

Prevalence of Twig Blight of Chilli Caused by *Choanephora cucurbitarum* in Major Growing Districts of Telangana

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ABSTRACT

The mucor fungi Choanephora cucurbitarum is a facultative saprobe belonging to the Family Choanephoraceae is the new emerging pathogen as well as serious threat to chilli cultivars and other vegetables also in the Telangana state. The genus Choanephora was first described by Currey (1873) from fructifications on flowers of Hibiscus rosa sinensis. Till 1990 very few records of this pathogen on a few hosts were available in the literature in India. A roving survey was conducted in 6 major chilli growing districts of Telangana state representing 13 mandals and 38 villages for the prevalence of Choanephora twig blight diseases in chilli. Maximum disease incidence were recorded in Khammam district varying from 20 to 32% where as in Karimnagar and Warangal district the disease incidence was 18 and 15% respectively. There was no incidence of twig blight disease in chilli in Medak, Ranga Reddy and Nizambad districts.

Key words: Chilli, Twig blight, Mucor fungi, Disease incidence, Survey, Prevalence.

INTRODUCTION

Chilli (*Capsicum frutescens*.) is an important spice grown for its fruits, which are used in green as well as ripe dried form for its pungency. Chilli belongs to the genus *Capsicum*, family Solanaceae. It has originated in Mexico, Southern Peru and Bolivia⁸. Most widely cultivated species all over the world for its pungent and non-pungent fruits. Many chilli constituents are important for nutritional value, flavor, aroma, texture and colour. Chillies are low in sodium and cholesterol free, rich in vitamin A, vitamin C, vitamin E, a good source of potassium and folic acid. Fresh

green chilli peppers contain more vitamin C than citrus fruits and fresh red chilli has more vitamin A than carrot. It with bright colour and less pungency are preferred in Europe and in the West. Chilli is commercially important for two qualities, i.e., its red colour is due to the pigment capsanthin and its biting pungency is due to capsaicin².

Chilli is commercially important for two qualities, i.e., its red colour is due to the pigment capsanthin and its biting pungency is due to capsaicin. Capsaicin also known as hinders cholesterol.

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Chilli production suffers from many diseases caused by fungi, bacteria, viruses, nematodes and also by abiotic stresses. Chilli suffers from several seed borne fungal fruit rot diseases. *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 rot⁴. This disease is also common on squash and southern pea but occurs on the floral parts of many types of plants¹. It causes blossom blight, die back, wet rot and soft rot of stems or side shoots of chilli plants⁶.

The fungus is more successful under humid conditions and thrives best at a temperature of 25°C and relative humidity of about 100%. A temperature of about 31°C stimulates the production of large sporangia but unfavorable for conidia formation⁷.

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.

MATERIAL AND METHODS

The present research was carried out in the Department of Plant Pathology, College of

Agriculture, Professor Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad, Ranga Reddy District, Telangana.

A roving survey was conducted on incidence of *Choanephora cucurbitarum* was conducted in 6 major chilli growing districts of Telangana state representing 13 mandals during Kharif 2014 for the prevalence of *Choanephora* twig blight.

The survey was confined to 38 villages. Detailed survey was conducted in these villages during field visits during the month of december. Data on the total number of plants, number of twig blight infected plant in per square meter was marked and the naturally infected leaf/chilli crop with typical *Choanephora* blight symptoms were collected in the field (Fig 1). The study areas were Karimnagar, Warangal, Nizambad, Medak, Khammam and Ranga Reddy of Telangana state.

At each location, five fields were marked and at each field, five plants were assessed out to identify and count the number of healthy and diseased plants. Per cent incidence of the disease was recorded in each field and Mean for each village. The details of the survey data from different districts were collected and the data was recorded in the sheet (Table 1). Disease intensity was measured by grading the fruits using 0-5 scale. The scale is as follows.

Numerical rating	Disease intensity
0	No incidence
1	1-5% of mature leaves with necrotic and chlorotic symptoms
2	6-15% of mature leaves with necrotic and chlorotic symptoms
3	16-50% young shoots and stem with water soaked lesions
4	51-95% water soaked lesions with abundant mycelia growth and fructification
5	Dead plant

The Per cent Disease Incidence (PDI) was calculated as per the following formula⁵:

$$\text{PDI} = \frac{\text{No. of infected plants}}{\text{Total No. of plants observed}} \times 100$$

Table 1: Specimen copy of the data sheet used during survey of *Choanephora* twig blight in chilli

Survey of <i>Choanephora</i> twig blight in chilli Data Sheet			
1	Sample No.	:	1
2	Date of collection	:	22-12-2014
3	Name of the farmer	:	Mr.Bhaskar rao
4	Locality		
	a) Village	:	Gudimalla
	b) Mandal	:	Khammam rural
5	Name of the variety	:	Super teja
6	Rainfed /Irrigated	:	Irrigated (vegetable or for red chilli)
7	Total area	:	5 acres
8	Time of sowing	:	July 3 rd week
9	Purpose of variety (vegetable or for red chilli)	:	For red chilli
10	Stage of the crop	:	Harvesting, 2 nd picking
11	Condition of the crop	:	
	a. Twig blight incidence	:	32.0 %
12	Previous crop	:	Maize
13	Type of soil	:	Sandy clay loam soil



Fig. 1: Survey of twig blight in chilli in the farmers field village Gudimalla of khammam district

RESULTS

Periodical routine survey was conducted in six major chilli growing districts of Telangana state representing thirteen mandals and Thirty eight villages during *kharif* 2014 for the prevalence of *Choanephora* twig blight diseases in chilli and the results are presented in Table 2 and Fig 2.

For field survey, necessary data was collected from the farmers spread over in Ranga Reddy, Karimnagar, Nizambad, Medak, Khammam and Warangal districts of Telangana. The survey revealed that out of six districts of Telangana state twig blight disease incidence was noticed only in three districts

viz., Warangal, Karimnagar and Khammam. *Choanephora cucurbitarum* was recorded in the months of July to Dec. Its frequency was almost equal in all the months of its occurrence. The severity of this disease varied from locality to locality and with respect to the varieties grown.

Among the districts surveyed, severity of disease was more in Khammam district the maximum disease incidence was recorded varying from 20 to 32% in all the five villages of surveyed where as in other district the disease incidence was observed only in one village with 18 and 15% disease incidence of each out of 9 and 10 villages surveyed in

Karimnagar and Warangal districts respectively.

There was no incidence of twig blight in Medak, Nizambad and Rangareddy districts of Telangana during the surveying Among the three districts, villages in Khammam recorded

more than 20% of incidence of incidence where as in Warangal and Karimnagar district least disease incidence was recorded 15% and 18% respectively. The survey results indicated that the disease of economic importance and has the potential to cause heavy yield loss.

Table 2: Survey for the prevalence of twig blight of chilli in major growing districts of Telangana state

Name of the district	Name of the Mandal	Name of the village	Sample number	Twig blight incidence (%)
Ranga Reddy	Chevella	Urella	1	0.0
		Shankarpally	2	0.0
		Deveriera Pally	3	0.0
		Antharam	4	0.0
		Hasthepur	5	0.0
	Vikarabad	Kamareddiguda	6	0.0
		Kompalle	7	0.0
		Pathur	8	0.0
		Phulmaddi	9	0.0
		Pendlimadgu	10	0.0
Medak	Zahirabad	Shekarpur Hothidi	11	0.0
			12	0.0
Karimnagar	Malharrao	Nacharam	13	0.0
		Mathkupalle	14	0.0
		Dubbapeta	15	0.0
	Mahadevapur	Edapalle	16	0.0
		Elkeswaram	17	0.0
		Kamanpalle	18	0.0
	Manthini	Eklaspur	19	18.0
		Maidipalle	20	0.0
		Mallaram	21	0.0
Warangal	Mahabubabad	Laxmipur	22	0.0
		Ammangal	23	0.0
		Anantharam	24	0.0
		Pendyal	25	0.0
		Nandipalle	26	0.0
	Mandapet	Palathodu	27	15.0
		Yeditha	28	0.0
		Ippanapadu	29	0.0
	Kuravi	Nerada	30	0.0
		Narayanpur	31	0.0
Nizambad	Sirikonda	Gadkole	32	0.0
	Nandipet	Ailapur	33	0.0
Khammam	Garla	Chinnakistappu	34	23.0
		Siripuram	35	20.0
	Khammam rural	Gudimalla	36	32.0
		Gollapadu	37	25.0
		Chintapalli	38	25.0



Fig. 2: Map showing different districts of Telangana to know the occurrence of twig blight disease on chilli crop

SYMPTOMATOLOGY

The infected leaves which were collect during the field survey are quite characteristics. Initial symptoms were often associated with flowers, flower buds or apical growing points of the plant. The infected leaves first developed a

grayish color similar to hot water scald or chemical injury. The infected portion dries up and curls. Host tissues have a hairy appearance resulting from the tall sporangiophores that produce a cluster of brown sporangia (Fig 3).



Fig 3 a) Typical symptoms of twig blight diseases on chilli leaves and twigs during survey
b) Chilli twigs with sporangia and sporangiophore of *Choaneophora cucurbitarum*

DISCUSSION

The highest severity (32%) of twig blight was recorded in fields of Gudimalla village of Khammam rural mandal of khammam district. The least incidence (15%) of the disease was recorded in Palathodu village of Mandapet mandal and no incidence was recorded in the remaining districts of Telangana state. It may be concluded from the above discussion that various biotic and abiotic factors influence the incidence of twig blight. The present investigation from survey revealed that the twig blight of chilli occurs in more severe

form in farmer's field, if the environmental conditions are very much congenial. Also the areas where the twig blight is recorded in severe form are found practicing chilli cultivation over the years without crop rotation. The continuous cultivation of chilli crop helps pathogen to survive in debris during the off season and flourish when the new crop is planted. Hence there is need to adapt crop rotation and plan for taking suitable management strategies whenever there is forecast of climatic conditions favorable for the outbreak of twig blight of chilli. The

frequency of occurrence of *Choanephora* twig blight was regular in Khammam which may be due to continuous raising of chilli year after year from a long time hence it is concluded that disease was prevalent at Khammam districts.

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