

A new species of *Lacosoma* (Lepidoptera, Mimallonoidea, Mimallonidae) from southern Brazil, and a new combination

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Abstract: A new species in the genus *Lacosoma* Grote, *L. horii* sp. n., is described from a single male specimen collected in Paraná, Brazil. The holotype is deposited in the Collection of Padre Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil. This new species is potentially of conservation concern due to the fragmented nature of its habitat and extreme rarity in natural history collections. In examination of genitalia of numerous *Lacosoma* species for this and ongoing work, *L. subrufescens* (Dognin), **comb. n.** is recognized to belong in *Lacosoma*, and is hereby transferred from *Trogoptera* Herrich-Schäffer.

Key words: Andean mountains, Brazilian Atlantic Forest, diurnal, *Lacosoma subrufescens* **comb. n.**, taxonomy, *Trogoptera*

INTRODUCTION

The genus *Lacosoma* Grote, 1864 currently contains 36 species, with representatives of the genus found from Canada to Argentina (Becker, 1996; Franclemont, 1973; Herbin and Mielke, 2014; Herbin and Monzón, 2015; Herbin, 2016; St Laurent, unpublished). The genus is characterized by displaying scalloped forewings in most species, relatively small size among Mimallonidae, simple triangular valves, narrow, sharply tipped uncus, and complex gnathos/juxtal projections of the male genitalia which are usually bifurcated and covered in setae.

Most Mimallonidae are nocturnal, but one species of *Lacosoma*, *L. chiridota* Grote, 1864 from North America, has diurnally active males (St Laurent and Carvalho, 2017). Most *Lacosoma* are lightly colored, displaying various shades of pale gray, pink, yellow, and tan, but a few species are very dark to nearly black, which is not common among Mimallonidae. The single known diurnal *Lacosoma* species has a dark brown male, which has been speculated to be related to its diurnal behavior considering the lighter tan coloration of the nocturnal female and other nocturnal *Lacosoma* species. We describe a new species of *Lacosoma* from southern Brazil, and consider the possibility that its rarity in collections may be a result of it being a partially diurnal species, because, like *L. chiridota*, this species is among the most darkly colored *Lacosoma* species, and the new species has so far been collected at light on only one occasion. Despite being diurnal, males of *L. chiridota* do come to lights during night collecting, however infrequently (St Laurent and Carvalho, 2017).

The last author to fully revise *Lacosoma*, Schaus (1928), focused primarily on external morphology, especially wing venation, to assign taxa to the various genera described

in the same work. Several species, in a number of genera, were incorrectly placed by Schaus (e.g., see St Laurent and Dombroskie, 2016; St Laurent and Cock, 2017). In completing the present article, we became aware of the incorrect placement of *L. subrufescens* (Dognin, 1916), **comb. n.** based on both external and genital morphology and transfer this species accordingly to *Lacosoma* from *Trogoptera* Herrich-Schäffer, [1856].

MATERIALS AND METHODS

Dissections were performed as in Lafontaine (2004). The abdomen and genitalia of *Lacosoma horii* sp. n. were examined with standard procedures, first heating with 10% KOH to macerate soft tissues, followed by staining with gentian violet solution. All structures are kept in glycerol filled microvials. Morphological, including genitalia, terminology follows Kristensen (2003). Figures were edited with Adobe Photoshop CS4 (Adobe 2008). The maps were built with SimpleMapper (Shorthouse 2010) and edited with CS4.

The labels of the holotype of *Lacosoma horii* sp. n. are written verbatim, with lines of the labels separated by semicolons, and labels separated by forward slashes. Locality information was georeferenced with Google Earth.

Specimens from the following collections were examined:

CGCM	Coll. Carlos G. C. Mielke, Curitiba, Paraná, Brazil
DZUP	Coll. Pe. Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil
NHRS	Entomological Collections, Swedish Museum of Natural History, Stockholm, Sweden
USNM	National Museum of Natural History [formerly United States National Museum], Washington D.C., USA

RESULTS AND DISCUSSION

Lacosoma horii St Laurent & C. Mielke, new species

Figs 1, 4, 7

Description. Male. *Head*: Dark purplish brown, eyes very large, more than two thirds area of head; frons colored as head but with scattered light brown scales; antenna coloration brown, contrasting against darker coloration of head, antenna bipectinate to tip, though distal quarter of pectinations much reduced in size, scape and pedicel covered with conspicuous scales; labial palpus highly reduced, dorsally colored as head, ventrally and apically light brown, apparently three segmented, palpus not extending beyond frons. *Thorax*: Light purple, scales of various widths, some hair-like, many petiolate. *Legs*: Femur coloration as thorax, tibia and tarsus light brown with salmon shades, becoming lighter brown distally from tibial/tarsal junction. Tibial spurs short, clothed in light brown scales. *Forewing dorsum*: Forewing length: 13 mm; wingspan: 24 mm. Triangular, apically pronounced, mesal margin convex, entire margin from apex to tornus unevenly scalloped, tornus truncate. Ground color purplish brown, with purple-gray scales more prevalent antemedially and along anal margin. Pale gray scaling present along apex. Antemedial line weakly defined as border separating purplish gray antemedial area from purplish brown distal remainder of wing. Postmedial line uneven but roughly straight from anal area of wing to costa. Discal spot a purplish gray oval, concolorous with antemedial area. Fringe orange brown, strongly contrasted against darker coloration of wing. *Forewing ventrum*: Similar to dorsum but costal area browner, purple gray scaling less pronounced antemedially. *Hindwing dorsum*: Vaguely triangular, coloration and patterning as for forewing dorsum, but lighter purplish gray scaling more widespread, not restricted to antemedial area, discal spot absent; antemedial line absent, postmedial line slightly curved outward, submarginal area broader than on forewing dorsum. *Hindwing ventrum*: Nearly identical to hindwing dorsum but postmedial line more uneven with more pronounced outward bend mesally. *Abdomen*: Dorsal coloration and scaling as for thorax but scales appressed, ventrally dark gray. Valvae with distinct scale tufts. *Genitalia*: (Fig. 4) n=1. Tegumen dorsally rectangular with pair of triangular processes extending outward from either side of latero-posterior edge; gnathos apparently as narrow bar antero-ventrally projected tapering to narrow bar fused to juxta; anterior projection extends ventrally from internal wall of either side of tegumen, forming arc from which emerge two pairs of fingerlike projections on posterior edge. Uncus acutely triangular with sharp, beak-like apex. Valva subtriangular with scattered setae; sclerotized arm extends from inner margin of valva, enlarged at the anterior-most region, which is articulated with base of the fingerlike processes of gnathos. Juxta fused to phallus and gnathos complex, component of juxta dorsal to phallus forming inverted “L,” dorsally projected perpendicular to phallus; dorsal component of juxta apically broadened, covered in setae. Phallus otherwise simple, cylindrical. Vesica bag-like, shorter than overall length of phallus. Bulbus ejaculatorius equal in length to sclerotized shaft. **Female.** Unknown.

Type: **Holotype**, ♂. BRAZIL – PR; Ponta Grossa, St. Pk. Vila Velha; 25°13'37.88"S, 50°2'15.43"W; 860 m, 17.II.2017; C. Mielke & E. Joerke leg./32.720 Col. C. Mielke/ HOLOTYPE male *Lacosoma horii* St Laurent & C. Mielke, 2018 [red label]/ (Deposited in the DZUP, Figs 1, 4). **No paratypes.**

Etymology: The new *Lacosoma* species is named after Professor Michio Hori, of Kyoto University, Japan, an enthusiastic entomologist.

Diagnosis: *Lacosoma horii* cannot be confused with any other known species of Mimallonidae. The purplish gray coloration is unique among *Lacosoma*, and this coloration combined with the presence of scalloped wing margins typical of most species of *Lacosoma*, allow for easy identification of this new species. Other darkly colored (dark brown to black, not purplish gray) *Lacosoma*, besides displaying different coloration, have wavier forewing postmedial lines (*L. chiridota*, found in North America) or contrasting tan forewing apices (*L. briasia* Schaus, 1928 and *L. syrinx* (Druce, 1898) found in Central America and the Amazon).

Distribution (Fig. 7): This species is known only from the holotype, collected in an Araucaria forest fragment in the Brazilian Atlantic Forest Biome in Paraná, Brazil. The type locality is shown in Fig. 9.

Remarks: Although the unique specimen of *L. horii* was collected at a light around 21 h, it is possible that this species may be partially diurnal or crepuscular as is the case with *L. chiridota*, a darkly colored species for which the males are similarly rarely collected at light.

Lacosoma horii belongs to a species-group, which is so far not officially named, that contains a diverse, rather externally homogenous section of the genus. Moths in this group are recognizable by the pale gray and pinkish coloration, broadly preapical crenulate or irregular postmedial lines, and male genitalia bearing distinct blade-like gnathos extensions that are often serrated, short triangular tegumental protuberances, a thickened saccular edge of the valvae with distinct spine-like hairs midway along the valve, which are also occasionally found at the base of the valves. This group contains many similar species including *L. diderica* Schaus, 1928, *L. puniceum* Herbin, 2016, and *L. ostrinum* Herbin, 2016. We are also aware of a species from Southeastern Brazil that is nearly identical to the pre-Andean *L. diderica* (Figs 2, 5), but which differs slightly in genitalia characters from the syntype of *L. diderica* from Bolivia (USNM, genitalia prep. 86061, C.H. #5, examined). The primary differences between the type of *L. diderica* and *L. cf diderica* from Brazil are the accentuated portion of the saccular edge of the valves where the spines protrude (which are longer in the type), and the length of the tegumental toothed extensions (which are shorter in the type).

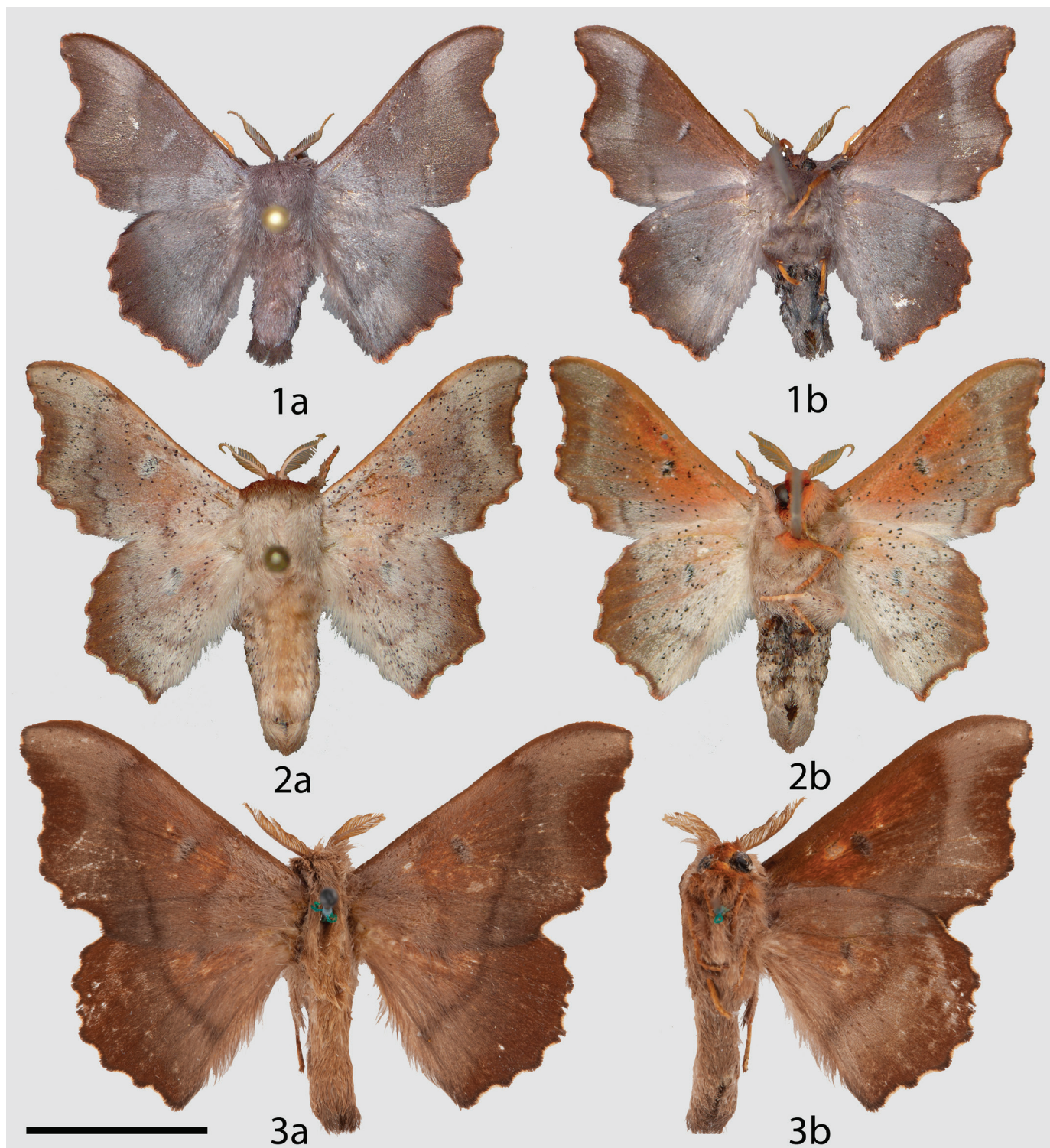
Lacosoma horii displays genitalia characteristics that are similar to these aforementioned species, especially by the narrowed gnathos extensions, but which are smooth in *L. horii* and usually toothed in other *Lacosoma* in this group. We compared the genitalia of *L. horii* to the Brazilian representative of this species group near *L. diderica* (Figs 2, 5) in order to confirm that the dark coloration of *L. horii* was not due to it being a melanic individual of an otherwise common species. The genitalia traits, namely the gnathos structure, and the dark coloration however, were found to be unique to this new species.

Lacosoma subrufescens (Dognin, 1916), new combination
Figs 3, 6, 8

Cicinnus subrufescens Dognin, 1916: 32
Trogoptera subrufescens; Schaus, 1928: 654, fig. 88b
Trogoptera subrufescens; Gaede, 1931: 11
Trogoptera subrufescens; Becker, 1996: 18

Type material. **Holotype**, ♂. COLOMBIA: Tolima: Monte Tolima [Nevado del Tolima?, 4.638140°, -75.338934°], 3200 m, Fassl [leg.] (USNM, examined). **Additional material examined.** 1 ♂, Same locality and collector as holotype, “238”, NHRS-TOBI 000001956 [dissected] (NHRS, Figs 3, 6).

Diagnosis. *Lacosoma subrufescens* can be recognized by the deep chestnut brown coloration; stout, broadened wings; and strong postmedial line on all wings, characters that allow this species to be distinguished from other *Lacosoma*, which

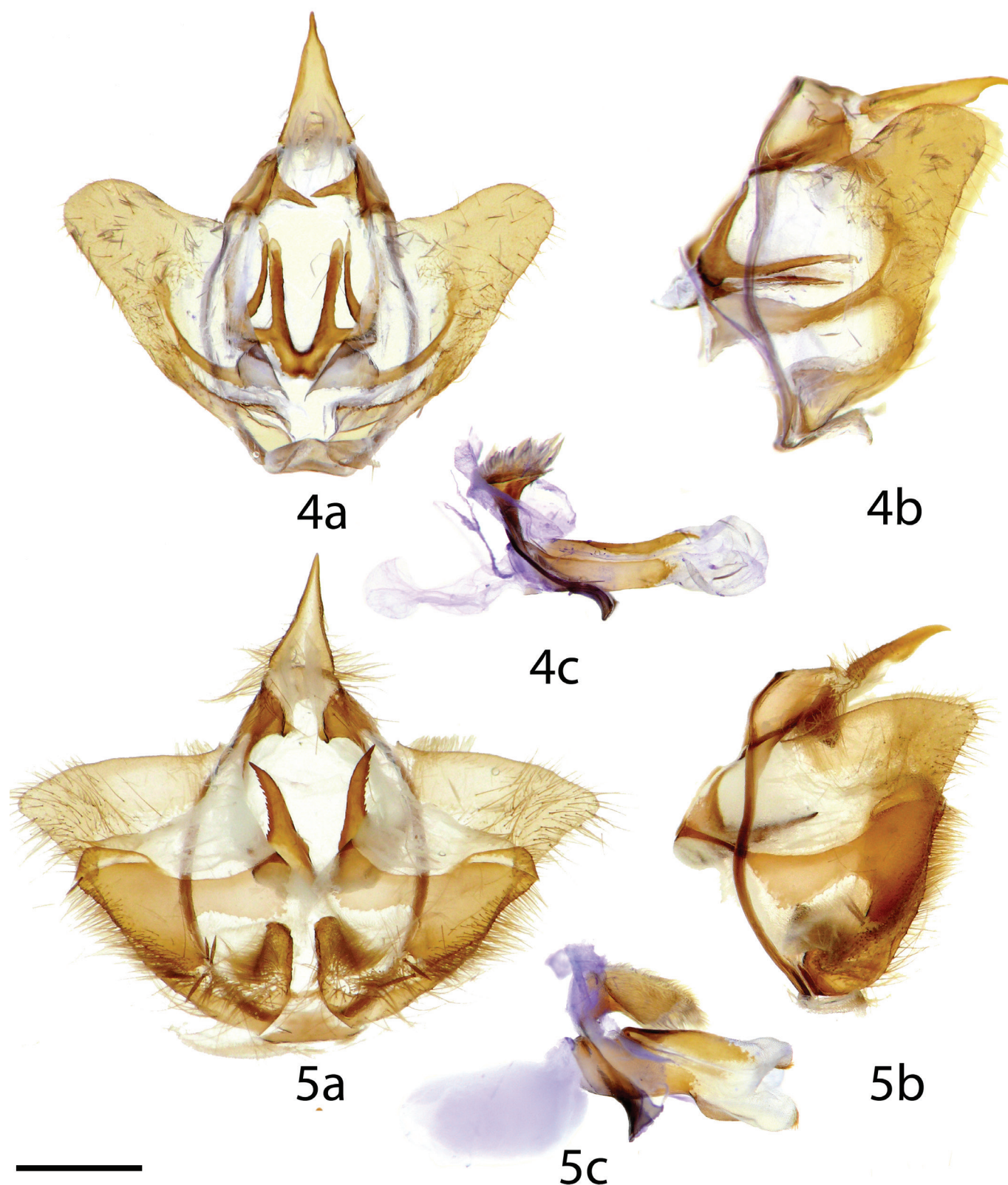


Figs 1–3. Adult male *Lacosoma*, a= dorsal, b= ventral. 1. *L. horii* holotype, Brazil, Paraná, Ponta Grossa, St. Pk. Vila Velha, 860 m (DZUP). 2. *L. cf. diderica*, Brazil, São Paulo, Guapiara, Paivinha, 800 m (CGCM). 3. *L. subrufescens* topotype, Colombia, Tolima, Monte Tolima, 3200 m (NHRS). Scale bar: 1 cm.

generally have narrower wings, and display coloration in gray (sometimes very dark as in *L. horii* above) and salmon shades. The male genitalia is typical of *Lacosoma*, but display a uniquely shaped gnathos component. *Lacosoma* display various shapes and sizes of this sclerotized region central to the genitalia, which can form complexes with the juxta. However, in *L. subrufescens*, this region lacks any elongated or sharp

toothed projections as commonly observed in this genus (see Herbin 2016). Rather, in *L. subrufescens* this structure forms reduced extensions no greater in length than the tegumental projections.

Distribution. Verified records of this species are so far restricted to the type locality in Tolima, Colombia.



Figs 4, 5. *Lacosoma* male genitalia, a= ventral, b= lateral, c= phallus lateral. **4.** *L. horii* holotype, Brazil, Paraná, Ponta Grossa, St. Pk. Vila Velha, 860 m [C. Mielke dissection 32.720] (DZUP). **5.** *L. cf. diderica* Brazil, São Paulo, Guapiara, Paivinha, 800 m [C. Mielke dissection 28.521] (CGCM).

Remarks. *Lacosoma subrufescens* is a rarely collected, high elevation Andean species of *Lacosoma*. This species was described from a single male specimen by Dognin (1916), the holotype, though we are aware of a second specimen from the

same locality and collector in the NHRS (Fig. 3). Examination of this specimen, including its genitalia, confirmed our suspicion that this taxon was in fact a *Lacosoma* species and not *Trogoptera* as it was placed by Schaus (1928). *Trogoptera* display squared

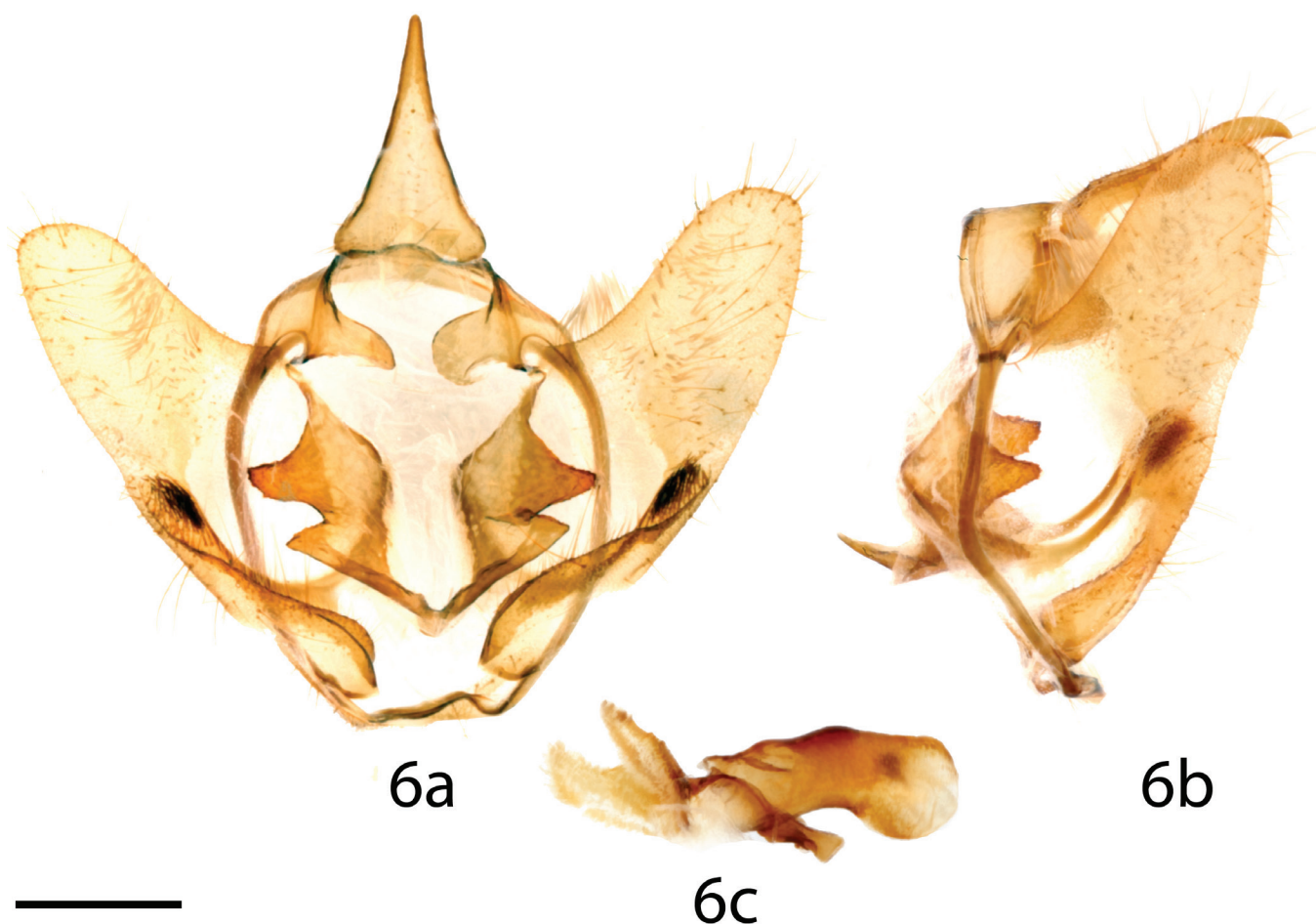


Fig. 6. *Lacosoma subrufescens* topotype, Colombia, Tolima, Monte Tolima, 3200 m [NHRS-TOBI 000001956 dissection] (NHRS). Scale bar: 1 mm.

wing margins and a distinct notch at the forewing tornus and hindwing anterior margin. Their genitalia are also distinct, such that they display a fused, heavily sclerotized gnathos (unfused in *Lacosoma*), and asymmetric setae filled lobes within the diaphragm that extend into the body cavity. The phallus in *Trogoptera* is elongated and simple, without the complex juxtal associations as seen in all examined *Lacosoma* species. Schaus (1928) offered no justification for the placement of *L. subrufescens* in *Trogoptera*, and upon detailed examination of the external and genital morphology, we conclude that this placement was erroneous.

ACKNOWLEDGMENTS

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Figs 7, 8. Type localities for examined *Lacosoma*. 7. *L. horii*. 8. *L. subrufescens*.



Fig. 9. The type locality of *Lacosoma horii* n. sp. in Brazil, PR, Ponta Grossa, St. Pk. Vila Velha, 860 m.

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