

A NEW SUN MOTH FROM THE GALÁPAGOS ISLANDS (LEPIDOPTERA: HELIODINIDAE)

J. B. HEPPNER¹ AND BERNARD LANDRY

Florida State Collection of Arthropods,
DPI, FDACS, P. O. Box 147100, Gainesville, Florida 32614, USA; and
CLBRR, Agriculture Canada, Neatby Bldg., CEF, Ottawa, Ontario K1A 0C6, Canada

ABSTRACT.— *Heliodines galapagoensis*, n. sp., is described for the Galápagos Islands, Ecuador. The larvae have been reared on *Cryptocarpus pyriformis* HBK. (Nyctaginaceae).

KEY WORDS: Ecuador, Gelechioidea, *Heliodines galapagoensis* n. sp., Neotropical, Nyctaginaceae, Oecophoridae, Pyralidae, Stathmopodinae, taxonomy, Yponomeutoidea.

Heliodinidae, or sun moths, include small colorful moths that are diurnally active. The family was last reviewed on a world basis by Meyrick (1914), but he included various genera that actually are Oecophoridae and which are now placed in the subfamily Stathmopodinae. Meyrick (1914) did not distinguish between these two groups, since superficially they appear alike, with metallic coloration and similar venation. Heliodinidae, however, have small porrect labial palpi and a naked haustellum base, among other characters; Stathmopodinae have large recurved labial palpi and a scaled haustellum base: very different characters that now place them in different superfamilies, Yponomeutoidea and Gelechioidea, respectively. The species that remain validly in Heliodinidae now number about 48 species worldwide, with many others undescribed.

Little has been published on the microlepidoptera of the Galápagos Islands, a well-known island group off the coast of Ecuador. Meyrick (1926) made the only complete summary of the microlepidoptera fauna of these islands, but he listed only 11 known species not counting Pyralidae. Since then, other works have covered the larger moths and butterflies, most recently Hayes (1975). Only in the last few years has more been done with microlepidoptera, as a result of recent survey collecting and resulting papers (Landry and Gielis, 1992; Landry, 1993). The present paper deals with a new species of Heliodinidae discovered on the Galápagos Islands, the first record of this family for the archipelago.

Heliodines galapagoensis Heppner & Landry, new sp.

Diagnosis.— This small species is noteworthy for its prominent hind legs, having large black hair tufts with markings of silver and orange. The wing maculation is noteworthy for the pale yellow mark near the wing base in some females; this is not evident in most males.



Fig. 1. *Heliodines galapagoensis* n. sp.: a) adult perching on leaf, Santa Cruz, March 1992 (S. B. Peck photo); b) adult ♀ paratype.

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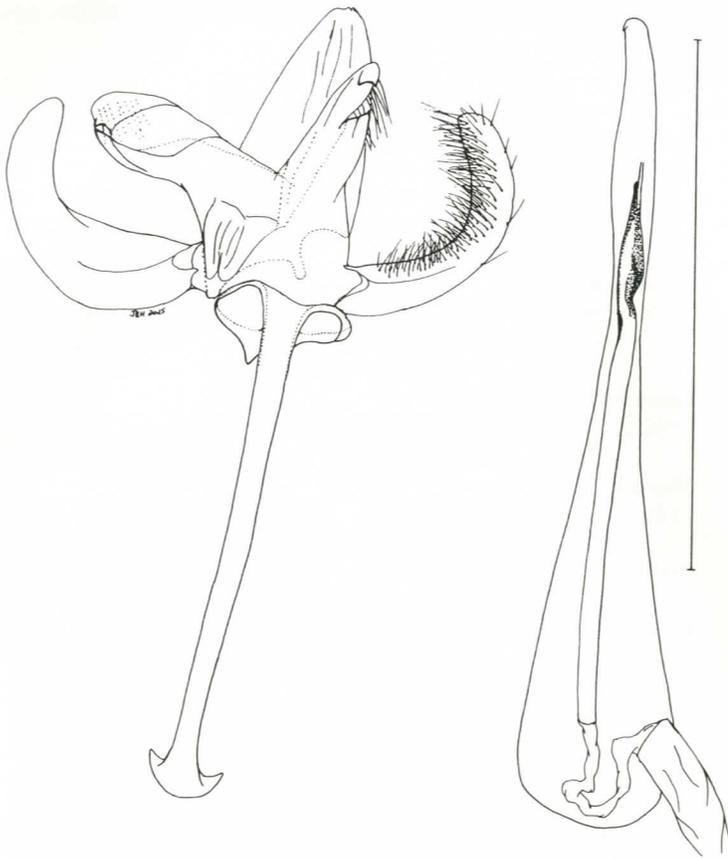


Fig. 2. *Heliodines galapagoensis* n. sp., holotype ♂ genitalia, plus detail of aedeagus (slide JBH 2025) (scale line = 1mm).

Description.— Wing expanse: 7.5-9.0mm.

MALE.— Forewing length: 3.5-4.2mm. *Head:* shining bronze gray-fuscous; white line along eye margin and clypeus. Labial palpus fuscous, with white venter on 1st segment. Antenna fuscous, with white rings ventrally from base to mid-antenna. *Thorax:* shining fuscous; venter orange, with silver on prothorax from patagia to coxa. Legs bronze-fuscous, with some orange on tibial base and base of forecoxa; white on venter of tarsal segments; hind legs very long (ca. twice length of abdomen), with hind femur and coxa silvery-white; hind tibia greatly enlarged, with scale tufts of black and silver, interspersed by cream-white, and with orange laterally. *Forewing:* shining bronze-fuscous overall; orange on costal margin near base to 1/5; some mottled dark orange scales on wing center midwing to apex and near tornus, pale yellow basal marks sometimes present (as in females) but not prominent; fringe fuscous; venter fuscous. *Hindwing:* fuscous mixed with burnt orange; fringe fuscous and bronze-fuscous; venter fuscous. *Abdomen:* orange; venter and lateral sides silvery-white. *Male genitalia* (Fig. 2): tegumen short narrow band, triangular; vinculum stout and angulated lateral to very long saccus having a recurved anchor-like end; uncus membranous merging with anal tube; gnathos a split pincher-like structure, with many setae on venter of dorsal structure; valva simple, with elongated ends and very recurved dorsally, with setal field most of valval length; anellus a simple, short tube; aedeagus very long (subequal to genitalia length), with a minute hook at tip and gradually widening to bulbous base; vesica a very long tube (3/4 aedeagus length), with a slightly sclerotized and twisted apical cornutus.

FEMALE (Fig. 1).— Maculation similar to male but with a pale yellow mark near forewing base and with wing base darker fuscous; hindwings somewhat more orange dorsally. *Female genitalia* (Fig. 3): ovipositor simple, elongated, with setal ring far posterior to antrum area; papilla

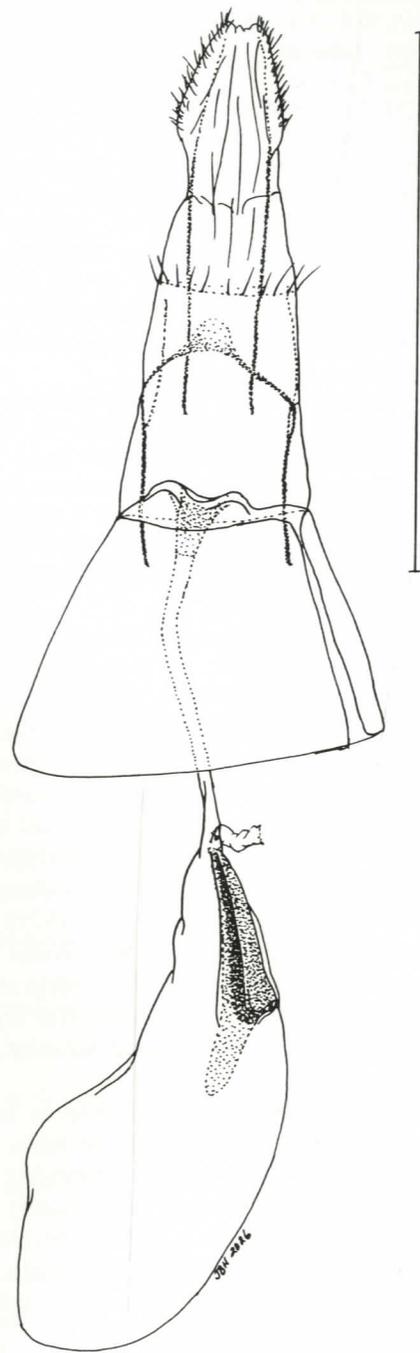


Fig. 3. *Heliodines galapagoensis* n. sp., allotype ♀ genitalia (slide JBH 2026) (scale line = 1mm).

anal setose; apophyses with long posterior pair (about 2X of anterior pair), while anterior pair form a ventral convergence band; ostium bursae a simple funnel, evaginating to segmental margin of sternal plate and constricted to ductus width at funnel anterior end; antrum ovate, simple, with small depression each side; ductus bursae simple, somewhat shorter than length of bursa; ductus seminalis simple, near bursa; corpus bursae a large, elongated oval sac, wider toward middle; signum a large elongated and strongly sclerotized ventral fold of the bursal wall, from the juncture with the ductus bursae to center of bursa.

Types.— *Holotype* ♂: Galápagos Is.— *Santa Cruz*: CDRS (arid zone), 18 Jan 1989, ?*Cryptocarpus* sp., B. Landry (slide JBH 2025) (CNC #21932). *Allotype* ♀: *San Cristóbal*: 4 km SE. Pto. Baquarizo, 20 Feb

1989, B. Landry (slide JBH 2026) (CNC).

Paratypes (13♂, 18♀, 3?): **Baltra:** (arid zone), 16 Jan 1989 (1♀) (MVL), B. Landry. **Genovesa:** *Bahia Darwin*, 10 Mar 1992 (1♂) (BL slide 702) (MVL), B. Landry. **Española:** *Bahia Manzanillo*, 25 Apr 1992 (1♂, 8♀, (MVL), B. Landry (BL slide 703 ♀). **Isabela:** *Puerto Villamil* (1km N), 3 Mar 1989 (2♂, 1♀) (MVL), B. Landry. **Pinta:** (arid zone), 15 Mar 1992 (1♂) (MVL), B. Landry. **Santa Cruz:** *CDRS* (arid zone), 18 Jan 1989 (2♂, 2♀), on *Cryptocarpus* leaves; 18 Jan 1989 (1♂, 2♀), reared ex *Cryptocarpus*, em. 25 Jan 1989; 19 Jan 1989 (1♂, 3♀); 21 Jan 1989 (1♀), reared ex *Cryptocarpus*, em. 25 Jan 1989; 19 Jan 1989 (1♂); (MVL) 3 Feb 1989 (1♀), B. Landry. **ECCD**, 6 Mar 1992 (2♂) (UVL), B. Landry. **Santiago:** *Cerro Inn*, 28 Mar 1992 (1♂, 1♀) (MVL), B. Landry (BL slide 704 ♀). **Seymour Norte:** (arid zone), 23 Jan 1989 (1♀) (MVL), B. Landry.

Paratypes are deposited in the following collections: the Museo Ecuatoriano de Ciencias Naturales, Quito, Ecuador; the Charles Darwin Research Station, Santa Cruz Id., Galápagos Is., Ecuador; the Florida State Collection of Arthropods, Gainesville, Florida (FSCA); the National Museum of Natural History, Washington, DC (USNM); the Natural History Museum, London, England (BMNH); the Canadian National Collection, Agriculture Canada, Ottawa, Canada (CNC); and B. Landry's personal collection, Aylmer, Québec.

Distribution.— Known from several of the islands in the Galápagos Archipelago, as noted above.

Flight period.— January to April.

Hosts.— *Cryptocarpus pyriformis* HBK. (Nyctaginaceae).

Biology.— The junior author (BL) reared the species in 1989. The caterpillars feed on the leaves of the host, sometimes in large numbers. The hostplant occurs in the littoral and arid zones of several (if not all) of the islands in the archipelago. The hostplant is native to the Galápagos but also occurs along the western coast of South America (Wiggins and Porter, 1971). Nyctaginaceae hosts are known for several other New World heliodinids.

Many heliodinids typically hold their hindlegs upright when perching (Fig. 1a). The enlarged and colorful hindlegs of *S. galapagoensis* fit well with this kind of behavior, resembling somewhat a mosquito.

Remarks.— This new species is remarkable in having added maculation in the female rather than in the male, the females usually having a yellow patch near the forewing base (some females have this very faint), whereas males usually do not show this. The genitalia are curious in having the male aedeagus seemingly extremely large compared to the female. *Heliodines galapagoensis* has male genitalia similar to that of the *tripunctella* species group (Hsu, pers. comm.).

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LITERATURE CITED

Hayes, A. H.

1975. The larger moths of the Galápagos Islands (Geometroidea, Sphingoidea & Noctuoidea). *Proc. Calif. Acad. Sci.* (San Francisco), 40:145-208.

Landry, B.

1993. Additions to the knowledge of the Pterophoridae (Lepidoptera) of the Galápagos archipelago, Ecuador, with descriptions of two new species. *Zool. Meded.* (Leiden), 67:473-485.

Landry, B., and C. Gielis

1992. A synopsis of the Pterophoridae (Lepidoptera) of the Galápagos Islands, Ecuador. *Zool. Verh.* (Leiden), 276:1-42.

Meyrick, E.

1914. Lepidoptera Heterocera. Fam. Heliodinidae. In *Genera Insectorum*, 165:1-29, 2 pl. Brussels.
1926. On microlepidoptera from the Galapagos Islands and Rapa. *Trans. Ent. Soc. London*, 1926:269-278.

Wiggins, I. L., and D. M. Porter

1971. *Flora of the Galápagos Islands*. Stanford: Stanford Univ. Pr. 998pp.