

# NOTES ON THE OSMETERIA OF *PAPILIO HOMERUS* LARVAE (LEPIDOPTERA: PAPILIONIDAE)

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**ABSTRACT.**— All larval instars of *Papilio homerus* have well developed osmeteria. Close up photography of living larvae shows the osmeteria are light pink in the first three instars and brick red in the fourth and fifth instars. Notes on the reluctance of mature larvae to extrude the osmeteria and protective camouflage are included.

**KEY WORDS:** biology, immatures, Jamaica, larval morphology, predation, protective coloration, West Indies.

The early description of *Papilio homerus* Fabricius larvae by Taylor (1894) did not include any reference to the existence of osmeteria or forked scent glands that can be extruded from a slit in the thorax just behind the head. Panton (1893) recorded the unusual absence of these organs in *P. homerus* larvae when compared with other Papilionid species and Swainson (1901) reported that the larva of this butterfly "differs from the rest of the larvae of the Papilionidae in not having the two fleshy retractile tentacles on the back of the segment next to the head." More recent larval descriptions, (Turner 1991), indicate that the osmeteria in the first three larval instars are small and brown while those in the fourth and fifth instars are brick red and well developed, giving off a terpineoid scent when extruded.

As far back as 1984, during larval rearing studies, we had observed that all larval instars of *P. homerus* had osmeteria and had attempted to photograph living specimens with these organs fully extended. Unlike the larvae of *P. andraemon* (Hübner), where all instars are predominantly black and white and readily extrude their long white osmeteria when slightly disturbed or attacked, the larvae of *P. homerus* require rather abrupt and vigorous stimulation before they will reluctantly extrude these organs for a few seconds. This extremely reluctant behavior or the description of preserved specimens probably accounts for the failure of the earlier authors to document the existence of these structures in the literature.

The main objective of this paper is to illustrate the osmeteria of the first and last (fifth) instar larvae of *P. homerus*. In the first instar (Fig. 1a), the total body length of the larva is 4 mm and the osmeteria are light pink and can extend to 1mm in length. In the mature larva (Fig. 1b-c), the total body length is 70mm and the brick red osmeteria can be extended to a length of 10mm.

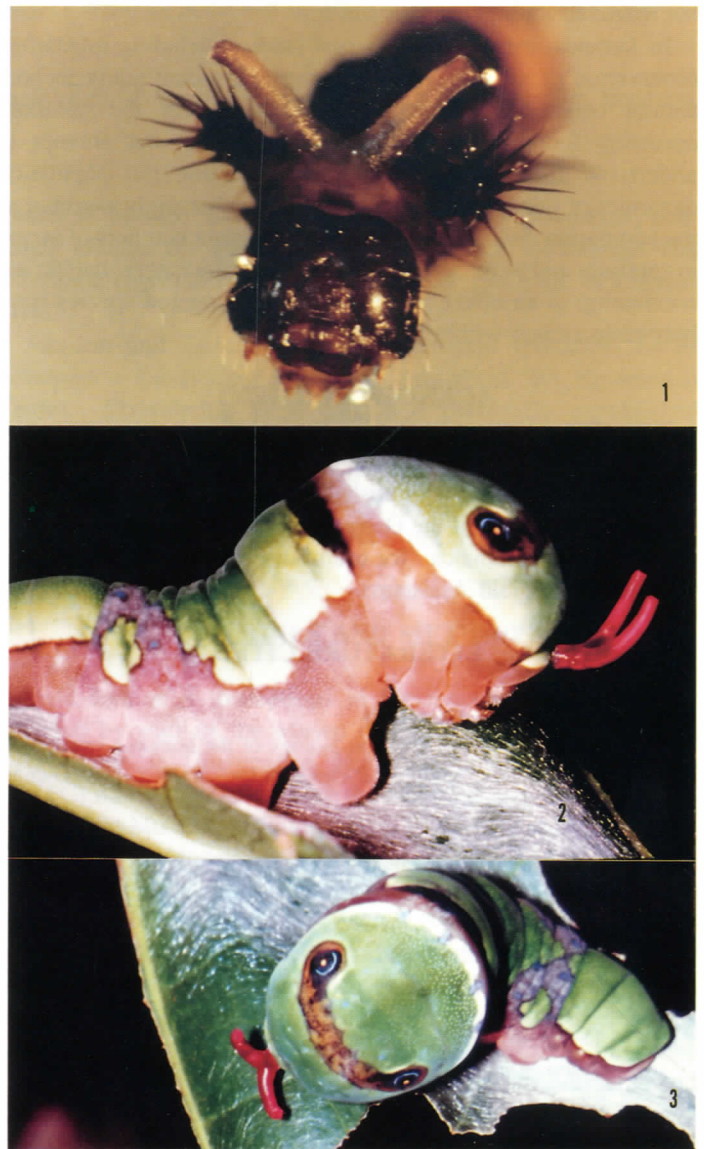


Fig. 1. Osmeteria of *P. homerus* larvae: a) First instar larva of *P. homerus* with osmeteria extended; b) Mature larva of *P. homerus* showing osmeteria and defensive posture; c) Mature larvae of *P. homerus* with osmeteria extended. Thoracic markings create false eyes and large mouth.

The osmeteria of *P. homerus* appear to be a second line of defence, the first line of defence being an array of protective colorations. Instars one to three are black and white and resemble the droppings of lizards and birds. The dorsal green coloration of the mature larvae blends well into the leafy background, the lateral brown markings giving the appearance of dead, curled leaves, while the anterior thoracic markings create a snake-like image (see Emmel and Garraway, 1990).

The only likely predators recorded from the habitat of *P. homerus* are birds, lizards and ants. The behavior of the *P. homerus* larvae is such that the osmeteria are likely to be effective against birds and lizards. Turner (unpublished) and Allen (pers. comm.) reported observing larval predation by birds, but no account of the extension of the osmeteria by larvae under natural conditions has been documented. Predation by lizards has never been reported, however, the larvae are of the size which may be taken by the *Anolis* spp. occurring in the habitat (Vogel, pers. comm.). Attack by an ant was recorded only once; *Camponotus* sp. was observed attacking a first instar. The body wall of the larva was slashed open, after which the ant lost interest, suggesting unpalatability; however, the osmeteria were not extruded throughout this attack.

In Jamaica, increased behavioral studies including intensified observation of all stages of *P. homerus* are continuing in both natural conditions and in sleeved sections of the naturally occurring foodplant for this species. An all out attempt to understand the underlying factors controlling the population dynamics of this insect is now becoming increasingly essential as the population dwindles. Attempts to rear large numbers of larvae in captivity and to release adult insects into the natural habitat are continuing, in an effort to prevent this endangered species from becoming extinct within the next decade.

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#### LITERATURE CITED

**Emmel, T. C., and E. Garraway**

1990. Ecology and conservation biology of the homerus swallowtail in Jamaica, (Lepidoptera: Papilionidae). *Trop. Lepid.* (Gainesville), 1:63-76.

**Panton, E. S.**

1893. A description of the larva of *Papilio homerus*. *J. Inst. Jamaica* (Kingston), 1:375-376.

**Swainson, E. M.**

1901. Notes on lepidopterous larvae from Jamaica. *J. New York Ent. Soc.*, 9:77-82.

**Taylor, C. B.**

1894. Description of the larva and pupa of *Papilio homerus*, Fab. *Trans. Ent. Soc. London*, 1894:409-410.

**Turner, T. W.**

1991. *Papilio homerus* Fab. (Papilionidae) in Jamaica, W. I.: field observations and description of immature stages. *J. Lepid. Soc.* (Los Angeles), 45:259-271.