Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
JPP 2018; 7(2): 1272-1274
Received: 20-01-2018
Accepted: 21-02-2018

Vamsi Krishna
Department of Plant Pathology, Agricultural College, UAS, Raichur, Karnataka, India

Amaresh YS
Department of Plant Pathology, Agricultural College, UAS, Raichur, Karnataka, India

Gururaj Sunkad
Department of Plant Pathology, Agricultural College, UAS, Raichur, Karnataka, India

Mallikarjun Kenganal
Department of Plant Pathology, Agricultural College, UAS, Raichur, Karnataka, India

Abbas Husain
Department of Horticulture, Agricultural College, UAS, Raichur, Karnataka, India

Correspondence
Vamsi Krishna
Department of Plant Pathology, Agricultural College, UAS, Raichur, Karnataka, India

Status of Alternaria blight of tomato in different districts of North Eastern Karnataka

Vamsi Krishna, Amaresh YS, Gururaj Sunkad, Mallikarjun Kenganal and Abbas Husain

Abstract
The production and productivity of tomato has been facing many challenges of which early blight of tomato caused by *Alternaria solani* is generating considerable interest in terms of severe loses. To work on such a problem the dimensions of the devastation duly supported by data is a prerequisite. So the present paper aims to validate the distribution of this disease in tomato growing areas of north eastern districts of Karnataka *viz*., Raichur, Koppal and Yadgiri where disease severity was expressed in percent varied from 74.66 to 11.20 was observed. Koppal among three districts and Yalburga among different taluks has recorded highest mean disease severity of 37.31 and 51.63 percent respectively. Factors of climate, crop stage and cultural practices were found to be the major reasons under the investigation.

Keywords: Alternaria leaf blight, Tomato, Severity, Karnataka, Percent disease severity

Introduction
Tomato [*Solanum lycopersicum* Mill.] belongs to the family solanaceae is the second most important vegetable crop after potato and is first amongst processing crops. The production and productivity of tomato has been exposed to different biotic and abiotic constrains which have impeding effect on its cultivation. Keeping abiotic factors apart, among different biotic factors diseases plays a major role, which have direct impact on yield of tomato. Tomato is found to be susceptible to range of viral, bacterial, nematode and fungal diseases. Among the fungal diseases, early blight also known as target spot disease incited by *Alternaria solani* (Ellis and Martin) Jones and Grout is one of the world's most catastrophic disease incurring loss both at pre and post harvest stages in tomato growing tracks of India (Munde *et al*., 2013) [3], so also in Karnataka (Prasad, 2004) [4] and other states (Sahu *et al.*, 2013) [6]. The symptoms on tomato plants were first noticed on the older leaves as minute brown to black necrotic spots measuring one to two mm in diameter. These spots often enlarged with concentric rings to produce characteristic target board effect. Later upward progress of the disease was observed and leaves dried up and drooped down (Walker, 1952) [8]. Researches have always seen the disease as a major threat of tomato cultivation but the documentation of devastation is not widely understood and available data date backs a decade ago. So, within the frame work of these criteria a study was initiated to know the severity and distribution of Alternaria blight in three districts of north eastern Karnataka.

Materials and Methods
A random roving survey was made in three districts of North eastern Karnataka *viz.*, Raichur, Koppal, Yadagir where three taluks in each district and five villages in each taluk were observed for severity of Alternaria blight during *Kharif* 2016. Tomato fields were carefully observed for the incidence of disease and the factors which may be predisposing for incidence of the disease. The severity of Alternaria blight was recorded as per 0-5 disease rating scale. (Mayee and Datar, 1985) [1]

Scale	Description
0	No symptoms on the leaf
1	0-5 percent leaf area infected and covered by spot, no spot on petiole and branches
2	6-20 percent leaf area infected and covered by spot, some spots on petiole
3	21-40 percent leaf area infected and covered by spot, spots also seen on petiole, branches
4	41-70 percent leaf area infected and covered by spot, spots also seen on petiole, braches, stem
5	>71 percent leaf area infected and covered by spot, spots also seen on petiole, branch, stem, fruits

$$\text{Percent disease index (PDI)} = \frac{\text{Sum of the individual disease ratings}}{\text{Number of fruits/leaves scored} \times \text{Maximum disease grade}} \times 100$$

Results and Discussion

The disease prevalence has shown wide range of diversity which was expressed as percent disease index ranging from 11.20 in Naikal village to 74.66 percent in Kukunoor village. The severity of disease in different villages of the same taluks also shows considerable variation (Table1).

Table 1: Survey on the severity of early blight caused by *Alternaria solani* in major areas of northern eastern Karnataka during *Kharif* 2016.

Sl. No.	District	Taluka	Village	Crop stage	Number of fields	PDI
1		Raichur	MARS Farm	Harvesting	5	43.86
			Palkamdoddi	Flowering	5	24.80
			Chandrabanda	Harvesting	5	62.80
			Biajangera	Harvesting	4	51.15
			Sidharampur	Harvesting	5	60.13
	Raichur	Mean				48.54
		Deodurga	Gabbur	Fruiting	3	36.83
			Mallinaikandoddi	Flowering	4	25.45
			Bhummangund	Fruiting	4	39.12
			Mailapur	Vegetative	3	27.91
			Kolur	Flowering	3	24.60
		Mean				30.78
		Lingasugur	Eachanhal	Vegetative	3	26.60
			Adavibhavi	Flowering	4	34.87
			Sante-kellur	Fruiting	3	35.83
			Neeralkera	Vegetative	3	16.40
			Hunkunti	Flowering	4	24.90
		Mean				27.72
2	Koppal	Koppal	Hiresindogi	Fruiting	2	23.50
			Kamanur	Vegetative	3	16.66
			Lebgera	Flowering	4	26.50
			Chiksulikeri	Fruiting	3	34.00
			Hirebommanhal	Flowering	4	34.16
		Mean				26.96
		Kustugi	Hirebannigol	Flowering	3	27.58
			Nerebenchi	Fruiting	3	35.60
			Hiremannapur	Vegetative	4	24.75
			Kandakur	Fruiting	3	35.83
			Hanamsagar	Harvesting	4	43.00
		Mean				33.35
		Yalburga	Nittali	Fruiting	4	41.60
			Kuknoor	Harvesting	3	74.66
			Yalburga	Flowering	3	35.66
			Bandi	Fruiting	3	40.36
			Mataldinni	Harvesting	3	65.86
		Mean				51.63
3	Yadgir	Shahapur	Khanapur	Fruiting	3	57.60
			Naikal	Vegetative	3	11.20
			Gundhalli	Flowering	4	24.60
			Manginhal	Fruiting	3	42.33
			Gulsaram	Fruiting	4	52.20
		Mean				37.58
		Yadgir	Paglapur	Flowering	3	24.86
			Ramasamudra	Fruiting	4	36.50
			Jaigram	Fruiting	3	35.83
			Zinkera	Fruiting	3	33.41
			Chanderki	Flowering	4	33.06
		Mean				32.73
		Shorapur	Khanapur	Fruiting	3	54.60
			Karnal	Fruiting	4	34.87
			Hemnoor	Flowering	3	29.75
			Kupgal	Fruiting	4	34.62
			Sathampet	Fruiting	3	43.20
		Mean				39.40

The severity of disease among different districts did not differ much with a close variations of Koppal (37.31), Yadgir (36.57) followed by Raichur (35.68). (Table. 1). On the contrary there is a considerable difference at taluk level in disease severity among the same district.

Table 2: District wise mean severity of early blight caused by *Alternaria solani* in tomato growing areas of north eastern Karnataka during *Kharif* 2016.

Sl. No.	District	Taluk	PDI
1	Raichur	Raichur	48.54
		Deodurga	30.78
		Lingasugur	27.72
	Mean		35.68
2	Koppal	Koppal	26.96
		Kustugi	33.35
		Yalburga	51.63
	Mean		37.31
3	Yadgir	Shahapur	37.58
		Yadgir	32.73
		Shorapur	39.40
	Mean		36.57

Throughout the survey the crop stage was found to be closely related with the disease severity and the susceptibility increases with increase in age of the crop recorded more disease severity in those fields where the stage of crop was at fruiting and harvesting compared to vegetative and flowering. The enhanced susceptibility of plant with age advancement was supported with previous studies made by Vloutoglou and Kalogerakis (2000) [7]. Maximum disease severity were observed in leaf minor infested field. The highest disease severity (74.66) was observed in Kukunoor village of Yalburga taluk in Koppal district. The increase in disease incidence with attack of leaf miner where damage of leaves enhancing disease and predisposed with leaf miner attack for incidence of *Alternaria* blight on tomato and other crops has been supported with previous studies made by Durairaj *et al*., 2010 [2]. Among nine taluks surveyed, the maximum disease severity was recorded in Yalburga (51.63%) taluk of Koppal, while minimum disease severity (26.96%) was observed in Koppal taluk of same district, while the severity of the disease was also found varied from one location to other. The differences of disease distribution among different locations might be due to cultivar difference which responds differently to pathogen, variability of pathogen, favorable environmental conditions which include a set of factors such as optimum temperature and relative humidity, moisture conditions that must have favored the disease development, build up of inoculum which resulted in subsequent increase of disease severity. In those locations where less disease severity were recorded due to the absence of congenial conditions for disease development coupled with good management practices reduced the buildup of inoculum subsequently decreasing disease severity Roopa and Yadahalli (2016) [5]. This conclude that there was varied distribution of Alternaria blight in three districts surveyed and subjected to factors of age, climate, and leaf miner infestation to certain extent and this information may eventually improve knowledge about the disease and further research findings.

Acknowledgements: We gratefully acknowledge Dr. Aswathnarayana for his support and guidance during the survey.

Reference

1. Datar VV, Mayee CD. Chemical management of early blight of tomato. J Maharashtra Agric. Univ. 1985; 10:278-280.
2. Duarairj C, Karthikeyan G, Ganapathy N, Karuppuchamy P. Predisposition effect of *Liriomyza trifolii* damage to *Alternaria* leaf spot disease in tomato. Karnataka J Agric. Sci. 2010; 23(1):161-162.
3. Munde VG, Diwakar MP, Thombre BB, Utpal Dey. Survey and surveillance of early blight of tomato caused by *Alternaria solani* in Konkan region. Intl. J Plant. Prot. 2013; 6(2):476-477.
4. Prasad Y, Naik MK. Status of Alternaria Blight of tomato in North Eastern Karnataka. Karnataka J. Agri. Sci., 2004; 17(3):607-608.
5. Roopa S, Yadahalli KB. Severity and distribution of Alternaria blight disease of tomato in Northern Karnataka. Biochem. Cell Arch. 2016; 16:1.
6. Sahu DK, Khare CP, Patel R. Seasonal occurrence of tomato diseases and survey of early blight in major tomato-growing regions of Raipur district. The Ecoscan. 2013; 4:153-157.
7. Vloutoglou I, Kalogerakis SN. Effects of inoculum concentration, wetness duration and plant age on development of early blight (*Alternaria solani*) and on shedding of leaves in tomato plants. Plant. Pathol. 2000; 49:339-345.
8. Walker JC. Diseases of Vegetable Crops, McGraw Hill Book Company Inc., New York. 1952, 529.