

## RHINOCEROS BEETLE PESTS OF OIL PALM IN PAPUA NEW GUINEA

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### Introduction

There are **four types** of rhinoceros beetles of economic importance to oil palm in PNG (Figs. 1, 2, 4 & 6). You can (and should) check on them in the relevant pest display boxes and on the posters that are in all plantation and OPIC offices.

### Biology

The adult rhino beetles are nocturnal, and are seldom seen during the day. The larvae of these beetles do not cause damage to live oil palms, but feed in rotting wood or other organic detritus (dead or decaying wood or compost, EFB piles).

The main pest species at present is the Asian Rhinoceros beetle, *Oryctes rhinoceros* (Fig. 1), this insect is causing damage to oil palm in NI Province, PNG. Any suspect insects should be sent to PNGOPRA for identification. They are readily trapped using pheromone traps. Male and female rhino beetles can be easily distinguished, as the males have a distinctly larger horn on the head than the females, and females have distinct red hairs at the tip of the abdomen.

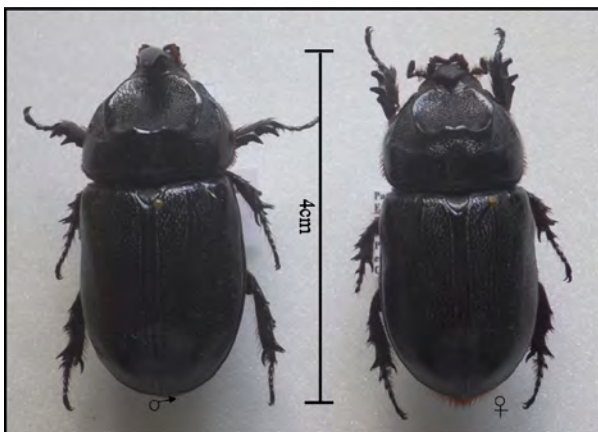


Figure 1: Adult male *O.rhinoceros*. Female is similar with smaller horn and has red hairs at the tip of the abdomen (both about 4cm in size). (These are pinned specimens).



Figure 2: Adult male (L) and female (R) *O.centaurus*. (These are pinned specimens).



Figure 3: Typical damage by *Oryctes* sp., showing young palm base damage (below) and characteristic shape of fronds after crown damage (below).

Rhinoceros Beetle (*O.centaurus*) (Fig.2) is much larger version of *O.rhinoceros*. The larvae are found in decaying palms, (coconuts & oil palms). The adult beetle damage living oil palms by boring into the crown to feed.

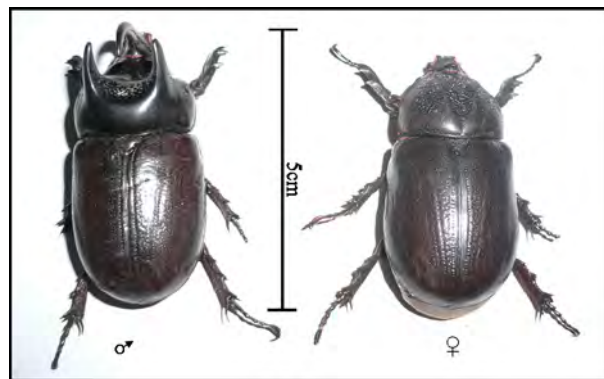


Figure 4: Adult *Scapanes australis*, (male left, female right, both about 5cm in size). (These are pinned specimens).



Figure 5: Typical damage by *Scapanes*, showing the bore hole (above) collapsed frond that has broken at the site of the emergence hole

The Taro beetle (*Papuana* spp.) of which there are many subspecies (Fig.6) is much smaller. The male has an obvious horn on the head, and two distinct lateral tubercles (humps) on either side of the area just behind the head (prothorax). The female has a single, much smaller horn, and much less pronounced tubercles. All these beetles fly at night and hide during the daytime. All are black in colour. *Papuana* spp. often attacks young palms in the nurseries by boring into the root systems, quite often killing the seedlings. All these beetles are often attracted to light at night.

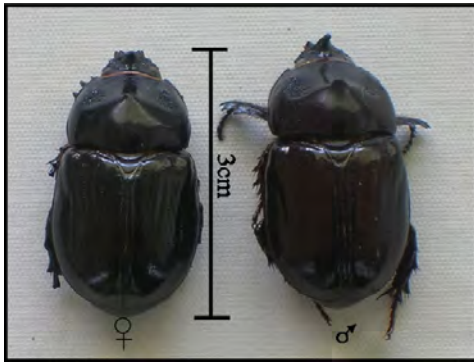


Figure 6: Adult male *Papuana* spp., female is similar but with much smaller horn & tubercles.



Figure 7: Typical damage by *Papuana* spp. on young nursery seedling.

### Food plants and Damage

It is the adults of all these beetles that are responsible for damage to oil palms. The larvae do not cause damage, and are to be found elsewhere feeding in rotting organic matter (wood or compost), they may even be considered as beneficial by breaking down dead wood. The damage to oil palm caused by the three larger rhino beetles is similar; resulting in the characteristic diamond-shape of the fronds as a result of the beetles boring into the crown before frond emergence (Fig. 3). The smaller Taro beetle, *Papuana* spp. may make a hole in the soil in a nursery pot (poly bag), or just under the pot (if roots have grown through), and will only attack young palms (also rarely in experimental plantings) (Fig. 7). *Scapanes* usually causes damage to palms of

about 5-6 years old, particularly when they are planted near natural forest. Damage is usually recognised by 1 or 2 collapsed fronds and the large exit hole at the point of collapse (Fig.5). *Oryctes* will also attack older palms which may show exit holes low on the frond rachis, it is similar to that caused by *Scapanes*.

### Control and sanitation

The current recommendation for the control of all rhinoceros and related beetles in oil palm is "hand-picking". In the case of all of the adult beetles, they may be removed from the feeding hole using a wire with sharpened hook tip, a process called "winkling". Sanitation (keeping the palms and their surroundings clean) and rapid planting and management of cover crop early in the planting cycle is essential, as this removes potential breeding sites and is an essential component of control, as there are not many natural enemies that help to control rhinoceros beetles. Fungal, viral and bacterial diseases will kill adult beetles and the younger stages. The removal (spreading) of EFB piles and old decaying logs is essential, as they provide ideal breeding sites. Fungal pathogens (*Metarhizium*) has been used by treatment of the windrows. *Oryctes rhinoceros* populations are currently being monitored using pheromone traps and killed using the fungal pathogen (*Metarhizium*) to infect adult males to encourage dispersal of infective spores. Potential use of viral entomopathogens have been investigated.

Planting beneficial (nectar and shelter) providing plants will encourage natural enemies (e.g. *Scolia* sp.-Hymenoptera).

### Importance of Survey and Reporting

Regular surveys for the presence or absence of all pests are essential to enable Managers to know when to request a Pest Visit from PNGOPRA. Populations of most rhino beetles may be monitored using synthetic sex attractants (pheromones).

During surveys, samples of beetles on or in palms should be collected and sent to PNGOPRA for confirmation of identity and for any follow up that may be required. Samples collected should **not** be sent in plastic bags, but be kept in either ventilated plastic containers or tins, as the insects will either break out through the bags or die in the bags and rot very quickly. A Pest Visit request should be emailed through to PNGOPRA, (the email address is given below).

#### Label information required is:

1. Locality where the sample was collected, Plantation, Division, MU, Section or Block?
2. Host plant: from which host plant were samples collected? If oil palm, how old was the palm?
3. Date of collection and who made the collection.

#### Authority to undertake palm Treatment (TTI)—an important reminder

Plantations or OPIC considering to undertake TTI with *Methamidophos* are reminded that this is not permitted by the PNG Department of Environment and Conservation (DEC) without written authority from PNGOPRA (Head of Entomology). Permission is granted by the possession of a signed Pest Recommendation form. Treatment teams are expected to receive regular training in Operational, and Health and Safety procedures.

For further information contact:

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