Environment & Ecology 29 (1) : 143—147, 2011
 ISSN 0970-0420

Incidence of Arecanut Spindle Bug, *Carvalhoia arecae* Miller and China (Heteroptera : Miridae)

N. KANTHARAJU, C. THIPPESWAMY, HOSAMANI VENKATESH SIDDALINGAPPA AND YALAVAR SHIVASHARANAPPA

Department of Agricultural Entomology, College of Agriculture Navile, Shimoga 577204, India
E-mail : kantha.raj@rediffmail.com

Abstract

The study conducted on Incidence of arecanut spindle bug revealed an incidence ranging from 1.60 to 8.20 bugs per palm and 2.20 to 14.50 bugs per palm at Gajanur and Sanyasi kodamagge respectively. The highest incidence was observed during I fortnight of August, 2006 in both the localities while the lowest incidence was noticed during II fortnight of March, 2007 and II fortnight of December, 2006 at Gajanur and Sanyasi Kodamagge respectively. Further the simple correlation between the bug population and weather parameters revealed that the incidence of spindle bug had the significant negative correlation with maximum temperature and significant positive correlation with rainfall and relative humidity.
Key words : Spindle bug, Incidence, Gajanur, Sanyasi Kodamagge, Correlation.

The spindle bug *Carvalhoia arecae* Miller and China (Heteroptera : Miridae) was first reported as pest of arecanut palm from Dakshina Kannada (Karnataka) (1). While it was a new genus and species from *Areca catechu* (2). These are brightly colored red and black bugs, inhabit the innermost two or three leaf axils and are of a chronic problem in areca plantations of Kerala, Karnataka and parts of Tamilnadu (3). Both nymphs and adults hiding in leaf axils suck the sap from the emerging spindle and tender leaflets. Fresh feeding marks appear as watery streaks on the infested leaflets and spindle. These linear lesions turn brown and become necrotic resulting in small shot holes. As a result of feeding, the spindle often dries and fails to open. Complete decay and death of the spindle during rainy season is also noticed. Persistent incidence of this pest without preventive measures would be detrimental to the general health and longevity of palm. Seedling and young palms under such condition may die. Now, the spindle bug has assumed the pest status extensively in areca gardens of Shimoga region and causing severe economic loss to the farmers. Knowledge of the seasonal fluctuations in population density is imperative for evolving effective control schedules against the pest. The bug occurs in abundance during June to October with maximum populations in August and September in southern Kerala (3). On the other hand, the pest population was high during the monsoon and post monsoon periods and low during summer months (4). However, information on the population density of the pest in Karnataka is lacking. The present paper summarizes the results of studies on population fluctuation of the pest carried out during 2006-07 at Shimoga and Bhadravathi taluks.

Methods

To study the seasonal incidence of arecanut spindle bug, the gardens at Gajanur of Shimoga taluk and Sanyasi Kodamagge of Bhadravathi taluk, were selected as representatives of malnad and maidan situations respectively. From each place, two years old arecanut gardens were selected. From each garden, 20 plants showing symptoms of infestation by spindle bugs were selected and labelled. The number of bugs present in the spindle and leaf axils were counted and mean number of bugs was worked out by summing the bugs from 20 plants. Observations were taken at fortnightly intervals from second fortnight of May, 2006 to first fortnight of May, 2007. During the study period, the meteorological data like maximum temperature, minimum temperature, relative humidity and rainfall were recorded. The bug popu-

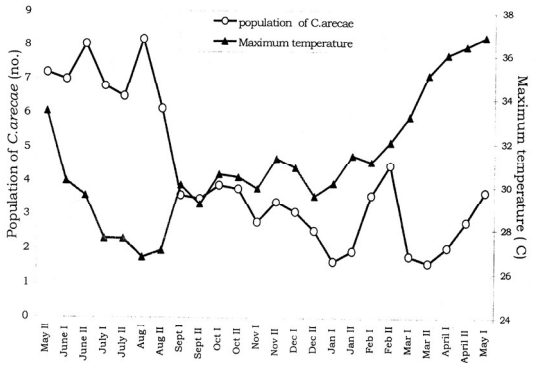

Figure 1. Population fluctuation of *C. arecae* as influenced by maximum temperature at Gajanur.

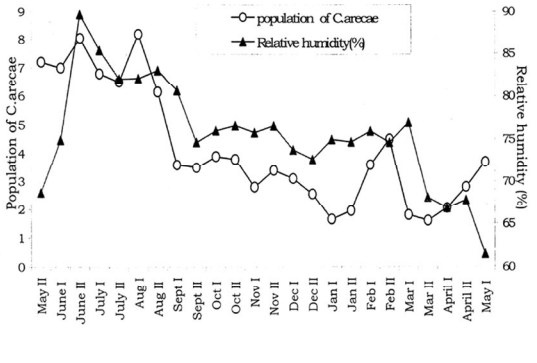

Figure 2. Population fluctuation of *C. arecae* as influenced by relative humidity at Gajanur.

lation was correlated with the meteorological data prevailed during each fortnight.

Results and Discussion

Survey for the incidence of arecanut spindle bug at Gajanur, Shimoga taluk from second fortnight of May, 2006 to first fortnight of May, 2007 (Table 1) revealed that the pest occurred throughout the year with an incidence ranging from 1.60 to 8.20 bugs per palm. The highest incidence of 8.20 bugs per palm was observed during first fortnight of August, 2006, while the lowest incidence of 1.60 bugs per palm was observed during second fortnight of March,

Table 1. Seasonal incidence of arecanut spindle bug at Gajanur, Shimoga taluk from II fortnight of May, 2006 to I fortnight of May, 2007.

	Period of observation		Mean no. of bugs/palm	Temperature (C) Maximum	Minimum	Average	RH (%)	Rainfall (mm)
1	May II	2006	7.20	33.43	20.56	26.99	68.67	58.20
2	Jun I		7.00	30.25	20.66	24.55	74.90	49.80
3	Jun II		8.05	29.58	20.93	25.25	89.70	190.60
4	Jul I		6.80	27.59	20.56	24.67	85.43	137.80
5	Jul II		6.50	27.58	18.96	23.27	82.05	46.20
6	Aug I		8.20	26.74	14.73	20.73	82.13	99.60
7	Aug II		6.15	27.05	16.18	21.61	83.07	22.00
8	Sep I		3.60	30.09	16.46	23.27	80.66	90.00
9	Sep II		3.50	29.18	15.20	22.19	74.67	21.00
10	Oct I		3.90	30.58	15.46	23.62	76.00	8.20
11	Oct II		3.80	30.45	16.75	23.60	76.60	8.90
12	Nov I		2.80	29.93	16.20	23.06	75.78	77.40
13	Nov II		3.40	31.33	16.66	23.99	76.57	2.90
14	Dec I		3.10	30.90	14.60	22.75	73.77	–
15	Dec II		2.55	29.58	15.06	22.32	72.67	–
16	Jan I	2007	1.65	30.18	13.40	22.79	74.97	–
17	Jan II		1.95	31.47	15.31	23.39	74.69	–
18	Feb I		3.60	31.16	16.12	23.64	75.94	–
19	Feb II		4.50	32.07	17.12	24.59	74.63	–
20	Mar I		1.80	33.22	19.06	26.14	76.93	–
21	Mar II		1.60	35.13	20.25	27.69	68.10	3.20
22	Apr I		2.05	36.06	22.73	29.39	66.83	4.80
23	Apr II		2.80	36.44	23.53	29.98	67.80	23.00
24	May I		3.70	36.86	25.06	30.96	61.47	15.20

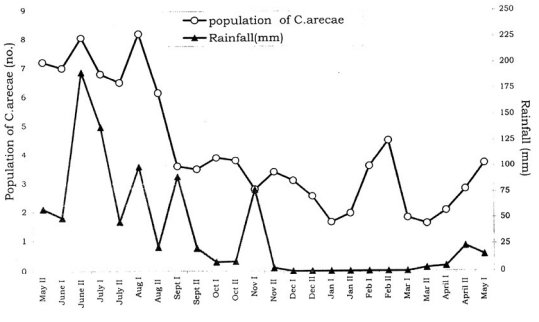

Figure 3. Population fluctuation of *C. arecae* as influenced by rainfall at Gajanur.

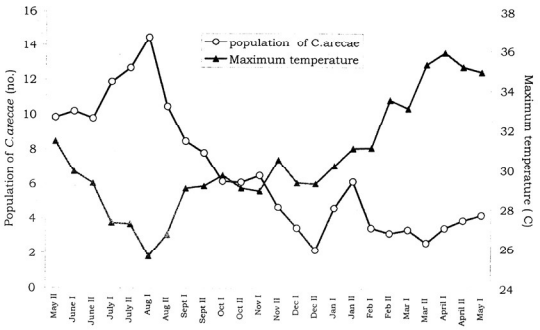

Figure 4. Population fluctuation of *C. arecae* as influenced by maximum temperature at Sanyasi Kodamagge.

2007. In general, higher incidence was observed from second fortnight of May, 2006 to second fortnight of August, 2006 with an incidence ranging from 6.15 to 8.20 bugs per palm. However, from second fortnight of December, 2006 onwards the incidence declined to 2.55 bugs per palm, which may be due to increased temperature and decreased relative humidity. A moderate incidence of 2.80 to 3.90 bugs per palm was observed from first fortnight of September to first fortnight of December, 2006. But in second fortnight of February, 2007, once again the incidence reached the peak with 4.50 bugs per palm and thereafter the bug incidence declined. From the first fortnight of May, 2007 the incidence showed an increas-

Table 2. Seasonal incidence of arecanut spindle bug at Sanyasi Kodamagge, Bhadravathi taluk from II fortnight of May, 2006 to I fortnight of May, 2007.

	Period of observation			Mean no. of bugs/ palm	Temperature (C) Maximum	Minimum	Average	RH (%)	Rainfall (mm)
1	May	II	2006	9.85	31.40	21.34	26.37	68.53	46.60
2	Jun	I		10.20	29.90	21.85	25.87	81.57	29.60
3	Jun	II		9.80	29.30	21.25	25.27	82.20	110.80
4	Jul	I		11.90	27.30	20.93	24.11	83.97	66.30
5	Jul	II		12.70	27.23	19.32	23.27	86.31	32.80
6	Aug	I		14.50	25.60	19.57	22.58	87.57	49.80
7	Aug	II		10.50	26.71	17.56	22.13	86.72	30.20
8	Sep	I		8.50	29.06	20.50	24.78	86.32	42.90
9	Sep	II		7.85	29.18	18.37	23.77	85.92	19.40
10	Oct	I		6.20	29.73	19.94	24.83	83.00	12.50
11	Oct	II		6.15	29.08	18.73	23.90	80.69	–
12	Nov	I		6.55	28.93	17.73	23.33	77.55	35.20
13	Nov	II		4.70	30.53	18.35	24.44	77.15	–
14	Dec	I		3.50	29.35	15.72	22.53	75.87	–
15	Dec	II		2.20	29.31	16.20	22.75	71.36	–
16	Jan	I	2007	4.65	30.23	15.22	22.72	73.81	–
17	Jan	II		6.20	31.10	16.29	23.69	71.80	–
18	Feb	I		3.50	31.12	17.08	24.10	67.18	–
19	Feb	II		3.20	33.53	17.18	25.35	69.12	–
20	Mar	I		3.40	33.11	20.06	26.58	65.53	–
21	Mar	II		2.65	35.33	20.23	27.78	65.13	–
22	Apr	I		3.50	35.92	20.52	28.22	64.28	11.80
23	Apr	II		3.95	35.19	20.63	27.91	64.96	20.00
24	May	I		4.25	34.93	21.13	28.03	64.76	4.60

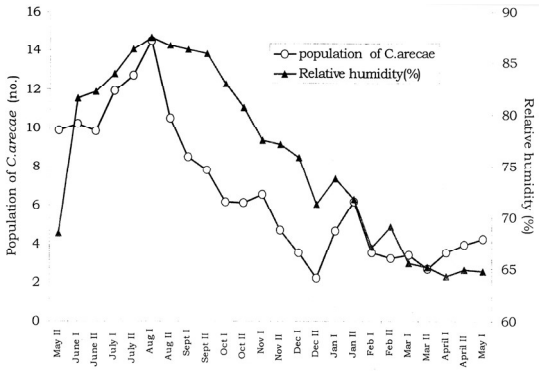

Figure 5. Population fluctuation of *C. arecae* as influenced by relative humidity at Sanyasi Kodamagge.

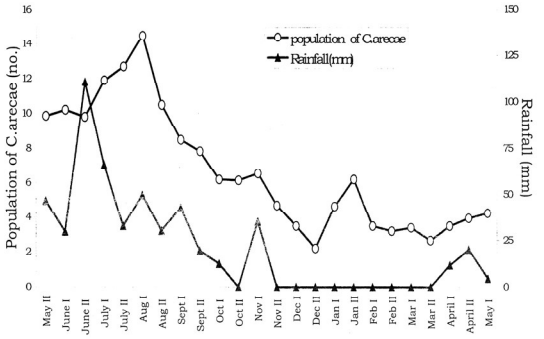

Figure 6. Population fluctuation of *C. arecae* as influenced by rainfall at Sanyasi Kodamagge.

ing trend with 3.70 bugs.

Seasonal incidence of *Carvalhoia arecae* at Sanyasi Kodamagge, Bhadravathi taluk (Table 2) revealed that the pest occurred throughout the year with population ranging from 2.20 to 14.50 bugs per palm. However the highest incidence of 14.50 bugs per palm was observed during first fortnight of August, 2006 while the lowest incidence of 2.20 bugs per palm was observed during second fortnight of December, 2006. The lowest incidence of 2.20 bugs observed during second fortnight of December, 2006 might be due to higher temperature and low relative humidity. In general, higher incidence was observed during second fortnight of May, 2006 to second fortnight of September, 2006 with population ranging from 7.85 to 14.50 bugs per palm. A moderate incidence of 3.50 to 6.55 bugs per palm was observed from first fortnight of October to first fortnight of December, 2006. A number of workers (3) reported the peek incidence of spindle bug in Kerala was from June to October with maximum population during August and September. Similarly the peek incidence of spindle bug is reported (5) in Kerala as the bug population increases in July, October, December and January. The pest occurred throughout the year with the peek period of pest abundance in January and November at Krishnapuram during July at Palode and in February at Sullia (6).

Table 3. Correlations between population of *C. arecae* and meteorological factors at Gajanur. *Significant.

Factor	Gajanur	Sanyasi kodamagge
Rainfall	0.70*	0.73*
Relative humidity	0.55*	0.76*
Maximum temperature	– 0.52*	– 0.73*
Minimum temperature	0.15	0.37

The results of seasonal incidence of arecanut spindle bug in relation to weather parameters (Table 3) revealed that, the population of arecanut spindle bug had the significant positive correlation with relative humidity and rainfall, while it had a significant negative correlation with maximum temperature and spindle bug population showed the non-significant positive correlation with minimum temperature in both the localities of Gajanur and Sanyasi Kodamagge (Figs. 1—6). Many workers reported (5) that the maximum temperature was negatively correlated while the minimum relative humidity was positively correlated. Further, the rainfall also influenced the bug population. Similarly, among weather factors, positive correlation was observed with rainfall and pest population and no significant correlation was observed between temperature, relative humidity and pest population as also reported earlier (6).

References

1. Khandige S. B. 1955. A capsid bug on areca. *Arecanut Bull.* 6 : 120—121.
2. Miller N. C. E. and W. E. China. 1957. A genus and

species of Miridae from *Areca catechu* in South India (Hemiptera : Heteroptera). *Bull. Ent. Res.* 47 : 429—431.

3. Nair R. B. 1964. *Carvalhoia arecae* Miller and China, a major pest of *Areca catechu*. *Arecanut J.* 15 : 57—61.
4. Koya K. M. A., T. S. S. Rawther, B. Sathiamma and C. Kurian. 1979. Evaluation of six granular insecticides for the control of arecanut spindle bug, *Carvalhoia arecae* Miller and China, in the field. *Pesticides.* 13 : 50—51.
5. Jacob S. A. 1990. *Distribution of the Spindle bug of arecanut, Carvalhoia arecae Miller and China in Kerala, its bio-ecology, suspected role as a vector of yellow leaf disease and control.* Cen. Plant. Crops Res. Inst. Palode, Trivendrum. Series / Report no : RNT VIII (131).
6. Sathiamma B., K. M. A. Koya, V. A. Abraham, T. S. S. Rawther and C. Kurian. 1985. *Seasonal fluctuation in population of the spindle bug, Carvalhoia arecae Miller and China (Heteroptera : Miridae). Arecanut research and development.* Pp. 133—136. K. Shama Bhat and C. P. R. Nair (eds). Proc. SIJAR 1982. CPCRI, Kasaragod.