



Occurrence and Distribution of Major Pests and Diseases of Coconut during Roving Survey in Kanyakumari District of Tamil Nadu

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ABSTRACT

Roving survey was carried out during 2022-23 in Agastheeswaram, Rajakamangalam, Kurunthancode, Thuckalay, Thoivalai and Killiyoor blocks of Kanyakumari district and the extent of damage in terms of incidence and intensity were recorded for major pests and diseases of coconut. The fungal diseases *viz.*, bud rot, basal stem rot and phytoplasma disease *viz.*, root (wilt) and insect pests namely Rugose spiraling whitefly, Rhinoceros beetle and Red palm weevil were widely prevalent in these blocks of the districts. The data revealed that the maximum infestation of rugose spiraling whitefly (18.44 %) in Vellimallai village of Kurenthencode block and minimum incidence of 8.00 percent was noticed in Nattalam village of Killiyoor block. The rhinoceros beetle was noticed in all age palm groups. The maximum incidence (16.22 %) was noticed in Nallur village of Agastheeswaram block and minimum incidence (5.00 %) in Puthalam village of Rajakkamangalam block. Incidence of red palm weevil was 16.43 per cent in Nullivillai B of Thuckalay block and minimum incidence of 1.33 was recorded in Eravipudoor village of Agastheeswaram block. Among the various diseases, Root wilt was severe and highest incidence of 74.42 per cent was observed in Thippiramalai village of killiyoor block followed by 52.63 per cent in Vellimallai village of Kurenthencode block. The highest incidence of bud rot (7.91%) was observed in Dharmapuram village of Rajakkamangalam block and basal stem rot incidence (5.0 %) in Nattalam village, Killiyoor block.

Key Words : Basal stem rot, Bud rot, Red palm weevil, Rhinoceros beetle, Root (wilt), Rugose spiraling whitefly

INTRODUCTION

Coconut (*Cocos nucifera* Linn.) is an important plantation crop in India. In the present scenario of climatic change this valuable plant is devastated by several pest and diseases that not only deteriorate the quality of fruits but also reduced the vigour and yield of palms. (Chowdappa *et al*, 2018 and Neeraja *et al*, 2020). Though coconut palm is hardy in nature and adaptable to varied climatic conditions but affected by many diseases at various phases of its growth starting from seedlings to bearing stage. Among the diseases, bud rot, thanjore wilt (or) basal stem rot, stem bleeding disease, leaf blight and root wilt were the major diseases of coconut in India

(Snehalatharani, 2016). Yield loss up to 10 per cent and 13 per cent was due to bud rot and basal stem rot respectively and leaf blight and root wilt inflicts yield loss ranged from 10- 25 % and 35- 80% respectively (Jhonson *et al*, 2014, Ramjegatheh *et al*, 2019).

The coconut palm is attacked by a number of insect pests all around the year. In India, coconut pests are divided as major and minor pests like as rugose spiraling whitefly, rhinoceros beetles, red palm weevil, leaf eating caterpillar and white grub are considered as major pests and other pests like slug caterpillars, scale insects, mealybugs, cored bugs termites and mites are considered as minor

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pest. Muyengi *et al* (2015) showed that about 46.7% of the farmers experienced the problem of rhinoceros beetle (*Oryctes monoceros*) in their farms and about 4.7% problems with coconut mites (*Aceria guerreronis*).

Wankhede *et al* (2019) reported that the infestation of black headed caterpillar was 6.70 per cent in palghar district. Gurav *et al* (2018) observed that *O. arenosella* was observed in all taluks throughout the year in the range of 18.79 to 54.92 per cent in Navsari district. The per cent (%) yield loss due coconut rugose spiraling whitefly was 6.61 and 22.45 per cent in ECT palms with low and medium RSW incidence while comparatively greater yield loss of 27.59 per cent was recorded in palms with high incidence (Raghuteja *et al* 2023). Studies of Chandrika *et al* (2010) recorded yield loss of 45.4 per cent from leaf eating caterpillar infested coconut palms in the succeeding year of severe pest incidence. In the year 2011, Rajan *et al* (2011) reported that slug caterpillar (*Macrolepta nararia*) inflicts higher yield losses (90–95 per cent) of coconut palms in severely infested gardens. Subramanian *et al* (2018) reported that red palm weevil (RPW) causing loss to an extent of 1–3 per cent in young coconut plantations. The objective of this present investigation was to study the occurrence and distribution of the important pest and disease of coconut by roving survey to assess the pest and disease severity

MATERIALS AND METHODS

Roving survey was carried out during 2022-23 in Agastheeswaram, Rajakamangalam, Kurunthancode, Thuckalay, Thoivalai and Killiyoor blocks of Kanyakumari district and the extent of damage in terms of incidence and intensity were recorded for major pests and diseases of coconut. Two villages in each block with two gardens in each village were selected and 100 palms in each garden were considered for recording observations. The rhinoceros beetle, red palm weevil and rugose spiralling whitefly of coconut were recorded by

using following methods

1. Rhinoceros beetle (*Oryctes rhinoceros* L.):

Per cent of palm infested (Out of 100 palms/garden- The top 10 fronds in each palm with single/multiple cuts was observed.

2. Red palm weevil (*Rhynchophorus ferrugineus*):

Per cent of palms infested (out of total palm (>100) garden with typical symptom of Red palm weevil.

3. Rugose spiraling whitefly (RSW) (*Aleurodicus rugioperculetus*):

Table 1. Infestation criteria, infestation level of Rugose spiraling whitefly (RSW).

Infestation level	Criteria to set infestation level
Low	<10% plants are infested; fewer than 10 nymphs & adults per leaf or leaflet
Medium	11-30% plants are infested; 11-20 nymphs & adults per leaf or leaflet
High	31-60% plants are infested; 21-40 nymphs & adults per leaf or leaflet
Severe	61-90% coconut plants are infested; 41-50 nymphs & adults per leaf or leaflet
Very severe	>90% coconut plants are infested; more than 50 nymphs & adults per leaf or leaflet.

The diseases *viz.*, bud rot, basal stem rot and root (wilt) incidences were assessed in terms of percentage. The observation recorded on disease incidence based on expression of characteristic symptoms of the respective disease.

RESULTS AND DISCUSSION

The data on major pests and diseases of coconut are represented in Table 2 and 3. The infestation of rhinoceros beetle was noticed in all age palm groups. The maximum incidence of 16.22 per cent was noticed in Nallur village of Agastheeswaram block and minimum incidence 5.0 percent was recorded in Puthalam village of Rajakkamangalam block. Rao Chalapathi *et al* (2018) found that the per cent

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of leaf damage due to rhinoceros beetles ranged from 12.5 to 35.5 and spindle damage ranged from 33.3 per cent to 45 per cent. Similarly Wankhede *et al* (2019) reported that maximum incidence of rhinoceros beetle was 21.34 percent in Sindhudurg district and minimum incidence of 5.00 in Raigad district of Maharashtra.

Incidence of red palm weevil was high in Nullivillai B (16.43 %) of Thuckalay block and minimum incidence of 1.33 was recorded in Eravipudoor village of Agastheeswarm block. Red palm weevil, *Rhynchophorus ferrugineus* Oliv, is a serious pest attacking different species of palm trees. Wankhede *et al* (2019) reported the occurrence of red palm weevil incidence in Sindhudurg (0.99%), Raigad (0.74 %), Palghar (2.43%) and Ratnagiri (1.72 %) district. Wankhede *et al* (2019) reported that in managed coconut garden recorded minimum incidence of rhinoceros beetle (25.73%), eriophyid mite (41.74%) and mite grade index 0.71 whereas, maximum infestation of rhinoceros beetle, red palm weevil and eriophyid mite were observed to be 30.31, 71.70 and 0.37 per cent, respectively in

unmanaged garden.

Infestation of Rugose spiraling whitefly was 18.44% in vellimalli village of kurenthencode block and minimum incidence of 8.00 percent was noticed in nattalam village of killiyoor block. Elango *et al* (2019) reported high incidence of rugose spiraling whitefly in coimbatore (62.86%) district followed by tiruppur (56.06%) and erode (54.43%) and minimum incidence in kanyakumari district (40.96%). Among the natural enemies *E. guadeloupae* is the predominant parasitoid with the potential of parasitizing RSW upto 70-80%. The field samples collected from kanyakumari district had more parasitization (60.75%) by *E. guadeloupae* followed by coimbatore (58.60%) and tiruppur (56.06%) district. Gopal Das *et al* (2023) reported the infestation severity by RSW ranged from 69 to 97.5 percent in different geographical regions of Bangladesh.

Among the various diseases, Root wilt is a phytoplasmal disease and it is transmitted by vector namely *Proutista moesta*. Root wilt was found in almost all the blocks of Kanyakumari district.

Table 2: Incidence of Rugose spiraling whitefly, Rhinoceros beetle and Red palm weevil in different blocks of Kanyakumari district of Tamil Nadu.

Block	Villages	Rugose spiraling whitefly (%)	Rugose spiraling whitefly Intensity	Rhinoceros beetle (%)	Red palm weevil (%)
Agastheeswaram	Eravipudoor	10.66	Mild	7.83	1.33
	Nallur	16.44	Mild	16.22	12.00
Rajakamangalam	Dharmapuram	11.55	Mild	7.49	3.26
	Puthalam	10.22	Mild	2.00	2.00
Kurunthancode	Vellichanthai - A	10.22	Mild	9.60	6.53
	Vellimallai	18.44	Moderate	4.61	9.44
Thuckalay	Nullivillai A	16.66	Moderate	5.07	9.26
	Nullivillai B	13.33	Moderate	13.34	16.43
Thovalai	Veeramarthandanpudur	8.67	Mild	3.66	2.69
	Siramadam	8.89	Mild	8.93	3.87
Killiyoor	Thippiramalai	8.89	Mild	8.89	4.03
	Nattalam	8.00	Mild	3.67	2.83

Table 3: Incidence of Root wilt , Basal stem rot and Bud rot in different blocks of Kanyakumari district of Tamil Nadu.

Block	Villages	Root wilt (%)	Basal stem rot (%)	Bud rot (%)
Agastheeswaram	Eravipudoor	1.14	2.50	3.20
	Nallur	17.33	2.12	2.10
Rajakamangalam	Dharmapuram	8.01	1.50	7.91
	Puthalam	4.00	1.80	2.50
Kurunthancode	Vellichanthai - A	34.86	2.55	4.8
	Vellimallai	52.63	3.08	4.55
Thuckalay	Nullivillai A	41.00	2.35	2.50
	Nullivillai B	35.29	3.50	5.58
Thovalai	Veeramarthandapuram	9.94	2.69	0.79
	Siramadam	3.72	2.5	1.80
Killiyoor	Thippiramalai	74.42	2.5	18.61
	Nattalam	37.86	5.0	6.00

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Maximum incidence of 74.42 % was observed in thippiramalai village of killiyoor block followed by 52.63 % in vellimallai village of kurenthencode block and minimum incidence of 1.14 Percent in eravipudoor village of agastheeswaram block. The results were in line with findings of Ramjegathesh *et al* (2018) and Rajeswari *et al* 2020 who found maximum incidence (37.25%) of the disease in Gudalur village of Theni district. The disease intensity of Kerala wilt in the contiguous disease tract ranged from 1.5 per cent in Thiruvananthapuram district to 75.6 per cent in Kottayam district. The annual loss due to disease is estimated to be about 968 million nuts. The recent survey conducted by Department of Agriculture, Kerala showed that the disease incidence has been reduced by 24.0 per cent. The reasons for decline in the disease incidence was attributed to removal of diseased palms, replanting with quality seedlings, replacement of coconut with rubber and adoption of integrated disease management practices. The highest bud rot incidence of 7.91% was observed in Dharmapuram village in Rajakamnagalm block and basal stem rot incidence (5.0%) in Nattalam village, Killiyoor block . Stem bleeding is an important disease in Thanjavur and

Kanyakumari districts. About 0.10% infestation was reported in block ABC and 0.11% infestation in block EF respectively (Athira, 2017).

CONCLUSION

This investigation could be useful to gain knowledge on occurrence and distribution of major pests and diseases of coconut in kanyakumari district and to understand the spatial distribution and to develop effective management strategies to prevent the losses caused by the major pests and diseases in coconut.

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