

## Chemical Control of *Alternaria Brassicae* (Berk. Sacc.) Causing Leaf Spot of Cabbage (*Brassica Oleracea L. Var. Capitata*)

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**Abstract:** *Alternaria brassicae* (Berk. sacc.) was isolated from the leaves of cabbage and were identified on the colony characteristics and morphology of conidia. Four fungicides: Dithane M-45, Topsin-M, Liromanzeb, and Vitigran blue were applied. Vitigran blue significantly inhibited the colony growth of *Alternaria brassicae* followed by Dithane M-45. The number of leaf spots on inoculated leaves were reduced by spraying Vitigran blue followed by Dithane M-45. It is recommended that leaf spots can be controlled by pre-application of both Vitigran blue and Dithane M-45 fungicides.

**Keywords:** Cabbage, Leaf spots, *Alternaria brassicae*, Fungicides

### Introduction

Cabbage (*Brassica oleracea L. Var. Capitata*) is more important among the cole crops for vegetable purpose. It introduced probably in ancient times in Greece and Rome in 2000-2500 B.C. But, the introduction of cabbage in Sub-continent is recent (Katyal and Chadha, 1977), because it is good in Vitamin-A, creates cooling effect in the body, prevents from constipation, helps in digestion and is useful for diabetes (Khosro, 1992). Many diseases in the field as well as in the storages attack cabbage. Among the common diseases viz. leaf spot, fusarium wilt, ring spot, downy mildew and club root but *Alternaria brassicae* is frequently occurring disease that exhibits loss every year (Bedlan, 1991). *Alternaria brassicae* is wide spread and is also known to occur on potato, tomato, brinjal, bean, turnip, oil seeds, and many others (Katyal and Chadha, 1977). The biological control of this disease may also be possible by incorporating diffusates of *Streptomyces rochei*, but chemical control is preferred to eradicate this disease, therefore the different fungicides were applied to control *Alternaria brassicae* causing leaf spots in cabbage.

### Materials and Methods

Cabbage infected leaves showing symptoms of *Alternaria brassicae* blight were collected from cabbage hybrid grown at Horticultural Garden of Sindh Agriculture University Tando Jam. Three samples of 100 leaf pieces and each was surface disinfected in 0.01% HgCl<sub>2</sub> solution for 1-2 minutes and washed with distilled water for 3-4 minutes. Five treated leaf pieces were placed on sterilized PDA plates, which were incubated for 6-7 days at 25°C. Fresh culture was prepared by placing 6 mm agar disk from stock culture of PDA plates and further incubated at 25°C for 7 days. After 7 days conidial suspension was prepared by mixing culture with 20 ml of distilled water. One ml of spore suspension was sprayed over fresh PDA plates and incubated for 7 days at 25°C. Plates were examined under microscope and pure culture was maintained by multiplying it at regular intervals whenever needed. For effect of different fungicides on colony growth of fungus, four fungicides i.e. Dithane M-45, Topsin-M, Liromanzeb, and Vitigran blue were tested to find-out their effect on growth of fungus. The fungicides were incorporated in to PDA medium at the following rates:

- i. 50 mg in 100 ml of medium
- ii. 150 mg in 100 ml of medium
- iii. 250 mg in 100 ml of medium

Various dilutions of fungicides were also incorporated in PDA medium so as to give concentration of 10, 25, 50, and 100 ppm. The concentration of each fungicide was prepared based on percent active ingredient of fungicide as follows:  
 100 ppm was prepared by adding 100 ml distilled water to 10 mg of its formulation.  
 50 ppm was prepared by adding 50 ml distilled water to 100 ppm  
 To see the effect of different fungicides on development of disease, three plants (7days old) per treatment were

sprayed. The effect was observed after 7 days of inoculation. The observation was repeated twice.

### Results and Discussion

*Alternaria brassicae* (Berk. sacc.) was isolated in PDA from infected leaves of cabbage grown at Horticultural Garden, Sindh Agriculture University Tando Jam. The disease was easily recognized on infected leaves. Circular shaped spots were uniformly dark colored with usually target like appearance.

**Table 1: Effect of Different Fungicides on Colony Growth of *Alternaria Brassicae*.**

Fungicides	Dose (mg/100ml PDA medium)	Average Colony Growth (mm)
Dithane M-45	50	8.9 g
	150	7.1 h
	250	5.2 j
Liromanzeb	50	11.9 e
	150	9.8 f
	250	8.9 g
Topsin - M	50	19.0b
	150	17.5 h
	250	15.1 d
Vitigran blue	50	6.1 i
	150	3.2 i
	250	2.1 m
Control	(-)	20.5 a
LSD (P = 0.05)	= 0.3	Growth (mm)
Cv %	= 2.3	

**Table 2: Fungicidal Control of Leaf Spots of Cabbage Caused by *Alternaria Brassicae*.**

Fungicides	Dose (mg/100ml PDA Medium)	Average Number of Spots per leaf
Dithane M - 45	250	5.4 d
Liromanzeb	150	6.2 c
Topsin -M	100	13.2 b
Vitigran Blue	250	3.4 e
Control	(-)	20.3 a
LSD (P = 0.05)	= 0.58	
Cv %	= 3.88	

The pathogen was identified by dark colored mycelial growth with concentrated rings. Conidia were golden brown, obovate, transverse and longitudinally septate, free and in chains with light brown beak. Similar as reported by Moude *et al.*, 1984. All the fungicides significantly inhibited the colony growth of fungus *Alternaria brassicae* but Vitigran blue was effective than others by reducing 90-95% cabbage leaf spots (Table 1 & 2).

### References

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