

CAUDAL FALSE FACE PATTERNS ON THE LARVAE OF FLORIDA SWALLOWTAILS (LEPIDOPTERA: PAPILIONIDAE)

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ABSTRACT.— The mature larvae of four Florida swallowtail species that feed and rest in the open on their host plants possess distinctive false-face patterns on the caudal end; these are exposed to approaching predators coming up stems or leaf petioles. Larvae of three Florida swallowtail species with frightening patterns and eyespots on the cephalic end, on the other hand, make rolled leaf shelters to hide in between feeding bouts, and the enlarged false faces typically "stare" out of the shelters at predators approaching from the leaf petioles or stems.

KEY WORDS: defensive behavior, immature stages, *Papilio*, protective coloration.

The larvae of many swallowtail butterflies in the genus *Papilio* are classic examples of protective coloration (Fig. 1a, b). In species such as *Papilio glaucus* Linnaeus, *Papilio troilus* Linnaeus, and *Papilio palamedes* Drury from Florida, the thorax is enlarged and adorned with eyespots giving the larva the semblance of a small snake. Such frightening color patterns on the cephalic ends of *Papilio* larvae are well known (see color plates in Holland, 1931; Klots, 1951; Pyle, 1981; and Scott, 1986). However, protection of the caudal end would seem to be an equally important strategy, since lizards, birds, and other predators may approach from behind, along a branch or leaf. We have observed and photographed remarkable patterns of frightening coloration on the caudal segments of larvae of some Florida swallowtail species. The purpose of this paper is to briefly describe and illustrate this apparently hitherto unnoted phenomenon.

The last instar larvae of the Rutaceae-feeding swallowtails from south Florida, the Giant Swallowtail (*Papilio cresphontes* Cramer), the Bahama Swallowtail (*Papilio andraemon bonhoti* Sharpe), and the Schaus Swallowtail (*Papilio aristodemus ponceanus* Schaus), all have a whitish caudal end with some dark markings. When viewed from the side, the white patch and markings seem to simply form part of the overall disruptive color pattern (Minno and Emmel, 1992). But when viewed from behind (the view that a predator stalking a larva along a branch would see), false face patterns are clearly evident (Fig. 1c, d, e).

The Giant Swallowtail and Bahama Swallowtail have similar caudal false face patterns consisting of two small eyes, nostrils, and a downturned mouth (Fig. 1c and d). The Schaus Swallowtail has quite a different, skull-like pattern (Fig. 1e). All three of these species eat the leaves of shrubs and small trees and usually rest exposed on the branches when not feeding. They also characteristically rest or feed with their heads pointing outwards on the leaf or on the stem, away from the center of the plant and the direction from which predators such as lizards and birds would usually approach.

Larvae of other Florida species that have false face patterns on

the thorax (*P. glaucus*, *P. troilus*, and *P. palamedes*) also eat the leaves of trees and shrubs, but move to and hide in rolled leaf shelters with the head and thorax pointed toward the petiole of the leaf when not feeding. A predator approaching these caterpillars from the stem would see the thoracic eyespots glaring from the rolled shelter.

One other swallowtail from Florida, the Eastern Black Swallowtail (*Papilio polyxenes asterius* Stoll), also has a distinctive false face pattern on the caudal end (Fig. 1f). This species feeds on the foliage, flowers, and young seeds of herbs in the Apiaceae, and, like the Rutaceae-feeders, rests exposed upon the plant with its head facing upward or outward. Its false face on the rear segment may serve the same purpose as in the Rutaceae-feeding larvae.

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Fig. 1. Papilionid larvae from Florida: (a) *Papilio palamedes* Drury, fourth instar larva; b) *Papilio glaucus australis* Maynard, cephalic end of last instar larva; (c) *Papilio cresphontes* Cramer, caudal end of last instar larva; (d) *Papilio andraemon bonhotei* Sharpe, caudal end of last instar larva; (e) *Papilio aristodemus ponceanus* Schaus, caudal end of last instar larva; (f) *Papilio polyxenes asterius* Stoll, caudal end of last instar larva.

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