

SHILAP Revista de Lepidopterología

ISSN: 0300-5267 avives@orange.es

Sociedad Hispano-Luso-Americana de Lepidopterología España

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SHILAP Revista de Lepidopterología, vol. 38, núm. 151, septiembre, 2010, pp. 341-351

Sociedad Hispano-Luso-Americana de Lepidopterología

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Three new species of Blastobasinae moths from Beijing, China (Lepidoptera: Gelechioidea, Coleophoridae)

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Abstract

Three new species of Blastobasinae (Lepidoptera: Gelechioidea: Coleophoridae) are described from Beijing, China as *Pseudohypatopa ramusella* Adamski & Li, sp. n., *Blastobasis sinica* Adamski & Li, sp. n., and *B. drymosa* Adamski & Li, sp. n.. A lectotype for *Holcocera anthracographa* Meyrick, 1937, is designated. This species is redescribed and is transferred to *Pseudohypatopa* Siney, 1986. Photographs of the imagos and illustrations of the male and female genitalia are provided for the identification of these species.

KEY WORDS: Lepidoptera, Gelechioidea, Coleophoridae, Blastobasinae, Holcocerini, morphology, Taxonomy, China

Tres nuevas especies de Blastobasinae de Pekín, China (Lepidoptera: Gelechioidea, Coleophoridae)

Resumen

Se describen tres nuevas species de Blastobasinae (Lepidoptera: Gelechioidea: Coleophoridae) de Beijing, China como *Pseudohypatopa ramusella* Adamski & Li, sp. n., *Blastobasis sinica* Adamski & Li, sp. n. y *B. drymosa* Adamski & Li, sp. n.. Se designa un lectotipo para *Holcocera anthracographa* Meyrick, 1937. Se redescribe esta especie y se transfiere a *Pseudohypatopa* Sinev, 1986. Se proporcionan fotografías de los imagos e ilustra la genitalia del macho y de la hembra de estas especies para facilitar su identificación.

PALABRAS CLAVE: Lepidoptera, Gelechioidea, Coleophoridae, Blastobasinae, Holcocerini, morfología, taxonomía, China.

Introduction

The blastobasine moths are small to medium-sized, narrow-winged moths that include about 400 species worldwide. This number vastly underestimates the species richness for the group as they are abundant in several institutions and private collections and are one of the most commonly collected groups of Gelechioidea, especially in the Americas.

For over 100 years, since MEYRICK (1894), the Blastobasinae have been considered a monophyletic taxon. ADAMSKI & BROWN (1989) and HODGES (1998) have corroborated this notion of the monophyly of the Blastobasinae as its members can be identified by having the following combination of characters: forewing with pterostigma between Sc and R1, base of CuA2 at right angle or near to cubitus, and subcubital retinaculum present in female, spiniform setae in a transverse row on abdominal terga, phallus sclerite present, valva divided, anellus setose, and eighth sternum plate-like in female.

The Holcocerini are the least known blastobasine moths in the New World with 10 described

species. This tribe appears about half as diverse in species as the Blastobasini. The Holcocerini are distinguished from the Blastobasini by the following apomorphies: phallus with a ring support at base, eighth sternum with anterior margin medially emarginate in female, and inception of ductus seminalis distant from ostium. In addition, there are several plesiomorphies found in most species of Holcocerini listed by ADAMSKI & BROWN (1989) that are helpful in differentiating them from species of Blastobasini.

Based upon previous literature and holdings in museum collections, the Blastobasini appear the more numerous of the two tribes of Blastobasinae. Many Old World species have unique male genital features, and thus may result in a proliferation of new genera. Species within Blastobasini may be recognized by having: a forewing with a reduced tornus, tegumen with tergal setae present, vinculum wide, juxta bandlike, anellus with stout setae or with macrosetae, gnathos with arms projecting ventrolaterally, anellus separate from juxta, ovipositor with four membranous divisions posterior to eighth segment, female eighth tergum with a darkly pigmented median longitudinal streak, ostium approximate with seventh segment, and signum hornlike.

Probably the least known blastobasine fauna exists on mainland China. Although MEYRICK (1894, 1907, 1908, 1916, 1922, 1925, 1937), MORIUTI (1982, 1987), KUZNETZOV & STEKOLNIKOV (1984), KUZNETZOV & SINEV (1985), PARK (1984, 1989), SINEV (1986, 1993, 2007), PARK & SU-YOUNG (2000), ADAMSKI (2002, 2003), ADAMSKI & MALIKUL (2003) and OHSHIMA (2003) have described species of Blastobasinae from adjacent countries that may indicate affinities with the Chinese fauna, few articles have specifically treated or described species of the subfamily from this vast country. Moreover, they are very limited in number and in scope (e. g., ZHEN & LI, 2009).

The purpose of this article is to add three new species to the Chinese fauna and to stress the need to document the blastobasine fauna of this large country. By doing this, eventually we may understand more fully the phylogenetic relationships and biogeographically affinities of the Blastobasinae on a worldwide basis.

Materials and Methods

Gross morphological observations, including measurements and illustrations, of adult specimens were made using a dissecting microscope (reflected light) with a calibrated micrometer and a Zeiss compound microscope (transmitted light). Genitalia were dissected as described by CLARKE (1941), except Mercurochrome and chlorazol black were used as stains.

The Methuen Handbook of Colour (KORNERUP & WANSCHER, 1978) was used as a color standard. All label data of type specimens are given verbatim and are expressed in quotations, while bracketed data are used to complete label information in abbreviated form, or to help with the recognition of uniquely shaped or patterned labels. All types of new species are deposited in the Insect Collection, College of Life Sciences, Nankai University, Tianjin, People's Republic of China [NKUM].

Taxonomic Treatment

Holcocerini Adamski & Brown 1989

Pseudohypatopa ramusella Adamski & Li, sp. n. (Figs. 1, 5-6)

Type material: Holotype ♂, "CHINA, N[orth] W[est], Beijing, Heiden-chui [Haidian Qu], Jiu-Feng Forest Park, 13 July 2008, col. J.-C. Sohn", "♂ Genitalia Slide by DA, No. 6141" [yellow label]. Deposited in NKUM.

Description: Adult: Head: Vertex and frontoclypeus with brownish-gray scales tipped with pale gray; outer surface of labial palpus brownish gray intermixed with pale-gray scales along apical margin of second palpomere, inner surface similarly patterned except paler; scape brownish gray basally, pale

gray distally; pecten brown; flagellum pale brown, with long cilia on ventral margin; proboscis with brownish-gray scales tipped with pale gray.

Thorax: Tegula and mesonotum brownish gray. Legs with brownish gray scales tipped with white intermixed with pale-gray scales near midsegments and apices of all segments and tarsomeres. Forewing (Fig. 1): Length 6.1 mm (n=1), with scales brownish gray tipped with white intermixed with brownish gray scales and pale-gray scales within and slightly beyond area of cell; cell with two large spots, one near midcell, one near distal end; submedian fascia faint; base brownish gray; post basal fascia incomplete, extending from CuP to posterior margin. Undersurface brownish gray. Hindwing translucent brownish gray.

Abdomen: Male genitalia (Figs. 5-6): Uncus curved ventrally, dorsally keeled, densely setose, gradually narrowed to a rounded apex; ventroposterior margin of gnathos entire, weakly fused with tegumen; vinculum narrow, about as wide as gnathos; valva divided, upper part membranous, setose, digitate, wide basally, abruptly narrowed near 1/3 length, apex broadly rounded; lower part of valva setose along ventral margin, wide basally, extending slightly beyond upper part, distally narrowed, and forming an acuminate, inwardly-curved, dorsally projecting process; juxta triangular, with rounded apices; phallus and internal sclerite serpentine-shaped, at least twice length of valva; sclerite of phallus apically bifurcate; anellus bearing several microsetae.

Female: Unknown.

Etymology: The species epithet, *ramusella*, is derived from the Latin, *ramus*, meaning branch, and refers to the bifurcate or branched apical part of the internal sclerite of the phallus.

Diagnosis: *Pseudohypatopa ramusella* Adamski & Li, sp. n. is similar to *Pseudohypatopa longicornutella* Park, 1989 by sharing a keeled uncus, a wide dorsal part of the upper part of valva, and a long cornutus but differs from the latter by having the ventral margin of the juxta entire, a more stout apical process of the lower part of the valva, a recurved apical part of the internal sclerite of the phallus, and a less divergent apical bifurcation of the apical part of the internal sclerite of the phallus.

Pseudohypatopa anthracographa (Meyrick, 1937) comb. n. (Figs. 2, 7-8, 13)

Type material: Lectotype &, designated herein, "Lectotype" [round purple-bordered label], "[India], Khasis, 5000 f[ee]t, Shillong, 6-VI-1928, [T. B.] Fletcher Coll[ector].", "Brit[ish] Mus[eum] 1937-156", "Cotype, Holcocera anthracographa Meyr[ick], Meyr[ick] Det. 1937", "BM & Genitalia Slide No. 31944." In BMNH. A lectotype is being designated in order to maintain stability of usage of the name of a taxon with congeners that look similar. Paralectotypes (4 ♂♂, 1 ♀): 1 ♂, "Syntype" [round blue-bordered label], "[India] Khasis, 5000 ft., Shillong, 24-VI-1928, Fletcher Coll.", "Cotype, Holcoera anthracographa Meyr., det. 1937", "BM & Genitalia Slide No. 31943"; 1 &, "[India] Khasis, 5000 ft., Shillong, 5-VII-1928, Fletcher Coll.", "Cotype, Holcocera anthracographa Meyr., Meyr. det. 1937", "BM ♂ Genitalia Slide No. 20006" [specimen missing right wings]; 1 ♂, "Syntype" [round bluebordered label], "[India] Shillong, Assam, T. B. Fletcher, VI-[19]28", "Holcocera anthracographa Meyrick, 3/3, E. Meyrick det. in Meyrick Coll., "Meyrick Coll., B. M. 1938-290", "anthracographa Meyr.", "BM ♂ Genitalia Slide No. 31946"; 1 ♀, "Syntype" [round blue-bordered label], "[India] Shillong, Assam, TBF, 6-20", "Meyrick Collection, B. M. 1938-290", "Holcocera anthracographa Meyrick, 1/3, E. Meyrick det., in Meyrick Coll.", "BM ♀ Genitalia Slide No. 31946"; 1 ♂, "Syntype" [round blue-bordered label], "[India] Shillong, Assam, TBF, 5000 ft., 6-28", "Meyrick Coll., B. M., 1938-290", "Holcocera anthracographa Meyrick, 2/3, E. Meyrick det., in Meyrick Coll." [specimen not dissected]. All paralectotypes in BM(NH).

Redescription: Adult: Head: Vertex with gray scales tipped with pale gray; outer surface of labial palpus gray, inner surface gray intermixed with pale-gray scales and few white scales; scape of antenna with gray scales tipped with pale gray, pecten gray; flagellum gray, with more cilia in males; first flagellomere in male dilated, forming a notchlike space between itself and flagellomeres 2-4; first flagellomere unmodified in female; proboscis pale gray.

Thorax: Tegula and mesonotum gray intermixed with few pale-gray scales on posterior end. Legs with gray scales tipped with pale gray intermixed with pale-gray scales along distal margins of all

segments and tarsomeres. Forewing (Fig. 2): Length 6.2-8.8 mm (n=7), pale gray intermixed with gray scales and gray scales tipped with pale gray; cell with two gray spots, one near middle and one on distoposterior end near tornus; costa with four large submarginal spots, one near base, one basal to midcell spot, one distal to midcell spot, and one within subapical area; area posterior to CuP with two large spots, one near anal lobe and one basiposterior to midcell spot; marginal spots present or absent. Undersurface gray. Hindwing: translucent gray at base, gradually darkening to apex.

Abdomen: Male genitalia (Figs. 7-8): Uncus setose, laterally flattened, slightly widening dorsoventrally, and forming an apical ridge; gnathos, a thin opened ring, posteroventral margin slightly notched medially; vinculum narrow, about as wide as gnathos; valva divided, upper part membranous, setose, digitate, widened basally, gradually narrowing, parallel sided on apical 1/4; inner margin deeply emarginated; lower part of valva distally setose, wide basally, extending to near upper part, distally narrowed, and forming an acuminate, inwardly-curved and dorsally projecting process; juxta triangular, acuminate; phallus at least twice longer than valva, internal sclerite broadly curved, apically bifurcate and slightly divergent, forming two lobelike processes; anellus reticulate, bearing several microsetae. Female genitalia (Fig. 13): Ovipositor telescopic, divided into three membranous subdivisions, seventh sternum setose posteriorly, deeply emarginate medially on anterior margin; ostium within membrane near anterior margin of eighth sternum; antrum membranous, slightly widened; ductus bursae nearly three times longer than ovipositor, spinulate inside anterior half; corpus bursae spinulate, bearing a dentate and platelike signum.

Remarks: Although MEYRICK (1937: 145) stated that the description of *Holcocera* anthracographa was based upon seven specimens, only six specimens are found to be conspecific. A seventh specimen bears a label with the same data as above except, "13-V-1928", and is a species of Gelechiidae with similar pattern to the above specimens. This specimen is not dissected.

Diagnosis: *Pseudohypatopa anthracographa* is similar to *P. longitubulata* Zhen & Li, 2009 in sharing a keeled uncus, a dorsally acuminate juxta, a widened upper part of valva, a long, broadly curved, and apically bifurcate internal sclerite of phallus, and female with corpus bursae with signum platelike. *Pseudohypatopa anthracographa* differs from *P. longitubulata* by having a juxta with an entire margin, base of the upper part of the valva deeply emarginated, a more stout apical process of the lower part of valva, and posterior part of ductus bursae with fewer coils.

Blastobasini Meyrick, 1894

Blastobasis sinica Adamski & Li, sp. n. (Figs. 3, 9-10, 14)

Type material: Holotype \eth , "CHINA, N[orth] W[est], Beijing, Heiden-chui [Haidian Qu], Jiu-Feng Forest Park, 13 July 2008, col. J.-C. Sohn", " \eth Genitalia Slide by DA, No. 6142" [yellow label]. Deposited in NKUM. Paratypes (1 \eth , 5 \mathfrak{PP}): same data as holotype except, " \eth Genitalia Slide by DA, No. 6143" and, " \mathfrak{PP} Genitalia Slide by DA. Nos. 6144-6148." All paratypes deposited in NKUM.

Etymology: The species epithet, *sinica*, is derived from the Latin, *Sinicus*, meaning from China, and refers to the country of discovery.

Description: Head: Vertex and frontoclypeus with brownish-gray scales tipped with pale gray; labial palpus in male about twice width of labial palpus in female; outer surface of labial palpus in male brown on basal half, pale brown on distal half or pale brown intermixed with few brown scales basally; inner surface pale brown; outer surface of labial palpus in female brown intermixed with pale-brown scales along apical margin of second palpomere, inner surface similarly patterned but paler; scape with scales brownish-gray tipped with pale gray; pecten pale brown; flagellum brown; first flagellomere in male dilated, forming a notchlike space between dilated part and flagellomeres 2-4; first flagellomere unmodified in female; proboscis with scales brownish gray tipped with pale gray.

Thorax: Tegula and mesonotum brownish gray. Legs with brownish gray scales tipped with white intermixed with pale-gray scales near midsegments and apices of all segments and tarsomeres. Forewing (Fig. 3): Length 5.9-7.1 mm (n=7), brown intermixed with brownish gray scales and brown

scales tipped with pale gray; basal 1/3 paler than distal 2/3, both areas bisected by a linear suffusion of pale-gray scales; basal area of distal 2/3 brown, gradually becoming paler towards apex; cell with two spots (one near midcell, one near distal end) or both spots absent. Undersurface brown. Hindwing translucent brownish gray, gradually darkening to apex.

Abdomen: Male genitalia (Figs. 9-10): Uncus slightly curved ventrally, sparsely setose, moderately broad basally, gradually narrowed distally to a narrowly rounded apex; gnathos broadly widened medially, darkly pigmented, with posteroventral margin bidentate; dorsal strut of tegumen bifurcate near posterior half; tergal setae present; vinculum wide, at least three times the width of gnathos; juxta bandlike; valva divided, upper part setose, digitate, extending dorsoposteriorly from a basally dilated proximal flange; proximal flange overlaid by membrane bearing dense microtrichiae and few elongate spinelike setae; microtrichiate membrane extending from upper arm of proximal flange along base of costa, across diaphragma to opposite valva; base of digitate process of upper part of valva bearing several elongate, spinelike setae in a row; lower part of valva parallelsided along 4/5 length, abruptly narrowed, forming an elongate, acuminate, inwardly-curved, dorsally projecting process; process with a flattened inner surface; phallus nearly straight, slightly shorter than valva; internal sclerite of phallus shallowly serpentine; anellus bearing two dense patches of conelike setae. Female genitalia (Fig. 14): Ovipositor telescopic, divided into four membranous subdivisions; eighth tergum with a linear, darkly-pigmented marking along median longitudinal axis; ostium within membrane posterior to seventh segment, juxtaposed posterolaterally by two large areas of dense microtrichiae; seventh tergum bearing 3-4 transverse, irregular rows of spinelike setae; posterior margin of seventh sternum broadly emarginate medially; ductus bursae slightly longer than ovipositor, internally bearing several rows of platelets on anterior 1/3; ductus seminalis and ductus bursae arising from a short ductlike antrum; internal walls of corpus bursae bearing small platelike processes and a slightly curved hornlike signum.

Diagnosis: *Blastobasis sinica* Adamski & Li, sp. n. is similar to *B. drymosa* Adamski & Li, sp. n. by sharing elongate, spinelike setae on the base of the digital process and on the expanded base of the upper part of the valva, but differs from the latter by having a wider gnathos, more elongate, spinelike setae on the base of the digital process of the upper part of the valva, and a proximal flange overlaid with membrane bearing dense microtrichiae. Both species are very similar to *Blastobasis spiniella* Park from South Korea because they share a dilated base of the upper part of the valva bearing several elongate, spinelike setae.

Blastobasis drymosa Adamski & Li, sp. n. (Figs. 4, 11-12)

Type material: Holotype ♂, "CHINA, N[orth] W[est], Beijing, Heiden-chui [Haidian Qu], Jiu-Feng Forest Park, 13 July 2008, col. J.-C. Sohn", "♂ Genitalia Slide by DA, No. 6149" [yellow label]. Deposited in NKUM.

Description: Head: Vertex and frontoclypeus pale brown; labial palpus wide in male, as in *Blastobasis sinica*; outer surface of labial palpus with basal half brown intermixed with pale brown scales on distal half; inner surface pale brown; scape pale brown; pecten pale brown; flagellum brown; first flagellomere in male dilated, forming a notchlike space between dilated part and flagellomeres 2-4; proboscis pale brown.

Thorax: Tegula and mesonotum pale brown. Legs with brownish gray scales tipped with white intermixed with pale-gray scales near midsegments and apices of all segments and tarsomeres. Forewing (Fig. 4): Length 5.2 mm (n=1), pale brown; median fascia faint; cell with a slightly obliterated spot near distal end. Undersurface pale brown. Hindwing translucent pale brown.

Abdomen: Male genitalia (Figs. 11-12): Uncus slightly curved ventrally; sparsely setose, moderately broad basally, parallel sided to subapical area, gradually tapering to a narrowly rounded apex; gnathos moderately broad, darkly pigmented beneath dorsolateral arms; posteroventral margin of gnathos protuberant medially with a slightly bidentate apex; tergal setae present; vinculum wide, at least three times width of gnathos; juxta bandlike; valva divided, upper part setose, digitate, extending

dorsoposteriorly from a basally dilated proximal flange; proximal flange overlaid by membrane bearing a large cluster of spinelike setae; sparsely microtrichiate membrane extending from upper arm of proximal flange along base of costa, across diaphragma to opposite valva; base of digitate process of upper part of valva bearing a pair of elongate, spinelike setae; lower part of valva parallelsided along 4/5 length, abruptly narrowing, forming an acuminate, inwardly-curved, dorsally projecting process; process with a flattened inner surface; phallus slightly curved; internal sclerite of phallus broadly curved; anellus bearing two dense patches of conelike setae.

Female: Unknown.

Etymology: The species epithet, drymosa, is derived from the Greek, $\delta \varrho \psi \mu o \varsigma$ (drymos), meaning forest, and refers to the Jiu-Feng Forest Park, where $Blastobasis\ drymosa$ was first discovered.

Diagnosis: *Blastobasis drymosa* is similar to *B. sinica* by sharing elongate, spinelike setae on the base of the digital process and on the expanded base of the upper part of the valva, but differs from the latter by having a narrower gnathos, fewer elongate, spinelike setae on the base of the digital process of the upper part of the valva, and a large cluster of spinelike setae near inner margin of proximal flange overlaid with membrane bearing sparse microtrichiae. Both species are very similar to *Blastobasis spiniella* Park from South Korea because they share a dilated base of the upper part of the valva bearing few or several elongate, spinelike setae.

Acknowledgments

We thank Jae-Choen Sohn, University of Maryland, College Park, Maryland, for providing us with the study specimens that he collected in Beijing; Kuniko Arakawa, Moriya-shi, Japan, for the illustrations; and Kevin Tuck, Microlepidoptera Section, Natural History Museum, London, England, for providing type specimens for examination.

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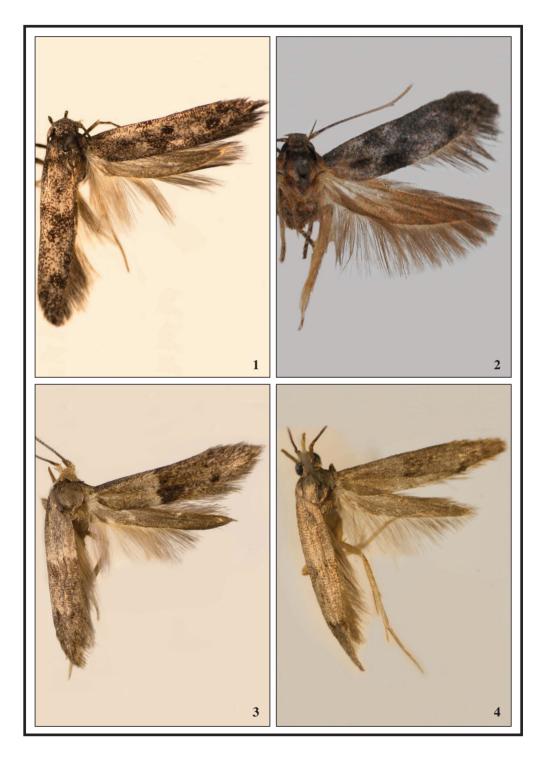
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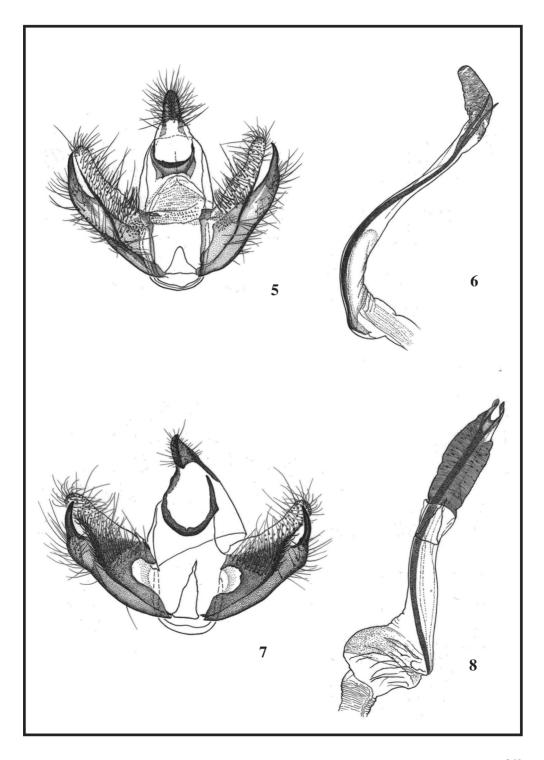
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(Recibido para publicación / Received for publication 6-V-2010) (Revisado y aceptado / Revised and accepted 22-VII-2010) (Publicado / Published 30-IX-2010)

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SHILAP Revta. lepid., 38 (151), septiembre 2010 **349**

