

In vitro* Evaluation of Different Fungicides on the Mycelial Growth and Sclerotia Production of *Sclerotinia sclerotiorum

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SUMMARY

***In vitro* effect of two systemic fungicides viz., carbendazim and metalaxyl at different concentrations (25, 50 and 100mg/ml) and three non-systemic viz. captaf, mancozeb and copper oxychloride at different concentrations (100, 250 and 500 mg/ml) were evaluated against mycelial growth and sclerotia production of *Sclerotinia sclerotiorum* causing stem rot in mustard. Among all the five fungicides carbendazim was observed to completely (100%) inhibit the mycelial growth and sclerotial production of the fungus.**

Key words :

Mycelial growth, Sclerotia, *Sclerotinia sclerotiorum*.

The mustard is an important edible oilseed crop of the country. Although cultural, agronomical and environmental factors are responsible for low productivity but occurrence of pests and diseases is an other important factor. Rot of mustard has become important in recent time in India and elsewhere with high disease incidence and severe yield losses leading to discouragement of growers of the crops. It has recently emerged in a serious form in many parts of country (Kumar and Thakur, 2000). In Uttar Pradesh it causes losses as high as 72 % (Chauhan *et al.*, 1992). Therefore present study was undertaken to assess the potential of different chemicals (fungicides) for the management of *Sclerotinia* rot of mustard crop.

MATERIALS AND METHODS

Effect of five fungicides on the growth of *S. sclerotiorum* was studied by poisoned food technique as described by (Nene and Thapliyal, 1979). Three concentrations of each fungicides were prepared in sterilized distilled water (Table 1). To obtain the desired concentration of fungicides in the medium, amount of stock solution to be added in PDA was calculated by using the formula :

$$C_1V_1 = C_2V_2$$

where,

C₁ = Concentration of stock solution (mg/ml)

C₂ = Concentration of fungicide (mg/ml)

V₁ = Volume (ml) of the stock solution to be added.

V₂ = Volume of PDA medium.

Required amount of stock solution was poured in 60 ml of sterilized molten PDA to get final concentration of 25, 50, and 100 mg/ml for systemic and 100, 250 and 500 mg/ml for non systematic fungicides. Such treated PDA medium was poured into sterilized Petri plates @20 ml/plate and allowed to solidify. After solidification, the poisoned medium was inoculated with 5 mm discs of *S. sclerotiorum* taken from 3 days old culture. Petri plate containing PDA served as control. The treatments were replicated thrice. Observations on colony diameter and number of sclerotia formed were recorded after 4 and 21 days of inoculation, respectively. The data so obtained were computed to per cent inhibition of growth (I) over check by using the formula :

$$I = \frac{C - T}{C} \times 100$$

where,

C = Radial growth in check

T = Radial growth in treatment

RESULTS AND DISCUSSION

The results presented in Table 1 indicated that all the fungicides at different concentrations under test proved inhibitory to *S. sclerotiorum* and significantly reduced the colony diameter as well as production of sclerotia in compared to check. Carbendazim was found most

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Table 1 : Effect of fungicides on the mycelial growth and sclerotia production of *Sclerotinia sclerotiorum*

Fungicides	Concentrations (mg/ml)	Colony diameter (mm)	Growth inhibition (%)	No. of Sclerotia per plate
Bavistin	25	7.3	91.88	1.3
(Carbendazim)	50	0.0	100.00	0.0
	100	0.0	100.00	0.0
Ridomil-MZ	25	26.7	70.33	8.7
(Metalaxyl)	50	15.0	83.33	5.3
	100	0.0	100.00	0.0
Captan	100	31.0	65.55	11.0
(Captaf)	250	20.3	77.44	7.3
	500	3.8	95.77	0.0
Indofil M-45	100	79.3	11.88	21.0
(Mancozeb)	250	57.3	36.33	16.7
	500	5.3	94.11	1.0
Blitox -50	100	83.3	7.55	24.7
(Cu oxychloride)	250	68.2	24.22	15.0
	500	46.0	48.88	13.3
Check		90.0	-	31.0
C.D. (P=0.05)		1.52	-	1.83
C.V. %		2.74	-	11.25

effective in growth inhibition (100%) and production of sclerotia per plate at the lowest (25%) concentrations as compared to other fungicides under *in vitro* test. This fungicide has been found effective even 25 (mg/ml) concentration. Other fungicides were found less efficacious at lower concentrations and found effective at higher concentration only. Similar results have been obtained by several workers (Howthorne and Jarvis, 1973; Lee and Wu, 1986; Nedelcu *et al.*, 1988; Matheron and Matejka, 1989; Singh and Saha, 1989 and Singh and Kapoor, 1996) in inhibiting the growth of *S. sclerotiorum* *in vitro*.

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