Coconut rhinoceros beetle - Melanesian (057)

Photo 1. Hole in stem of betel nut bored by the Melanesian coconut rhinoceros beetle, *Scapanes australis*.

Photo 2. *Scapanes australis* third stage larvae.

Photo 3. *Scapanes australis,* male.

Common Name

Melanesian rhinoceros beetle, coconut rhinoceros beetle, Scapanes

Scientific Name

Scapanes australis. Different sub-species (*Scapanes australis australis* and *Scapanes australis grossepunctatus*) exist in Papua New Guinea; the situation in Solomon Islands has not been studied.

Distribution

Widespread. Southeast Asia, Oceania. It is recorded from Papua New Guinea and Solomon Islands.

Hosts

The main hosts are coconut, oil palm and betel nut, but the beetle is also found on banana, sugarcane and wild palms.

Symptoms & Life Cycle

The adults bore into crowns of coconut, oil palm, betel nut, and other palm species, as well as pseudostems of bananas (Photo 1). Damage to coconuts is considerable, especially up to 5 years' old. The emerging fronds show V-shaped cuts, twisting, spiraling and truncated leaflets. If the growing point is damaged, the palms die. The damage allows entry of other organisms: termites and, especially, *Rhynchophorus* weevils.

The eggs are creamy-white, about 5 mm long and 3 mm diameter, laid singly in soil near rotting logs or other decaying matter that provides food for the larvae. In Papua New Guinea, breeding sites occur in cocoa and coconut plantations associated with rotting stumps of shade tree (e.g., *Gliricidia sepium*). Breeding sites have also been found in old nests of magapodes, when these were near breadfruit trees.

Eggs hatch after about 30 days producing C-shaped larvae (Photo 2), with heads of reddish-brown to brown. As the larvae grow, they moult twice, reaching 10 cm in length and 2 cm wide, before pupating at about 9 months. Adults are black, 4-6 cm long, and are strong fliers. Males are horned (Photo 3) while females have small double horns on their heads. Adults live for about 4 months. Males and females have been seen in the same tunnel in the crown of a coconut, but it is the male alone that is seen most commonly.

Impact

Damage can be severe when coconuts are planted in land cleared from forest, where the rotting logs provide breeding sites. All the palms may be damaged within 5 years, discouraging farmers from planting or replanting coconuts. However, as the logs rot away, and there are less breeding sites, the attack decreases.

Detection & Inspection

Look for the larvae beneath rotting logs. However, for correct identification, they need to be bred to adults, as they are similar to other beetles in the scarab family. Keep them in a sterilised cow dung and sawdust mixture. Look for the horns on the adult male beetles, they are characteristic, whereas females may be more difficult to recognize.

There could be confusion with *Oryctes rhinoceros*, but that attacks much older palms.

In the field, inspect the crown of the palms, looking for V-shaped cuts in the leaves, distorted fronds and fibre pushed from the tunnels into the crown. Follow the tunnel to find the beetle.

Management

Control of *Scapanes* is difficult as they can cause substantial damage even though the numbers of adult beetles per hectare is relatively low.

NATURAL ENEMIES

As Waterhouse and Norris say in *Biological Control Pacific Prospects*, "Scapanes is not an attractive target for biological control". It is mainly a grower-made problem due to planting coconuts in recently cleared forests. There have been no attempts at biological control although Scapanes is susceptible to *Oryctes rhinoceros nudivirus* which has been used against *Oryctes rhinoceros.* Its success against *Scapane*s is limited by the dispersed distribution of the larvae.

CULTURAL CONTRO

Before planting:

- If possible replant coconuts within existing coconut plantations, where it might be expected that potential breeding sites for *Scapanes* would be low.
- Remove or burn breeding sites, large logs in particular (a difficult practice for small holders when clearing sites from forest).
- Plant *Pueraria phaseolodes, Mucuna pruriens* or other legume species as soon as the trees have been felled to cover the logs and stumps in order to interrupt egg laying.

RESISTANT VARIETIES

Fast-growing varieties are more likely to outgrow the damage caused by the beetles. In Papua New Guinea, fewer palms of the Gazelle Tall died from attack compared to Rennell Tall or Malayan Dwarf.

CHEMICAL CONTROL

Chemical control of this pest is very difficult and not recommended under small-scale production systems.

A pheromone has been isolated and used in mass trapping trials in Papua New Guinea. It is said to be easy to make and is cheap. It attracts both males and females. It has still to be put to use in estate and smallholder plantations.

Previously, granular insecticides were placed in the axils of the fronds. Lindane (HCH) and Furadan (carbofuran) have been used in the past, but the production and use of these chemicals is restricted or banned in many countries. Recommendations for alternatives should be sought from government authorities.

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Information from Waterhouse DF, Norris KR (1987) *Biological Control Pacific Prospects*. Inkata Press. Photo 1 Pita Tikai, SPC, Honiara, Solomon Islands. Photos 2&3 L. Beaudoin-Ollivier, CABI (2010) *Scapanes australis* (rhinoceros beetle) Crop Protection Compendium (**www.cabi.org/cpc**

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