



## Banana Moth—A Potentially Fatal Pest of *Pritchardia* and Other Palms

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*Pritchardia* species, some endemic to the Hawaiian Islands, are among the most valued and cherished palms. A few species are quite rare. Growers expend significant resources to acquire these plants and grow and maintain them in tropical landscapes. Therefore, any significant *Pritchardia* pest or disease problem must be dealt with effectively to protect the investment of time, human resources, and capital.

Plant stress arising from nutritional deficiencies, especially deficiencies of potassium and magnesium, and other factors is a ubiquitous problem for *Pritchardia* species in some Hawaiian landscapes. Other stresses, including herbicide injury, drought, shallow soil, planting in blue-rock, flooding, and mechanical wounding of stems, can place the palm's physiology under great strain during establishment in landscapes after outplanting.

Plants so weakened can become targets for the banana moth, *Opogona sacchari* (Bojer), perhaps the most important insect pest of *Pritchardia* in Hawaii. Adult females lay eggs in wounded or compromised *Pritchardia* tissues. The caterpillar larvae hatch and feed voraciously on the living and decaying tissues of the host, and this can cause extensive damage. Where enough eggs are laid in the youngest leaves of a plant, a fatal heart rot disease caused by caterpillar feeding may ensue. This condition and its management are described here.

### The banana moth's morphology and life cycle

The banana moth is a significant pest of many plants in Hawaii, including sugarcane, banana, and pineapple. Substantial losses in crop yield, overall reductions in plant health, and even plant death may result from banana moth infestations.

*O. sacchari* has a wide distribution, occurring in many island locations throughout the world and in the Americas and Africa. It was accidentally introduced to



A young *Pritchardia hillebrandii* plant in a Hawaii landscape, dying from attack by banana moths, *Opogona sacchari*. The heart of this plant is completely rotten.

Hawaii and is known to occur on Oahu and Hawaii.

The larvae of *O. sacchari* are generally considered to be scavengers that feed on decaying and dead plant material. However, they also can colonize living tissues. In Hawaii they are perhaps best known as pests of sugarcane, where they damage the “eyes” (buds) of the plants, but they also attack many other ornamental and

food crop plants.

The adult moths are 10–15 mm ( $\frac{3}{8}$ – $\frac{5}{8}$  inch) long and have grayish-brown wings with two small but prominent black spots on each wing. When the moths are at rest, their two antennae are folded over the wings or lie next to the abdomen. Adult females lay tiny eggs into naturally existing or wound-created crevices on plants; the eggs hatch in about a week.

Upon hatching, the young caterpillars (larvae) bore into the plant, eventually producing characteristic frass deposits. Fully developed caterpillars removed from their tunnels measure 20–30 mm ( $\frac{3}{4}$ – $1\frac{1}{8}$  inches) long and are somewhat transparent; it is possible to see some of their internal organs with the naked eye. A distinguishing characteristic of the caterpillar is the presence of brown patches on its top and dark brown “breathing pores” along its sides.

The larvae pupate within the plant. Following the emergence of the adult moths from the pupae, empty pupal cases may be observed protruding from the stems or other tissues of the infested plants. The life cycle is completed in about 40–45 days under summer conditions in Hawaii, a bit longer in cool weather. Thus, a considerable number of generations per year can be produced.

### Damage to *Pritchardia* palms

The severed petioles of pruned *Pritchardia* plants attract the wound-seeking banana moths that are searching for a suitable place to lay their eggs. These plants also have a large number of natural openings, protected crevices, and naturally decaying tissues all over the stem. Adult female moths lay eggs in these locations, and moth populations begin to increase on the infested plant.

The banana moth’s feeding causes stress for the *Pritchardia* plants. Other stressors may be present, such as drought, weed-whacker damage, fertilizer burn, waterlogging, and herbicide or pesticide injury. These factors contribute to a decline in plant health. This process can take many months to develop into a significant problem.

Eventually, where plants are thus weakened or where moth populations are particularly large, young heart-leaves come under attack by the voracious moths. These succulent, nutrient-rich tissues are particularly susceptible to the moths’ feeding, and severe damage can occur rapidly. Because palms are monocots, with their growing point at the center of the base of the stem, when the heart-leaves are destroyed, plant death is sure to follow.



Adult banana moth, *Opogona sacchari*, and pupal case (magnified about 6 X; actual size about  $\frac{1}{2}$  inch long). Photo by Arnold Hara.



Necrotic heart leaves of a dying *Pritchardia hillebrandii* plant infested with banana moths.



Necrotic heart leaves (above) and an adjacent leaf (below), easily pulled out from the center of a dying *Pritchardia hillebrandii* plant infested with banana moths. Opportunistic fungi infest the tissues, accelerating their decomposition.

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Significant heart rot of a young *Pritchardia hillebrandii* plant infested with banana moth larvae.



A declining *Pritchardia hillebrandii* plant infested with banana moths. Rotten tissues are easily detached from the base of the plant, revealing necrosis of living stem tissues beneath. Several mature leaves show signs of stress. From a distance, the plant may appear to be relatively healthy at this stage of decline. However, upon closer inspection, it becomes evident that the heart leaves are also rotting.



Banana moth larvae found feeding within an affected heart of a declining *Pritchardia hillebrandii* plant.



Opportunistic fungi and caterpillar frass pellets on the surface of a rotting *Pritchardia hillebrandii* leaf petiole.

## Management of the pest

The following management practices may minimize the detrimental effects of banana moth attacks on *Pritchardia*.

### Minimize plant stress

Plants under stress are very susceptible to attack by the banana moth. The most dangerous and common stress factor in this regard is drought. A second important stress factor is poor plant nutrition. Keep plants well irrigated and properly fertilized. Do not let potted palms become too dry. Use soil testing results to help guide fertilizer practices. Avoid using herbicides near *Pritchardia* plants in landscapes if possible. Although herbicides are safe to use around most palms, in some cases or for certain species problems may arise when plants are contacted by herbicide sprays. Avoid over-pruning of leaves, and treat pruned surfaces with an approved insecticide such as one derived from *Bacillus thuringiensis* (“Bt”). Both *B. t. kurstaki* and *B. t. aizawai* have broad registrations among ornamental plants.

### Intercrop

Host-finding by the moth may be more difficult in diverse plantings. Therefore, avoid monocropping palms or placing susceptible plants in exposed positions in barren landscapes. However, the banana moth is so polyphagous (has such a wide host range) that intercropping might not work where other hosts for the moth are present.

### Use approved insecticides

Check with your nearest Cooperative Extension Service office for the latest information on registered insecticides that may be sprayed on *Pritchardia* plants to protect them from banana moth attack. The most effective products are probably pyrethroids, useful as contact insecticides after infestations develop, and Bt products, which have some residual and preventive effects as moths feed on tissues that received Bt spray applications.

Learn to recognize the banana moth and symptoms of its damage. Scout *Pritchardia* plants regularly for moths and moth damage. Treat plants as described.

### Alternate hosts

Watch for the buildup of moth populations on alternate hosts in the vicinity of *Pritchardia* palms. Banana moths have few qualms about what they eat, it seems. They occur in grasses, banana, and coffee and can be found wherever there is decaying vegetation.

### Damage to other palms

Banana moth damage is not confined to *Pritchardia* palms. Other palm species may also be subject to attack and show symptoms similar to those described here, according to the UH-CTAHR Agricultural Diagnostic Service Center. Mortality due to banana moth attack of the following palm species has been observed in Hawaii in recent years: floribunda palm; foxtail palm (*Wodyetia bifurcata*); Manila palm (*Veitchia merrillii*), and coconut palm (*Cocos nucifera*). The point of moth entry is usually either into the young heart leaves or some place along the stem in natural openings or wounds.