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In-vitro Evaluation of Different Fungicides against Chilli Twig Blight Caused by *Choanephora cucurbitarum*

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ABSTRACT

A study on management of Choanephora twig blight of chilli was carried out in year 2014. Under in vitro evaluation bio efficacy of different fungicides was tested against test pathogen Choanephora cucurbitarum by poison food technique at different concentrations i.e. 0.05, 0.1, 0.15, 0.2, 0.25 and 0.3% respectively. The present findings revealed that captan was found quite more effective while the least effective was carbendazim against the test pathogen Choanephora cucurbitarum.

Key words: *Chilli, Choanephora cucurbitarum, Bio efficacy, Test pathogen, Captan, Carbendazim*

INTRODUCTION

Chilli (*Capsicum frutescens*) is a self-pollinated crop bearing a pod like fruit (berry) and belongs to family Solanaceae. It originated from South and Central America where it is still under cultivation [8]. It is a tropical and subtropical crop mainly grown in India, Japan, Mexico, Turkey, United States of America and African countries. India is the largest producer of chillies in the world, accounting for over 45% of the total area under cultivation from almost the sea level up to an altitude of 2000 meters with an annual rainfall of 60-150 cm[2].

Choanephora cucurbitarum is a plant pathogenic fungus causing fruit rots, flower rot and leaf blights on a variety of plants including squash, pumpkin, pepper, pea and bean. This fungus is known to attack several other crops which include cereals such as millet, rice and sorghum. The fungus also causes pod blight known as wet rot, blossom blight and whisker rot[3]. This disease is also common on squash and southern pea but occurs on the floral parts of many types of plants[1]. It causes blossom blight, die back, wet rot and soft rot of stems or side shoots of chilli plants[4]. The crop is suffering from various diseases of which the fungal disease, *Choanephora* blight in chilli caused by *Choanephora cucurbitarum* has become one of the constraints in chilli growing areas resulting in poor yields, besides reducing quality.

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MATERIAL AND METHODS

The present investigation was carried out in the Department of Plant Pathology, College of Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, Ranga Reddy District, Telangana.

Isolation and Identification of *Choanephora cucurbitarum*

The test pathogen *Choanephora cucurbitarum* which was isolated from chilli twigs were collected from the farmers' field during survey in Khammam district with maximum disease incidence in the field. Twig blight lesions were surface sterilised (1% Sodium hypo chlorite) for one minute, followed by the sterile water wash and kept for incubation. After 48 hours fungal colonies developed and fresh mycelium transferred to Petri plate containing PDA medium. Pathogen was purified by single spore techniques and pathogen culture was multiplied and maintained on PDA at 25 ± 2^{o}C in BOD incubator. The test fungus was isolated from infected twigs and leaves on potato dextrose agar medium and was identified as *C. cucurbitarum* with the help of descriptions given by Wolf . The fungal colony appeared white to pale yellow on PDA plates. The white coloured mycelium on maturity produced black pin heads indicating onset of sporulation.

***In vitro* evaluation of different fungicides against *Choanephora* twig blight of chilli**

At six different concentrations i.e., 0.05, 0.1, 0.15, 0.2, 0.25 and 0.3 seven fungicides viz. Copper oxychloride, Mancozeb, Chlorothalonil, Azoxystrobin, Captan, Hexaconazole and Carbendazim were evaluated against *Choanephora cucurbitarum* by poisoned food technique[5].

The required quantity of fungicide were weighed and mixed in the potato dextrose agar medium by thorough shaking for uniform mixing of the fungicide before pouring into Petri dishes so as to get the desired concentration of active ingredient of each fungicide. Six concentrations of each treatment were used. Three replications were maintained for each fungicide for each of its concentration in CRD. To avoid bacterial contamination a little amount of streptomycin was added in each flask before plating; seven mm disc was cut with the help of sterilized cork borer from three day old culture of the test fungus and was placed in the center of the medium in the reversed position to maintain continuous contact of the pathogen with poisoned medium. PDA plates without fungicide served as control. The radial growth of the colony was measured when the growth in control plates reached the rim of the Petri plates; per cent growth inhibition under the influence of different fungicides was calculated on the basis of the control. Per cent inhibition of mycelial growth was calculated using the formula (Vincent, 1927)

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

Where,

I = Per cent inhibition of mycelial growth

C = Colony diameter in control (mm)

T = Colony diameter in treatment (mm)

RESULTS AND DISCUSSION

The sensitivity of different fungicides against *C. cucurbitarum* was tested *in-vitro* by poisoned food technique at different concentrations (0.05, 0.1, 0.15, 0.2, 0.25 and 0.3%) and the data are presented in Table 1. Most of the tested fungicides significantly inhibited the mycelial growth of *C. cucurbitarum* over control. The present results revealed that none of the test fungicide showed 100% inhibition at all the tested concentrations but with the increasing in concentration of fungicides there was a decrease in radial growth of *C. cucurbitarum* and per cent inhibition over control was increased.

Out of seven fungicides tested, five fungicides significantly recorded inhibition over control. However the fungicides azoxystrobin and captan recorded maximum (100%) inhibiton at 0.15% concentration followed by chlorothalonil (96.2%), hexaconazole (90.2%), mancozeb (86.8%) and copper oxychloride with 86.6 per cent at 0.15 per cent concentration. The fungicide chlorothalonil, hexaconazole and mancozeb recorded maximum (100%) inhibition at 0.2% concentration while copper oxychloride at 0.3% (Plate 1).

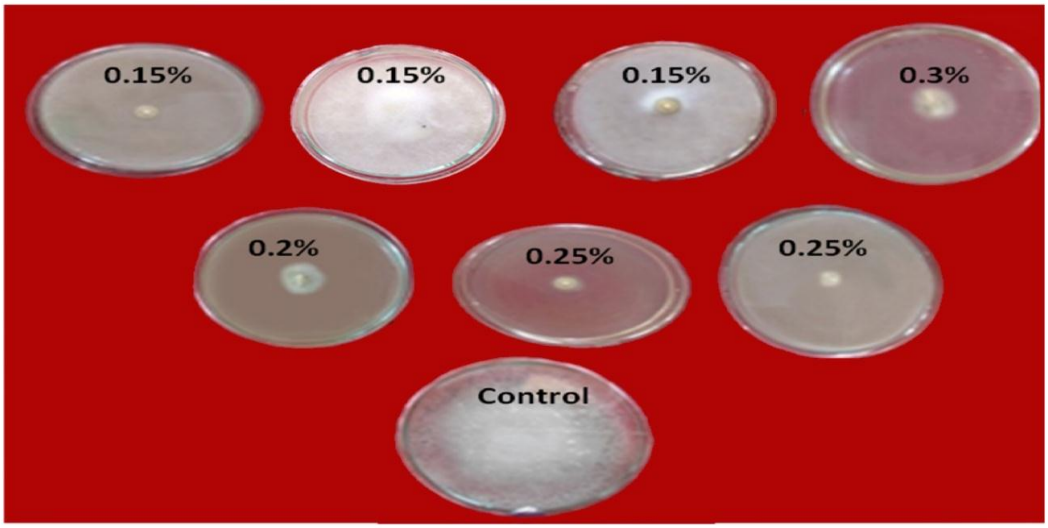

Plate 1: Effect of different fungicides on the radial growth of *Choanephora cucurbitarum* at different concentrations

1 Azoxystrobin
2 Carbendazim
3 Captan
4 Copper oxychloride
5 Chlorothalonil
6 Hexaconazole
7 Mancozeb
8 Control

Table 1: Evaluation of fungicides at different concentrations in inhibiting the mycelia growth of *Choanephora cucurbitarum in vitro*

Sl.No	Fungicide	0.05		0.1		0.15		0.2		0.25		0.3	
		Radial growth (mm)	Inhibition (%)	Radial growth (mm)	Inhibition %	Radial growth (mm)	Inhibition %	Radial growth (mm)	Inhibition %	Radial growth (mm)	Inhibition (%)	Radial growth (mm)	Inhibition (%)
1	**Azoxystrobin**	18.3	79.6	11.4	87.3	0.0	100	0.0	100	0.0	100	0.0	100
2	**Carbendazim**	90.0	0.0	90.0	0.0	90.0	0.0	90.0	0.0	90.0	0.0	90.0	0.0
3	**Captan**	20.6	77.1	18.5	79.4	0.0	100	0.0	100	0.0	100	0.0	100
4	**Copper oxychloride**	18.7	79.2	15.9	82.3	12.0	86.6	10.3	88.5	9.7	80.3	0.0	100
5	**Chlorothalonil**	15.6	82.6	11.0	82.6	3.4	96.2	0.0	100	0.0	100	0.0	100
6	**Hexaconazole**	17.2	80.8	14.7	83.6	8.8	90.2	4.2	95.3	0.0	100	0.0	100
7	**Mancozeb**	15.7	82.5	13.6	84.8	11.8	86.8	2.9	96.7	0.0	100	0.0	100
8	**Control**	90.0	0.0	90.0	0.0	90.0	0.0	90.0	0.0	90.0	0.0	90.0	0.0
	CD (P=0.05)		0.521		0.085		0.511		0.276		0.428		0.232
	SE(m)		0.188		0.027		0.164		0.994		0.148		0.107

The present findings revealed that captan was found most effective where as carbendazim was least effective in inhibiting the test fungus *C. cucurbitarum.* Oladiran[6] reported that captan was most effective fungicide against *C. cucurbitarum* causing pod blight of cowpea. Panja[7] also reported that captan 50% (2.0 g/l), ziram 27% (1.5 ml/l) and copper oxy chloride 50% (3 gm/l) was most effective in inhibition of radial growth and sporulation of *C. cucurbitarum* at different concentrations tested.

CONCLUSION

Bio efficacy of several fungicides was tested against *Choanephora cucurbitarum* by poison food technique at six concentrations i.e 0.05, 0.1, 0.15, 0.2, 0.25 and 0.3% respectively under *in vitro* conditions. Among them captan at 0.15% recorded maximum inhibition of mycelia growth of *Choanephora cucurbitarum*.

REFERENCES

1. Afolabi, A., Environmental influence on the incidence of shoot diseases and healthof *Amaranthus* seeds in humid tropics. *Nigeria Journal of Botanical*. **23:** 3-4 (1994).
2. Anonymous., *Choanephora cucurbitarum*. Distribution Maps of *Plant Disease*: Map (2008).
3. Kacharek, J., Daiho, L and Digvigay, N.U., Biological management of fruit rot in the world's hottest chilli. *Journal of Plant Protection Research.* **50(3):** 269-273 (2003).
4. Maeda, K., Karahashi, Y., Ohsato, S and Yoneyama, K., Appearance of a new leaf rots disease on common ice plant. *Journal of General Plant Pathology*. **54:** 207-212 (2010).
5. Nene, Y.L and Thapliyal, P.N., *Fungicides in Plant Disease Control.* Third edition, Oxford and IBH Publishing Company Private Limited. New Delhi. pp : 691 (1993).
6. Oladiran, A.O., *Choanephora* pod rot in southern Nigeria. *Tropical Pest Management*. **26(4):** 396-406 (1980).
7. Panja, B.N., Relative efficacy of different fungicide *in vitro* and in field for controlling twig blight disease of chilli caused by *Choanephora cucurbitarum* (Berk and Rav.) Thaxter economically. *Plant Protection Bulletin*. Faridabad . **51(1/2):** 17-19 (1999).
8. Pickersgill, B., Genetic resources and breeding of *Capsicum* spp. *Euphytica*. **96:** 129-133 (1997).
9. Vincent, J.M., Distortion of fungal hyphae in the presence of certain inhibitors. *Nature.* **159:** 850 (1927).