

Know More About The Occasional Pests of Coconut Palm

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Introduction

As many as 800 pests including insects and mites associated with the coconut palm were listed by Kurian *et al.* (1979). The major pests responsible for heavy crop losses in coconut are rhinoceros beetle boring into the unopened fronds and spathes, the leaf eating caterpillar which feeds on the functional leaf tissues, the much dreaded red palm weevil tunnelling into the stem or crown and the cocokchafer beetle grubs feeding on the roots. Other pests which are gaining importance in the recent years as emerging pest problems are the coreid bug, mealy bugs, scale insects and the nut infesting eriophyid mite. Apart from these, there are many other potential enemies designated as minor pests which attack coconut palm (Mathen *et al.* 1962). Menon and Pandalai (1960) and Nair (1989) had listed certain caterpillars, termites, mites and beetles attacking coconut palm. Normally they did not cause any economic damage but at times under inadequate biological or environmental

regulations they multiply in enormous proportions and cause serious damage.

1. The Slug Caterpillars

They are also known as 'nettle grubs'. Sathiamma *et al.* (1972) described the two slug caterpillars *Contheyla rotunda* and *Macroleptera nararia* as sporadic pests of coconut. The infestation becomes severe in post monsoon and summer months. The caterpillars feed on the coconut leaflets sparing only the midrib. Whenever it occurs mechanical removal of these pests can be practised in seedlings. Cutting and burning of highly infested leaves prevents the spread of the pest in older plantations. The slug caterpillars are attacked by some bacterial and fungal pathogens and insect parasites (Kurian *et al.* 1983). In cases of severe infestation spraying of the lower side of leaves with carbaryl 0.1percent or endosulfan 0.1percent is recommended.

Contheyla rotunda H.

This is a pest of sporadic occurrence and during severe outbreaks the larvae

completely defoliate the palm. Plants *viz* banana, wild arrow root and tea are reported as alternate host plants. Adult moth is about 0.5 centimetre in length having wing expanse of one centimetre. Colour varies from greyish brown to dark grey. Antennae are plumose in males and filiform in females. Eggs are elliptical and compressed and are laid singly on the underside of leaflets in small batches. Average number of eggs laid per female is 215. The eggs hatch in about 5 days. Larva is covered all over on the dorsal side with spines and two narrow grey stripes (*Fig.1*) Young larvae feed on the lower epidermal tissues, but as they grow up start feeding right through the leaf at the edge. Larval period is on an average 34 days. On completion of larval period they spin dense cocoons of brown silk impregnated with a loose white powdery substance. Pupal period is 52 days. *Rogas sp.*, *Antrocephalus sp.*, and *Chrysis sp.* are recorded as parasite on *C. rotunda*.

Latoia lepida C.

The adult is a stout moth with a wing expanse of 4 cm. The forewings are green with grey brown outer border and a black patch basally. The hind wings are yellowish with a grey fringe. The eggs are laid in batches of 10-15 cm on the lower surface of the leaflets and appear as flat scale like patches. A female lays on an average 167 eggs. The eggs hatch in about a week. Caterpillars are thick, flat and yellowish green in colour with a greenish blue stripe dorsally and two yellowish green stripes laterally one on each side of the body. (*Fig 2.*) Body has a series of tufts of spines which are highly irritant in action. Pupation takes place after 5

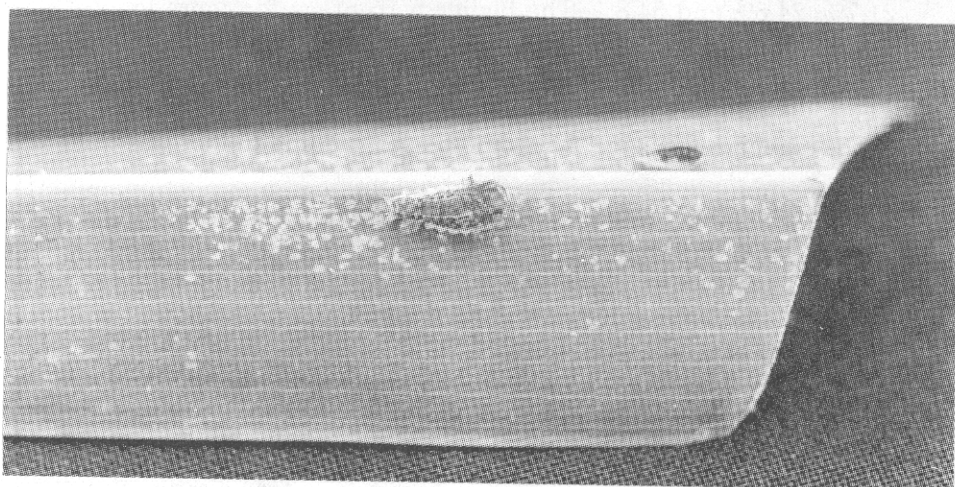


Fig. 1 : *Contheyla rotunda* - larva

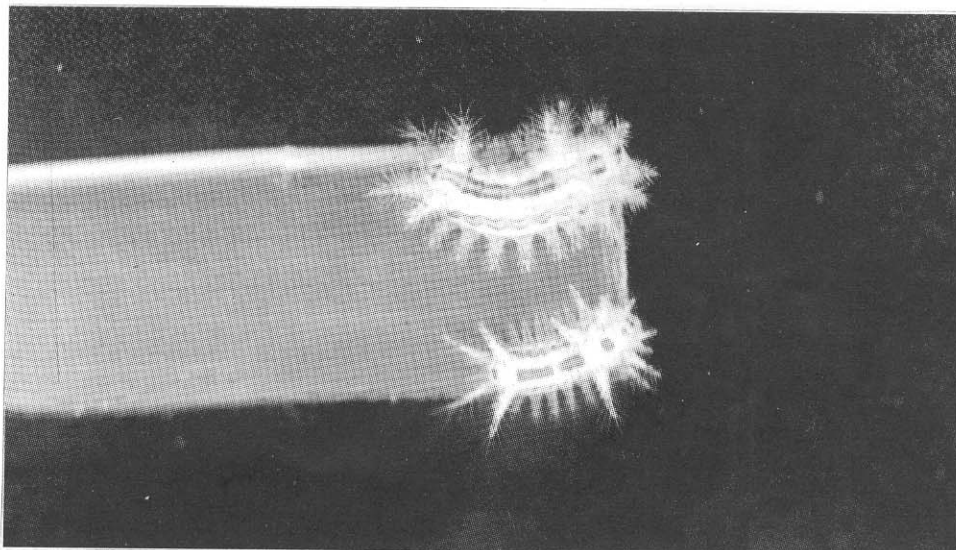


Fig. 2 : *Latoia lepida* - caterpillars

weeks of larval life inside a hard shell like greyish oval cocoon. The moths live for about a week. The pest is more common in the coastal and backwater areas. The caterpillar is polyphagous in habit usually seen on castor also. The caterpillar is parasitised by the species of *Clinocentrus*, *Stomatoceras*, etc.

***Macroleptra nararia* M.**

Adult is pale brownish coloured moth. The basal two third portion of the fore wing is red in colour while the outer border is brown. The tiny scale like eggs which are laid singly on both sides of the leaves hatch in 4-5-days. The fully grown larva is 8-11 mm long and is yellowish green on the upper side and pinkish on the underside. A series of red tipped tubercles increasing in length towards the hind end with very short spines are present on the upper side. The larva is strongly mandibulate and devoid of prolegs. The larval period is on an average 31 days. Pupa is enclosed in a 5-7 mm round, brownish shell which is covered sparsely by light yellowish brown silk. Caterpillars are mostly confined to lower surface of leaflets. Severely affected palms are devoid of green parts of leaflets. This is a polyphagous insect capable of feeding on a widely unrelated plant species like artocarpus., citrus, pongamia, erythrina, etc. Mallik *et al.* (1996)

reported severe infestation of coconut palm by *M. nararia* near Bangalore during 1995 and effective control of the pest by spraying with either chlorpyrifos (0.05%) or monocrotophos (0.05%).

2. The Leaf Rollers

The larvae of the butterflies *Suastes gremius* and *Gangara thyraxis* live in tubes formed of rolling up portions of palm leaves and hiding in these folds they feed on the leaf lamina. Seedlings in the nursery or just after transplantation are mostly affected. These pests are mainly spread to different places through transport of seedlings. *Suastes gremius* and *Gangara thyraxis* are the two leaf rollers

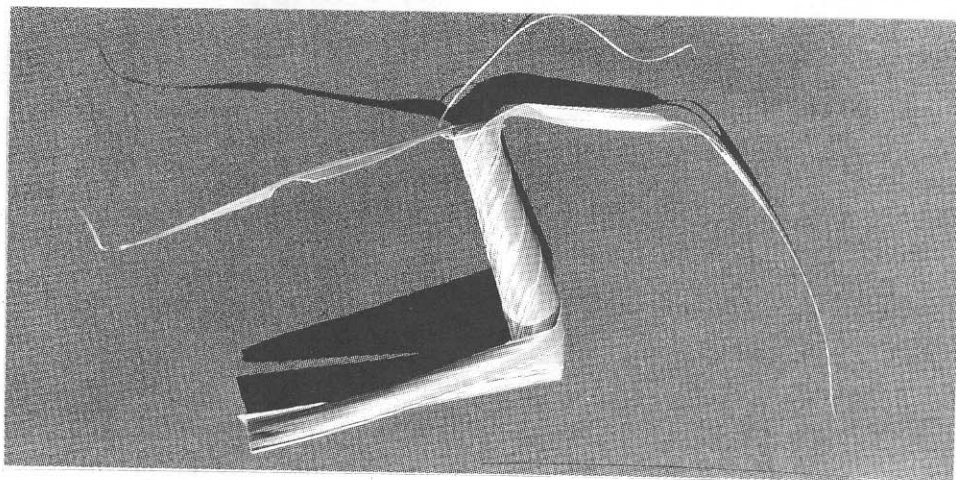
reported. Clipping off and burning the infested portions of leaflets with the pests, controls the spread of this pest.

***Gangara thyraxis* M. (White leaf roller)**

This hesperiid butterfly has a brown body with a wing expanse of about 80 mm. Wing is brown with six yellow spots on the forewing, three larger ones situated near the middle and three smaller towards the apex. The eggs are laid on the leaves in irregular masses which hatch in about a week. The larvae construct tubes by uniting the edges of the leaflets (*Fig. 3*) with strong whitish coloured silken material. Inside these tubes they live in concealment eating voraciously from the edges of the leaflet leaving behind only the midrib. The full grown caterpillar is pale green with reddish markings, the colour generally concealed by numerous long, prominent white waxy filaments. The larval period lasts for about 5 weeks and pupation takes place in leaf folds. The pupae have a habit of vibrating and striking against the inner surface of folds when disturbed. Pupal period lasts for 10 days. (Sathiamma and Abraham 1998)

***Suastes gremius* F. (Green leaf roller)**

S. gremius is a hesperiid butterfly with a wing expanse of about 40 mm, and is brown in colour with light yellow



Tubes made with coconut leaflet by *Gangara thyraxis*



spots on the forewing and a few black dots on the hind wing. Upright eggs are laid singly on the leaves. Egg is light red with a white and sculptured egg shell. Eggs hatch to pale green caterpillars with 5 pairs of prolegs. The larvae are smooth, flattened, elongate, tapering evenly to either end. The head is large and oval, black brown with a prominent central suture. The full grown larva is green with a prominent dark green mid-dorsal line. On completion of larval stage it closes the ends of the tubular leaf let cell, in which they hide and feed, with silk and changes to a yellowish green pupa. Sathiamma *et al.* (1981) described the biology of this pest and reported a total life period from egg to adult of 36-47 days including 5 larval instars. This pest is abundant during the month of July-September. Palmyra palm and date palm are alternate hosts.

3. *Turnaca acuta* W. (Long green Caterpillar)

This infests leaves and flowers. During 91-92, severe attack of this caterpillar occurred in Periyar district of Tamil Nadu accounting of 30-50 percent damage to coconut palm.

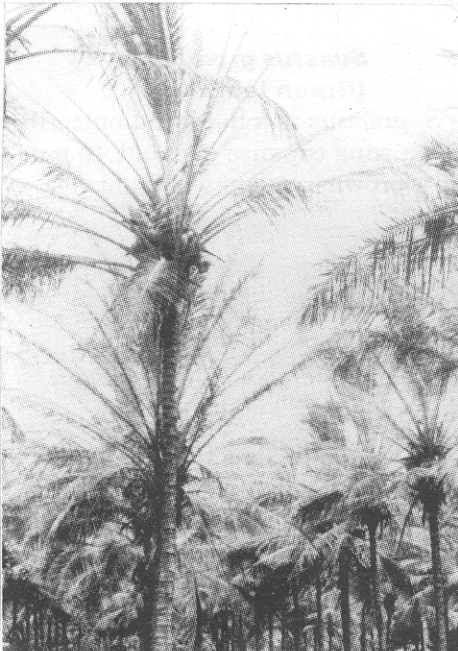


Fig. 4 : Coconut palm affected by *Turnaca acuta*

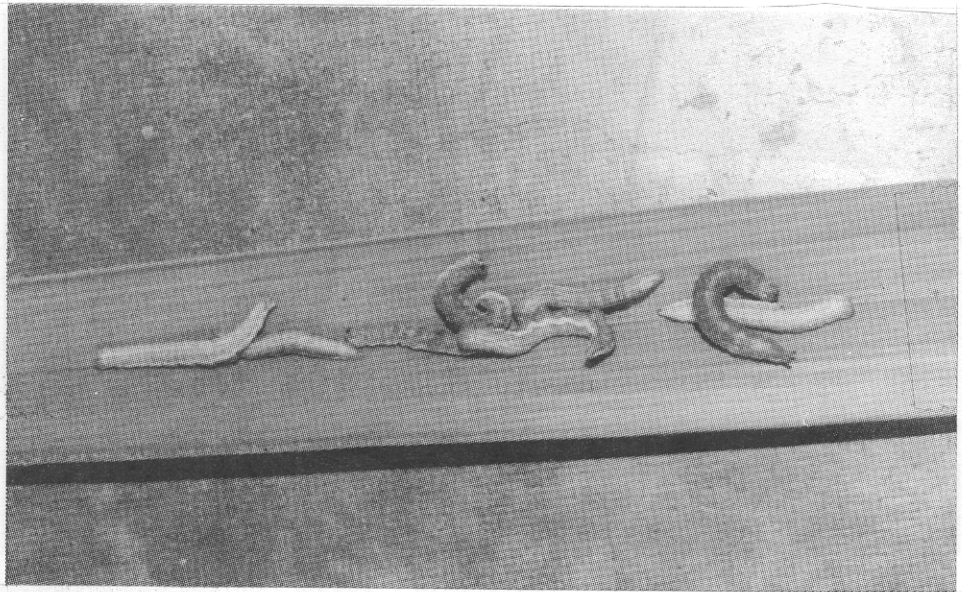


Fig. 5 : *Turnaca acuta* - caterpillars

Caterpillars of *T. acuta* feed on the coconut leaves leaving the midrib as sticks (Fig.4). Early stages are brown in colour with two pink stripes on the dorsal side whereas the grown up caterpillars are green with swollen head (Fig 5). Larval period is 20 days. They pupate in leaf folds made by webbing. Pupal period is 9-10 days. Adult moths are dull white in colour with bipectinate antennae (Swamiappan and Sundarababu, 1995)

4. *Manatha albipes* M. (Bag worm)

The caterpillar lives inside a protective covering made of foreign particles and bitten leaf parts glued to mucus. Caterpillar never comes out of this bag and moves with the bag. The caterpillar remains hanging on the lower side of the leaf. The feeding marks are left as circular holes on the leaf. Pupation takes place inside the bag. Before pupation the bag will be firmly stick to the leaf surface. Cutting and burning the heavily infested leaves prevents

the spread of this pest. Spraying the infested palms with insecticides like carbaryl 0.01% is necessary to prevent further build up of this pest.

5. *Cyclodes omma* Van der Hoeven (Nut borer)

This is a noctuid, moth, the caterpillars of which bore into the buttons making characteristic hole near the perianth region, feed on the contents inside and cause them to drop (Fig 6).

6. *Batrachedra arenosella* Wik. (Lesser coconut spike moth)

The larvae gnaw the male and female flowers of coconut palm and the inflorescence develops a distinctly black

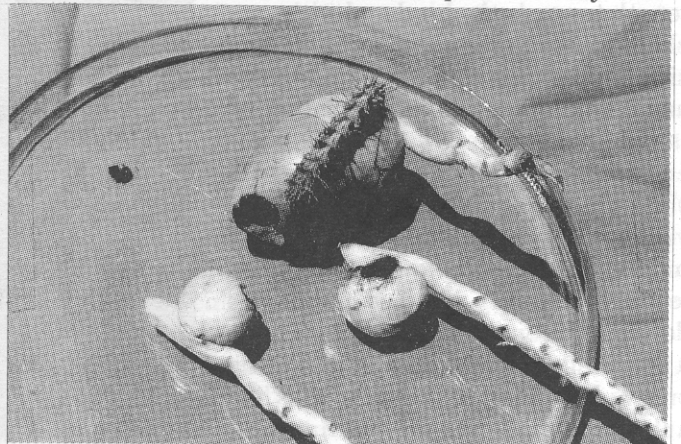


Fig. 6 : *Cyclodes omma* - caterpillar and affected buttons

appearance. Eggs are laid in the linear depression of green spathe and the larva bore into the unopened inflorescence and feed on the female and male coconut flowers. The full grown caterpillar pupates in a cocoon of white silk at the base of the spathes, the damage of which is apparent when it opens.

**7. *Syntomis passalis* Fab.
(Flower caterpillar)**

Caterpillars of this syntomid moth feed on the male and female flowers of coconut. Infestation on the stigma and perianth portions of buttons upto 2 months of growth results in button shedding. Extent of damage to buttons ranges from 3 to 36 percent. Caterpillars are black in colour and beset with urticating hairs. Moths are brightly coloured having scaleless spots on their wings. All the stages of this pest are seen inside the infested spathe (Ponnamma and Kurian, *et. al* 1986).

**8. *Myllocerus curvicornis* Fab.
(Ash Weevil)**

Male and female of this weevil measure 6.4 mm and 7 mm, respectively. Meso and meta thorax are fused together and elytra cover the abdomen completely. Life cycle is completed in 45 days in 4 larval instars (Ponnamma *et al.*, 1984). This is a polyphagous

insect with varying host range like coconut, cocoa, mango, glyricidia, stylosanthes, etc. (Ponnamma *et al.* 1981) Adult weevil remains in the lower surface of the leaflets more commonly towards the tip and feed from the margin in circular patches (*Fig. 7*) preferring mostly the middle and inner whorls (Kurian *et al.* 1978; Ponnamma and Nambiar 1984, Ponnamma *et al* (1982). During day time they hide mostly among the grass and in the soil and migrate to the coconut palm during dusk.

**9. *Diocalandra stigmaticollis* G.
(Stem and bark weevil)**

The adult is a brown weevil of about 6 mm with long pointed snout. It is about 6 mm in length and 1.5 mm in width. The larva is dull white in colour about 8 mm in length. It infests the cuts and wounds on the palm trunk and petioles. It is also found on palms with stem bleeding disease. The larvae of the weevil burrow into the soft tissues of the bark and never go deep in the fibrous portions of the trunk. The cylindrical cavities made by the weevils are filled with resinous secretions, similar to thick molasses. In the infested palm the production of leaf and spathe is delayed, buttons shed considerably and setting is affected upto 75 percent (Louis and

Chandrasekharan, 1980). Tunnelling by the beetles within the leaf petiole which is close to the trunk results in the loosening of the fibres and the petiole loses its grip with the coconut trunk and thus such leaves hang from the trunk. Spraying or swabbing the trunks with 0.05percent quinalphos, after removing the hanging fronds, gives effective control of the infestation (Nair, 1989).

**10. *Xyleborus* spp.
(Shot-hole borer)**

Infests the bark. The common species found in India is *X. perforans* W. (Nair, 1975). Damage caused to coconut palms by *X. semiopacus* in Karnataka was described by Deshpande *et al.* 1982. This causes serious damage to coconut in coastal areas of Tamil Nadu also. Bore holes are found at heights upto 140 cm. There is reduction of fronds and premature nutfall in infested palms. When infested trunks are opened, severe tunnelling upto 18-22 cm depth and all stages of the pest are seen inside. The pest can be controlled by stem injection through a stove wick soaked in 0.2percent fenthion or 0.2percent dichlorvos and plugging the hole and repeating the treatment after a month using the same hole and wick. Swabbing of the bark with 0.1 percent chlorpyrifos also gives adequate control of this pest.

**11. *Odontotermes obesus*
Ramb. (Termite)**

Although nearly 31 species of termites are reported from coconut all over the world (Keshyap *et al.* 1984) the most common species affecting coconut in India is *Odontotermes obesus*. The termite infestation in coconut is more common in seedlings in the nursery or just after transplantation. Coconut seedlings are infested either through the base of the seednut or at the collar region where the growing cabbage portion is eaten away. The wilting of the central shoot is usually the first visible symptom of damage and this is often followed by the death of the seedling (*Fig. 8*). Kurian and Mathen *et al.* (1964) have given an account of

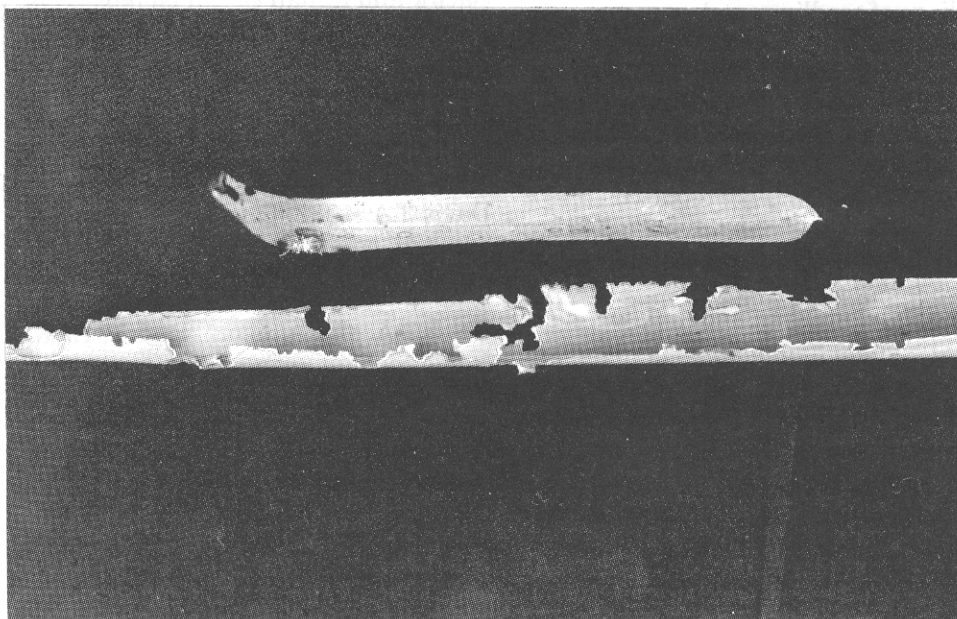


Fig. 7 : Myllocerus curvicornis and affected leaflet

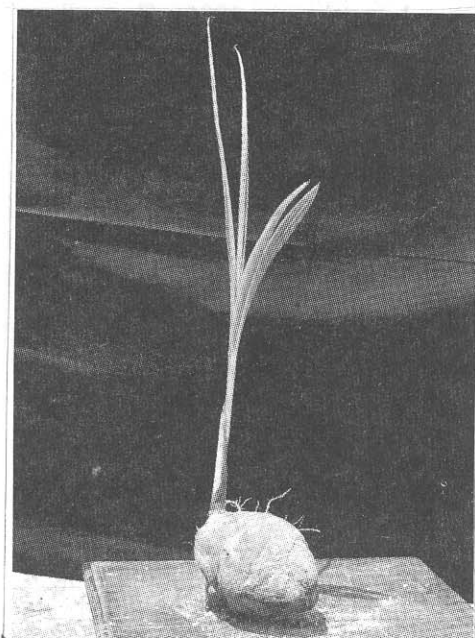


Fig. 8 : Termite affected coconut seedling

damage done by termites on the germinating coconuts. Upto 20 percent of damage is reported in lateritic areas. As a precaution, when sowing of nuts in nursery/transplanting is carried out in termite infestation prone areas, soil insecticides can be applied. In cases of termite attack in standing crop, soil drenching with 0.05 per cent chlorpyrifos may be adopted. If required a second application can be given after 20-25 days. Adequate irrigation to seedlings minimizes the problem. The termite damage to grown up palms is mainly seen on the trunk or crown. In such cases swabbing or drenching affected areas with 0.05% chlorpyrifos is an effective method of control.

12. Ants

The small red ant *Dorylus orientalis* inhabits soil and damages the seedlings. The red ant *Oecophylla smaragdina* builds nests on the leaves and inflorescences and causes indirect damage by protecting the mealy bugs infesting the coconut spindle and inflorescence.

13. Other Arthropods

1. Mites

Nearly 38 species of mites are recorded on coconut all over the world (Sathiamma 1995). Among the mites

recorded on coconut palm 19 are polyphagous species of which 12 species belongs to the family *Tetranychidae*, 6 to *Tenuipalpidae* and one to *Eriophyidae*. These mites infest the foliage, inflorescence and nuts. They suck sap which results in drying of the affected portion. Nursery seedlings and just transplanted plants are more prone to mite infestation. Usually they appear as occasional pests, but under congenial conditions, sporadic outbreaks can cause substantial loss to the crop (Sathiamma, 1991; Mohanasundaram and Kuruppuchamy, 1989). The spider mites (*Tetranychidae*) are dominant on coconut palm. Gifted with a high biotic potential the spider mites are capable of rapid population build up and often reach epidemic proportions. In severe infestation spraying with any one of acaricides namely dimethoate 0.05%, dicofol 0.05% or wettable sulphur 0.2%, can effectively control these pests. Phytoseiid predators like *Amblyseius* spp. check the population of the pest in nature.

Raoiella indica H.

(False spider mite)

The first published record of a mite on coconut palm in India was that of *R. indica* from Coimbatore. It is one of the potential mite pests damaging the foliage of seedlings and young coconut palms. Spraying of monocrotophos 0.04%, dimethoate 0.03% or phosphamidon 0.05% is recommended for control of *R. indica* (Jalaluddin and Mohanasundaram, 1990). Sarkar and Somchoudhury (1988) reported 76.39% mortality of mites by monocrotophos 0.05% spray. Staphylinid *Oligota* sp. Coccinellid *stethorus* sp. and predatory mites *Phytoseius* sp. and *Amblyseius* sp. are recorded as dominant predators of *R. indica* (Somchaudhury and Sarkar, 1989). High population of *R. indica* is seen from January to May.

Oligonychus iseilemae H.

(White spider mite).

Commonly known as the coconut white mite, was recorded as a pest on coconut palm foliage (Sathiamma 1983, 1986). The mites live in colony on the

lower surface of the leaflets along the midrib under delicate webbing. The immature and adult mites suck sap from the foliage resulting in the drying up of affected palms. *O. iseilemae* occurred in the field during all months of the year with peak population from February to June.

Tetranychus ludeni Z.

(Red spider mite)

This coconut red spider mite was recorded as a polyphagous species infesting a number of agricultural and horticultural crops (Puttaswamy and Channabasavanna, 1979). *T. ludeni* appeared as an occasional pest of coconut palm (Sathiamma 1986, 1988). Immature and adult mites infest the leaflets and suck sap. It is present in the field during all months.

Dolichotetranychus

vandergoofti Oud.

This is a tenuipalpid mite recorded on nuts of coconut palm (Sathiamma, 1985, Mohanasundaram *et al.* 1989). This mite infests the perianth portion of the nut and during severe infestation it can cause immature nut fall.

2. *Birgus latro*

(Coconut robber crab)

This giant crab is distributed in the Pacific and Indian Ocean Islands. This was reported to feed on coconut in Andaman Islands by Davis (1987) and Davis and Rudolf (1978).

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