

## The First Endemic Hawaiian *Heliothis* (Lepidoptera: Noctuidae): *H. melanoleuca*, a New Species from Riparian Forest

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While there are 5 species of *Helicoverpa* Hardwick (1965) known from Hawaii, including 4 endemics, *Heliothis* s.s. was previously represented here only by the introduced tobacco budworm, *H. virescens*. An endemic Hawaiian species, *Heliothis melanoleuca*, is described in this paper from 9 specimens collected on Oahu. This new species has distinctive black and white vestiture (Fig. 1) sometimes tinged with yellow and/or green, which is quite unlike any other heliothine noctuid. However, examination of the genitalia of both sexes, and other characters, betrays an affinity with “typical” *Heliothis* species, as defined by Matthews (1991).

The unusual patterning of the wings is suggestive of lichen-like cryptic coloration, and it is possible that the adults may rest during the day on lichen-covered substrates. Indeed, exposed rocks partially covered with mosses and lichens are common in the type locality: wet, riparian forest on Mt. Tantalus, Oahu, elevation 550m (1,800 ft). The only other heliothines which occur naturally in the wetter parts of the tropics are the species of the *H. virescens*-group (Matthews, 1991). However, *H. melanoleuca* possesses none of the synapomorphies of the latter group listed in Poole *et al.* (1993), and its phylogenetic affinities within the genus remain undetermined.

Description of the adult (the only life history stage known to date) is based on the holotype with variation among the paratypes noted in parentheses. The single female paratype has lost much vestiture from the wings, therefore appearing lighter than the males, but since it is not otherwise much different, it is not described separately. Insect collection abbreviations are from Arnett & Samuelson (1986).

### *Heliothis melanoleuca* Mitchell, new species

Figs. 1–7

Expanse: 32 mm (range = 28–32 mm, mean = 30.3 mm, n = 9).

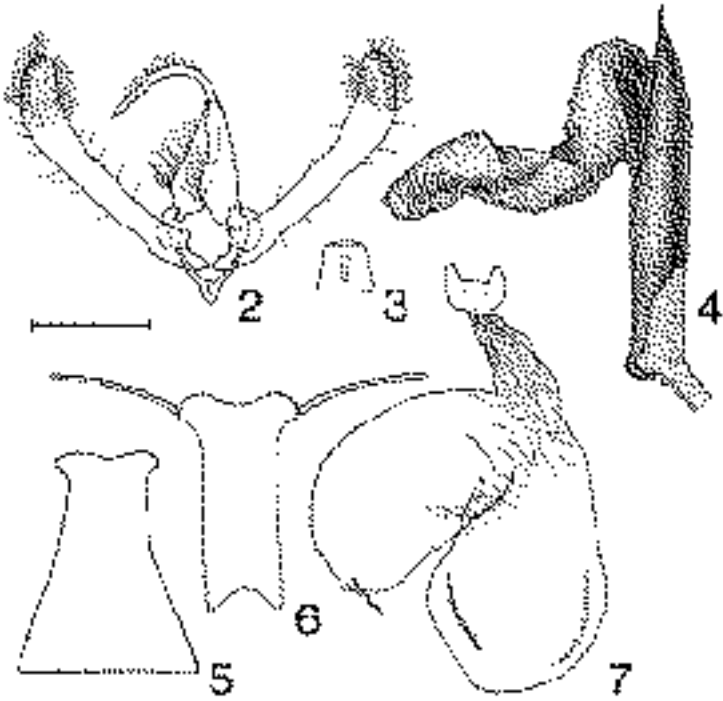
**Head:** Eyes well developed. First 2 palpal segments predominantly dark gray with some white distally; third palpal segment with short appressed setae, gray dorsally and white ventrally (white dorsally and ventrally in some paratypes). Frons with even short black and white scales mixed together, appearing gray to the naked eye. Vertex with longer uneven scales of the same colors. Scape of antenna bearing distinct white scales; flagellum dorsally clothed in short black appressed scales, bare ventrally; each flagellomere with a pair of lateral setae longer than flagellomere.

**Thorax:** Forewing dorsally mottled, ranging from pure creamy white (yellowy white tinged with green in 2 paratypes from type locality; yellowy white tinged with amber in 2 paratypes from North Halawa Valley) to dirty gray to black. Proximal half of basal area gray. Basal line black, well developed. Distal half of basal area predominantly whitish anteriorly, with 2 central gray patches;

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**Fig. 1.** Holotype (male), habitus. **Figs. 2–6.** Male genitalia and associated sclerites. **2,** = valvae; **3,** = juxta; **4,** = aedeagus; **5,** = eighth tergite. **6,** = eighth sternite. **Fig. 7.** Female genitalia. Scale bar = 2 mm for Figs. 2-3 and 1 mm for Figs. 4-7.

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predominantly gray posteriorly but with thin white band before antemedial line. Dentate antemedial line black, greatly thickened anteriorly. Basal half of median area mottled white and gray to black. Orbicular spot with black oval border surrounding white interior. Claviform spot squarish, overlying antemedial line basally. Medial line poorly defined, broken posterior to reniform spot, expanded into large more or less rectangular black patch on anterior wing margin, and into similar smaller patch on posterior margin. Reniform spot open anteriorly; interior dark gray with 3 white patches posteriorly. Subreniform spot poorly defined, indistinguishable from surrounding area but for black outline. Postmedial line scalloped, strongly curved towards base anteriorly, broken periodically by irregular white line on outer margin. Subterminal area black from costa through radial sector, with three white spots along costal margin; black patch surrounding diffuse white dot in cubital region and on posterior wing margin, the black patches delimiting subterminal line at outer margin; otherwise predominantly white. Terminal area predominantly gray (grayish brown in some paratypes). Adterminal line of distinct black patches. Long apical fringe of alternating gray and white. Forewing ventrally white with reniform spot showing through as gray patch. Basal half of hindwing dorsally even fawn gray, with outer half somewhat lighter. Hindwing ventrally even whitish gray with somewhat darker postmedian line and diffuse discal spot. Vestiture black on anterior face of prothorax, immediately posterior to eye. Thorax dorsally with long black and white setae intermixed, appearing gray to the naked eye (white in 5 paratypes), setae about twice as long those on vertex. Transverse, more or less straight, black band anteriorly on mesothorax, about half as wide as mesothorax. Weaker, posteriorly concave black band near posterior margin of mesothorax, and posteriorly convex black band on posterior margin of metathorax, laterally contiguous with first band, together enclosing light oval area. Longitudinal black band laterally above wing bases. Thorax laterally and ventrally covered by long white vestiture, mixed with gray from below head to between forelegs. Legs black with white patches around joints; single strong spine sometimes present on outer margin of prothoracic tibia, at half length of tibia, about half as long as outer protibial spur (visible in 3 of 7 male paratypes, and in the single female paratype).

**Abdomen:** First 4 segments whitish dorsally, with black patch mesally on first segment. Rest of abdomen same color as hindwings.

**Male genitalia:** Paratypes: Valves long and strap-like, distally recurved, 20–28 stout spines forming corona apically (Fig. 2). Surface of cucullus with mat of fine long setae, produced over dorsal margin of cucullus and dorsal to corona. Tegumen with posteroventral angle sclerotized, bearing brush of long fine setae. Uncus curved, the angle of curvature weakening distally towards flattened apex; bearing brush of setae dorsally, longest near midpoint of uncus. Juxta as long as wide (Fig. 3). Scobinate bar loosely attached to aedeagus basally otherwise positioned at base of vesica (Fig. 4). Vesica short, twisted through one complete spiral turn, with band consisting of lightly sclerotized transverse ridges extending longitudinally from base to tip. A single rounded basal diverticulum on vesica. Eighth tergite with anterior arms reduced and rounded (Fig. 5). Eighth sternite with sides parallel, proximal apodemes at least  $0.6 \times$  as long as sternite (Fig. 6).

**Female genitalia:** Ductus bursae approximately twice as long as wide, weakly sclerotized over most of length (Fig. 7). Appendix bursae saccate, subequal to corpus bursae.

**Type material.** Holotype, male (BPBM 15,880): “Hawaiian Is: Oahu I. Mt. Tantalus El. 1800 ft. Fluor. light. 13-x-1992. W. D. Perreira collector”; additional label reads “M & K Tauber also collectors.” Paratypes, 3 males (1 in HDOA, 2 in BMNH) and 1 female (BPBM): same collection data as the holotype; one male (USNM): “Hawaiian Is: Oahu I. Mt. Tantalus El. 1800 ft. UV light. 19-viii-1985. W.D. Perreira collector.” Genitalia slides made by R.W. Poole (USNM 46080, USNM 45895 and USNM 45896, female) and P. Gentili (USNM 46070). 3 males (2 in BPBM, 1 in USNM) “Hawaiian Is: Oahu I: North Halawa Valley El. 1000 ft. Malaise trap. 11-i-1996, 18-xi-1996, 1-xii-1996, D.J. Preston collector”.

**Etymology.** The specific epithet *melanoleuca* is derived from the Greek words for black (melanos) and white (leukos), in reference to the unusual vestiture of this species.

### Acknowledgments

I am grateful to Bob Poole for bringing these specimens to my attention, Patricia Gentili and Bob Poole for preparing genitalia slides, David Preston for providing habitat information, and the editors of this volume for accommodating this contribution at short notice. This work was supported by the U. S. Department of Agriculture - NRICGP.

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