Efficacy of Fungicides Against *Rhizoctonia bataticola* Causing Wilt of *Coleus forskohlii* (Wild) Briq.

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International Journal of Plant Protection, Vol. 2 No. 1 : 31-32 (April to September, 2009)

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SUMMARY

Wilt caused by *Rhizoctonia bataticola* is a serious disease of *Coleus forskohlii.* Efficacies of systemic and non-systemic fungicides were evaluated against *Rhizoctonia bataticola* at different concentrations. Among systemic fungicides, Carboxin (0.05 and 0.1) and Hexaconazole, Metalaxyl and Traidemifon at 0.1 per cent completely (100%) inhibited the growth of *R. bataticola* and among the non-systemic fungicides tested, Thiram at 0.1, 0.2 and 0.3 per cent concentrations was found effective against *Rhizoctonia bataticola.*

Key words : Fungicides, Management, Wilt, Coleus, *Rhizoctonia bataticola.*

Accepted :* *January, 2009

Coleus forskohlii (Wild) Briq. is a plant of Indian origin and its tuberous roots contain 0.1 to 0.5% forskolin which is a diterpenoid having hypotensive and cardioactive properties. In India, the crop is cultivated in parts of Gujarat, Maharasthra, Rajasthan, Tamil Nadu and Karnataka. A survey conducted in the districts of Bijapur, Bagalkot, Belgaum, Dharwad and Uttar Kannada during 2006-07 indicated the severe incidence of wilt complex which is becoming a major threat for coleus cultivation. Wilt complex is caused by different causal agents *viz., Fusarium chlamydosporum, Rhizoctonia bataticola* and *Sclerotium rolfsii* (Ramprasad Shresti, 2005). Therefore, the studies were carried out on the management of wilt complex of coleus. With this in view, an attempt was made to evaluate the fungicides *in vitro* against *Rhizoctonia bataticola,* a major pathogen associated with the wilt complex of *Coleus forskohlii.*

MATERIALS AND METHODS

The efficacy of six systemic fungicides (at the concentration of 0.025, 0.05 and 0.1 per cent) and five non-systemic fungicides (at 0.1, 0.2 and 0.3%) were assayed by poisoned food technique (Nene and Thapliyal, 1973). Required quantity of individual fungicide was added separately into molten and cooled Potato dextrose agar so as to get the desired concentration of fungicides. Later, 20 ml of the poisoned medium was poured into sterile Petriplates. Mycelial discs of 5 mm size from actively growing culture of the fungus were cut out by a sterile cork borer and one such disc was placed at the centre of each agar plate. Control was maintained without adding any fungicide to the medium. Each treatment was replicated thrice. Such plates were incubated at room temperature for eight days and radial colony growth was measured. The efficacy of a fungicide was expressed as per cent inhibition of mycelial growth over control that was calculated by using the formula suggested by Vincent (1947)–

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

where,

I = Per cent inhibition

C = Radial growth in control

T = Radial growth in treatment

RESULTS AND DISCUSSION

Efficacy of six systemic and five non systemic fungicides was tested at three concentrations in the laboratory against *Rhizoctonia bataticola* (Table 1). The results indicated that there was significant difference among the systemic fungicides in inhibiting the mycelial growth of *R. bataticola*. Among the systemic fungicides evaluated, Carboxin (99.88%) was significantly effective against *R. bataticola*, followed by Hexaconazole (96.79%) being superion than other fungicides. Traidemifon (88.77%) and Iprodine +

carbendazim (75.68%) appeared next in order of superiorly. Carboxin was successful in completely (100%) inhibiting the mycelial growth at 0.05 and 0.1 per cent concentrations. However, Carbendazim (27.78%) was least effective in inhibiting the mycelial growth of *R. bataticola* (Table 1). Among the different concentrations tested, 0.1 per cent was very effective followed by 0.05 per cent. Least inhibition was observed in 0.025 per cent concentration.

Table 1: Inhibition of mycelial growth of *R. bataticola* by different systemic fungicides

Treatments	Per cent inhibition (PI) of mycelial growth at different concentrations			
Concentrations	0.025%	0.05%	0.1%	Mean
Carboxin	99.63	100.00	100.00	99.88
	(88.03)*	(90.05)	(90.05)	(89.37)
Carbendazim	0.00	29.63	53.71	27.78
	(0.00)	(29.18)	(47.15)	(25.44)
Hexaconazole	94.44	95.93	100.00	96.79
	(76.40)	(78.43)	(90.05)	(81.62)
Metalaxyl	1.85	29.63	100.00	43.83
	(4.55)	(32.90)	(90.05)	(42.50)
Traidemifon	76.67	89.63	100.00	88.77
	(61.45)	(71.27)	(90.05)	(74.26)
Iprodine +	34.00	91.85	95.18	75.68
carbendazim	(39.21)	(73.48)	(77.44)	(63.38)
Mean	52.10	72.78	91.48	72.12
	(11.94)	(62.55)	(80.80)	(62.76)
	Fungicide (F)	Concentration (C)	F x C	
S.E. ±	0.26	0.19	0.46	
C.D. (P=0.01)	1.00	0.73	1.77	

*Values in parenthesis are arcsine-transformed values

Significant differences were recorded in per cent inhibition of mycelial growth of *R. bataticola* with non systemic fungicides. Thiram (99.26%) gave maximum inhibition of mycelial growth. The next best were Mancozeb (63.00%) and Chlorothalonil (57.41%) However, Copperoxychloride has no effect on fungal growth (Table 2).

Among the different concentrations of non systemic fungicides tested, Thiram at 0.3 per cent concentration completely (100%) inhibited the growth of *R. bataticola.* However, Copperoxychloride was completely ineffective for inhibition of mycelial growth of *R. bataticola* at all the three concentrations (0.1%, 0.2% and 0.3%). However, among the different concentrations tested, 0.3 per cent concentration was significantly effective when compared to 0.1 and 0.2 per cent concentrations. *In vitro* evaluation of fungicides provides preliminary information regarding efficacy against a pathogen within a shortest period of time and therefore, serves as a guide for further field testing.

Table 2: Inhibition of mycelial growth of *R. bataticola* by different non-systemic fungicides

Treatments	Per cent inhibition (PI) at different concentrations			
Concentrations	0.1%	0.2%	0.3%	Mean
Thiram	98.52	99.26	100.00	99.26
	(84.33)*	(87.19)	(90.05)	(87.19)
Chlorothalonil	40.74	62.22	69.26	57.41
	(39.65)	(52.12)	(56.36)	(49.38)
Mancozeb	54.82	56.67	77.41	63.00
	(47.79)	(48.86)	(61.66)	(52.77)
Captan	7.41	55.19	64.45	42.35
	(12.99)	(48.00)	(53.44)	(38.14)
Copper oxychloride	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Mean	40.30	54.67	62.22	52.40
	(36.95)	(47.23)	(52.30)	(45.49)
	Fungicide (F)	Concentration (C)	F x C	
S.E. ±	1.223	0.947	2.118	
C.D. (P=0.01)	4.742	3.672	8.213	

*Values in parenthesis are arcsine-transformed values

ACKNOWLEDGEMENT

Thanks to National Medicinal Plant Board, Government of India, New Delhi for providing financial assistance during investigation.

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REFERENCES

Nene, Y.L. and Thapliyal, P.N. (1973). *Fungicides in plant disease control*, second edition. Oxford and IBH Publishing Co. New Delhi, pp. 413-415.

Ramprasad Shresti, A. Y. (2005). Studies on collar rot complex of *Coleus forskohlli* (Wild) Briq. M.Sc. (Agri.) Thesis, University of Agricultural Sciences, Dharwad (Karnataka).

Vincent, J.M. (1947). Distortion of fungal hyphae in presence of certain inhibitors. *Nature*, **159**:850.

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