

Advisory leaflet 14
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SOUTH PACIFIC COMMISSION
FRUIT-PIERCING
MOTH



Adult moth feeding on guava fruit (natural size)

The **FRUIT-PIERCING MOTH** (*Othreis fullonia*) is very widespread, being found in Africa, India, South-east Asia, Australia and the Pacific Islands. Within the South Pacific Commission region, it is found in most island groups but has *not* been reported in Kiribati, Marshall Islands, Nauru, Pitcairn Islands Tokelau or Tuvalu. It is a migratory species and has been found occasionally in New Zealand and on ships at sea.

DAMAGE TO FRUIT

A wide range of fruits is attacked, particularly banana, citrus, guava, mango, pawpaw and tomato. The adult moth is active at night. It lands on the ripening fruit, pierces the skin with the tip of its proboscis (tongue) and sucks out the juices (frontispiece). The tip of the proboscis is armed with saw teeth (Fig. 1). A brown, circular, rotten area develops round the tiny puncture hole.

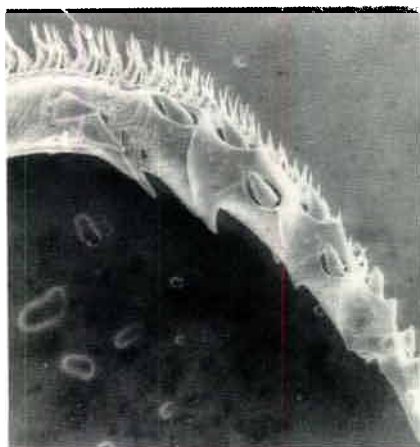


Fig. 1: Tip of the proboscis (tongue) showing saw teeth (approx. $\times 30$).

The attack by the fruit-piercing moth has also been associated with damage to the fruit by the rot fungus *Oospora*. Sometimes the rotten fruit falls from the tree.

To distinguish the damage caused by the fruit-piercing moth from that caused by fruit-flies, the fruit should be cut open; in fruit-fly damaged fruit, the grubs (larvae) can usually be seen and the fruit flesh has far more liquid than in fruit damaged by the fruit-piercing moth, which are soft and mushy.

DESCRIPTION AND LIFE-CYCLE

The adult moths are about 3.5-5.0 cm long, with a wing span of 8-10 cm. The body is pale- to purple-brown with a dull yellow abdomen. The forewings are of an olive-brown to red-brown colour often flecked with green and white. The underwings are edged with a black border which has white dots along the edge, and have an inner orange area with a black comma-shaped mark inside it.

The female lays up to 300 eggs at a time on the underside of the leaves of the leguminous tree *Erythrina* (Fig. 2).



Fig. 2: Eggs on underside of *Erythrina* leaf ($\times 1\frac{1}{2}$).

Several species of *Erythrina* [=coral tree, dadap, drala (Fiji), ngatae (Samoa)] serve as food plants. In New Caledonia, *Stephania forsteri*, a creeping vine found in the forest, is also a host for

the larvae. The eggs of *Othreis* are often deposited on the leaves of plants growing near *Erythrina* trees.

The eggs are at first pale green but turn brown before hatching. The newly hatched larvae (caterpillars) are 4-5 mm long, with brown spots on a clear green body. The larva moults four times and when full-grown is about 5.5 cm (Fig. 3) and can be either of two colour forms. 'Green' larvae are pale bright bluish green with an 'eye' mark on each side of the second abdominal segment.



Fig. 3: Full-grown larva of fruit-piercing moth (approx. $\times \frac{3}{4}$).

The centre of the 'eye' mark is bright blue. The spiracles are bright crimson. 'Brown' larvae are richly coloured in brown, black and white and have two large white and black 'eye' spots on each side of the body.

Pupae are formed among the webbed leaves of *Erythrina* or on nearby plants (Fig. 4). They are about 3 cm long and

shining brown-black. The life-cycle from hatching of the egg to adult takes about 30-62 days depending on the season and on other environmental factors.



Fig. 4: Pupae of fruit-piercing moth (approx. $\times \frac{3}{4}$).

CONTROL

Biological Control

The larvae of the fruit-piercing moth can be attacked by several parasites and predators. The most important parasite is the tachinid fly, *Winthemia caledoniae*, native to New Caledonia. It has been introduced into Tonga and is probably established there. This fly is about 1 cm long. It usually lays its eggs on the 5th (or rarely the 4th) stage *Othreis* larvae. The eggs of the fly take 3-3½ days to hatch and the moulting larvae penetrate into the body of the *Othreis* caterpillar, where they feed on the body fluids. The fly larvae continue feeding until the caterpillar pupates. Once the pupa has formed,

the fly larvae emerge, generally from between the abdominal segments. These emerging *Winthemia* larvae may pupate in a cocoon amongst the *Erythrina* leaves or they may fall from the tree and pupate in the soil. Parasitized *Othreis* pupae have an average of six fly larvae in them. Flies emerge from the pupae after 12-23 days.

In New Caledonia, the eggs of *Othreis* can be parasitized by three tiny wasps, *Ooencyrtus* sp., *Telenomus* sp. and *Trichogramma australicum*, and by a whitish fungus, *Fusarium* sp.. Larvae of lacewing flies (*Chrysopa* spp.), lygaeid bugs and ants have been observed to feed on the eggs. Other parasites of *Othreis* larvae and pupae are the small wasps, *Echthromorpha striata*, *Euplectrus platyhypenae* (also known from Fiji) and *Lasiopimpla pacifica*. Several predators of *Othreis* larvae have also been noted: the widespread Pacific 'hornet', *Polistes olivaceus*, the predatory bug *Platynopus melanacanthus*, the praying mantis, *Tenodera costalis* and several birds. The occurrence of these parasites and predators on *Othreis* on Pacific Islands other than New Caledonia is not recorded.

Cultural Control

Erythrina species are widely used in the Pacific as 'living fence posts' and also as shade trees, particularly for cocoa growing. However, it is recommended that *Erythrina* should not be planted near fruit-tree plantations, otherwise large populations of *Othreis* could build up on the *Erythrina* trees. The moth can fly considerable distances, so any large concentrations of *Erythrina* near an orchard (i.e., up to 5 km radius from the orchard) are a source of fruit-piercing moths. The prompt collection of maturing and damaged ripe fruit from orchards is also advised because these fruit attract moths.

OTHER MOTHS

Several other moths may be found feeding on fruits if the trees are examined during the night. There are three fruit-piercing species related to *Othreis fullonia*: *O. paulii* (Fiji), *O. matema* (a migrant species recorded in Fiji, New Caledonia, Norfolk Island and Society Islands) and *Eudocima salamina* (Fiji, New Caledonia, Papua New Guinea, Solomon Islands, Tonga, Vanuatu and Western Samoa). Other moths frequently found on damaged or fallen fruits feed on the flesh of already damaged fruit.



This leaflet was prepared by P. A. Maddison, Entomology Division, DSIR, Auckland, New Zealand. The photographs were taken by B. S. Eykel, Entomology Division, I. H. Hallett, Plant Diseases Division, DSIR, using the University of Auckland scanning electron microscope (Fig. 1) and by P. Cochereau (Fig. 2, courtesy of ORSTOM, Paris). Further information can be obtained from the Plant Protection Officer, South Pacific Commission.

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