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STATUS OF EARLY BLIGHT OF TOMATO IN MORENA, BHIND AND GWALIOR DISTRICTS OF MADHYA PRADESH

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ABSTRACT
Early blight (*Alternaria solani*) is an important and destructive foliar disease of tomato and prevalent in all tomato growing areas of Madhya Pradesh surveyed during 2014-15. The field survey was carried out during Kharif season 2014-15 at Gwalior, Bhind and Morena Districts of Madhya Pradesh and the percent disease incidence (PDI) was recorded ranged from 27.50% to 63.36%. The highest percent disease was observed in Research farm (63.36%) of Gwalior District. The minimum percent disease incidence was observed in Daboha (27.5%), village of Bhind District.

INTRODUCTION

Tomato [*Lycopersicon esculentum* Mill (2n = 24)] is considered as "Poor man's orange" in India. It is the most important and useful member of the family Solanaceae and is grown in tropics as well as subtropics during Rabi and Kharif season.Tomato is the world's largest vegetable crop and known as protective food both because of its special nutritive value as well as also for its wide spread production. Tomato is being extensively grown as an annual plant all over the world. (Somappa *et al*., 2013). India ranks second in area and production. In Madhya Pradesh area and production of tomato is 65.72 ha and 1937.37 tons respectively with productivity 29.5 tons/ha (Anonymous, 2014). There are several diseases known in tomato which caused by fungi, bacteria, viruses and nematodes. But from all fungal diseases early blight of tomato is one of the most important diseases (Munde *et al*. 2013). It is very destructive in temperate humid climates. Although the disease is called early blight, but can occur on the plant at all stage of development. Early blight can cause decrease in fruit quantity and quality (Kumar and Srivastava, 2013). Epidemic of early blight having coefficient of disease index (CODEX) 71.66% was noticed to cause a remarkable loss upto 78.5% in the yield of tomato (Datar and Mayee, 1981). It is most prevalent and destructive throughout the tomato growing areas causing loss of millions of Dollar annually worldwide including India (Datar and Mayee, 1982). In present study farmer's field surveyed for finding the status of early blight of tomato in some districts of Madhya Pradesh.

MATERIALS AND METHODS

Present investigations were undertaken to study on *Alternaria solani (Ellis and Martin)* causing early blight of tomato (*Lycopersicon esculentum Mill)*. The materials used and methods followed are described below. A systematic survey was carried out for recording the incidence of early blight on tomato grown in farmer's field in Gwalior, Bhind and Morena districts at the time of different stage of development. Five fields in each of villages of the three districts were surveyed. Using five plants from each field disease severity was assessed by using 0-5 scale based on the percentage of infected leaf area. Percent disease incidence was also estimated. Different locations were visited during Kharif season 2014-15 for assessing the intensity of the disease. Some plants from each cultivars or crop were taken randomly every time from each locality. The disease samples collected during the survey were examined microscopically to note the symptoms and prevalence of *Alternaria* sp. pathogenic on tomato. Disease scale to calculate the percent disease incidence of Alternaria leaf blight of tomato. (0-5 scale given by Datar and Mayee, 1982) in Table-1

$$\text{PDI}(\%) \quad \frac{\text{Sum of individual rating}}{\text{No.of plants examined} \quad \text{Maximum disease scale}} \quad 100$$

RESULTS AND DISCUSSION

To find out the prevalence of the disease on farmer's field a planned survey of the tomato growing area was carried out in the cropping year 2014-15. Five villages from each district viz; Gwalior, Bhind and Morena were surveyed for recording the incidence of early blight at different stage of development. In all the locations surveyed none of the field remained free from the early blight disease.

The field survey conducted in Gwalior, Bhind and Morena

Table 1: Disease scale to calculate the percent disease incidence of Alternaria leaf blight of tomato. (0-5 scale given by Dater and Mayee, 1982)

S. No.	Grade	Percent leaf area infected
1	0	<1
2	1	1-5
3	2	6-20
4	3	21-40
5	4	41-75
6	5	>75

Percent disease incidence (PDI) was worked out by using the formula given by Wheeler (1969)

Table 2: District wise incidence of early blight of tomato was calculating the average of five localities of respective district of M.P.

S. No.	Districts	Number of locations
1	Gwalior	5
2	Bhind	5
3	Morena	5
Total		15

Table 3: Percent disease incidence (PDI) of early blight of tomato in various districts of M.P. during 2014-15

S.No.	Location	%Disease incidence*
1	Gwalior	63.36
2	Ekehara	34.20
3	Saujana	51.40
4	Shyawari	56.00
5	Milavali	46.60
Mean		50.31
Bhind		
6	Daboha	27.50
7	Jamana	30.60
8	Mehgaon	55.00
9	Gingirkhi	47.42
10	Gormi	30.50
Mean	38.20	
Morena		
11	Ambah	61.27
12	Dimni	45.50
13	Sirmorkapura	51.50
14	Bharatpura	37.40
15	Ranpur	41.50
Mean	47.43	

Average of five locations.; The field survey conducted in Gwalior, Bhind and Morena districts of Madhya Pradesh during 2014-15 revealed that the maximum disease incidence (50.312 PDI) was observed in Gwalior district followed by Morena (47.43 PDI) and Bhind (38.20 PDI) districts. Highest disease incidence of 63.36 percent was recorded in Research Farm in Gwalior, while the lowest (27.50% PDI) was in Daboha village of Bhind district. In Gwalior district the range of disease

districts of Madhya Pradesh during 2014-15 revealed that the maximum disease incidence (50.312 PDI) was observed in Gwalior district followed by Morena (47.43 PDI) and Bhind (38.20 PDI) districts. Highest disease incidence of 63.36 percent was recorded in Research Farm in Gwalior, while the lowest (27.50% PDI) was in Daboha village of Bhind district. In Gwalior district the range of disease incidence was recorded 34.20 to 63.36 with mean incidence of 50.31 percent. The maximum disease incidence was found in Research Farm (63.36% PDI), which was followed by Shyawari (56.00%PDI), Saujana (51.40% PDI), Milavali (46.60% PDI) and minimum disease incidence was found in Ekeraha (34.20% PDI). In Bhind district the range of disease incidence was recorded 27.50 to 55.00 PDI with mean incidence of 38.20 percent. The maximum disease incidence was found in Mehgaon (55.00% PDI), which was followed by Gingirkhi (47.42%PDI), Jamana (30.60 %PDI), Gormi (30.50%PDI) and minimum disease incidence was found in Daboha (27.50% PDI). In Morena district, the percent disease incidence ranged from 37.40 to 61.27 with mean incidence of 47.43 percent (Table-8). The maximum disease incidence was found in Ambah (61.27%PDI), which was followed by Sirmorkapura (51.5%PDI), Dimni (45.50%PDI), Ranpur (41.50%PDI) and minimum disease incidence was found in Bharatpura (37.40% PDI).The survey also revealed that, the severity and incidence of early blight of tomato varied from location to location, obviously due to various factors like temperature, relative humidity, rainfall, sowing dates, diverse cultivars used and even it could also be attributed to existence of pathogenic variability. The higher disease incidence may be due to susceptibility of the cultivars or favourable environmental conditions. That must have helped for buildup of inoculum and subsequently resulting in increased disease severity. Such higher incidence of early blight was recorded by Datar and Mayee (1981).Present finding is in agreement with Munde *et al*. (2013) who carried out a survey of early blight of tomato disease at Thane, Raigad, Ratnagiri and Sindhudurg districts and showed that *A. solani* was constantly associated with early blight infected plants of tomato at all the locations. Similarly, Ganie *et al*. (2013) also reported that the disease was prevalent in all the potato growing areas of Kashmir valley surveyed during 2009 and 2010. Kamble *et al*. (2009) also reported early blight incited by *Alternaria solani* was found to be major disease of tomato under agroclimatic conditions of Konkan region and revealed that, early blight disease intensity in Raigad district ranged between 20.78 to 42.30 per cent and 35.12 to 55.75 per cent in Thane district. Balai *et al*. (2013) also assessed the disease intensity of Alternaria blight during rabi seasons 2009-10 and 2010-11 in Azamgarh, Ballia, Bhadohi, Chandauli, Ghazipur, Jaunpur, Mau, Mirzapur, Sohanbhdra and Varanasi of Eastern Uttar Pradesh and five neighboring districts of Bihar, viz. Sivan, Buxar, Arah, Bhabhua and Aurangabad. And found disease intensity range in different areas from 16.93 to 38.59 percent and 15.12 to 38.86 percent. Similarly Atik, 2007 and Randhawa, 2004, also conducted survey in different areas and found that none of the surveyed tomato field was found to be free from early blight disease of tomato. Variations were found in disease incidence in all surveyed fields because of the variation in climatic condition of a area and agronomic practices of a particular area.

REFERENCES

Atik, O., El-Ahmed, A., Abou-Shaar, M. and Yabrak, M. 2007. Field survey of the Alternaria tomato disease, and research of resistant genetic resources in Syria. *Arab J. Pl. Protec.* **25(2):** 129-137.

Anonymous 2014. DCA, Indian Horticulture Database-2014. p. 181.

Balai, L. P., Singh, R. B. and Yadav, S. M. 2013. Survey for the disease status intensity of Alternaria blight of pigeonpea in eastern part of Uttar Pradesh and adjoining districts of western Bihar. *The Bioscan.*

8(1): 63-66.

Datar, V. V. and Mayee, C. D. 1981. Assesssment of losses in tomato yield due to early blight. *Indian Phytopath*. **34(2):** 191-195.

Datar, V. V. and Mayee, C. D. 1982. Conidial dispersal of *Alternaria solani* in tomato. *Indian Phytopath*. **35:** 68-70.

Ganie, S. A., Ghani, M. Y. and Shabir-u-Rehman, Q. N. 2013. Bioefficacy of plant extracts and biocontrol agents against *Alternaria solani*. *African J. Microbio. Res*. **7(34):** 4397-4402.

Kamble, S. B., Sankeshwari, S. B. and Arekar, J. S. 2009. Survey on early blight of tomato caused by *Alternaria solani*. *Internat. J. Agric. Sci*. **5(1):** 317-319.

Kumar, S. and Srivastava, K. 2013. Screening of tomato genotypes against early blight (*Alternaria solani*) under field condition. *The Bioscan*. **8(1):** 189-193.

Munde, V. G., Diwakar, M. P., Thombre, B. B. and Dey, U. 2013. Survey and surveillance of early blight of tomato caused by *Alternariasolani*in Konkan region. *Internat. J. Pl. Protec*. **6(2):** 476-477.

Randhawa, H. S., Deora, A. and Sharma, R. C. 2004. Incidence of Alternaria leaf blight in tomato and efficacy of commercial fungicides for its control. *Ann. Biol*. **20(2):** 211-218.

Somappa, J., Srivastava, K., Sarma, B. K., Pal, C.and Kumar, R. 2013. Studies on growth conditions of the tomato Alternaria leaf spot causing *Alternaria solani*. *The Bioscan*. **8(1):** 101-104.

Wheeler, B. E. J. 1969. *An Introduction to Plant Diseases. J. Wiley and Sons Limited,* London, p. 301.