# ENTOMOLOGY BULLETIN: NO. 32
# PESTS OF COCONUT PALM
# THE NEW GUINEA RHINOCEROS BEETLE

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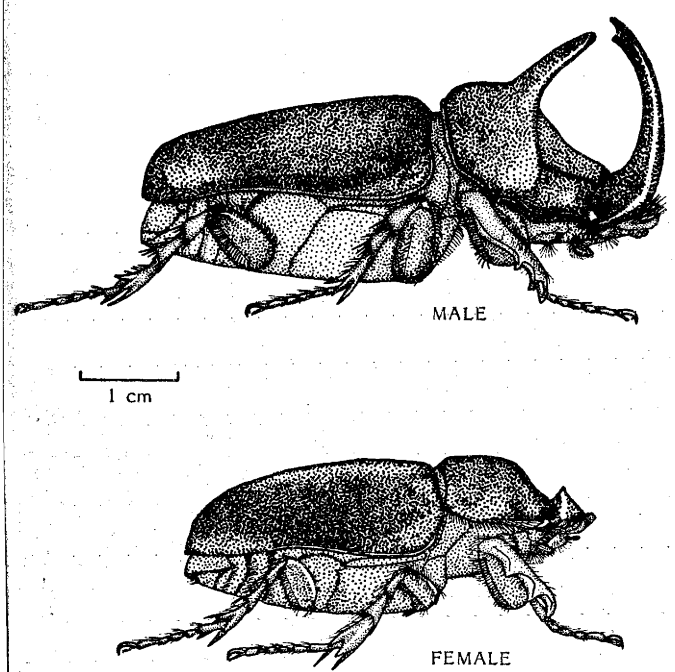
## INTRODUCTION

The New Guinea rhinoceros beetle, *Scapanes australis* is a devastating pest of young coconut palms in Papua New Guinea. It occurs in all areas of the country where coconuts are grown. The beetle is indigenous to this country (i.e. it is not an introduced pest). It can make establishing young coconut palms in the field very difficult. In areas where damage is severe, young palms are often killed.

## DESCRIPTION

The adult beetles are shiny and dark brown to black, depending on age. They are 40-58 mm in length. Males have a very large horn on the head and two large forwardly directed horns on the thorax (the part between the head and abdomen). These horns may be reduced in some beetles. Females do not have any forwardly directed horns on the thorax but have only a tiny double-pointed cap on the head.




*The New Guinea rhinoceros beetle,* Scapanes australis.

The larvae (grubs) are creamy white and c-shaped with legs. They are normally found just beneath dead rotting forest logs on the soil surface.

## BIOLOGY

After mating, the female adult beetle lays eggs in the soil usually near a dead forest log. After hatching from the eggs, the larvae feed on the rotting logs. The time interval for each immature stage of the beetle in the breeding site is as follows:

| | |
|---|---|
| Egg | 4 weeks |
| First Instar larva | 5 weeks |
| Second Instar larva | 6 weeks |
| Third Instar larva | 7 months |
| Prepupa | 3 weeks |
| Pupa | 6 weeks |

The adult lives for about 4 months.

Since the breeding sites of the beetles are dead logs in recently cleared jungle, young palms close to newly cleared areas are attacked more than palms in areas which have been cleared or logged for many years.

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## ECONOMIC IMPORTANCE

Attack on coconut palms

New Guinea rhinoceros beetles attack only young palms from just past the seedling stage to about 5 years old. Damage to coconut palms is caused by the adult only. The larvae do not feed on living palm tissues.

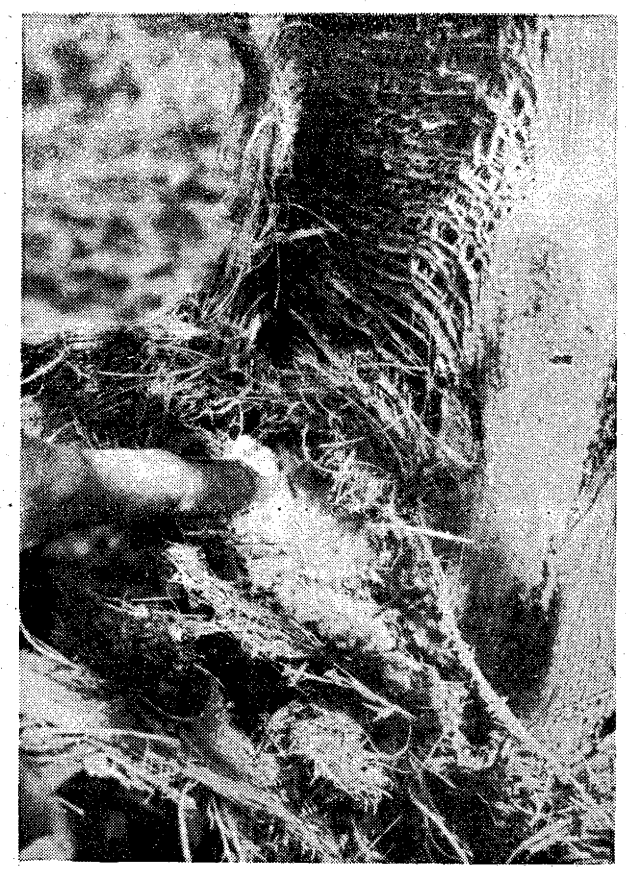
The beetles crawl down an axil of a frond and bore into the middle of the stem, or they bore straight into the trunk from the outside. The damage results in the opened fronds having v-shaped cuts. The beetles feed on tissue juices and some of the crushed fibre is pushed outside the entrance hole. Their attack is quite similar to that of Asiatic rhinoceros beetles (see Entomology Bulletin No. 31). The only difference is that the two types of rhinoceros beetle attack palms of different ages.

Severe attack by New Guinea rhinoceros beetles may kill the palm. Large stands of palms can be lost due to the beetle attack. Sometimes the growing points of 1-2-year-old palms may not be completely destroyed, but the plants may produce twisted fronds with the leaflets compressed and crumpled. As the attacked palm grows the trunk may grow crookedly.

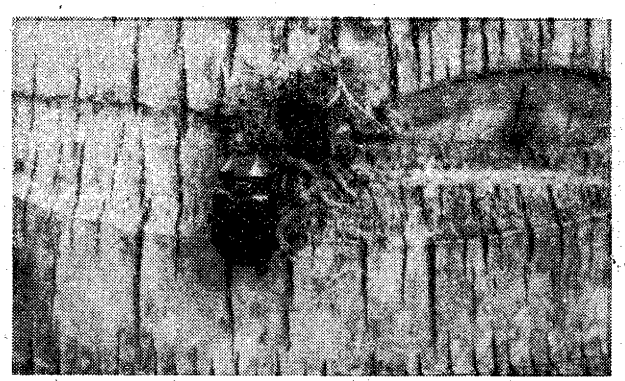
The New Guinea rhinoceros beetle not only damages the spear cluster in the crown of the palm but it may also damage young nuts and trunks of coconut palms. However these types of damage are rare. The trunks can be attacked if they have been damaged by knife cuts.

Host plants

Young coconut palms are the main food source of the adult beetles but they may also feed on oil palm, banana, manila hemp, sugarcane, betel nut palm, and other ornamental and wild palms.



*Damage by an adult New Guinea rhinoceros beetle boring into the heart of young coconut palm from the outside.*



*Adult beetle damage on a 5-year-old coconut plam trunk which has had a previous knife cut. This type of damage is rare.*

*Adult beetle feeding on a young nut of a 5-year-old coconut palm. This type of damage is also rare.*

## CONTROL METHODS

The New Guinea rhinoceros beetle is a very difficult pest to control. To reduce the amount of damage to the palms, several control methods should be used.

### Cultural control

For cultural control of the New Guinea rhinoceros beetle, coconut blocks and plantations should be kept clean. Any dead logs should be chopped, dried and burnt. In addition, *Pueraria phaseoloides* should be planted. This cover crop grows over any dead logs and stumps, and makes it difficult for the beetles to find their breeding sites. Cultural control is especially important for coconut blocks and plantations near virgin forest.

### Biological control

The virus disease used on Asiatic rhinoceros beetle, *Oryctes rhinoceros* is ineffective on the New Guinea rhinoceros beetle. A fungus disease called the green muscardine fungus infects the New Guinea rhinoceros beetle. This fungus is present in the field but at a very low level. The level can be increased by growing the fungus in the laboratory and distributing it on coconut palm axils. This disease does help in the control of the New Guinea rhinoceros beetle, but it spreads only slowly.

### Chemical control

The Entomology section of the Department of Primary Industry recommends that 6% lindane granules should be used. Apply 30-60 g of the granules per palm. The granules should be distributed through the spear and leaf axils at 3 monthly intervals or more frequently if necessary. In some areas, this insecticide is ineffective because it is washed away by heavy rainfall. Contact your nearest D.P.I. entomologist for advice.

Since one control method rarely achieves an acceptable level of control for this pest, all control methods recommended should be applied to blocks and plantations where the beetle is a problem.

## FURTHER READING

Arura, M. (1984). Entomology Bulletin No. 31. Pests of coconut palm - The Asiatic rhinoceros beetle. *Harvest* 10(2): 84-86.

Perry, G.H. (1976). Control of indigenous rhinoceros beetle in coconuts. Lowlands Agricultural Experiment Station. *Information Bulletin* No. 11. LAES, Keravat, East New Britain Province.

## FURTHER INFORMATION

If damage from the New Guinea rhinoceros beetle is occurring, get advice from your nearest D.P.I. entomologist or didiman. Entomologists are based at:

PORT MORESBY
D.P.I., P.O. Box 417, KONEDOBU
Tel: 214699 Ext. 255

LAE
Bubia Agriculture Research Centre
P.O. Box 73, LAE
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MOUNT HAGEN
Kuk Agricultural Research Station
P.O. Box 339, MOUNT HAGEN
Tel: 551377

KIMBE
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