

Tetrio Sphinx, Giant Gray Sphinx, Frangipani Hornworm, *Pseudosphinx tetrio* (Linnaeus) (Insecta: Lepidoptera: Sphingidae)¹

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Introduction

The tetrio sphinx, *Pseudosphinx tetrio* (Linnaeus), is a common moth in the American tropics and subtropics that less frequently occurs in southern parts of Florida. Although the adults exhibit mostly drab grey coloration, larvae are conspicuous, large caterpillars that often occur in gardens feeding on frangipani and other members of the dogbane family (Apocynaceae).

Synonymy

(from Heppner 2003)

Pseudosphinx Burmeister (1856)

Pseudophinx Burmeister (1855, misspelled)

Macrosila Lucas (1857) [preocc. Walker (1856)]

tetrio (Linnaeus) (1771)

hasdrubal (Cramer) (1780)

obscura Butler (1877)

Other names in the literature synonymous with *P. tetrio* include *Sphinx plumeriae* (Fabricius), 1775 (Santiago-Blay 1985).



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Figure 1. *Pseudosphinx tetrio* (Linnaeus) adult; dorsal view; wingspan 12.5 cm. Credits: James Dunford, University of Florida

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1. This document is EENY-344, one of a series of Featured Creatures from the Entomology and Nematology Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Published: March 2005. This document is also available on Featured Creatures Website at <http://creatures.ifas.ufl.edu>. Please visit the EDIS Website at <http://edis.ifas.ufl.edu>.
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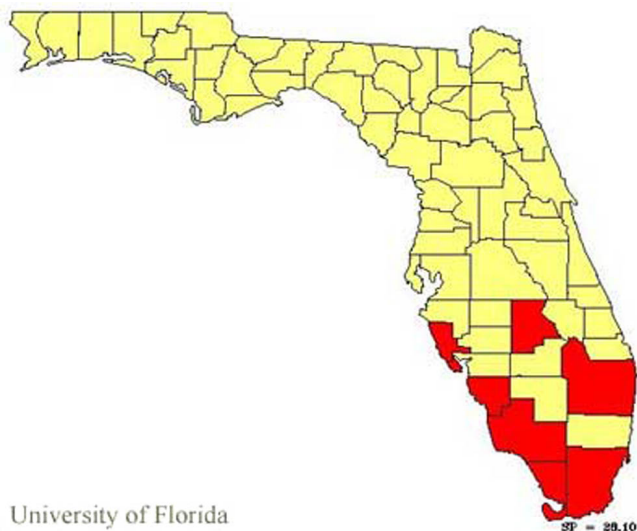
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Distribution

This moth is widespread throughout the American tropics and subtropics in lowland habitats. Its range extends from southern Brazil through Central America, Mexico, and the West Indies to south Florida, southern Mississippi, Arkansas, Texas, and southern Arizona. Adults have strayed as far north as Nebraska, Pennsylvania and Connecticut. It is very common in the Greater Antilles but its occurrence is less common in the United States. Florida records include the southern counties Collier, Dade, Highlands, Lee, Monroe, Palm Beach, and Sarasota. Brown (1976) recorded it on Sanibel Island and Minno and Darrow (1995) reported its presence in the Florida Keys (records included Key Largo, Duck Key, Big Pine Key, and Key West). Additional specific locality and/or date records compiled from specimen label data at the Florida State Collection of Arthropods include the following:

Adults: Dade Co: Miami-27-VI-1947; no locality-19-XII-1960; Palm Beach Co.: Belle Glade VIII-1959

Larvae: Dade Co.: Coral Gables-20-VII-1994



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Figure 2. County records of *Pseudosphinx tetrio* (Linnaeus) in Florida. Credits: Kathryn A. Barbara, University of Florida

Given the conspicuous coloration and size of larvae as well as their occurrence in gardens and landscape settings and the popularity of sphingids to insect collectors, additional Florida records undoubtedly occur but they are probably largely

restricted to southern counties where hostplants (i.e. *Plumeria* spp.) exist.

Description

Adult: Adult dorsal forewing is brownish with a dark spot at the base of the costal margin and blurry gray and white markings. Dorsal hindwing is dark brown with white along the inner margin and the lower half of the outer margin. The body is striped with transverse grey-white bands and wider black ones. Average wingspan is 12.7 to 14 cm (females are typically larger than males and lighter in color).

Eggs: Eggs exhibit no sculpturing except for minute punctures on the surface. They are pale green, ellipsoidal and measure approximately 2.2 to 2.5 mm.

Larvae: Larvae are velvety black with yellow rings and a reddish-orange head and can attain lengths of up to 6 inches. The black 'horn' located on abdominal segment 8 is approximately one inch long and is located on an elevated orange 'button.' Thoracic legs and prolegs are orange and speckled with black spots. Newly molted larvae are light yellow and dark gray in alternating transverse rings; several hours after molting, larvae become their typical yellow and black coloration.



Figure 3. *Pseudosphinx tetrio* (Linnaeus) larva showing relative size on adult hand; Maricao Forest, Puerto Rico. Credits: Gino Nearn, University of Florida

Pupae: Newly formed pupae are yellow, and after two to three hours brown spots appear on its surface. The pupal coloration eventually darkens to a yellowish-brown with lateral dark stripes on the thorax and rings on the abdomen. The final color after



Figure 4. *Pseudosphinx tetrio* (Linnaeus) on *Plumeria alba*, Buck Island, St. Croix, U.S. Virgin Islands. Credits: Dan Clark, Florida/Caribbean Exotic Plant Management Team (FCEPMT), National Park Service



Figure 5. Close-up of *Pseudosphinx tetrio* (Linnaeus) larva feeding; Maricao Forest, Puerto Rico. Credits: Gino Nearn, University of Florida

fully hardening is a uniform dark reddish-brown; pupal length is approximately 7.0 cm.

Life Cycle and Biology

Females lay approximately 50 to 100 eggs in clusters on leaves of the host tree. The larval color pattern is a typical aposematic warning sign that they are potentially toxic to predators. Hostplants in the family Apocynaceae produce white, toxic latex that *P. tetrio* is able to detoxify and possibly sequester for defense purposes. Some cuckoo birds in Belize however are not deterred and have been reported feeding on larvae (Meerman 2002). The larva has been hypothesized to be a coral snake mimic in Costa Rica (Janzen 1980). Janzen (1980) also reports that larvae wave their anterior portion back and forth when disturbed and bite when handled. Jahnes et al. (2002) conducted preliminary studies to define the

interactions and bioactive properties of *P. tetrio* larvae and the hostplant *Himatanthus sucuuba* (Spruce ex Müll. Arg.) Woodson, a plant known to be used as an anti-inflammatory and to treat various ailments such as anemia, arthritis, and cancer from its bark extracts. Larval hairs have also been reported to cause a clinical case of the keratitis (Merle et al. 2001). Minno and Darrow (1995) suggested that native Florida hostplants may include the apocynaceous vines *Rhabdadenia biflora* (Jacq.) and *Echites umbellata* Jacq. These vines occur in salt marshes and at the edges of mangrove forests in south Florida.

Adults eclose from pupae in leaf litter or subterranean chambers. Several adult flights occur in Florida from March to September. Adults are known to nectar on rosy or sea periwinkle (*Vinca rosea* L.). Gribel and Hay (1993) recorded *P. tetrio* adults nectaring on *Caryocar brasiliense* Cambess. in Brazil and suggested that it may be a minor pollinator along with bats for that plant species. They observed *P. tetrio* landing on the flower and nectaring with their relatively short proboscis and coming into contact with plant reproductive structures. Adults are attracted to lights and flowers at night.

Host Plants

Apocynaceae (dogbane family)

Plumeria rubra L. (frangipani, temple trees)

Plumeria alba L.

Plumeria obtusa L.

Ilamanda cathartica L.

Himatanthus sucuuba (Spruce ex M. Arg.) Woodson

Adenium sp.?

Rhabdadenia biflora (Jacq.) (rubber vine) (native Florida hostplant?)

Echites umbellata Jacq. (devil's potato) (native Florida hostplant?)

Frangipani trees have lemon to gardenia like fragrant and waxy flowers that are used to string together Hawaiian leis. They are typically planted to create a tropical look to urban areas. Some varieties grow up to 25 feet with an equal spread. There are also smaller varieties that grow to heights of 6 feet. Frangipani trees originated in the New World tropics, from the Caribbean Islands and Central America.

Oleaceae

Jasminum spp. (jasmine) (this host record may be in error as *P. rubra* is sometimes referred to as jasmine [Morton and Ledin 1952])

Damage

Tetrio sphinx caterpillars often appear in gardens or landscaping and can defoliate frangipani trees in a few days or couple of weeks. One caterpillar can devour three large leaves per day. They typically start feeding from the leaf tip and work back and have been known to feed on tree stems if excessive feeding depletes leaf availability. They are typically present from July to September in southern Florida.



Figure 6. *Pseudosphinx tetrio* (Linnaeus) larvae defoliating a tree in Maricao Forest, Puerto Rico. Credits: Gino Nearns, University of Florida



Figure 7. Closer view of *Pseudosphinx tetrio* (Linnaeus) larva defoliating a tree in Maricao Forest, Puerto Rico. Credits: Gino Nearns, University of Florida

Management

Mechanical: Hand-picking larvae is probably the best way to eliminate them from trees.

Biological: Use of a biorational or "soft" pesticide product with spinosad or *Bacillus thuringiensis* (B.t.) will also work (Gabel 2003). Their presence and feeding habits typically do not cause severe damage to hosts and trees typically survive *P. tetrio* defoliation.

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