



STEM NECROSIS AND LEAF SPOT DISEASE CAUSED BY *MYROTHECIUM RORIDUM* ON COFFEE SEEDLINGS IN CHIKMAGALUR DISTRICT OF KARNATAKA

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Abstract

The quality of raising seedlings in a perennial crop like coffee may be affected by several abiotic and biotic factors. In India, coffee seedlings are affected by three different diseases in the nursery viz., collar rot, brown eye spot, stem necrosis and leaf spot. The stem necrosis and leaf spot disease caused by the fungus *Myrothecium roridum* Tode ex Fr. is posing a serious problem in coffee nurseries particularly during rainy period of July and August months. The present study was under taken with a fixed plot survey to assess the distribution, incidence and severity of stem necrosis and leaf spot disease in major coffee growing taluks of Chikmagalur district in the year 2016 and 2017. Out of 22 coffee nurseries surveyed in four major coffee growing taluks of Chikmagalur district, the survey results (pooled data analysis of two years 2016 & 2017) indicated that maximum leaf spot incidence (23.98%) was recorded on Chandragiri cultivar of arabica coffee in Koppa taluk and minimum incidence (16.40%) in Mudigere taluk on C×R cultivar of robusta coffee. Maximum leaf spot severity (30.34%) was recorded on Chandragiri in Chikmagalur taluk and minimum severity (14.87%) in Koppa taluk on C×R. Maximum stem necrosis incidence (22.00%) was observed in Koppa taluk on Chandragiri and minimum incidence (3.60%) on coffee cultivar C×R from N. R. Pura taluk of Chikmagalur district. The data recorded on *Myrothecium* leaf spot incidence and severity and stem necrosis disease data recorded on the coffee cultivars Chandragiri and C×R were subjected to correlation analysis in relation to rainfall received during the months of July and August in the years 2016 and 2017. The analysis indicated that total rainfall was positively correlated with the disease incidence and severity in all the taluks of Chikmagalur district. Further, the analysis clearly indicated that rainfall plays a major role in the occurrence of the disease and has an effect on incidence and severity of the pathogen *M. roridum* on coffee seedlings.

Key words: Coffee, *Myrothecium roridum*, stem necrosis, leaf spot, nursery

Introduction

The most important member of the family Rubiaceae is the genus *Coffea*. Coffee is a perennial agricultural crop and its produce is the world's most valuable exporting commodity grown in more than 80 countries across four continents. About 50 producing countries export coffee for earning their foreign currency. Due to its flavour and commercial value of the bean, the demand for coffee seeds and seedlings for different coffee cultivars has been increasing over the years with expansion of coffee cultivation in India (Anon., 2014). The importance of best quality planting material as an investment is a well realized factor for commercial cultivation of coffee. Hence,

nursery is a pre-requisite for meeting quality seedlings. The coffee seedlings are grown under shade in the nurseries and are ready to be transplanted in the field when they are 6 to 12 months old. During this course of time the coffee seedlings are prone to many pests and diseases. Adequate protection has to be given against diseases in the nursery as the seedlings play a major role in raising a good and healthy coffee plantation.

Stem necrosis and leaf spot disease is caused by the fungus *Myrothecium roridum* Tode ex Fr. The pathogen infects foliage as well as stem of coffee seedlings and is observed on both the cultivated species of *Coffea*. The fungus *Myrothecium* belongs to Family: Incertae sedis, Order: Hypocreales, Class: Sordariomycetes. It is

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reported that *Myrothecium* spp. are common soil inhabitants in temperate and tropical regions of the world (Domsch *et al.*, 1980). Presently, there are several species of *Myrothecium*, most of them are reported as saprophytes. *M. roridum* is considered as a cosmopolitan plant pathogen with a wide host range causing leaf spot and necrosis on many economically important crop plants (Parakhia and Vaishnav, 1984; Ahrazem *et al.* 2000).

The fungus *M. roridum* causing stem necrosis and leaf spot disease is considered as one of the major disease of coffee seedlings in Brazil, Colombia, Costa Rica and Guatemala since 1960s (Schieber and Echandi, 1963). In India, stem necrosis and leaf spot disease is considered as an emerging major disease in coffee nurseries since 5-6 years. The disease is posing a serious problem in many of the coffee growing areas of India (Daivasikamani *et al.*, 2016; Ranjini and Raja Naika, 2018). There are few reports available on *M. roridum* incidence on coffee seedlings from India. Nagaraj and George (1958) reported the *Myrothecium* disease observed on coffee seedlings as “Target leaf spot” disease. While, Nirmala Kannan and Muthappa (1982) reported the *Myrothecium* disease as “Tip blight of coffee”.

Disease symptoms

The pathogen *M. roridum* infects both stem and leaf of coffee seedlings. The symptoms are;

On stem: The affected seedlings show water-soaked brown to grey discoloration on the tender stem with necrosis of tissues above the soil level. Sometimes 2 to 3 such lesions are noticed on the same stem. The infected region later shows cushion shaped black fruiting bodies surrounded by white mycelia (Fig. 1). Affected seedlings gradually start wilting and die.

On leaves: Infected leaves initially show water soaked circular necrotic spots which gradually spread. These spots then become brown with concentric rings. In severe condition 2 to 3 such spots coalesce to form irregular necrotic patches and may even cover the entire lamina of the leaf. Black fruiting bodies are noticed on the under surface of the affected leaf all along the concentric rings of the necrotic spot (Fig. 2). Occasionally the centre of the lesion cracks irregularly, ruptures and some of the affected tissues drop down during the rainy season (Ranjini and Raja Naika, 2018).

This disease is emerging as a new problem in the coffee nurseries. There is lack of information on the prevalence of the disease in coffee growing regions of Karnataka state. Hence, the present study was undertaken in Chikmagalur district of Karnataka to assess the distribution, incidence, severity of the disease and effect of other factors influencing the disease development and etiology of the pathogen to develop suitable management practices against this disease.

Materials and Methods

To assess the distribution, incidence and severity of stem necrosis and leaf spot disease of coffee seedlings, a disease survey was conducted in Chikmagalur district of Karnataka state by adopting fixed plot survey (Waller *et al.*, 2002). Using the survey format baseline data such as rain fall received, coffee cultivars raised, nursery mixtures used, nutrients applied, use of PGRs, application of plant protection chemicals etc. were collected from the farmers growing coffee seedlings in the nurseries. During the survey, incidence and severity of stem necrosis and leaf spot disease were recorded separately. Observations on the disease were recorded from four major coffee growing taluks of Chikmagalur district. A minimum of 5 villages spread over in each taluk was selected and a total of 22 villages were selected for the survey. The survey was carried out during the years 2016 and 2017 at peak incidence period of the disease (July and August) when there was a continuous rain without long dry spell. In each nursery, *Coffea arabica* cv. Chandragiri (Sln.13) and *Coffea canephora* cv. C×R (Sln.3R) was selected in four major coffee growing taluks viz., Chikmagalur, Koppa, N. R. Pura and Mudigere in Chikmagalur district. The Chandragiri and C×R are the two major coffee cultivars grown widely in the coffee tracts of India falling under the category of arabica and robusta respectively. In each nursery, 50 seedlings per coffee cultivar were selected to record disease incidence and 10 seedlings to record disease severity.

Incidence and severity of stem necrosis and leaf spot were recorded from Chandragiri and C×R coffee cultivars and also collected the data of rainfall received during the months of July and August for the years 2016 and 2017 from the nurseries identified for the survey. Further, disease score was calculated using the formula as given below:

$$\% \text{disease incidence} = \frac{\text{Total No. of infected seedlings}}{\text{Total No. of seedlings observed}} \times 100$$

Observation on disease severity was recorded by following 0-9 point scale as described by Mayee and Datar (1986). The per cent disease severity was expressed using the formula as given below:

Disease rating scale

Grade	Per cent leaf area infected
0	0
1	1-10
3	11-25
5	26-50
7	51-75
9	>75

Per cent disease severity was calculated and expressed as per the formula given by Wheeler (1969).

$$\% \text{disease severity} = \frac{\text{Sum of all numerical disease rating}}{\text{Total No. of samples observed}} \times 100$$

$$\times \text{Maximum disease rating grade}$$

The data on incidence and severity of leaf spot and incidence of stem necrosis recorded from Chandragiri and C × R coffee cultivars were correlated with rainfall received during the months of July and August for the

years 2016 and 2017.

Results and Discussion

Survey and surveillance on disease form the basis for any successful plant protection that depends on early detection of disease followed by timely adoption of management measures. Survey on the incidence and severity of disease helps to gather information on the prevalence, severity and distribution of disease, pathogen diversity in a particular agro-climatic zone. As the stem

Table 1: Stem necrosis and leaf spot disease incidence and severity in different taluks of Chikmagalur district during 2016

Name of the taluk	Name of the village	Rainfall (mm)		Arabica (cv. Chandragiri)			Robusta (cv. C×R)		
		July	August	%LSI	%LSS	%SNI	%LSI	%LSS	%SNI
Chikmagalur	Jenugadde	265	132	13.40	26.90	14.00	13.80	14.30	8.00
	Kanathi	246	157	14.30	28.70	18.00	15.80	17.50	12.00
	Arenoor	345	201	22.00	34.00	24.00	20.60	18.40	14.00
	Avathi	389	220	23.80	39.80	26.00	21.80	19.20	18.00
	Hosahalli	353	179	17.00	33.80	18.00	18.60	18.70	20.00
	Mean	319.60	177.80	18.10	32.64	20.00	18.12	17.62	14.40
	Range	246-389	132-220	13.40 -23.80	26.90 -39.80	14.00 -26.00	13.80 -21.80	14.30 -19.20	8.00 -20.00
Koppa	Adigebylu	592	377	18.50	14.90	18.00	16.80	8.20	6.00
	Seegodu	657	521	23.50	28.30	28.00	20.00	18.40	17.00
	Hiregadde	546	376	17.80	10.30	14.00	6.60	4.50	5.00
	Ravinagara	652	466	18.70	23.60	18.00	19.20	9.30	6.00
	Honnegundi	673	463	22.10	25.60	18.00	19.80	12.00	9.00
	Megunda	868	609	39.50	43.50	38.00	21.20	18.90	18.00
	Mean	566.00	405.83	23.40	24.40	23.00	17.30	11.90	10.20
Range	546-868	376-609	17.80 -39.50	10.30 -43.50	14.00 -38.00	6.60 -21.20	4.50 -18.90	5.00 -18.00	
N. R. Pura	Shivanagara	335	197	18.20	26.00	14.00	21.40	13.60	0.00
	Balehonnur	415	253	23.00	34.40	22.00	21.80	16.00	2.00
	Karehadlu	625	480	35.40	37.10	44.00	22.30	21.60	14.00
	Bannur	334	174	17.20	14.90	2.00	7.60	10.20	0.00
	Karkie	344	159	9.30	10.30	0.00	6.80	6.90	0.00
	Mean	410.60	252.60	20.62	24.54	16.40	15.98	13.66	3.20
	Range	344-625	159-480	9.30 -35.40	10.03 -37.10	0.00 -44.00	6.80 -22.30	10.90 -25.60	0.00 -14.00
Mudigere	Hesagal	421	209	10.90	23.60	10.00	12.90	15.60	2.00
	Daradahalli	649	321	17.60	33.10	22.00	19.20	23.10	10.00
	Bidarahalli	646	243	17.00	30.00	20.00	18.60	20.30	8.00
	Hanumanahalli	804	283	25.30	41.30	34.00	21.50	22.60	14.00
	Sabbenahalli	266	156	10.90	21.80	10.00	11.50	11.90	0.00
	Phalguni	474	161	16.90	25.10	20.00	12.90	19.60	2.00
	Mean	473.16	194.00	16.40	29.20	19.30	16.10	18.85	6.00
Range	266-804	156-321	10.90 -25.30	21.80 -41.30	10.00 -34.00	11.50 -21.50	11.90 -23.10	0.00 -14.00	

Legend: % LSI: Per cent Leaf Spot Incidence, % LSS: Per cent Leaf Spot Severity, % SNI: Per cent Stem Necrosis Incidence

necrosis and leaf spot disease caused by the pathogen *Myrothecium roridum* is becoming a major threat to seedlings in coffee nurseries, the disease survey was undertaken and the results are presented. For stem necrosis, observations were recorded only on the disease incidence, since the infection of the pathogen *M. roridum* on any portion of the main stem of developing coffee seedlings leads to death of the seedlings. Hence, disease severity could not be recorded. In the case of leaf spot disease the disease incidence and severity were recorded.

The stem necrosis and leaf spot disease incidence and severity recorded from different nurseries of Chikmagalur district for the years 2016 and 2017 are presented in table 1 and 2 respectively.

It is evident from the data (table 1) that maximum mean disease incidence of stem necrosis (23.00%) and leaf spot (23.40%) was observed in arabica coffee from Koppa taluk which has received a total rainfall of 971.83 mm in the months of July and August 2016. Whereas, in robusta coffee maximum mean disease incidence of stem

Table 2: Stem necrosis and leaf spot disease incidence and severity in different taluks of Chikmagalur district during 2017

Name of the taluk	Name of the village	Rainfall (mm)		Arabica (cv. Chandragiri)			Robusta (cv. C×R)		
		July	August	%LSI	%LSS	%SNI	%LSI	%LSS	%SNI
Chikmagalur	Jenugadde	212	359	17.80	28.10	16.00	13.80	20.10	16.00
	Kanathi	291	526	24.00	29.10	24.00	17.70	22.10	18.00
	Arenoor	337	348	19.80	28.60	20.00	16.20	21.30	18.00
	Avathi	365	440	21.00	29.10	24.00	17.70	22.10	20.00
	Hosahalli	276	277	15.10	21.70	12.00	13.10	16.80	4.00
	Mean	296.20	390.00	19.54	27.32	19.20	15.70	20.48	15.20
	Range	212-365	277-526	15.10 -24.00	21.70 -29.10	12.00 -24.00	13.10 -17.70	16.80 -22.10	4.00 -20.00
Koppa	Adigebylu	556	560	19.10	13.90	16.00	15.80	8.00	4.00
	Seegodu	564	563	19.50	19.60	22.00	15.80	8.20	8.00
	Hiregadde	616	562	21.70	25.60	22.00	16.20	10.90	12.00
	Ravinagara	430	570	17.80	10.30	10.00	6.50	7.90	4.00
	Honnegundi	654	677	28.50	28.30	24.00	16.20	14.40	18.00
	Megunda	713	789	41.20	40.50	38.00	17.00	21.10	20.00
	Mean	496.16	526.83	24.60	23.00	22.00	14.60	11.80	11.00
Range	430-713	560-789	17.80 -41.20	10.30 -40.50	10.00 -38.00	6.50 -17.00	7.90 -21.10	4.00 -20.00	
N. R. Pura	Shivanagara	290	358	18.20	24.00	12.00	12.30	15.00	0.00
	Balehonnur	352	395	19.00	32.40	28.00	19.40	20.40	2.00
	Karehadlu	530	554	39.20	38.20	41.00	25.80	21.50	12.00
	Bannur	296	337	15.20	19.20	2.00	5.80	7.40	0.00
	Karkie	272	363	8.90	9.30	0.00	7.60	11.20	0.00
	Mean	348.00	401.40	20.10	24.62	16.60	14.18	15.10	2.80
	Range	272-530	337-554	8.90 -39.20	9.30 -38.20	2.00 -41.00	5.80 -25.80	7.40 -21.50	0.00 -12.00
Mudigere	Hesagal	333	367	11.90	18.80	12.00	8.60	14.60	0.00
	Daradahalli	430	462	16.60	22.30	16.00	9.90	16.10	8.00
	Bidarahalli	465	485	21.90	24.30	24.00	17.50	16.30	10.00
	Hanumanahalli	595	459	45.30	49.10	39.00	20.20	22.20	18.00
	Sabbenahalli	229	346	11.00	15.00	10.00	6.90	4.80	0.00
	Phalguni	468	408	15.00	21.10	15.00	9.10	14.60	2.00
	Mean	364.50	360.00	20.28	25.10	19.33	12.03	14.77	6.33
Range	229-595	346-485	11.00 -45.30	15.00 -49.10	10.00 -39.00	6.90 -20.20	4.80 -22.20	0.00 -18.00	

Legend: % LSI: Per cent Leaf Spot Incidence, % LSS: Per cent Leaf Spot Severity, % SNI: Per cent Stem Necrosis Incidence

Table 3: Mean incidence and severity of stem necrosis and leaf spot disease in different taluks of Chikmagalur district during 2016 and 2017

Name of the taluk	Name of the village	Rainfall (mm)		Arabica (cv. Chandragiri)			Robusta (cv. C×R)		
		July	August	%LSI	%LSS	%SNI	%LSI	%LSS	%SNI
Chikmagalur	Jenugadde	238	245	14.20	25.20	13.00	14.40	20.80	9.00
	Kanathi	268	341	19.00	31.30	19.00	19.40	22.80	22.00
	Arenoor	341	274	21.80	33.30	24.00	20.20	26.10	24.00
	Avathi	377	330	23.00	34.40	28.00	26.60	29.30	28.00
	Hosahalli	314	228	16.00	27.50	17.00	17.80	22.60	21.00
	Mean	307.60	283.60	18.80	30.34	20.20	19.68	24.32	20.80
	Range	238-377	228-341	14.20 -23.00	25.20 -34.40	13.00 -28.00	14.40 -26.60	20.80 -29.30	9.00 -28.00
Koppa	Adigebylu	574	468	17.80	10.30	11.00	8.10	9.10	6.00
	Seegodu	610	542	20.60	24.60	22.00	19.30	12.10	19.00
	Hiregadde	581	469	19.00	14.40	17.00	17.80	10.20	7.00
	Ravinagara	541	518	20.20	22.60	19.00	19.20	12.00	9.00
	Honnegundi	663	570	26.00	28.30	25.00	19.70	21.40	21.00
	Megunda	790	699	40.30	42.00	38.00	20.00	24.40	22.00
	Mean	626.50	544.33	23.98	23.70	22.00	17.35	14.87	14.00
Range	541-790	468-699	19.00 -40.30	14.40 -42.00	11.00 -38.00	8.10 -20.0	9.10 -24.40	6.00 -22.00	
N. R. Pura	Shivanagara	312	277	18.20	25.00	13.00	19.30	17.50	1.00
	Balehonnur	383	324	21.00	33.40	25.00	22.40	20.20	3.00
	Karehadlu	577	517	37.30	37.65	42.50	26.30	27.60	14.00
	Bannur	315	255	16.20	17.00	2.00	9.60	14.40	0.00
	Karkie	308	261	9.10	9.80	0.00	8.30	10.30	0.00
	Mean	379.00	326.80	20.36	17.76	16.50	17.18	18.00	3.60
	Range	308-577	255-517	9.10 -37.30	3.60 -33.40	0.00 -42.50	8.30 -26.30	10.30 -27.60	0.00 -14.00
Mudigere	Hesagal	377	288	11.40	22.50	11.00	12.30	18.10	3.00
	Daradahalli	539	391	17.10	31.80	23.00	22.50	22.60	20.00
	Bidarahalli	555	364	16.90	23.90	18.00	15.60	22.60	11.00
	Hanumanahalli	699	371	35.30	41.10	36.50	22.70	26.20	21.00
	Sabbenahalli	247	251	10.90	20.30	10.00	11.90	18.10	3.00
	Phalguni	471	284	16.00	23.10	17.50	13.40	21.80	4.00
	Mean	481.33	324.83	17.93	27.12	19.33	16.40	21.57	10.33
Range	247-699	251-391	10.90 -35.30	20.30 -41.10	10.00 -36.50	11.90 -22.70	18.10 -26.20	3.00 -21.00	

Legend: % LSI: Per cent Leaf Spot Incidence, % LSS: Per cent Leaf Spot Severity, % SNI: Per cent Stem Necrosis Incidence

necrosis and leaf spot was 14.40% and 18.12% respectively from Chikmagalur taluk. In arabica, the mean minimum stem necrosis incidence recorded was 16.40% from N. R. Pura taluk and leaf spot incidence of 16.40% from Mudigere taluk which has received a total rainfall of 663.20 mm and 667.16 mm respectively in the peak disease incidence period of July and August months of 2016. In case of robusta, mean minimum stem necrosis and leaf spot incidence recorded was 3.20% and 15.98%

respectively from N. R. Pura taluk of Chikmagalur district. The mean maximum leaf spot disease severity was 32.64% in arabica and 18.85% in robusta recorded from Chikmagalur and Mudigere taluks respectively. Whereas, mean minimum leaf spot disease severity was 24.40% and 11.90% in the case of arabica and robusta respectively recorded from Koppa taluk of Chikmagalur district.

In arabica coffee (table 2), maximum mean disease

Table 4: Correlation coefficient (r) of stem necrosis and leaf spot incidence and severity with total rainfall of July and August in different taluks of Chikmagalur district during the years 2016 and 2017

Name of the taluk	Leaf spot incidence				Leaf spot severity				Stem necrosis incidence			
	Chandragiri		C×R		Chandragiri		C×R		Chandragiri		C×R	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
	‘r’ value											
Chikmagalur	0.93	0.92	0.96	0.98	0.97	0.69	0.81	0.84	0.86	0.97	0.80	0.72
Koppa	0.94	0.96	0.71	0.65	0.99	0.96	0.86	0.96	0.92	0.95	0.84	0.94
N. R. Pura	0.93	0.95	0.59	0.89	0.76	0.80	0.89	0.75	0.95	0.89	0.99	0.99
Mudigere	0.86	0.78	0.98	0.83	0.94	0.78	0.91	0.93	0.87	0.84	0.97	0.87

**Fig. 1:** Stem Necrosis on coffee seedlings

incidence of stem necrosis (22.00%) and leaf spot (24.60%) was observed from Koppa taluk which has received a total rainfall of 1022.99 mm in the months of July and August 2017. In robusta coffee, maximum mean disease incidence of stem necrosis and leaf spot was 15.20% and 15.70% respectively recorded from Chikmagalur taluk which has received a total rain fall of 686.20 mm in July and August 2017. In arabica, the mean minimum stem necrosis incidence recorded was 16.60% from N. R. Pura taluk and leaf spot incidence of 19.54% from Chikmagalur taluk which has received a total rainfall

**Fig. 2:** Leaf Spot symptoms on coffee seedlings

of 749.40 mm and 686.20 mm respectively in the peak disease incidence period of July and August months of 2017. In case of robusta, mean minimum stem necrosis and leaf spot incidence recorded was 2.80% and 12.03% respectively from N. R. Pura and Mudigere taluks. The mean maximum leaf spot disease severity was 27.32% in arabica and 20.48% in robusta respectively recorded from Chikmagalur taluk. Whereas, mean minimum leaf spot disease severity was 23.00% and 11.80% in the case of arabica and robusta respectively recorded from Koppa taluk of Chikmagalur district.

Two years mean incidence and severity of stem necrosis and leaf spot diseases are presented in the table 3.

The two years (2016 & 2017) pooled data analysis (table 3) revealed that mean maximum stem necrosis incidence of 22.00% in arabica and 20.80% in robusta coffee was recorded from Chikmagalur taluk which has received a mean total rainfall of 591.20 mm in July and August months. Whereas, mean minimum stem necrosis incidence of 16.50% in arabica and 3.60% in robusta coffee was recorded from N. R. Pura taluk which has received a mean total rainfall of 705.80 mm. Similarly, mean maximum leaf spot incidence of 23.98% in arabica and 19.68% in robusta coffee was recorded from Koppa and Chikmagalur taluk respectively which has received

a mean total rainfall of 1170.83 mm and 591.20 mm in July and August months. Mean minimum leaf spot incidence of 17.93% in arabica and 16.40% in robusta coffee was recorded from Mudigere taluk which has received a mean total rainfall of 806.16 mm. The mean maximum leaf spot disease severity was 30.34% in arabica and 24.32% in robusta respectively was recorded from Chikmagalur taluk. Whereas, mean minimum leaf spot disease severity of 17.76% and 14.87% in the case of arabica and robusta respectively was recorded from N. R. Pura and Koppa taluk of Chikmagalur district.

The data recorded on *Myrothecium* leaf spot incidence and severity and stem necrosis disease incidence from the coffee cultivars Chandragiri and C×R were subjected to correlation analysis in relation to rainfall received during the months of July and August in the year 2016 and 2017. The results from the analysis were found highly significant. From the data (table 4) it is evident that the total rainfall was positively correlated with the disease incidence and severity in all the taluks of Chikmagalur district. The analysis clearly indicated that rainfall plays a major role in the occurrence of the disease and has a profound effect on incidence and severity of stem necrosis and leaf spot.

Parakhia (1979) in his disease survey studies observed that *M. roridum* was causing considerable damage to bittergourd in Junagadh area. A survey conducted by Sumera *et al.* (2017) on bittergourd disease in different ecological zones of Punjab revealed that highest *Myrothecium* leaf spot disease incidence in mixed cropping zone compared to single cropping zone. This indicated the pathogen behavior in different agro-climatic zones. Tripathi *et al.* (1986) in the course of a survey conducted near Kanpur recorded the leaf spot disease caused by *Myrothecium roridum* on *Cassia glauca*, *C. obtusifolia*, *Dalbergia sissoo* and *Erythrina indica* which suggested the wide host range of *M. roridum*.

The survey study revealed that the fungus *M. roridum* causing stem necrosis and leaf spot disease on coffee seedlings is widely distributed in all the coffee nurseries. The incidence and severity of leaf spot disease and incidence of stem necrosis varied from village to village within the taluk and between taluks in Chikmagalur district where the survey was carried out. This variation in disease incidence and severity from location to location may be attributed to influence of abiotic factors such as temperature, relative humidity and rainfall and also the package of practices followed in coffee nurseries by different coffee growers. From the survey, it is observed that the fungus *M. roridum* could infect all the cultivars of coffee. Out of twenty two coffee nurseries identified

for the survey studies in four taluks of Chikmagalur district, none of the coffee nursery was found free from the disease during the survey period of two years. The locations which received the maximum rainfall recorded high incidence of disease. The correlation analysis revealed that rainfall plays a major role in the occurrence of the disease and has an effect on incidence and severity of stem necrosis and leaf spot disease. The survey data indicated that distribution, incidence and severity of stem necrosis and leaf spot disease of coffee seedlings varied from location to location and *Coffea canephora* cv. C×R had less incidence of stem necrosis and leaf spot disease compared to *Coffea arabica* cv. Chandragiri.

Acknowledgement

The author's are grateful to the Director of Research, Central Coffee Research Institute (CCRI) for providing facilities to carry out the research work and also to all the Scientists of Plant Pathology Division, CCRI for their co-operation during the study.

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