Evaluation of Phytoextracts Against *Curvularia Eragrostidis* Causing Leaf Tip Blight of Spider Lilly *in Vitro* Condition

V. P. Prajapati[1*], N. K. Gajre[1], D. H. Tandel[1], A. J. Deshmukh[1] and R. C. Patel[2]

[1]Dept. of Plant Pathology, [2]Assistant Research Scientist, Navsari Agricultural University, Navsari, Gujarat (396 450), India

Corresponding Author

V. P. Prajapati
e-mail: virpathologist@nau.in

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Abstract

The aqueous phytoextracts of commonly available ten plant species evaluated *in vitro* by poisoned food technique against their inhibitory effect on the mycelial growth of *Curvularia eragrostidis*. The turmeric (*Curcuma longa* L.) was found most effective with per cent growth inhibition of 75.18% followed by dhatura (*Datura metal* L.)(46.67%), neem (*Azardirachta indica* A. Juss.) (44.07%), tulsi (*Ocimum sanctum* L.)(41.11%) and ardusi (*Adhatoda vasica* (L.) Nees.)(40.00%) for growth of *Curvularia eragrostidis.*

Keywords: Botanicals, *C. eragrostidis*, Leaf Tip Blight, Spider lilly

1. Introduction

Spider lilly (*Hymenocallis littoralis* L. syn. *H. adnata* L.) is bulbous ornamental plant belongs to family Amaryledaceae is one of the popularly grown and economically important flowering crop in southern Gujarat, India. Production of spider lilly is worth rupees 7.50 crores per annum in Surat (Gujarat) region. Farmers grow Spider lilly for its fetches remunerative price, pleasant fragrance and have attractive white flowers. Due to importance and easy culturable practices in this high rainfall area, the crop is gaining popularity among the growers (Bhatt, 2007). The crop was severely affected by the leaf tip blight disease resulting in huge losses to the farmers year after year. Leaf tip blight (*Curvularia eragrostidis* (Henn.) J.A.Mey.) disease of spider lilly has become a major problem in recent past with a threat to successful and profitable cultivation in south Gujarat. The hazardous effects of chemicals used in plant disease management have diverted plant pathologists to find out the alternative methods of plant disease control which may cause little or no adverse effect on environment. Notable success of disease control through use of botanicals in the laboratory, glass house and field have been achieved during past several years. On the basis of this information, there is a possibility of development of biological control for plant diseases through botanical pesticides.

2. Materials and Methods

2.1. Preparation of phytoextracts

Healthy fresh plant parts i.e., leave, cloves and rhizomes were selected washed thoroughly with clean water and finally rinsed with distilled sterile water. Fifty grams of respective plant parts were minced with the help of grinder by adding 50ml sterile water. The extracts were filtered through double layered sterile muslin cloth and collected in 150ml conical flasks and plugged with non absorbent cotton. The filtered extracts were autoclaved at 1.2 kg cm^{-2} pressure for 20 minutes.

2.2. Poisoned food technique

The sterilized extracts were individually added in previously sterilized PDA @ 10 per cent (i.e. 2 ml extract + 18 ml PDA) in the conical flasks and mixed thoroughly at the time of pouring in the previously sterilized petri plates. All the plates containing phytoextracts were inoculated by placing the 5 mm diameter mycelial disc from vigorously grown 8 days old pure culture of *C. eragrostidis* with sterilized forceps and incubated at room temperature (27 $\pm$ 2˚C). Three repetition of each treatment were maintained and the plates without phytoextracts served as control. The observations on colony diameter (mm) were recorded periodically and the per cent growth inhibition (PGI) was calculated by using formula as suggested by Vincent (1927) given as below:

$$PGI = \frac{100\ (DC-DT)}{DC}$$

Where,

PGI=Per cent growth inhibition

DC = Average diameter of mycelial colony of control set (mm)

DT = Average diameter of mycelial colony of treated set (mm)

3. Results and Discussion

The results reveled in Table 1 showed that all the plant extracts significantly inhibited growth of the *C. eragrostidis*. Among them maximum inhibition of 75.18% was found in turmeric followed by extract of Dhatura (46.67%) which was statistically at par with Neem (44.07%), Tulsi (41.11%) and Ardusi (40.00%) which in turn was also at par with Garlic (36.67%) and Ginger (36.67%) followed by Kadvi mehandi (26.30%), Male fern (23.33%) and Acalypha (17.41%). Extracts of Turmeric (*Curcuma longa* L.), Dhatura (*Datura metal* L.), Neem (*Azardirachta indica* A. Juss.), Tulsi (*Ocimum sanctum* L.) and Ardusi (*Adhatoda vasica* (L.) Nees.) have strong toxic principle present in their extract which directly inhibit the growth of *C. eragrostidis* as well as outstandingly good model of biological control agent. The results of the present investigation are analogous to the previous findings published by several workers. The extracts of Dhatura, Ginger, Jangli aushb, Neem, Turmeric were effective against *C. eragrostidis* causing leaf blight of tea. (Saha *et al.*2005). Hence it can be recommended after rigorous testing in the pot and field condition against the pathogen for management of leaf tip blight of spider lilly. Phytoextracts were found better for the inhibition of *C. eragrostidis* by earlier workers (Upadhyaya and Gupta,1990, Srivastava and Lal,1997, Verma and Kharwar, 2006 and Archana,2008).

Table 1: *In vitro* efficacy of phytoextracts against *C. eragrostidis*

Sr. No.	Phytoextracts	Concentration	PPU	ACD	GIOC
1.	Dhatura (*Datura metal* L.)	0.2%	Leaves	48.00	46.67
2.	Tulsi (*Ocimum sanctum* L.)	0.2%	Leaves	53.00	41.11
3.	Acalypha (*Acalypha indica* L.)	0.2%	Leaves	74.33	17.41
4.	Kadvi mehandi (*Lowsonia inermis* L.)	0.2%	Leaves	66.33	26.30
5.	Ardusi (*Adhatoda vasica* (L.) Nees.)	0.2%	Leaves	54.00	40.00
6.	Neem (*Azadirachta indica* A Juss.)	0.2%	Leaves	50.33	44.07
7.	Garlic (*Allium sativum* L.)	0.2%	Cloves	57.00	36.67
8.	Turmeric (*Curcuma longa* L.)	0.2%	Rhizomes	22.33	75.18
9.	Ginger(*Zingiber officinalis* Rossa.)	0.2%	Rhizomes	57.00	36.67
10	Male fern (D*ryopteris filixmas* (L.) Schott.)	0.2%	Leaves	69.00	23.33
11.	Control		-	90.00	-
	SEm±			2.85	
	CD (p=0.05)			8.35	
	C.V. %			8.46	

PPU: Plant parts used; ACD: Average colony diameter (mm); GIOC: Growth Inhibition over control (%)

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