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## *In-vitro* efficacy of fungicides against *Phomopsis vexans* caused *Phomopsis* blight in Brinjal

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**Abstract**

*Phomopsis* blight caused by *Phomopsis vexans* is one of the major constraints in the production of brinjal. In order to find out the effective fungicides against *Phomopsis vexans* experiment was carried out *in-vitro* evaluation of fungicides. The results of present investigation revealed that the maximum growth inhibition after seven days against *Phomopsis vexans in-vitro* condition was recorded in the treatment of carbendazim 87.46 per cent followed by propiconazole 86.29 per cent. Other fungicide treatments growth inhibition recorded hexaconazole and tebuconazole whereas 72.18 per cent and 64.83 per cent respectively. Copper oxychloride showed growth inhibition 54.20 per cent and minimum growth inhibition was noticed in copper hydroxide 47.40 per cent and this treatment.

**Keywords:** *Phomopsis vexans*, *in vitro*, *phomopsis* blight, brinjal.

**Introduction**

Brinjal or eggplant (*Solanum melongena* L.) is one of the most common, popular vegetable crop grown in almost worldwide. India is considered to be the centre of origin of cultivated brinjal from where it spread to the other parts of the world (Chaudhury and Kalda, 1968) [1]. The global area under brinjal cultivation has been estimated as 18.75 million hectares with total production of brinjal fruit of about 49.66 million MTs with an average productivity of 26.5 t/ha (FAO, 2014) [2]. Eggplant suffers from twelve different diseases among then *Phomopsis* blight and fruit rot caused by *Phomopsis vexans* major constraints in its cultivation in our country. This pathogen causes over 50 per cent losses in production and productivity in various parts of the world (Nolla, 1929; Panwar et al., 1970) [5, 6] It is reported that the losses due to this disease are to the extent of 10-20 per cent. The fungus is seed borne. Pycnidia with or without beak are found in the affected tissue. Pycnidia were submerged and formed all over the surface of the mycelium. The mycelium is hyaline and septate, the conidiophores (phialides) within the pycnidium are hyaline, simple, or septate and arise from the innermost layer of cells lining the pycnidial wall. Two types of conidia (alpha and beta) were observed. Alpha conidia were hyaline, single celled, biguttulate and subcylindrical (4.1-6.5 × 1.2-1.9 μm). Beta conidia were filiform, curved, hyaline and septate (6.2-7.6 × 0.5-0.8 μm) (Mahadevakumar and Janardhana, 2016) [4].

**Material and Methods**

The experiment was carried out *in-vitro* condition during the year 2015 at the College of Agriculture, Nagpur. The tested fungicides were used Carbendazim (0.1%), Propiconazole (0.05%), Hexaconazole (0.1%), Copper oxychloride (0.3%), Copper hydroxide (0.3%) and Tebuconazole (0.05%). Based on active ingredient, the requisite quantity of each fungicide was calculated and mixed thoroughly with autoclaved and cooled (40°C) Potato Dextrose Agar medium (PDA) in conical flask to obtain desired concentrations. Plain PDA medium without fungicides served as untreated control. Fungicide amended PDA medium was then poured aseptically in petriplates (90 mm dia) and allowed to solidify at room temperature. After solidification of the medium, all the plates were inoculated aseptically with 5 mm culture disc of the test fungus obtained from a week old actively growing pure culture of *Phomopsis vexans*. The fungicides were incorporated into the sterilized PDA medium. The sterilized Petriplates containing fungicide amended medium were inoculated with 5 mm culture disc of freshly prepared culture of the test fungus and incubated at 28 ± 1°C for 7 days.

The efficacy of fungicides was expressed as percent of radial growth over control, which was calculated by using the formula given in (Vincent, 1947) [8].

$$\text{Percent inhibition (PI)} = \frac{C - T}{C} \times 100$$

Where,

C = Radial growth in control

T = Radial growth in treatments

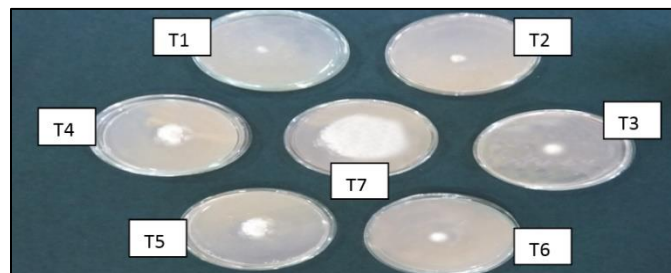
## Results and Discussion

### Effect of fungicides on inhibition growth of spore germination of *Phomopsis vexans* in vitro.

The data indicated that the maximum growth inhibition after seven days against *Phomopsis vexans* in-vitro condition was recorded in the treatment of carbendazim 87.46 per cent followed by propiconazole 86.29 per cent. Other fungicide treatments growth inhibition recorded hexaconazole and tebuconazole whereas 72.18 per cent and 64.83 per cent respectively. Copper oxychloride showed growth inhibition 54.20 per cent and minimum growth inhibition was noticed in copper hydroxide 47.40 per cent and this treatment.

Minimum colony growth diameter in mm was observed after seven days against *Phomopsis vexans* in-vitro condition in the treatment of carbendazim 6.86 mm followed by propiconazole 7.50 mm and both these treatment at par with each other. Other effective fungicide treatments such as hexaconazole and tebuconazole recorded 15.22 mm 19.24 mm colony radial

growth and these two treatments were at par each other. The next treatments viz., copper oxychloride and copper hydroxide recorded 25.06 mm and 28.78 mm colony radial growth and these two treatments were at par with each other. Maximum colony diameter growth was exhibited in control 54.72 mm. Similar results found with Rohini *et al.* (2015) [7] reported that, out of four fungicides, carbendazim 50% WP proved to be effective in inhibiting the mycelial growth of *P. vexans* tested in *in vitro*. It showed 100 per cent inhibition of mycelial growth of *P. vexans* at all the concentrations. Hossain *et al.* (2013) [3] reported that carbendazim (0.1%) proved to be effective in arresting the spore germination and mycelial growth showing largest inhibition (6.29 cm) in culture media of *Phomopsis vexans* assayed in *in vitro*.



T1 Carbendazim @ 0.1% T2 Propiconazole @ 0.05%  
T3 Hexaconazole @ 0.1% T4 Copper oxychloride @ 0.3%  
T5 Copper hydroxide @ 0.3% T6 Tebuconazole @ 0.05%  
T7 Control

### Effect of different fungicide on colony growth of *Phomopsis vexans* by poisoned food technique

**Table 1:** Per cent growth inhibition of *Phomopsis vexans* under different fungicides by poisoned food technique.

Tr. No.	Treatment Details	Conc. %	7 DAI	
			Mean colony diameter growth (mm)	Per cent growth inhibition
T <sub>1</sub>	Carbendazim	0.1	6.86 (15.18)*	87.46
T <sub>2</sub>	Propiconazole	0.05	7.50 (15.89)	86.29
T <sub>3</sub>	Hexaconazole	0.1	15.22 (22.96)	72.18
T <sub>4</sub>	Copper oxychloride	0.3	25.06 (30.04)	54.20
T <sub>5</sub>	Copper hydroxide	0.3	28.78 (32.44)	47.40
T <sub>6</sub>	Tebuconazole	0.05	19.24 (26.02)	64.83
T <sub>7</sub>	Control	-	54.72 (47.71)	-
	F test		Sig.	
	SE (m)±		1.29	
	CD (p=0.01)		3.81	

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