

LIFE HISTORY OF *GRETA DIAPHANA* FROM THE DOMINICAN REPUBLIC (LEPIDOPTERA: NYMPHALIDAE)

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ABSTRACT.— The life history of *Greta diaphana* (Drury) (Ithomiinae) (assigned to ssp. *charadra* Schwartz) from the Cordillera Central in the Republica Dominicana, island of Hispaniola, is described, and its food plant, *Cestrum coelophlebium* O. E. Schulz (Solanaceae) is reported.

KEY WORDS: Caribbean, Central America, Costa Rica, Cuba, *Episcada*, eggs, Hispaniola, hostplants, *Hymenitis*, *Hypoleria*, Ithomiinae, Jamaica, larval morphology, Neotropical, pupae, Solanaceae, Trinidad, West Indies.

Only 2 species of Ithomiinae clearwing butterflies occur in the West Indies north of Trinidad. Both are in the genus *Greta*, which is also known from mainland tropical America. *Greta cubana* (Herrich-Schäffer) is restricted to the forested mountains of Cuba. *Greta diaphana* (Drury) has 5 named subspecies: one on Jamaica, and four in different parts of the Dominican Republic (Schwartz, 1982). Aside from brief notes by Turner (published in Smith *et al.*, 1994) on one pupa of *G. diaphana diaphana* from Jamaica, the immature stages of *G. diaphana* remain largely unknown.

In April 1994 the senior author observed a female *G. d. charadra* Schwartz ovipositing on *Cestrum coelophlebium* O. E. Schulz (Solanaceae) on a mountainside above La Cienaga in La Vega Province, Dominican Republic, at 1000m elevation. In September 1995, eggs and last instar larvae were collected from the food plant in the vicinity of Mata Grande, Santiago Province, at 1300m elevation, and subsequently raised. Both localities are in the Cordillera Central.

The plants of *Cestrum coelophlebium* utilized by the butterfly typically are two to three feet high. The leaves of the foodplant are green and leathery, except for the apical leaves, which are soft and have a very distinct purple color. The female lays clusters of 20-30 eggs on the underside of the green leaves in the upper part of the plant. Larvae remain gregarious until pupation, starting to feed on the apical leaves and subsequently moving down the plant. This solanaceous host species is endemic to Hispaniola (Walter Judd, pers. comm.).

Immature stages are preserved at the University of Florida collection. A voucher specimen of the food plant is deposited in the Herbarium of the University of Florida.

DESCRIPTION OF IMMATURE STAGES

EGG: The eggs are white, elongated and laid in clusters (Fig. 4J). They are 0.8 mm high and 0.6 mm wide. There are 17 thick vertical ribs and 12 thin transverse ribs which create a cell-like (reticulate) structure across the egg's surface which integrates into rosette-shaped cells in the micropylar region (Fig. 1A).

FIRST INSTAR LARVA: The body is whitish when hatched (Fig. 4A), turns greenish after feeding (Fig. 4B). Head is black, 0.45mm wide, 0.40mm high. The integument in this instar as well as in the later instars stays transparent, and the larva's green coloration results from the food ingested by larvae. First and later instars have a dark brown sclerotized anal plate, bearing longer and tougher setae. The rest of the body bears short and thin, inconspicuous setae. The crochets are in biordinal meseries. Legs and claws are light brown. The primary setae of the head capsule (Fig. 1B) are still noticeable among secondary setae of second and third instars (Fig. 1C). In later instars, setae are practically uniform.

SECOND INSTAR (Fig. 4C): This stage resembles the first instar, except for the new appearance of minute secondary setae. Head is 0.60mm wide, 0.55mm high.

THIRD AND FOURTH INSTARS (Fig. 4 D,E): These two stages acquire three longitudinal stripes: a white medial stripe and a yellowish lateral stripe above the spiracle line. Head capsules are similar in these instars and are translucent white or light brown with numerous pigmented black spots which become more intensive in the occipital area and around the stemmata. There is a certain degree of variation in pigmentation of the head capsule and in some specimens it is almost entirely black. The head is 0.95mm wide, 0.75mm high in the third instar and 1.3mm wide, 1.05mm high in the fourth instar.

FIFTH INSTAR: The head capsule is 1.90mm wide, 1.62mm high. It is largely pigmented with the frontoclypeus and area just above frontoclypeal suture remaining white. The white area intergrades into a spotted area, the width of which varies in different specimens (Fig. 4F). The later intergrades into a black area. The stemmatal area is always completely pigmented (Fig. 4G). The head is covered with short and thin setae (Fig. 2A). The integument is almost completely pigmented. The spiracle line on each side is bordered by two wide yellow stripes. The white median stripe as well as both yellow stripes are bordered by black thin stripes, which represent unpigmented areas. The body bears numerous thin and short setae, which become long and thick in the anal area (Fig. 2B), posterior to the sclerotized triangular anal plate.

PREPUPA: The prepupa is green, with just a trace of the supraspiracular yellow stripe left (Fig. 4H).

PUPA: The tiny pupa (Fig. 4J) is green with golden stripes along costae, four golden marks on the wing, and golden eyepieces and horns. It is 9.5mm long and 5.0mm wide in its widest point. Distribution of

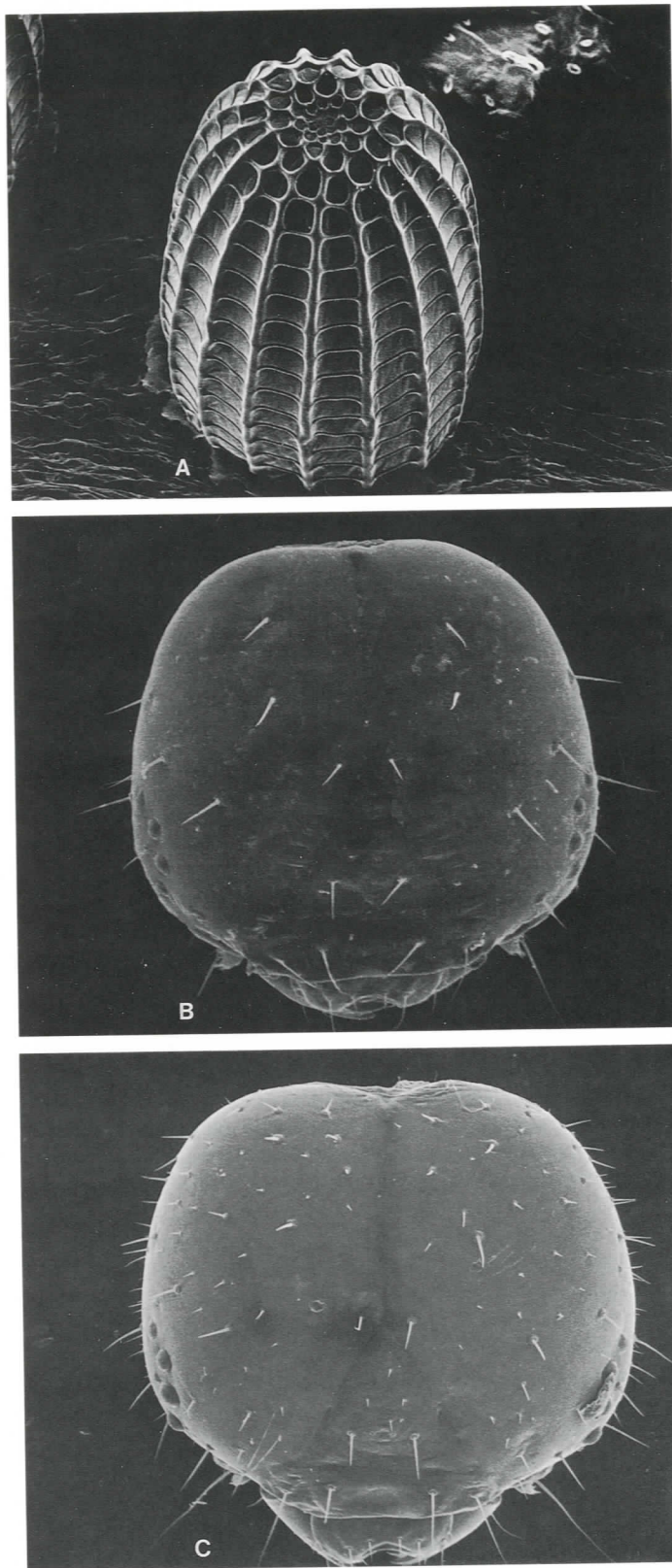


Fig. 1. Micrograph of (A) Egg (100x); (B) Head capsule of the first instar larva (200x); (C) Head capsule of the third instar larva (100x).

golden pigment is shown with dots in Fig.3.

DEVELOPMENT TIME: Total time of development from egg to adult at 25°C in the laboratory is 30 days. The foodplant utilized was stored for the whole period in a plastic bag in a refrigerator.

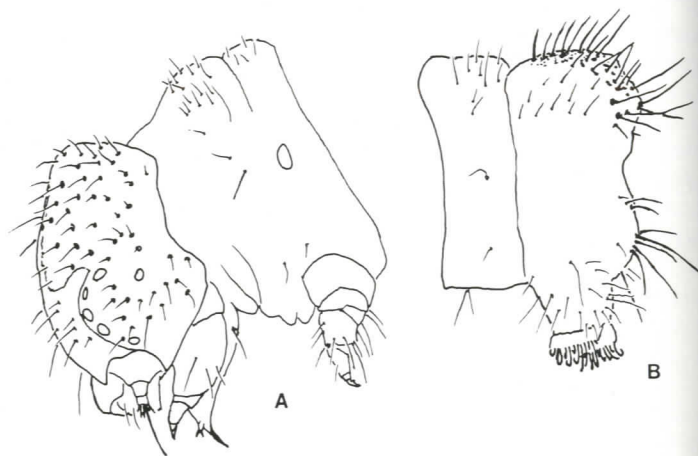


Fig. 2. Fifth instar larva: (A) Head and first thoracic segment; (B) Last abdominal segment.

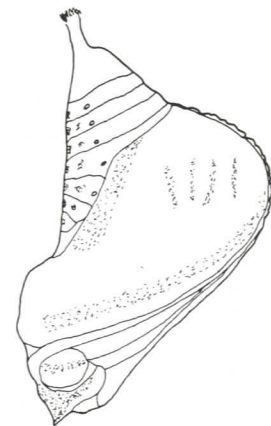


Fig. 3. Pupa (dots indicate location of golden pigment).

DISCUSSION

The genus *Greta* may have as many as 20 species (including some currently placed in *Hypoleria* and in *Hymenitis* by other authors; Mielke and Brown, 1979), yet only *G. (H.) nero* (Hewitson) has had extensive notes published on its life cycle (Young, 1972). Even this paper does not describe the egg, larva or pupa in detail, making it difficult to compare our observations on *Greta diaphana*.

It is worth pointing out, that, unlike *G. diaphana* eggs and larvae of *G. nero* and other species in related genera are solitary (Young, 1973, 1978; DeVries, 1987). The mode of oviposition and appearance of immature stages of *G. diaphana* resemble those of *Episcada salvinia* (Bates), a member of a different ithomiine tribe which uses *Solanum* as a host (DeVries, 1987; confirmed by the senior author at Las Alturas, Costa Rica).

Despite the fact that oviposition in clusters and gregarious larval behavior appears, probably independently, in different tribes of Ithomiinae, they might serve as sufficient characters for placing *G. diaphana* into a separate genus.

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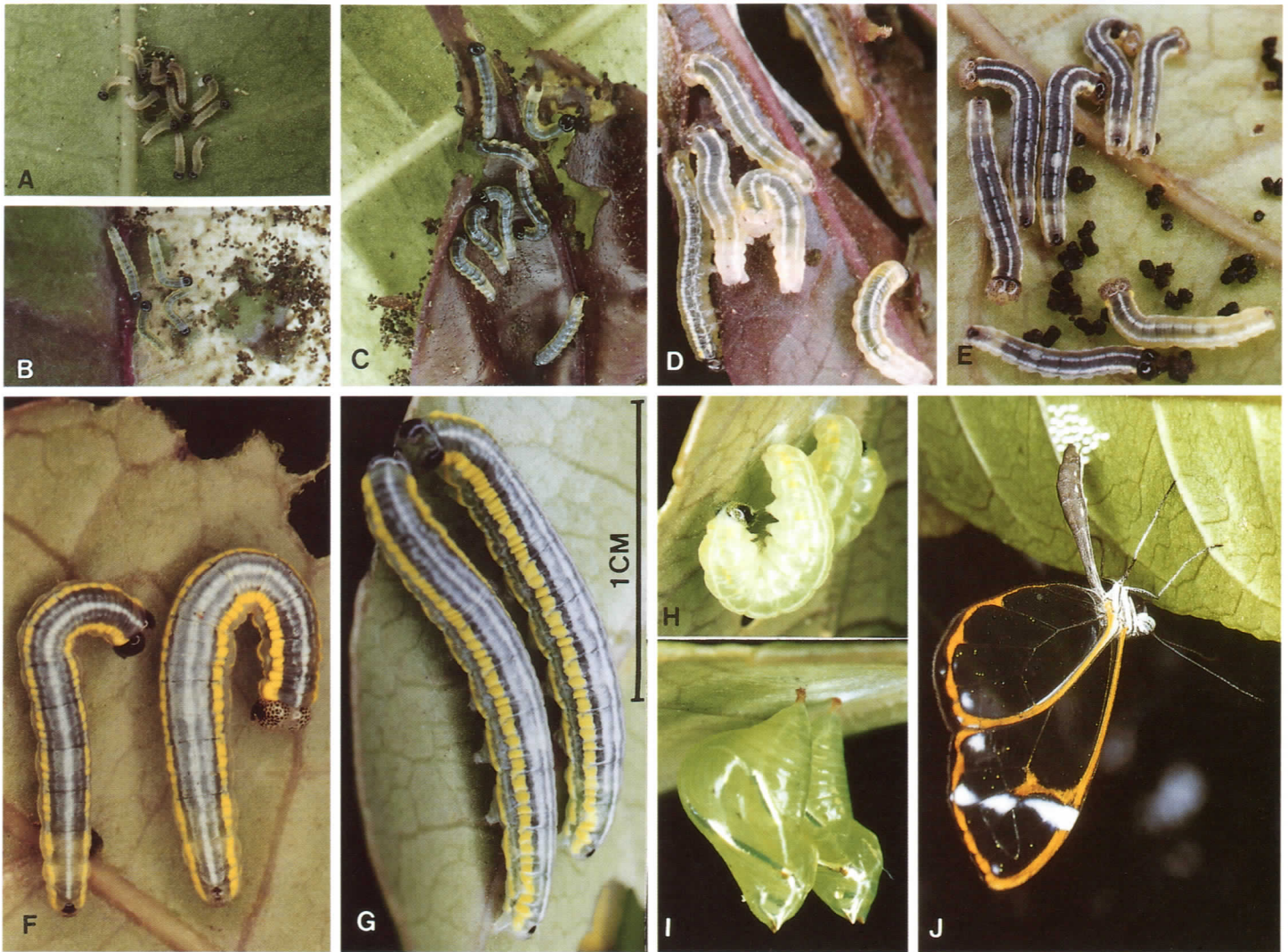


Fig. 4. Life history of *Greta diaphana* on *Cestrum coelophlebium* (Solanaceae) (A) First instar larvae after hatching; (B) Larvae after three days of feeding; (C) Second instar larva; (D) Fourth and just molted fourth instar larvae; (E) Fourth instar larvae; (F) (G) Fifth instar larvae; (H) Prepupa; (I) Pupa; (J) Female ovipositing in the wild.



Fig. 5. Adult ovipositing on hostplant.

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