

SCREENING OF PLANT SPECIES FOR SUSCEPTIBILITY TO INFESTATION BY *OLIGONYCHUS ISEILEMAE* (H.) (FAM - TETRANYCHIDAE, ORDER : ACARINA), THE WHITE SPIDER MITE ON COCONUT PALM*

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Original record of *Oligonychus iseilemae* is from a grass *Iseilema laxum* Hack (Hirst, 1924). Later this was recorded from the perennial crop, coconut (Sathiamma, 1983; 1986). No other crop plants were recorded as natural hosts for this mite. Tests were carried out to assess the susceptibility of nineteen plant species to infestation by *O. iseilemae* and the summary of the findings are presented in this report.

Nineteen plant species including four species of palms, eight graminaceous plants

and seven dicotyledonous plants grown as cultivated crops or occurring as weeds in coconut plantations were screened for their susceptibility to *O. iseilemae* (Table 1). Leafbits (2.5 sq. cm size) were set in petriplate cages on cotton pads and one pair of adult mites was introduced in to each of the cages. For plants with narrow leaves, as for example *Cyperus*, *Oryza* etc. leaf bits of two to three leaves were kept together to achieve 2.5 sq. cm area. The mites were retained in the cages for 24 hrs for egg laying and removed subsequently.

Table 1. List of plant species tested for their reaction to *Oligonychus iseilemae* (H.)

Family	Scientific name	Common name	Host status
Apocynaceae	<i>Catharanthus roseus</i> (L.) G. Don.	Periwinkle	+
Arecaceae	<i>Areca catechu</i> L.	Betel nut palm	-
	<i>Calamus rotang</i> L.	Rattan palm	+
	<i>Chrysalidocarpus lutescens</i> Wendl.	Chrysalis palm	-
	<i>Elaeis guineensis</i> Jacq.	Oil palm	+
Asclepiadaceae	<i>Hemidesmus indicus</i> (L.) Schult.	Indian Sarasaparila	+
Cyperaceae	<i>Cyperus rotundus</i> L.	Nut grass	+
Gramineae	<i>Cynodon dactylon</i> (L.) Pers.	Bermuda graa	-
	<i>Oryza sativa</i> L.	Paddy	+
	<i>Pennisetum typhoides</i> (Burm.) Stapf & Hubb.	Pearl millet	+
	<i>Pennisetum purpureum</i> Schum.	Napier grass	+
	<i>Saccharum officinarum</i> L.	Sugarcane	+
	<i>Sorghum vulgare</i> Pers.	Sorghum	+
	<i>Zea mays</i> L.	Corn	+
Lauraceae	<i>Cassytha filiformis</i> L.	Dodder laurel	+
Malvaceae	<i>Sida rhombifolia</i> L.	Broom jute sida	-
Pedaliaceae	<i>Sesamum indicum</i> L.	Sesame	-
Solanaceae	<i>Solanum melongena</i> L.	Brinjal	-
Sterculiaceae	<i>Theobroma cacao</i> L.	Cocoa	-

+ Host - Non-host

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Cages with coconut leafbits and mites were also maintained for comparison. Ten replications each were done for all the host plants. The cages with the eggs were properly maintained with adequate moisture. Observations were recorded at 24 hrs. interval on the effect of the host plants on the developmental biology and duration of life stages, longevity and fecundity of females. Screening was done in the laboratory at a temperature range of 25-32°C and relative humidity range of 45 - 88%. Data obtained were analysed by the analysis of variance technique.

Table 2. Effect of eight host plants as compared to coconut on the egg to adult period, female longevity and fecundity of *Oligonychus iseilemae* (Hirst) in the laboratory (Mean of 20 replications)

Host plant	Egg to adult period (days)	Female longevity (days)	Fecundity
<i>Cocos nucifera</i>	8.40 (7-10)	21.90 (16-31)	32.10 (27-42)
<i>Cyperus rotundus</i>	8.90 (8-10)	9.30 (6-12)	9.80 (4-16)
<i>Elaeis guineensis</i>	9.30 (8-10)	14.10 (10-22)	15.10 (8-32)
<i>Oryza sativa</i>	10.10	6.20 (9.11)	3.40 (3-9)
<i>Pennisetum typhoides</i>	10.30 (8-12)	9.80 (6-12)	10.90 (6-15)
<i>P. purpureum</i>	7.80 (6-9)	16.10 (10-29)	37.50 (16-74)
<i>Sorghum vulgare</i>	7.00 (7-10)	17.80 (10-30)	64.70 (27-95)
<i>Saccharum officinarum</i>	9.40 (8-10)	14.50 (8-21)	10.20 (5-18)
<i>Zea mays</i>	7.90 (6-9)	8.10 (5-10)	13.60 (7-18)
G. mean	8.79	13.09	21.92
SE per plot	0.87	4.34	10.28
F	16.13**	13.90**	35.95**
CD (P = 0.05)	0.78	3.87	9.16

Figures given in parentheses represent range

Observations revealed that only eight plant species out of the nineteen plants screened are susceptible to the mite infestation (Table 2). These host plants include *Cyperus rotundus*, *Elaeis guineensis*, *Oryza sativa*, *Pennisetum typhoides*, *P. purpureum*, *Saccharum officinarum*, *Sorghum vulgare* and *Zea mays*.

Analysis of the data revealed that among the host plants screened there is significant difference in the egg to adult period, female longevity and fecundity of *O. iseilemae* (Table 2). The mean egg to adult period recorded on coconut is 8.4 days. The shortest period 7.0 days was observed on *S. vulgare* and longest period 10.3 days on *P. typhoides*. Maximum female longevity of 21.9 days was observed on *C. nucifera* followed by 17.8 days on *S. vulgare*. Fecundity was observed to be high on *S. vulgare* and *P. purpureum*, 64.7 and 37.5 eggs/female, respectively. The eggs laid on *A. catechu*, *C. lutescens* and *C. dactylon* failed to hatch or had immature mortality after hatching. The mite completed the egg to adult period on *Calamus rotang*, but the emerged progeny was very limited and had a short adult life.

O. iseilemae infested the lower surface of the leaves in web on all the host plants screened, except *S. officinarum*, *C. rotundus* and *O. sativa* plants in which both the leaf surfaces were infested. Feeding by the mites caused white specks initially and finally the affected leaves dried up.

Though dodder laurel, *Cassytha filiformis* and periwinkle, *Catharanthus roseus* hosted population of *O. iseilemae*, no visible injury could be seen except development of lesions and curling up of leaves.

Screening of different annual and perennial host plants revealed that the host plants had varied influence on the duration of developmental period, longevity and

fecundity of *O. iseilemae*. But none of these host plants are natural hosts of this mite. As the perennial coconut palm with its luxuriant green canopy afforded abundant food supply through out the year and as such, there is hardly any need for migration/dispersal to other annual hosts present in coconut gardens. However, there is need for regular surveillance on other hosts as there is chance for multiplication on suitable hosts leading to an outbreak condition. Similarly, *O. pratensis* B. was recorded infesting the coconut palm and several annual and perennial host plants (Jeppson *et al.* 1975) and *O. velascoi* R. infesting three palms out of thirty plants screened (Cayme and Gapsin, 1987). As compared to coconut, *O. iseilemae*

laid more eggs and had more adult progeny with a comparatively shorter developmental period on graminaceous host plants such as sorghum and Hybrid Napier. Coconut ranked only the third position. Gupta *et al.* (1974) obtained almost similar results on the sugarcane spider mite *O. indicus*, where the fecundity was very high and egg to adult period very short on sorghum and maize. The *Oligonychus (Reckiella)* group comprised mostly grass infesting mites including *O. iseilemae* (Jeppson *et al.* 1975). An adaptation from the annual graminaceous host to a perennial palm host had effected change in its biological characteristics of *O. iseilemae*.

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