17.50	19.67	78.14
T_9	Hexaconazole 5%SC	0.05	00.00	00.00	00.00	00.00
T_{10}	Carbendazim 12% + Mancozeb 63% WP	0.15	00.00	00.00	00.00	00.00
T_{11}	Thiophanate Methyl 70%WP	0.1	13.00	13.83	13.42	85.08
T_{12}	Chlorothalonil 75% WP	0.1	24.33	26.50	25.42	71.75
T_{13}	Propineb 70% WP	0.2	00.00	00.00	00.00	00.00
T_{14}	Bordeaux Mixture 100%	1.0	00.00	00.00	00.00	00.00
T_{15}	Sulphur 55.16% SC	0.1	84.16	83.67	83.92	6.75
T_{16}	Control	-	90.00	90.00	90.0	
S.E. ±			2.56	1.62	2.28	
C.D.@ 5%			7.28	6.31	6.96	

Conclusion

It is thus concluded that the treatments of Metalyxyl 4% + Mancozeb 64% WP @ 0.2%, Tebuconazole 50% + Trifloxystrobin 25% WG @ 0.1%, Mancozeb 75% WP @ 0.2%, Hexaconaxole 5%SC @ 0.05%, Carbendazim 12% + Mancozeb 63%WP @ 0.15%, Propineb 70% WP @ 0.2% and Bordeaux mixture at 1% concentration are significantly superior in inhibiting cent per cent mycelial growth of *Colletotrichum gloeosporides*

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