

Survey for black spot of papaya in selected districts of Southern Karnataka, India

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ABSTRACT

Papaya is attacked by several diseases like anthracnose, powdery mildew, black spot, brown spot and papaya ring spot. Among the diseases, Black spot of papaya (*Asperisporium caricae* (Speg. Maubl)) is the important disease wherever papaya is grown and is one of the limiting factors in papaya production. A random survey for disease severity was conducted in papaya growing areas of Southern Karnataka districts viz., Bangalore, Mandya and Mysore during the late winter of 2011-2012. Among selected districts of Southern Karnataka surveyed for the severity of black spot disease of papaya, the severity on leaves ranged from 41.33-69.5 per cent and on fruits 18.33 to 36.33 per cent during late winter. Highest disease severity was recorded in Mysore districts at Chikkanahalli on leaves 69.5 per cent and on fruits 36.63 per cent and lowest in Mandya district at Dhanaguru on leaves 41.33 per cent and on fruits 18.33 per cent.

Key words : Black spot, Papaya, Survey, *Asperisporium caricae*

Introduction

Papaya (*Carica papaya* L.) is an important fruit crop, belongs to family *Caricaceae*. *Carica* is the largest of the four genera with 48 species, among which *Carica papaya* L. is most important and cultivated all over the world (Badillo, 1971 and Waller, 1992). Papaya is the native of tropical America (Singh, 1990). Papaya is a good source of vitamin A, vitamin C and calcium (Arriola *et al.*, 1980 and Hayes, 1993). The raw fruits contain an alkaloid or proteolytic enzyme "Papain", which is a commercial product of several tropical American nations and is used in several medicine and food preparations. Economically, *Carica papaya* is the most important species within the *Caricaceae*, being cultivated widely for consumption as a fresh fruit and for use in drinks, jams, candies and as dried and crystallised fruit (Villegas, 1997). In India, the papaya is grown for table pur-

pose, papin and pectin extraction in the state of Kerala, Orissa, West Bengal, Karnataka, Assam and Gujarat (Singhal, 1990). Karnataka ranks fifth in area and first in the production. Approximately 6000 ha area is covered under papaya with a production of 440.9 MT with an average productivity of 11.27 MT/ha and total production and area of India during 2010-2011 was 4196000 MT and 106000 ha with average productivity of 39.6 MT ha⁻¹ (NHB).

Among the several emerging diseases of papaya, black spot disease is also most lethal. Both leaves and fruit of papaya are affected by the black spot pathogen *Asperisporium caricae*. The fruits were affected on the surface, reducing the fresh-market value, but there is no reduction in quality. This disease can affect papaya plants at any stage of their growth. Periods of wet weather may increase the development of the disease. The use of fungicides is the most appropriate management option. This dis-

ease has been reported from different parts of the country and is found to be serious in recent years. Hence, survey was conducted to know the incidence and severity of black spot of papaya in selected districts of Southern Karnataka.

Material and Methods

A random survey for disease severity was conducted in papaya growing areas of Southern Karnataka districts viz., Bangalore, Mandya and Mysore during the late winter of 2011-2012. Per cent disease severity was recorded by field key 0-5 scale on foliage and fruits (Plate 1 & 2) these scales were converted to per cent disease index (PDI) using the formula given by Wheeler (1969).

$$PDI = \frac{\text{Sum of individual disease ratings}}{\text{No. of observations assessed}} \times \frac{100}{\text{Maximum disease rating}}$$

Scale	Description
0	No plants showing any symptoms
1	1% or less plants exhibiting symptoms
2	1-10% plants exhibiting symptoms
3	11-20% plants exhibiting symptoms
4	21-50% plants exhibiting symptoms
5	51% plants exhibiting symptoms

Results and Discussion

A random survey was conducted for occurrence of

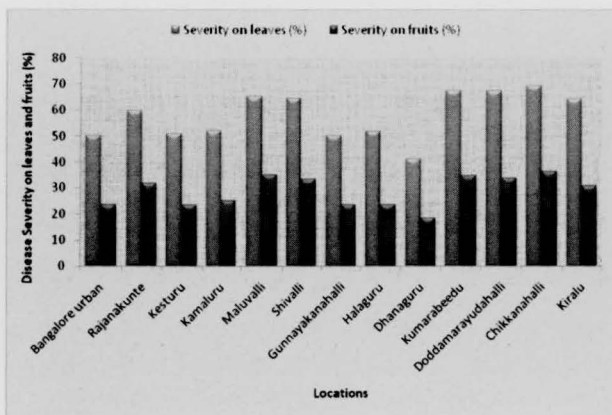


Fig. 1. Survey for severity on black spot of papaya in southern Karnataka.

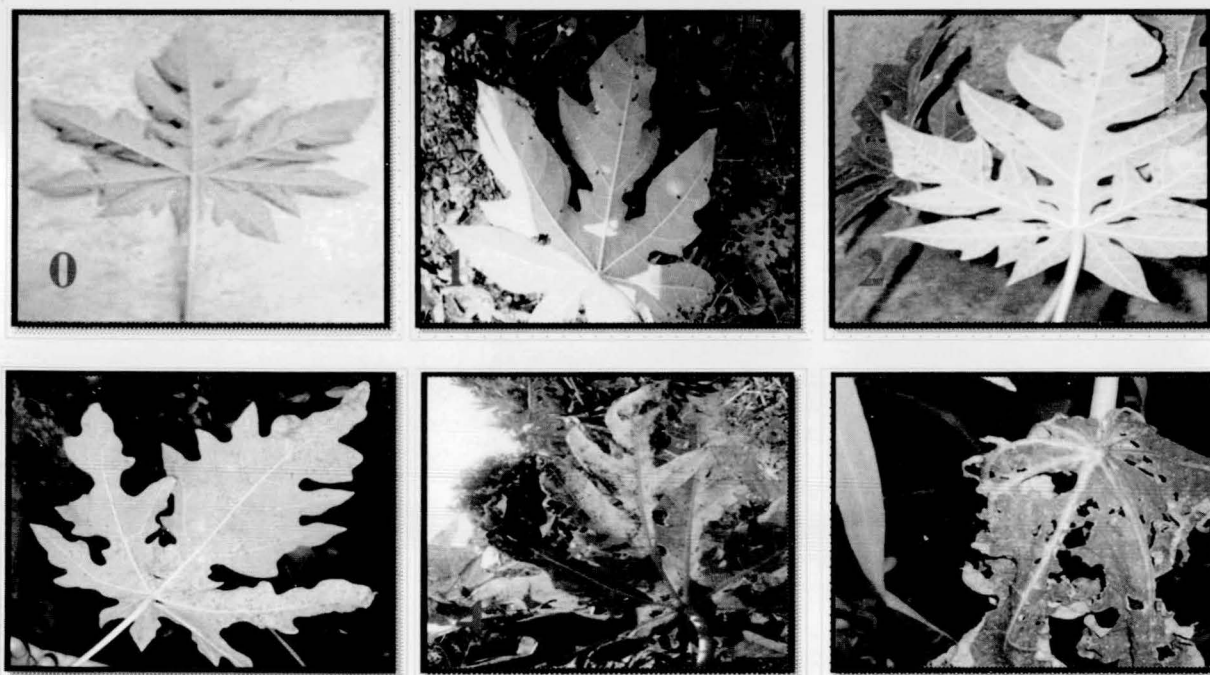
black spot disease in papaya growing regions of South Karnataka caused by *Asperisporium caricae*. The consolidated district-wise observation on severity is given in Table 1 and depicted in Fig 1.

A maximum disease severity of 59.66 per cent and 31.66 per cent was recorded on leaves and fruits respectively at Rajankunte in Bangalore district followed by 52.00 per cent and 25.00 per cent was recorded on the leaves and fruits respectively at Kamaluru in Doddaballapur taluk (Bangalore rural district), 50.33 per cent and 23.33 per cent was recorded on leaves and fruits respectively at ZARS, Horticulture field Bangalore. The disease severity of 51.00 per cent and 23.33 per cent was recorded on leaves and fruits respectively at Kestur in Doddaballapur taluk (Bangalore rural district). In Mandya district a maximum disease severity of 65.33 per cent and 35.00 per cent was recorded on leaves ad fruits respectively at Malavalli, followed by 64.66 per cent and 33.33 per cent on leaves and fruits respectively at Shivalli, 51.66 per cent and 23.33 per cent on leaves and fruits respectively at Halaguru. The disease severity of 50.33 per cent and 23.33 per cent on leaves and fruits respectively at Gunnayakanahalli. The least disease severity of 41.33 per cent and 18.33 per cent was recorded on leaves and fruits respectively at Dhanaguru in Mandya district. In Mysore district a maximum severity of 69.50 per cent and 36.33 per cent was recorded on leaves and fruits respectively at Chikkanahalli followed by 67.50 per cent and 34.56 per cent was recorded on leaves and fruits respectively at Kumarabeedu and 67.33 per cent and 33.60 percent was recorded on leaves and fruits respectively at Doddamarayudahalli. The least disease severity of 64.20 per cent and 30.62 per cent was recorded on leaves and fruits respectively at Kiralu in Mysore district. Similarly Adikaram and Wijepala (1995) reported the occurrence of papaya black spot in Srilanka, a disease previously confined to south and central Americas and Africa.

The study indicated that the disease severity was recorded on leaves ranged from 41.33 to 69.5 per cent and on fruits 18.33 to 36.33 per cent. In Mysore district maximum disease severity at Chikkanahalli on leaves 69.50 per cent and on fruits 36.33 per cent was recorded. Whereas in Mandya district, the least disease was noticed at Dhanaguru on leaves 41.33 per cent and on fruits 18.33%. Similar observations were recorded by Cumagan and Padilla (2007) conducted survey for papaya diseases including black

Table 1. Survey for black spot of papaya in selected districts of Southern Karnataka

Sl. No	Locations	Variety	Age of the crop	Per cent severity on leaves	Per cent severity on fruits
Bangalore district					
Bangalore urban					
1	ZARS, Horticulture field Bangalore	Solo	1 year	50.33	23.33
Bangalore rural					
2	Rajanakunte	Red lady	1 year	59.66	31.66
	Rajankunte	Red lady	4 month	25.50	-
Doddaballapur taluk					
1	Kesturu	Local	9 month	51.00	23.33
2	Kamaluru	Red lady	1 year	52.00	25.00
Mandya district					
Malavalli taluk					
1	Malavalli	Local	10 month	65.33	35.00
2	Shivalli	Red lady	1 year	64.66	33.33
3	Gunnayakanahalli	Red lady	1 year	50.33	23.33
4	Halaguru	Local	11 month	51.66	23.33
5	Dhanaguru	Local	1 year	41.33	18.33
Mysore district					
1.	Ilavalahobli				
1	Kumarabeedu	Solo	10month	67.50	34.56
3	Doddamarayudahalli	Solo	9 month	67.33	33.60
3	Chikkanahalli	Solo	1 year	69.50	36.33
2.	Varunahobli				
5	Kiralu	Local	1 year	64.20	30.62

**Plate 1.** Field key for scoring Papaya black spot disease on foliage on 0-5 scale

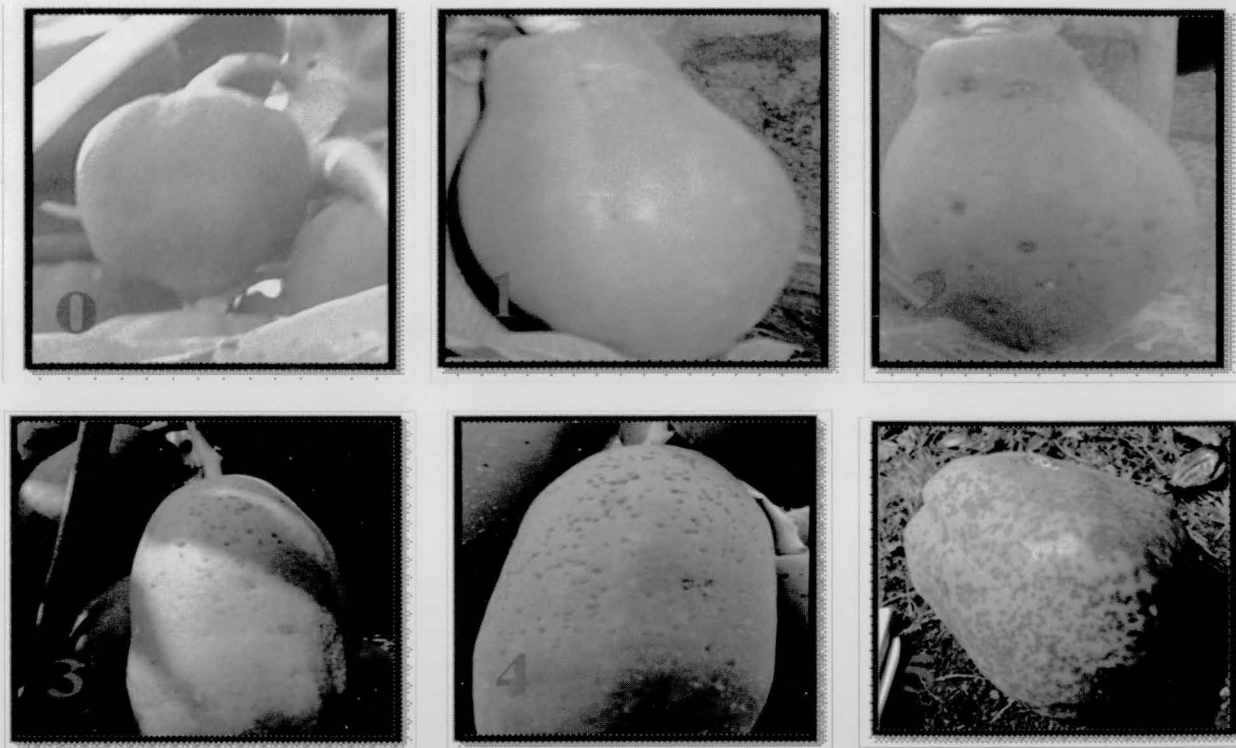


Plate 2: Field key for scoring Papaya black spot disease on fruits on 0-5 scale

spot in four provinces of the Philippines viz. Batangas, Laguna, Cavite and Quezon. Typical symptoms of black leaf spot were observed and collected in Silang and Indang, Cavite and Lipa, Batangas and south of Manila on cv. 'Red Lady'. The reasons for such variations at different locations be due to cultivar reaction to the disease, prevailing environmental conditions and presence of other diseases. Disease severity was more in Mysore district due to cool climatic condition which favours the pathogen.

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