

SCIENTIFIC NOTE: ON THE IMMATURE STAGES OF CITRUS-FEEDING BUTTERFLIES OF HISPANIOLA

Andrei Sourakov

McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida,
P. O. Box 112710, Gainesville, Florida 32611-2710, USA, asourakov@flmnh.ufl.edu

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During my field work in the Dominican Republic 1994-1997, I made a number of observations on the life histories of various butterflies. Some of them were published (e. g., Sourakov 1996, 2000, 2007; Sourakov and Emmel 1995a&b, 1996), while many remain unpublished. In anticipation of the possible revision of the *Butterflies of the West Indies and South Florida* (Smith *et al.*, 1994) (Jacqueline Miller, pers. comm.), I plan to publish a series of notes, describing complete or partial life histories of Hispaniolan butterflies, with the hope that these descriptions will aid in filling some gaps in our knowledge on the subject. Here, I would like to present several life history notes and illustrations for those butterflies, the eggs of which were collected on cultivated citrus in the vicinity of Jarabacoa, Cordillera Central.

Hesperidae: *Eantis papinianus* (Poey, 1832)

The taxonomic placement of Hispaniolan populations for *Eantis papinianus* (Poey, 1832) has been debated. Smith *et al.* (1994) considered these populations as *Achlyodes mithridates sagra* Evans, 1953, but *sagra* was later synonymized with the

Cuban population and placed in *Eantis* by Warren (1996). The larva was described in the original description of this species from Cuba (Poey, 1832). Here, the photographs of the immature stages of *E. papinianus* from Hispaniola are provided for possible comparisons with populations of *mithridates* species group members from other regions. For instance, the last instar larva of *Eantis tamenund* (Edwards, 1871), illustrated by Jim Brock at butterfliesofamerica.com (Warren *et al.*, 2009), has a more angular head and less extensive yellow stripes. The pupa of the latter species illustrated by Brock appears green vs. the white pupa of *E. papinianus*, due to a less waxy surface.

Immature stages: *E. papinianus* illustrated here (Fig. 1) were collected on citrus and reared on wild lime, *Zanthoxylum fagara*. Larvae of all instars make shelters. First through 3rd instar larvae are green with black head and smooth shiny surface (Fig. 1A-C). Fourth instar larva develops two longitudinal dorsal yellow stripes and its body is covered with light dots; head dark-cream colored, with white stemmata and black mandibles (Fig. 1D-E). In the fifth instar, body coloration is similar to 4th instar, while the head is light-cream colored (Fig. 1F-H). Pupation occurs inside a shelter made of one or two rolled leaves. Pupa is protected by a thick white wax layer (Fig. 1I-J).

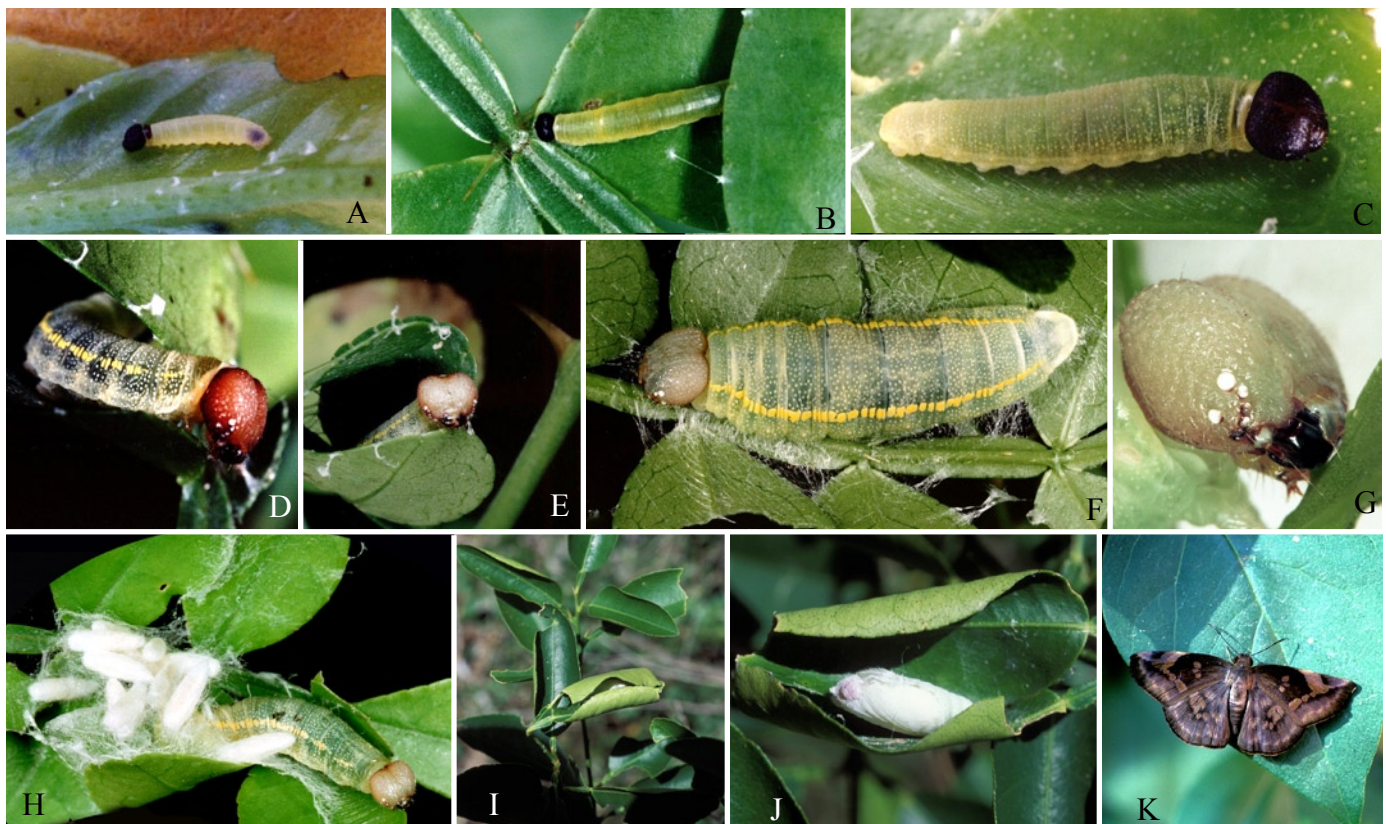


Fig. 1. Life history stages of *Eantis papinianus* (Hesperidae): (A, C) 1st instar feeds on young leaves; (B) 2nd instar begins to construct shelters by pulling leaves together with silk; (D) 4th instar; (E) 4th instar larva inside a shelter; (F) 5th instar; (G) head, 5th instar; (H) gregarious braconid parasitoid (probably genus *Cotesia*) emerged from 5th instar larva; (I) pupal shelter; (J) pupa exposed by unrolling the shelter; (K) adult.

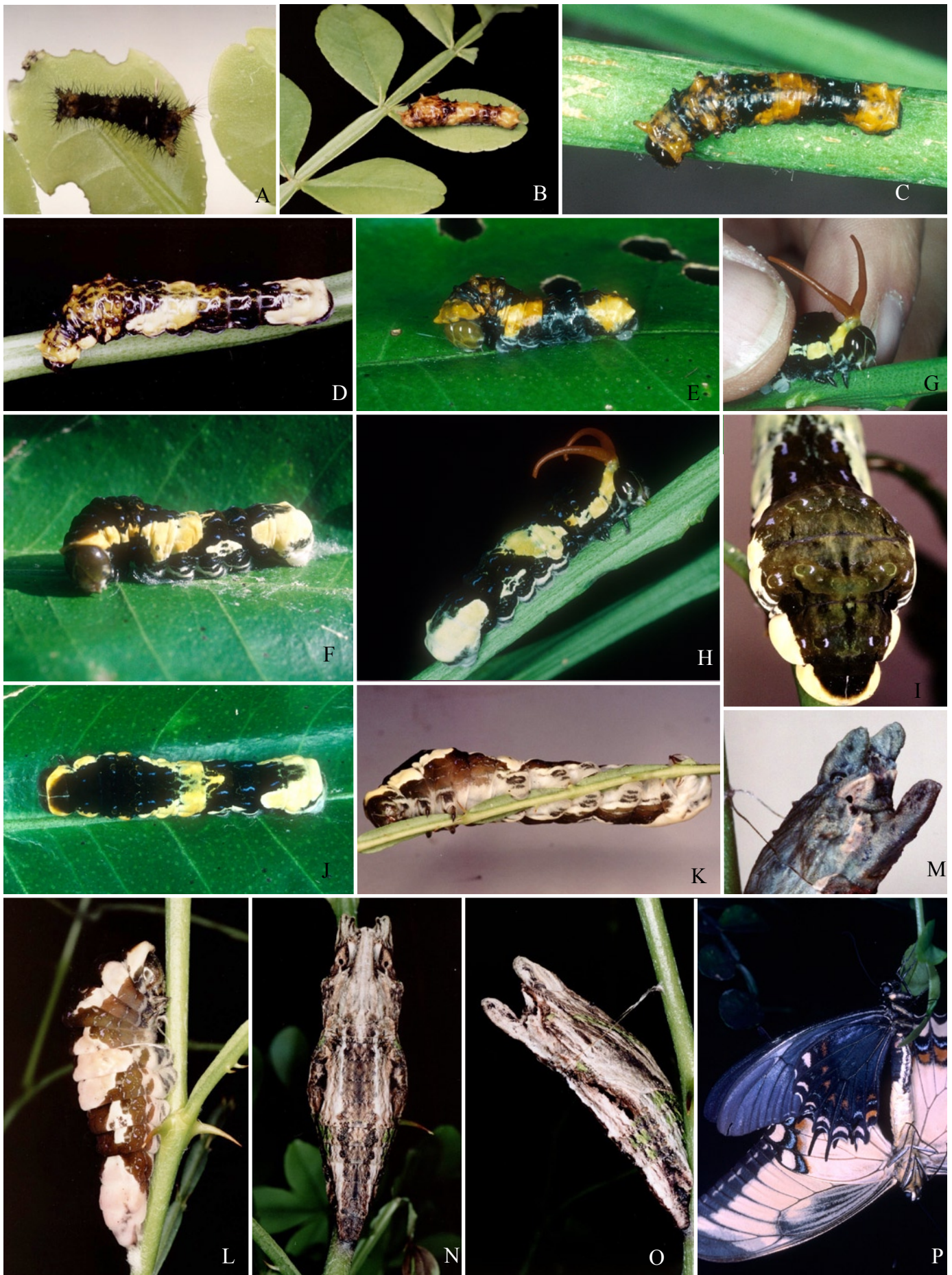


Fig. 2. Life history stages of *H. androgeus epidaurus*: (A) 1st instar feeds on young leaves; (B) 2nd instar; (C-E) 3rd instar; (F) 4th instar; (G-K) 5th instar; (L) prepupa; (M-O) pupa; (P) adults in copula (female above).



Fig. 3. Larval stage of *Heraclides pelaus imerius*. (A) 1st instar; (B) 2nd instar.

Papilionidae: *Heraclides pelaus imerius* Godart, 1819 and *H. androgeus epidaurus* Godman & Salvin, 1890

Descriptions of the mature *H. pelaus* larva can be found in Smith *et al.* (1994), reciting Wolcott's (1923) and Cockerell's (1893) accounts from Puerto Rico and Jamaica, respectively, while no descriptions of earlier stages or pupae are available. In Fig. 3, we provide photographs of the same larva at its 1st and 3rd instars, which resulted from an egg found among these of *H. androgeus* and *H. machaonides* Esper 1796. *H. androgeus* immatures are illustrated in Fig. 2, while larvae of *H. machaonides* were practically identical to the immatures of *H. cresphontes*. Hence, the larvae of the latter two species are quite distinct from the one illustrated in Fig. 3. The individual in Fig. 3 is assumed to be of *H. pelaus imerius*, which was the only other citrus-feeding swallowtail flying in the area at the time. Since the time the observations presented here took place, yet another citrus-feeding swallowtail has been introduced to Hispaniola, *Papilio demoleus* (Linnaeus, 1758), and is firmly established there. Its immatures are also quite distinct from those of the above three species of swallowtails (e. g., http://en.wikipedia.org/wiki/Papilio_demoleus).

Immature stages: While *H. pelaus* first instar is olive colored with white posterior saddle (Fig. 3A), the first instar of *H. androgeus* is black with orange posterior and median saddles and anterior projections (Fig. 2A). *H. pelaus* 3rd instar (Fig. 3B) remains olive with additional white saddle appearing in the midsection and 1st thoracic segment is also turning white. The same regions in *H. androgeus* third instar remain orange. In the 4th and 5th instars, *H. androgeus* larva acquires blue dorsal broken lines with formerly orange areas turning crème-color. The prolegs and abdomen also become cream to white colored (Fig. 2K) at this point. Pupa, grayish at first (Fig. 2M), when hardens, develops camouflage coloration of white, gray, brown and even green (Fig. 2N,O).

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