



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2019; 7(5): 1917-1919

© 2019 IJCS

Received: 04-07-2019

Accepted: 06-08-2019

Ashish Bobade

Krishi Vigyan Kendra, B.M.
College of Agriculture, Khandwa,
Madhya Pradesh, India

PP Shastry

Zonal Agricultural Research
Station, Khargone,
Madhya Pradesh, India

Jagdish Kumar Patidar

Department of Plant Pathology,
College of Agriculture, Gwalior,
Madhya Pradesh, India

Reeti Singh

Department of Plant Pathology,
College of Agriculture, Gwalior,
Madhya Pradesh, India

RK Pandya

Department of Plant Pathology,
College of Agriculture, Gwalior,
Madhya Pradesh, India

Correspondence

Ashish Bobade

Krishi Vigyan Kendra, B.M.
College of Agriculture, Khandwa,
Madhya Pradesh, India

Survey of anthracnose of chilli: A potential threat to chilli crop in major chilli growing districts of Madhya Pradesh

Ashish Bobade, PP Shastry, Jagdish Kumar Patidar, Reeti Singh and RK Pandya

Abstract

Anthracnose disease of chilli is widely distributed and economically important disease which affects the crop at pre and post-harvest crop stages. Anthracnose is caused by *Colletotrichum capsici* which produce small, circular black spots with concentric rings of acervuli on fruit skin which turn the fruit black. An extensive survey was conducted in 16 selected locations of Barwani, Khargone, Jabalpur, Burhanpur, Dewas, Jhabua, Khandwa and Chhindwara districts of Madhya Pradesh during 2016-17 and 2017-18. Minimum anthracnose incidence was recorded in Jabalpur district (17.45%) followed by Chhindwara district (19.60%) and Khargone district (20.90%), while maximum disease incidence was recorded in Burhanpur district (28.90%) followed by Barwani district (24.15%) and Jhabua district (23.70%).

Keywords: Survey, anthracnose, chilli, chilli crop, major chilli growing

Introduction

Chilli (*Capsicum annuum*) is one of the major crops, cultivated in tropical and subtropical domains of the world. It belongs to *Solanaceae* family (Hussain and Abid, 2011) ^[4] and is considered valuable cash crop around the world and also in India. In India during 2017, area under pepper chilli cultivation was 848.04 thousand hectare with a total production of 2163.89 thousand tonnes (Anon, 2017). Several biotic and abiotic factors influence the productivity of the chilli pepper crop worldwide. Among the biotic factors, many fungal, bacterial, nematodes and virus result into terrifying diseases which decay the quality and quantity of the produce and are mostly difficult to control (Nono-womdim, 2001) ^[8].

Anthracnose of chilli caused by *Colletotrichum capsici* is a major problem in chilli pepper production which infects the ripened fruits and result into fruit rot, occur frequently around the world in chilli growing areas (Poulos, 1992) ^[11]. Attack of *Colletotrichum capsici* results up to 50% fruit yield loss (Pakdeevaporn *et al.*, 2005) ^[9]. Production of anthracnose symptoms on chilli fruit includes sunken necrotic tissues with concentric rings of acervuli and fruit blemishes which reduced the market value (Manandhar *et al.*, 1995) ^[6].

Extensive work has been carried out on this disease in various countries of the world but in India, no work has been done to document the exact picture of the anthracnose disease especially in Madhya Pradesh. Current study was designed to investigate the disease incidence of chilli anthracnose by conducting extensive survey and this report will help other researchers to develop integrated strategic approach to manage the anthracnose of chilli in future to avoid yield losses due to the disease.

Methods and Materials

An intensive roving survey was conducted during Kharif 2016-17 and 2017-18 in the farmers field of major chilli growing districts of Madhya Pradesh *viz.*, Khandwa, Khargone, Burhanpur, Badwani, Dewas, Jhabua, Jabalpur and Chhindwara to find out the incidence of Anthracnose in chilli. In this survey, two blocks were taken from each district and from each block five fields were randomly selected in chilli growing villages. From each selected field the observation on incidence of Anthracnose disease was taken. For the calculation of disease incidence in each location, randomly 50 chilli plants were selected. Based on the infected and total number of fruits, per cent disease incidence was calculated by using following formula.

$$\text{Per cent disease incidence} = \frac{\text{Total number of infected fruits}}{\text{Total number of fruits}} \times 100$$

Results and Discussion

A survey was carried out in chilli growing districts of Madhya Pradesh to find out the incidence of anthracnose disease during 2016-17 and 2017-18. During the survey, total 16 places were visited under 08 districts viz., Barwani, Khargone, Jabalpur, Burhanpur, Dewas, Jhabua, Khandwa and Chhindwara. During 2016-17 and 2017-18, anthracnose disease was found at all the sites and the disease incidence ranged from 14.40 to 31.60 per cent and 18.80 to 28.40 per cent respectively, (Table-1). During 2016-17, lowest anthracnose incidence was noticed in Jabalpur (14.40%) followed by Shahpura (16.80%), Pandhana (17.60%), Sausar (20.40%), Kasrawad (21.20%), Dewas (21.60%), Khategaon (23.20%), Khargone (23.60%), Chhegaon Makhan (24.40%) and Rama (24.80%) and the highest anthracnose incidence was recorded in Khaknar (31.60%) followed by Burhanpur (30.40%), Barwani (28.40%), Pandhana (27.60%), Petlawad (27.20%) and Thikari (25.60%) [Table-1]. District level comparison mean district incidence indicate that the minimum anthracnose incidence was recorded in Jabalpur district (15.60%) followed by Chhindwara district (19.00%), Khargone district (22.40%) and Dewas district (22.40%), while maximum disease incidence was recorded in Burhanpur district (31.00%) followed by Barwani district (27.00%), Jhabua district (26.00%) and Khandwa district (26.00%) [Table-1 and 2].

During 2017-18, lowest anthracnose incidence was noticed Khargone (18.20%) followed by Dewas (18.60%), Jabalpur (18.80%), Thikari (19.40%), Sausar (19.60%), Shahpura (19.80%), Pandhana (20.20%), Petlawad (20.40%), Kasrawad (20.60%) and Pandhana (20.80%) and the highest anthracnose incidence recorded in Khaknar (28.40%), Burhanpur (25.20%), Barwani (23.20%), Khategaon (22.80%), Rama (22.40%) and Chhegaon Makhan (21.20%) [Table-1]. District level comparison mean district incidence indicate that the lowest anthracnose incidence was noticed in Jabalpur district (19.30%) followed by Khargone district (19.40%), Chhindwara district (20.20%), Khandwa district (20.70%) and Dewas district (20.70%), while highest anthracnose incidence was recorded in Burhanpur district (26.80%) followed by

Jhabua district (21.40%) and Barwani district (21.30%) [Table-1 and 2].

Mean of two years data showed that minimum anthracnose incidence was recorded in Jabalpur (16.60%), Shahpura (18.30%), Pandhana (19.20%), Sausar (20.00%), Dewas (20.10%), Khargone (20.90%), Kasrawad (20.90%), Thikari (22.50%) and Chhegaon Makhan (22.80%), while maximum anthracnose incidence was recorded in Khaknar (30.00%), Burhanpur (27.80%), Barwani (25.80%), Pandhana (23.90%), Petlawad (23.80%), Rama (23.60%) and Khategaon (23.00%) [Table-1]. District level comparison mean district incidence indicate that the minimum anthracnose incidence was recorded in Jabalpur district (17.45%), Chhindwara district followed by (19.60%), Khargone district (20.90%) and Dewas district (21.55%), while maximum disease incidence was recorded in Burhanpur district (28.90%) followed by Barwani district (24.15%), Jhabua district (23.70%) and Khandwa district (23.35%) [Table-1 and 2]. Similar survey was conducted by Mishra *et al.* (2018) and reported that maximum anthracnose severity recorded in Jaunpur (54.91%) and Mirzapur (54.00%). Prasad (2016) conducted survey was to assess the percent disease incidence of anthracnose of chilli in five locations in Bulileka area. The percentage incidence of anthracnose affected fruits under field a condition was more in green fruits which ranges from 65.5% to 78.5%. Sattar *et al.* (2016) [13] conducted comprehensive field survey was in five major chilli growing districts in Punjab province Pakistan. The mean disease incidence was highest in Kasur district (85.1%) followed by 81.83% in Vehari district while minimum mean disease incidence was observed in Rawalpindi district (37%). Anamika *et al.* (2014) also conducted survey in five locations of Rewa Province to assess the incidence of anthracnose of chilli and they observed 55.53 to 71.10 percent disease severity under field conditions. Similar results were reported by Yadav *et al.* (2016) [15], Park *et al.* (2007) [10] and Krishnareddy *et al.* (2008) [5]. Ekbote (2002) [3] conducted a survey on the prevalent diseases of chilli (*C. annuum*) in 6 talukas in the Haveri district of Karnataka. Fruit rot caused by *C. capsici* was the most prevalent disease (36.4%) of chilli. Sharma *et al.* (2011) [14] surveyed chilli and sweet pepper growing areas in Himachal Pradesh for the prevalence of fruit rot/anthracnose disease caused by a complex of *Colletotrichum* species. Disease incidence ranged from 12.5-45.0% based on total plants assessed in the field.

Table 1: Survey of anthracnose of chilli in major chilli growing districts of Madhya Pradesh

District	Block	Per cent disease incidence		
		2016-17	2017-18	Mean
Barwani	Barwani	28.40	23.20	25.80
	Thikari	25.60	19.40	22.50
Mean		27.00	21.30	24.15
Khargone	Khargone	23.60	18.20	20.90
	Kasrawad	21.20	20.60	20.90
Mean		22.40	19.40	20.90
Jabalpur	Jabalpur	14.40	18.80	16.60
	Shahpura	16.80	19.80	18.30
Mean		15.60	19.30	17.45
Burhanpur	Burhanpur	30.40	25.20	27.80
	Khaknar	31.60	28.40	30.00
Mean		31.00	26.80	28.90
Dewas	Dewas	21.60	18.60	20.10
	Khategaon	23.20	22.80	23.00
Mean		22.40	20.70	21.55
Jhabua	Rama	24.80	22.40	23.60
	Petlawad	27.20	20.40	23.80

	Mean	26.00	21.40	23.70
Khandwa	Chhegaon Makhan	24.40	21.20	22.80
	Pandhana	27.60	20.20	23.90
	Mean	26.00	20.70	23.35
Chhindwara	Sausar	20.40	19.60	20.00
	Pandhana	17.60	20.80	19.20
	Mean	19.00	20.20	19.60

Table 2: Anthracnose incidence of chilli in major chilli growing district of Madhya Pradesh

District	Per cent disease incidence		
	2016-17	2017-18	Mean
Barwani	27.00	21.30	24.15
Khargone	22.40	19.40	20.90
Jabalpur	15.60	19.30	17.45
Burhanpur	31.00	26.80	28.90
Dewas	22.40	20.70	21.55
Jhabua	26.00	21.40	23.70
Khandwa	26.00	20.70	23.35
Chhindwara	19.00	20.20	19.60

References

- Anamika, Salome RE, Nath P. Survey of anthracnose disease in chilli crop in Rewa region. *Int. J. Sci. Res.*, 2014; 3(8):1851-1854.
- Anonymous. Food and Agriculture Organization of the United Nations, 2017. <http://www.fao.org/faostat/en/>
- Ekbote SD. Survey of chilli diseases in Haveri district Karnataka. *J Agric. Sci.*, 2002; 15(4):726-728.
- Hussain F, Abid M. Pest and diseases of chilli crop in Pakistan: A review. *Int. J Biol. Biotech.* 2011; 8:325-332.
- Krishnareddy M, Rani RU, Kumar KSA, Reddy KM. Capsicum chlorosis virus (Genus *Tospovirus*) infecting chilli pepper (*Capsicum annuum*) in India. *J American Phytopathol. Soc.*, 2008; 92(10):1469-1475.
- Manandhar JB, Hartman, GL, Wang TC. Anthracnose development on pepper fruits inoculated with *Colletotrichum gloeosporioides*. *Pl. Dis.* 1995; 79:380-383.
- Mishra A, Ratan V, Trivedi S, Dabbas MR, Kripa S, Singh AK, Dixit S, Srivastava Y. Survey of anthracnose and wilt of chilli: A potential threat to chilli crop in central Uttar Pradesh. *J Pharma. Phytochem.* 2018; 7(2):1970-1976.
- Nono-womdim R. An overview of major virus diseases of vegetable crops in Africa and some aspects of their control. In: *Proceedings of Plant Virology in sub Saharan Africa*, 4-8 June 2001 IITA, Nigeria, 2001, 213-230.
- Pakdevaraporn P, Wasees S, Taylor PW, Mongkoloporn O. Inheritance of resistance to anthracnose caused by *Colletotrichum capsici* in *Capsicum annuum*. *Pl. Breed.* 2005; 124:206-208.
- Park YHB, Kim CG, Jeong SC, Yoon WK, Park KW, Lee BK. The effect of the anthracnose resistant chili pepper (Pep EST gene) on the non-target insects, Green Peach Aphids (*Myzus persicae* Sulzer, Homoptera). *Korean J Appl. Entomol.*, 2007; 46(3):343-348.
- Poulos JM. Problems and progress of chilli pepper production in the tropics. In: C.B Hock, L.W Hong, M Rejab, A.R Syed, (eds). *Proceedings of the conference on chilli pepper production in the tropics*. Malaysia: Kuala Lumpur, 1992, 98-129.
- Prasad RR. Survey of chilli anthracnose; Potential threat to chilli crops a focus on Bulileka, Labasa, Fiji Island. *Int. J Sci. Res. Publ.* 2016; 6(11):558-563.
- Sattar A, Abid R, Amjad S. Gondal, NM, Sajjad H. Survey of chilli anthracnose; potential threat to chilli crops a focus on Punjab, Pakistan. *Pakistan. J Phytopathol.* 2016; 28(01):81-86.
- Sharma PN, Katoch A, Sharma P, Sharma SK, Sharma OP. First report on association of *Colletotrichum coccodes* with chili anthracnose in India. *Pl. Dis.*, 2011; 95(12):1584.
- Yadav MK, Singh R. Intensity of anthracnose disease (*Colletotrichum capsici* Sydow.) on chilli crop in Jaunpur district region of eastern U.P. *Hort. Flora. Res. Spectrum*, 2016; 5(1):65-68.