

Original Research Article

<https://doi.org/10.20546/ijcmas.2018.703.439>

Assessment of Chilli Anthracnose and Fruit Rot in Major Chilli Growing Areas of Andhra Pradesh State, India

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ABSTRACT

Keywords

Chilli anthracnose and fruit rot, Survey, Per cent disease incidence, Andhra Pradesh

Article Info

Accepted:

04 February 2018

Available Online:

10 March 2018

Chilli anthracnose and fruit rot disease incidence was assessed in five major chilli growing districts of Andhra Pradesh. Per cent disease incidence was calculated as the proportion of plants showing symptoms, out of the total number of plants. Highest (50.84) mean per cent incidence was observed in Guntur district while the lowest (33.01) mean per cent incidence was observed in Chittoor district. Among the different mandals surveyed in AP, highest incidence (52.16 %) was recorded in Bollapalli mandal of Guntur district in a range of 48.00 % to 55.00 % while least incidence (30.52 %) with 28.00 % to 33.00 % range was observed in Somala mandal of Chittoor district.

Introduction

Chilli (*Capsicum annum* L.) is the most important spice crop in the world. Indian chilli is considered to be world famous for two important commercial qualities such as colour (due to pigment Capsanthin) and pungency levels (due to Capsaicin). In India, chilli is cultivated in an area of 8.40 lakh hectares producing 20.96 lakh tonnes and Andhra Pradesh stands first among the major chilli

producing states in India with an area of 2.06 lakh hectares producing 8.83 lakh tonnes (Horticultural Statistics at a Glance, 2017). Among the biotic factors affecting chilli, anthracnose and fruit rot disease is the most important factor which results in crop losses 10 % to 80 % in different parts of (Poonpolgul and Kumphai, 2007). The anthracnose or fruit rot of chilli caused by *Colletotrichum capsici* (Syd.) Butler and Bisby cause huge losses in India. Yield losses of 18-25 % (Natrajan and

Subramaniam, 1976), 66-84 % (Thind and Jhooty, 1985), 30-76 % (Sujathabai, 1992), 8-27 % (Datar, 1995), 12-15 % (Kannan *et al.*, 1998), 10-60 % (Pandey and Pandey, 2003), 10-54 % (Lakshmesha *et al.*, 2005), 50 % (Sharma *et al.*, 2005), 21-47 %. (Rajput, 2011) were reported from different parts of India. Survey for incidence of plant diseases is an important step in the management of plant diseases which helps in identifying the pathogens and diseases prevalent in a particular crop and area, intensity of the disease and losses caused by them. It is very much necessary for understanding the disease and devising necessary management strategies. Hence, the present study is undertaken to know the status of disease in major chilli growing areas of Andhra Pradesh.

Materials and Methods

Roving survey was conducted in different chilli growing areas of Andhra Pradesh during *Kharif* 2014-15. The districts surveyed were Guntur, Prakasam, Krishna, Kurnool, Chittoor in Andhra Pradesh (Fig. 1). In each district, five mandals and in each mandal four villages were selected. In each village, four fields were selected for the study. Observations were recorded in four one meter square areas randomly in each field by walking diagonally starting from South west corner. Chilli anthracnose in observed fields was expressed as Per cent Disease Incidence (PDI) and also the maximum disease grade observed in the fields was also recorded.

$$\text{Percent disease incidence} = \frac{\text{No. of plants infected with dieback and fruit rot}}{\text{Total number of plants}} \times 100$$

The maximum disease grade observed in majority of the fields observed in a village was also recorded as per 0-9 disease rating scale as given by Kamble *et al.*, (2015).

Scale	Disease on plants
0	No symptoms on leaf or branch or fruit.
1	Small Irregular brown spots covering 1 % or less area of leaf or branch or fruit
3	brown dirty pin head spots covering 1-10 % area of leaf or branch or fruit
5	Dark brown dirty black spots with blackish margin covering 11-25 % area of leaf or branch or fruit.
7	Dark brown circular or irregular spots with blackish covering 26-50 % area of leaf or branch or fruit.
9	Dark brown circular or irregular spots with blackish covering 51 % and above area of leaf or branch or fruit.

Results and Discussion

In the survey conducted in five districts of Andhra Pradesh namely, Guntur, Krishna, Kurnool, Prakasam and Chittoor, the overall mean per cent incidence of anthracnose and fruit rot in AP is 40.87 per cent. (Table 1 & 2).

Among the districts of AP surveyed, highest (50.84) mean per cent incidence was observed in Guntur district while the lowest (33.01) mean per cent incidence was observed in Chittoor district. Other three districts surveyed, Krishna, Kurnool and Prakasam recorded the mean disease incidences of 36.09, 44.29 and 40.14 per cent respectively (Table 1). Among the different mandals surveyed in AP, highest incidence (52.16 %) was recorded in while least incidence (30.52 %) was observed in Somala mandal of Chittoor district.

The data presented in the table 2 revealed that highest mean fruit rot incidence 52.16 % was recorded in Bollapalli mandal of Guntur district in a range of 48.00 % to 55.00 % followed by Sattenapalli mandal with 51.68 % incidence in a range of 48.60 % to 55.00 %, in

different village surveyed, followed by Macherla mandal (PDI of 51.64 % in a range 45.00 % to 55.60 %) of Guntur district.

The lowest incidence 30.52 % with 28.00 % to 33.00 % range was noticed in Somala mandal of Chittoor district followed by Chatrai mandal of Krishna district which recorded 31.80% PDI in the range of 28.00-37.60 in different villages.

This is followed by Punganuru mandal of Chittoor district with 32.00 % PDI in the range of 29.00-37.60 %. In other mandals of the state the disease ranged in between the highest and lowest incidence values. Maximum disease grades of 7 and 9 were observed on individual plants in different mandals indicating the severity of the disease.

Fig.1 Map showing the districts surveyed in Andhra Pradesh

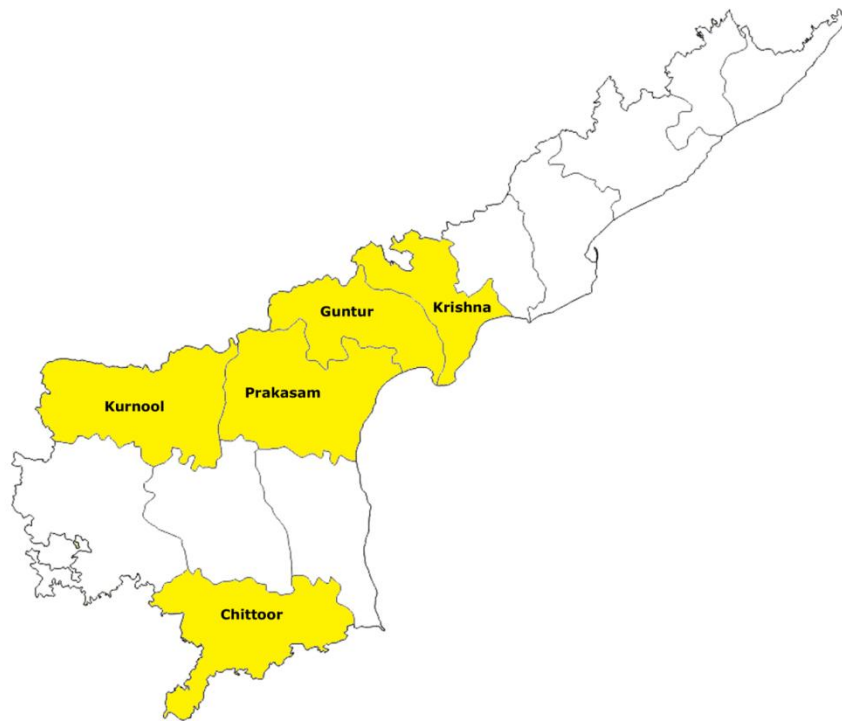


Table.1 Chilli anthracnose disease incidence in major chilli growing districts of Andhra Pradesh

S. No.	District	Range of Per cent Disease Incidence	Mean Per cent Disease Incidence
1	Guntur	48.84-52.16	50.84
2	Krishna	31.80-41.48	36.09
3	Kurnool	39.76-51.20	44.29
4	Prakasam	35.48-43.48	40.14
5	Chittoor	30.52-30.00	33.01
Mean disease incidence in AP			40.87

Table.2 Chilli anthracnose incidence in different mandals of Andhra Pradesh

S. No.	Mandal	Range of Per cent Disease Incidence	Mean Per cent Disease Incidence	Maximum Disease Grade Observed
Guntur District				
1	Prathipadu	45.00-54.00	49.88	9
2	Sattenapalli	48.60-54.00	51.68	9
3	Bollapalli	48.00-55.00	52.16	7
4	Dachepalli	32.00-58.20	48.84	7
5	Macherla	45.00-55.60	51.64	9
Krishna District				
6	Penuganchiprolu	28.40-41.40	35.40	7
7	Vissanapet	34.00-47.80	41.48	7
8	Gampalagudem	33.00-45.80	38.44	9
9	Tiruvuru	28.80-41.40	33.32	7
10	Chatrai	28.00-37.60	31.80	9
Kurnool District				
11	Nandyal	49.00-54.00	51.20	9
12	Pamulapadu	38.00-51.00	44.48	7
13	Gadivemula	39.40-50.00	43.48	7
14	Guduru	28.40-51.40	39.76	7
15	Gonegandla	29.00-50.00	42.52	7
Prakasam District				
16	Dornala	27.00-45.60	35.48	7
17	Arthavedu	32.40-48.40	39.68	7
18	Podili	38.40-47.80	43.48	7
19	Donakonda	34.60-45.60	39.76	7
20	Tripurantakam	34.40-48.40	42.32	7
Chittoor District				
21	Vadamalpeta	30.40-38.60	35.00	7
22	Ramachandrapuram	29.00-37.60	33.72	5
23	Gangadara Nellore	24.00-38.40	33.80	7
24	Somala	28.80-33.00	30.52	7
25	Punganuru	29.00-37.60	32.00	7
Mean incidence in Andhra Pradesh			40.87	

The present results of this study were within the range of disease incidence observed by findings of different other workers during surveys made by them. Ekbote (2002) conducted a survey in Haveri district of Karnataka and reported the that fruit rot caused by *C. capsici* was the most prevalent

disease with average PDI of 36.40 with highest mean PDI of 42.00 and lowest PDI of 41.00. Sharma *et al.*, (2011) also, surveyed in Himachal Pradesh in 2007 and 2008 and reported the disease incidence range of 12.50-45.00 per cent.

Anamika *et al.*, (2012) conducted survey to assess the incidence of anthracnose of chilli in five locations in Rewa Province of Fiji and reported fruit rot incidence of 55.50 to 71.10 % with an average incidence as 63.70 %. Sattar *et al.*, (2016) conducted a field survey in five major chilli growing districts of Pakistan and reported the disease incidence range between 37.00 and 85.10 per cent. Several other workers in the recent past had conducted intensive surveys in different parts of India. Koppad and Mesta (2017) conducted a roving survey in Belagavi, Dharwad, Haveri and Gadag districts of Karnataka and reported the overall disease severity in the range of 19.21 to 59.14 per cent.

Yadav *et al.*, (2017) also reported the mean disease incidence of fruit rot in different villages of Jaipur and Rajasthan as 60.33 per cent with maximum incidence of 66.70 per cent and minimum incidence of 51.75 per cent.

Traditionally, Guntur district is having highest chilli area in Andhra Pradesh. The chilli growing areas were highly concentrated with continuous cultivation over many years which might be one of the main reasons for inoculum build up in the fields. Also, most of the soils are deep black which retain more moisture during rains, thus providing congenial environment for survival, infection and spread of the pathogen. The provenance effect might be playing a major role in high incidence (50.84 %) of the disease.

The higher incidence of the disease may be attributed to the continuous cultivation of the crop for many years as these areas are traditionally known for chilli cultivation since many years and there is continuous availability of inoculum of the pathogen.

In the present study, it was concluded that the disease incidence was highly varied among the

surveyed locations. Chilli growing in Guntur district is highly prone to the disease compared with other surveyed districts.

Acknowledgements

This work is supported by way of deputation for doctoral studies by Sri Konda Laxman Telangana Horticultural University and financial and professional assistance is gratefully acknowledged.

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How to cite this article:

Venkata Ramesh, K., R. Sarada Jayalakshmi Devi, K. Gopal, B. K. M. Lakshmi, T. Murali Krishna and Ravindra Reddy, B. 2018. Assessment of Chilli Anthracnose and Fruit Rot in Major Chilli Growing Areas of Andhra Pradesh State, India. *Int.J.Curr.Microbiol.App.Sci*. 7(03): 3789-3794. doi: <https://doi.org/10.20546/ijcmas.2018.703.439>