



In Vitro Effect of combination of chlorothalonil & other fungicides on *Colletotrichum capsica*

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Abstract

Leaf spot disease is a major problem in turmeric production worldwide. Turmeric is an important spice and hence there is essential to suggest the appropriate fungicide and its concentration to reduce the yield loss caused by them. An experiment was done by using the different combination of fungicides. All the tested combinations of fungicides proved to be efficient & significant to reduce the mycelial growth of *Colletotrichum capsici*. It was found that the combination of Chlorothalonil and the mancozeb showed less PCE while combination of Chlorothalonil and Dithane M-45 showed more PCE.

INTRODUCTION

Turmeric (*Curcuma Long*) known as the "golden spice" is one of the most important herbs in tropical and subtropical countries. Turmeric is herbaceous, perennial herb. It belongs to family zingiberaceae. The rhizome is edible part of the plant which is mainly used in the commercial, cosmetic and medicinal. The rhizome contains protein (6.3%), fats (5.1%), starch (6.1%) and minerals (3.1%) The characteristics smell of turmeric is due to presence of volatile oil (1.3 to 5.5%) The bright yellow colour of turmeric is due to ketonic dye curcumin which turns reddish colour with sodium, potassium and ammonium hydroxide (Ponde et.al, 1993). The most important chemical component called curcuminoids which include curcumin, mentanil yellow, lead chromate etc. (sambamurthy et.al.1989). Hence, considering economic importance of the crop and the disease, the percent investigation was under taken to control or manage the leaf spot of turmeric caused by *colletotrichumcapsici*.

Material and Method-

In Laboratory effect of chlorothalonil fungicide with different combinations of fungicides on *Colletotrichum capsici* was observed by applying the food poisoning technique as used by (Onkar et al. 1993)

Firstly, the infected leaves of Leaf spot of turmeric were collected. Then isolation, purification and identification of the pathogen were done.

For Integrated control, the fungicide chlorothalonil used in combination. The minimum inhibitory concentration (MIC) of each fungicide was prepared & mixed equally; such mixed fungicide 10 ml and 10 ml czapek-dox agar media of double strength was poured in sterilized petriplates aseptically.

A 5 mm disc of pure culture was inoculated in the centre of plate aseptically. Linear growth was measured & recorded in mm daily for 8 days.

The minimum inhibitory concentration was recorded in the form of percent control Efficacy (PCE). It is calculated by using following formula

$$PCE = 100 (1-x/y)$$

Where X = Diameter of colony treated with fungicide

Y = Maximum growth of the fungus on Control.

Results and discussion-

In vitro the effect of Chlorothalonil fungicide with different combinations of fungicides on the *Colletotrichum capsici* was determined by food poisoned technique.

The different Combinations like Chlorothalonil and mancozeb, chlorothalonil & Dithane M-45, chlorothalonil & Dithane Z-78, chlorothalonil & Hexaconazole, chlorothalonil alone etc. were tested.

It was found that the combination of Chlorothalonil & Mancozeb showed less PCE while combination of chlorothalonil and mancozeb M-45 showed more PCE viz.91, 14, 50, 100 & 86 on 1st day and 8th day of incubation period respectively.

Table 1. Effect of combination of Chlorothalonil and other fungicides on the PCE of *Colletotrichum capsici*

Concentration (ug/ml)	Percent control efficacy (PCE)							
	Incubation period (Days)							
	1	2	3	4	5	6	7	8
Chlorothalonil + Mancozeb	91.14	83.00	79.00	68.67	58.00	55.74	53.00	50.00
Chlorothalonil + Dithane M-45	100.00	100.00	100.00	100.00	97.00	92.67	88.14	86.00
Chlorothalonil + Dithane Z-78	100.00	100.00	100.00	98.14	94.00	86.14	80.67	76.67
Chlorothalonil + Hexaconazole	100.00	100.00	100.00	98.00	92.14	88.00	86.74	80.00
Chlorothalonil alone (900)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
S.E. ±	1.772	3.4	4.199	6.088	7.674	7.579	7.831	8.174
C.D at P=0.01	11.527	22.18	27.322	39.607	49.923	49.303	50.944	53.176
C.D at P=0.05	6.966	13.367	16.512	23.936	30.171	29.800	30.787	32.136

Conclusion

The present study evaluated the efficacy of chlorothalonil in combination with other fungicides against *colletotrichum capsici*, the causative agent of Leaf spot of turmeric.

The results demonstrated that the specific Combinations, particularly those involving Systemic fungicides with different modes of action significantly enhanced the inhibitory effects compared to individual treatments.

Chlorothalonil when used in combination with Mancozeb M-45 showed more PCE

These findings suggest that integrated fungicide strategies incorporating chlorothalonil & other fungicides can after effective control of *Colletotrichum capsici*, reduce the risk of resistance development.

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