

Descriptions of Four New Species of *Struthoscelis* Meyrick (Lepidoptera: Oecophoridae: Oecophorinae), One from Area De Conservación Guanacaste, Northwestern Costa Rica, Providing the First Known Biology for the Genus, and Discovery of a Novel Wing Morphology in Males

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**DESCRIPTIONS OF FOUR NEW SPECIES OF *STRUTHOSCELIS*
MEYRICK (LEPIDOPTERA: OECOPHORIDAE: OECOPHORINAE),
ONE FROM AREA DE CONSERVACIÓN GUANACASTE,
NORTHWESTERN COSTA RICA, PROVIDING THE FIRST KNOWN
BIOLOGY FOR THE GENUS, AND DISCOVERY OF A NOVEL WING
MORPHOLOGY IN MALES**

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Abstract.—We describe and illustrate four new species of *Struthoscelis*: *S. christianafigueresae* **new species**, from Costa Rica; *S. davisorum* **new species**, from Costa Rica; *S. konia* **new species**, from Peru; and *S. solamarita* **new species**, from Venezuela. We report the first known biology for a species of *Struthoscelis* and revisit the generic diagnosis based on newly discovered morphology including a novel structure in the male forewing. We provide comparative illustrations of all new species and of the male genitalia of *S. semiotarsa* Meyrick, 1916.

Key Words: *Apanteles leonelgarayi*, barcode, Braconidae, COI, Microgastrinae, orchid herbivore, *Sobralia chrysostoma*, *Sobralia mucronota*

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Edward Meyrick (1913) described the oecophorid genus *Struthoscelis* for a single species, *Struthoscelis acrobatica* Meyrick, 1913, represented by two males in his personal collection from Chanchamayo Province, Peru. He did not provide an etymology, but he seems to have likened the species to an ostrich (*struthio* L. = ostrich + *skelos* Gr. = leg). Indeed, the species has a diagnostically

and exceptionally long hindtibia and metatarsi and long, white and brown scales reminiscent of a displaying ostrich (Fig. 1). Three years later, Meyrick (1916) described a second species, *Struthoscelis semiotarsa* Meyrick, 1916, based on two males from Rio Maroni, French Guiana. These two species comprised the entire diversity of the genus for the last 100 years.



Fig. 1. Live specimen of an unknown species of *Struthoscelis* at light in Braulio Carrillo National Park, Costa Rica, 500 m elevation.

As part of an ongoing systematic treatment of the Lepidoptera of Area de Conservación Guanacaste (ACG) in northwestern Costa Rica (Burns and Janzen 1999; Burns and Janzen 2001; Hebert et al. 2004; Burns and Janzen 2005a, 2005b; Hajibabaei et al. 2006; Burns et al. 2007; Burns et al. 2008; Burns et al. 2009; Janzen et al. 2009; Solis et al. 2009; Burns et al. 2010A, 2010b; Janzen and Hallwachs 2011; Janzen et al. 2011; Bristow et al. 2012; Brown et al. 2013; Bertrand et al. 2014; Brown et al. 2014; Grishin et al. 2014; Phillips-Rodriguez et al. 2014; Grishin et al. 2015; Sourakov et al. 2015; Heikkilä et al. 2017), we recognized a new species of *Struthoscelis* reared from larvae feeding on two species of orchids in the genus *Sobralia* (Orchidaceae). MAM also located three more novel species represented by few specimens from unidentified

material in two museum collections. This treatment expands the known fauna to six species and is the first report of biological information for any species of *Struthoscelis*. We also describe a novel feature of wing morphology of these species including a previously unreported secondary sexual character in the forewing of the males. In addition, we provide the first description of female *Struthoscelis*.

We follow the current classification for the family Oecophoridae and subfamily Oecophorinae (Hodges 1974, 1998; Heikkilä 2014) and the placement of *Struthoscelis* in Oecophorini in the checklist of Neotropical Lepidoptera (Becker 1984). All of the species in the genus lack spines on the tergites, have a beak-like uncus and gnathos, and the gnathos is broadly attached to the tegumen (“fused”) with a finely denticulate upper surface near the apex. The valvae

are simple with a costal process and a saccular process, and the juxta is membranous, with the lateral arms prominent and setose (Figs. 8–11).

MATERIALS AND METHODS

Parataxonomists collected larvae as part of the ongoing inventory of the caterpillars of ACG and their host plants (Janzen and Hallwachs 2011, 2016). Additional information about specimens can be found in online databases: ACG inventory (Janzen and Hallwachs 2017; indexed by the unique identifier nn-SRNP-nnnnnn or DHJPARNnnnnnn) and the USNM Department of Entomology Collections (<http://collections.nmnh.si.edu/search/ento/>; indexed by the unique identifier USNMENTnnnnnnnn). MAM dissected and prepared genitalia from pinned specimens following the methods of Clarke (1941) and Robinson (1976); took measurements with an ocular micrometer from the left side of the specimen when possible; and used a Visionary Digital imaging station for photographs and the GIMP for photo-editing. MAM and Elisabeth P. Roberts created other digital illustrations using the vector graphics application Inkscape and digital photographs as guides. Morphological terms follow Hodges (1974, 1998) and Kristensen (2003). MAM used Brown (1978) to source roots and stems for etymologies and composition of new taxon names. We use the following museum acronyms: CUIC, Cornell University Insect Collection, Ithaca, N.Y., U.S.A.; USNM, National Museum of Natural History, Washington D.C., U.S.A.; and we indicate holotype deposition for each species.

DHJ and WH submitted a single leg from each specimen to the Biodiversity Institute of Ontario, Guelph University, for DNA barcoding (Ratnasingham and Hebert 2007), where all sequence-based

information can be retrieved using the sample ID numbers (nn-SRNP-nnnnnn). Sequence data were obtained from the 5' terminus of the COI gene amplified using standard primers (LepF1–LepR1) following established protocols (Ivanova et al. 2006). We include the BOLD Barcode Index Number (BIN) (Ratnasingham and Hebert 2013) with the ACG species description, as well as the individual inventory voucher codes (nn-SRNP-nnnnn) for the specimens.

RESULTS

There were very few specimens for study, even among the reared species. Initially, MAM embarked on measurements of the hindlegs but determined there was no appreciable difference in lengths among species with specimens that still had hind legs. In the USNM there is one specimen of *S. acrobatica* with labels indicating it was part of the Meyrick collection and compared by J. F. G. Clarke to the type and three specimens of *S. semiotarsa*, one of which has identical collecting labels as the holotype. In addition, images from Clarke (1963) of the holotype of *S. semiotarsa* compare well with the male specimen at USNM (Fig. 11). MAM also “browsed” putatively closely-related Neotropical species from other genera but could not find any taxa with similar wing or phallus morphology.

Struthoscelis Meyrick, 1913: 177

Type species: *Struthoscelis acrobatica* Meyrick, 1913: 177, by monotypy, type locality Peru, Chanchamayo.

Diagnosis.—Species of *Struthoscelis* are mostly white-scaled with an indistinct forewing pattern; have disproportionately long hindlegs compared to other gelechioids; and the tibiae and basal tarsomeres have erect, long, lanceolate

scales directed dorsally forming a bushy mass (Fig. 1). Meyrick (1913) originally reported that the type species had ocelli, but this seems to be inaccurate as none of the specimens we examined had ocelli. The head is smoothly rounded, not protruding anteriorly, and the scales on the frons are depressed in the middle. The scape is flattened and lacks a pecten; the male flagellomeres have dense, semi-erect golden setae ventrally; and the antennal flagellomeres are filiform. The labial palpus is rough-scaled on the first two segments with the ventral and apical scales on the second segment as long as the segment is wide. The third segment is smooth-scaled. The second segment is straight, directed anteriorly at rest, the third segment is slightly curved and directed posteriorly. The second and third segments are subequal in length. Meyrick (1913) noted the wing morphology, stating there was a “peculiar distortion of the veins in the forewing.” We expand on that morphology here. The wings are narrow, with 10 longitudinal veins (Fig. 2). Our interpretation is that R_1 and R_2 and M_1 and M_2 are fused throughout. The discal cell is compressed so that what is normally the apical end faces anterolaterally rather than laterally (Figs. 2, 3). A second cell is formed by the base of M_1 crossing to the base of R_5 (Figs. 2, 3). The veins $R_3+R_4+R_5$, R_4+R_5 , and Cu_1+Cu_2 are stalked. The males of each species have a dorsally concave, membranous sac at the base of the cubitus extending almost to the junction of R_1+R_2 with the discal cell (Fig. 2). Clarke (1963: 451, fig. 1a) included this structure in an illustration, but did not discuss it. This is the first mention of a structure of this kind among oecophorines to the best of our knowledge. Structures of this kind that are particular to only one sex are typically associated with courtship and/or mate attraction.

This may be the case, but we reserve comment until further data are available. The legs are covered with appressed, ovoid scales. The phallus of three of the new species is distinct in having ventrolateral extensions, similar in appearance to pectoral fins of a shark or dolphin with species-specific rough or denticulate texture at the apex.

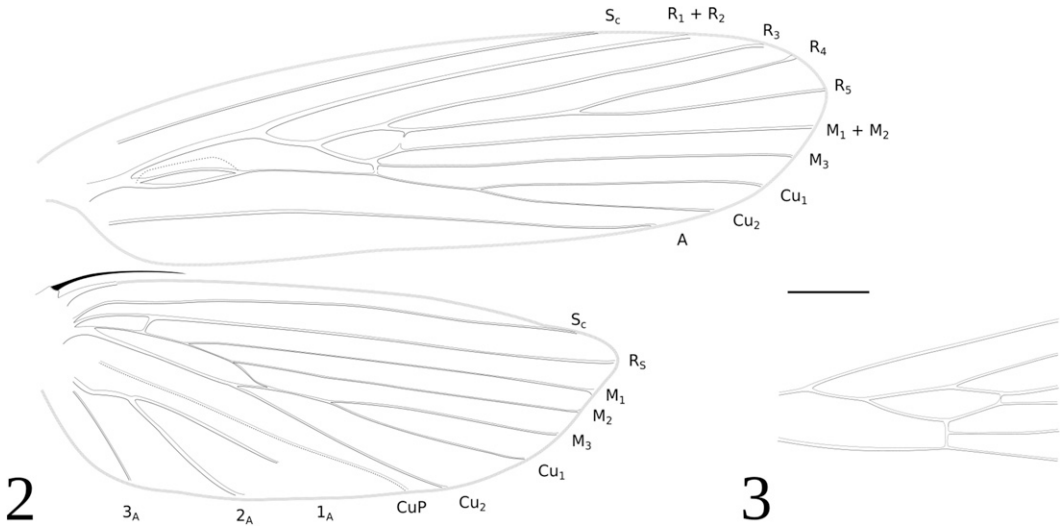
***Struthoscelis christianafigueresae* Metz,
new species**

urn:lsid:zoobank.org:act:F2DC8A9E-
ACCC-482F-9166-90FF7C83B151
(Figs. 4, 5, 8, 9, 12, 14–17)

Diagnosis.—*Struthoscelis christianafigueresae* can be distinguished from congeners by a long narrow valva bearing a saccular process with a blunt apex and blunt subapical tooth, a broadly rounded and finely dentate ventrolateral processes on the phallus (Fig. 8, 9), a small and ovoid corpus bursae, a very long ductus bursae, and a conical signum (Fig. 12).

Etymology.—*Struthoscelis christianafigueresae* is dedicated to Ms. Christiana Figueres in recognition of her decades of care of the ACG biosocio-economic environment, as well as that for Costa Rica, and now for the world as inspiration and leader of the United Nations (UN) climate effort by being the energetic and highly successful Executive Director of the UN Framework Convention on Climate Change (UNFCCC) of the Paris accords for the World.

Description.—*Head*: Scales on head creamy-white throughout, some scales with light brown tips, scales narrow, near eye margin erect and curving medially, occipital scales erect. Compound eye height 1.4X width, and low on head, gena not visible in lateral view. Antennal flagellomeres cuticle yellow, scales creamy-white, some with light brown tips, male flagellomeres with dense, semierect



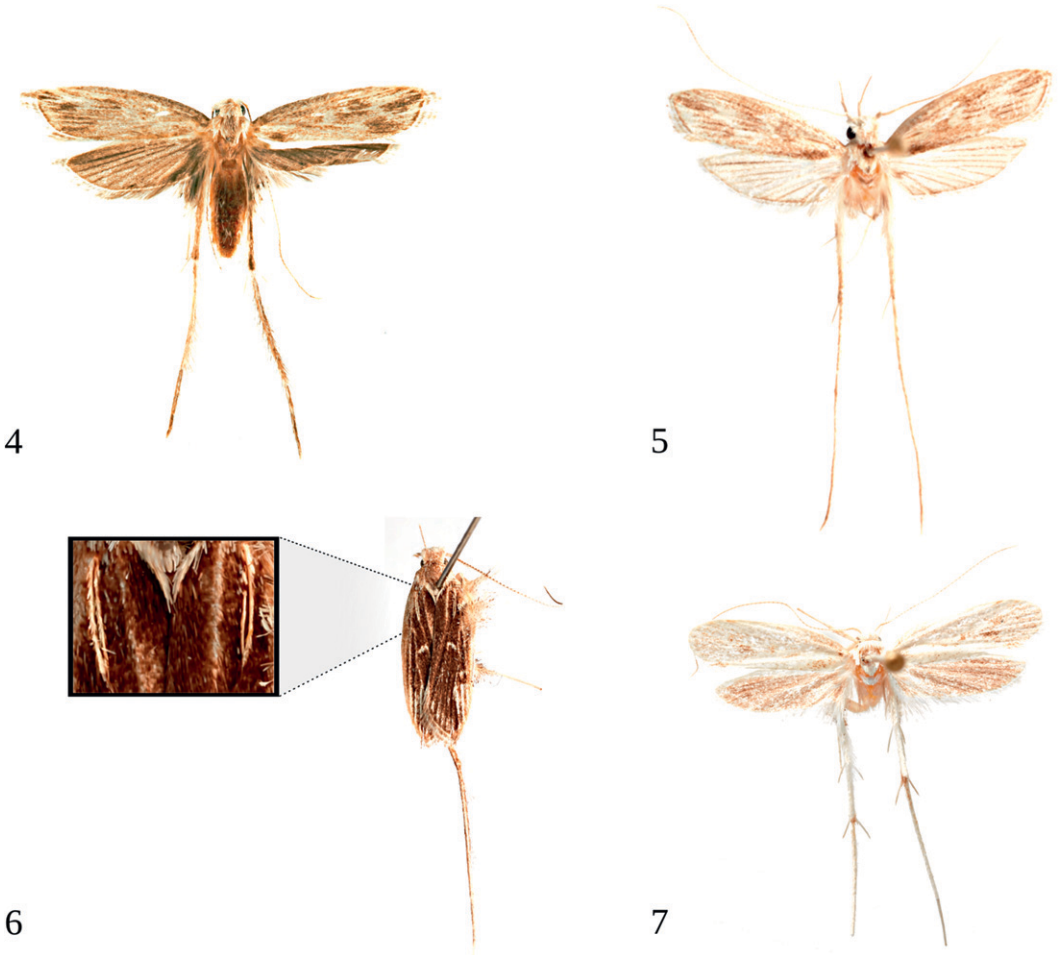
Figs. 2–3. Wing venation. 2, Wings of male *Struthoscelis semiotarsa* Meyrick, 1916 (USNMENT01318443, USNM slide # 69,430), dotted line indicates dorsally concave, membranous sac. 2, Distal half of discal cell and second cell of *Struthoscelis solamarita*, **new species**, holotype female (USNMENT01282087). Scale bar = 1.0 mm.

golden setae ventrally with a length 4–5X width of flagellomeres basally, length and density of ventral setae decreasing through terminal flagellomeres. Labial palpus scales creamy-white mixed with light brown. Maxillary palpus with white scales, directed ventrally at rest, tapering to apex. Base of haustellum with white, appressed, ovoid scales and erect, long, narrow scales.

Thorax: With creamy-white scales mixed with light brown scales throughout, long, narrow, parallel-sided. Leg scales white. Tibial spurs slightly unequal in length, medial spur 1.3X length of lateral spur on mesotibia, basomedial spur 1.5X basolateral spur on metatibia, distomedial spur 1.3X length of distolateral spur on metatibia. Forewing length 9.0 mm (Figs. 4, 5), dorsal scales creamy-white with scattered reddish-brown scales and concentrated reddish-brown scales along veins, terminal line, and anal area, and three wide, diffuse bands of reddish-brown scales submedially, medially, and postmedially,

ventral scales of male silvery-white with scattered bronze-colored and concentrated bronze-colored scales along veins, ventral scales of female uniformly bronze-colored except in distal half of costal cell and area posteriad of cubitus. Hindwing length 7.5 mm, dorsal scales creamy-white with scattered bronze-colored and concentrated bronze-colored scales along veins in male, entirely covered with bronze-colored scales in female except costal and basal half of subcostal cell creamy-white, ventral scales of male silvery-white with mixed bronze-colored scales along veins and creamy-white scales mixed with light brown scales in basal costal and subcostal cells, ventral scales in female mostly bronze-colored with some silvery-white scales in middle of cells and some creamy-white scales in basal costal and subcostal cells. Fringe with creamy-white scales and light brown tips.

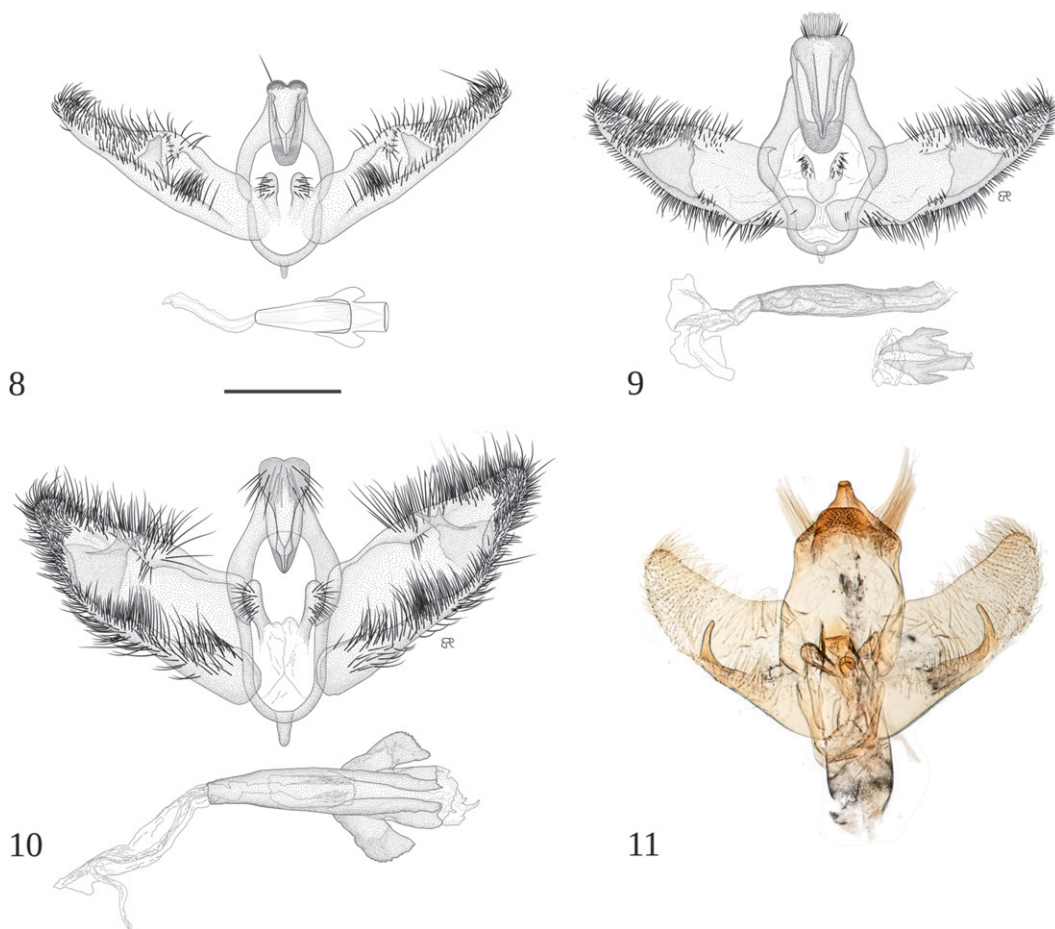
Abdomen: Creamy-white with concentrated patches of reddish-brown scales laterally. Male genitalia (Fig. 8, 9)



Figs. 4–7. Adult dorsal habitus. 4, *Struthoscelis christianafigueresae*, **new species**, holotype female (USNMENT01200866, 10-SRNP-73245). 5, *Struthoscelis davisorum*, **new species**, male (USNMENT01200090). 6, *Struthoscelis konia*, **new species**, holotype male, inset shows outline and openings to dorsally concave, membranous sacs. 7, *Struthoscelis solamarita* **new species**, holotype female (USNMENT01282087). Images not to scale.

with tegumen height 2X length, simple, slightly arced in lateral view, strongly arced in posterior view, uncus length subequal to tegumen height, beak-like, dorsal surface of base divided medially by deep furrow forming two hemispherical halves, with deeply socketed scales, gradually tapered to sharp point, two dorsal carinae continuous with dorsal hemispheres ending subapically, ventrolateral carina continuous to apex, mostly straight in lateral view, slightly

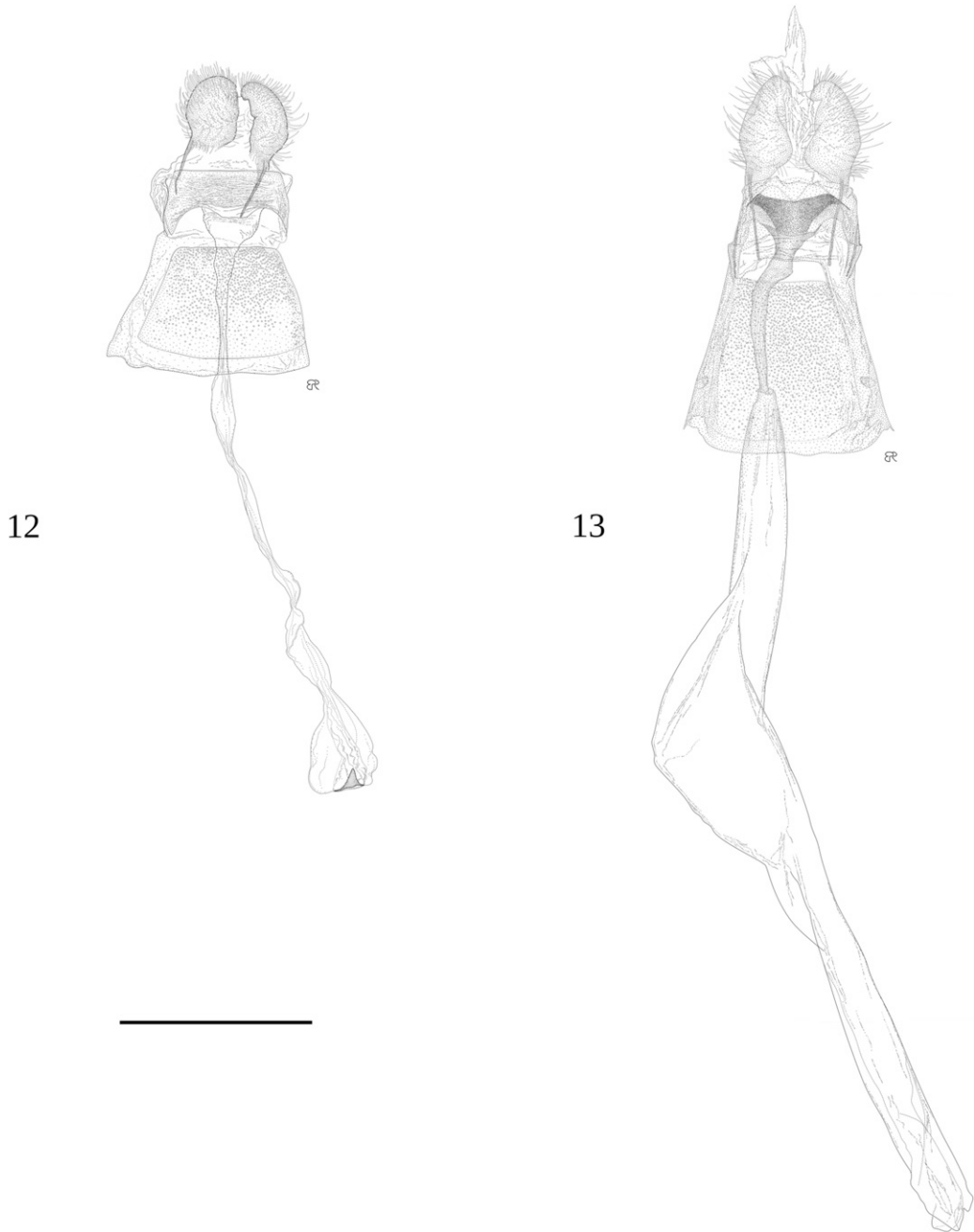
hooked at apex, apex with few short setae, gnathos subequal in length to uncus, equal to width at base, twice as wide throughout most of length, gradually tapered to blunt apex, medially membranous in basal $\frac{3}{4}$, distal $\frac{1}{4}$ hardened with dorsal surface roughly textured, straight in lateral view, vinculum strap-like, very short in lateral view, fused dorsally with valva, with an anteriorly-directed, conical saccus with a length 3X width, valva length 3.25X widest point



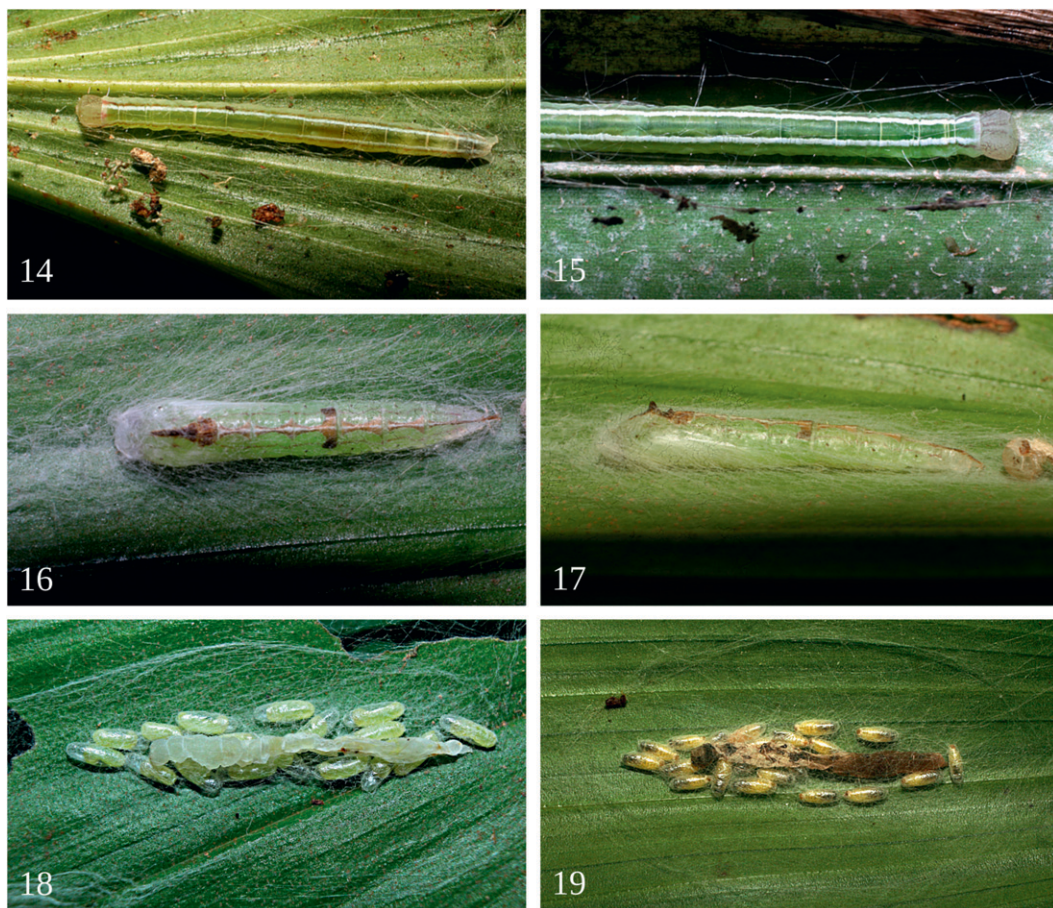
Figs. 8–11. Male genitalia. 8, *Struthoscelis christianafigueresae*, **new species**, male (USNMENT01200861, 10-SRNP-71634, USNM slide # 146,314), sacculus bent dorsally. 9, *Struthoscelis davisorum*, **new species**, male (USNMENT01200090, USNM slide # 146,428), sacculus bent ventrally. 10, *Struthoscelis konia*, **new species**, holotype male. 11, *Struthoscelis semiotarsa* Meyrick, 1916 (USNMENT01318443, USNM slide # 69,430). Scale bar = 0.5 mm.

in lateral view, roughly lanceolate, tip bluntly pointed, costal lobe at 1/3 valva length, triangular, overhanging medio-central area of valva, saccular lobe extremely broad at base, abruptly tapering to blunt point with subapical spur, length of process only slightly less than width of valva, no darkly sclerotized transtilla evident on dorsal diaphragm, disc of juxta not evident, lateral lobes of juxta finger-like, length 1.5X width, bluntly pointed, posterolateral apex with few setae, phallus cylindrical, slightly

tapered anteriorly, with flat, broadly-rounded, ventrolateral fin-like processes with extremely fine teeth along distolateral edge, vesica apparently lacking cornuti. Female genitalia (Fig. 12) with terminal segments lengths and widths subequal, short, papillae anales hemispherical, only slightly longer than wide, area between papillae anales entirely membranous, apophyses anteriores extremely short and with a weakly darkened, small, hook-like processes, apophyses posteriores subequal in length to papillae



Figs. 12–13. Female genitalia. 12, *Struthoscelis christianafigueresae*, **new species** (USNMENT01200862, 10-SRNP-71621, USNM slide # 146,315). 13, *Struthoscelis solamarita*, **new species** (USNMENT01282087, USNM slide # 146,429). Scale bar = 1.0 mm.



Figs. 14–19. Immature stages and parasitoids of *Struthoscelis christianafiguerae*, **new species** in situ. 14, Larva (10-SRNP-70739). 15, Larva (10-SRNP-31696). 16, Pupa (10-SRNP-70738). 17, Pupa (10-SRNP-70738). 18, Immatures of *Apanteles leonelgarayi* Fernández-Triana, 2014 in situ. 18, Early pupae of *Apanteles leonelgarayi* (DHJ726507). 19, Late pupae of *Apanteles leonelgarayi* (DHJ479510).

anales, straight, slightly tapered towards apex, ventromedial surface of segment VIII rough-textured, level posterior to ostium, ostium slightly greater than 1/2 of posterior margin of segment VII, antrum length 1.5X width, bowl-like, membranous, ductus bursae narrow, long, ca. 3.5 times length of segment VII, junction of ductus bursae and corpus bursae distinct, corpus bursae spherical, diameter about 0.2X length of ductus bursae, signum conical, on anterior wall of corpus bursae.

Specimens examined.—Holotype ♀ (USNMENT01200866, 10-SRNP-73245), Costa Rica: Area de Conservación Guanacaste: Guanacaste: Sector Pitilla: Bullas, 440 m, 10.98670, -85.38503, 6 November 2010, coll. R. Calero, ex. *Sobralia mucronata*; ec. 7 December 2010 (deposited at USNM). Paratypes: 1 ♀ (USNMENT01200860, 10-SRNP-73243), same data as holotype; 1 ♂ (USNMENT01200865, 10-SRNP-73246, abdomen missing), same data as holotype, ec. 28 November 2010; 1 ♀

(USNMENT01200862, 10-SRNP-71621, USNM slide # 146,315), same locality as holotype, 25 May 2010, ec. 12 June 2010; 1 ♂ (USNMENT01200861, 10-SRNP-71634, USNM slide # 146,314), same data as holotype, ec. 1 June 2010; 1 ♂ (USNMENT01200863, 10-SRNP-72650, USNM slide # 146,426), same locality as holotype, 18 August 2010, as wild pupa, coll. M. Rios, ec. 22 August 2010. 1 ♀ (USNMENT01200859, 10-SRNP-70739), Quebradona, 475 m, 10.99102, -85.39539, 9 February 2010, coll. R. Calero, ex. *Sobralia mucronata*, ec. 17 March 2010; 1 ♂ (USNMENT01200864, 10-SRNP-71712), same data, 1 June 2010, ec. 30 June 2010. 1 ♀ (USNMENT01200858, USNM slide # 146,427), Panama, San Blas Nusagandi, 350 m, 9°20'N, 78°56'W, 1–6 March 1985, Flint & Louton.

The following specimens are in the same BIN in BOLD, so we consider them conspecific and paratypes. These specimens are not currently deposited in the USNM, so we did not examine them, but each has been DNA-barcoded.

Costa Rica: (09-SRNP-107252) Area de Conservación Guanacaste: Sector Rincon Rain Forest: Potrero Chaves, 433 m, 10.93868, -85.32167, 19 August 2009, colls. F. Quesada & H. Cambronero, ex. light trap; (13-SRNP-71627) Sector Pitilla: Quebradona, 475 m, 10.99102, -85.39539, 24 September 2013, coll. D. Martinez, ex. *Sobralia mucronata*, ec. 11 October 2013; (10-SRNP-70738) same data, 9 February 2010, ec. 8 March 2010. (10-SRNP-31696) Sector Pitilla: Sendero Naciente, 700 m, 10.98705, -85.42816, 19 July 2010, coll. M. Rios, ex. *Sobralia* 16842, ec. 9 August 2010; (15-SRNP-80055) Sector Rincon Rain Forest: Chayito, 470 m, 10.94585, -85.32044, 11 January 2015, leg. A. Chavarria, ex. *Sobralia* 20855, ec. 3 February 2015; (13-SRNP-44556) Sector Rincon Rain Forest: Sendero Venado,

420 m, 10.89678, -85.27001, 14 November 2013, coll. J. Perez, ex. *Sobralia chrysostoma*, ec. 4 December 2013; (12-SRNP-970) Sector San Cristobal: Rio Blanco Abajo, 500 m, 10.90037, -85.37254, 12 March 2012, leg. E. Araya, ex. *Sobralia chrysostoma*, ec. 3 April 2012.

Distribution.—This species is known from Costa Rica and a single specimen from Panama.

Biology.—The caterpillar (Figs. 14, 15) is a leaf scraper and tier of mature leaves of the terrestrial orchids *Sobralia mucronata*, *Sobralia chrysostoma*, and *Sobralia* sp., growing in broken shade of edges of mid-elevation rain forest. There are continuous overlapping generations throughout the year. To date, this is the only species of distinctively orchid leaf-eating microlepidopteran that has been encountered by the biodiversity inventory of ACG. A generalist species of Depressariidae has been recorded once to feed on *Sobralia* leaves. There is no indication that the extraordinarily long legs of the adult are related to the biology of the caterpillar. This species is parasitized by the microgastrine braconid wasp *Apanteles leonelgarayi* Fernández-Triana, 2014 (DHJPAR0040434, DHJPAR0041648, DHJPAR0041673, DHJPAR0042519, DHJPAR0042532, DHJPAR0042944, DHJPAR0056525). The authors of the wasp species recorded the host as “Elachistidae, elachJanzen01 Janzen835” (Fernández-Triana et al. 2014) at a time when it was not yet realized that this caterpillar was a species in Oecophoridae.

Molecular data.—DNA sequences from the COI barcode region have received the Barcode Index Number (BIN) of BOLD:AAA3464 DOI dx.doi.org/dx.doi.org/10.5883/BOLD:AAA3464.

Struthoscelis davisorum Metz,
new species

urn:lsid:zoobank.org:act:5D0E31F9-8065-4198-934A-6E354A2E5FF3

(Figs. 5, 9)

Diagnosis.—*Struthoscelis davisorum* can be distinguished from congeners by a broad valva bearing a saccular process with a simple, blunt apex and an acutely tapered and roughly dentate ventrolateral processes on the phallus (Fig. 9).

Etymology.—*Struthoscelis davisorum* is dedicated to Donald R. Davis and Mignon B. Davis, collectors of the single known specimen, in recognition of their dedication to the study of microlepidoptera.

Description.—*Head:* Scales on head creamy-white mixed with light brown, scales on frons narrow, occipital scales erect. Compound eye height 1.2X width, and low on head, gena not visible in lateral view. Antennal flagellomeres cuticle yellow, scales creamy-white annulated with pale brown, male flagellomeres with dense, semierect golden setae ventrally with length 3–4X width of flagellomeres basally, length and density of ventral setae decreasing through terminal flagellomeres. Labial palpus scales creamy-white suffused with pale brown. Maxillary palpus with white scales, directed ventrally at rest, tapering to apex. Base of haustellum with white, appressed, ovoid scales and erect, long, narrow scales, many with light brown apices.

Thorax: With creamy-white scales suffused with pale brown throughout, long, narrow, scales parallel-sided. Leg scales white and pale brown. Tibial spurs slightly unequal, medial spur 1.2X length of lateral spur on mesotibia, basomedial spur 1.6X basolateral spur on metatibia, distomedial spur 1.2X distolateral spur on metatibia. Forewing length 10.0 mm (Fig. 5), dorsal scales creamy-white with

scattered reddish-brown scales and concentrated reddish-brown scales along veins, terminal line, and anal area, and three wide, diffuse bands of reddish-brown scales submedially, medially, and postmedially, ventral scales silvery-white with scattered bronze-colored and concentrated bronze-colored scales in basal 1/3. Hindwing length 8.0 mm, dorsal scales creamy-white with scattered bronze-colored and concentrated bronze-colored scales along veins, ventral scales silvery-white with mixed bronze-colored scales along veins and creamy-white scales mixed with light brown scales in basal costal and subcostal cells. Fringe with creamy-white scales and light brown tips.

Abdomen: Male genitalia (Fig. 9) with tegumen height 1.3X length, simple, slightly arced in lateral view, strongly arced in posterior view, uncus length 1.3X tegumen height, beak-like, dorsal surface of base divided medially by deep furrow forming two hemispherical halves, with deeply socketed scales, gradually tapered to sharp point, two dorsal carinae continuous with dorsal hemispheres ending subapically, a ventrolateral carina continuous to apex, mostly straight in lateral view, slightly hooked at apex, apex with few short setae, gnathos subequal in length to uncus, equal width at base, twice as wide throughout most of length, gradually tapered to semi-sharp apex, medially membranous in basal 3/4, distal 1/4 hardened with dorsal surface roughly textured, straight in lateral view, vinculum straplike, very short in lateral view, fused dorsally with valva, with an anteriorly-directed, pedunculate saccus with a length 3X width, valva length 2.4X widest point in lateral view, roughly lanceolate, tip bluntly pointed, costal lobe at 1/3 valva length, triangular, overhanging mediocentral area

of valva, saccular lobe extremely broad at base, quickly tapering to a blunt apex, length of process subequal to width of valve, no darkly sclerotized transtilla evident on dorsal diaphragm, disc of juxta darkened, lateral lobes of juxta finger-like, length 1.5X width, bluntly pointed, posterolateral apex with few setae, phallus cylindrical, slightly tapered anteriorly, with flat, digitate, ventrolateral fin-like processes with coarse teeth along distal edge, vesica apparently lacking cornuti. Female unknown.

Specimens examined.—Holotype ♂ (USNMENT01200090, USNM slide # 146,428), Costa Rica: Heredia: Est. Biol. La Selva (OET), Puerto Viejo de Sarapiquí, 10°26'N, 84°01'W, 50–150 m, 20 June 2003, colls. D. & M. Davis, STR, 350 m from entrance (USNM).

Biology.—Unknown.

***Struthoscelis konia* Metz, new species**

urn:lsid:zoobank.org:act:2E492CAA-30D1-4C87-83B8-480706089997
(Figs. 6, 10)

Diagnosis.—*Struthoscelis konia* can be distinguished from congeners by its darker forewing scaling, a wider valva bearing a saccular process with a sharply bidentate apex, and a digitate and coarsely dentate ventrolateral processes on the phallus (Fig. 10).

Etymology.—The specific epithet is from the Greek “konia” (feminine) = dust; “the dusty one,” referring to the darker scales making this species darker than the other known species.

Description.—*Head*: Scales on head creamy-white mixed with light brown, scales on frons narrow, near eye margin erect and curving medially, occipital scales erect. Compound eye height 1.5X width, and low on head, gena not visible in lateral view. Antennal flagellomeres

cuticle yellow, scales creamy-white annulated with pale brown, male flagellomeres with dense, semierect golden setae ventrally with length 3–5X width of flagellomeres basally, length and density of ventral setae decreasing through terminal flagellomeres. Labial palpus scales creamy-white suffused with pale brown. Maxillary palpus with white scales and few light brown scales, directed ventrally at rest, tapering to apex. Base of haustellum with white, appressed, ovoid scales and erect, long, narrow scales, many with light brown apices.

Thorax: With creamy-white scales suffused with pale brown throughout, long, narrow, scales parallel-sided. Leg scales white and pale brown. Tibial spurs slightly unequal, medial spur 1.3X length of lateral spur on mesotibia, basomedial spur 1.5X basolateral spur on metatibia, distal metatibial spurs broken off. Forewing length 10.5 mm (Fig. 6), dorsal scales mostly pale brown, creamy-white surrounding opening to sac at base of cubitus, forming spot at distal end of discal cell, forming a broken band across apex of R₃ and bases of R₄ and R₅, forming a broken band across apices of median and cubital veins, and at base of anal vein, visible ventral scales uniformly bronze-colored. Hindwing 9.0 mm, visible dorsal and ventral scales uniformly bronze-colored. Fringe with alternating bands of pale brown and creamy-white scales.

Abdomen: Male genitalia (Fig. 10) with tegumen height 1.3X length, simple, slightly arced in lateral view, strongly arced in posterior view, uncus length 1.3X tegumen height, beak-like, dorsal surface of base divided medially by deep furrow forming two hemispherical halves, with deeply socketed scales, gradually tapered to sharp point, two dorsal carinae contiguous with dorsal hemispheres ending subapically, a ventrolateral carina continuous to apex, mostly straight in lateral view, slightly

hooked at apex, apex with few short setae, gnathos subequal in length to uncus, equal width at base, twice as wide throughout most of length, gradually tapered to semi-sharp apex, medially membranous in basal $\frac{3}{4}$, distal $\frac{1}{4}$ hardened with dorsal surface roughly textured, straight in lateral view, vinculum straplike, very short in lateral view, fused dorsally with valva, with an anteriorly-directed, pedunculate saccus with a length 3X width, valva length 2.4X widest point in lateral view, roughly lanceolate, tip bluntly pointed, costal lobe at $\frac{1}{3}$ valva length, triangular, overhanging mediocentral area of valva, saccular lobe extremely broad at base, quickly tapering to a sharply bidentate apex, length of process subequal to width of valve with points projecting above costa, no darkly sclerotized transtilla evident on dorsal diaphragm, disc of juxta not evident, lateral lobes of juxta fingerlike, length 1.5X width, bluntly pointed, posterolateral apex with few setae, phallus cylindrical, slightly tapered anteriorly, with flat, digitate, ventrolateral fin like processes with coarse teeth along distal edge, vesica apparently lacking cornuti. Female unknown.

Specimens examined.—Holotype ♂, Peru: Pasco Dept.: San Juan de Cacazu, 31 km NE Villa Rica, 10°35'S, 75°07'W, 830 m, 9 September 1987, 19:00–21:00 hr, black light, colls. N. Jacobson, W. Lozada (CUIC).

Biology.—Unknown.

***Struthoscelis solamarita* Metz,
new species**

urn:lsid:zoobank.org:act:7C72BDA6-044C-4E62-A5AF-5C88A433DFB3
(Figs. 3, 7, 13)

Diagnosis.—*Struthoscelis solamarita* can be distinguished from congeners by having a longer second medial wing cell

(Fig. 3); a long, cylindrical corpus bursae; and the absence of a signum (Fig. 13).

Etymology.—The specific epithet is from the Latin “sol” (masculine) = sun + the Latin “marita” (feminine) = wife. “The sun wife,” referring to the nickname MAM uses for his wife, “sunshine.”

Description.—*Head*: Scales on head creamy-white throughout, very few scales with light brown tips, scales near eye margin narrow, medially curving, mostly lacking in single specimen, occipital scales erect. Compound eye height 1.2X width, and low on head, gena not visible in lateral view. Scales of antenna creamy-white, some with light brown tips. Labial palpus scales creamy-white with some pale brown on lateral surface of second segment. Maxillary palpus with white scales, directed ventrally at rest, not tapering to apex. Base of haustellum with white, appressed, ovoid scales.

Thorax: With creamy-white scales throughout and few light brown, long, narrow, scales parallel-sided. Leg scales white. Tibial spurs slightly unequal, medial spur 2X the length of lateral spur on mesotibia, basomedial spur 1.4X basolateral spur on metatibia, distomedial spur 1.2X length of distolateral spur on metatibia. Forewing length 8.7 mm (Fig. 7), dorsal scales creamy-white with scattered reddish-brown, much of pattern lost on specimen, but no evident concentration of darkened scales on veins, ventral scales uniformly bronze-colored except in distal half of costal cell and area posteriad of cubitus. Hindwing length 7.7 mm, dorsal scales entirely bronze-colored except costal and basal half of subcostal cell creamy-white, ventral scales bronze-colored through middle of wing longitudinally and silvery-white mixed with few bronze-colored scales in anterior and posterior

areas, some creamy-white scales in basal portion of costal and subcostal cells. Remnants of fringe with creamy-white scales.

Abdomen: Female genitalia (Fig. 13) with segment VII length 2X basal width, segment VII length and width subequal, papillae anales kidney-shaped, longer than wide, medial margins medially concave, area between papillae anales entirely membranous, apophyses anteriores subequal in length to segment VIII, straight, continuous with invaginated membrane between segments VII and VIII, apophyses posteriores length 2X length of apophyses anteriores, straight, slightly tapered towards apex, ventromedial surface of segment VIII raised in a triangular shape forming lateral channels into ostium and short lamellae lateral to ostium juxtaposed to raised surface off segment VIII, ostium width slightly greater than 1/2 of posterior margin of segment VII, antrum cylindrical, wider basally, slightly darkened, ductus bursae length 0.75X length of segment VII, junction of ductus bursae and corpus bursae distinct, corpus bursae shaped like a sock with a distinct turn at approximately 1/3 length, length 5X length of segment VII, width subequal to segment VII at turn, tapering gradually to anterior end, signum absent. Male unknown.

Specimens examined.—Holotype ♀ (USNMENT01282087, USNM slide # 146,429), Venezuela: Amazonas [T. F. Amaz.]: Cerro de la Neblina [Basecamp], 00°50'N, 66°09'44"W, 140 m, 1–10 March 1984, colls. D. Davis & T. McCabe (deposited at USNM).

Distribution.—This species is known from a single female collected in southern Venezuela.

Biology.—Unknown.

Remarks.—The female is unknown for *S. acrobatica* and *S. semiotarsa* from Peru

and French Guiana, respectively. The female of *S. solamarita* was collected from the extreme southern extent of Venezuela in the Amazon Basin. The difference in collecting localities and the difference in wing venation in the single female of *S. solamarita* provide evidence that it is a distinct species.

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