

## TWO PLANTHOPPERS FROM COCONUT THAT ARE POTENTIAL THREATS TO OIL PALM IN PAPUA NEW GUINEA

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### Introduction

There are two main types (species) of planthoppers ("true" bugs) commonly found on oil palm in PNG. They are both large, however they have not been found to occur together, and their distribution appears to be separated by altitude. In WNB, and on the mainland, in the lower altitudes we find *Zophiuma butawengi* (previously known as *Z. lobulata*), (Fig. 1, 2 & 3) which is well known for being the causal agent of a frond die back known as Finschhafen Disorder (FD) which causes leaflet yellowing (chlorosis) and death, subsequently affecting fruit production, and in severe attacks, death of the palm. On the mainland, in the Madang Province (so far), we find *Z. pupillata*, a similar but distinctly pink coloured planthopper, typically found on coconut palms (Fig. 5).

You can (and should) check in the relevant pest display boxes and on the posters that are in all plantation and OPIC offices; however please note *Z. pupillata* is not yet represented in the display boxes, although specimens may be seen in the entomology collection at PNGOPRA, Dami.

These two planthoppers have well marked false "eye" markings at the tip of each wing (Figs. 1 & 5).

### Biology

These planthoppers usually fly at night, and may be found sitting on the underside of fronds during the day, often in association with nymphs (young stages). Egg masses can be found under leaflets or leaf bases (Fig. 4) and are covered with white waxy scales produced from the tip of the female abdomen. *Z. butawengi* egg masses have also been found on other plants such as Banana and Taro in WNB. Eggs of *Z. butawengi* are commonly parasitized by very small Hymenoptera of the Families Encyrtidae and Mymaridae. Nymphs (young stages) are wingless, and may be easily recognised by the long twin "tails" at the tip of the abdomen that are presumed to ward off parasitoids and predators (Figs. 3 & 5[r]).



Figure 1: *Zophiuma butawengi*, adult. (Photo. R. Roe). Scale bar = 5mm.

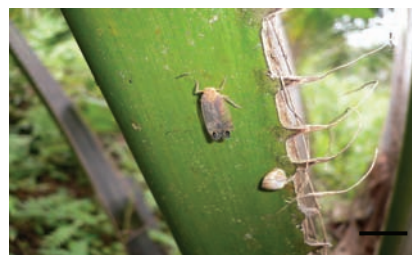


Figure 2: *Zophiuma butawengi* adult, in typical pose on oil palm rachis. Scale bar = 5mm.



Figure 3: *Zophiuma butawengi*, 1<sup>st</sup> instar nymph. (Note the long tails). Scale bar = 5mm.

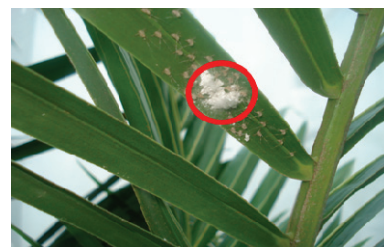


Figure 4: *Zophiuma butawengi*, egg mass and 1<sup>st</sup> instar nymphs on the underside of an oil palm leaflet.



**Figure 5:** *Zophiuma pupillata*: male (l), female (c) and nymph (r). Scale bar = 5mm.

### Food plants and Damage

Planthoppers are found commonly on the underside of fronds of oil palm, coconuts and betel nut (*Areca catechu*) palms. Biological and host preference studies have been undertaken at Dami, and results published. Adults and nymphs feed by piercing the vascular tissues (phloem) of the host and they imbibe the sap. It is known that feeding by large numbers of *Z. butawengi* are the cause of what is known as Finschhafen Disorder [FD] (Figs. 6 & 7), while *Z. pupillata* is strongly linked with the fatal, and for the oil palm industry, potentially threatening Bogia Coconut Syndrome (BCS) currently only found in the Madang Province of PNG, and, as yet, not found on oil palm.



**Figure 6:** Finschhafen Disorder (FD) on a symptomatic oil palm



**Figure 7:** Finschhafen Disorder (FD) on betel nut (*Areca catechu*)

### Sanitation and Control

Sanitation (keeping the palms and their surroundings weed free) along with early planting and management of cover crop in the planting cycle is essential. As with other pests, planting beneficial (nectar and shelter) plants will encourage natural enemies *e.g.* Encyrtidae and Myrmadae (Hymenoptera) which have been reared from

eggs of *Z. butawengi*, both of whom could be mass reared for release as biological control agents for *Z. butawengi*, and may well be suitable against *Z. pupillata* in the future.

Control of these insects is difficult as adults are highly mobile, however they (especially nymphs) may be controlled using Targeted Trunk Injection (TTI), in the same way as for sexavae and stick insects, although the FD will have manifested itself by the time the adults have been located.

Studies on *Z. butawengi* identified a number of fungal pathogens ("entomophagous fungi"), but there is currently no work being undertaken on this aspect of Integrated Pest Management (IPM).

### Importance of Survey and Reporting

Regular surveys for the presence or absence of planthoppers are essential to enable Managers to know when to request a Pest Visit from PNGOPRA. There is currently no efficient system for monitoring planthopper populations, apart from visual recording.

During surveys, samples of planthoppers from palms should be collected and sent to PNGOPRA for confirmation of identity or for any follow up actions that may be required.

Samples collected should **not** be sent in plastic bags or pots but in the white pollination bags, which should be fully labelled.

### Label information required is:

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

A Pest Visit request should be emailed through to PNGOPRA, (the *e-mail* address is given below).

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

*Plantations or OPIC considering whether 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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