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ADDITIONS TO THE BLASTOBASINAE (LEPIDOPTERA: COLEOPHORIDAE) OF THE GALAPAGOS ISLANDS WITH DESCRIPTION OF A NEW *HOLCOCERA* CLEMENS

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Holcocera gozmanyi sp. n. is described herein and represents the only known species within the genus from the Galapagos Islands, Ecuador. Illustrations of the head, wing venation, and male and female genitalia are included in addition to photographs of the holotype, the female wing coupling system, the abdomen, and a female paratype. Autapomorphies for *H. gozmanyi*, such as the absence of the aedeagal sclerite, the female retinaculum with a short row of long bristlelike setae on the cubitus, and the male and female with paired subtriangular patches of transverse, irregular rows of spinelike setae on the abdominal terga are not known to occur in other Blastobasinae. A key to the three species of Blastobasinae (Coleophoridae) known from the Galapagos Islands is provided, along with new host plant data for *Blastobasis normalis* (MEYRICK, 1926) and *Calosima darwini* ADAMSKI et LANDRY, 1997.

Key words: Coleophoridae, Blastobasinae, Galapagos Islands, endemicity, host plants

INTRODUCTION

The Blastobasinae (Coleophoridae) of the Galapagos Islands appears to be a very depauperate group having only two previously recognized species (ADAMSKI & LANDRY 1997). Since this publication the senior author was able to spend three months collecting more specimens of microlepidoptera in the Galapagos in 2002, 2004, and 2005, the latter expedition resulting in the discovery of a new species of *Holcocera* CLEMENS on the island of Fernandina. More specimens of the other two species were also reared at the Charles Darwin Research Station or were collected by Mr. PATRICK SCHMITZ of Geneva, Switzerland.

The Blastobasinae are a deceptively small taxon with slightly over 200 species worldwide. However, with many more undescribed species than described their estimated species richness could easily exceed several hundred species. Although depauperate in the Palaearctic Region their center of diversity is in the New World, particularly in the Neotropics. About 70 species of *Holcocera* have been described worldwide and over half of these species are known from the Neotropi-

cal Region. With more collecting and study of specimens already present in major institutional and private collections, these numbers will undoubtedly increase.

The purpose of this study is to describe the new *Holcocera* from Fernandina, to provide new host plant records, and to document additional diagnostic characters to differentiate the other two Galapagos species of Blastobasinae.

MATERIAL AND METHODS

Most of the specimens were collected at night with an ultra-violet light suspended in front of a white sheet or inside a tower made of fine white gauze. They were prepared in the field following the technique shown in LANDRY and LANDRY (1994). Some specimens were reared at the Charles Darwin Research Station, Santa Cruz Island, Galapagos (CDRS), mostly in recent years in the Station's quarantine laboratory.

In describing the new species the gross morphological observations and measurements of the adult vestiture were made using a dissecting microscope (reflected light) with a calibrated micrometer. The Methuen Handbook of Colour (KORNERUP & WANSCHER 1978) was used as a color standard. Genitalia were dissected as described by CLARKE (1941) except, mercurochrome and chlorazol black were used as stains. Pinned specimens and genital preparations were examined with dissecting and compound microscopes. Measurements of wings were made using a calibrated ocular micrometer. The holotype is deposited in the Muséum d'histoire naturelle, Geneva, Switzerland (MHNG). Paratypes are deposited in the Natural History Museum, London, U.K. (BMNH), the collection of the Invertebrates Department of the CDRS, the MHNG, and the United States National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C., USA.

Reared specimens of *Calosima darwini* and *Blastobasis normalis* were borrowed from the BMNH and the Australian National Insect Collection, Canberra, Australia (ANIC). Host plant names and classification follow MCMULLEN (1999).

Holcocera gozmanyi sp. n.
(Figs 1–3, 6–10)

Diagnosis – The species will separate easily from the other Galapagos Blastobasinae by virtue of its wide, paired patches of spinelike setae on the abdominal terga (Fig. 9), the absence of distinct pattern elements on the forewing (Figs 1 and 2), and the absence of pecten on the antennal scape (Fig. 3). The other two species of Blastobasinae have narrow lines of spinelike setae near the apical margins of their abdominal terga, they have distinct darker markings on the forewings (see ADAMSKI & LANDRY 1997), and they have a conspicuous pecten (Figs 4 and 5) on the antennal scape.

Autapomorphies and relationships: Base of digitate process of upper part of valva about 1/4 width of distal part; dorsal margin of lower part of valva curved inwardly; anellus widened apically; aedeagal sclerite absent; both male and female

with paired subtriangular patches of transverse, irregular rows of spinelike setae on abdominal terga; and female retinaculum with a short row of very long, bristlelike scales along base of cubitus. The relationships between *Holcocera gozmanyi* and other *Holcocera* are difficult to establish because of the unusual suite of autapomorphies possessed by the former. However, *H. gozmanyi* can be placed in *Holcocera* on the basis of the following shared synapomorphies: ventrolateral margin of gnathos weakly fused with tegumen, anellus bearing microsetae, and proximal flange of valva with few setae.

Description – Head (Fig. 3): Vertex and frontoclypeus gray; outer and inner surfaces of labial palpus with basal two segments pale brown intermixed with few gray scales, terminal segment gray; scape of antenna and flagellum gray dorsally, pale brown ventrally; male with more cilia ventrally; scape without pecten; male first flagellomere deeply notched dorsally; proboscis pale brown.

Thorax: Tegula and mesonotum gray intermixed with few pale-brown scales; forewing (Figs 1, 2): length 3.9–4.3 mm for ♂ (n = 6); 5.0–5.3 mm for ♀ (n = 8), gray intermixed with few pale-brown scales, with no diagnostic markings; female retinaculum (Fig. 10) with short row of very long, bristlelike scales along base of cubitus, and several hooked scales along base of radius; male frenulum with one acanthus, female with two acanthae (Fig. 10); undersurface pale-gray scales intermixed with pale-brown scales; venation (Fig. 6) with pterostigma between Sc and R1; R4 and R5 stalked; M2 closer to M3 than to M1; M3 stalked with CuA1 slightly beyond cell; hindwing: translucent pale gray; venation (Fig. 6) with Rs and M1 parallel about ½ length, slightly divergent for distal ½; base of M2 and stem of M3 and CuA1 arising from distoposterior margin of cell; M2 arched between M1 and M3 + CuA1.

Abdomen (Fig. 9): Male with paired subtriangular patches of transverse, irregular rows of spinelike setae on abdominal terga 2–7, female with paired patches of spinelike setae on abdominal terga 2–6.

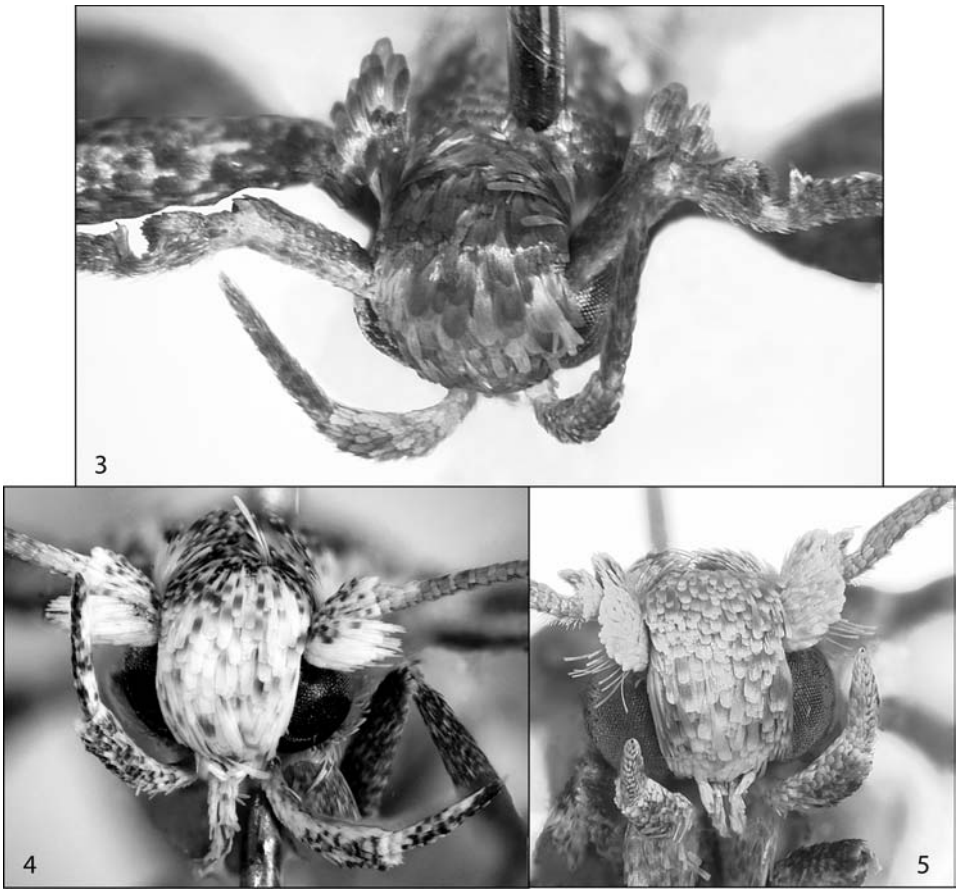
Male genitalia (Fig. 7): Uncus with dorsal surface extending posteriorly, confluent apically with ventral surface, forming small, conical, and setose apex; gnathos forming semicircular bandlike ventral support for tuba analis; vinculum narrow, slightly widened ventrally; juxta platelike, slightly narrowed ventromedially; valva divided longitudinally; upper part digitate, setose, gradually widening from dilated base; lower part gradually widened from slightly narrowed base, with ventral and

Figs 1–2. *Holcocera gozmanyi*, sp. n.: 1 = male, holotype, 2 = female, paratype

dorsal margins curved inwardly, abruptly narrowed distally and produced ventrodistally into upturned, spinelike process; proximal flange short, setose; aedeagus straight, parallelsided; aedeagal sclerite absent; juxta fused with anellus; anellus setose, widened apically, wrapped around apical part of aedeagus, joining longitudinally from apical cleft on dorsal surface.

Female genitalia (Fig. 8): Ovipositor telescopic, divided into three membranous subdivisions; papillae anales elongate setose lobes; eighth sternum setose, deeply notched anteriorly; ostium closer to eighth sternum than to seventh sternum; antrum rounded and membranous; inception of ductus seminalis on anterior part of antrum; ductus bursae moderately long, membranous; corpus bursae small bearing one diminutive conical signum on anterior end.

Holotype ♂: "ECU[ADOR], Galápagos, Fernandina, Cabo Douglas, GPS: S 00°18.269', W 091°39.098', u[ltra]-v[iolet] l[ight], 15.ii.2005, B. LANDRY, P. SCHMITZ." Specimen not dissected and deposited in MHNG.



Figs 3–5. Heads of Galapagos Blastobasinae: 3 = *Holcocera gozmanyi*, 4 = *Calosima darwini*, 5 = *Blastobasis normalis*

Paratypes (5 ♂, 9 ♀). 3 ♂, 3 ♀ with same label data as holotype (1 ♂ with genitalia slide by D. ADAMSKI No. 5603 (= USNM Slide No. 83224), 1 ♀ with genitalia slide by D. ADAMSKI No. 5606 (= USNM slide No. 83223) and wing slide by D. ADAMSKI No. 5645 (= USNM wing slide No. 83222)); 2 ♂, 5 ♀ with same data as holotype except date, 9.ii.2005 (1 ♂ with genitalia slide by D. ADAMSKI, No. 5604, 1 ♀ with genitalia slide by D. ADAMSKI, No. 5605); 1 ♀, Fernandina, Punta Espinosa, 12.v.1992, M[ercury] V[apour] L[amp], *leg*. B. LANDRY. Two paratypes are deposited in the BMNH, two in the CDRS, two in the USNM, and eight in the MHNG.

Distribution and natural history – *Holcocera gozmanyi* is only known on Fernandina Island of the Galapagos archipelago, Ecuador. The specimens have been collected in February and May at light in the early hours of the night in the narrow littoral zone at the type locality and Punta Espinosa.

Etymology – *Holcocera gozmanyi* is named in honor of Dr LÁSZLÓ GOZMÁNY, former curator of the Lepidoptera of the Hungarian Natural History Museum, Budapest.

KEY TO THE BLASTOBASINAE (COLEOPHORIDAE) FROM THE GALAPAGOS ISLANDS

1	Male	2
–	Female	4
2	First flagellomere of antenna notched	3
–	First flagellomere of antenna not notched (Fig. 4)	*Calosima darwini*

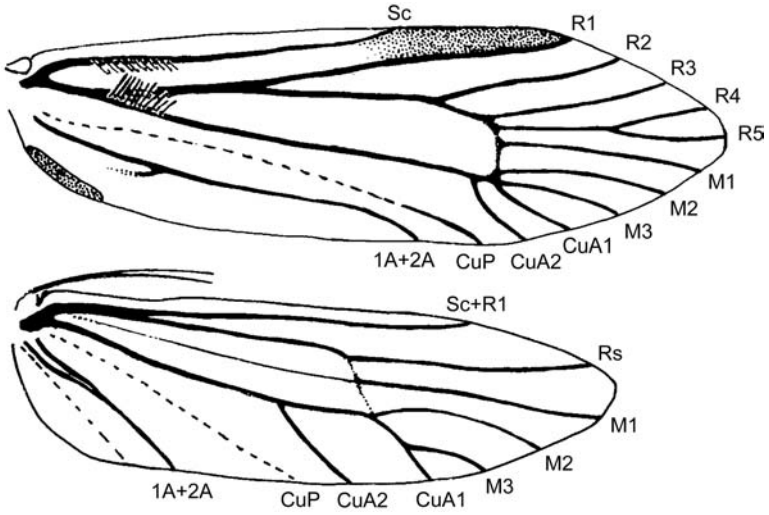
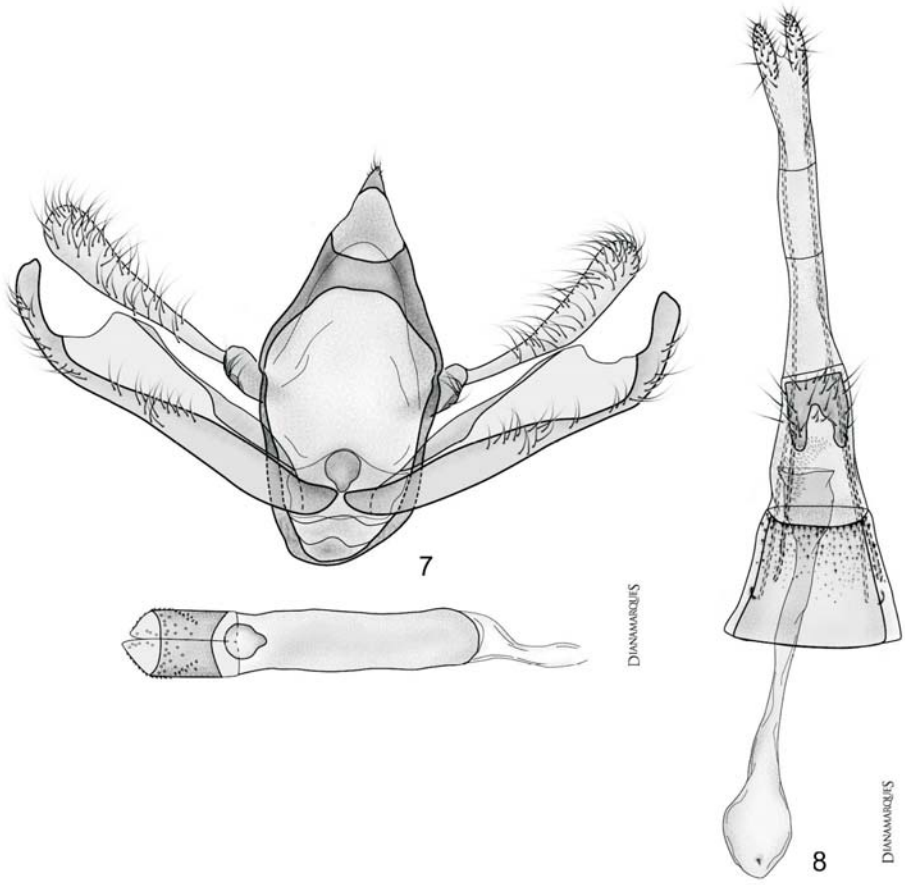


Fig. 6. Wing venation of *Holcocera gozmanyi*

3 Forewing almost uniformly dark gray, without distinct pattern elements; antennal scape without pecten (Fig. 3) *Holcocera gozmanyi*

– Forewing gray to reddish-brown, usually with conspicuous pattern elements in the form of a median fascia and two darker spots at distal end of cell (one at midline and other below); antennal scape with conspicuous pecten (Fig. 5) *Blastobasis normalis*

4 Frenulum with 2 or 3 acanthae; antennal scape with or without pecten; ostium closer to eighth sternum than to seventh sternum; eighth sternum deeply emarginate anteriorly; ductus bursae wide 5



Figs 7–8. Genitalia of *Holcocera gozmanyi*, sp. n.: 7 = male (genital capsule and aedeagus separated), 8 = female, ventral view

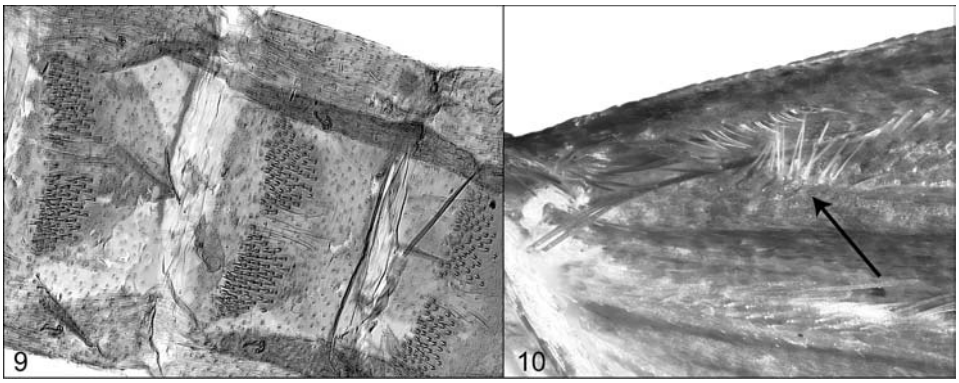
– Frenulum with 2 acanthae; pecten made of about 12 narrow scales directed straight ventrally (Fig. 5); ostium closer to seventh sternum than to eighth sternum; eighth sternum not emarginate; ductus bursae extremely narrow *Blastobasis normalis*

5. Frenulum with 2 acanthae (Fig. 10); antennal scape without pecten (Fig. 3); antrum rounded (Fig. 8); eighth sternum emarginate anteriorly by more than ½ length; signum small *Holcocera gozmanyi*

– Frenulum with 3 acanthae; conspicuous pecten made of undifferentiated scales directed lateroventrally (Fig. 4); antrum undifferentiated; eighth sternum emarginate anteriorly by less than ½ length; signum large *Calosima darwini*

DISTRIBUTION OF THE SPECIES NEW HOST RECORDS

Six new host plant records for *Calosima darwini* will be presented elsewhere by ROQUE-ALBELO *et al*. (unpublished). In addition, BL examined specimens of *C. darwini* reared from seeds of the lead tree (*Leucaena leucocephala* (LAM.) DE WIT, Mimosaceae, vouchers in ANIC), the seeds of *Acacia insulae-iacobi* RILEY (Mimosaceae, voucher in CDRS), and from fallen flowers of the giant prickly pear cactus (*Opuntia echios* var. *gigantea* (J. T. HOWELL) D. M. PORTER, Cactaceae, vouchers in MHNG).



Figs 9–10. *Holcocera gozmanyi*, sp. n.: 9 = abdominal segments 2–4, 10 = female wing coupling mechanism with arrow pointing to bristle-like scales of retinaculum on base of cubitus

Table 1. Status and distribution of the Blastobasinae in the Galapagos Islands. E: endemic; N: native. Islands: Bal: Baltra, Esp: Española, Fer: Fernandina, Flo: Floreana, Gen: Genovesa, Isa: Isabela, Mar: Marchena, Pta: Pinta, Pzn: Pinzon, Rab: Rabida, SCl: San Cristobal, SCz: Santa Cruz, Sgo: Santiago

Species	Status	Islands												
		Bal	Esp	Fer	Flo	Gen	Isa	Mar	Pta	Pzn	Rab	SCl	SCz	Sgo
Blastobasis normalis	N		x	x	x	x	x	x	x	x		x	x	x
Calosima darwini	E	x			x						x	x	x	x
Holcocera gozmanyi	E			x										

Concerning *Blastobasis normalis*, BL identified two specimens reared from seeds of white mangrove (*Laguncularia racemosa* (L.) GAERTN. f., Combretaceae, vouchers in the BMNH). This is the first host plant record for this species found so far only on the Galapagos and continental Ecuador.

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