A Shoemaker Butterfly *Prepona laertes* (Lepidoptera: Nymphalidae)[1]

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Introduction

Prepona laertes (Hübner) is a butterfly native to South and Central America. In August 2013, USDA and FDACS-DPI found an established population of the species in Broward County, Florida (Hayden 2013). The caterpillars feed on leaves of cocoplum (*Chrysobalanus icaco* L.). The simultaneous presence of adult butterflies, eggs, and caterpillars of all stages, plus an anecdotal prior sighting, suggested establishment some months prior to discovery. The infestation has persisted to the present time in a localized area in Coconut Creek, Florida.

Distribution

The species is distributed broadly from tropical Mexico to subtropical South America. It is not present in the Antilles, and it has not been found previously in the natural environment in North America. The butterflies inhabit many types of mesic and humid forests and can exist in suburban areas in their native range (Neild 1996). It is doubtful that they tolerate temperatures below freezing.

Description

Prepona laertes differs from other butterflies in Florida in wing pattern (Figures 1–5). The forewing length (base to apex) is 3.5 to 5.0 cm (1.4–2.0 inches), males being smaller. The wings are black on the dorsal side with a broad, blue medial band. Ventrally, they are grayish to tan brown with narrow, angular lines. Each hind wing has two small eyespots. Males have a large tuft of yellow hairs on the hind wing.

Figure 1. Male *Prepona laertes* from initial interception in Florida, dorsal aspect. Scale bar = 1 cm.
Credits: J. E. Hayden, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

Larvae are smooth and brown (Figures 6–8). The head has a pair of closely set horns, appearing "coneheaded." The abdomen is swollen anteriorly, thickest at the second segment. The prolegs on the last segment are rudimentary and hidden under a pair of long, crooked "tails." These features are most pronounced in older caterpillars (Figure 8), and first-instar larvae (Figure 6) cannot be distinguished easily

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from those of native species. Mature larvae reach lengths of 7.0–7.5 cm. The cryptic larvae move slowly with a waddling gait (DeVries 1987).

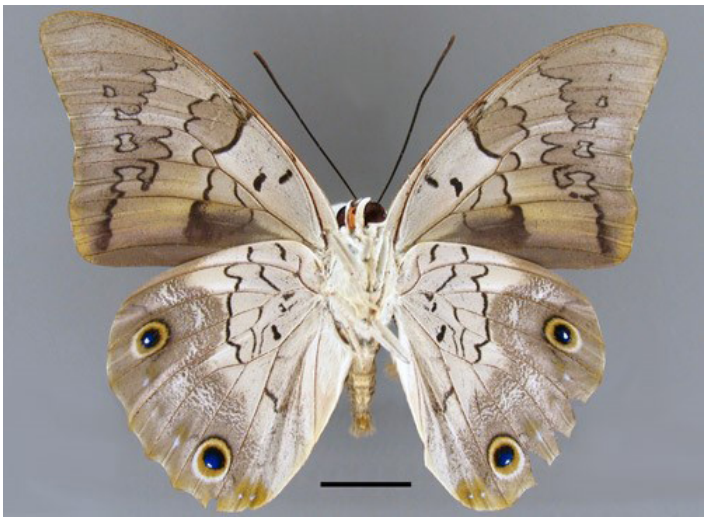

Figure 2. Male *Prepona laertes*, ventral aspect. Scale bar = 1 cm.
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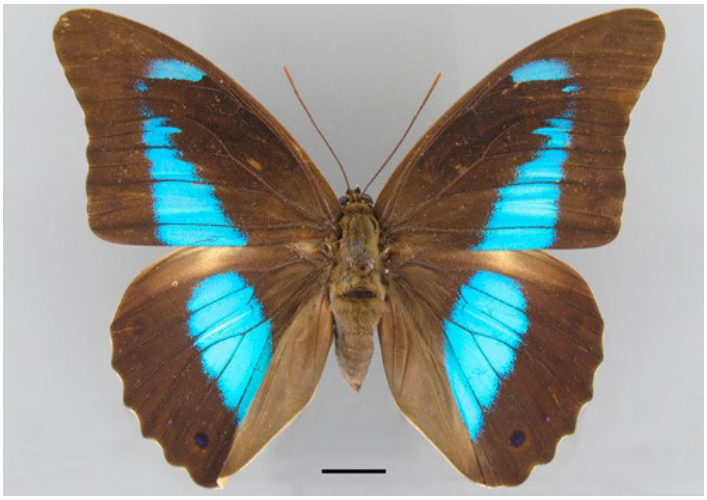

Figure 3. Female *Prepona laertes* from Peru, dorsal aspect (Florida Museum of Natural History). Scale bar = 1 cm.
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Eggs are laid singly on leaves and hatch in about a week (Figure 9). They are 2.0–2.5 mm, white and spherical. The stout green pupa (Figure 10) has a pair of horns and hangs from a branch (Muyshondt 1973). The adult emerges in 12 to 14 days.

Preliminary evidence suggests that *Prepona laertes* in parts of its native range may comprise at least two host races or cryptic species, one of which feeds on Fabaceae (Leguminosae), and another on Chrysobalanaceae (Janzen et al. 2009). However, morphological characters that differ consistently have not yet been found (Dias et al. 2011).

Figure 4. Female *Prepona laertes*, ventral aspect. Scale bar = 1 cm.
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Figure 5. Live male *Prepona laertes* raised in quarantine.
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Prepona laertes, as currently circumscribed, has many synonyms and subspecies (Lamas 2004), including *Prepona omphale* (Hübner) and *Prepona laertes demodice* (Godart). The genus *Prepona* Boisduval includes several other similar species in the Neotropical region (Ortiz-Acevedo and Willmott 2013, Warren et al. 2016).

Hosts

Larvae feed on foliage of trees mainly in the plant families Chrysobalanaceae and Fabaceae. Across the native range, recorded hosts include *Chrysobalanus icaco* (cocoplum, hicaco), *Hirtella racemosa* Lam., *Licania arborea* Seem.,

Andira inermis (Wright) DC. (cabbagebark tree or angelin), *Zygia longifolia* (Willd.) Britton & Rose, species of *Inga* Mill., *Melicoccus bijugatus* Jacq. (mamoncillo, Spanish lime, genip, family Sapindaceae), *Psidium* L. (guava, guayaba, family Myrtaceae), and (doubtfully) on *Coffea arabica* L. (coffee, family Rubiaceae) (Beccaloni et al. 2008). In Florida, only damage to cocoplum has been observed thus far in the wild. In captivity, the larvae can consume and complete development on gopher apple (*Licania michauxii* Prance). This is consistent with the hypothesis that a specialist host race has been introduced. Nevertheless, any of the known hosts should be scrutinized for damage. Records of related species on Myrtaceae, although few, are enough to predict it as an alternative host family.

Figure 6. Larva of *Prepona laertes*, first instar on cocoplum leaf.
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Figure 7. Second instar larva of *Prepona laertes* on cocoplum leaf. Scale in mm.
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Behavior and Detection

Larvae feed singly on leaves and generally prefer new foliage. A larva chews the distal half of a leaf, leaving the midrib or major vein intact as a resting perch. It often decorates the perch with pieces of leaves dangling on silk. Other species of nymphalid butterflies make this same pattern of leaf damage on other plants, but in Florida, only

Figure 8. Fifth instar (mature larva) of *Prepona laertes* on gopher apple foliage.
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Figure 9. Egg of *Prepona laertes* on cocoplum leaf.
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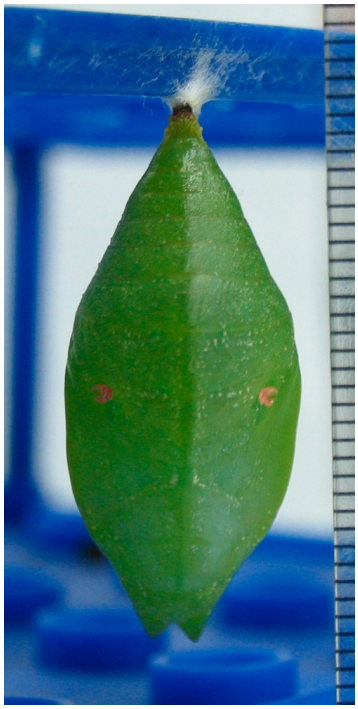

Figure 10. Pupa of *Prepona laertes*. Scale in millimeters.
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Prepona laertes is known to feed on cocoplum in this way. In other species, these perches serve as retreats for larvae to defend against predatory ants (Salvato and Salvato 2016), and they may serve the same function in *Prepona laertes*. Fully grown larvae consume whole leaves. The larvae grow slowly, and the whole life cycle takes about three months. In the native range, the larvae suffer from relatively low rates of parasitization by Hymenoptera and Diptera (Muyshondt 1973, Janzen and Hallwachs 2009).

Adults are strong, fast fliers and frequent the middle and upper canopy and forest edges. Males are territorial and habitually attack blue objects of similar size, mistaking them for rivals. Females lay single eggs on leaves in the shade. The characteristic feeding pattern of the larvae is easiest to observe, and the larvae are the life stage that is most likely to be found in Florida.

Examination of specimens is necessary to confirm identification and to document records. To collect a sample, place a larva in a vial of 70% isopropyl or ethyl alcohol with the damaged leaf. Adults can be attracted to rotten fruit or carrion, but the bait may be ineffective, depending on weather, the environment, and individually varying butterfly behavior. Patrolling males can be attracted with blue flags and netted. Immobilize adult butterflies by firmly squeezing the thorax and place them in an envelope to avoid crushing in transit. Submit specimens with collection data to FDACS-DPI Entomology, 1911 SW 34th Street, Gainesville, FL 32608-1021.

Similar Species

Some other native nymphalid butterflies have ventrally brown wings with eyespots, but they are not dorsally blue and black. Many lycaenids (blues and hairstreaks) are dorsally blue and ventrally brown with spots, but they are much smaller. The Malachite, *Siproeta stelenes* (Linnaeus), has green rather than blue markings that appear ventrally as well as dorsally. In any case, an identification based on a fast-flying individual is difficult to confirm, and photographs of perching adults or a real specimen are needed.

The most similar caterpillars that feed on the same hosts are *Schizura* moths (Notodontidae), which have humps on the first and eighth abdominal segments and paired "tails." However, the head is not cone-shaped, and most are green and brown in color.

Much damage to cocoplum leaves is caused by beetles such as the Sri Lankan weevil (*Myllocerus undecimpustulatus undatus* Marshall). They notch leaf margins or chew in an irregular pattern, but they do not construct a characteristic midrib perch.

Economic Importance

Prepona laertes is not reported to cause economically significant damage in its natural range, although they are abundant where *Melicoccus* grows in suburbs (Neild 1996). In Florida, larvae have been observed thus far on wild cocoplum. The plant is native to south Florida and is one of the most common choices for hedgerows in developments, so the butterfly has the potential to become widely distributed.

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