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Survey for grey leaf blight of coconut disease in the southern part of Karnataka

Vishwas Gowda G R[1*], Suresh D Ekabote[2], H Ravindra[3], S Onkarappa[4], Sathish K M[5]
[1] Research Scholar, Department of Plant Pathology, College of Agriculture Shivamogga, UAHS, Shivamogga, Karnataka, India
[2] Professor and Head, Department of Horticultural Crop Protection, College of Horticulture, Hiriyur, UAHS, Shivamogga, Karnataka, India
[3] Professor (Nematology) and AINRP (T) ZAHRS, UAHS, Shivamogga, Karnataka, India
[4] Scientist (Plant Protection), KVK, Hiriyur, Karnataka, India
[5] Assistant Professor, Department of Biotechnology UAHS, Navile, Shivamogga, Karnataka, India

Abstract
In ancient Indian literatures, Coconut (*Cocos nucifera* L.) is described as 'Kalpa Vriksha' which means tree which provides all the necessities of life. Among several fungal diseases affecting coconut, grey leaf blight caused by *Pestalotiopsis* spp., is significant. Symptoms of grey blight characterized as initially minute yellow or brown spots surrounded on the leaflets by a grayish band. Later signs are marked by a grayish center with a dark brown margin and as the disease becomes extreme brown spots coalesce to form blight on the leaves. A roving survey was carried out during 2019-2020 in the southern part of Karnataka to assess the incidence and severity of the grey blight of coconut. The per cent disease index was recorded using 0-9 scale. The study showed that the maximum per cent disease severity was observed in Chikkamagaluru (66.38 %), followed by Chitradurga (55.62%) and minimum per cent disease severity was observed in Shivamogga (51.04 %).

Keywords: coconut, grey leaf blight, per cent disease index, *Pestalotiopsis* spp.

Introduction

Coconut palm (*Cocos nucifera* L.) is a member of the family Arecaceae (palm family) and the only species of the genus *Cocos*. Coconut fruit is a drupe, not a true nut. The coconut palm is endearingly called 'Kalpa Vriksha, ' meaning the tree of heaven. It provides food, fuel, cosmetics, folk medicine and building materials, among many other uses.

In India, coconut is produced an area of 2150.89 thousand hectares with a production of 21288.24 million nuts; in which Karnataka is a major producer of coconut in India in an area of 619.78 thousand hectares with a production of 4947.74 million nuts (CBD, 2019) [3]. Kerala is top in producing coconut in India, followed by Tamil Nadu and Karnataka.

From India, over a dozen and half fungi have been reported to cause various leaf diseases of coconut. About 40 leaf disease-causing fungi were reported from the major coconut growing countries of the world. Out of this, grey leaf blight was the most common disease reported from 28 countries (Joseph and Radha, 1979; Koshi, 2000 and Doraiswamy *et al*., 2003) [5, 6, 4]. Therefore, a survey was conducted to record the per cent disease index of grey leaf blight disease.

Material and Methods

The intensive roving survey was conducted during 2019 and 2020 to know the severity of grey leaf blight of coconut in the farmers fields in Chitradurga, Shivamogga, Chikkamagaluru and Hassan districts. In each district, two taluks were selected, in each taluk, two villages were selected and in each village, two fields were surveyed. Plants were chosen in a zigzag manner, and the severity of grey leaf blight of coconut was recorded by following 0 to 9 scale was given by Suryachandraselvan *et al.* (1991) [8] and Naik *et al*. (1997) [7].

Table 1

Per cent leaflet area infected	Grade
0	0
1-10	1
11-20	2
21-30	3
31-40	4
41-50	5
51-60	6
61-70	7
71-80	8
Above 80	9

Per cent disease index (PDI) was calculated using the following formula proposed by Wheeler (1969) [8].

$$\text{Per cent disease index(PDI)} = \frac{\text{Sum of the individual disease rating}}{\text{Number of fruits or leaves observed}} \times \frac{100}{\text{Maximum disease grade.}}$$

Results and Discussion

The data from the survey revealed in table 1. Per cent disease index in various locations ranged from 45.73 to 69.79.The highest disease index (69.79%) was observed in the Bramanahalli village of Tarikere taluk, followed by a village of Kadur taluk in

Thimmapura (67.60 PDI). Nidige (Shivamogga) reported a minimum disease index (45.73 %).

The highest disease index in the district of Shivamogga was recorded in the Siddapura village of Bhadravathi taluk (53.53 %), while the least disease index was recorded in the Nidige village of Shivamogga taluk (45.73 %). The maximum disease index was recorded in the Bramanahalli village of Tarikere taluk (69.79 %), whereas the lowest disease was recorded in Gedenahalli village in Kadur taluk (63.80 PDI) in Chikkamagaluru district. The maximum disease was reported in Peelapura of Hosadurga taluk (59.60 %), while the lesser disease was reported in Babbur village of Hiriyur taluk (49.36 %) in the district of Chitradurga. Kurubharalli village of Arsikere taluk recorded the highest disease index (54.55 %), while Thoti village of Channarayapatnataluk reported the least disease index (49.62 %) in Hassan district.

Among the districts surveyed, the mean maximum severity of the disease (66.38 %) was reported in the district of Chikkamagaluru followed by Chitradurga (55.62 %) and the mean least severity (51.04%) was observed in the district of Shivamogga, respectively.

Among all the districts, the highest severity of the disease was recorded in Chikkamagaluru, may be due to cultivar susceptibility and favourable environmental conditions, includes optimum temperature, high rainfall and relative humidity, potassium deficiency in red soil, humidity conditions that may have favoured inoculum build-up and consequently increased severity of the disease. At the same time, the disease was noticed less in Shivamogga district than in other districts. This may be due to unfavourable environmental conditions that reduced inoculum build-up and reduced the severity of the disease.

From the surveyed results, it was observed that leaves were more vulnerable to *Pestalotiopsis* spp. the attack and more severity of disease on leaves, regardless of location and variety. Maximum PDI 69.79 was recorded in the village of Bramanahalli (Chikkamagaluru), followed by 67.60 PDI of districts of Thimmapura (Chikkamagaluru) among the various districts surveyed for the disease. Whereas, at Nidige (Shivamogga) district shows a minimum severity of 45.73 PDI disease was reported. In general, the incidence and severity of the disease in different agro-climatic zones and varieties vary from season to season, which may be due to variations in the pathogen, host varieties or climatic conditions. Athira (2017) [2] performed comprehensive filed survey estimates of the primary coconut diseases in TNAU's Southern land. The survey was completed from January to April, 2017 and the risk level calculation was accompanied by the analysis of the per cent disease index and per cent disease occurrence, the severity of these diseases and their frequency. The findings showed that EF block was afflicted with three foliar diseases *viz*., Grey leaf blight, leaf blight and leaf rot with an overall occurrence of disease of 43.05, 35.12 and 24.14 per cent. The most favourable environment for this pathogen is well-drained soils or potash poor soils, consistent wet weather for 4 to 5 days and strong winds.

Table 1: Survey for grey leaf blight of coconut disease in southern part of Karnataka during 2019-20

Sl. No	District	Taluk	Village	GPS Co-ordinates	Per cent disease index	Mean Percent disease index
1.	Shivamogga	Shivamogga	Nidige	13.8870/75.6303	45.73	51.04
			Navile	13.9739/75.5791	52.66	
		Bhadravati	Siddapura	13.8434/75.6772	53.53	
			J.D. Katte	13.8707/75.6645	52.25	
2.	Chikkamagaluru	Kadur	Gedenahalli	13.5143/76.0508	63.80	66.38
			Thimmapura	13.5178/76.0439	67.60	
		Tarikere	Bramanahalli	13.6923/75.8959	69.79	
			Chatanahalli	13.6838/75.9110	64.36	
3.	Chitradurga	Hiriyur	Belaghata	13.9271/76.4934	56.91	55.62
			Babbur	13.9582/76.6242	49.36	
		Hosadurga	Peelapura	13.7693/76.2183	59.60	
			Arihalli	13.7889/76.2566	56.63	
4.	Hassan	Arsikere	Vaderahalli	13.4997/76.0723	54.13	52.58
			Kurubharalli	13.4969/76.0766	54.55	
		Chanarayapatna	Thoti	12.9035/76.3898	49.62	
			Belagihalli	12.9064/76.3900	52.04	

A) Brown spots on leaves B) Grey centre with brown margin on leaves

C) Blightened appearance on leaves

Plate 1: Symptoms of Grey Leaf Blight of Coconut

Conclusion

Although grey blight disease of coconut was considered as minor disease now a days become major disease probably due to more influenced by environmental conditions. The increase in disease incidence and severity was observed with increase in Temperature, humidity rainfall, Potassium deficiency and also the severity is differed based on location.

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