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Two new Oriental species of *Eumorphus* Weber (Coleoptera, Endomychidae)

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Abstract

Two new species of *Eumorphus* from Asia, *E. falcifasciatus* **sp. n.** and *E. qiujianyuei* **sp. n.** are described and illustrated.

Keywords

Coccinelloidea, Coleoptera, Lycoperdininae, new species, Oriental Region, taxonomy

Introduction

The genus *Eumorphus* was established by Weber (1801) with *Eumorphus sumatrae* Weber, 1801 (= *Erotylus quadriguttatus* Illiger, 1800) as the type species. This genus is classified in the largest subfamily of Endomychidae, Lycoperdininae, the monophyly of which was tested and confirmed by the phylogenetic studies of Tomaszewska (2000, 2005). Robertson et al. (2015) presented a large-scale phylogenetic study for the Cucujoidea, using molecular evidence to rebuild the relationship tree of this superfamily and established one new superfamily, Coccinelloidea, with Endomychidae placed within it. This study further confirmed the monophyly of the subfamily Lycoperdininae and established its sister relationship with the subfamily Epipocinae (Robertson et al. 2015).

Tomaszewska (2005) recognized five generic groups among 38 genera of Lycoperdininae known at that time. The 23 genera known then from the Oriental Region have been classified in four of five generic groups (*Lycoperdina*-, *Amphix*-, *Amphisternus*- and

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Eumorphus-groups). Since then two new genera of Lycoperdininae have been described from the Oriental Region: *Stroheckeria* Tomaszewska, 2006 and *Humerus* Chang & Ren, 2013. Both, indicated by the authors as belonging to *Amphisternus*-group (Tomaszewska 2006, Chang and Ren 2013), sister group of *Eumorphus*-group which includs the genus *Eumorphus* Tomaszewska (2005).

The *Eumorphus*-group includes 14 genera, five of which are distributed in the Oriental Region: *Avencymon* Strohecker, 1971, *Encymon* Gerstaecker, 1857, *Eumorphus* Weber, 1801, *Platindalmus* Strohecker, 1979 and Parindalmus Achard, 1922.

Strohecker (1968) listed 73 species (including subspecies) in his synopsis of the genus *Eumorphus*, of which *E. convexus*, *E. cryptus*, *E. elegans*, *E. eurynotus*, *E. leptocerus*, *E. micans*, and *E. parvus* were described as new species, and *E. austerus indianus*, *E. bipunctatus crucifer*, *E. bipunctatus mirus*, and *E. murrayi carinensis* were introduced as new subspecies. In addition, eleven nominal species were reduced to subspecies: *E. assamensis subsinuatus*, *E. bulbosus arrowi*, *E. coloratus vitalisi*, *E. cyanescens thomsoni*, *E. dilatatus turritus*, *E. eburatus guerini*, *E. fryanus festivus*, *E. fryanus quadripustulatus*, *E. quadriguttatus andamanensis*, *E. quadriguttatus convexicollis*, and *E. sybarita consobrinus*. Subsequently two species were removed from *Eumorphus* and transferred to other genera, *E. calcaratus* Arrow, 1920 to *Platindalmus* (Strohecker 1979) and *E. nanus* Arrow, 1920 to *Indalmus* (Strohecker 1971); and one species was been transferred into *Eumorphus*: *Engonius bicoloripedoides* (Mader, 1955) by Strohecker (1968).

In 2007, Ren and Wang described two new species of *Eumorphus*, *E. dentatus* and *E. letilimarginatus* from China. *Eumorphus* is the largest genus of the subfamily Lycoperdininae and prior to the present study, this genus included 76 species (including subspecies) (Shockley et al. 2009).

During the examination of Endomychidae collected in China and Borneo, two new species were recognized and are described here.

Materiasl and methods

Type specimens of the new species described here are deposited in the following institutions or private collections:

MHBU Museum of Heibei University, Baoding, China
CCLX Collection of Lingxiao Chang, Beijing, China

The specimens were examined and described using a Nikon® SMZ800 dissecting microscope. The following measurements were made using a Leica® M205 A dissecting microscope: body length from apical margin of clypeus to apex of elytra; width across both elytra (at widest part); elytral length along suture, including scutellum. The abdomen was boiled in 10% NaOH solution, cleaned, and finally aedeagus was dissected in distilled water. Habitus photos were taken using a Canon® Eos 5D III SLR camera and Canon® MP-E 65mm macro lens. All photographs were modified in Adobe Photoshop® CC 2015.

Taxonomy

Eumorphus Weber, 1801

Eumorphus Weber, 1801: 31.
Type species. *Erotylus quadriguttatus* Illiger, 1800.
Eumorphoides Guérin–Méneville, 1858: 12.
Type species. *Eumorphus tetraspilotus* Hope, 1832.
Enaisimus Guérin–Méneville, 1858: 16.
Type species. *Eumorphus quadrinotatus* Gerstaecker, 1857.
Haplomorphus Guérin–Méneville, 1858: 18.
Type species. *Eumorphus bipunctatus* Perty, 1831.
Heterandrus Guérin–Méneville, 1858: 26.
Type species. *Eumorphus confusus* Guérin–Méneville, 1857.

Diagnosis. The species of *Eumorphus* are most similar to those of *Platindalmus* and *Gerstaeckerus*. However, *Eumorphus* can be distinguished from these other genera by the following combination of characters: 1) lateral margin of pronotum with a tendency to form irregularly broken lines, inconstant and often asymmetrical; 2) mandible is narrowly chisel-shaped at its apex; 3) elytra with basal margin simple; 4) intercoxal process of mesoventrite with lateral margins subparallel; 5) male femora lacking fringes of long hairs on inner edges (after Tomaszewska 2005).

Eumorphus falcifasciatus sp. n.

http://zoobank.org/1F8715EC-E053-4819-829C-54B9A59E769C
Figs 1, 3

Type material. Holotype, male, Borneo, Sabah, Keningau district, Jungle Girl Camp, 1215 m, 2016-IV-26, Chang L.X. leg (CCLX)**.**

Diagnosis. *Eumorphus falcifasciatus* is a very unique species by its colouration, differing from all others in having the anterior elytral maculae falciform and posterior maculae dentate.

Description. Length 16.1 mm. Body pyriform, approximately 1.9 times as long as wide; moderately convex; subopaque. Colour black brown with two yellow maculae on elytra.

Head. Antenna composed of 11 antennomeres, long, rather stout, nearly 1/2 body length, with antennomeres 1 and 3–8 distinctly longer than wide; scape approximately 5.5 times as long as pedicel; pedicel very short, nearly as long as wide; antennomere 3 longer than 4–5 combined; antennomere 4 as long as 5; antennomeres 5 slightly longer than 6; antennomeres 6–8 subequal in length; club composed of three antennomeres, very broad, approximately 4.0 times as wide as antennomere 8, moderately flat and compact.

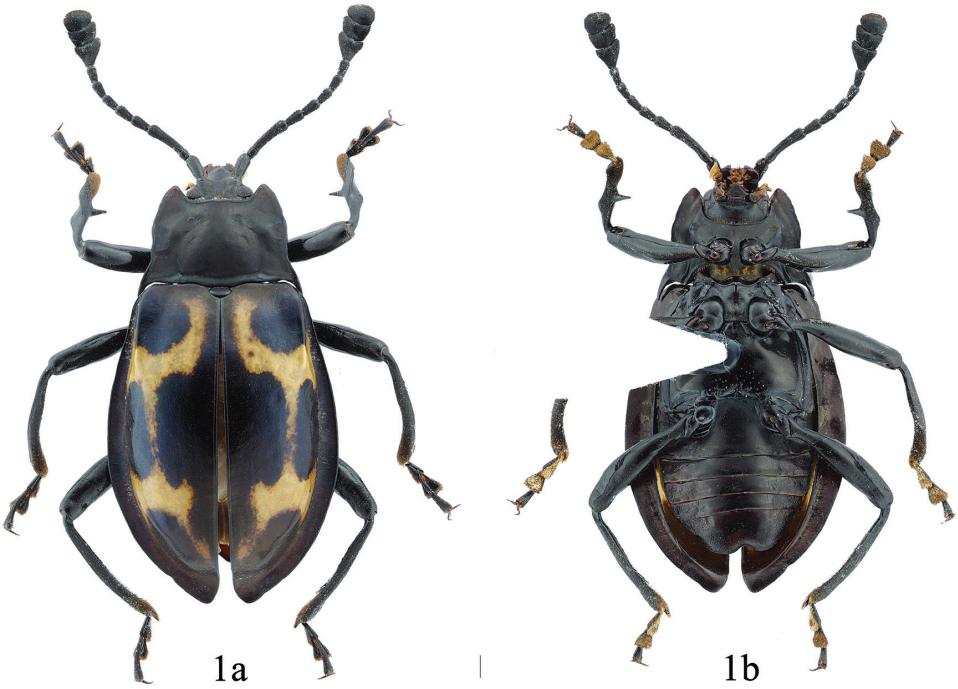

Figure 1. Dorsal and ventral habitus of *E. falcifasciatus* sp. n. male. **a** dorsal view **b** ventral view. Scale bar 1 mm.

Thorax. Pronotum 3.5 mm long, 5.7 mm wide; widest at base; finely, rather densely punctate; lateral and anterior margins narrowly bordered; anterior edge with small stridulatory membrane; sides undulate, abruptly widened basally from 1/4 length; anterior angles produced, rather acute; posterior angles strongly, acutely produced backwards, distinctly curved basally and overlapping most of humeri; disc weakly convex, surface uneven with one large transverse oval raised area posteromedially and two small round raised areas anterolaterally; median furrow absent; lateral sulci shallow, linear, extending to 1/2 pronotal length; basal sulcus weakly sinuate, moderately deep. Prosternal process moderately widely separating the procoxae; gradually widening to apical 1/4, thence abruptly converging towards apex. Mesoventral process nearly quadrate, disc weakly convex, sides subparallel. Elytra 11.8 mm long, 8.3 mm wide; 1.4 times as long as pronotum; 1.5 times as wide as pronotum, sides curved, widest near behind 1/2 length of elytron; lateral flattened margins abruptly widening from basal 1/6 to apex, nearly 1/5 of elytral width; sides distinctly converging from apical 1/3 towards apex; finely, densely punctate; humeri weakly prominent. Each elytron with two large irregular maculae. Anterior elytral macula falciform, occupies about 4/5 of elytral width and 2/3 of elytral length, outer sides touching elytral lateral margin, inner margin of macula placed closely to elytral suture. Posterior macula crown-shaped, located at apical 1/3, its anterior margin

tridentate, posterior margin widely emarginate medially. Protibiae slender basally, abruptly widening from basal 1/4 to apex; outer edge strongly sinuate; dorsal edge with S-shaped longitudinal ridge; inner edge with large, sharp tooth near 1/2 length; mesotibiae weakly curved from about 1/3 length to apex; metatibiae simple throughout its length, acutely produced apically.

Abdomen with five ventrites. Ventrite 1 almost as long as three following ventrites combined; ventrites 2-4 subequal in length. Ventrite 5 with lateral margins strongly converging posteriorly, posterior margin deeply, narrowly emarginate medially. Aedeagus (Fig. 3) long, heavily sclerotized, straight. Median lobe hook-shaped at apex, and branched latero-apically; branch rather long and strongly reflexed upwardly. Tegmen basal, comparatively large, ring-shaped.

Etymology. The name refers to the anterior elytral macula falciform.

***Eumorphus qiujianyuei* sp. n.**
http://zoobank.org/DDECE70A-4C04-4C30-BC67-5758A2CF8899
Figs 2, 4

Type material. Holotype, male, Hainan, Wuzhishan, 21.V.2014, Jian-Yue Qiu leg. (MHBU).

Diagnosis. *Eumorphus qiujianyuei* is similar to *Eumorphus austerus austerus* in appearance, but can be differentiated based on the following combination of characters: posterior angles of pronotum strongly and acutely produced, with tips curved inwardly (in *E. austerus austerus* posterior angles of pronotum weakly produced); sides of pronotum undulate (in *E. austerus austerus* rather smooth); and mesotibiae gently curved distally from near 1/2 length (in *E. austerus austerus* abruptly and strongly curved distally from near 1/2 length).

Description. Length 12.3 mm. Body broadly oval, approximately 1.8 times as long as wide; moderately convex; shiny. Colour brown with four yellow maculae on elytra. Antenna with scape red. Femora at apical 1/2 or 1/3 red.

Head. Antenna composed of 11 antennomeres, long, rather slender, nearly 1/2 body length, with antennomeres 3–8 distinctly longer than wide; scape approximately 4.5 times as long as pedicel; pedicel short, subquadrate; antennomere 3 distinctly longer than 4–5 combined; antennomere 4 slightly longer than 5, antennomeres 5–8 subequal in length; club composed of three antennomeres, moderately broad, flat. Maxilla with terminal palpomere prolonged, nearly 2.0 times as long as palpomere 3, cylindrical, weakly curved distally.

Thorax. Pronotum 2.4 mm long, 4.9 mm wide; widest at base; finely, rather densely punctate; lateral and anterior margins narrowly bordered; anterior edge with small stridulatory membrane; sides undulate, distinctly converging from apical 1/3 to apex, abruptly widened basally from 1/5 length; anterior angles distinctly produced, rather acute; posterior angles strongly, acutely produced, with tips curved inwardly; disc weakly convex; median furrow absent; lateral sulci linear, deep, ex-

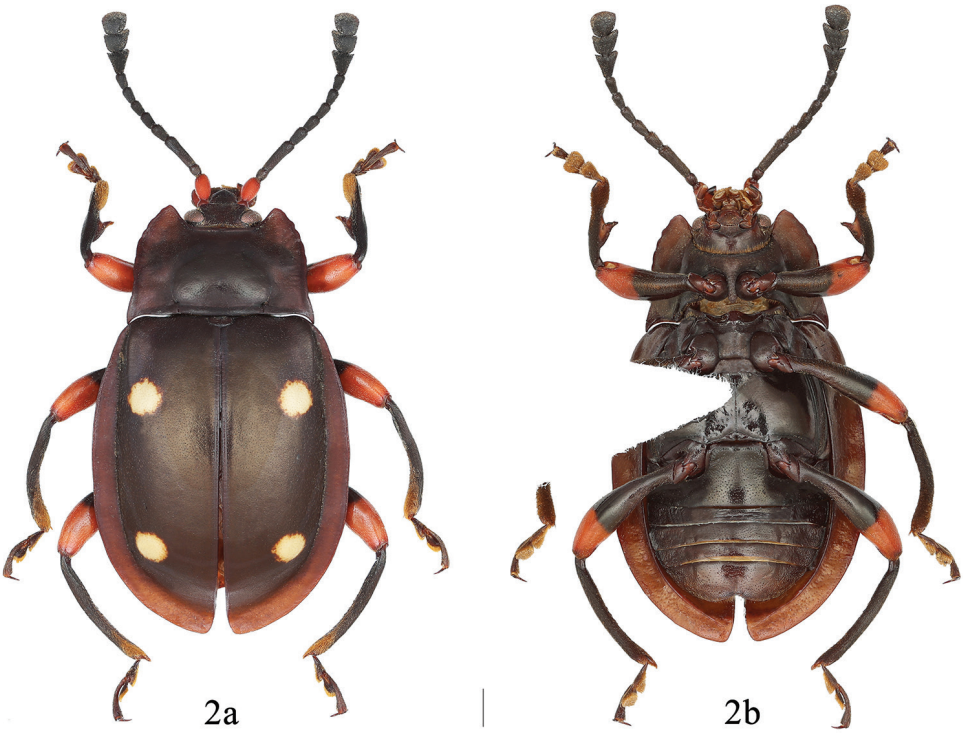

Figure 2. Dorsal and ventral habitus of *E. qiujianyuei* sp. n. male. **a** dorsal view **b** ventral view. Scale bar 1 mm.

tending to basal ¼ length; basal sulcus nearly straight, deep. Prosternal process moderately widely separating procoxae; subparallel, weakly widening before apex then abruptly converging apically. Mesoventral process transverse rectangle, parallel sided, flat; posterior margin nearly straight. Elytra 8.9 mm long, 6.7 mm wide; 1.3 times as long as pronotum; 1.4 times as wide as pronotum, sides curved, widest near 1/2 length of elytron; lateral margins moderately widely flattened, nearly 1/5 of elytral width; distinctly converging from apical 1/3 to apex; finely, densely punctate; humeri weakly prominent. Each elytron with two small round spots. Anterior elytral spot occupies about 1/4 of elytral width, located posterior to humerus. Posterior spot of the same size as anterior one, located at apical 1/4. Protibiae in male with one large, sharp tooth near 1/2 length at inner edge, strongly expanded basally; mesotibiae distinctly curved distally from near 1/2 length; metatibiae simple, acutely produced apically.

Abdomen with five ventrites. Ventrite 5 with lateral margins strongly converging posteriorly, posterior margin deeply, narrowly emarginate medially. Aedeagus (Fig. 4) rather long, heavily sclerotized, weakly curved basally, abruptly widened from basal 1/3 to apex. Median lobe branched apically; the long branch abruptly raised at basal 1/3, strongly reflexed apically. Tegmen basal, comparatively large, ring-shaped.

Figures 3–4. Aedeagi. **3** *E. falcifasciatus* sp. n. **4** *E. qiujianyuei* sp. n. Abbreviations: **a** lateral view **b** apical view. Scale bars 1 mm.

Etymology. This new species is dedicated to Ms. Jian-Yue Qiu, an insect researcher from Chongqing, who has been working on classification of insects for many years, collecting and providing many specimens of Endomychidae used in our studies.

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We are indebted to Dr. W. Tomaszewska (Museum and Institute of Zoology, Warsaw, Poland) and Dr. F.W. Shockley (Smithsonian Institution, Washington, DC, USA) for providing useful comments which improved this manuscript. We thank Mr. Wen-Xuan Bi (Shanghai, China) very much for he discussed the genus *Eumorphus* with us, and make his viewpoint about the some suspected new species if belong to this genus.

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RESEARCH ARTICLE

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A comprehensive guide to the Argentinian case-bearer beetle fauna (Coleoptera, Chrysomelidae, Camptosomata)

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Abstract

Knowledge of Argentinian Camptosomata has largely remained static for the last 60 years since the last publication by Francisco de Asis Monrós in the 1950's. One hundred and ninety Camptosomata species (182 Cryptocephalinae and 8 Lamprosomatinae) in 31 genera are recorded herein from Argentina. Illustrated diagnostic keys to the subfamilies, tribes, subtribes and genera of Argentinian Camptosomata, plus species checklists and illustrations for all genera of camptosomatan beetles cited for each political region of Argentina are provided. General notes on the taxonomy and distribution, as well as basic statistics, are also included. This study provides basic information about the Camptosomata fauna in Argentina that will facilitate in the accurate generic-level identification of this group and aid subsequent taxonomic revisions, and phylogenetic, ecological, and biogeographic studies. This information will also facilitate faunistic comparisons between neighboring countries. Two nomenclatural acts are proposed: *Temnodachrys* (*Temnodachrys*) *argentina* (Guérin, 1952), **comb. n.**, and *Metallactus bivitticollis* (Jacoby, 1907), **comb. n.** The following are new records for Argentina: *Stegnocephala xanthopyga* (Suffrian, 1863) and *Lamprosoma azureum* Germar, 1824. Currently, the most diverse camptosomate tribe in Argentina is Clytrini, with almost twice the number of species of Cryptocephalini. New records for Argentina are predicted.

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Keywords
Argentina, Cryptocephalinae, Distribution, Diversity, Genera, Lamprosomatinae, Provinces, Richness, Taxonomy

Introduction

In Argentina there are 956 recorded species of Chrysomelidae (excluding Bruchinae) in 258 genera (Cabrera and Roig-Juñent 1998a). Only two subfamilies of leaf beetles are not represented in Argentina: Donaciinae Kirby and Synetinae LeConte and Horn. Most subtropical species are distributed in the Amazonian and Chacoan domain (Cabrera and Willink 1973). However, current knowledge of Argentinian Chrysomelidae is incomplete. The present paper is the first one in a planned series on the Argentine chrysomelid fauna.

The chrysomelid subfamilies Cryptocephalinae and Lamprosomatinae are collectively known as "Camptosomata" or "case-bearers," due to the peculiar habit of having their eggs, larvae, and pupae living in a fecal protective case (Brown and Funk 2005; Chaboo et al. 2008; Erber 1988, Jolivet and Hawkeswood 1995). Adults of case-bearing chrysomelids feed on foliage of a variety of eudicots (Erber 1988), but their larvae often show departures from strict phytophagy. The larvae of some Clytrini and Cryptocephalini live in ant nests, where they feed on other items such as ant droppings and pellets, detritus, leaf litter and even dead insects collected by the ants (Agrain et al. 2015, and references therein). The larvae of camptosomates can be easily recognized by the behavior of carrying a portable case and the J-shaped body morphology.

Lamprosomatinae includes four tribes (Chamorro and Konstantinov 2011): Cachiporrini (1 genus), Neochlamysini (2 genera), Sphaerocharini (1 genus), and Lamprosomatini (10 genera) (Seeno and Wilcox 1982), totalling 190 described species (Reid 2016). Reid (2016) and Chamorro (2014a), concur on a world estimate of 250 species. In Argentina, the only genus represented is *Lamprosoma* Kirby. Cryptocephalinae includes ~5300 species, independently calculated by Chamorro, (2014b) and Reid (2016) that are classified into three tribes: Cryptocephalini, Clytrini, and Fulcidacini (until recently treated under the name Chlamisini) as originally proposed by Reid (1995, 2000). Members of the subfamily are distributed worldwide, but many tribes have distinct distributions (Erber 1988). Species are phytophagous in the adult stage, primarily leaf and flower feeders. All three tribes of this subfamily have representative genera in Argentina. The main goal of this contribution is to provide an updated systematic framework for Argentinian Camptosomata, treating all of its genera in order to better measure our current knowledge of these groups. This work includes the compilation of former fragmentary literature on the subject.

Type material of Argentinian Camptosomata

Most of the type specimens of Argentinian Camptosomata are deposited in European institutions: The Natural History Museum, London, United Kingdom (BMNH), Hun-

garian Natural History Museum, Budapest, Hungary (HNHM), Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium (KBIN), Museo Regionale di Scienze Naturali di Torino (MRSN), Museum für Naturkunde der Humbolt Universitat, Berlin, Germany (ZMHB), and National Museum, Prague, Czech Republic (NMPC). There are also type specimens in institutions in the United States: Museum of Comparative Zoology Collection, Harvard University, Boston, USA (MCZ), and the National Museum of Natural History, Smithsonian Institution, Washington D.C., USA (USNM). Yet, some type specimens are deposited in Museo de La Plata, La Plata, Argentina (MLPA) (see Cabrera and Roig-Juñent 1998b), Instituto y Fundación Miguel Lillo, Tucumán, Argentina (IMLA) (Aranda et al. 2016), and Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia', Buenos Aires, Argentina (MACN) (Bachmann and Cabrera 2010). Two of the most prominent workers on Argentinian Camptosomata were Francisco de Asis Monrós, whose collection was donated to the Smithsonian Institution (USNM) (Staines 1995), and Manuel Viana, whose collection is now housed in Tucumán and Salta Provinces in Argentina and in Chile. More recently, a few type specimens have been deposited in in the Instituto Argentino de Investigaciones de las Zonas Áridas, Mendoza, Argentina (IADIZA) by Agrain (2013, 2014).

Methods

We studied all catalogs and specialized literature dealing with the genera treated in this contribution. Nomenclature follows previous authors, especially those who made extensive revisions of this group, such as Andrew Moldenke, Francisco Monrós, Jacintho Guérin, and Martin Jacoby. Characters used for identification keys are those used by: Agrain and Roig-Juñent (2011), Chamorro-Lacayo and Konstantinov (2009), Guérin (1943), Karren (1972), Lacordaire and Chapuis (1854), Moldenke (1970, 1981), Monrós (1949a, 1953a), and Riley et al. (2002). An identification key to the subfamilies, tribes, subtribes, genera, and subgenera of Argentinian Camptosomata was made by compiling and modifying previous publications as indicated in Table 1. Some couplets in our key, derived from keys provided by earlier authors, are based on extreme representatives of a rather continuous spectrum. The latter is due to the fact that many genera, and especially subgenera, require modern revision. Our key is built for the identification of taxa on the territory of Argentina but is useful for the South American continent. The characters given for some widely distributed genera (e.g., *Cryptocephalus* Geoffroy, *Pachybrachis* Chevrolat) may not apply to species outside Argentina. Images of dorsal and lateral habiti were taken by different authors as indicated in superscript values: ([1]) F. Agrain, ([2]) L. Chamorro, ([3]) C. Gorretta, N. Cabrera, and ([4]) D. Sassi, and edited by F. Agrain.

We conducted an exhaustive search of all publications citing Argentinian camptosomates. Here we present a checklist of all currently known camptosomate species from Argentina, their distribution, host plant preferences, juvenile data where available, and known predators. Junior synonyms are provided for each species when applicable. The 24 provinces in Argentina (Fig. 1A) are abbreviated as follows: Buenos Aires (BAS),

Table 1. Main sources of information used for the identification key.

Group	Citation
Genera of Fulcidacini	Chamorro-Lacayo and Konstantinov (2009), Karren (1972), Lacordaire and Chapuis (1854).
Genera and subgenera of Clytrini	Agrain and Roig-Juñent (2011), Lacordaire and Chapuis (1854), Moldenke (1981), Monrós (1953a).
Subtribes of Cryptocephalini	Lacordaire and Chapuis (1854), Riley et al. (2002).
Genera of Cryptocephalina	Lacordaire and Chapuis (1854), Monrós (1949a), Watts (2005).
Genera of Pachybrachina	Chamorro (2013); Lacordaire and Chapuis (1854).

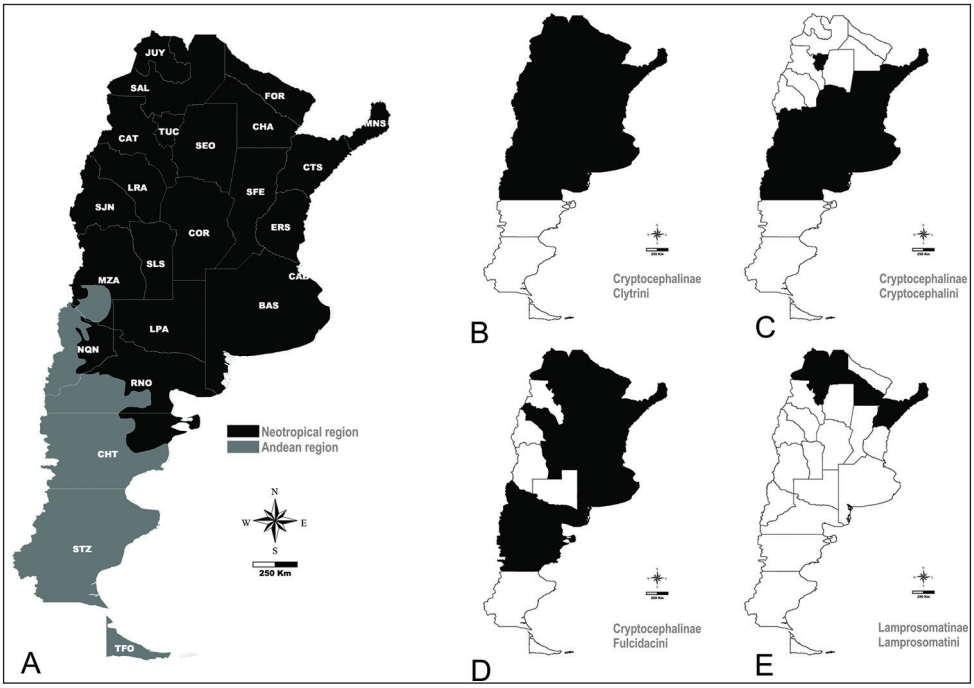

Figure 1. Distribution of Camptosomata tribes. **A** Map showing Argentinian administrative divisions with abbreviation as used in text. Andean and Neotropical regions as indicated in color reference **B** In black, administrative divisions containing Clytrini species **C** In black, administrative provinces containing Cryptocephalini species **D** In black, administrative divisions containing Fulcidacini species **E** In black, administrative divisions containing Lamprosomatini species.

Catamarca (CAT), Chaco (CHA), Chubut (CHT), Ciudad Autónoma de Buenos Aires (CAB), Córdoba (COR), Corrientes (CTS), Entre Ríos (ERS), Formosa (FOR), Jujuy (JUY), La Pampa (LPA), La Rioja (LRA), Mendoza (MZA), Misiones (MNS), Neuquén (NQN), Río Negro (RNO), Salta (SAL), San Juan (SJN), San Luis (SLS), Santa Cruz (SCZ), Santa Fe (SFE), Santiago del Estero (SEO), Tierra del Fuego (TFO), Tucumán (TUC). The source map of Andean and Neotropical regions of Argentina was obtained from Löwenberg-Neto (2014).

Terminology

Terminology follows previous authors as indicated in table 1. The term "egg anal pit" refers to a medioventral excavation on terminal abdominal ventrite, mostly present in the females (Chaboo 2007, and references therein). The term "rectal apparatus" refers to a specialized region of the rectum of females, whose sclerites and muscles are used during oviposition (De Monte 1957, Erber 1988, Brown and Funk 2005, Schöller 2008). This structure is unique to the Cryptocephalinae (Reid 1995).

Results

Keys to the subfamilies, tribes, subtribes, genera, and subgenera of Argentinian Camptosomata

Note: Some of the characters in this key are valid for Neotropical species only

1 Body dorsally highly convex and ventrally flattened (semicircular in cross-section) (Fig. 2A); abdominal ventrites not connate; antennal grooves present on intercoxal prosternal process; females without a well developed fovea (egg anal pit) on ventrite V (**Lamprosomatinae**). Distal margin of last ventrite thick (Fig. 2B); last ventrite not excised in shape of arc (Fig. 2C); pygidium completely covered by elytra; scutellum acutely triangular (small to very small); elytral punctation arranged in regular rows or with a tendency to form such rows.....***Lamprosoma*** **Kirby** (Fig. 34). **(Lamprosomatini)**

– Body not highly convex, not flattened ventrally (Fig. 2D) (oval in cross-section); abdominal ventrites connate; antennal grooves absent on intercoxal prosternal process (except Fulcidacini and Ischiopachina (Clytrini); females with a distinct, variably shaped fovea (egg anal pit) on ventrite V .... **2. (Cryptocephalinae)**

Cryptocephalinae

2(1) Intercoxal prosternal process with antennal furrows; body surface usually tuberculate (Fig. 2E); elytral suture usually serrate .....**4 (Fulcidacini)**

2' Pronotum and intercoxal prosternal process without antennal furrows (Ischiopachina with furrows on hypomeron); body surface not tuberculate; elytral suture entire.....**3**

3(2) Antennae short (not surpassing the length of pronotum), serrate; procoxae contiguous (Fig. 2F) ..... **9 (Clytrini)**

3' Antennae long (surpassing the length of pronotum, sometimes nearly equal to total body length), filiform, sometimes some segments expanded and flattened; procoxae separated (Fig. 2G)..... **29 (Cryptocephalini)**

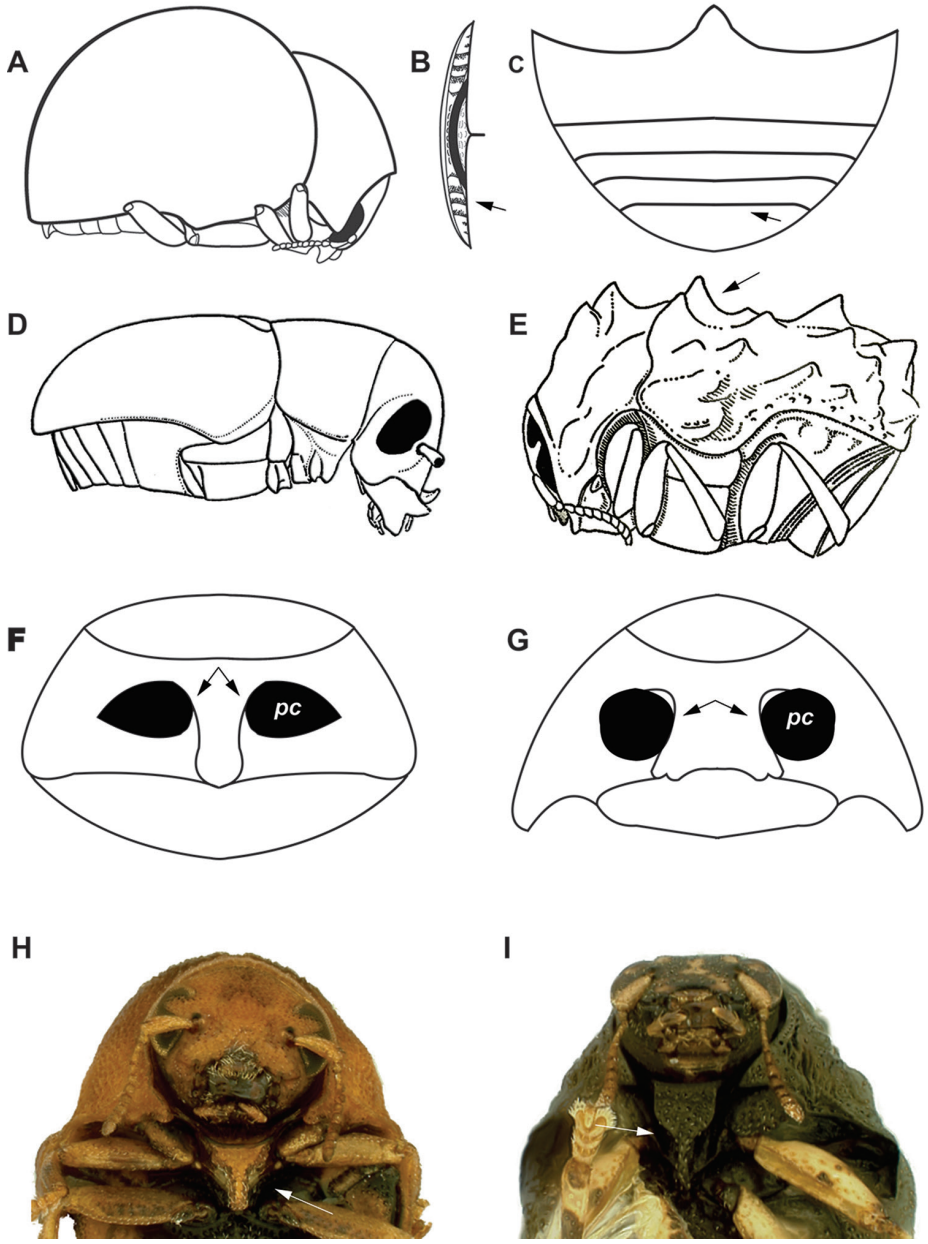

Figure 2. Diagnostic characters plate 1. **A** Body dorsally highly convex and ventrally flattened (semicircular in cross-section (drawn after Monrós 1956) **B** Distal margin of last ventrite thick (drawn after Chamorro and Konstantinov 2011) **C** Last ventrite not excised in shape of arc **D** Body cylindrical, not flattened ventrally (drawn after Monrós 1953a) **E** body surface usually tuberculate (drawn after Monrós 1951) **F** procoxae prominent and contiguous **G** procoxae not prominent and separated **H** prosternal process more than 3/4 as long as intercoxal prosternal process (after Chamorro-Lacayo and Konstantinov (2009) **I** intercoxal prosternal process gradually constricted at about 2/3 of its length (after Chamorro-Lacayo & Konstantinov (2009).

Fulcidacini

4(2) Intercoxal prosternal process nearly rectangular, with posterior margin slightly narrower than anterior margin; pronotal and elytral tubercles reduced, sometimes with velvet patches.....***Melittochlamys*** **Monrós** (Fig. 32)

4' Intercoxal prosternal process varying in shape, triangular or angulate between mesocoxae, but never rectangular, with posterior margin much narrower than anterior margin; pronotal and elytral tubercles well developed.....**5**

5(4) Body equal to or greater than 10 mm long; colour brightly metallic; head with vertex longitudinally impressed; tarsal claws simple..... ***Fulcidax*** **Voet** (Fig. 31)

5' Body less than 10 mm long; head with vertex not impressed; tarsal claws usually appendiculate (except *Exema* (from simple to appendiculate) **6**

6(5) Pronotum with six distinct, small, sharp, longitudinal carinae converging posteromedially, fan-like; color uniform, generally black ....***Aulacochlamys*** **Monrós** (Fig. 28)

6' Pronotum with or without tubercles, but never with six longitudinal, fan-like carinae **7**

7(6) Head not completely retracted into the prothorax; mandibles in males larger than in females; intercoxal prosternal process strongly and abruptly constricted behind anterior margin; prosternal process more than 3/4 as long as intercoxal prosternal process (Fig. 2H) …***Pseudochlamys*** **Lacordaire** (Fig. 33)

7' Head completely retracted into prothorax; mandibles in males as large as in females; intercoxal prosternal process gradually constricted at about 2/3 of its length (Fig. 2I) **8**

8(7) Males without spines or spinulae on ventrite I; antennomere V nearly as long as VI; elytral suture crenulation usually incomplete (*i.e.*, suture entire immediately following scutellum) .....***Chlamisus*** **Rafinesque** (Fig. 29)

8' Males with spines or spinulae on ventrite I; antennomere V much shorter than VI; elytral suture crenulation always complete..... ***Exema*** **Lacordaire** (Fig. 30)

Clytrini

9(3) Prothorax with lateral antennal grooves on hypomeron **Ischiopachina Chapuis** (Monotypic subtribe). Elytra without strong parallel longitudinal carinae; color metallic ..... ***Ischiopachys*** **Chevrolat** (Fig. 16)

9' Prothorax without lateral antennal grooves on edge of hypomeron **10**

10(9) Tarsal claws simple ..... **12 (Megalostomina Chapuis)**

10' Tarsal claws bifid or appendiculate (Fig. 3A) **11**

11(10) Scutellum flat, in the same horizontal plane as elytra; elytra without longitudinal carinae, frons distinct .....**15 (Babiina Chapuis)**

11' Scutellum raised above elytral plane; elytra with strong parallel, longitudinal carinae; frons very narrow **Arateina Moldenke;** (monogeneric subtribe) ....***Aratea*** **Lacordaire** (Fig. 4). (monogeneric subtribe)

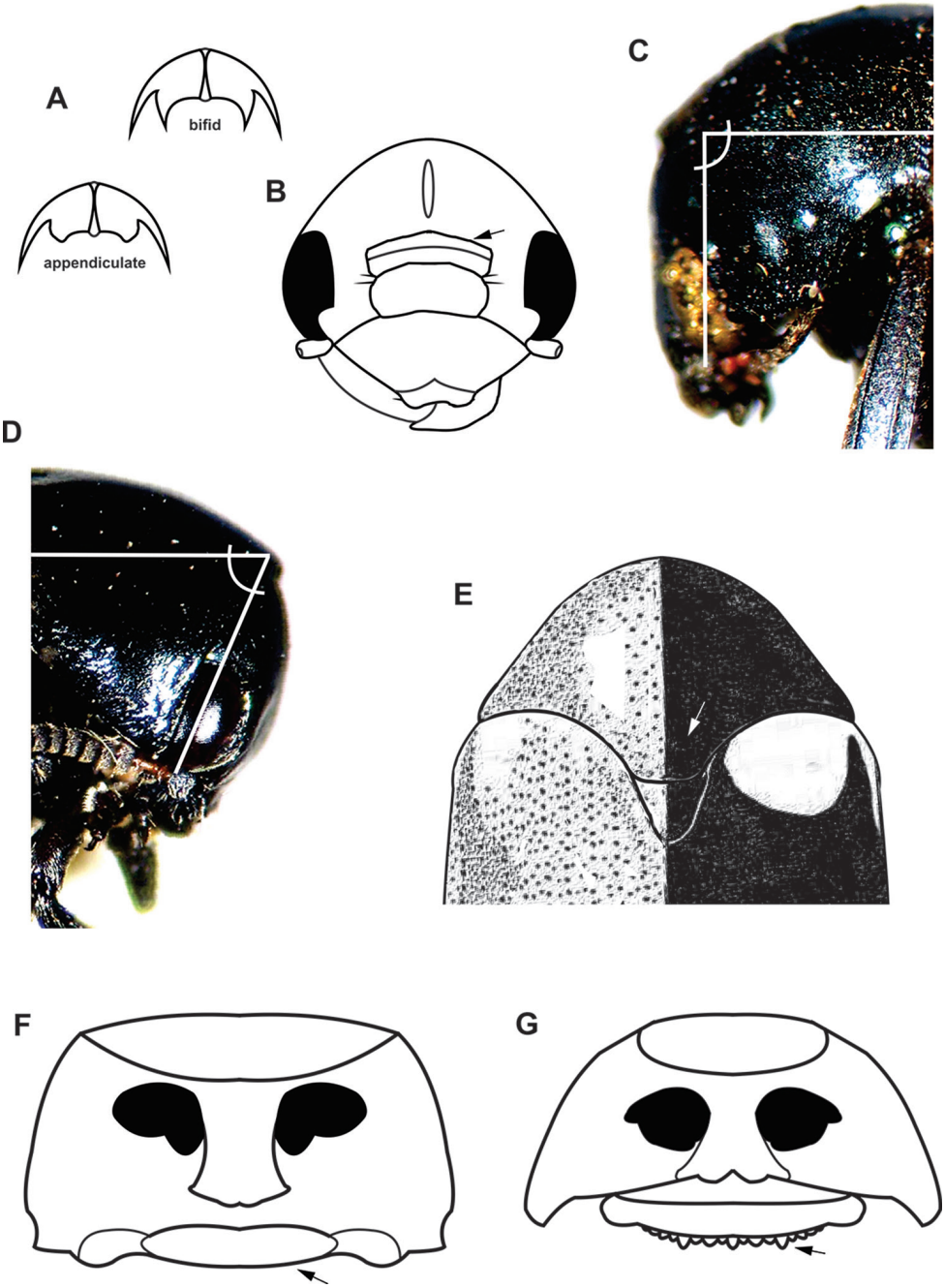

Figure 3. Diagnostic characters plate 2. **A** Tarsal claws bifid or appendiculate **B** Frons with deep transverse sulcus. **C** Head forming straight angle with respect to pronotum **D** Head strongly directed downward, forming 45º angle with respect to pronotum **E** Posterior margin of pronotum broadly expanded, forming distinct scutellar lobe with angular corners (drawn after Monrós 1953a) **F** Pronotum margined at base, not crenulate **G** Pronotum not margined at base, crenulate.

12(10) Eyes entire or only slightly emarginate **13**

12' Eyes strongly emarginate..... ***Megalostomis*** **Chevrolat** (Fig. 19)

13(12) Scutellum foveate; body not metallic; pygidium with transverse subapical carina; aedeagus occupying entire abdominal length ....***Euryscopa*** (***Coleomonrosa***) **Moldenke** (Fig. 18)

13'. Scutellum not foveate; body brilliant metallic, or with noticeable metallic reflections; pygidium without subapical transverse carina; aedeagus smaller, not occupying entire abdominal length..... **14**

14(13) Eyes elongate, not protruding; body robust, subquadrate..... ..... ***Themesia*** **Lacordaire** (Fig. 20)

14' Eyes round and protruding; body elongate... ***Coscinoptera*** **Lacordaire** (Fig. 17)

15(11) Tarsal claws bifid; dorsum of body uniformly metallic; body lengthened..... ..... ***Helioscopa*** **Gistel** (Fig. 9)

15' Tarsal claws appendiculate; dorsum of body not uniformly metallic; body compact..... **16**

16(15) Epipleural lobes very pronounced;angle of epipleural lobes rounded; elytra striae strongly impressed; dorsal coloration black, with omnipresent metallic bronze reflections..... ***Saxinis*** (***Saxinis***) **Lacordaire** (Fig. 13)

16' Epipleural lobes weakly developed, not angulate, no more than two striae wide; elytra striae not strongly impressed; dorsal coloration without bronze reflections..... **17**

17(16) Pygidium with transverse subapical angle, evenly bent perpendicular to longitudinal axis of body; epipleural lobe not well developed in lateral view..... **18**

17' Pygidium flat, surface slightly convex, with tip sometimes bent; epipleural lobe distinctly rounded in lateral view..... **23**

18(17) Eyes feebly emarginate, distinctly projecting, conspicuously protruding at sides of head .....***Dinophthalma*** **Lacordaire** (Fig. 8)

18' Eyes distinctly emarginate, not markedly projecting **19**

19(18) Anterior margin of pronotum arcuate, entirely covering head from dorsal view; body shape elongate, cylindrical and flat; size large, greater than 10 mm long; frons flat; lateral margins of prothorax not widely explanate..... ..... ***Babia*** (***Coleolacordairei***) **Moldenke** (Fig. 5)

19' Anterior margin of pronotum transverse or arcuate, but not concealing entire head from dorsal view..... **20**

20(19) Body shape strongly cylindrical, elongate, not flattened; elytra not fully covering pygidium; elytral punctation barely noticeable ....***Cylindrodachrys*** **Monrós** (Fig. 6)

20' Body shape not cylindrical or elongate; elytra fully covering pygidium; elytral punctation evident..... **21**

21(20) Frons strongly tapering, triangular, without transverse sulcus; body shape subquadrate; aedeagus with strong dorsal and ventral tufts of pubescence..... ..... ***Pnesthes*** **Lacordaire** (Fig. 11)

21' Frons not strongly tapering below eyes, subrectangular, with length only slightly greater than width; aedeagus without pronounced ventral and dorsal

patches of setae, with only a few dorsal setae present..... .....**22**. ***Temnodachrys*** **Monrós** (Fig. 14)

22(21) Frons with deep transverse sulcus (Fig. 3B); body shape subrectangular..... ..... ***Temnodachrys*** **(*Temnodachrys*) Monrós**

22' Frons without deep transverse sulcus; body guttiform or minute and with subparallel sides ..... ***Temnodachrys*** **(*Eudachrys*) Monrós**

23(17) Body shape subcircular in outline; legs with longitudinal carinae; anterior pronotal margin strongly explanate and completely concealing head from dorsal view.....**24**

23' Body shape subrectangular, sides subparallel; legs without longitudinal carinae; anterior margin of pronotum never concealing all of head in dorsal view.....**27**

24(23) Forelegs longer (especially in males) than mid- and hind legs; tarsomere III enlarged, shallowly excavated; head less reflexed, 90º with respect to prosternum (Fig. 3C) .....***Stereoma*** **Lacordaire** (Fig. 12)

24' All legs with similar development; tarsomere III narrow, deeply excavated; head more reflexed, forming 45º angle with respect to prosternum (Fig. 3D)..... .....**25**. ***Urodera*** **Lacordaire** (Fig. 15)

25(24) Posterior margin of pronotum broadly expanded, forming distinct scutellar lobe with angular corners (Fig. 3E)..... ***Urodera*** **(*Austrurodera*) Moldenke**

25' Posterior margin of pronotum not broadly expanded and not forming a scutellar lobe with angular corners **26**

26(25) Front tibiae with indistinct posterolateral carinae, with surface not deeply excavate and reflective between carinae; frons of male with three shallow depressions ..... ***Urodera*** **(*Urodera*) Lacordaire**

26' Front tibiae with strong posterolateral carinae, with surface deeply excavate and reflective between carinae; frons of male with deep medial depression.... .....***Urodera*** **(*Stereomoides*) Moldenke**

27(23) Pronotum with weak metallic green reflections; antennomere IV much smaller than V; frons wide, with width greater than or subequal to length; frons without medial pit .....**28**. ***Paraurodera*** **Moldenke**. (Fig. 10).

27' Pronotum without metallic reflections; antennomere IV subequal in size to V; frons narrow, with length more than twice width; frons with deep medial pit.....***Dachrys*** **Erichson** (Fig. 7)

28(27) Anterior margin of pronotum transverse, not concealing head at all in dorsal view; frons with submedial depressions; sexual dimorphism of frons extreme, the male having extremely wide frons and elongate mandibles..... .....***Paraurodera*** **(*Torourodera*) Moldenke**

28' Anterior margin of pronotum explanate and partially concealing head; frons with medial and two submedial depressions; sexual dimorphism reduced, with frons and mandibles similarly developed in male and female..... .....***Paraurodera*** **(*Paraurodera*) Moldenke**

Cryptocephalini

29(3) Claws simple or, if appendiculate, intercoxal prosternal process longer than wide to subquadrate.....**30**

29' Claws appendiculate, each with broad, basal tooth; intercoxal prosternal process wider than long.....**31. Monachulina Leng**

30(29) Pronotum margined at base (except in *Mylassa*), not crenulate (Fig. 3F)..... ..... **32** (**Pachybrachina Chapuis)**

30' Pronotum not margined at base, usually crenulate (Fig. 3G) (**Cryptocephalina Gyllenhal)**. Eyes with distinct excavation on internal margin; dorsum glabrous; male front tibiae with reduced sexual dimorphism; posterior pronotal margin not produced ..... ***Cryptocephalus*** **Geoffroy** (Fig. 21)

31(29) Anterior margin of pronotum simple, arcuate; pronotal punctures distinct throughout; intercoxal prosternal process bilobed, with small lateral projections; anterior margin of prosternum uniformly concave; pronotal anterior opening circular.....***Lexiphanes*** **Gistel** (Fig. 22)

31' Anterior margin of pronotum produced; pronotal punctures absent; intercoxal prosternal process truncate; anterior margin of prosternum with one or two medial flanges; pronotal anterior opening ventrally widened..... ..... ***Stegnocephala*** **Baly** (Fig. 23)

32(30) Eyes small, bulging, with canthus shallow.....**33**

32' Eyes large, extending dorsad beyond upper third of head, usually with upper half of eye larger than ventral half; canthus deep, extending approximately 1/4 distance into eye; posterior margin of pronotum (directly opposite scutellum) not produced posteriorly, margined with basal row of punctures, bisinuate; scutellum not heart-shaped **34**

33(32) Dorsal surface generally setose; pronotum greatly vaulted, with lateral margins narrow; pronotum medially lobed posteriorly, lobe elevated and truncate; scutellum heart-shaped ..... ***Mylassa*** **Stål** (Fig. 26)

33' Dorsal surface glabrous; pronotum regularly convex, with lateral margins prominent, visible from above, with posterior margin regularly biconcave, with mesobasal region regularly rounded and slightly produced posterad; scutellum with posterior margin truncate....***Ambrotodes*** **Suffrian** (Although this genus has not been yet reported from Argentina, we include it in this key because its species are common along the eastern border of the Andes in Chile.

34(32) Posterior margin of intercoxal prosternal process convex, produced beyond posterior margin of prothorax; mesotibial spurs present or absent; body robust; punctures not deep or large, particularly on pronotum; dorsal surface shiny.....**35**

34' Posterior margin of intercoxal prosternal process straight, rarely produced beyond posterior margin of prothorax; gestalt cylindrical (height of each elytron approximately 2.5 width), pronotum narrower than elytral bases combined,

overall flattened not vaulted; punctures on head, prothorax and elytra evident, large; elytral punctation commonly confused (but punctation in rows not uncommon); forefemora enlarged or not; each mesotibia usually with terminal spur in both sexes ..... ***Pachybrachis*** **Chevrolat** (Fig. 27)

35(34) Posterior margin of intercoxal prosternal process rounded; lateral margin of elytra deeply excised, exposing abdomen caudally; elytra length approximately 2× or less length of pronotum ..... ***Griburius*** **Haldeman** (Fig. 24)

35' Posterior margin of intercoxal prosternal process gradually narrowing, pointed; lateral edge of elytra not deeply excised; abdomen not exposed; elytral length greater than 2× length of pronotum ... ***Metallactus*** **Suffrian** (Fig. 25)

Cryptocephalinae Gyllenhal, 1813

Adults: Body cylindrical, or rarely as long as wide; in dorsal view parallel-sided with prothorax mostly as wide as combined elytral bases; rarely body rounded; multicolored and patterned, particularly Cryptocephalini, black with red humeri commonly in Clytrini, brown, black, straw-yellow and some with velvet spots in Fulcidacini, glabrous to pubescent, particularly Clytrini. Head retracted into prothorax up to frons or almost completely, with compound eyes completely to barely visible from above. Compound eyes entire, level to strongly protuberant; canthus weak to deep. Antennae 11-segmented, longer than pronotum and filiform in Cryptocephalini (sometimes antennomeres distally dilated and flattened), shorter than pronotum and dentate in Clytrini, clavate in Fulcidacini. Pronotum about 0.75–1.0 times as long as wide, widest basally; sides slightly rounded or sinuate; base slightly narrower or as wide as combined elytral bases. Prosternum in front of coxae usually narrow and shorter than shortest diameter of a single coxal cavity, flat to moderately convex, sometimes produced to conceal mouthparts. Prosternal process complete, usually parallel-sided; notosternal sutures distinct. Procoxae not projecting below prosternum, without concealed lateral extensions; trochantins exposed within coxal cavity. Stridulatory device present on concealed part of mesoscutellum. Tarsi 5-5-5 in both sexes; penultimate tarsomere reduced and antepenultimate bilobed, all usually wider in males; tarsomere III densely clothed beneath with adhesive microtrichia; pretarsal claws simple to deeply bifid. Abdomen with five free ventrites and six tergites. Ventrite I more than twice as long as II, usually longer than ventrites II-IV combined, without postcoxal lines; intercoxal process narrowly rounded to almost truncate. Functional spiracles present on tergites I-VI. Tergite VI forming strongly pigmented pygidium, always exposed; anterior edge of sternite VIII in male without median strut. Ventrite V (=sternite VII) in females with variably-sized apical fovea. Males with segment IX membranous and spiculum gastrale Y-shaped. Aedeagus of cucujiform type; tegmen Y-shaped; struts (remnants of tergite IX) either present or absent; penis flattened to rounded, slightly to strongly curved apically; apically and/or laterally usually with tufts of setae. Sternite VIII in female lacking spiculum ventrale. Ovipositor short, rigid and oval

with distinct proctigeral, paraproctal, and coxital baculi; paraprocts deltoid, slightly shorter than undivided coxites, sclerotized or less pigmented proximally, flattened, digitate lobes of variable form, apically setose; styli absent. Spermatheca strongly to moderately sclerotized, variably shaped, usually J-, C-, or S-shaped. Rectal sclerites (rectal apparatus) present in female.

Larvae: J-shaped, generally protected by a case. According to Reid (1990, 1995), Agrain and Marvaldi (2009) and Chamorro (2014b), the following features characterize the subfamily Cryptocephalinae in the broad sense (*i.e.*, including Clytrini, Cryptocephalini and Fulcidacini), and are probably synapomorphies of cryptocephalines, by outgroup comparison with other chrysomeloids and weevils (Reid 1995, 2000): body J-shaped; frons, clypeus, and labrum fused; six stemmata, clustered 4 + 2; spiracles uniforous with reticulate peritreme; egg bursters on TII and TIII and associated with a long and a short seta. Lamprosomatinae show a number of larval features in common with the cryptocephalines, being the body J-shaped among the most obvious (and related with their habit of carrying a case), as well as the fusion of frons, clypeus and labrum. Yet, unlike the cryptocephaline larvae, those of Lamprosomatinae have bicameral spiracles with peritreme simple, and five stemmata grouped 2 + 3. The maxillary palp 3-segmented plus the palpiger, as present in both groups, is likely a plesiomorphy, and although both subfamilies have egg-bursters confined to the meso- and metathorax, those in Lamprosomatinae lack the short ventral seta (Agrain and Marvaldi 2009, and references therein).

Tribe Clytrini Kirby, 1837

Subtribe Arateina Lacordaire, 1848

Diagnosis. Same as for genus, see below.

***Aratea* Lacordaire, 1848**
Fig. 4

Lacordaire 1848: 467; Chapuis 1874: 151; Jacoby and Clavareau 1906: 73; Guérin 1943: 86; Monrós 1953a: 261; Moldenke 1981: 88.

Type species. *Aratea costata* Lacordaire, 1848. By monotypy.

Diagnosis. This genus is easily recognized by the presence of strong parallel carinae on the elytra; other diagnostic characters include: frons very narrow; scutellum slanting posterodorsally, distinctly protruding from the plane of elytra; intercoxal prosternal process nearly absent between fore coxae; epipleural margin broadly angled, tip rounded; elytra without pubescence; frons with medial pit, densely and coarsely punctate throughout; and pygidium strongly convex.

Figure 4. *Aratea costata* Lacordaire [(1)], left: habitus (dorsal view), right: habitus (lateral view).

Distribution. Only two species from Brazil, one present in Argentina, likely to also occur in Paraguay.

Remarks. Agrain and Roig-Juñent (2011), found eight autapomorphies for the genus, among them elytra with strongly marked longitudinal striae constitutes an exclusive synapomorphy to the genus.

Argentinian species checklist.

1. *Aratea costata* Lacordaire, 1848 (FOR, MNS, SEO).

Subtribe Babiina Chapuis, 1874

Babia Chevrolat, 1836

Babia Chevrolat in Dejean 1836: 441, 1842: 409 in d'Orbigny; Lacordaire 1848: 424–425; Chapuis 1874: 147; Jacoby 1880: 33; Jacoby and Clavareau 1906: 70; Clavareau 1913: 81; Schaeffer 1933: 319–320; Guérin 1943: 65–66; Monrós 1953a: 212–213, 1953b: 46; Moldenke 1970: 132, 1981: 103.

= *Harpasta* Gistel, 1848: 123.

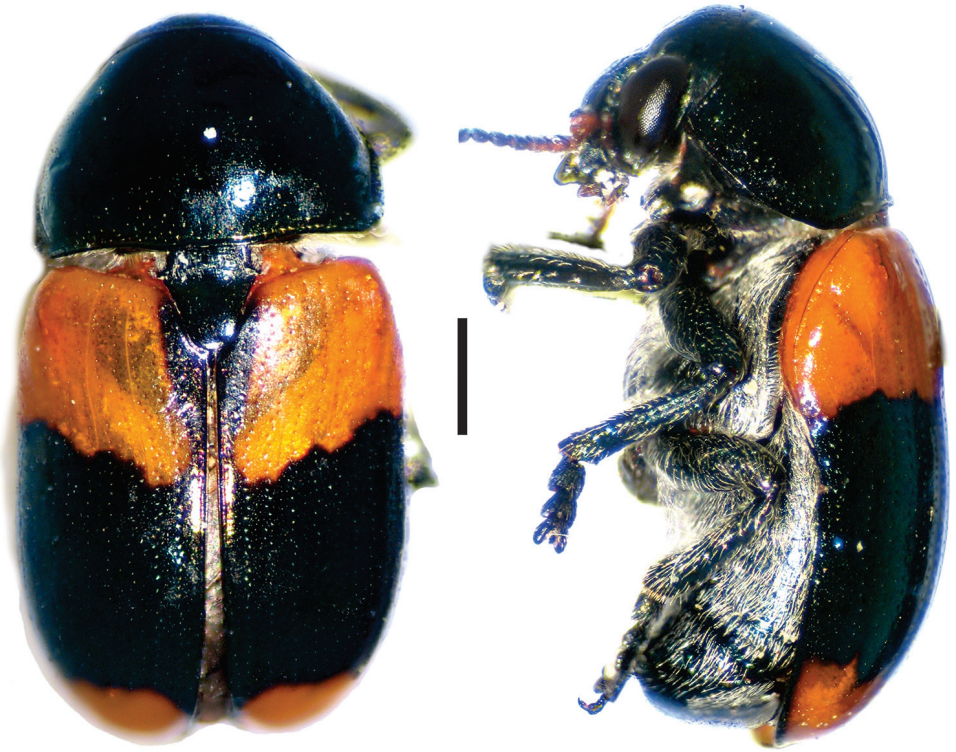

Figure 5. *Babia* (*Coleolacordairei*) *elongata* Guérin [1], left: habitus (dorsal view), right: habitus (lateral view).

Note. Moldenke (1981), divided *Babia* into six subgenera based on morphological features, such as the general shape of the body, pronotal margin, frons and antennomere morphology: *Babia* (*Babia*) Chevrolat and *B.* (*Archaebabia*) Moldenke from America north of Mexico; *Babia* (*Coleolacordairei*) Moldenke, *Babia* (*Heterobabia*) Moldenke, and *Babia* (*Megababia*) Moldenke from the Neotropical region. Only the monotypic *B.* (*Coleolacordairei*) is represented in Argentina.

***Babia* (*Coleolacordairei*) Moldenke, 1981**

Fig. 5

Type species. *Babia elongata* Guérin, 1945. By monotypy.

Diagnosis. This subgenus can be reliably diagnosed by the shape of anterior margin of pronotum, which is arcuate, and covers the entire head in dorsal view. Also, body shape is elongate (length 3x width), cylindrical and flat; frons is flat; lateral margin of prothorax not widely explanate.

Distribution. Brazil and Argentina.

Remarks. Moldenke (1981), mentioned the size of this species to be greater than 10 mm, but average size is smaller than 10 mm.

Argentinian species checklist.

1. *Babia* (*Coleolacordairei*) *elongata* Guérin, 1945 (BAS, COR, ERS, JUY, LRA, RNO, SAL, SFE, TUC). Host plant: Fabaceae: *Acacia* sp. (Monrós 1953a).

Cylindrodachrys Monrós, 1944

Fig. 6

Monrós (1944: 148, 1953b: 148).

Type species. *Cylindrodachrys cleroides* Monrós (1944: 148).

Diagnosis. This genus exhibits a particular combination of three characters unique among Clytrini: adult body shape strongly cylindrically elongate; elytra not fully covering pygidium; and inconspicuous elytral punctations, thus superficially resembling a clerid.

Distribution. This monotypic genus is limited to Paraguay and north and central Argentina.

Remarks. According to Monrós (1944) this species has always been collected in extremely xeric places.

Argentinian species checklist.

Cylindrodachrys cleroides Monrós, 1944 (CAT, COR, MZA, SEO, SLS). Host plant: Solanaceae: *Solanum eleagnifolia* (Quillo); Malvaceae: *Gossypium hirsutum* (Monrós, 1953a).

Dachrys Erichson, 1847

Fig. 7

Erichson 1847: 164; Lacordaire 1848: 405–406; Chapuis 1874: 146; Jacoby and Clavareau 1906: 68–69; Clavareau 1913: 80; Guérin 1943: 53–54; Monrós 1953a: 208–209, 1953b: 48–49; Moldenke 1970: 108.

Type species. *Dachrys succincta* (Erichson, 1834), designated by Monrós (1953b: 48).

Diagnosis. This genus resembles *Saxinis*, but is distinguished by the epipleural lobe not well developed and from *Temnodachrys* by the sides of the prothorax curved (strongly convergent towards the head); frons with deep medial pit; and distinct elytral pattern with transverse black bands on reddish base color.

Distribution. Austral region of Chile and Argentina.

Remarks. Monrós (1953b) separated the genera: *Saxinodachrys*, *Cylindrodachrys*, and *Temnodachrys*, formerly considered within *Dachrys*. Currently monotypic.

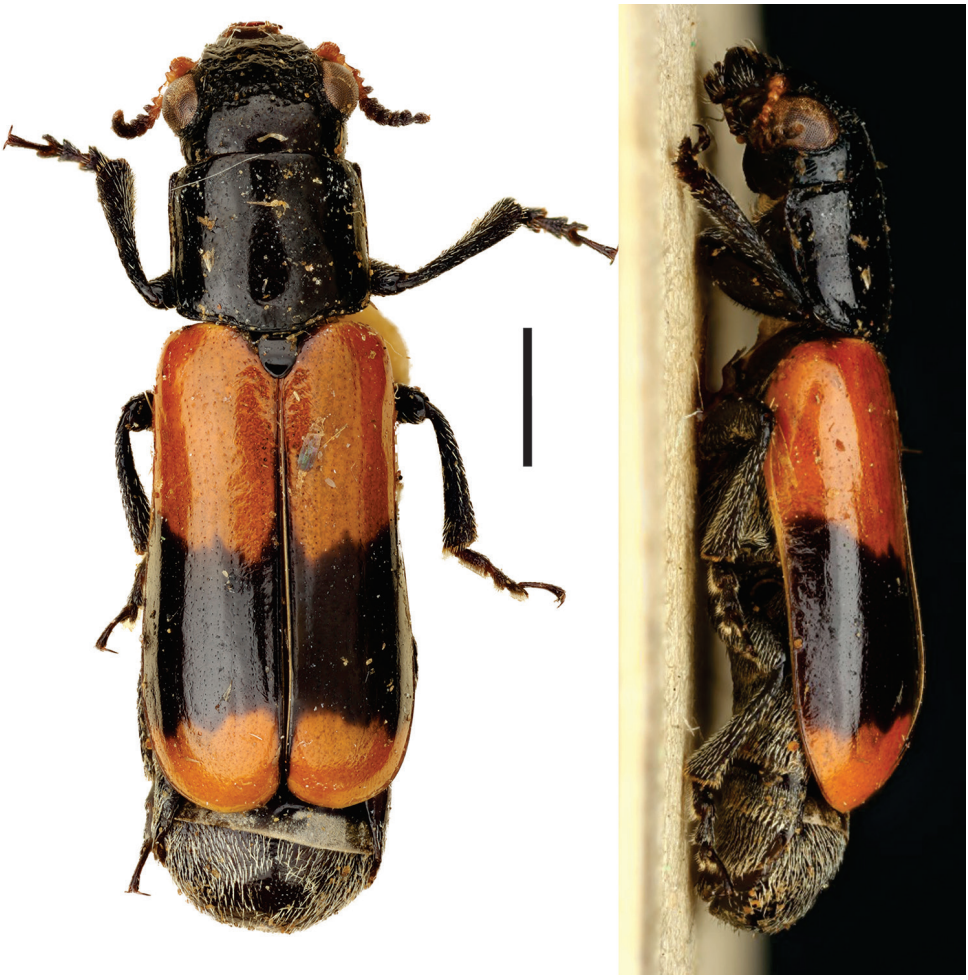

Figure 6. *Cylindrodachrys cleroides* Monrós [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Argentinian species checklist.

Dachrys succincta (Erichson, 1834) (CHU, NQN, RNO). Host plant: Rhamnaceae: *Discaria* sp. (Monrós, 1953a) and *Chacaya trimereus* (Roig-Juñent, 2004).
= *Clythra succincta* Erichson, 1834.
= *Dachrys succincta* Lacordaire, 1848.

Dinophthalma **Lacordaire, 1848**

Fig. 8

Dinophthalma Lacordaire 1848: 400; Chapuis 1874: 145; Jacoby and Clavareau 1906: 67; Guérin 1943: 47; Monrós 1953a: 143.

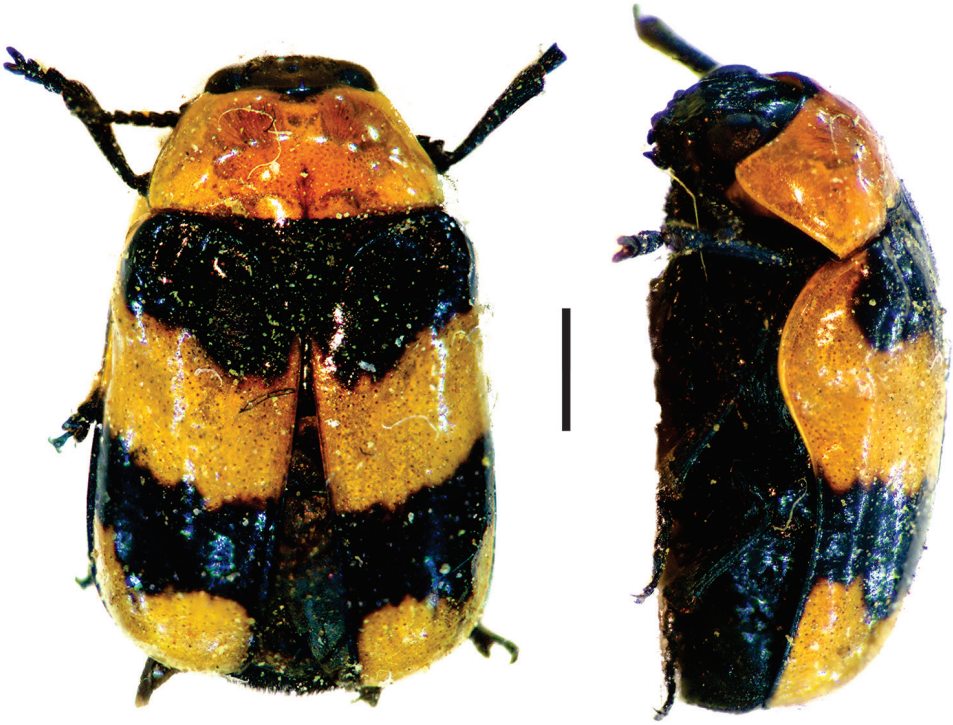

Figure 7. *Dachrys succincta* (Erichson) [(1)], left: habitus (dorsal view), right: habitus (lateral view).

Type species. *Dinophthalma ophthalmica* Lacordaire, 1848 designated by Monrós (1953a: 143).

Diagnosis. Small body size (less than 7 mm). This genus is very similar to *Temnodachrys*, from which it can be easily separated by the extraordinary development of the eyes, which are protruding and reaching the lateral margins of the head. Also, antennae with antennomere III large, conical; pronotum transverse; elytra without callus.

Distribution. Brazil, Ecuador, Bolivia, Paraguay, and Argentina.

Argentinian species checklist.

Dinophthalma amplicollis Monrós, 1953 (MNS).

Dinophthalma discicollis consimilis Baly, 1877a (FOR, MNS).

= *Dinophthalma consimilis* Baly, 1877a.

= *Babia pallidipennis* Guérin, 1943.

Helioscopa Gistel, 1848

Fig. 9

Helioscopa Gistel: 1848: 123, Monrós and Bechyné 1956: 1122.

= *Acidalia* Chevrolat, 1836

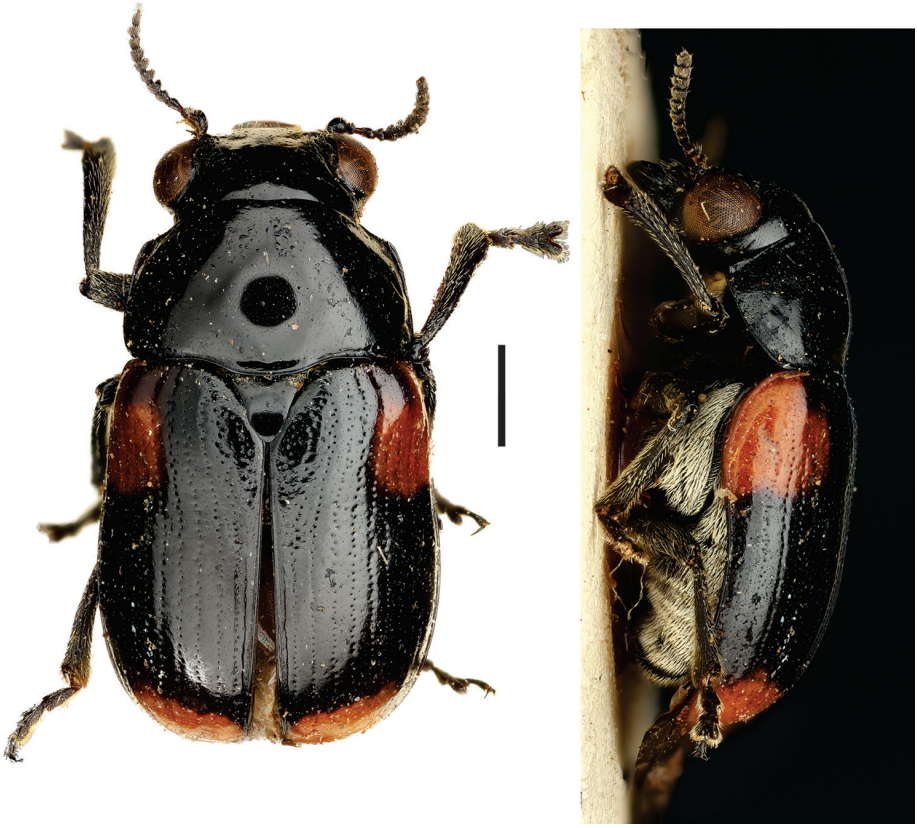

Figure 8. *Dinophthalma amplicollis* Monrós [(2)], left: habitus (dorsal view), right: habitus (lateral view).

= *Tellena* Lacordaire, 1848
= *Tellenina* Monrós, 1953a.

Type species. *Clythra varians* Sahlberg, 1823. By monotypy.

Diagnosis. body elongate, brilliant metallic, uniform green/blue coloration; and bifid tarsal claws. Also, antennae serrated from IV antennomere; pronotal margin slightly marginate; scutellum long, triangular, with round apex; legs long, with long tarsi, last tarsomere surpassing ½ the lobes of tarsomere III.

Distribution. Southern Brazil, Argentina and Paraguay. Only two subspecies of this genus have been cited in Argentina.

Argentinian species checklist.

1a. *Helioscopa varians varians* (Sahlberg, 1823) (MNS).
= *Clythra varians* Sahlberg, 1823.
= *Tellena varians* Lacordaire, 1848.

1b. *Helioscopa varians angusticollis* (Jacoby, 1897) (CHA, COR, JUY, MNS, SEO, TUC). Host plant: Boraginaceae: *Cordia salviflora*, Argentina / Monrós, (1953a).
= *Tellena angusticollis* Jacoby, 1897.

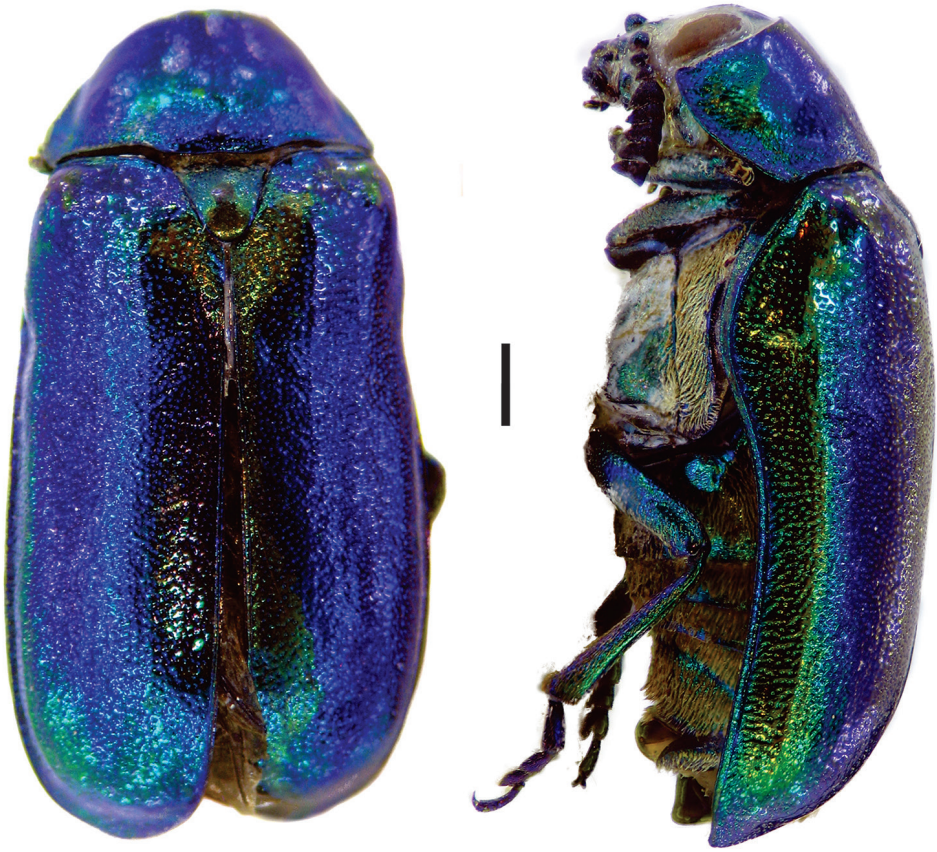

Figure 9. *Helioscopa varians varians* (Sahlberg) [(1)], left: habitus (dorsal view), right: habitus (lateral view).

***Paraurodera* Moldenke, 1981**
Fig. 10

Paraurodera Moldenke (1981: 110).

Note. This genus was created by Andrew Moldenke (1981) to include seven species previously included in *Urodera*. Moldenke (1981) divided it into two subgenera as follows:

***Paraurodera* (*Paraurodera*) Moldenke, 1981**

Type species. *Paraurodera similis* Moldenke, 1981, by original designation.

Diagnosis. According to Moldenke (1981), this group can be separated from *Urodera* by the following combination of characters: subrectangular body shape, with

Figure 10. *Paraurodera* (*Paraurodera*) *haematifera* (Lacordaire) [1], left: habitus (dorsal view), right: habitus (lateral view).

sides subparallel; anterior margin of pronotum never concealing entire head in dorsal view; legs without longitudinal carinae. Additional characters that may help distinguish this genus are: frons without strong sexual dimorphism; antennomere IV clavate, smaller than V; hind pronotal angles sinuate, perpendicular.

Distribution. Argentina, Brazil, Colombia, and Uruguay.

Argentinian species checklist.

Paraurodera (*Paraurodera*) *bergi* (Harold, 1875) (CHA, COR, CTS, LRA, MNS, MZA, SEO, SFE). Host plant: Fabaceae: *Acacia caven* (Mol.) Mol. (Viana and Williner 1972).

= *Stereoma bergi* Clavareau, 1913.

Paraurodera (*Paraurodera*) *hamatifera densepunctata* Monrós, 1953a (CHA, COR, FOR, JUY, MNS, SAL).

Paraurodera (*Paraurodera*) *hamatifera hamatifera* (Lacordaire, 1848) (CHA, COR, CTS, ERS, FOR, LRA, MNS, MZA, SAL, SEO, SFE, SJN, SLS, TUC). Host plant: Fabaceae: *Prosopis* sp. (Monrós, 1953a), *Prosopis nigra* (Ward et. al., 1977) and *Prosopis alpataco* (Roig-Juñent, 2004); *Acacia farnesiana* (Viana and Williner, 1974); *Hieronimus* sp. (Ward et al., 1977).

Paraurodera (*Paraurodera*) *inornata* (Monrós, 1953a) (CHA).

Paraurodera (*Paraurodera*) *similis* Moldenke, 1981 (JUY, SAL, FOR, CHA, MNS, SEO, TUC, CTS, COR, CAT, SFE, BAS, MZA). Host plant: Zygophyllaceae: *Zucagnia punctata* flowers (Roig-Juñent, 2004).
= *Urodera vau* Monrós, 1953a (nec Lacordaire, 1848).

Paraurodera (*Torourodera*) Moldenke, 1981

Type species. *Urodera fallax* Harold, 1875, designated subsequently by Moldenke (1981: 111).

Diagnosis. Anterior margin of pronotum not explanate; male head very conspicuous; frons with very strong sexual dimorphism, male mandibles prominent; antennomere IV much smaller than V; hind pronotal angles obtuse.

Distribution. This subgenus is endemic to Argentina.

Argentinian species checklist.

Paraurodera (*Torourodera*) *duplicata* (Monrós, 1953a) (CAT, CHA, COR, CTS, FOR, MNS, SEO, SFE, SLS). Host plant: Fabaceae: *Prosopis* sp. and *P. rucifolia* (Ward et al., 1977), *Prosopis alba* (Viana and Williner, 1974).

Paraurodera (*Torourodera*) *fallaciosa* (Monrós, 1953a) (COR, CTS, SFE, SLS).

Paraurodera (*Torourodera*) *fallax* (Harold, 1875) (BAS, CAT, CHA, COR, CTS, ERS, FOR, JUY, MNS, MZA, SAL, SEO, SFE, TUC). Host plants: Fabaceae: *Sesbania punicea*, and *S. virgata* (Monrós, 1953a); *Prosopis caldenia* (Aravena, 1940; 1974).

Pnesthes Lacordaire, 1848

Fig. 11

Lacordaire (1848: 403); Chapuis (1874: 1–16); Jacoby and Clavareau (1906: 68); Guérin (1943: 51).

Type species. *Pnesthes ligata* Lacordaire designated by Monrós (1953a: 150).

Diagnosis. The most particular character to diagnose this genus is the shape of the head, which is anteriorly prolonged, strongly tapering and triangular. Other diagnostic characters are: elongate body, shiny and glabrous; eyes moderately salient; pronotal base lobate; scutellum long and,triangular.

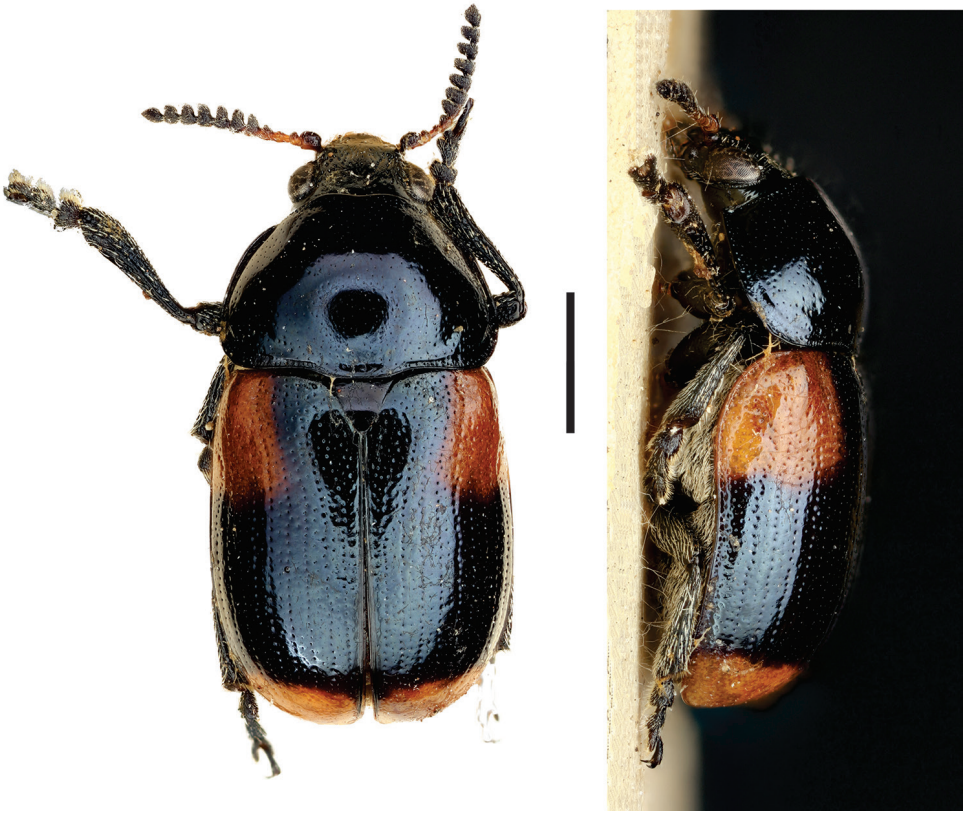

Figure 11. *Pnesthes instabilis minuta* Monrós [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Distribution. Two species from Brazil, one of these with a subspecies in Northeastern Argentina which was separated from the typical form by Monrós (1953a) on the basis of its smaller size and distinct punctuation.

Argentinian species checklist.

Pnesthes instabilis minuta Monrós, 1953a (MNS, SFE).

Stereoma Lacordaire, 1848

Fig. 12

Stereoma Lacordaire 1848: 437; Chapuis 1874: 148; Jacoby 1880: 34; Jacoby and Clavareau 1907: 71; Guérin 1943: 72; Monrós 1953a: 215; Moldenke 1981: 107.

Type species. *Stereoma clitellata* Lacordaire, designated by Monrós (1953a): 215.

Diagnosis. Sexually dimorphic, with males having enlarged forelegs; head completely concealed within prothorax; mesosternum broad; tarsal segments very transverse, tarsomere III cleft $^{1}/_{2}$ length to receive IV; tarsomere IV notoriously short and

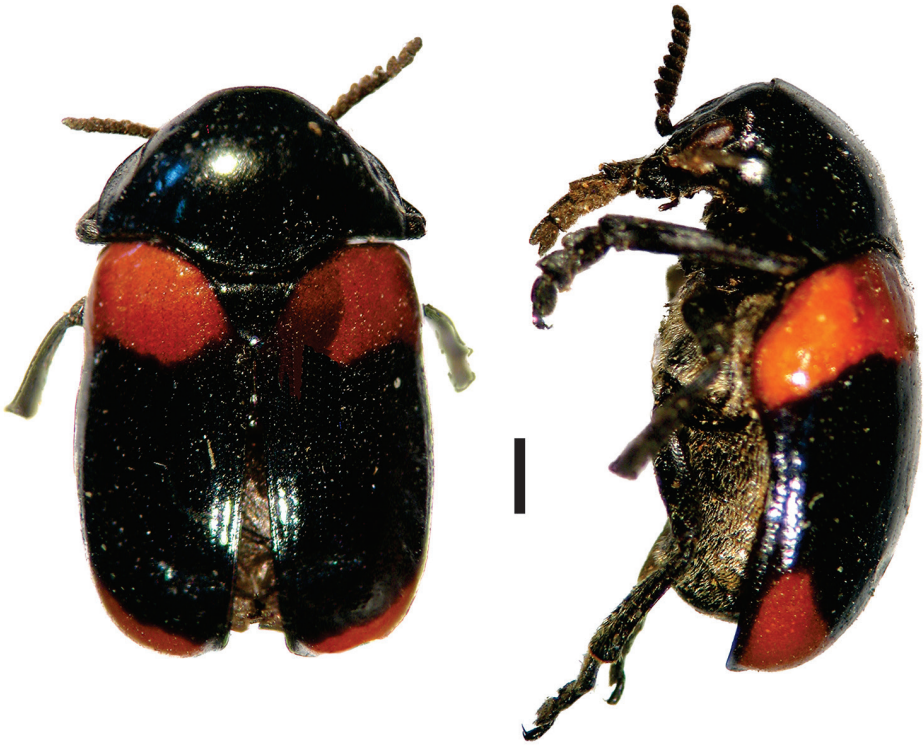

Figure 12. *Stereoma clitellata clitellata* Lacordaire [(1)], left: habitus (dorsal view), right: habitus (lateral view).

thick; frons with prominent transverse sulcation; lateral margin of pronotum broadly explanate, hind angles broadly rounded. This genus is closely related to *Urodera*, from which it can be separated by the conspicuous development of the legs, since the latter is much larger in males and females compared to *Urodera*.

Distribution. Seven species and four subspecies are known from Argentina, another 10 species are known from Meridional America (southern part of South America).

Remarks. *Sesbania virgata* (Fabaceae) has been cited as a hostplant for *Stereoma* sp. in Argentina (Monrós 1953a).

Argentinian species checklist.

Stereoma anchoralis Lacordaire, 1848 (COR).

Stereoma angularis Lacordaire, 1848 (MNS).

3a. *Stereoma clitellata burmeisteri* Harold, 1875 (CHA, COR, FOR, JUY, LRA, MNS, SAL, SEO, SFE, TUC).

= *Stereoma burmeisteri* Harold, 1875.

3b. *Stereoma clitellata clitellata* Lacordaire, 1848 (CHA, CTS, FOR, MNS, SFE).

Host plant: Fabaceae: *Acacia decurrens* (Monrós, 1953a).

3c. *Stereoma clitellata concolor* Lacordaire, 1848 (JUY, SAL, SEO).

= *Stereoma concolor* Lacordaire, 1848.

4a. *Stereoma laevicollis bosqui* Monrós, 1953a (SFE).

4b. *Stereoma laevicollis laevicollis* (Harold, 1875) (CAT, CHA, FOR, JUY, LRA, SAL, SEO, SLS). Host plant: Fabaceae: *Cassia aphylla* (Viana & Williner, 1974). = *Urodera laevicollis* Harold, 1875.
4c. *Stereoma laevicollis orophila* Monrós, 1953a (JUY, SAL, TUC).
5. *Stereoma obesa* Monrós, 1953a (SEO).
6. *Stereoma seenoi* Moldenke, 1981 (JUY). [Moldenke (1981), mistakenly cited this species from (Jujuy: Bolivia), it belongs to Jujuy: Argentina.].

Saxinis **Lacordaire, 1848**

Saxinis Lacordaire 1848: 478–79; Chapuis 1874: 150; Jacoby 1880: 36–37; Horn 1892: 8; Jacoby and Clavareau 1906: 74; Clavareau 1913: 84; Guérin 1943: 88; Blackwelder 1946: 639; Monrós 1953a: 257–258; Moldenke 1970: 154, 1981: 106.

Note. Moldenke (1981) erected *Saxinis* (*Boreosaxinis*) to include North American species. The other four species of *Saxinis* are included in the nominotypic subgenus and distributed in Central and South America, with only one species described from Argentina.

Saxinis **(*Saxinis*) Lacordaire, 1848**
Fig. 13

Moldenke 1981: 106.

Type species. *Saxinis sagittaria* Lacordaire, 1848, designated by Monrós (1953a: 257).

Diagnosis. This group can be easily distinguished from all other members of this subtribe by the very large and generally pointed epipleurae. South American species exhibit a black dorsal coloration always with metallic bronze reflections.

Distribution. Usually foundin Central and South America.

Argentinian species checklist.

Saxinis (*Saxinis*) *meridionalis* Monrós, 1953a (BAS, CHA, COR, ERS, FOR, JUY, LPA, LRA, MZA, SAL, TUC).

Temnodachrys **Monrós, 1953**
Fig. 14

Dachrys Lacordaire, 1848 (part)
Temnodachrys Monrós 1953a: 153–15, 1953b: 48–49; Moldenke 1970: 109, 1981: 107.

Note. Monrós (1953b) divided this diverse genus (more than 60 species) into two subgenera based on the presence of a deep transverse sulcus in the interocular region.

Figure 13. *Saxinis* (*Saxinis*) *meridionalis* Monrós [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Temnodachrys (*Eudachrys*) Monrós, 1953

Type species. *Temnodachrys cruciata* (Lacordaire, 1848), designated by Monrós (1953b: 49).

Diagnosis. Frons without deep transverse sulcus; body minute, drop-like shaped with sides subparallel.

Distribution. This subgenus has over 60 species and is distributed from Mexico to Argentina and Chile, 22 species have been cited for Argentina.

Argentinian species checklist.

1a. *Temnodachrys* (*Eudachrys*) *complexa complexa* (Lacordaire, 1848) (BAS, CHA, CTS, ERS, MNS, SEO, SFE, TUC). Host plant: Rosaceae: *Rosa* sp. (Roses) (Monrós 1953a).

1b. *Temnodachrys* (*Eudachrys*) *complexa pallipes* Monrós, 1953a (BAS, CTS, FOR, MNS, SFE).

Figure 14. *Temnodachrys* (*Temnodachrys*) *aeneofasciata*(Lacordaire) [(1)], left: habitus (dorsal view), right: habitus (lateral view).

Temnodachrys (*Eudachrys*) *cruciata* (Lacordaire, 1848) (BAS, COR, MNS, MZA, SEO, SFE). Host plant: Asteraceae: *Eryngium* sp. (Monrós, 1953a).
Temnodachrys (*Eudachrys*) *decolorata* Monrós, 1953a (SEO).
Temnodachrys (*Eudachrys*) *haywardi* Monrós, 1953a (NQN).
Temnodachrys (*Eudachrys*) *impressifrons* Monrós, 1953a (SFE).
Temnodachrys (*Eudachrys*) *lacordairei* Monrós, 1953a (JUY, SAL).
Temnodachrys (*Eudachrys*) *laeta* (Lacordaire, 1848) (JUY, MNS).
Temnodachrys (*Eudachrys*) *longipennis* (Guérin, 1943) (FOR, MZA).
Temnodachrys (*Eudachrys*) *manca* (Harold, 1875) (COR, MZA, SEO).
= *Urodera manca* Clavareau, 1913.
Temnodachrys (*Eudachrys*) *monticola* Monrós, 1953a (TUC).
Temnodachrys (*Eudachrys*) *oyaguava* Monrós, 1953a (COR, MNS).
Temnodachrys (*Eudachrys*) *punctipennis* (Monrós, 1951b) (MNS).
Temnodachrys (*Eudachrys*) *puntana* Monrós, 1953a (COR, MZA, SLS). Host plant: Fabaceae: *Cercidium praecox* (Ruiz & Pavon ex Hook.) Harms; (Roig-Juñent 2004).

Temnodachrys (*Eudachrys*) *pygmaea* Monrós, 1953a (JUY).
Temnodachrys (*Eudachrys*) *sympathica* Monrós, 1953a (CHA, COR, SEO).
Temnodachrys (*Eudachrys*) *taeniatoides* Monrós, 1953a (MNS).
Temnodachrys (*Eudachrys*) *trisignata* (Lacordaire, 1848) (COR, JUY, SEO, TUC).
Temnodachrys (*Eudachrys*) *trivirgata* (Lacordaire, 1848) (CAT, SAL). Host plant: Astaeraceae (Monrós 1947).
Temnodachrys (*Eudachrys*) *vianai* Monrós, 1953a (MNS).
Temnodachrys (*Eudachrys*) *willinki* Monrós, 1953a (CHA, COR, FOR, MNS, MZA, SAL, SEO, SFE, TUC). Host plant: Fabaceae: *Prosopis* sp. (Monrós, 1953a).
Temnodachrys (*Eudachrys*) *wygodzinskyi* Monrós, 1953a (JUY).
Temnodachrys (*Eudachrys*) *xerophila* Monrós, 1953a (FOR, SEO, LRA, COR, SLS). Host plant: Solanaceae: *Solanum eleagnifolia* Cav. (Quillo) (Monrós, 1953a).

Temnodachrys (*Temnodachrys*) Monrós, 1953

Type species. *Temnodachrys aeneofasciata* (Lacordaire, 1848), designated by Monrós (1953b: 49).

Diagnosis. Frons with deep transverse sulcus; body shape subrectangular.

Distribution. Seven species, from northern Brazil (one species) to central Argentina (six species).

Remarks. The characters mentioned by Guérin (1952) in the original description of *Dachrys argentina*, are sufficient to transfer this species to this subgenus. The author mentioned the presence of a deep transverse sulcus in interocular region. Secondly, sides of the prothorax are much less convergent that expected and pronotal and elytral coloration pattern does not fit *Dachrys*. In addition, distribution of *Dachrys* is limited to Chile and southern Argentina, while Jujuy is the northernmost province. Finally, Guérin indicated the similarity with *T.* (*T.*) *signatipennis* (Lacordaire), and *Dachrys gracilis* Harold [=*T.* (*T.*) *aeneofasciata* (Lacordaire)].

Argentinian species checklist.

Temnodachrys (*Temnodachrys*) *argentina* (Guérin, 1952), **comb n.** (JUY).
= *Dachrys argentina* Guérin, 1952.

Temnodachrys (*Temnodachrys*) *aeneofasciata* (Lacordaire, 1848) (BAS, CHA, COR, CTS, ERS, FOR, JUY, LPA, MNS, MZA, NQN, SAL, SEO, SFE, TUC). Host plant: Fabaceae: *Sesbania marginata*, *Sesbania virgata*, and *Prosopis algarrobilla* (Monrós 1953a); *Prosopis caldenia* (Aravena 1974); *Prosopis affinis*. (Monrós 1953a).
= *Dachrys gracilis* Harold, 1875.
= *Dachrys aeneofasciata* Lacordaire, 1848.

Temnodachrys (*Temnodachrys*) *aphodiodes* (Lacordaire, 1848) (BAS, COR, ERS, LPA, MNS, SFE). Host plant: Fabaceae: *Mimosa farinosa* (Monrós 1953a).

Temnodachrys (*Temnodachrys*) *hybrida* Monrós, 1953a (ERS).

Temnodachrys (*Temnodachrys*) *neffi* Moldenke, 1981 (CAT). Host plant: Fabaceae: *Prosopis torquata* (Cavanilles ex Lagasca) D.C., *Prosopis chilensis* (Molina) Stuntz emend.; *Mimosa farinose* Griseb, *Mimosa ephedroides* (Gillies ex Hook. & Arn.) Benth.

Temnodachrys (*Temnodachrys*) *pauperrima* Monrós, 1953a (JUY, SAL, CHA, LRA).

Temnodachrys (*Temnodachrys*) *quichua* Monrós, 1953a (JUY, SAL).

Temnodachrys (*Temnodachrys*) *signatipennis* (Lacordaire, 1848) (JUY, SAL, FOR, MNS, TUC, SEO, CAT, COR, LRA, CTS, SFE, SLS, BAS). Host plants: Fabaceae: *Acacia caven* (Mol.) Mol. (Monrós 1953a); *Piptadenia macrocarpa* Benth and *Piptadenia cebil* (Griseb.) (Jolivet, 1978); *Sesbania virgata* (Cav.) Argentina / (Monrós 1953a); *Anadenanthera colubrina var cebil* (Vell. Conc.) Brenan Argentina / (Jolivet 1978; Hayward 1944).

Urodera Lacordaire, 1848

Fig. 15

Urodera Lacordaire 1848: 449; Chapuis 1874: 149; Jacoby 1880: 34–35; Jacoby and Clavareau 1906: 72; Clavareau 1913: 83; Leng 1920: 288; Guérin 1943: 80–81; Blackwelder 1946: 638; Monrós 1953a: 232–233; Moldenke 1970: 114, 1981: 112.

Note. Moldenke (1981) divided this genus into five subgenera (including the nominotypic one). Two of these subgenera are present in Argentina, plus two species regarded by Moldenke (1981) as *incertae sedis*.

Urodera (*Austrurodera*) Moldenke, 1981

Moldenke 1981: 113.

Type species. *Urodera quadrisignata* Lacordaire, 1848, designated by Moldenke (1981: 113).

Diagnosis. Posterior margin of pronotum broadly expanded, forming distinct scutellar lobe usually bounded by acute angles; scutellum posteriad humeral callus, scutellum nearly as long as length of posterior lobe of pronotum; aedeagus with broad weakly-sclerotized dorsal medial flap.

Distribution. Argentina, Brazil, Colombia, Costa Rica, Guatemala, Panama, Paraguay, and Venezuela.

Remarks. Moldenke (1981) subdivided this subgenus into two groups. Argentinian species belong to type II group, which are characterized by having protibiae twice carinate on posterolateral surface; and antennomere IV $^{1}/_{3}$ - $^{3}/_{4}$ times width of V.

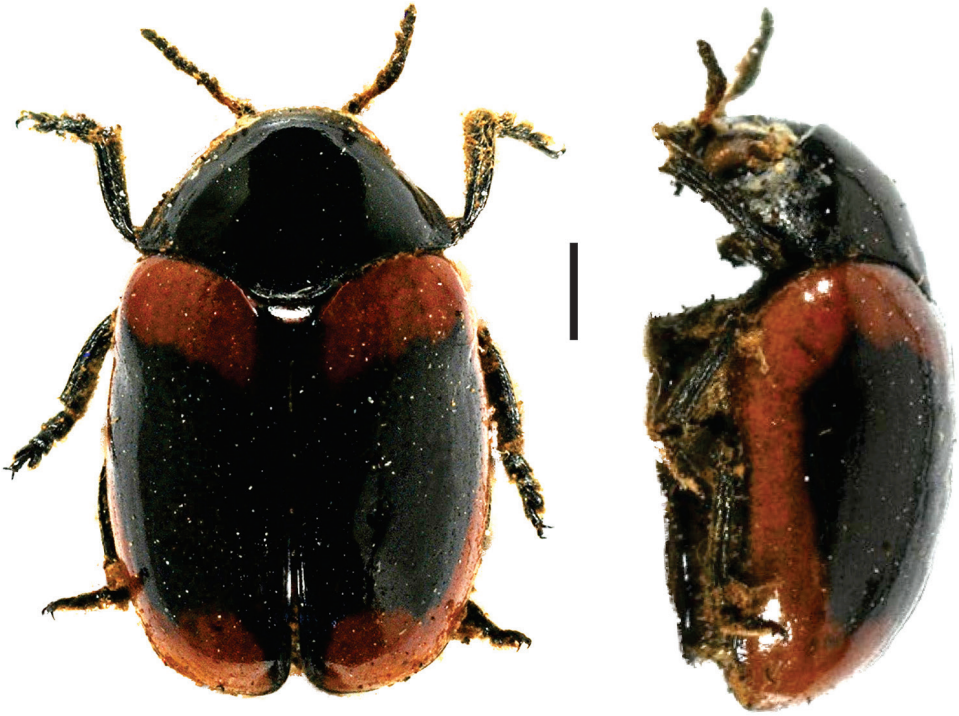

Figure 15. *Urodera* (*Austrurodera*) *circumcincta circumcincta* Lacordaire [(3)], left: habitus (dorsal view), right: habitus (lateral view).

Argentinian species checklist.

1a. *Urodera* (*Austrurodera*) *circumcincta circumcincta* Lacordaire, 1848 (MNS, CTS, CHA, JUY).

1b. *Urodera* (*Austrurodera*) *circumcincta circumducta* Lacordaire, 1848 (MNS, CTS, CHA).

= *Urodera circumducta* Lacordaire, 1848

2. *Urodera* (*Austrurodera*) *monrosi* Moldenke, 1981 (MNS).

Urodera (*Stereomoides*) Moldenke, 1981

Moldenke 1981: 114.

Type species. *Stereoma tetraspilota* Lacordaire, 1848, designated by Moldenke (1981: 113).

Diagnosis. Scutellum length 1.5x or more than length of posterior lobe of pronotum; frons of male with deep medial depression; dorsal region of aedeagus with very prominent row of setae, no cleft, ventral lobe absent, apex of aedeagus extraordinarily truncate.

Distribution. Argentina, Bolivia, Brazil, Paraguay, and Peru.

Argentinian species checklist.

Urodera (*Stereomoides*) *neffi* Moldenke, 1981 (CAT). Host plant: Asteraceae: *Baccharis* sp.

Urodera (*Stereomoides*) *tetraspilota* (Lacordaire, 1848) (MNS, SAL).
= *Stereoma tetraspilota* Lacordaire, 1848.

Urodera incertae cedis by Moldenke (1981)

1. *Urodera lanuginosa* Monrós, 1953a (SEO, SFE).
2. *Urodera crucifera crucifera* Lacordaire, 1848 (*sensu* Monrós) (JUY, SAL, TUC).
   = *Urodera hoepfneri* Lacordaire, 1848.
   = *Urodera chevrolati* Lacordaire, 1848.

Subtribe Ischiopachina Chapuis, 1874

As mentioned above, further studies are necessary to clarify the relationships of Arateina and Ischiopachina with the remaining subtribes.

Ischiopachys Chevrolat, 1836

Fig. 16

Ischiopachys Chevrolat in Dejean 1836: 440; Lacordaire 1848: 468–469; Chapuis 1874: 153; Jacoby 1880: 37; Jacoby and Clavareau 1906: 75–76; Clavareau 1913: 85; Guérin 1943: 90; Blackwelder 1946: 639; Monrós 1953a: 263–264, 1953b: 46; Moldenke 1970: 190.

Type species. *Ischiopachys bicolor* (Olivier, 1791), designated by Monrós (1953b: 46).

Diagnosis. This genus has several diagnostic characters that clearly separate it from all other Neotropical Clytrini: scutellum inclined posterodorsally, distinctly protruding from the plane of elytra; intercoxal prosternal process nearly absent between fore coxae; epipleural margin broadly angled, tip rounded; elytra without pubescence; frons with medial pit, densely and coarsely punctate throughout; pygidium strongly convex; pronotum with lateral margins sulcate to receive antennae in repose; dorsum brilliant metallic.

Distribution. From Mexico to Argentina.

Argentinian species checklist.

1a. *Ischiopachys cribipennis cribipennis* Lacordaire, 1848 (CTS). Host plant: *Sfolocalyx*? and *curupatí* (Monrós, 1953a).

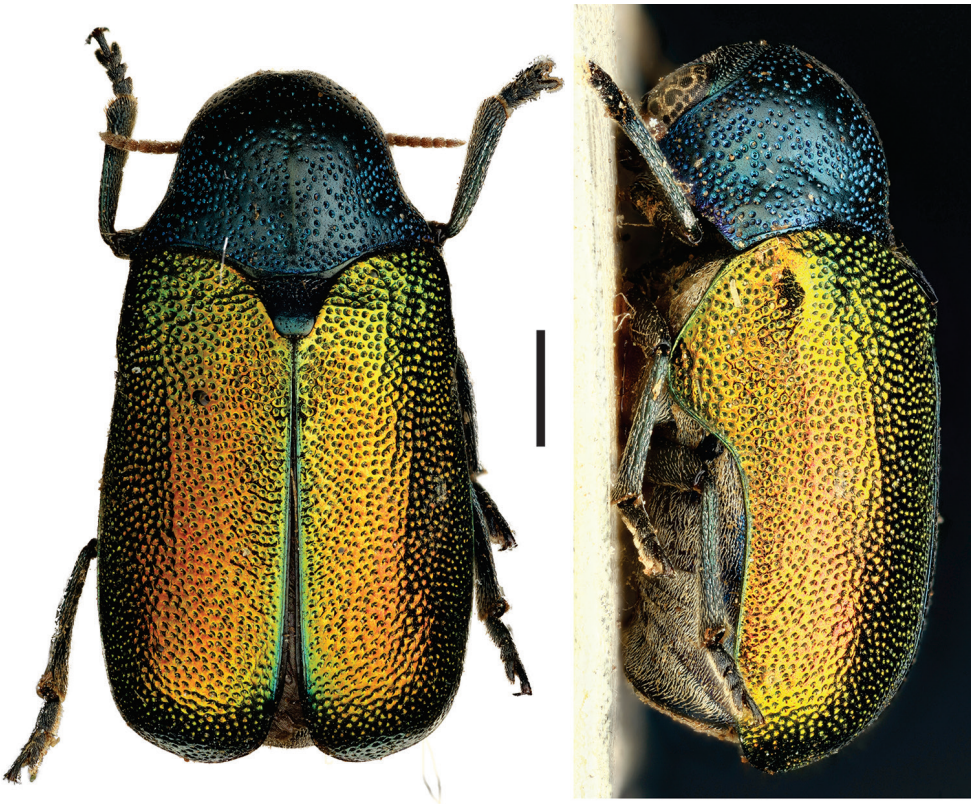

Figure 16. *Ischiopachys cribipennis cribipennis* Lacordaire [(2)], left: habitus (dorsal view), right: habitus (lateral view).

1b. *Ischiopachys cribipennis micans* Lacordaire, 1848 (CHA, CTS, ERS, FOR, JUY, MNS, SAL, SEO, SFE, TUC). Host plants: Fabaceae: *Prosopis* sp.; *Piptadenia* sp.; *Caesalpinia* sp.sp. (Monrós, 1953a). Rutaceae: *Citrus* sp. (Naranjo) (Monrós, 1953a).
Ischiopachys micans Lacordaire, 1848.

2. *Ischiopachys empyrea empyrea* Lacordaire, 1848 (TUC, SAL).
= *Ischiopachys empyrea smaragdina* Monrós, 1953a.

Subtribe Megalostomina Chapuis, 1874

Major classification changes in Megalostomina were implemented based on the development of sexual dimorphic characters, especially as they relate to head modifications in males (Agrain and Roig-Juñent 2011). The monophyly of the subtribe is well supported by a set of synapomorphies, including external morphology and genitalia (Agrain and Roig-Juñent 2011).

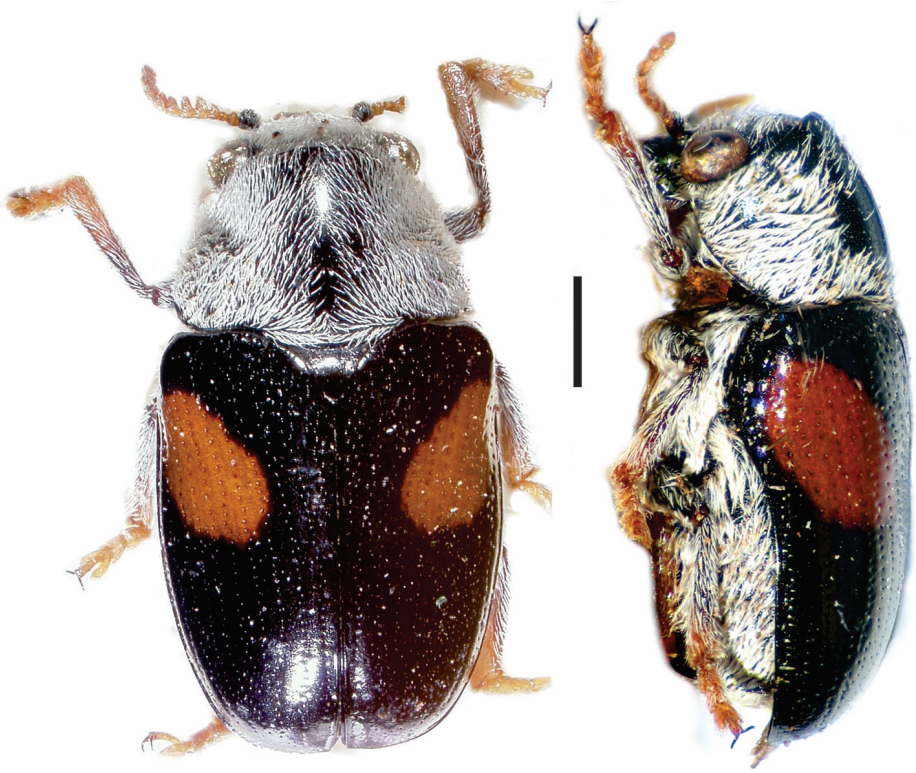

Figure 17. *Coscinoptera albopilosa* (Monrós) [(1)], left: habitus (dorsal view), right: habitus (lateral view).

Coscinoptera Lacordaire, 1848

Fig. 17

Coscinoptera Lacordaire 1848: 511; Chapuis 1874: 139; Jacoby 1880: 31; Horn 1892: 12–13; Jacoby and Clavareau 1906: 62–63; Clavareau 1913: 77; Leng 1920: 288; Guérin 1943: 32–33; Blackwelder 1946: 637; Monrós 1951a: 1150–1151; Monrós 1953a: 114–115; Moldenke 1970: 41, 1981: 89.

Type species. *Coscinoptera desmiphora* Lacordaire, 1848, designated by Monrós (1953a: 114).

Diagnosis. This genus can be separated from *Euryscopa* by the lack of bilobed lacinia and the elytra with confused punctation, in some cases exceedingly coarsely and deeply punctate. Other useful diagnostic characters are: head moderately prominent, covered with dense fine punctation and silky pubescence; male head as long as wide; eyes round and salient; prothorax transverse, pronotal disc as high as long; scutellum often coarsely punctate and always with dense white pubescent; elytra either metallic unicolored and glabrous or black; ventrites usually covered with exceedingly dense white pubescence; female anal pit normally small and only moderately depressed.

Distribution. USA to Argentina.

Remarks. As for other groups within Clytrini, it is in need of modern taxonomic revision. Several species groups have been proposed, but their monophyly has not yet been tested. Monrós (1953a), split this genus into two informal species groups, mainly based on sexual dimorphism evident in male heads. Moldenke (1970) proposed six informal species groups. Subsequently, Moldenke (1981) preserved only three of his earlier groups and transferred some species to two new genera (*Coleorozena* and *Coleothorpa*). More recently, Agrain and Roig-Juñent (2011), recovered a monophyletic clade (sister to *Megalostomis*), containing the type species of *Coscinoptera*, *Coleorozena*, and *Coleothorpa*. This clade is supported by two synapomorphies: male head as long as wide, and pronotal disc as high as long. Consequently, the latter two genera were synonymized with *Coscinoptera*. Some North American species are found in the nests of ant genera *Camponotus* Mayr and *Formica* Linnaeus. Moldenke (1981) divided this genus into three species groups and he indicated three species to be present in Argentina: *Coscinoptera euryscopoides* Monrós, and *Coscinoptera terebellum* Lacordaire within group II; and *Coscinoptera tibialis* Harold within group III.

Argentinian species checklist.

1. *Coscinoptera albopilosa* (Monrós, 1953a) (BAS, CHA, COR, ERS, MNS, SEO, SFE). Host plant: Asteraceae: *Baccharis* sp. (branches). Zygofilaceae: on flowers (Monrós, 1947).
   = *Euryscopa scapularis* Guérin, 1945; nec Lacordaire, 1848.
   Euryscopa albopilosa Monrós, 1953a.
   Coleorozena albopilosa Moldenke, 1981.
2. *Coscinoptera argentina* Burmeister, 1877 (COR, ERS, SEO).
   Euroscopa (*Coleoguerina*) *argentina*: Moldenke, 1981 (misspelled for *Euryscopa*).
3. *Coscinoptera atypica* Monrós, 1953a (MNS).
   Euroscopa (*Coleoguerina*) *atypica*: Moldenke, 1981 (misspelled for *Euryscopa*).
4. *Coscinoptera denieri* Monrós, 1953a (CHA, FOR).
   Euroscopa (*Coleoguerina*) *denieri*: Moldenke, 1981 (misspelled for *Euryscopa*).
5. *Coscinoptera dubia* Guérin, 1949 (COR, MZA, SEO).
   = *Coscinoptera argentina* Guérin, 1944, not Burmeister, 1877.
   Euroscopa (*Coleoguerina*) *dubia*: Moldenke, 1981 (misspelled for *Euryscopa*).
6. *Coscinoptera euryscopoides* Monrós, 1953a (SAL, SEO).
7. *Coscinoptera guerini* (Monrós, 1953a) (CHA, CTS, FOR, MNS).
   Coleorozena guerini: Moldenke, 1981.
   Euryscopa guerini Monrós, 1953a.
8. *Coscinoptera humeralis* Monrós, 1953a (CAT, CHA, COR, MZA, SAL) Host plant: Fabaceae: *Prosopis* sp. (Roig-Juñent, 2004).
   Euroscopa (*Coleoguerina*) *humeralis*: Moldenke, 1981 (misspelled for *Euryscopa*).
9. *Coscinoptera nigerrima* Guérin, 1945 (COR, SEO).

Euroscopa (*Coleoguerina*) *nigerrima*: Moldenke, 1981 (misspelled for *Euryscopa*).

10. *Coscinoptera obliqua* Lacordaire, 1848 (CTS).
    obliqua Lacordaire, 1848 (*incertae sedis* in Moldenke, 1981).
10. *Coscinoptera terebellum* Lacordaire, 1848 (CTS, MNS).
    Euryscopa terebellum: Monrós, 1953a.
11. *Coscinoptera tibialis* Harold, 1875 (CHA, COR, ERS, FOR, MZA, SAL TUC, SEO). Host plant: Fabaceae: *Acacia caven* (Mol.) Mol. (Monrós, 1953a).

Euryscopa Lacordaire, 1848

Euryscopa Lacordaire, 1848: 493–494; Chapuis 1874: 140; Jacoby 1880: 31–32; Horn 1892: 15–16; Jacoby and Clavareau 1906: 64; Clavareau 1913: 78; Guérin 1943: 34–35; Monrós 1953a: 102–103; Moldenke 1970: 74, 1981: 93.

Note. Moldenke (1981) divided this genus into three subgenera, one of these, *E.* (*Coleoguerina*), was synonymized by Agrain and Roig-Juñent (2011) with *Coscinoptera*. From the remaining two subgenera only one has representative species in Argentina, *E.* (*Coleomonrosa*).

Euryscopa (*Coleomonrosa*) Moldenke, 1981

Fig. 18

Type species. *Euryscopa semicincta* Lacordaire, 1848, designated by Moldenke 1981: 94.

Diagnosis. Size greater than 7mm; robust, widest at humeral angle; scutellum foveate; aedeagus occupying entire abdominal length, distinctly straight; body not metallic, eyes weakly emarginate; antennomere IV smaller than V; elytral punctation seriate or sub-seriate, without pubescence; pygidium with transverse subapical carina.

Distribution. Argentina, Brazil, Colombia, Costa Rica, French Guiana, Mexico, Peru, Suriname, and Venezuela.

Argentinian species checklist.

1. *Euryscopa* (*Coleomonrosa*) *haematoptera* Lacordaire, 1848 (MNS).
   Euryscopa haematoptera Lacordaire, 1848.
   Euryscopa (*Coleomonrosa*) *haematoptera*: Moldenke, 1981.
2. *Euryscopa* (*Coleomonrosa*) *scapularis* Lacordaire 1848 (COR, MNS). Host plant: Asteraceae:
   Baccharis sp. (Monrós 1947).
   Euryscopa scapularis (Moldenke 1981) Lacordaire, 1848.
   Euryscopa (*Coleomonrosa*) *scapularis*: Moldenke, 1981.

Figure 18. *Euryscopa* (*Coleomonrosa*) *haematoptera* Lacordaire [(1)], left: habitus (dorsal view), right: habitus (lateral view).

Megalostomis Chevrolat, 1836

Fig. 19

Megalostomis Chevrolat 1836: 416; Lacordaire 1848: 519; Blanchard 1851: 534; Chapuis 1874: 135; Gemminger and Harold 1874: 3294; Jacoby 1876: 809, 1880: 29; Horn 1892: 10; Jacoby and Clavareau 1906: 58; Clavareau 1913: 74; Bruch 1914: 348; Guérin 1943: 9; Monrós 1953a: 61, 1953b: 46; Moldenke 1970: 14, 1981: 99.

Megalostomis (*Megalostomis*) Chevrolat 1836: 416; Lacordaire 1848: 534; Chapuis 1874: 137; Jacoby and Clavareau 1906: 59; Guérin 1943: 15; Monrós 1953a: 71; Moldenke 1970: 19, 1981: 100.

=*Megalostomis* (*Minturnia*) Lacordaire 1848: 520; Chapuis 1874: 136; Jacoby and Clavareau 1906: 60; Guérin 1943: 11; Monrós 1953a: 62; Moldenke 1970: 19, 1981: 100; Agrain and Roig-Juñent 2011: 672, 695 (SYN).

=*Megalostomis* (*Heterostomis*) Lacordaire 1848: 554; Chapuis 1874: 138; Jacoby and Clavareau 1906: 60; Guérin 1943: 27; Monrós 1953a: 78; Agrain and Roig-Juñent 2011: 672, 695 (SYN).

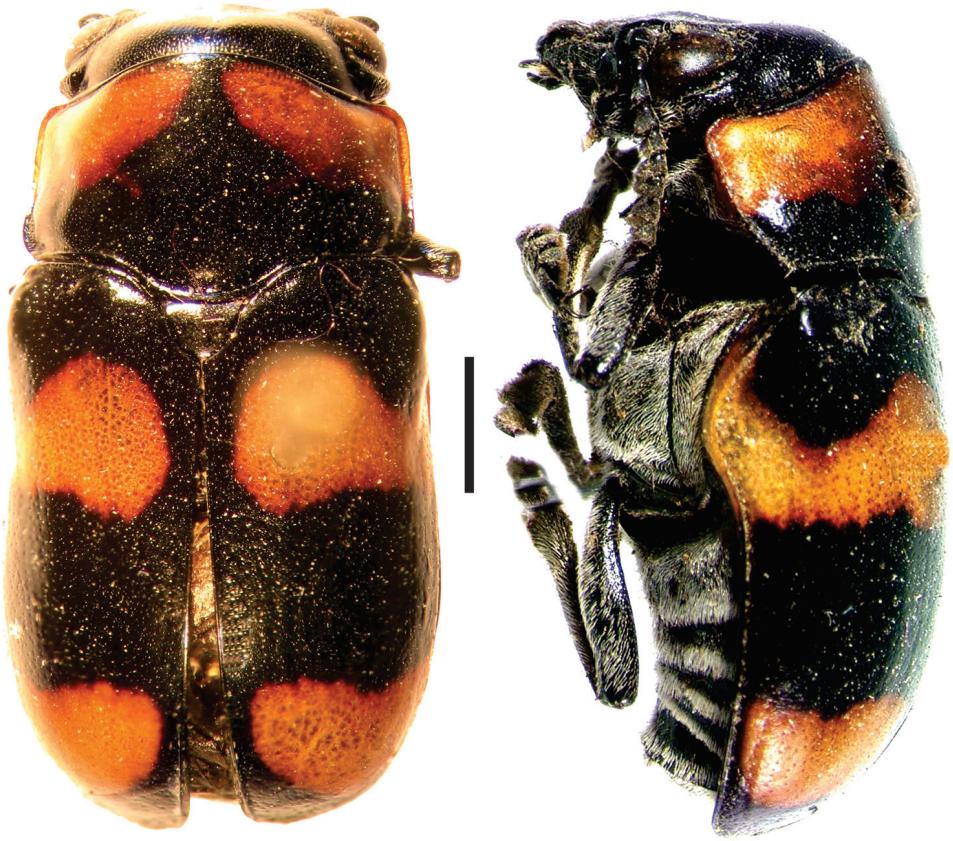

Figure 19. *Megalostomis grossa* (Forsberg) [(1)], left: habitus (dorsal view), right: habitus (lateral view).

=*Megalostomis* (*Scaphigenia*) Lacordaire 1848: 547; Chapuis 1874: 137; Jacoby and Clavareau 1906: 60; Clavareau 1913: 75; Achard 1926: 148; Guérin 1943: 24; Monrós 1953a: 88; Seeno and Wilcox 1982: 33; Agrain et al. 2007: 340; Agrain and Roig-Juñent 2011: 672, 695 (SYN).

=*Megalostomis* (*Pygidiocarina*) Moldenke 1970: 26, 1981: 83; Agrain and Roig-Juñent 2011: 672, 695 (SYN).

=*Megalostomis* (*Coleobyersa*) Moldenke 1981: 101; Agrain and Roig-Juñent 2011: 672, 695 (SYN).

=*Megalostomis* (*Snellingia*) Moldenke 1981: 101; Agrain and Roig-Juñent 2011: 672, 695 (SYN).

Type species. *Clythra boopis* (Germar, 1824) [= *Megalostomis grossa* (Forsberg 1821)], subsequent designation by Monrós 1953b: 46.

Diagnosis. Among the species of *Megalostomis*, several morphological differences exist and the head and thorax are highly variable, therefore, the most useful

morphological characters are: presence of a carina in the inter-ocular area, development of anterior teeth on the mandibles, clypeus sculpture, and the degree of retraction of the head inside the prothorax. The thorax may have strong constrictions, which are often present in those species showing great development of the head and mouthparts. The elytra are also variable; the most distinctive characters are the coloration pattern and the ordering of the elytral punctation. Although also variable, the abdomen and legs are not especially useful for the recognition of species groups. The pygidium may possess distinct sculpture patterns, which are useful to diagnose among species.

Distribution. *Megalostomis* distribution includes North, Central and South America, especially diverse in xeric temperate or subtropical zones.

Remarks. This genus was revised by Agrain (2013). *Megalostomis* now includes 43 species (Agrain 2014), 13 of them present in Argentina. According to Agrain and Roig-Juñent (2011) this genus is supported by two synapomorphies: eyes strongly emarginated and dorsal plate of aedeagus with straight margin. The morphology in the genus is highly variable, especially for sexual dimorphic features such as: a greater development of mandibles, the presence of constrictions on the pronotal disc, development of double infraocular projection and lengthening of forelegs (Agrain 2013).

Argentinian species checklist.

1. *Megalostomis analis* (Forsberg, 1821) (COR, CTS, FOR, MNS, SEO).
   = *Clythra analis* Forsberg, 1821.
   = *Clythra bicincta* Germar, 1824.
   = *Megalostomis bicincta* Germar 1824.
   Megalostomis (*Heterostomis*) *analis*: Lacordaire, 1848.
   = *Megalostomis* (*Heterostomis*) *analis* var *seminigra* Achard, 1926.
   = *Megalostomis* (*Heterostomis*) *analis* var *lateralis* Achard, 1926.
2. *Megalostomis consimilis* Achard, 1926 (CAT, CHA, COR, CTS, FOR, JUY, LRA, MZA, SAL, SEO, SLS, TUC). Host plants: Fabaceae: *Prosopis algarrobilla* (Roig-Juñent 2004), *Prosopis affinis* (Roig-Juñent 2004), *Prosopis* sp. (Viana and Williner 1974).
   Megalostomis (*Scaphigenia*) *consimilis*: Agrain et al., 2007.
   = *Megalostomis* (*Scaphigenia*) *cornuta* Monrós, 1945 (nec Lacordaire, 1848).
   Megalostomis (*Scaphigenia*) *cornuta consimilis*: Monrós 1956a.
3. *Megalostomis cornuta* Lacordaire, 1848 (COR, SAL, SEO).
   = *Megalostomis cornuta* Dejean, 1836 (*nomen nudum*).
   Megalostomis (*Scaphigenia*) *cornuta* Lacordaire, 1848.
   = *Megalostomis* (*Scaphigenia*) *cornuta* var. *baeri* Achard, 1926.
   = *Megalostomis* (*Scaphigenia*) *cornuta* var. *obliterate* Achard 1926.
   = *Megalostomis* (*Scaphigenia*) *cornuta* var. *divisa* Guérin, 1949.
4. *Megalostomis gazella* Lacordaire, 1848 (CAT, CHA, COR, CTS, ERS, FOR, JUY, LPA, LRA, MNS, MZA, SAL, SEO, SFE, SJN, SLS, TUC). Host plants: Fabaceae: *Prosopis* sp.; *Acacia* sp. (Monrós 1953a); *Prosopis caldenia* (Aravena

1974), *Prosopis flexuosa* (Roig-Juñent 2004). Ant hosts: Colonies of *Camponotus* sp. (Monrós 1953a, as Dr. Oblobin pers. comm.)
Megalostomis (*Scaphigenia*) *gazella* Lacordaire, 1848.
= *Megalostomis* (*Scaphigenia*) *gazella* var. *clavapex* Achard, 1926.
= *Megalostomis* (*Scaphigenia*) *gazella* var. *flavapex*: Monrós, 1953a (misspelling pro clavapex).
= *Megalostomis* (*Scaphigenia*) *gazella* var. *nigrapex* Achard, 1926.
= *Megalostomis* (*Scaphigenia*) *gazella* var. *nigrescens* Achard, 1926.
= *Megalostomis meretrix* Lacordaire, 1848.
= *Megalostomis bicingulata* Lacordaire, 1848.

5. *Megalostomis grossa* (Forsberg, 1821) (COR, CTS, FOR, JUY, MNS) .
= *Clythra grossa* Forsberg, 1821.
= *Clythra boopis* Germar, 1824.
= *Megalostomis boopis*: Dejean, 1836.
= *Megalostomis interrupta* Dejean, 1836 (*nomen nudum*).
Megalostomis (*Megalostomis*) *grossa* Lacordaire, 1848.
= *Megalostomis* (*Megalostomis*) *grossa brasiliana* Achard, 1926.
= *Megalostomis* (*Megalostomis*) *grossa cinctipennis* Achard, 1926.
= *Megalostomis grossa* var. *boopis* Achard, 1926.
= *Megalostomis grossa* var. *quadrimaculata* Achard, 1926.

6. *Megalostomis kollari* Lacordaire, 1848 (COR, MNS).
Megalostomis (*Scaphigenia*) *kollari* Lacordaire, 1848.

7. *Megalostomis lacordairei* Lacordaire, 1848 (CAT, CHA, CTS, FOR, LRA, MNS, MZA, SAL, SEO, SFE, SJN, SLS, TUC). Host plants: Fabaceae (Monrós 1953a) *Cercidium praecox* (Brea); *Prosopis* sp.; *Geoffroea decorticans* (Chañar) (Viana and Williner 1974); *Acacia caven* (Mol.) Mol. (Viana and Williner 1974); *Senna aphylla* (Agrain and Marvaldi 2009); *Prosopis* sp. and Verbenaceae (Cordo and DeLoach 1995): *Aloysia gratissima*. Zygophyllaceae: *Bulnesia retama* (Common name in Argentina: Retamo, in Peru: Calato).
= *Megalostomis lacordairei* Dejean, 1836 (*nomen nudum*).
Megalostomis (*Heterostomis*) *lacordairei* Lacordaire, 1848.
= *Megalostomis* (*Heterostomis*) *histrionica* Harold, 1875.
= *Megalostomis* (*Heterostomis*) *lacordairei* var. *seminigra* Achard, 1926.
= *Megalostomis lacordairei* var. *basalis* Achard, 1926.
= *Megalostomis lacordairei* var. *collaris* Achard, 1926.
= *Megalostomis lacordairei* var. *conjuncta* Achard, 1926.
= *Megalostomis lacordairei* var. *consimilis* Achard, 1926.
= *Megalostomis lacordairei* var. *histrionica* Achard, 1926.
= *Megalostomis lacordairei* var. *interrrupta* Achard, 1926.
= *Megalostomis lacordairei* var. *reducta* Achard, 1926.

8. *Megalostomis querula* Lacordaire, 1848 (CTS, ERS) Host plants: Salicaceae: *Caesaria sylvestris* (Guacatonga or wild coffee) (Agrain 2013).

Megalostomis (*Minturnia*) *querula* Lacordaire, 1848.
= *Megalostomis* (*Minturnia*) *propinqua* Lacordaire, 1848.
= *Megalostomis* (*Minturnia*) *univittata pacifica* Monrós, 1953a.

9. *Megalostomis religiosa* Lacordaire, 1848 (CTS, MNS).
= *Megalostomis religiosa* Dejean, 1836 (*nomen nudum*).
Megalostomis (*Scaphigenia*) *religiosa* Lacordaire, 1848.
= *Megalostomis distincta* Lacordaire, 1848.

10. *Megalostomis robustipes* Monrós, 1953a (MNS).
=*Megalostomis* (*Minturnia*) *robustipes* Monrós, 1953a.

11. *Megalostomis tricincta* (Germar, 1824) (CTS, MNS).
= *Clythra tricincta* Germar, 1824.
Megalostomis (*Megalostomis*) *tricincta*: Lacordaire, 1848.
= *Megalostomis* (*Scaphigenia*) *bubalus* Lacordaire, 1848.
= *Megalostomis* (*Scaphigenia*) *religiosa* Monrós, 1945 (nec Lacordaire, 1848).
= *Megalostomis* (*Scaphigenia*) *bubalus bubaloides* Monrós, 1953a.

12. *Megalostomis univittata* Lacordaire, 1848 (MNS, SAL).
= *Megalostomis* (*Minturnia*) *univittata univittata* Lacordaire, 1848.
= *Megalostomis* (*Minturnia*) *univittata oblita* Monrós, 1953a.

13. *Megalostomis vianai* Monrós, 1947 (MNS).
Megalostomis (*Minturnia*) *vianai* Monrós, 1947.

Themesia **Lacordaire, 1848**

Fig. 20

Themesia Lacordaire 1848: 517-518; Chapuis 1874: 138; Jacoby and Clavareau 1906: 62; Clavareau 1913: 77; Guérin 1943: 30; Monrós 1953a: 130; Moldenke 1970: 12.

Type species. *Themesia auricapilla* (Germar, 1824), designated by Monrós 1953a: 130.

Diagnosis. This genus is close to *Coscinoptera*, from which it can be separated by its unicolored metallic green/blue coloration (except in *T. costaricensis* and *T. lacordairei*, not present in Argentina) and by its distinct body shape. Eyes large, non-emarginate and distinctly protruding; elytra glabrous without distinct punctation pattern, epipleurae reduced; pygidium flat; antennomere IV much smaller than V, not clavate; ventrites densely pubescent.

Distribution. From Costa Rica to Colombia, and in Brazil, Paraguay, and Argentina.

Argentinian species checklist.

1. *Themesia auricapilla grandis* Baly, 1877a (CTS, MNS, TUC).
Themesia grandis Baly, 1877a.

Figure 20. *Themesia auricapilla grandis* Baly [(1)], left: habitus (dorsal view), right: habitus (lateral view).

Tribe Cryptocephalini Gyllenhal, 1813

The most common characters to differentiate this tribe are the procoxae globose, distinctly separated by intercoxal prosternal process. In males of many species of *Cryptocephalus* (Cryptocephalina) and *Griburius* (Pachybrachina) the dorsal lobes of the eyes are strongly converging towards the median line and may come into contact with each other. Phylogenetic significance (if any) of this trait is unclear. The antennae are long and filiform in most genera, often reaching the humeral callus or further, although there are exceptions (eg. clavate in Fulcidacini).

Subtribe Cryptocephalina Gyllenhal, 1813

The most distinctive character is the crenulate, not margined, base of pronotum. Some characters present variation, such as the tarsal claws which may be simple or appendiculate, or antennae, which may be short and clavate to subserrate.

***Cryptocephalus* Geoffroy, 1762**
Fig. 21

Cryptocephalus Geoffroy, 1762: 231 (conserved name); Chevrolat 1836: 422; Saunders 1845: 142; Redtenbacher 1845: 118; Gistel 1848: 123; Haldeman 1849: 170; Stål 1857: 61; Chapuis 1874: 184; Jacoby 1880; 42; Baly 1877b: 32; Burmeister 1877: 64; Burlini 1953: 75; Lopatin 1965: 452; White 1968: 24; Blackwelder 1946: 644.
Cryptocephalus Müller, 1764 (subsequent use).
= *Physicerus* Chevrolat, 1836.
= *Strigogophorus* Chevrolat, 1836 (nomen nudum).
= *Dicenopsis* Saunders, 1842.
= *Mitocera* Saunders, 1842.
= *Ochrosopsis* Saunders, 1843.
= *Anodonta* Saunders, 1845, not Lamarck 1799 (Mollusca).
= *Idiocephala* Saunders, 1845.
= *Ochrosopsus*: Saunders, 1845 (error).
= *Canthostethus* Haldeman, 1849.
= *Mecostethus* Stål, 1857.
= *Euphyma* Baly, 1877c.

Type species. *Chrysomela sericea*, designated by Latreille 1810: 432.

Diagnosis. Anteriorly flat head, deeply inserted into the prothorax; eyes reniform; leading edge of prothorax laterally straight; denticles present on posterior margin of pronotum; thorax closely fitted to base of elytra (thus sometimes concealing denticles); anterior margin of intercoxal prosternal process uniformly concave or with medial flange; intercoxal width equal to or greater than width of coxal cavity; ventrite I of male without spines. Rectal apparatus bearing one ventral and two dorsal sclerites.

Distribution. Worldwide, with over 1700 species (Chamorro 2014b), with nine species cited for Argentina.

Remarks. Although a complex subgeneric classification does exist for Palearctic species (Schöller 2002), new world species including Argentinian, have not yet been assigned to subgenera.

Argentinian species checklist.
1. *Cryptocephalus acuminatus* Jacoby, 1907 (TUC).
2. *Cryptocephalus argentinus* Jacoby, 1907 (BAS).
3. *Cryptocephalus carbonarius* Burmeister, 1877 (BAS).
4. *Cryptocephalus fusculus* Suffrian, 1863 (BAS).
5. *Cryptocephalus incommodus* Suffrian, 1863 (BAS).
6. *Cryptocephalus misellus* Suffrian, 1857 (BAS, CTS).
7. *Cryptocephalus tucumanensis* Jacoby, 1907 (TUC).
8. *Cryptocephalus subaenescens* Jacoby, 1907 (TUC).

Figure 21. *Cryptocephalus carbonarius* Burmeister [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Subtribe Monachulina Leng, 1920

The members of this subtribe have the intercoxal prosternal process noticeably wider than long; tarsal claws appendiculate; antennae are usually short (rarely longer than base of pronotum) and antennomeres expanded laterally.

Lexiphanes Gistel, 1848

Fig. 22

Lexiphanes Gistel, 1848: 123; Balsbaugh 1966: 660.
= *Monachus* Chevrolat 1836 (not Kaup 1829, not Flemming 1822).
= *Monachulus* Leng 1918.

Type species. *Cryptocephalus saponatus* Fabricius [= *Lexiphanes saponatus* (Fabricius)], designated by Balsbaugh (1966: 660).

Diagnosis. *Lexiphanes* may be most commonly confused with *Stegnocephala* and less so with *Cryptocephalus*. Both genera in Monachulina have shorter antennae (rarely surpassing half of entire body length) with antennomeres anteriorly expanded (less so in

Figure 22. *Lexiphanes consimilis* (Suffrian) [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Lexiphanes). Also, the intercoxal prosternal process is wide and bilobed with small lateral projections and the anterior margin of intercoxal prosternal process uniformly concave (Chamorro-Lacayo and Konstantinov 2004). *Lexiphanes* can be distinguished from *Stegnocephala* by the more uniform rounded shape of the pronotum, which lacks basolateral depressions. The prothoracic anterior opening in *Lexiphanes* has a circumference, best viewed anteriorly, with the dorsal and ventral margins on the similar vertical plane (in lateral view). In general, *Stegnocephala* is larger, more robust, and colorful than *Lexiphanes*.

Distribution. This genus is restricted to the New World, from México to Argentina with over 100 species. 11 of which are present in Argentina.

Remarks. Balsbaugh (1966) revised the North American species of this genus. The limits of the subtribe, genera, and species need revision. Information is lacking for Central and South American species that are known only from their original descriptions in the 19th century. The presence of denticles on the posterior margin of pronotum is shared with Cryptocephalina, therefore Monachulina may not be a natural group, and may be a synonym of Cryptocephalina. This hypothesis remains to be tested.

Argentinian species checklist.

1. *Lexiphanes anthracinus* (Burmeister, 1877) (Patagonia, RNO).
2. *Lexiphanes biplagiatus* (Boheman, 1858) (BAS, CTS).
3. *Lexiphanes coenobita* (Suffrian, 1863) (TUC).
4. *Lexiphanes consimilis* (Suffrian, 1863) (BAS).
5. *Lexiphanes ebeninus* (Burmeister, 1877) (SCZ).

Figure 23. *Stegnocephala xanthopyga* (Suffrian) [(2)], left: habitus (dorsal view), right: habitus (lateral view).

6. *Lexiphanes flavifrons* (Burmeister, 1877) (Patagonia, SCZ).
7. *Lexiphanes granarius* (Suffrian, 1863) (Argentina).
8. *Lexiphanes modestus* (Boheman, 1858) (Argentina).
9. *Lexiphanes nigritulus* (Boheman, 1858) (BAS).
10. *Lexiphanes ornatipennis* (Jacoby, 1908) (TUC).
11. *Lexiphanes saucius* (Burmeister, 1877) (BAS).

***Stegnocephala* Baly, 1877**
Fig. 23

Stegnocephala Baly 1877b: 32; Jacoby 1889: 122; Clavareau 1913: 113; Bruch 1914: 352.

Type species. *Cryptocephalus hemixanthus* Suffrian, by original designation.

Diagnosis. Coxa widely separated, epipleural lobes strongly produced. Chamorro-Lacayo and Konstantinov (2004), provided several prothoracic characters: pronotal punctures absent; intercoxal prosternal process truncate; anterior margin of intercoxal prosternal process with a medial flange, or two submedial flanges.

Distribution. From Costa Rica to Argentina, mainly in tropical regions.

Remarks. Weise (1921) disagreed with the separation of this genus from *Cryptocephalus*. White (1968), interpreted Weise's comment as the synonymyzation of *Stegnocephala* with *Cryptocephalus*. Since Weise (1921) only provided morphological differences of *Cryptocephalus perplexus* Suffrian, which is not the type species of the genus, we still consider *Stegnocephala* as a valid genus. Chamorro is currently revising the genus.

Argentinian species checklist.

Stegnocephala discoidalis Baly, 1877c (MNS).

Stegnocephala xanthopyga (Suffrian, 1863) (TUC). This species newly cited for Argentina (Tucuman, Famaillá: Quebrada de Lules, 30-I-1942 // F. Monrós Collection 1959).

Subtribe Pachybrachina Chapuis, 1874

The following characters (when combined) can help with the identification of its members (Chamorro 2013): Presence of tibial spurs (absent in *Mylassa*, *Ambrotodes*, and *Griburius s. str.*); lack of denticles on the posterior margin of the pronotum (i.e. not crenulate); base of pronotum margined and bilobed sinuate (except in *Mylassa* and less or differently margined in *Ambrotodes*); coarsely punctate dorsally and ventrally including hypomeron (except *Sternoglossus*, and *Mylassa*); confused elytral punctures (except *Mylassa*; less orderly in *Griburius*, *Metallactus*); intercoxal prosternal process lobed (bilobed in other groups) and posterior margin produced caudad (less so in *Pachybrachis*; eyes visible from above (not visible from above in *Mylassa* and *Ambrotodes*; bulging, particularly in *Ambrotodes*, and *Mylassa*, in all other genera the dorsal section of the eye is generally larger than the ventral part as separated by the well developed canthus (canthus weak in *Ambrotodes*, and *Mylassa*. This subtribe is currently being revised by Davide Sassi.

Griburius Haldeman, 1849

Fig. 24

Griburius Haldeman, 1849: 245.

= *Scolochrus* Suffrian, 1852.

Type species. *Griburius scutellaris* Haldeman 1849: 245 (= *Cryptocephalus scutellaris* Fabricius, 1801), by monotypy.

Diagnosis. Recently, Chamorro (2013) provided the following characters to identify the species of this genus: posterior margin of intercoxal prosternal process rounded; lateral margin of elytra deeply excised exposing abdomen caudally, elytra length approximately 2× or less length of pronotum. However, the limits of *Griburius* and *Metallactus* are confused and require revision.

Figure 24. *Griburius cultus* (Suffrian) [(4)], left: habitus (dorsal view), right: habitus (lateral view).

Distribution. Nearctic and Neotropical.
Argentinian species checklist.
Griburius bilineolatus (Suffrian, 1866) (BAS, COR).
Griburius conspurcatus (Suffrian, 1866) (BAS).
Griburius cultus (Suffrian, 1866) (BAS).
Griburius fastidiosus (Suffrian, 1866) (BAS).
Griburius octoguttatus Burmeister, 1877 (ERS).
Griburius persimilis Burmeister, 1877 (BAS).

Figure 25. *Metallactus argentinensis* Jacoby [(4)], left: habitus (dorsal view), right: habitus (lateral view).

***Metallactus* Suffrian, 1866**
Fig. 25

Metallactus Suffrian 1866: 248; Jacoby 1907: 848.

Type species. Not yet designated.

Diagnosis. *Metallactus* includes species that lack a deeply excised lateral edge of the elytra, additionally, the following characters may be useful to segregate species

into this genus: posterior margin of intercoxal prosternal process gradually narrowing, pointed; abdomen not exposed; elytral length greater than 2× length of pronotum (Chamorro 2013).

Distribution. Neotropical.

Remarks. This genus has not been revised since its original description by Suffrian (1866) and its relationship with related genera is presently unclear (Schöller 2003, Sassi 2015). Furthermore, Jacoby (1907) indicated *Metallactus* and *Griburius* to be very problematic to define, and a lot of species can not fit well in either genera. However, a study with a new diagnosis of the genus *Metallactus*, based on a new set of effective morphological characters is in progress (Sassi, *in prep.*).

Argentinian species checklist.

1. *Metallactus albipes* Suffrian, 1866 (CTS).
2. *Metallactus albopictus* Suffrian, 1866 (BAS, COR).
3. *Metallactus argentinensis* Jacoby, 1907 (COR).
4. *Metallactus bivitticollis* (Jacoby, 1907), **comb. n.** (BAS).
5. *Metallactus divisus* Jacoby, 1907 (SFE).
6. *Metallactus generosus* Suffrian, 1866 (CTS).
7. *Metallactus inustus* Suffrian, 1866 (BAS, CTS).
8. *Metallactus luniger* Suffrian, 1866 (Argentina).
9. *Metallactus nigrofasciatus* Suffrian, 1866 (COR, SLS). Host plant: Asteraceae: carqueja (*Baccharis* sp.) (Viana and Williner 1973).
10. *Metallactus nigrovittis* Jacoby, 1907 (SFE).
11. *Metallactus patagonicus* Suffrian, 1866 (BAS, COR, MZA, RNO).
12. *Metallactus pollens* Suffrian, 1866 (CTS).

***Mylassa* Stål, 1857**

Fig. 26

Mylassa: Stål 1857: 60; Baly 1877b: 32; Jakobson 1924: 258 (placed in Pachybrachina); Monrós 1949a: 492 (placed in Cryptocephalina); Schöller and Heinig 2003: 9, = *Cryptocephalus*; Suffrian 1863: 174; Blackwelder 1946: 644; Jerez and Briones 2010: 32.

Type species. *Mylassa fasciatipennis* Stål (=*Pachybrachis crassicollis* Blanchard), designated by Jakobson 1924: 258.

Diagnosis. This genus can be easily distinguished from all others in the area by the presence of pubescence on its body and by the presence of a basal thoracic lobe with raised, thickened apex. Furthermore, it has nearly entire eyes and the rectal apparatus bears two ventral and three dorsal sclerites, with the shape of the dorsal central plate band-like (very narrow) (Reid 1990; Schöller 2008).

Distribution. This genus has eight species described form Southern Chile and Argentina, and some new species awaiting description. Species are found between 30°S and 42°S and are associated with sclerophyllous shrubs (Jerez and Briones 2010).

Figure 26. *Mylassa pectinicornis* (Suffrian) [(4)], left: habitus (dorsal view), right: habitus (lateral view).

Remarks. This genus was considered a synonym of *Cryptocephalus* by several authors, however several studies support its validity and it is hypothesized to be included in Pachybrachina (Baly 1877b; Jakobson 1924; Monrós 1949a, Schöller 2008; Jerez and Briones 2010) or in its own subtribe (Reid 1990; Chamorro and Konstantinov, unpublished data).

Argentinian species checklist.

1. *Mylassa chachallaoi* Monrós, 1949a (CHU, RNO). Host plant: Proteaceae: *Lomatia obliqua* (Monrós 1949a).

2. *Mylassa crassicollis* (Blanchard, 1851) (NQN, RNO). Host plant: Anacardiaceae: "litrenillo", *Schinus*? (Bosq 1943), *Schinus* sp. (Monrós 1949a); Betulaceae: *Betula* sp., Elaeocarpaceae: *Aristotelia* sp., and *Aristotelia maqui*, *Aristotelia chilensis* (as main food source) (Monrós 1949a), Ericaceae: *Gaultheria* sp. (Monrós 1949a), *Pernettya* sp. (Bosq 1943), Salicaceae: *Populus* sp. (Monrós 1949a).
   = *Mylassa fasciatipennis* Stål, 1857.
3. *Mylassa discariana* Monrós, 1949a (RNO). Host plant: Rhamnaceae: *Discaria* sp. (Monrós 1949a).
4. *Mylassa frigens* Monrós, 1949a (NQN).
5. *Mylassa obliquata* (Suffrian, 1863) (NQN, RNO).
6. *Mylassa pectinicornis* (Suffrian, 1866) (NQN, RNO, CHU). Host plant: Proteaceae: *Lomatia obliqua* (Monrós 1949a).

Pachybrachis **Chevrolat, 1836**

Fig. 27

Pachybrachis: Chevrolat, 1836: 420.
= *Pachybrachis* Redtenbacher, 1845.
= *Pachystylus* Rey, 1883.
Pachybrachys: Mannerheim 1843: 311. Incorrect subsequent spelling.

Type species. *Cryptocephalus hieroglyphicus* Laicharting, 1781. By subsequent designation of Jacoby 1908: 265.

Diagnosis. Posterior margin of intercoxal prosternal process relatively entire, rarely produced beyond posterior margin of prothorax; gestalt cylindrical (height of each elytron approximately 2.5 width), pronotum narrower than elytral bases combined, overall flattened not vaulted; punctation on head, prothorax and elytra evident, large; elytral punctation commonly confused (but punctation in rows not uncommon); forefemora may or may not be enlarged; mesotibiae usually with terminal spur in both sexes.

Distribution. Neartic, Neotropical, Palearctic, and Oriental regions.

Remarks. A subgeneric classification exists for Palearctic species, Neotropical species have not yet been assigned to subgenera.

Argentinian species checklist.

1. *Pachybrachis foetidus* Suffrian, 1866 (BAS)
2. *Pachybrachis gayi* Blanchard, 1851 (ARGENTINA). Host plant: Fagaceae: *Nothofagus* and *Castanea* (Jolivet, 1978).
3. *Pachybrachis mysticus* Suffrian 1866 (BAS, LPA). Host plant: Fabaceae: *Prospis caldenia* (Aravena 1974).
4. *Pachybrachis nigronotatus* Boheman, 1858 (BAS)
5. *Pachybrachis xanthogrammus* Suffrian, 1866 (CTS, ERS).

Figure 27. *Pachybrachis mysticus* Suffrian [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Tribe Fulcidacini Jakobson, 1924

= Chlamisini Gressitt, 1946

This tribe is the least diverse within Cryptocephalinae, and it is much more diverse in the Neotropics (Chamorro 2014b). Most adults resemble caterpillar droppings. Chamorro-Lacayo and Konstantinov (2009), undertook a comprehensive synoptic study of the world genera of Fulcidacini.

Aulacochlamys Monrós, 1951c

Fig. 28

Aulacochlamys Monrós, 1951c: 657; Chamorro-Lacayo and Konstantinov 2009: 66.

Type species. *Exema costicollis* Lacordaire, 1848, by original designation.

Diagnosis. The most salient feature of this genus is the presence medially on the pronotum of six elevated distinct, small, sharp, longitudinal carinae, which converge medially near the posterior margin, reminiscent of a fan. These are small beetles (less than 3 mm length), cylindrical; with antennae serrated beyond antennomere V. antennomeres III-V slightly widened, but not dilated distally; pronotal base opposite

Figure 28. *Aulacochlamys costicollis* (Lacordaire) [(2)], left: habitus (dorsal view), right: habitus (lateral view).

mesoscutellum (posterior pronotal lobe) with or without notch; intercoxal prosternal process gradually narrowing posteriorly, broadening before apex; metascutellum concealed by elytra; elytral suture completely serrate, although serration may be weak near scutellum, elytral tubercles well developed. Tibiae slightly curved, cylindrical. *Aulacochlamys* can easily be distinguished from *Chlamisus* Rafinesque by the presence of the six longitudinal carinae on its pronotum.

Distribution. Pantropical, except Australia (Monrós 1951c). Six of the 21 Neotropical species are present in Argentina.

Argentinian species checklist.

1. *Aulacochlamys costicollis* (Lacordaire, 1848) (CTS, JUY, MNS).
2. *Aulacochlamys minuta* Monrós, 1951c (MNS).
3. *Aulacochlamys pygidialis* Monrós, 1951c (MNS).
4. *Aulacochlamys radiata* Monrós, 1951c (MNS).
5. *Aulacochlamys rectecarinata* Monrós, 1951c (CTS, MNS, TUC).
6. *Aulacochlamys ultima* Monrós, 1951c (COR).

***Chlamisus* Rafinesque, 1815**
Fig. 29

Chlamisus Rafinesque, 1815: 116; Chamorro-Lacayo and Konstantinov 2009: 71.
= *Chlamys* Knoch, 1801: 122.
= *Myochlamys* Ihering, 1907.
= *Arthrochlamys* Ihering, 1904.
= *Boloschesis* Jakobson, 1924.

Type species. *Chlamys foveolata* Knoch, 1801, by subsequent designation of Navajas 1946: 244 [preoccupied by *Chlamys* Röding, 1798, Mollusca].

Diagnosis. This genus can be separated from *Exema* Lacordaire by the following characters: males without spines or spinulae on ventrite I; antennomere V nearly as large as VI; sutural serration of elytra usually incomplete (suture entire immediately following mesoscutellum); intercoxal prosternal process posteriorly pointed (narrowed), posteriorly much narrower than anterior margin (Chamorro-Lacayo and Konstantinov 2009). Intermediate size (3-8 mm length). Body usually not metallic in color; elytra without velvety spots. Antenna serrate beyond antennomeres III or IV, antennomere II slightly widened, globose, antennomere V nearly as large as 6th. Pronotum medially elevated, with various bumps and short carinae; posterior pronotal lobe with well-differentiated notch; metascutellum not exposed.

Distribution. Cosmopolitan, with over 400 species described worldwide (Monrós 1951c; Reid 1991).

Argentinian species checklist.

1. *Chlamisus achalay* Monrós, 1951c (LRA, SAL).
2. *Chlamisus aeronauticus* Monrós, 1951c (JUY, SAL, TUC).
3. *Chlamisus apricarius* (Lacordaire, 1845) (CHT, NQN, RNO).
   = *Chlamys fulvescens* Blanchard, 1851.
   = *Chlamys minuta* Philippi & Philippi, 1864.
   = *Chlamys picta* Philippi & Philippi, 1864.
4. *Chlamisus clarapex* Monrós, 1951c (MNS).
5. *Chlamisus coya* Monrós, 1951c (JUY).
6. *Chlamisus discalceatus* Monrós, 1951c (CHA).
7. *Chlamisus discipennis* (Jacoby, 1901) (MNS). Host plant: Sterculiaceae: *Waltheria americana* (Bokermann 1963).
8. *Chlamisus echinatus* (Klug, 1824) (SAL) Host plant: Euphorbiaceae: *Croton pohlianus* (Bokermann 1963).
9. *Chlamisus gibbicollis* (Lacordaire, 1848) (BAS, CHA, COR, ERS, FOR, JUY, MNS, SAL, TUC)
   = *Chlamys lebasii* Lacordaire, 1848. Host plant: Sterculiaceae: *Waltheria americana* (Bokermann 1963).
10. *Chlamisus guarani* Monrós, 1951c (CTS).

Figure 29. *Chlamisus apricarius* (Lacordaire) [(3)], left: habitus (dorsal view), right: habitus (lateral view).

11. *Chlamisus hirtus* (Kollar, 1824) (CTS, MNS). Host plants: Fabaceae, Sapindaceae, Malvaceae, Sterculiaceae, Euphorbiaceae, (Monrós 1951c).

12a. *Chlamisus hispidulus hispidulus* (Klug, 1824) (BAS, CHA, COR, FOR, JUY, LRA, MNS, SAL, SEO, SFE, SLS, TUC).
= *Chlamys cordovensis* Jacoby, 1901. Host plants: Fabaceae: *Acacia* sp., *Acacia cavenia*; Asclepiadaceae: "Tasi" (Monrós 1951c).

12b. *Chlamisus hispidulus llajtamaucanus* Monrós, 1951c (COR, LRA, MZA, SEO).

13. *Chlamisus impressus* (Fabricius, 1801) (MNS).

14. *Chlamisus inopinatus* Monrós, 1951c (CTS).

15. *Chlamisus integrithorax* Monrós, 1951c (MNS).

16. *Chlamisus kammerlacheri* (Kollar, 1824) (MNS).

17. *Chlamisus kurkuncho* Monrós, 1951c (JUY, SAL).

18. *Chlamisus langsdorfii* (Kollar, 1824) (MNS).
= *Chlamys rugosa* Klug, 1824. Host plant: Fabaceae: *Bauhinia rufa* (Bokermann, 1963).

19. *Chlamisus longicornis* Monrós, 1951c (MNS).

20. *Chlamisus melochiae* Monrós, 1951c (COR, ERS, SAL, TUC). Host plant: Malvaceae: *Sphaeralcea* sp., Sterculiaceae: *Melochia* sp. (Monrós, 1951c), *Waltheria americana* (Bokermann 1963).

21. *Chlamisus mimicus* Monrós, 1950 (BAS, COR, CTS). Host plant: Melastomaceae: *Tibouchina* sp. (Bokermann 1963).
22. *Chlamisus olivaceus* (Kollar, 1824) (FOR).
    = *Chlamys bicolor* Klug, 1824.
23. *Chlamisus pilaga* Monrós, 1951c (FOR). Host plant: Sapindaceae: *Serjaria* sp. (Monrós 1951c).
24. *Chlamisus perforatus* Monrós, 1951c (MNS).
25. *Chlamisus pilicollis* Monrós, 1951c (MNS).
26. *Chlamisus proseni* Monrós, 1951c (JUY).

27a. *Chlamisus puncticollis* (Germar, 1824) (JUY).
    = *Chlamys muhlfeldii* Kollar, 1824. Host plant: Sapindaceae: *Serjaria* sp. (Monrós, 1951c).

27b. *Chlamisus puncticollis indigaceus* (Lacordaire, 1848) (COR, MNS).

28. *Chlamisus scortillus* (Lacordaire, 1848) (CTS).
    = *Chlamys scortillum* Lacordaire 1848. Host plant: Malpighiaceae: *Banisteria laevigata*, *Banisteria campestris* and *Banisteria crotonifolia* (Bokermann 1963).
29. *Chlamisus scrobicollis* (Lacordaire, 1848) (MNS, SAL).
30. *Chlamisus sidae* Monrós, 1951c (CHA, COR, CTS, FOR, JUY, MNS, SAL, TUC). Host plant: Malvaceae: *Sida rhombifolia* (Monrós, 1951c).
31. *Chlamisus sordidulus* Monrós, 1951c (CHA, CTS, FOR, JUY, MNS, SAL, SFE, TUC).
32. *Chlamisus sulcatus* (Kollar, 1824) (MNS).
    = *Chlamys cinnamomea* Klug, 1824. Host plant: Malpighiaceae: *Heteropteris seringiifolia* (Bokermann 1963).
33. *Chlamisus tucumanus* Monrós, 1951c (JUY, SAL, TUC). Host plant: Euphorbiaceae: *Croton* sp. (Monrós 1951c).
34. *Chlamisus vianai* Monrós, 1951c (MNS).

Exema Lacordaire, 1848

Fig. 30

Exema Lacordaire, 1848: 844; Jacoby 1908: 278; Karren 1966: 647; Chamorro-Lacayo and Konstantinov 2009: 74.

Type species. *Chlamys intricata* Kollar, 1824, by subsequent designation.

Diagnosis. Small species (2–3.5 mm length), cylindrical with widest near shoulders; antenna serrate beyond antennomere V, antennomeres III-IV slightly widened, but not dilated distally; pronotum with various bumps and short ridges, posterior pronotal lobe concave, usually without well differentiated notch.

Distribution. Present in Nearctic, Neotropical, and Oriental regions (Monrós 1951c; Karren 1966). Includes 26 species, 10 represented in the Neotropics.

Remarks. Gressitt and Kimoto (1961) synonymized this genus with *Chlamisus*, yet, this decision has been ignored and is considered to be a valid genus (Karren 1966,

Figure 30. *Exema variopicta* Monrós [(2)], left: habitus (dorsal view), right: habitus (lateral view).

1972; Seeno and Wilcox 1982; Riley et al., 2003). The relationship among Fulcidacini genera remains to be studied.

Argentinian species checklist.

1. *Exema carinipennis* Monrós, 1951c (COR, MNS).
2. *Exema morio* (Kollar, 1824) (MNS).
   = *Chlamys dubia* Kollar, 1824.
   = *Chlamys globosa* Klug, 1824 (nec Kollar, 1824). Host plant: Bambuseae (Monrós 1951c).
3. *Exema serjaniae* Monrós, 1951c (CHA, FOR, SAL, TUC). Host plant: Sapindaceae: *Serjania* sp. (Jolivet 1978).
4. *Exema variopicta* Monrós, 1951c (COR, JUY, MNS, SAL, SLS). Host plant: Verbenaceae: *Lantana hypoleuca* and *Lipia salvifolia* (Bokermann 1963).

Fulcidax Voet, 1806

Fig. 31

Fulcidax Voet 1806: 33; Jacoby 1880: 90; Monrós 1951c: 641; Blackwelder 1946: 650; Seeno and Wilcox 1982: 43; Chamorro-Lacayo and Konstantinov 2009: 76.
= *Poropleura* Lacordaire 1848: 863.

Type species. *Fulcidax azureus* Voet, 1806 = *Clytra monstrosa* Fabricius, 1798, by monotypy.

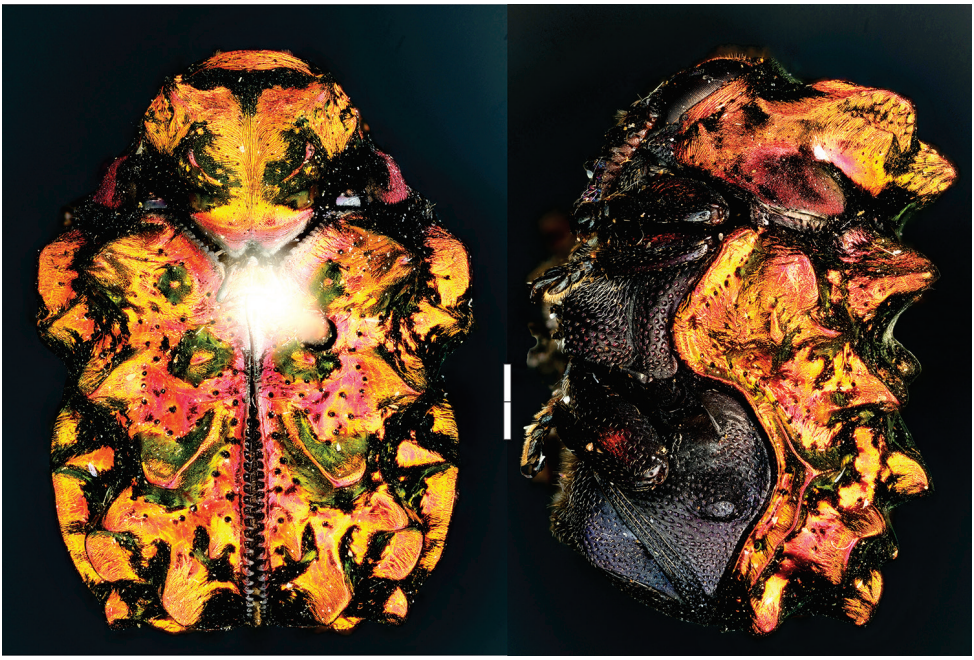

Figure 31. *Fulcidax bacca* (Kirby) [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Diagnosis. This genus includes some of the larger and more charismatic species in the group (6.5–7.2 mm length). Body subquadrate and metallic, antenna serrate beyond antennomere III; the head with a longitudinally impressed vertex; elytral tubercles pronounced; posterior pronotal lobe with an acute notch; sutural serration of elytra well-developed beyond the middle of suture towards apex; ventrite I with lateral tubercles; fore- and midtibial apices with spine; tarsal claws simple. According to Chamorro-Lacayo and Konstantinov (2009), *Fulcidax* can be distinguished from all other genera of the tribe by the longitudinally impressed vertex of the head, simple tarsal claws, large body size, and usually bright metallic coloration.

Distribution. From Mexico to Argentina, with seven species.

Remarks. This is a small genus with only seven described species (Monrós 1951c). Chamorro-Lacayo and Konstantinov (2009), mistakenly cited *Fulcidax chimaera* (Lacordaire) for Argentina, this is present in Goiaz state of Brazil.

Argentinian species checklist.

1. *Fulcidax bacca* (Kirby, 1818) (CTS, JUY, MNS, SAL, TUC). Host plants: Fabaceae: *Acacia* sp., *Prosopis* sp. (Monrós 1951c); Malpighiaceae: *Mascagnia cordifolia*, *Banisteria stellaris*, *Banisteria argyrophylla* (Bokermann 1963).

Figure 32. *Melittochlamys specula* (Klug) [(2)], left: habitus (dorsal view), right: habitus (lateral view).

***Melittochlamys* Monrós, 1948a**
Fig. 32

Melittochlamys Monrós, 1948a: 192; Fiebrig 1910: 253; Monrós 1949b: 617; Monrós 1951c: 666; Seeno and Wilcox 1982: 43; Chamorro-Lacayo and Konstantinov 2009: 80.

Type species. *Chlamys speculum* Klug 1824, by original designation.

Diagnosis. *Melittochlamys* can be separated from all other genera by the nearly rectangular prosternal process; since the process is more or less triangular in all other genera of warty leaf beetles. Intermediate size (length 3.60-5.20 mm); body shape subglobular; antenna serrate beyond antennomere III, antennomere III slightly dilated distally; pronotum without median elevation, relatively smooth; sutural serration of elytra absent or weakly developed; elytra without well developed tubercles; appendiculate tarsal claws.

Distribution. The genus include 13 Neotropical species (Chamorro-Lacayo and Konstantinov 2009).

Argentinian species checklist.

1. *Melittochlamys specula* (Klug, 1824) (MNS). Host plant: Myrtaceae: *Psidium guayaba* y *Psidium* sp. (Araça) (Bokermann 1963).

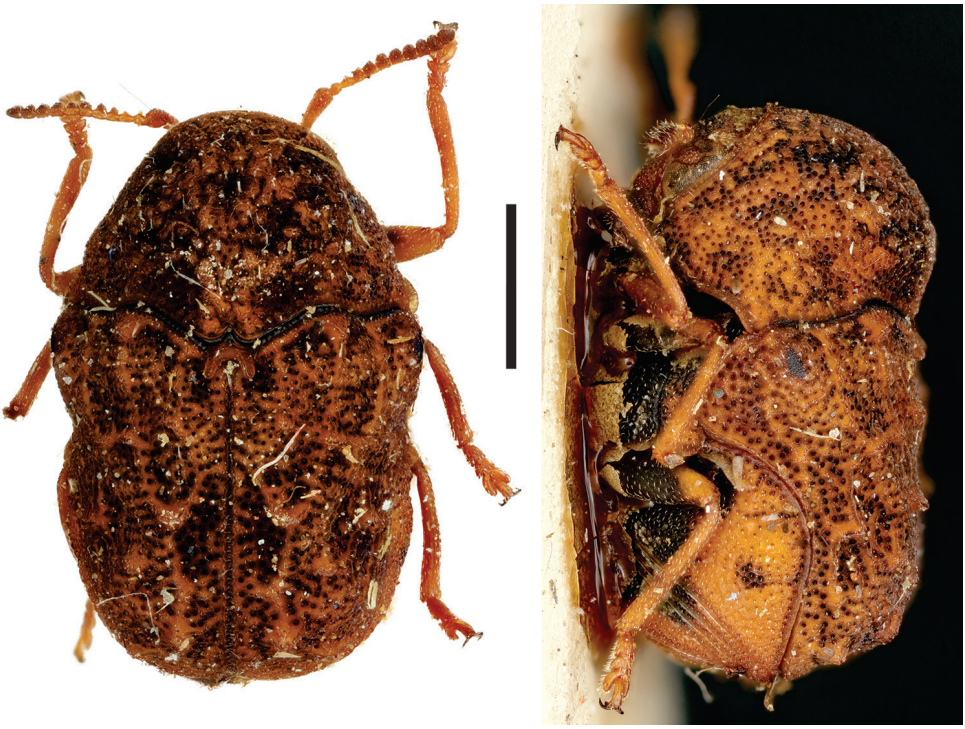

Figure 33. *Pseudochlamys seminigra* (Jacoby) [(2)], left: habitus (dorsal view), right: habitus (lateral view).

Pseudochlamys Lacordaire, 1848

Fig. 33

Pseudochlamys Lacordaire 1848:644; Clavareau 1913: 209; Blackwelder 1946: 647; Monrós 1951c: 542; Karren 1972: 902; Seeno and Wilcox 1982: 43; Chamorro-Lacayo and Konstantinov 2009: 83.

Type species. *Pseudochlamys megalostomoides* Lacordaire 1848, by monotypy.

Diagnosis. *Pseudochlamys* can be distinguished from all other genera in the tribe by: head not completely retracted into prothorax; mandibles enlarged in males (sexual dimorphism); intercoxal prosternal process strongly and abruptly constricted beyond anterior margin; and prosternal process more than ¾ as long as intercoxal prosternal process. These beetles are small sized (length 3.45-4.72 mm), cylindrical; body usually yellowish; canthus of eye as yellow as rest of frons; pronotum and elytra glabrous; head not completely retracted into prothorax; mandibles enlarged in males; antenna serrate beyond antennomere III, antennomere II slightly widened, globose, antennomere V as large as VI; posterior pronotal lobe with well differentiated notch; intercoxal prosternal process strongly and abruptly constricted beyond anterior margin; sutural serration of elytra complete; elytral tubercles poorly developed; tarsal claws bifid or appendiculate.

Distribution. This genus contains only five species, distributed in North, Central, and South America (Chamorro-Lacayo and Konstantinov 2009; Karren 1972).

Argentinian species checklist.

Pseudochlamys seminigra (Jacoby, 1904) (MNS).

LAMPROSOMATINAE LACORDAIRE, 1848

Adults: Body compact, strongly convex; head inserted into prothorax (not visible from above). Pronotum convex tightly appressed to elytral base; antennal groove present on each side of prosternal process. Elytra covering pygidium. Larva differs from Cryptocephalinae as pointed out in previous section.

Tribe Lamprosomatini Lacordaire, 1848

This tribe is composed of 10 genera (Seeno and Wilcox 1982) and 250 species (Chamorro 2014a). Four genera occur in the Neotropical region (Chamorro 2014a): *Lychnophaes* Lacordaire, *Dorisina* Monrós, *Lamprosoma* Kirby, and *Lamprosomoides* Monrós. It is the only Lamprosomatine tribe represented in Argentina where the fauna comprises 1 genus, *Lamprosoma*, and 8 species. *Lamprosoma* is characterized by the presence of a file on distal margin of last ventrite; last ventrite not excised in shape of arc; pygidium completely covered by elytra; scutellum acutely triangular (small to very small); elytral punctuation arranged in regular rows or with a tendency to form such rows.

Lamprosoma Kirby, 1818

Fig. 34

Kirby 1818: 445; Chevrolat in d'Orbigny 1846: 277; Lacordaire 1848: 574; Chapuis 1874: 216; Jacoby 1880: 90; Achard: 1914: 5; Monrós 1948b: 81; Monrós 1956b: 59; Monrós 1960: 9. Caxambú and Almeida 1999: 244; Caxambú and Almeida 2003: 330.

Type species. *Lamprosoma bicolor* Kirby, 1818: 445. By monotypy.

Diagnosis. body length about 4.5 mm; tarsal claws appendiculate with broad tooth; antenna short, antennomere VIII nearly as wide as VII or IX. Metallic coloration (some species multicolored), head not visible from above, clypeus excavate. According to Monrós (1956b) it can be differentiated from other Neotropical genera by having appendiculate claws at 180º angle, while *Dorisina* and *Lychnophaes* have simple claws at a more obtuse angle.

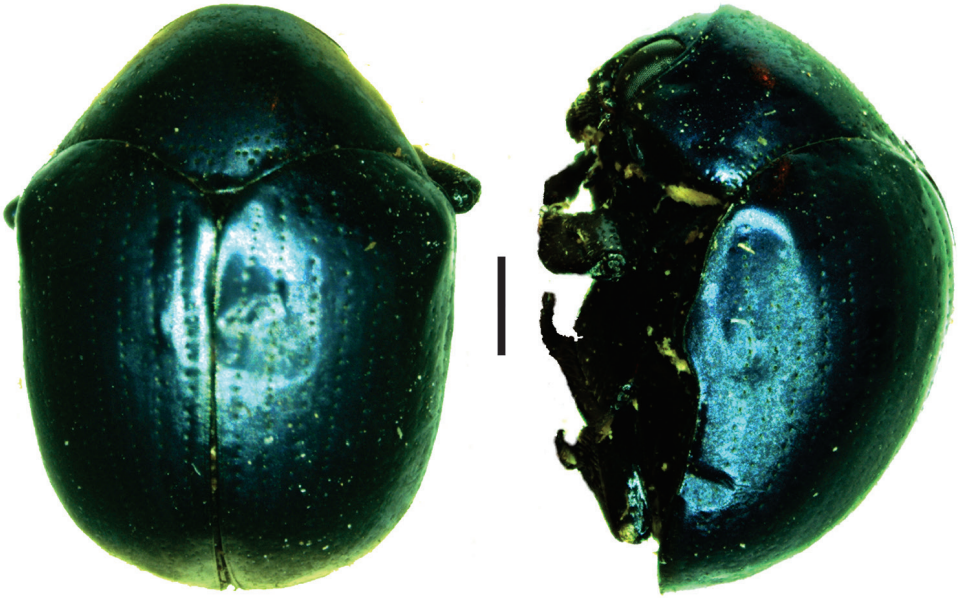

Figure 34. *Lamprosoma azureum* Germar [(3)], left: habitus (dorsal view), right: habitus (lateral view).

Distribution. Nearctic, Neotropical, in Argentina limited to north, and northeastern provinces.

Remarks. Adults feed on plants of the families Bombacaceae, Combretaceae, Melastomataceae, Mimosaceae. Therefore, some species have been considered as potential biological control agents for these plants (Caxambú and Almeida 2003).

Argentinian species checklist.

1. *Lamprosoma acaciae* Monrós, 1948b (JUY, SAL, TUC). Host plant: Fabaceae: *Acacia* spp. (Bark-gnawing).
2. *Lamprosoma azureum* Germar 1824 (MNS). This species newly cited for Argentina.
3. *Lamprosoma chorisiae* Monrós, 1948b (CHA).
   = *Lamprosoma chaguanacum* Monrós, 1948b. Parasitoids: Gelini and Hemitelini (Ichneumonidae) (Monrós 1948b). Host plant: Bombacaceae: *Chorisia* sp. (Monrós 1948b).
4. *Lamprosoma indigaceum* Monrós, 1947 (CTS).
5. *Lamprosoma minimum* Monrós, 1948b (SAL). Host plant: Fabaceae: *Acacia cavenia* (Bark-gnawing).
6. *Lamprosoma subnitidum* Monrós, 1948b (CTS).
7. *Lamprosoma triste* Guérin-Ménéville, 1844 (Northeast Argentina).
8. *Lamprosoma zariateguii* Monrós, 1947 (MNS).

Discussion and conclusions

This is the first comprehensive synthesis of Argentinian Camptosomata. This study may prove useful also for countries bordering Argentina. Similar contributions indicated the diversity of Camptosomata in other Neotropical countries as follows: Maes (1998) recorded 19 genera and 46 species for Nicaragua, Chaboo and Schöller (2016) accounted for 14 genera and 43 species for Peru; and in Brazil, 723 species, 26 subspecies in 37 genera of Cryptocephalinae (Sekerka et al. 2015) and 62 species in 5 genera of Lamprosomatinae (Sekerka 2017) were recorded.

Species richness and distribution patterns

Historically, Argentina has been divided in two main regions: Andean and Neotropical (Morrone, 2014). As depicted in the distribution pattern of Camptosomata tribes and subtribes by province (Fig. 35A–D), tribes are mostly distributed in the Neotropical region, while few species reach the Andean region or are found below 40º S latitude. Based on the map of species richness by province (Fig. 36) higher richness (up to 80 species) roughly coincides with the line dividing the Neotropical and Andean regions (Figs 1, 37). Poor data notwithstanding, this pattern fits at the latidudinal diversity gra-

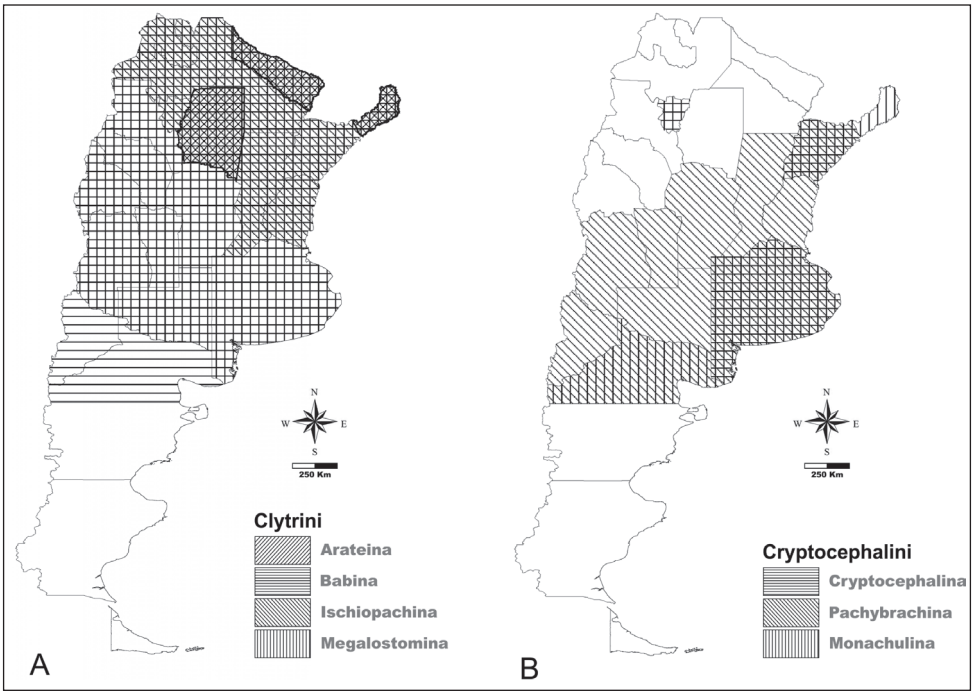

Figure 35. A Administrative divisions representing presence of subtribes of Clytrini as indicated in reference **B** Administrative divisions indicating presence of subtribes of Cryptocephalini as indicated in reference.

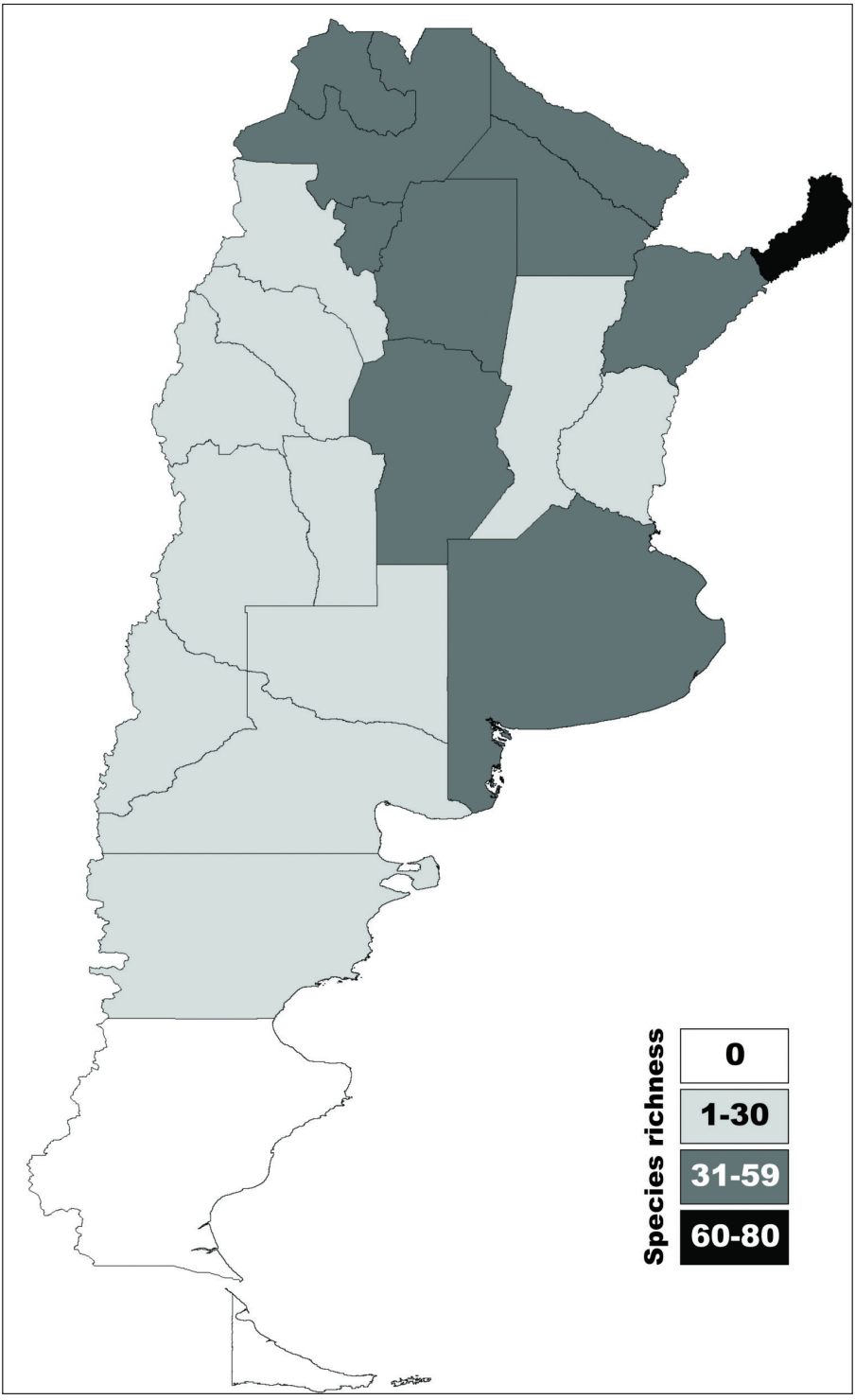

Figure 36. Map indicating species number (0–80) (richness) by province.

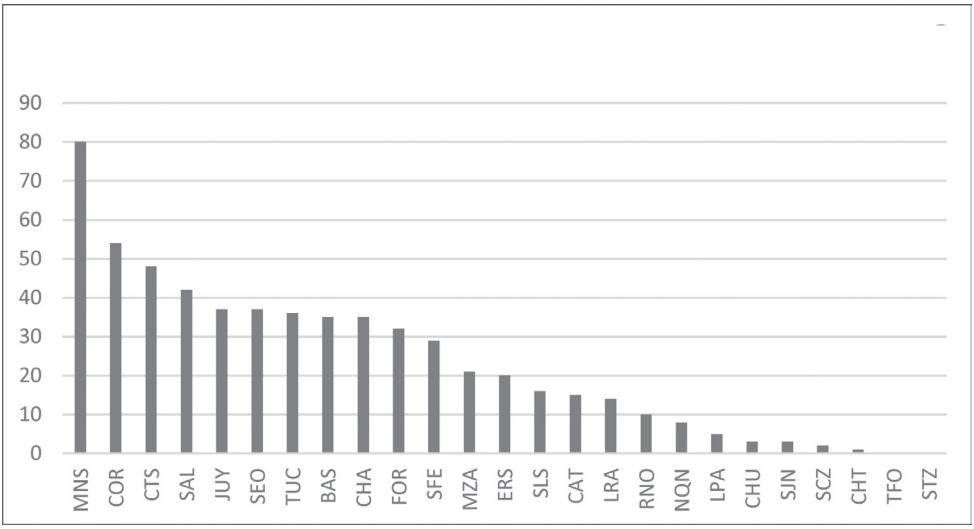

Figure 37. Bars diagram showing species by provinces, it can be observed that species richness diminished through southern provinces.

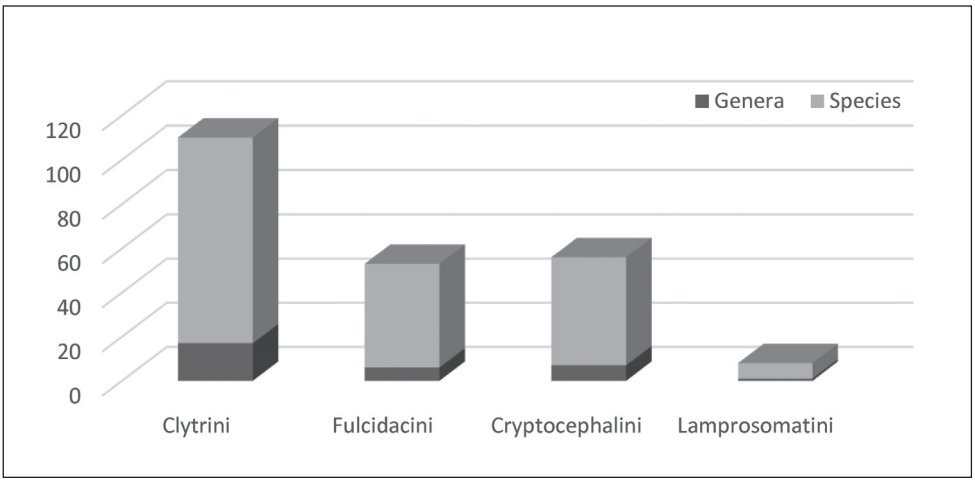

Figure 38. Bars diagram showing the number of genera and species by tribe of Argentinian Camptosomata.

dients hypothesis with greater species richness at tropical latitudes (Hillebrand 2004). Most of the central and northern provinces (*e.g.* CHA, COR, CTS, FOR, MNS, SAL, SEO, TUC) are presented on the left side of Figure 37, while most of southern provinces (CHT, CHU, NQN, SCZ, STZ, and TFO) appear on the right side, with few exception, for example the lack of information for SJN, ERS, or SLS.

Within Clytrini (Fig. 35A), Arateina is present in the northeastern provinces (FOR, MNS, SEO), while Ischiopachina is distributed throughout most of northeastern Argentina. Megalostomina is present from northern Argentina to the central

region (as far as MZA, LPA, and BAS). Babiina covers this same region, yet it reaches the southern provinces (NQN, and RNO). Clytrini has not been reported for the southern provinces beyond Rio Negro.

Cryptocephalini, on the other hand, is putatively mostly absent from the Northwestern provinces of Argentina. The presence of this tribe in Tucumán might indicate a more widespread distribution. Sampling bias and poor inventory may explain the absence of Fulcidacini in central and western regions of Argentina. The subtribes of Cryptocephalini (Fig. 35B) show a more widespread distribution for Cryptocephalina and Pachybrachina, while Monachulina are mostly recorded from Northeastern Argentina. Finally, Lamprosomatinae seems restricted to the Northern provinces, its absence in Formosa seems artificial, so presence of this subfamily surely will expand with more collecting in this region. According to current information, most species are distributed in the Neotropical provinces, especially: Araucaria forest, Chacoan, Monte, Pampean, Parana Forest, and Prepuna.

Current taxonomic knowledge, basic statistics and future research

A total of 190 species (182 Cryptocephalinae + 8 Lamprosomatinae) of Camptosomata are currently known from Argentina. The most diverse group of Camptosomata in Argentina is Clytrini (Fig. 38). However, Clytrini is also, by far, the most studied group in Argentina due to the efforts of Monrós in the 1950's. The patchy distribution at administrative division levels clearly indicates the need for specimen identification and incorporation of museum specimens into databases, as well as collection of new specimens. The latter will permit the application of ecological modelling and biogeographic studies of the group that will provide a more complete picture of the biogeographic history and ecological tolerance ranges, as well as help guide conservation policies for the group. The current estimate of endemic species in Argentina is uncertain, and its calculation based on extant information would be inaccurate, especially without a complete species checklist of bordering countries (i.e. Bolivia, Brazil, Chile, Paraguay, and Uruguay). When comparing the timelines in Fig. 39 with the graphic indicating species richness by genus (Fig. 40), it becomes clear that (except for Megalostomis, recently revised by Agrain (2013), several of the most diverse genera have not been revised in over 100 years. Many species are only known from their original descriptions in the mid 19th or mid 20th century (Fig. 39). In many cases, the type specimens were not illustrated. This has resulted in long series of unidentified specimens housed in public and private collections awaiting the study of name bearing types.

Our synthesis here is a necessary step towards further comprehensive study of Argentinian Camptosomata that will facilitate field work, assist in determination of unidentified material housed in South American collections, creation of illustrated of keys to the species level, and with identified specimens in hand achieve databasing of museum specimens. These elementary tasks are prerequisite to modern taxonomic revisions and evolutionary studies.

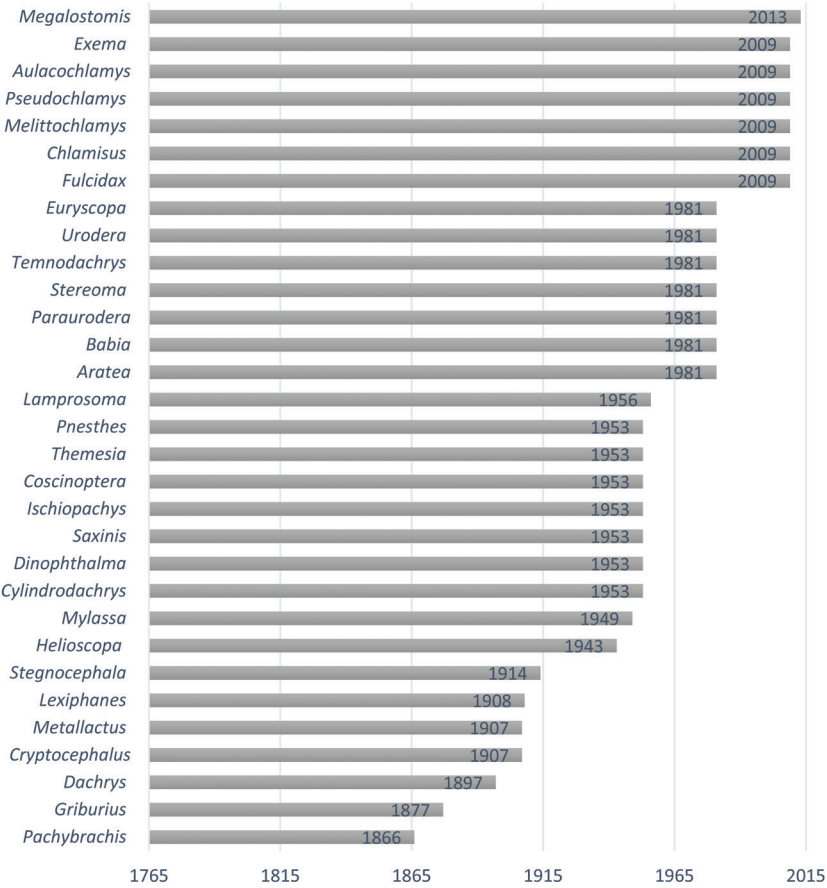

Figure 39. Timelines showing the years of the last work made on each genera that includes Argentinian species taxonomic treatment (simple checklist included).

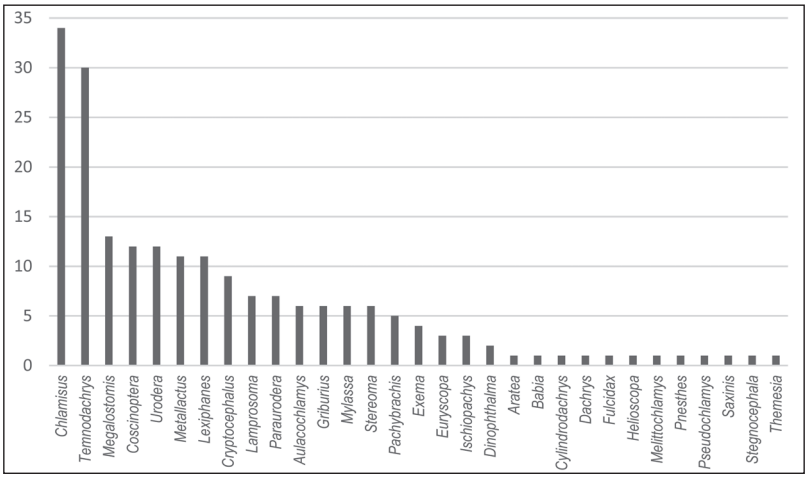

Figure 40. Species number by genus.

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First record of *Biromiris* from the Oriental region, with a new species from Philippines (Hemiptera, Heteroptera, Miridae, Phylinae)

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Abstract

The unique genus *Biromiris* Schuh is recognized from the Oriental region for the first time, with the description of a new species, *Biromiris tomokunii* **sp. n.**, from the Philippines. The new species is documented with photographic images of the dorsal habitus and male genital structures. A key to all known species of *Biromiris* is provided.

Keywords

Biromiris tomokunii, Leucophoropterini, Miridae, new species, Philippines, Phylinae, taxonomy

Introduction

Biromiris Schuh, 1984 (Phylinae), containing six described species from the Australian region, forms one of the smaller and rarely encountered genera of the plant bug tribe Leucophoropterini (Schuh 1984, Menard and Schuh 2011). The present work documents a new species of this unique genus from Palawan Island of the Philippines, and represents the first record for *Biromiris* from the Oriental region. A key is provided to facilitate identification of all the species of *Biromiris*.

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Materials and methods

The observed specimen (holotype) is deposited in the Department of Zoology, National Museum of Nature and Science, Tsukuba, Japan (NSMT). A Data Matrix code label, which uniquely identifies the specimen and is referred to as 'unique specimen identifier' (USI), was attached to the holotype. The code (e.g., AMNH_PBI 00380531) was digitized on the Arthropod Easy Capture (formerly the Planetary Biodiversity Inventory) database maintained by the American Museum of Natural History, New York, USA (http://research.amnh.org/pbi/heteropteraspeciespage/speciesdetails.php?fromall=fromall&speciesid=89593&genusid=5768).

All measurements are given in millimeters. The terminology mainly follows Menard and Schuh (2011) and Schuh (1984). Observation and measurements were performed under Olympus SZX7, dorsal images were taken in Leica S8APO equipped with Leica 10445930 1.0×, attached to Canon EOS Kiss digital camera body, and genital structures were made with Nikon ECLIPSE E400. The key to species was principally based on descriptions by Menard and Schuh (2011) and Schuh (1984).

Results

Biromiris Schuh, 1984

Biromiris Schuh, 1984: 206, type species by original designation: *Biromiris enarotadi* Schuh 1984; Schuh 1995: 241 (cat.), 2002–2014 (http://research.amnh.org/pbi/catalog/), Menard and Schuh 2011: 74 (diag., re-descr.)

Diagnosis. Distinguished by carinate lateral margin of pronotum; transverse roll (or, double chin) gula; terete or slender antennal segments III & IV; white dorsolateral area on metepisternum dorsal to scent gland; partial transverse fascia on anterior corium; and form of male genital structures. For detailed descriptions see Schuh (1984: 206) and Menard and Schuh (2011: 74).

Distribution. The Oriental to Australian regions across Wallacea.

Key to identification of species of *Biromiris*

1 Antennal segments III and IV terete **4**
– Antennal segments III and IV slender (or, linear) **2**
2 Body distinctly small, shorter than 2.30 mm; entire procoxa pale, tinged with red on distal region; cuneus with small white spot at inner corner; Philippines (Palawan)..... ***B. tomokunii* sp. n.**
– Body size longer than 3.00 mm; procoxa dark reddish, with white distal margin; cuneus with wide white area on anterior margin **3**
3 Body including ventral side basically chestnut; narrow vertex and pronotal carina; Australia (New South Wales)..... ***B. cassisi* Menard & Schuh**

– Body including ventral side basically brown; wide vertex and broad pronotal carina; Australia (Queensland) ..... ***B. binjour*** **Menard & Schuh**

4 Head, pronotum and scutellum orange brown or brown; antennal segment II entirely brown or basally golden **5**

– Head, pronotum and scutellum mahogany or chestnut; antennal segment II basally pale or mahogany and distally chestnut **6**

5 Scent gland evaporatory area unicolorous with thoracic pleuron; pro- and mesocoxae and femora golden, and metafemora dark red; labium reaching apex of mesocoxa; Indonesia (West Irian), Australia (Queensland) .... ***B. enarotadi*** **Schuh**

– Scent gland evaporatory area paler than thorax; all coxae and metafemora dark brown, and pro- and mesofemora pale; labium reaching apex of metacoxa; Australia (New South Wales) ..... ***B. scheyville*** **Menard & Schuh**

6 Ventral side of head and thorax mahogany or chestnut; posterior margin of vertex concave; metatibia without spines; Papua New Guinea (Morobe), Australia (Queensland) ..... ***B. bulolo*** **Schuh**

– Ventral side of head and thorax golden brown; posterior margin of vertex straight; metatibia with suberect pale spines, Indonesia (West Irian)..... ..... ***B. cyclops*** **Schuh**

Biromiris tomokunii **sp. n.**
http://zoobank.org/EB5D9D50-94EF-4424-A14D-41E56B3AC911
Figures 1–2

Type material. Holotype male. PHILIPPINES, Palawan, Matalangao, 10.33°N, 119.25°E, 450m, 29.viii.1985, M. Tomokuni (NSMT) (AMNH_PBI 00380531).

Diagnosis. Recognized by small size; brownish general coloration; wide vertex; slender (not terete) antennal segments III and IV; dark bunch of suberect setae on apex of the clavus; white transverse fascia and/or macula on the anterior and posterior corium; prominent spot on the inner corner of cuneus (Fig. 1); and unique form of male genital structures (Fig. 2).

The new species is distinguished from all congeners by its small size; slender antennal segments III and IV; anterior transverse white fascia continuous on clavus but narrow and not reaching claval commissure; distinct white macula on posterior corium at level of apex of clavus; and prominent white spot on inner corner of cuneus (Fig. 1A).

Description. Male. **Coloration** (Fig. 1A–D): Body including dorsum basically brown. *Head*: yellowish brown with dark basal margin on vertex; mandibular and maxillary plates, and ventral side of head tinged with red; clypeus same coloration as frons, with dark apex. *Antenna*: dark brown, with pale base on segment I and white on basal ½ of segment III. *Labium*: yellowish, tinged with red on segment I, apical segment darker. *Thorax:* pronotum and scutellum dark brown; thoracic pleura brown with ivory or white surface on metepisternum dorsal laterally to scent gland evaporatory area (Fig. 1D); peritreme of scent gland evaporatory area white and dark (Fig. 1D).

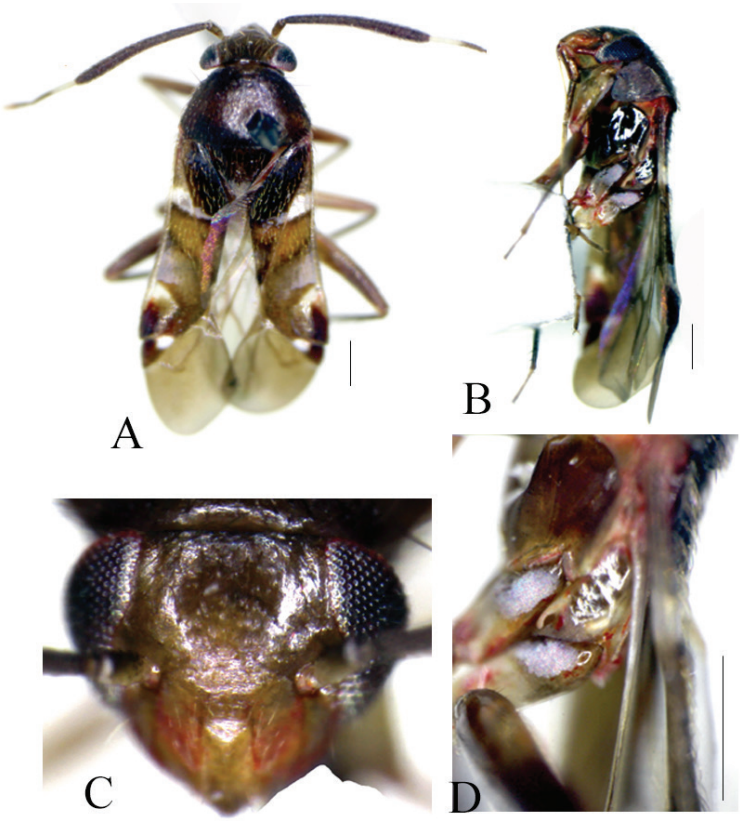

Figure 1. Habitus images of *Biromiris tomokunii*, holotype male. **A** dorsal view **B** lateral view **C** Head in frontal view **D** Scent gland evaporatory area. Scale bars, 0.5 mm.

Legs: entire procoxa, distal half of meso- and metacoxae pale, extreme apices tinged with red, and remaining proximal regions brown; all trochanters pale (or white); all femora yellowish, except for brown distal half of hind femur; entire protibia, proximal half of mesotibia and extreme base and apical 1/5 region of metatibia pale, and remaining regions dark; tarsal segments pale. *Hemelytron*: brown with dark brown on anterior regions of clavus and corium, and on apex of the clavus; anterior corium with distinctly white transverse fascia margined with dark posteriorly, reaching middle of clavus (Fig. 1A); posterior corium with white fascia at about apex of radius; posterior lateral region of corium red; cuneus brown, laterally tinged with red, and with prominent white spot on inner corner of cuneus; membrane grayish brown.

Surface and vestiture: *Head*: shiny and weakly shagreen; dorsally covered with pale or yellowish semi-erect simple setae, and ventrally with dark erect setae. *Antenna*: covered with appressed pale setae. *Thorax*: pronotum and scutellum weakly shagreen and impunctate; pronotum uniformly distributed with dark or black semi-erect setae. *Hemelytron*: weakly shagreen and impunctate with several reflecting patches; corium

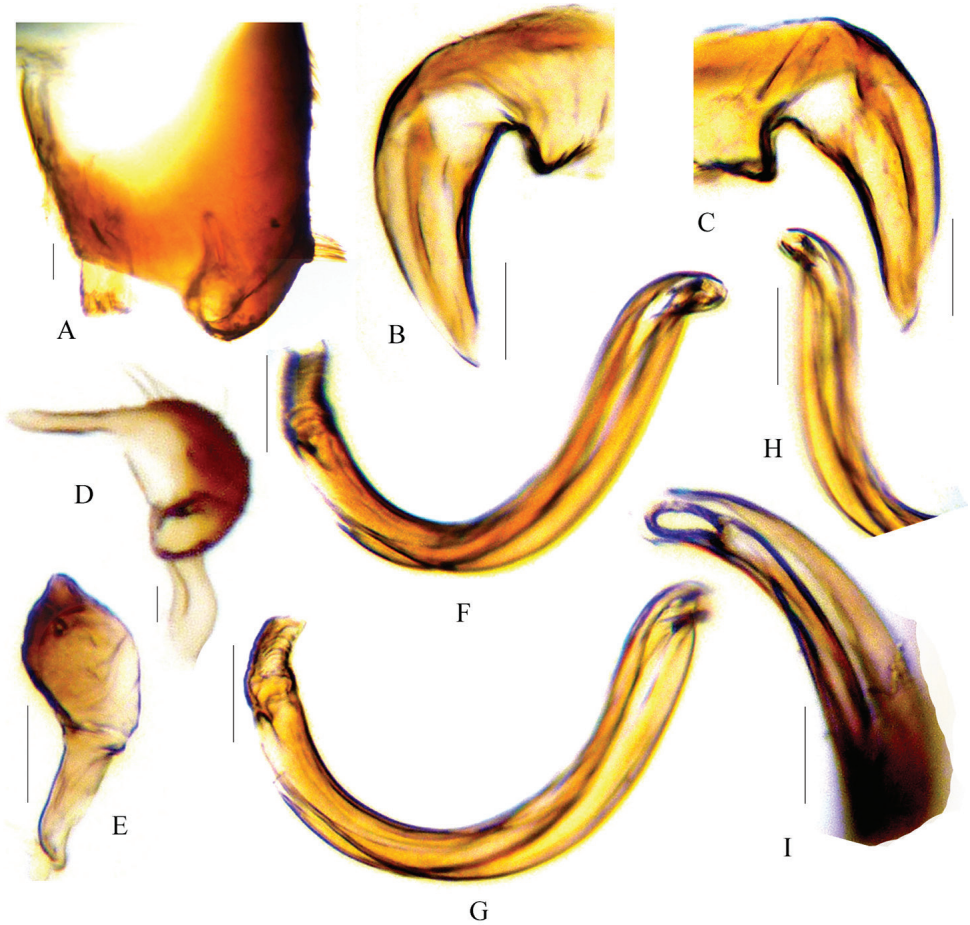

Figure 2. Male genital structures of *Biromiris tomokunii*. **A** Pygophore, right lateral view **B–C** Phallotheca **D** Left paramere, lateral view **E** Right paramere, anterior view **F–G** Endosoma **H–I** Apex of endosoma. Scale bars, **A–H** 0.2 mm; **I** 0.1mm.

with mixed vestiture, semi-erect black and yellow or golden simple setae; clavus with dark erect setae at the apex; cuneus with dark setae only. *Legs*: all legs covered with appressed pale or dark setae; and hind tibia with two rows of sub-erect dark spines. STRUCTURE: macropterous, body elongate-oval. *Head*: triangular, clypeus barely observed from dorsal view; vertex weakly concave, with carinate basal margin; eyes relatively small. *Antenna*: antennal fossae not continuous with inner margin of eyes, segment II clavate and relatively thick, and segments III and IV not terete. *Labium*: reaching apex of metacoxae. *Thorax*: pronotum convex and trapezoidal, with narrow collar-like margin lies underneath vertex, and lateral sides of the anterior pronotum with narrow carina; mesoscutum obscurely exposed; scent gland evaporatory area more or less triangular, with distinctly elevated peritreme. *Hemelytron*: posterior corium (anterior to cuneus) splayed out; cuneal fracture distinctly incised; cuneus small

and triangular. *Legs*: all femora long and sub-parallel except for narrow extreme apex; tarsal segment I and II sub-equal, and segment III relatively longer. GENITALIA (Fig. 2A–I): *Pygophore*: trapezoidal, with bunch of stiff bristles sub-apically on ventral side (Fig. 2A). *Left paramere*: small, with elongated posterior process, and distinctly short and narrow anterior process (Fig. 2D). *Right paramere*: leaf like, with a short and blunt apical process (Fig. 2E). *Phallotheca*: wide base and narrow apex as in Figure 2B–C. *Endosoma*: simple, weakly S-shaped, with small weakly sclerotized apically placed secondary gonopore (Fig. 1F–I).

Female. Unknown.

Measurements: 1♂: Total body length 2.21; length from apex of clypeus to cuneal fracture 1.90; width of head across eyes 0.51; width of vertex 0.28; length of antennal segments I–IV ? (broken); basal width of pronotum 0.70; length of pronotum 0.42; width across hemelytron 0.78; length of metafemur, tibia and tarsus 0.74, 1.14, 0.20.

Etymology. Named after Dr. Massaki Tomokuni (Curator Emeritus, Department of Zoology, NSMT), collector of the specimen.

Distribution. Philippines (Palawan).

Discussion

All six species of *Biromiris* described by Schuh (1984) and Menard and Schuh (2011) were based mainly on external morphology. The male and female genitalia are not examined for any species other than type species, *Biromiris enarotadi* Schuh; the male genital structures were illustrated and described (Schuh 1984). In this study the male genitalia of the holotype was examined in detail (Fig. 2).

The majority of *Biromiris* species are represented by just a few specimens or the holotype only; further researchers are encouraged to utilize broader surveys to clarify the zoogeographical distribution pattern and biology of this genus (Schuh 1984, Menard and Schuh 2011). *Biromiris* was previously known only from the tropical Australian region including New Guinea (Menard and Schuh 2011, Schuh 1984). The present discovery of the new species, *B. tomokunii* from the Philippines suggests that the genus is perhaps more widely distributed in the Oriental region and will probably include Sundaland elements as evidenced by occurrence of the new species on Palawan Island. Additionally, we anticipate more species of *Biromiris* will be found to occur widely across Wallacea, as revealed for quite a few phyline genera (Schuh 1984) and some of Bryocorinae (cf. Namyatova et al. 2016, Yasunaga and Ishikawa 2016).

Almost nothing is known about the biology of *Biromiris*, as most of species were collected in different kinds of trap (e.g. light traps and pitfall traps) except for *B. scheyville* Menard & Schuh; where the host plant was confirmed as Myrtaceae (Menard & Schuh 2011). The biology of the present new species, *B. tomokunii* remains unknown.

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RESEARCH ARTICLE

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Revision of the genus *Reinmara* Schaus, 1928 (Lepidoptera, Mimallonoidea, Mimallonidae) with the descriptions of four new species from South America

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Abstract

The mimallonid genus *Reinmara* Schaus, 1928 is revised. The three previously described species, *R. enthona* (Schaus, 1905), *R. minasa* Schaus, 1928, and *R. wolfei* Herbin & C. Mielke, 2014 are redescribed and the females of each are described and figured for the first time. Additionally, we describe four new species, two Andean: *R. andensis* **sp. n.** and *R. occidentalis* **sp. n.**, and two Brazilian: *R. atlantica* **sp. n.** and *R. ignea* **sp. n.**. The new species *R. ignea* and *R. atlantica* are likely of conservation concern due to their rarity in collections and their apparent endemism to an endangered biome, the Brazilian Atlantic Forest.

Keywords

Bolivia, Brazil, Ecuador, Peru, Taxonomy

Introduction

The type species of *Reinmara* Schaus, 1928, *R. enthona* (Schaus, 1905), was originally described in *Cicinnus* Blanchard, 1852. *Cicinnus* was, and to some extent, still is a sort of catchall category subsuming many taxa of uncertain phylogenetic position. Later,

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Schaus (1928) established the groundwork for much of the generic classification in current use for the family. In Schaus's work, *Reinmara* was described to include the Amazonian *R. enthona* and southeastern Brazilian *R. minasa* Schaus, 1928. Like most mimallonid genera described by Schaus, generic characterization was based primarily on wing venation. However, the close association of *Reinmara* with *Trogoptera* Herrich-Schäffer, [1856], based on male genitalia, was mentioned in this early work.

Since Schaus (1928), one species has been described from the Brazilian Cerrado: *R. wolfei* Herbin & C. Mielke, 2014. Therefore, apart from these two works and the species lists of Mimallonidae (Gaede 1931, Becker 1996), very little about this genus has been published. We here revise this genus, figuring both sexes of the three previously described species, the females of all of which were previously unknown. We also recognize and describe four new species, increasing the known diversity of *Reinmara* to seven species.

Methods

Dissections were performed as in Lafontaine (2004). Morphological, including genitalia, terminology follows Kristensen (2003). Genitalia and abdomens, when not slide mounted, are preserved in glycerol filled microvials.

Specimens from the following collections were examined:

AMNH American Museum of Natural History, New York, New York, USA
CDH Coll. Daniel Herbin, Garidech, France
CEIOC Entomological Collection of the Oswaldo Cruz Institute, Rio de Janeiro, Rio de Janeiro, Brazil
CGCM Coll. Carlos G. C. Mielke, Curitiba, Paraná, Brazil
CNC Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada
CPC Coll. Philippe Collet, Caen, France
CUIC Cornell University Insect Collection, Ithaca, New York, USA
DZUP Coll. Pe. Jesus S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brazil
ISEZ The Institute of Systematics and Evolution of Animals of the Polish Academy of Sciences, Kraków, Poland
MGCL McGuire Center for Lepidoptera & Biodiversity, Gainesville, Florida, USA
MNHN Muséum nationale d'Histoire naturelle de Paris, Paris, France
MNHU Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany
MNRJ Museu Nacional do Rio do Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil
MWM Museum Witt, Munich, Germany
MZSP Museu de Zoologia, Universidade de São Paulo, São Paulo, São Paulo, Brazil
NHMUK Natural History Museum, London, U.K.

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
VOB Becker Collection, Camacã, Bahia, Brazil
ZSM Zoologische Staatssammlung München [Munich], Germany

Figures were manipulated with Adobe Photoshop CS4 (Adobe 2008). Male genitalia are figured in natural color with CS4 "auto color" used to improve white backgrounds when necessary. The map was built with SimpleMappr (Shorthouse 2010) and edited with CS4. All geographical coordinates are approximate, and are based on the localities provided on specimen labels when coordinates were not explicitly given. GPS data were acquired with Google Earth.

We used DNA barcoding to help distinguish the similar species *Reinmara enthona* from *R. andensis* sp. n. Our barcoding protocol used a standardized short sequence of DNA as a species-level character (Hebert et al. 2003, Stoeckle and Hebert 2008), based on the mitochondrial cytochrome c oxidase 1 gene region ("COI"). These "barcodes" were obtained thanks to IBOL (International Barcoding of Life project), and were used in addition to adult habitus and genitalia examination to differentiate the aforementioned morphologically similar species. The Neighbor-joining method (Saitou and Nei 1987) was used to infer the relationships among sampled *Reinmara* specimens in MEGA6 (Tamura et al. 2013), based on sequences downloaded from and aligned in BOLD (Barcode of Life). 1000 bootstrap replicates were performed and are shown at the nodes of Fig. 7. Evolutionary distances were computed using the Kimura 2-parameter method (Kimura 1980); units of distance reflect the number of base substitutions per site. All codon positions were included. All positions containing gaps and missing data were eliminated. This component of enhanced species delimitation is reflected in the distance tree in Fig. 7.

The symbol ‡ is used in the text to represent unavailable names in the text (Fletcher and Nye 1982).

Results and discussion

Reinmara Schaus, 1928: 654.

Type species. *Cicinnus enthona* Schaus, 1905; Schaus 1928: 654, by original designation.

Diagnosis. *Reinmara* can be recognized by the usual contrast between medial and submarginal areas due to diffuse, lighter coloration medially, this coloration, combined with the straight forewing postmedial line, notched tornus, and elongated, slightly falcate forewings (males) distinguish this genus from most other Mimallonidae. The morphologically most similar genus, *Trogoptera* Herrich-Schäffer, [1856], has more rectangular forewings and often displays more earthen tones (except in *T. semililacea*

(Dognin, 1916) which is similar in color to some *Reinmara* but can be recognized by extremely long saccular extensions in the male genitalia). Genitalia of *Trogoptera* are very similar to those of *Reinmara*, but the fused gnathos is mesally extended by a singular structure, and is not distally separated as is the same structure in *Reinmara*. Schaus (1928) noted this difference in his description of *Reinmara*.

Description. Male. *Head*: Pale beige to brown, eyes very large, occupying more than two-thirds area of head; antenna pale brown, tan, bipectinate to tip with distal fifth of pectinations much shorter; labial palpus reduced, not extending beyond frons, three segmented, second segment roughly half length of first, third segment reduced, barely visible; vestigial proboscis present. *Thorax*: Coloration usually as for head but with additional, often pink, shading. *Legs*: Coloration as for thorax, vestiture thick, long; tibial spurs narrow, very sharp, basal half covered in scales. *Forewing dorsum*: Forewing length: 12.0–23.5 mm, wingspan: 33–43 mm. Triangular, outer margin concave to varying degrees mesally; tornus usually strongly notched, apex may appear somewhat falcate in species with prominently concave outer margin. Ground color various shades of brown, sparsely scattered with dark brown, tiny petiolate scales usually present. Ante- and medial areas nearly always with pale pink or almost silvery scales throughout, submarginal area generally appearing darker than medial area. Presence of antemedial line variable, dark postmedial line preapical, well defined. Discal mark always present as pale splotch, with darker central region faint or very prominent. Fringe coloration variable. *Forewing ventrum*: Similar to dorsum but appearing browner overall due to absence of well-defined ante- and medial pink shading, though some pink shading may be present, especially submarginally. Antemedial line absent, postmedial line reduced to traces in all but *R. ignea* sp. n., discal mark more prominent, darker than on forewing dorsum. *Hindwing dorsum*: Shape more rounded, outer margin convex except for when notch present on anterior margin, patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line usually weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum. Frenulum a single bristle. *Venation*: Typical of Mimallonidae, but Rs3 + Rs4 quite long stalked. *Abdomen*: Coloration usually as for thorax, but browner, with coppery luster in fresh specimens, fading to pale beige in older material. Vestiture thick, long, distal tip of abdomen with elongated, dark-brown tipped scales. *Genitalia*: Vinculum ovoid, circumscribing a complex diaphragm with four setae-filled sacks, from a ventral perspective: upper two sacs much smaller and outwardly everted with long outwardly extended setae, lower two sacks larger (bottom right sack the largest of the four), lower sacks not outwardly everted, setae of lower sacks extended outward from within sacks. Uncus simple, broad, truncated to varying degrees distally, appearing beak-like laterally. Gnathos robust, proximally rectangular or rounded, with broad, dual mesal extensions that are fused together near base but bifurcate as fingerlike tips distally. Valves broad, short, rounded apically, sacculus accentuated as slight fold with both blunt and sharp projections near distal most portion of fold, length of sharp projection usually asymmetrical when comparing sacculus of both valves. Juxta partially fused to ventrum of phallus, basally juxta as widened lip where affixed to vinculum. Base

of relatively small phallus narrower than distal portion, distal half of phallus variable in shape. Vesica very small, globular, with singular, long narrower extension. **Female.** *Head*: As for male but slightly broader; antenna dentate with very small pectinations along entire length of flagellum, except in *R. ignea* sp. n. where antenna more similar to that of male, but with smaller pectinations. *Thorax*: As for male. *Legs*: As for male. *Forewing dorsum*: Forewing length: 12–23 mm, wingspan: 27–43 mm. As for male but much broader, margin convex except for just below apex; tornus strongly notched. Coloration and patterning usually as for male, but see *R. ignea* sp. n. *Forewing ventrum*: Similar to dorsum but appearing browner overall due to absence of well-defined ante- and medial pink shading. Antemedial line absent, postmedial line usually reduced to traces, discal mark more prominent, darker than on forewing dorsum. *Hindwing dorsum*: Similar to forewing dorsum, but notch present on anterior margin, patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line usually weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum. Frenulum as multiple bristles. *Abdomen*: Similar to that of males but more robust overall. *Genitalia*: Stout, usually robust; tergite VIII forms smooth, posteriorly directed tongue-like extension, VIII heavily sclerotized laterally forming curving plate, which extends outward encircling papillae anales. Apophyses anteriores roughly half-length or equal to that of apophyses posteriores. Lamella ante- and postvaginalis converge as a wide, bowl-like structure. Ductus bursae short, narrow. Corpus bursae small in comparison to robust, heavily sclerotized remainder of genitalia, either bag-like or elongated. Papillae anales broad, rounded, covered in long, fine setae.

Remarks. The genus *Reinmara* is broadly distributed in South America. Prior to this study very little was known about the genus and females were unknown.

Unlike most genera of Mimallonidae studied by us in recent years, *Reinmara* have very homogenous male genitalia with only minor differences between externally distinct species (for example *R. enthona* and *R. minasa*), so we relied heavily on external characters, considering habitat specialization and endemism to specific habitats/biomes as seen in other mimallonid genera, as well as in one case COI barcoding, to differentiate species. We also recognize the close similarity in wing shape and male genitalia morphology between *Reinmara* and *Trogoptera*, but maintain them as separate, valid genera pending ongoing phylogenetic work.

Key to species of *Reinmara*

1 Size in both sexes moderate (forewing length: >16 mm), forewing antemedial line very faint, if present at all; ventrally, postmedial line on all wings weakly defined, outwardly curved, usually interrupted by wing veins; forewing apex not falcate or if so, weak, blunt. Male genitalia: phallus cylindrical, weakly curved (for example Figs 23c, 24c, 25c) **2**

– Size in both sexes relatively small (12 mm [♂], 12–16 mm [♀]), forewing antemedial line present, not faint; ventrally postmedial line on all wings essentially as well defined and following the same pattern as on dorsum; forewing

apex sharply acute, falcate. Male genitalia: phallus thin, strongly curved, and hook-like in shape (Fig. 30c) ..... ***R. ignea* sp. n.**

2 Male: Forewing postmedial line not outwardly lined with black suffusion from tornus to apex. Female: Forewing postmedial line not inwardly lined with light pink-gray suffusion, medial area pink suffused **3**

– Male: Forewing postmedial line outwardly lined with black suffusion from tornus to apex. Female: Forewing postmedial line inwardly lined with light pink-gray suffusion, medial area largely displaying the light brown ground color, not suffused with pink ..... ***R. minasa***

3 Forewing with deep notch at tornus, eastern slopes of the Andes mountains ... **4**

– Forewing smooth at tornus, notch absent, west of Andes .... ***R. occidentalis* sp. n.**

4 Phallus mostly cylindrical in shape, not distinctly broadened distally, found in the Amazon rainforest, moderate elevations of the Andes mountains, or from the Brazilian Atlantic Forest **5**

– Phallus distinctly broadened distally, endemic to the Cerrado of Brazil and adjacent regions of Bolivia ..... ***R. wolfei***

5 Forewing postmedial line notched toward costa at intersection with Rs4; forewing narrowed apically, slightly falcate, distributed in the Amazon rainforest and Brazilian Atlantic Forest **6**

– Forewing postmedial line not notched toward costa at intersection with Rs4; forewing not noticeably narrowed apically, though if somewhat truncated, submarginal area still broader than any other *Reinmara* species; endemic to eastern slopes of Andes mountains ..... ***R. andensis* sp. n.**

6 Setae-filled diaphragmal sacks of male genitalia well developed, extending into body cavity well beyond vincular ring. Pinkish gray suffusion generally broadly distributed in medial area of forewing. Broadly distributed in the Amazon rainforest ..... ***R. enthona***

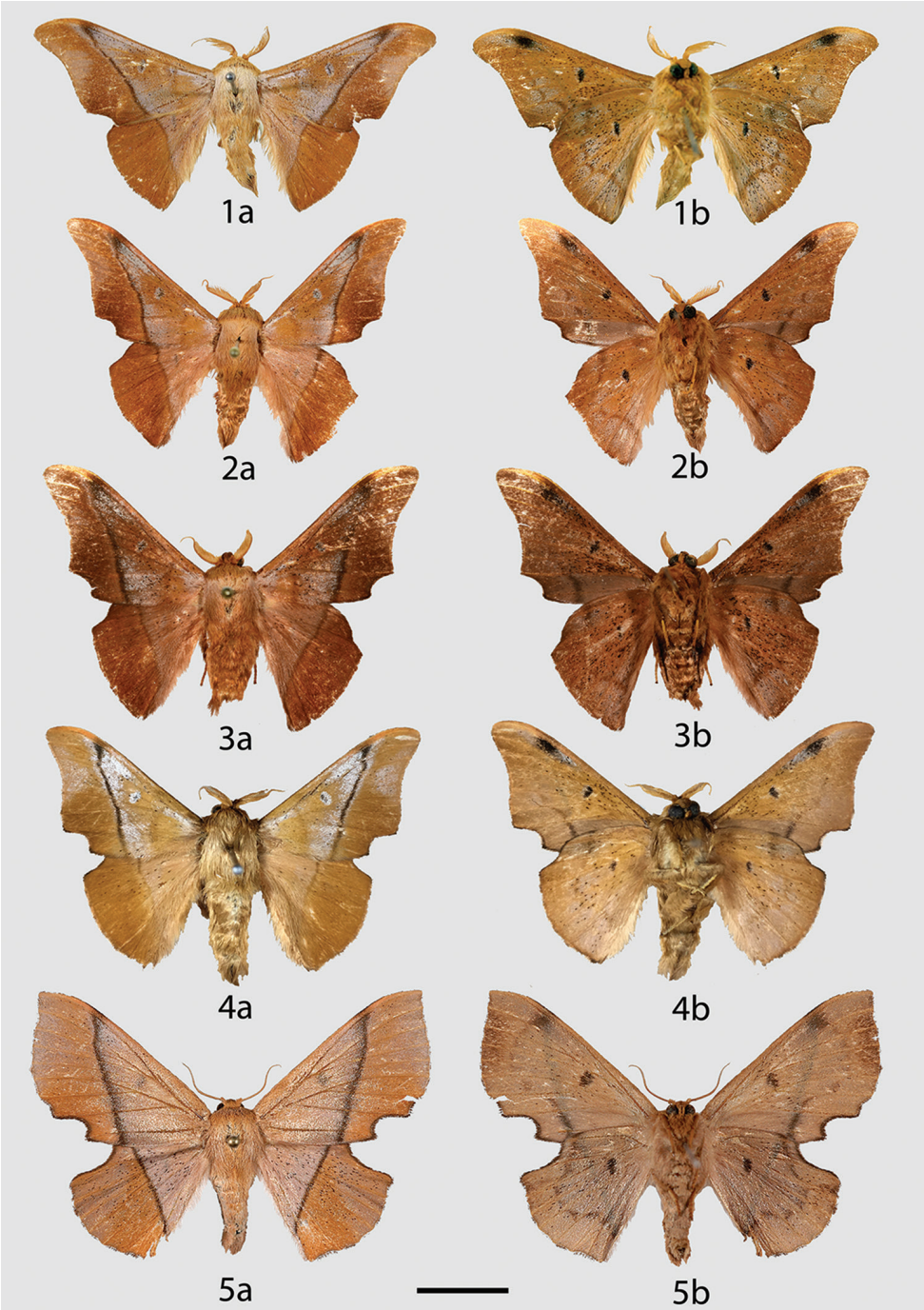
– Diaphragmal sacks of male genitalia half the size of those in *R. enthona*, sacks hardly extending into body beyond vinculum. Gray suffusion of medial area restricted to apical confluence of postmedial line with costa. Endemic to Brazilian Atlantic Forest, so far known only from Espírito Santo .... ***R. atlantica* sp. n.**

***Reinmara enthona* (Schaus, 1905)**
Figs 1–6, 23, 31, 36

Cicinnus enthona Schaus, 1905: 325–326
Reinmara enthona; Schaus 1928, fig. ♂ 88b
Reinmara enthona; Gaede 1931
Reinmara enthona; Becker 1996
Reinmara enthona; Herbin and Mielke 2014, fig. ♂ 42

Type material. Holotype, ♂. **FRENCH GUIANA:** St. Jean, Maroni, F. Guiana/ [Holo]Type, No. 8888, U.S.N.M./ USNM-Mimal: 1059/ Collection Wm Schaus/ *Perophora enthona* Type Schaus/ St Laurent diss.: 11-1-16:3/ (USNM, examined). Type locality: French Guiana, St. Jean du Maroni.

Additional material examined. (67 ♂, 3 ♀ total) **SURINAME:** 2 ♂, Moengo, Boven Cottica River: 26.V.1927, Cornell Univ. Lot 760, Sub 79, 80, St Laurent diss.: 10-25-15:2 (CUIC). 1 ♀, Brokopondo, Brownsberg NP, 490 m, 04°56'55"N, 055°10'55"W, 23:55 h, 28.III.2014, A.J. Hielkema [photographer], At HPL/BL (photo examined, Fig. 6, not collected). **FRENCH GUIANA:** 2 ♂, St. Laurent du Maroni, Cr. Naï, PK 13: 27.XII.1991, L. Sénécaux [leg.] (MNHN). 1 ♂, Rd. to Kaw, Camp Patawa: 25.III. –7.IV.2008, S. Kohll leg., DNA sample ID BC-Her 2691 (CDH). 1 ♂, 1♀, St. Jean du Maroni, Rd. Apatou, km 15: 27.VII.2011, Ph. Collet leg., UV (CPC). 1 ♂, St. Jean du Maroni: ex. Coll. Wm Schaus, USNM-Mimal:1784 (USNM). 1 ♀, Rd. to Kaw, km 37.5 + 2, 4°33.691'N, 52°08.391'W, 200 m: 30.VII–8.VIII.2003, ex. Coll. M. Laguerre, DNA sample ID BC-Her 2707, genitalia prep. D. Herbin ref. H. 1103 (CDH). 1 ♂, Rd. to Kaw, km 45: 17.VII.1991, F. Bénéluz leg., BMNH(E) 2008-107, NHMUK010247865 (NHMUK). 1 ♂, Rd. to Kaw: 16–30.XII.1998, A. Le Flao leg. (MNHN). 1 ♂, Rd. to Kaw, km 47: 4.VIII.1991, F. Bénéluz leg., BMNH(E) 2008-107, NHMUK010588025 (NHMUK). 1 ♂, Rd. to Patagai, 5°20'34.23"N, 53°12'47.86"W, 58 m: 3.X.2013, D. Herbin & O. Felis leg. (CDH). 2 ♂, Rd. Patagai/Counamama, 5°20'34.23"N, 53°12'47.86"W, 58 m: 4.XII.2013, D. Herbin leg. (CDH). 1 ♂, Rd. Patagai/Counamama, 5°22'59.51"N, 53°12'27.25"W, 49 m: 23.XI.2013, D. Herbin leg. (CDH). 1 ♂, Saül, Point de vue: 29.VII.2011, Ph. Collet leg., UV (CPC). 1 ♂, Réserve de la Trinité, Aya Haute Koursibo: 7.XI.2013, E. Poirier leg., UV (CPC). 1 ♂, Mont Mitaraka, 300 m: 20.VIII.2015, La Planète Revisitée, MNHN-PNI, Guyane 2015, APA-973-1, Ph. Collet leg. (CPC). 1 ♂, Rd. Changement, km 7: 13.VIII.1991, F. Bénéluz leg., BMNH(E) 2008-107, NMHUK010247866 (NHMUK). 1 ♂, Nouragues, Pararé, 4.038113952°N, 52.67309734°W: 23.V.–5.VI.2014, J. Barber, N. Homziack, A.Y. Kawahara, A. Keener & B. Leavell leg., DNA voucher number LEP-34752 (MGCL, molecular collection, barcoded). 2 ♂, Rd. Apatou, Layons km 26, 5°14'46.31"N, 54°11'07.55"W, 126 m: 1.X.2013, D. Herbin & O. Felis leg. (CDH). 1 ♂, Rd. Apatou, Layons km 26, 5°14'46.38"N, 54°11'52.16"W, 99 m: 2.X.2013, D. Herbin & O. Felis leg. (CDH). 1 ♂, Plateau des Mines, 5°20'42.59"N, 53°4'31.96"W, 49 m: 4.X.2015, D. Herbin & M. Laguerre leg. (CDH). 1 ♂, Rd. Coralie, 4°29'07.43"N, 52°23'49.40"W, 40 m: 7.XII.2013, D. Herbin leg. (CDH). 1 ♂, Rd. Coralie, 4°29'07.43"N, 52°23'49.40"W, 40 m: 7.XII.2013, D. Herbin leg. (CDH). 3 ♂, Rd. Coralie, PK 2: IV.1993, J. Navatte, H. de Toulgoët (MNHN). 1 ♂, Roura, Rd. Coralie, PK 2: 10.XII.1991, P. Kindl, L. Sénécaux leg., Coll. P. Kindl (MNHN). 1 ♂, Surroundings of Coralie, rd. dégrad Correze, PK 0.1: 9.XII.1994, P. Kindl leg., Muséum Paris don de Th. Kindl (MNHN). 2 ♂, Roura, Coralie, Rd. of dégrad Corrèz, PK 0.1, P. 10.XII.1991, 16.IV.1994, Kindl leg., Muséum Paris don de Th. Kindl (MNHN). 2 ♂, Rd. de la Montagne de Fer, 5°20'21.17"N,



Figures 1–5. *Reinmara enthona* adults, **a** dorsal **b** ventral. **1** Holotype ♂, French Guiana, St. Jean du Maroni (USNM) **2** ♂, French Guiana, Kaw Rd., Camp Patawa (CDH) **3** ♂, French Guiana, Patagai Rd., 58 m (CDH) **4** ♂, Brazil, Rondônia, Porto Velho, 180 m (USNM) **5** ♀, French Guiana, Kaw Rd., PK 37.5 + 2, 200 m (CDH). Scale bar: 1 cm.

53°32'22.10"W, 88 m: 30.IX.2013, D. Herbin & O. Felis leg. (CDH). 2 ♂, Rd. de Kaw, PK 2.5: 25.III.–17.I.1986, P. Sarry leg., ex. Coll. J. Haxaire (CDH). 1 ♂, Rd. de Kaw, layon du PK 37 au km 2.6: 19.VII.2001, ex. Coll. M. Laguerre, DNA sample ID BC-Her 2708, genitalia prep. D. Herbin ref. H. 653 (CDH). 1 ♂, Nouragues research station, 4.098°N, 52.68°W: 9.IX.2010, C. Lopez Vaamonde leg., DNA sample ID BIOUG00730-A04 (MNHN). 1 ♂, Nouragues, Inselberg Camp, Heliport drop zone, 4.088°N, 52.681°W: 1.II.2011, M. Smith & R. Rougerie leg., DNA sample ID NS-RR0769 (MNHN). 1 ♂, Orapu, Crique Grillon: 13.IV.1994, P. Kindl leg. (MNHN). **GUYANA:** 1 ♂, Amazon-Courantyne divide, head of Oronoque River: 1937, H. Beddington [leg.], B.M. 1937–588 (NHMUK). 1 ♂, Potaro: II.1908, S.M. Klages [leg.], Rothschild Bequest BM 1939–1 (NHMUK). **VENEZUELA: Amazonas:** 1 ♂, Río Mavaca, 2°2'N, 65°6'W, 150 m: 16–27.III.1989, David Grimaldi leg., Exp. Phipps-Fudeci (AMNH). **BRAZIL: Amazonas:** 4 ♂, Reserva Ducke, km 26, Hwy. Manaus-Itacoatiara: 16.IV.1972, 20.IV.1972, 15.V.1972, 21.V.1972, E.G., I. & E.A. Munroe [leg.], St Laurent diss.: 5-18-16:1 (CNC). 1 ♂, Fonte Boa, Upper Amazons: VI.1906, S.M. Klages [leg.], Rothschild Bequest, BM 1939–1, NHMUK010354559, St Laurent diss.: 11-1-16:8 (NHMUK). 1 ♂, Manaus, Uypiranga, m/d [right margin] of Rio Negro: X.1941, Parko leg., N. 10.822 I. Oswaldo Cruz, USNM-Mimal: 2404 (USNM). **Pará:** 1 ♂, Ponte Nova, Rio Xingu: ex. Coll. Dognin, USNM-Mimal: 1785, St Laurent diss.: 11-1-16:4 (USNM). 1 ♂, Belém, 20 m: I.1984, V.O. Becker leg., ex. Coll. Becker 46466, USNM-Mimal: 2211 (USNM). 1 ♂, No specific locality: A.M. Moss [leg.], Rothschild Bequest, BM 1939–1 (NHMUK). **Rondônia:** 8 ♂, Porto Velho, 180 m: 24–30.IV.1989, V.O. Becker leg., ex. Coll. Becker 61968, USNM-Mimal: 2200–2207, St Laurent diss.: 11-1-16:5, 11-16:10 (USNM). 1 ♂, Vilhena, 600 m: 9.XII.1997, V.O. Becker leg., ex. Coll. Becker 111449, USNM-Mimal: 2029, St Laurent diss.: 11-16:16 (USNM). **PERU: Madre de Dios:** 1 ♂, Upper Río Madre de Dios, Manu Park, 30–40 km S Salvación, 300 m: VIII.1998 (MWM). 1 ♂, Río Madre de Diós, E. de Salvación, 300 m: VII.1998, don de Claude Lemaire (MNHN). **Huánuco:** 3 ♂, Yuyapichis, ACP Panguana, 9°36'S, 74°56'W, 220 m: VI.2013 [1 ♂], IX.2013 [2 ♂], H. Thöny leg. (MWM). 1 ♂, Yuyapichis, Fazenda Tropical, 9°37'S, 74°56'W, 210 m: VI.2013, A. Eichinger leg., Genitalia prep. No. 29.220 MWM (MWM).

Diagnosis. *Reinmara enthona*, the type species of the genus *Reinmara*, is recognizable by the extensive suffusion of pinkish gray in the medial area. It is very similar to the following two species, but of the three species, *R. enthona* has the most extensive rosy medial suffusion, and a narrow submarginal area with quite falcate forewings (like *R. atlantica* sp. n., but unlike *R. andensis* sp. n.). The genitalia are intermediate in size between those of *R. andensis* and *R. atlantica*. The large diaphragmal sacks of *R. enthona* are similar to, but still smaller than those of *R. andensis*, whereas the same sacks of *R. atlantica* are about 50% smaller.

Description. Male. *Head*: As for genus, but light brown in color. *Thorax*: Coloration as for head. *Legs*: Coloration as for thorax, vestiture thick, long. *Forewing dorsum*:

Figure 6. *Reinmara enthona* ♀, Suriname, Brokopondo, Brownsberg NP, 490 m (Photograph courtesy of A.J. Hielkema, used with permission).

Forewing length: 16–22 mm, avg.: 19 mm, wingspan: 36–43 mm, n=16. Triangular, outer margin concave below apex; tornus notched, apex usually somewhat falcate. Ground color light brown to rich chocolate brown, very sparsely scattered with tiny, dark-brown, petiolate scales. Ante- and medial areas lighter brown than darker brown submarginal area, though in some specimens medial area may be very dark brown with less suffusion of grayish pink, lighter pinkish-gray scales present throughout medial area, including near costa on outer edge of postmedial line. Antemedial line almost nonexistent. Discal spot dark ovoid mark, surrounded by pale-gray scales, darker central area variable in expanse. Fringe coloration lighter brown than wing margin. *Forewing ventrum*: Similar to dorsum but more homogenously brown overall with very obvious black splotch at costa where postmedial line meets it, covering of dark petiolate scales may be much more extensive than on dorsum. Antemedial line absent, postmedial line reduced to traces. *Hindwing dorsum*: Notch on anterior margin weak, patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum but traces of postmedial line outwardly bent mesally. *Abdomen*: Coloration as for thorax. *Genitalia*: (Fig. 23) n=10. Typical of genus, uncus triangular but truncated distally. Gnathos with relatively short fingerlike tips of paired extensions. Valves broad, phallus somewhat conical, curved, distally quite broadened, but variable in width. **Female.** *Head*: As for male but slightly broader; antenna dentate with very small pectinations along entire length of flagellum. *Thorax*: As for male. *Legs*: As for male. *Forewing dorsum*: Forewing length: 23 mm, wingspan: 43 mm, n=1. As for male but much broader, margin convex except for just below apex; tornus strongly notched. Coloration and patterning usually as for male but medial area more

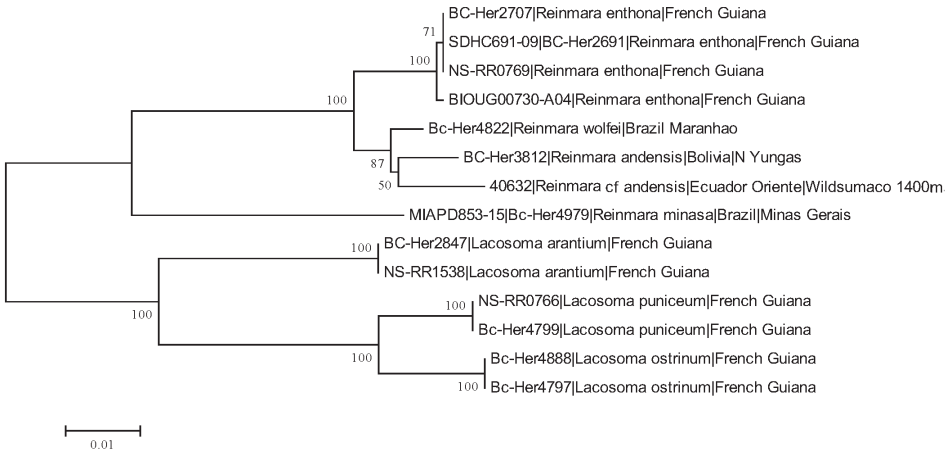


Figure 7. Phylogenetic tree built with neighbor-joining method in MEGA6 showing relationships among *Reinmara*, with *Lacosoma* Grote, 1864 as the outgroup. See remarks section for *R. andensis* regarding noted issues with this analysis.

uniformly pink, discal mark nearly absent. *Forewing ventrum*: Similar to dorsum but appearing browner overall due to absence of well-defined ante- and medial pink shading. Antemedial line absent, postmedial line reduced to traces, discal mark more prominent, darker than on forewing dorsum. *Hindwing dorsum*: Similar to forewing dorsum, but notch present on anterior margin, patterning as for forewing dorsum, but antemedial line absent. *Hindwing ventrum*: Following same pattern as forewing ventrum. *Abdomen*: Similar to that of male but more robust overall. *Genitalia*: (Fig. 31) n=1. Stout, robust; tergite of VIII forms elongated, posteriorly directed tongue-like overhang, VIII heavily sclerotized laterally forming curving plate below papillae anales. Apophyses anteriores roughly half-length of apophyses posteriores. Lamella ante- and postvaginalis converge as a wide, bowl-like structure covered in setae. Ductus bursae short, narrow. Balloon-like corpus bursae rather small in comparison to robust, heavily sclerotized remainder of genitalia. Papillae anales broad, apical pronounced, covered in long, fine setae.

Distribution (Fig. 36). This species is broadly distributed throughout the Amazon rainforest at lower elevations. There are records from Venezuela, Suriname, Guyana, French Guiana, Brazil, and Peru.

Remarks. Considering the expansive distribution of *R. enthona*, this name potentially includes several cryptic species. This section of the genus *Reinmara* warrants future investigation, especially on the lower and moderate elevations of the eastern Andes Mountains. We call attention to specimens from moderate elevations in Peru (MWM) and those from about 1400 m in Ecuador (MGCL) which could be *R. enthona*, *R. andensis* sp. n., or additional taxa. See remarks of *R. andensis* sp. n. for further discussion on this matter.

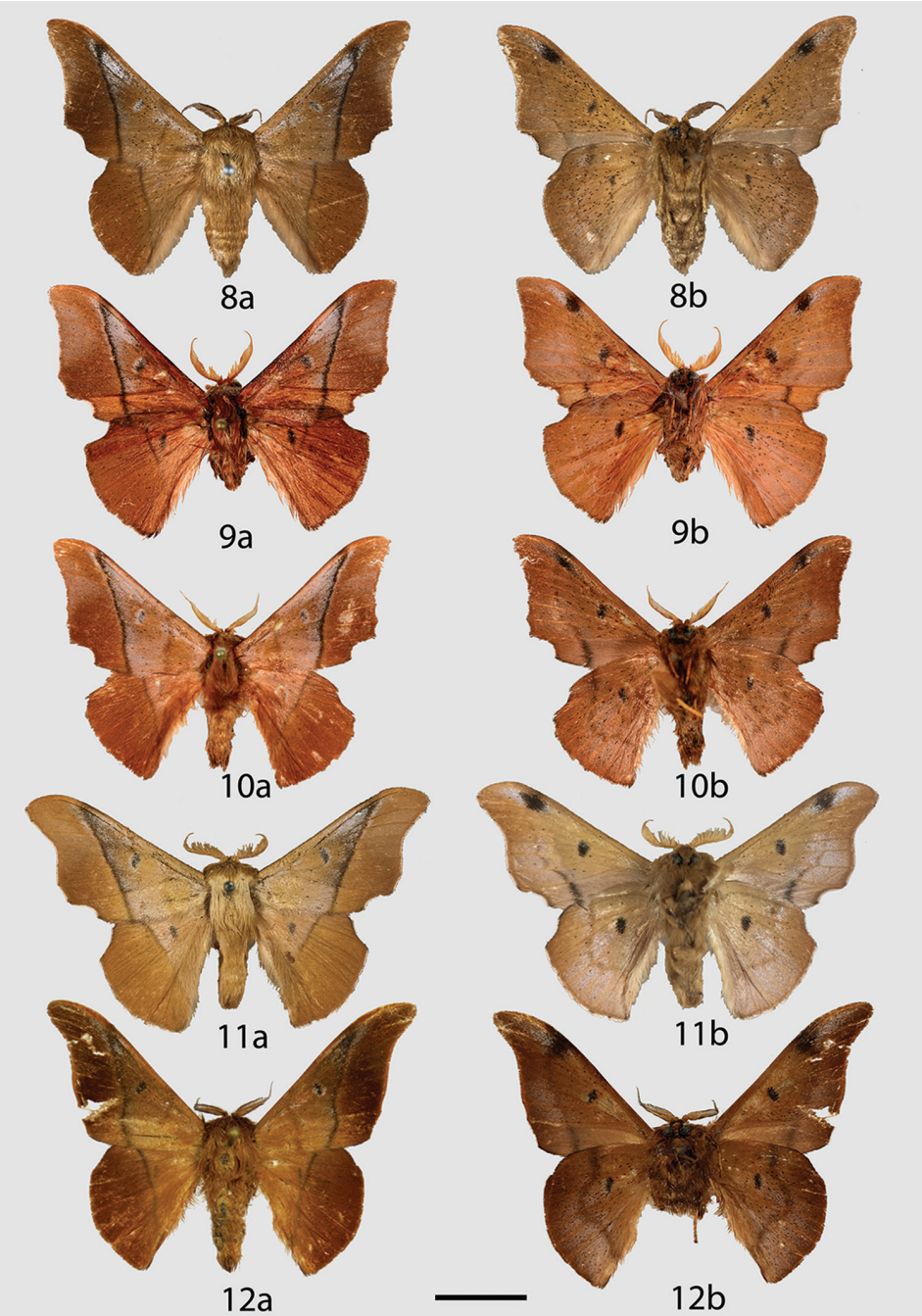
***Reinmara atlantica* sp. n.**
http://zoobank.org/4408352E-9363-4329-AADD-EA7E0C62DD5C
Figs 8, 24, 36

Type material. Holotype, ♂. **BRAZIL: Espírito Santo:** BRASIL: ES, Linhares. 40 m, 05–09.iv.1992, V.O.Becker Col/ Col. BECKER 82019/ USNM-Mimal: 2208/ St Laurent diss.: 11-1-16:6/ HOLOTYPE ♂ *Reinmara atlantica* St Laurent, Herbin, & C. Mielke, 2017 [handwritten red label]/ (ex-USNM, DZUP). Type locality: Brazil, Espírito Santo, Linhares.

Paratypes. (3 ♂ total) **BRAZIL: Espírito Santo:** 2 ♂, same data and Becker number as the holotype, USNM-Mimal: 2209–2210, St Laurent diss.: 11-1-16:7 (USNM). 1 ♂, same data and Becker number as holotype (VOB).

Diagnosis. *Reinmara atlantica* is very similar to *R. enthona* but is darker brown, usually slightly smaller, and has narrower forewings. Also, the light gray medial suffusions are mostly restricted to area along the postmedial line, especially near the costa, and are not present throughout the medial region as in *R. enthona*. The postmedial line is slightly angled toward the costa at Rs4 in *R. atlantica*, not interrupted there in *R. enthona*. The genitalia can be recognized by the narrower valves and smaller gnathos extensions relative to the whole of the genitalia. Perhaps the most reliable character differentiating these two species is the reduced size of all four diaphragmal sacs, especially noticeable in the lower right sac which is very reduced in comparison to that of *R. enthona*, and hardly extends inward toward the body cavity, whereas this huge sac in *R. enthona* extends well into the body cavity past the vincular ring.

Description. Male. *Head*: As for genus, but light brown in color. *Thorax*: Coloration as for head. *Legs*: Coloration as for thorax, vestiture thick, long. *Forewing dorsum*: Forewing length: 19–20 mm, avg.: 19.7 mm, wingspan: 35–36 mm, n=3. Triangular, outer margin concave below apex; tornus notched, apex somewhat falcate. Ground color rich brown, very sparsely scattered with tiny, dark-brown, petiolate scales. Ante- and medial areas lighter brown than darker brown submarginal area, lighter gray scales present near costa on both sides of postmedial line, but more expansive on inner side with narrow strip of suffusion scales along postmedial line, fading before anterior wing margin, small patch of light-gray scales also present in antemedial area. Antemedial line almost nonexistent. Discal spot dark ovoid mark, surrounded by pale-gray scales. Fringe coloration lighter with nearly white trailing edge. *Forewing ventrum*: Similar to dorsum but more homogenously brown overall with very obvious black splotch at costa where postmedial line meets it. Antemedial line absent, postmedial reduced to traces. *Hindwing dorsum*: Notch on anterior margin weak, patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum but traces of postmedial line outwardly bent mesally. *Abdomen*: Coloration as for thorax. *Genitalia*: (Fig. 24) n=2. Typical of genus, very similar to that of *R. enthona* but gnathos size reduced relative to whole of genitalia, diaphragm sacks much smaller overall especially lower right sac, which barely extends into body cavity past vincular ring, valves slightly narrower. **Female.** Unknown.



Figures 8–12. *Reinmara* adults, **a** dorsal **b** ventral. **8** *R. atlantica* Holotype ♂, Brazil, Espírito Santo, Linhares, 40 m (DZUP) **9** *R. andensis* Holotype ♂, Bolivia, N. Yungas, 1000–1800 m (MNHN) **10** *R. andensis* Paratype ♂, Locality as for Fig. 9 (CDH) **11** *R. andensis* Paratype ♂, Peru, Puno, Oroya, Río Inambari, 3100 ft (NHMUK) **12** *R. occidentalis* Holotype ♂, Ecuador, El Oro, 10 km NW Piñas, 750 m (MWM). Scale bar: 1 cm.

Distribution (Fig. 36). *Reinmara atlantica* is known only from the type locality in Espírito Santo, Brazil near sea level in the Atlantic Forest.

Etymology. This new species is named for the type locality, which is situated very near to the Atlantic coast of Brazil.

Remarks. Despite an abundance of Mimallonidae material from the Brazilian Atlantic Forest in collections visited during the course of this research (see list in Methods), the four specimens from Linhares were the only *R. atlantica* material located from this hyperdiverse biome. This species may be much more restricted within this biome than other species in the family that are also endemic to the Brazilian Atlantic Forest.

***Reinmara andensis* sp. n.**
http://zoobank.org/0AFC5C82-6BB5-47FB-B86F-76B76B06259C
Figs 9–11, 25, 36

Type material. Holotype, ♂. **BOLIVIA:** BOLIVIE, N. Yungas, 1000–1800 m, Oct,nov,Dec,2008, Leg. local collector for R. Marx, Coll. D. Herbin/ genitalia prep. D. Herbin ref H. 1134/ HOLOTYPE male *Reinmara andensis* St Laurent, Herbin, & C. Mielke, 2017 [handwritten red label]/ (MNHN). Type locality: Bolivia, northern Yungas [no specific locality provided on data label].

Paratypes. (9 ♂ total) **BOLIVIA:** 1 ♂, same data as for holotype (CDH). **La Paz:** 1 ♂, Nor [North] Yungas, Road Caranavi-Coroico, ca. 100 km NE La Paz, ca. 16.2°S, 67.6°W, 1000–1800 m: V–VI.2009, R. Brechlin & F. Meister leg. (MWM). 1 ♂, Río Songo [*recte* Río Zongo], 750 m: ex-Coll. Fassl, NHRS-TOBI 1951 (NHRS). **PERU: Puno:** 1 ♂, Santo Domingo, Carabaya, 6000 ft: I.1902, wet season, Ockenden [leg.], Rothschild Bequest, BM 1939–1, NHMUK01354562 (NHMUK). 1 ♂, Locality as for previous but: VI.1902, dry season, NHMUK 010318284 (NHMUK). 2 ♂, La Oroya [Oroya], Río Inambari, 3100 ft: III.1905, XI–XII.1905, wet season, G. Ockenden [leg.], Rothschild Bequest, BM 1939–1, NHMUK010354561, St Laurent diss.: 11-1-16:9 (NHMUK). 2 ♂, Locality and collector as for previous but: 3000 ft, V.1905, Ex-Coll. Oberthür, Brit. Mus. 1927–3, NHMUK010354560 (NHMUK).

Specimens of uncertain identity hereby excluded from the type series. ECUADOR: Napo: 1 ♂, 1 ♀, Wildsumaco Biol. Stat., E slope Andes Mtns, 0°40'17.2"S, 77°35'55.1"W, ~1400 m: 1–14.VIII.2016, Kawahara + Barber Labs et al. leg., DNA voucher numbers LEP-40632, 42829 (MGCL, molecular collection, barcoded). **PERU: San Martín:** 1 ♂, Mina de Sal, 1400 m: V.2007, Rainer Marx leg., Genitalia prep. No. 29.219 MWM (MWM). **Huánuco:** 1 ♂, Leoncio Prado, La Divisoria, 1600 m: 20.VI.1982, Charles F. Zeiger [leg.] (MGCL).

Diagnosis. *Reinmara andensis* is similar to *R. enthona* but larger, with broader wings and broader submarginal areas, which are more uniformly light brown. Medially the light gray scaling is reduced in comparison with *R. enthona*. The genitalia are very similar to those of *R. enthona*, but are overall somewhat larger, the gnathos extensions are shorter and phallus more tubular with a more protruding ventral distal lip in

comparison with *R. enthona*. The lower right diaphragm sac is larger and more ovoid in shape in *R. andensis*, in *R. enthona* it is smaller and more spherical.

Description. Male. *Head*: As for genus, but light brown in color. *Thorax*: Coloration as for head. *Legs*: Coloration as for thorax, vestiture thick, long. *Forewing dorsum*: Forewing length: 18.5–20.0 mm, avg.: 19.2 mm, wingspan: 37–40 mm, n=5. Triangular, margin slightly concave below apex; tornus notched, apex hardly falcate. Ground color light orange-brown, very sparsely scattered with tiny, dark brown, petiolate scales. Ante- and medial areas appearing lighter brown than more uniformly orange-brown submarginal area due to suffusion of lighter gray scales medially, especially near costa and on inner side of postmedial line, in some specimens medial area may be very dark brown with less suffusion of grayish pink. Antemedial line almost nonexistent. Discal mark pale gray, ovoid, variously darkened at center. Fringe coloration lighter than wing margin with nearly white trailing edge. *Forewing ventrum*: Similar to dorsum but more homogenously brown overall due to reduction in paler gray shading. Antemedial line absent, postmedial line reduced to traces. *Hindwing dorsum*: Notch on anterior margin weak, patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum but traces of postmedial line outwardly bent mesally. *Abdomen*: Coloration as for thorax. *Genitalia*: (Fig. 25) n=4. Typical of genus, very similar to that of *R. enthona* but overall larger structures, with shorter but more robust gnathos extensions and a more tubular phallus with more prominent ventral distal lip. **Female.** Unknown [putative female from Wildsumaco, Napo, Ecuador does not differ from female *R. enthona*].

Distribution (Fig. 36). *Reinmara andensis* is an Andean species present in southeastern Peru in the Puno region, as well as northwestern Bolivia. Other records from north central Peru in San Martín and Huánuco as well as eastern Ecuador may represent this or additional cryptic Andean taxa.

Etymology. This new species is named for its Andean distribution.

Remarks. Additional material from MWM and MGCL from other localities in Peru besides those from the Puno region need verification due to the unreliability of the collector and/or unclear collecting data. We anticipate that this new species is more broadly distributed, but considering the close similarity to *R. enthona* and unavailability of recently collected Peruvian material, we restrict the type series of this species to include only those from northwestern Bolivia and adjacent southeast Peru. Although *R. andensis* is endemic to the eastern slopes of the Andes, it appears to be sympatric with *R. enthona* at the lower elevations in the inhabited range of *R. andensis*.

Due to the barcoding results (Fig. 7) and biogeography placing an Ecuadorian specimen (Lep-40632) closer to *R. andensis*, we have included specimens from this location under additional examined material for *R. andensis*, though they are excluded from the type series pending additional information. Furthermore, these barcoding results are not clear in that *R. wolfei* (Bc-Her4822) is nested within the clade including *R. andensis* and the Ecuadorian *R.* cf *andensis*, with low bootstrap support. Morphology certainly suggests that *R. enthona* and *R. andensis* are more similar than the rather

unique, *R. wolfei*. Additional molecular and morphological data will be required to fully elucidate the relationships within *Reinmara*. We do not consider single genes, particularly COI, to offer significant phylogenetic signal, especially considering recent work refuting species delimitation based on genetic evidence alone (Sukumaran and Knowles 2017), thus we include the tree in Fig. 7 merely as additional evidence differentiating the Amazonian *R. enthona* from the externally similar Andean *R. andensis*.

In the NHMUK, the Peruvian specimens were collected both during the "dry season" and "wet season" with those specimens from the dry season being smaller overall than those from the wet season. No significant genitalia differences were noted between these sets of specimens however. *Reinmara andensis* is generally larger than *R. enthona* but dry season *R. andensis* are much closer in size to those of *R. enthona*.

***Reinmara occidentalis* sp. n.**
http://zoobank.org/2A610073-44B4-48BD-BF4A-F0808DA6530B
Figs 12, 26, 27, 36

Psychocampa nocturna‡ in Piñas 2007, fig. 215 ♂, ***nomen nudum***

Type material. Holotype, ♂. **ECUADOR: El Oro:** ECUADOR, El Oro prov. 10km NW PIÑAS, 3°38'51"S, 79°45'52"W, 12.04.2012; H=750 m, leg. R. Brechlin & V. Sinyaev, Museum Witt/ Genitalpräparat Heterocera Nr. 29.218 Musuem WITT München/ HOLOTYPE male *Reinmara occidentalis* St Laurent, Herbin, & C. Mielke, 2017 [handwritten red label]/ (MWM). Type locality: Ecuador, El Oro, 10 km NW of Piñas.

Paratype. ECUADOR: El Oro: 1 ♂, Road Piñas-Saracay, 3°39'52"S, 79°45'26"W, 800 m: 6.XII.2012, Sinyaev & Romanov, expedition Ron Brechlin leg., genitalia prep. 30.813 (MWM).

Diagnosis. *Reinmara occidentalis* is one of most obscurely colored species in the genus. This new species is recognizable by the lack of a well-defined notch on the forewing tornus, which is instead smooth, and by the dark brown submarginal coloration with an almost complete absence of gray/pink shading in the medial region. On the ventral surface of the wings, the postmedial line is more continuous and less intermittently notched than in *R. enthona*, *R. atlantica*, or *R. andensis*. The male genitalia are also unique in this species because the gnathos extensions are quite long and deeply divergent, and the phallus is somewhat twisted, noticeably bent, and broadened distally unlike any other in the genus. This species is so far the only *Reinmara* known from the western slopes of the Andes.

Description. Male. *Head*: As for genus, but dark brown in color. *Thorax*: Coloration as for head but slightly lighter brown. *Legs*: Coloration as for thorax, vestiture thick, long. *Forewing dorsum*: Forewing length: 22.5–23.5 mm, avg.: 23 mm, wingspan: 40–42 mm, n=2. Triangular, outer margin weakly concave below apex; tornus smooth, unnotched, apex somewhat falcate. Ground color brown, sparsely scattered with dark brown, tiny petiolate scales. Ante- and medial areas lighter brown than darker, chocolate brown submarginal area, lighter gray scales present near costa on

both sides of postmedial line. Antemedial line light brown but darker than surrounding area, wavy. Discal mark ovoid, surrounded by pale gray scales. Fringe coloration lighter brown than submarginal area. *Forewing ventrum*: Similar to dorsum but more homogenously brown overall, pale gray shading more evident near apex and submarginally. Antemedial line absent, postmedial line as on dorsum but fainter. *Hindwing dorsum*: Anterior margin without notch, but edge flatter than mesal wing margin. Patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum but postmedial line outwardly bent mesally. *Abdomen*: Coloration as for thorax. *Genitalia*: (Fig. 26, 27) n=2. Typical of genus, differing in the more robust gnathos mesal extensions with particularly elongated fingerlike tips, phallus twisted, bent mesally, and distally broadened. **Female.** Unknown.

Distribution (Fig. 36). *Reinmara occidentalis* is known from only two locations separated by a little over 2 km in the El Oro province of western Ecuador, on the western slopes of the Andes mountains from 750–800 m in elevation.

Etymology. This new species is named for the western (*occidentalis* Latin) Andean distribution.

Remarks. We are only aware of two specimens of this new species. Although data is still lacking in regards to the extent of the distribution of *R. occidentalis*, the distribution as well as the external morphology of this species are quite distinct from all others in the genus.

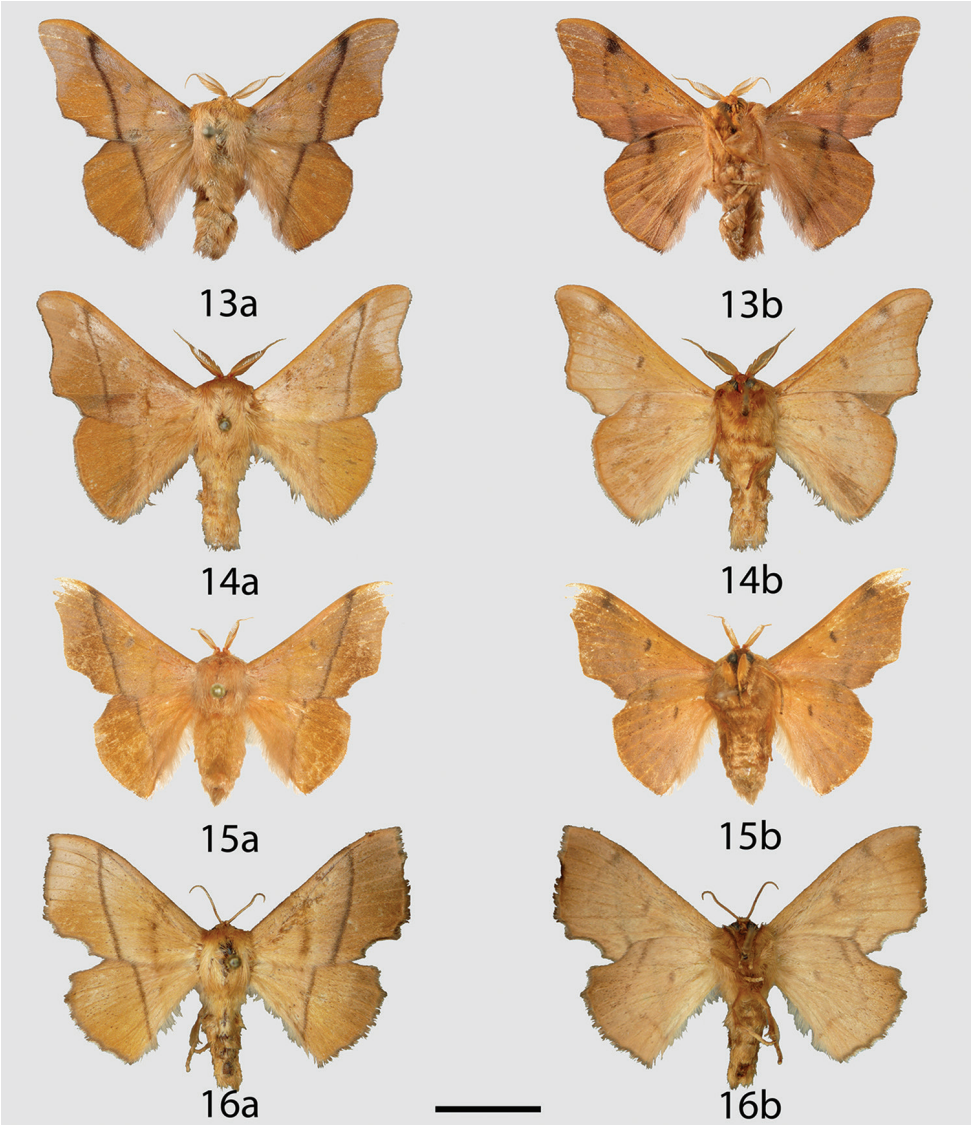
A specimen that may represent this new species was figured (fig. 215) in the plates of Piñas (2007) with the unavailable name *Psychocampa nocturna*‡ Piñas assigned by the author. As per information available in Thöny and Piñas (2015, 2017), all names proposed by Piñas in his works "Mariposas del Ecuador" are unavailable and must be regarded as *nomina nuda* since they do not satisfy ICZN requirements for taxonomically available name (e. g. no description is provided). Thus, we above treat this name as *nomen nudum*. While the specimen figured in Piñas (2007) closely resembles *R. occidentalis* by the obscured coloration, there is a weak notch present at the tornus of the forewings, thus we cannot say for certain if it is indeed this species. Furthermore, locality information is not available, so we are not able to verify if the locality for this particular specimen satisfies our understanding of the west Andean distribution of *R. occidentalis*. The listed wingspan of 44 mm is greater than that of either specimen that we have examined.

Reinmara wolfei **Herbin & C. Mielke, 2014**

Figs 13–16, 28, 32, 36

Reinmara wolfei Herbin and Mielke, 2014: 144, figs ♂ 40, 41, 43

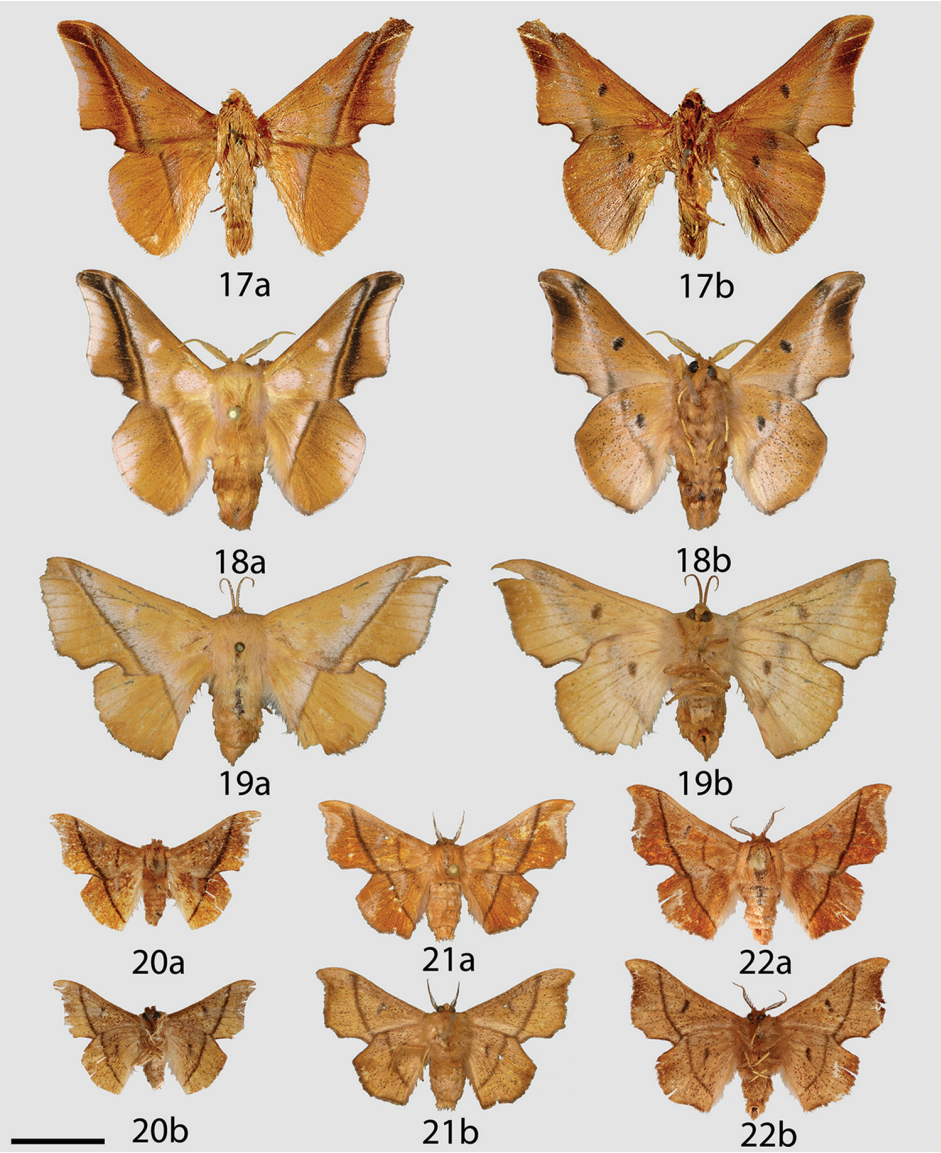
Type material. Holotype, ♂. BRAZIL: Maranhão: holotype, *Reinmara wolfei* HERBIN & MIELKE det./ Brésil, Maranhão, Feira Nova do Maranhão, Retiro, 480 m,



Figures 13–16. *Reinmara wolfei* adults, **a** dorsal **b** ventral. **13** Holotype ♂, Brazil, Maranhão, Feira Nova do Maranhão, 480 m [image originally published by Antenor, reused with permission] (DZUP) **14** ♂, Brazil, Distrito Federal, Planaltina, 1000 m (CPAC) **15** ♂, Brazil, Mato Grasso, 60 km S. of Poconé, Pantanal, 100 m (USNM) **16** ♀, Locality as for Fig. 14 (CPAC). Scale bar: 1 cm.

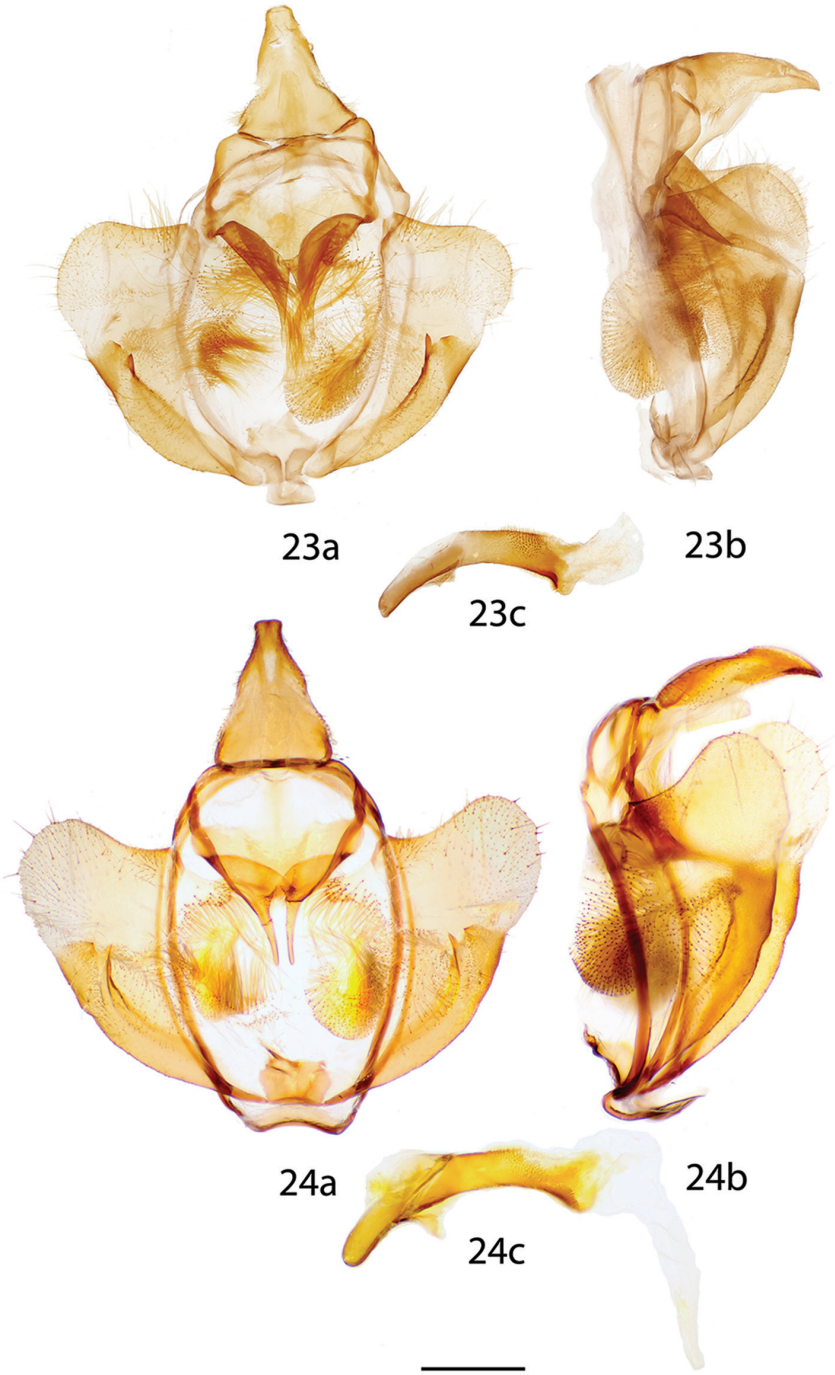
24/31-XII-2011, 07°00'31"S, 46°26'41"W, C. MIELKE leg./ DZ 15.713/ Genitalia prep. D. Herbin ref. H 953/ (DZUP, examined). Type locality: Brazil, MA, Feira Nova do Maranhão.

Additional material examined. (7 ♂, 4 ♀ total) **BRAZIL: Maranhão:** 1 ♂, Balsas, 8°38'S, 46°43'W, 525 m: Coll. EMBRAPA-CPAC No. 20907 (CPAC). **Goiás:** 1 ♂, 2 ♀,

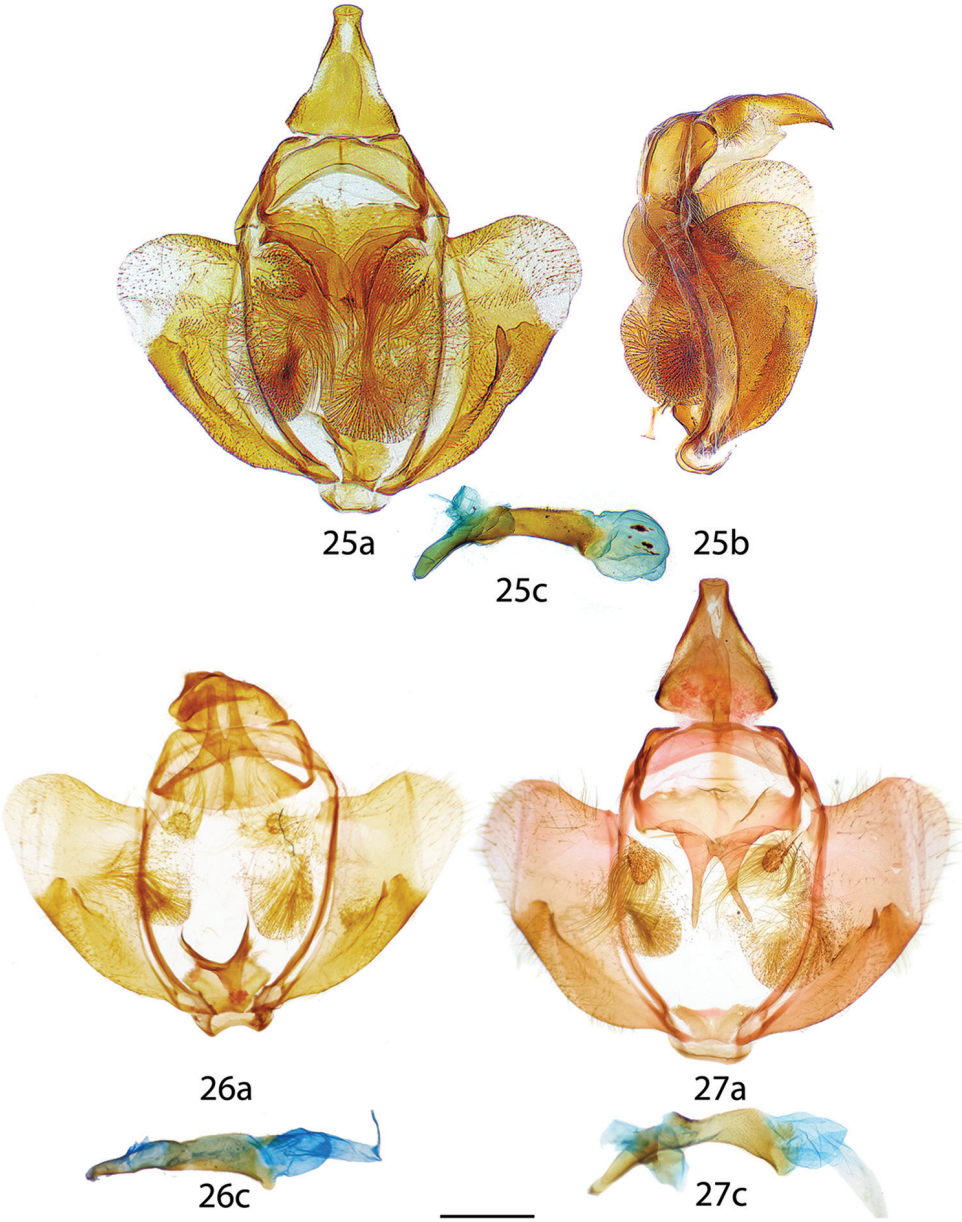


Figures 17–22. *Reinmara* adults, **a** dorsal **b** ventral. **17** *R. minasa* Holotype ♂, Brazil, Minas Gerais, Passa Quatro (MNHU) **18** *R. minasa* ♂, Brazil, São Paulo, São José do Barreiro, Bocaina, 1539 m (CGCM) **19** *R. minasa* ♀, Brazil, São Paulo, Santo Antônio do Pinhal, Eugênio Lefèvre, 1200 m (MZSP) **20** *R. ignea* Paratype ♂, Brazil, Santa Catarina, Rio Vermelho, 968 m (ISEZ) **21** *R. ignea* Holotype ♀, Brazil, São Bento do Sul, Rio Natal, 550 m (DZUP) **22** *R. ignea* Paratype ♀, Brazil, Rio de Janeiro, Nova Friburgo, 1100 m (USNM). Scale bar: 1 cm.

Leop. Bulhoes [Leopoldo de Bulhões]: XI.1935, III.1936, ex. coll. R. Spitz, H.R.P[earson] genitalia prep. 4184 [lost], NHMUK010354557, 010354558 (2 ♀, NHMUK); XII.1936, ex. coll. R. Spitz, HRP No. 1462 (1 ♂, MNRJ). **Distrito Federal:** 1 ♂, Brasília:



Figures 23, 24. *Reinmara* male genitalia, **a** ventral **b** lateral **c** phallus lateral. **23** *R. enthona*, Suriname, Moengo, Boven Cottica River, St Laurent diss.: 10-25-15:2 (CUIC). **24** *R. atlantica* Holotype, Brazil, Espírito Santo, Linhares, 40 m, St Laurent diss.: 11-1-16:6 (DZUP). Scale bar: 1 mm.

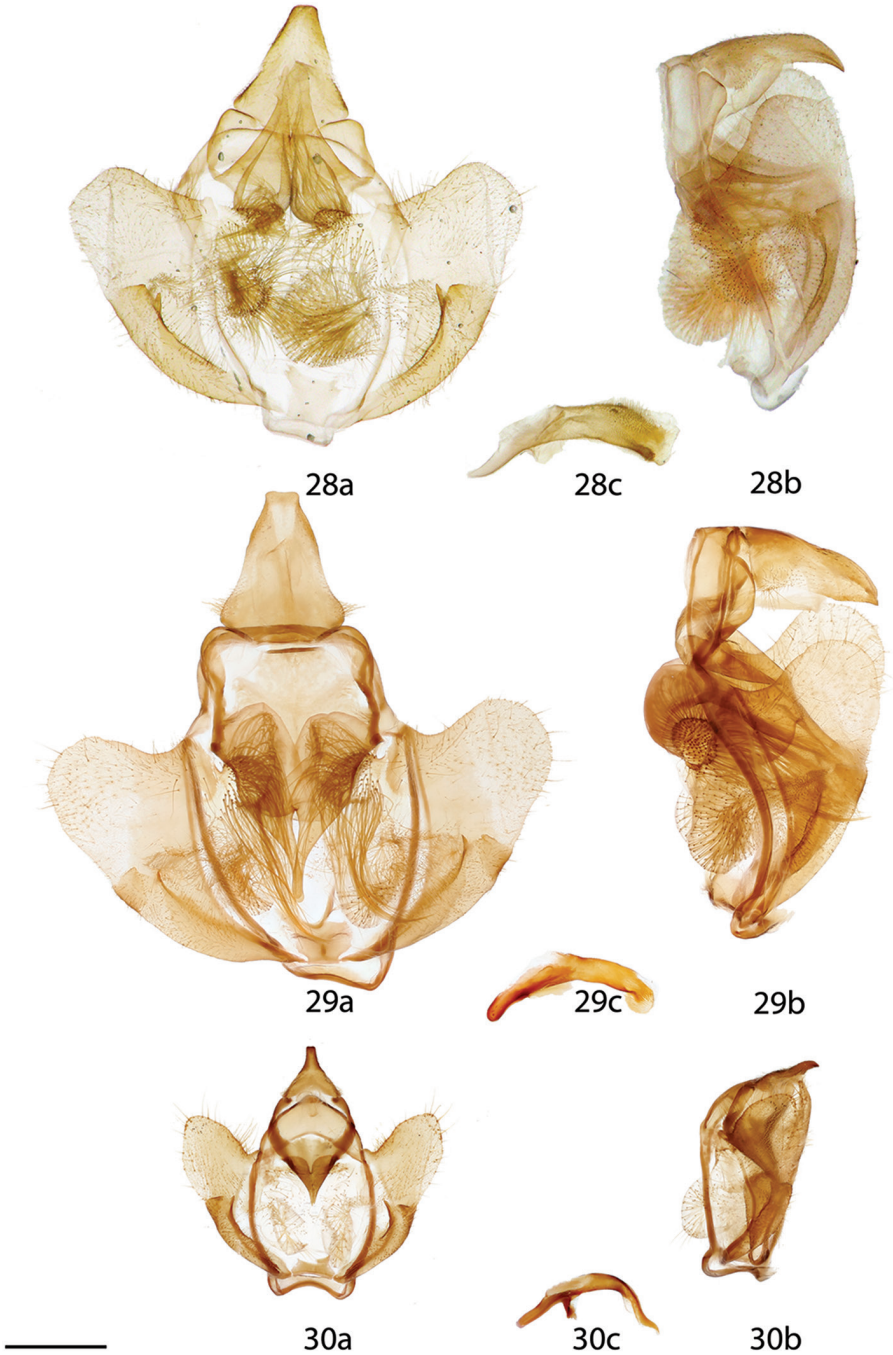


Figures 25–27. *Reinmara* male genitalia, **a** ventral **b** lateral **c** phallus lateral. **25** *R. andensis* Holotype, Bolivia, N. Yungas, 1000–1800 m, D. Herbin genitalia prep. H. 1134 (MNHN) **26** *R. occidentalis* Holotype, Ecuador, El Oro, 10 km NW of Piñas, 750 m, genitalia prep. 29.218 [phallus flipped horizontally, oriented somewhat dorsally] (MWM) **27** *R. occidentalis* Paratype, Ecuador, road Piñas to Saracay, 800 m, genitalia prep. 30.813 [phallus flipped horizontally] (MWM). Scale bar: 1 mm.

25.II.1966, ex. coll. Gagarin (DZUP). 2 ♂, 2 ♀, Planaltina, 15°35'S, 47°42'W, 1000 m: 11.XI.1976, 31.III.1977, 9.III.1978, 4.IV.1978, V.O. Becker leg., Coll. EMBRAPA-CPAC No. 2425, 4940, 6812, 6879 (CPAC). **Mato Grosso:** 1 ♂, 60 km south of Poconé, Pantanal, 100 m: 22.V.1998, V.O. Becker leg., ex. Coll. Becker 116547, St Laurent diss.: 11-1-16:2 (USNM). **BOLIVIA: Santa Cruz:** 1 ♂, Aguas Calientes [Roboré]: Travassos, Barros & Albuquerque leg. (CEIOC).

Diagnosis. *Reinmara wolfei* is characterized by the small size, sandy, tan brown coloration, only very faint to absent paler shading medially, and a faint or absent discal mark on the hindwing ventrum. The phallus of *R. wolfei* is the shortest and broadest of the genus. The female genitalia are not overly distinct from those of *R. enthona*.

Description. Male. *Head*: As for genus, coloration brown, antenna coloration brown. *Thorax*: Coloration lighter brown than that of head. *Legs*: Coloration as for thorax. *Forewing dorsum*: Forewing length: 15–17 mm, avg.: 16.3 mm, wingspan: 30–36 mm, n=4. Triangular, outer margin concave, tornus weakly notched. Ground color sandy brown. Ante- and medial areas concolorous, submarginal area above tornus slightly darker brown than remainder of wing in fresh specimens, pale suffusion present on inner side of postmedial line near costa. Antemedial line faint brown, wavy, postmedial line slightly curved, usually thick, black. Discal mark weakly represented by pale splotch with darkened region centrally. Fringe coloration as for remainder of wing or slightly darker. *Forewing ventrum*: Similar to dorsum but pale suffusions most absent except near apex. Antemedial line absent, postmedial line reduced to wavy traces, discal mark more prominent, darker than on forewing dorsum. *Hindwing dorsum*: Notch on anterior margin weak, patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum. *Abdomen*: Coloration as for thorax. *Genitalia*: (Fig. 28) n= 4. Typical of genus, differing in the relatively triangular shape of the uncus, more elongated gnathos mesal extensions with particularly elongated fingerlike tips that are usually slightly bent, sacculus fold with large tooth-like extensions, phallus short, blunt, broad, covered in fine setae. **Female.** *Head*: As for male but slightly broader; antenna dentate with very small pectinations along entire length of flagellum. *Thorax*: As for male. *Legs*: As for male. *Forewing dorsum*: Forewing length: 15–19 mm, avg.: 17.3 mm, wingspan: 33–35 mm, n=4. As for male but much broader, margin convex except for just below apex; tornus strongly notched. Coloration and patterning as for male but discal mark almost entirely absent. *Forewing ventrum*: Similar to dorsum but more homogenously brown overall due to absence of well-defined ante- and medial areas. Antemedial line absent, postmedial line reduced to outwardly curved traces, discal mark more prominent, discal mark darker than on forewing dorsum. *Hindwing dorsum*: Similar to forewing dorsum, but notch present on anterior margin, patterning as for forewing dorsum, but antemedial line absent, discal mark and postmedial line usually weakly defined. *Hindwing ventrum*: Following same pattern as forewing ventrum. *Abdomen*: Similar to that of males but more robust overall. *Genitalia*: (Fig. 32) n=1. Stout, robust; tergite VIII forms elongated, posteriorly directed shortened tongue-like overhang, VIII heavily sclerotized laterally



Figures 28–30. *Reinmara* male genitalia, **a** ventral **b** lateral **c** phallus lateral. **28** *R. wolfei*, Brazil, Distrito Federal, Planaltina, 1000 m, C. Mielke genitalia prep. 6.812 (CPAC) **29** *R. minasa*, Brazil, Espírito Santo, St Laurent diss.: 5-15-16:1 (CUIC) **30** *R. ignea* Paratype, Brazil, Santa Catarina, São Bento do Sul, Rio Vermelho, 968 m, St Laurent diss.: 5-6-16:1 (ISEZ). Scale bar: 1 mm.

forming curving plate below papillae anales. Apophyses anteriores roughly half-length of apophyses posteriores. Lamella ante- and postvaginalis converge as a wide, bowl-like structure covered in setae. Ductus bursae short, narrow. Corpus bursae rather small in comparison to robust, heavily sclerotized remainder of genitalia, balloon-like. Papillae anales broad, apical pronounced, covered in long, fine setae.

Distribution (Fig. 36). *Reinmara wolfei* is endemic to the Cerrado of central South America, with few records from Brazil in the states of Maranhão, Goiás, and Distrito Federal. We also report a specimen from the wet Pantanal in Brazil, Mato Grosso. A specimen from Cerrado habitat in Bolivia, Santa Cruz, is reported here as well.

Remarks. We figure and describe the female of this species for the first time, as well as the first Bolivian record. Until now, this species was known only from the male holotype from Maranhão, Brazil. We note some minor external differences between the specimens from drier Cerrado and that of the wet Pantanal, such as the slightly smaller size and brighter coloration in the Pantanal specimen (Fig. 15), but genitalia of this specimen are not noticeably different from those of typical *R. wolfei*.

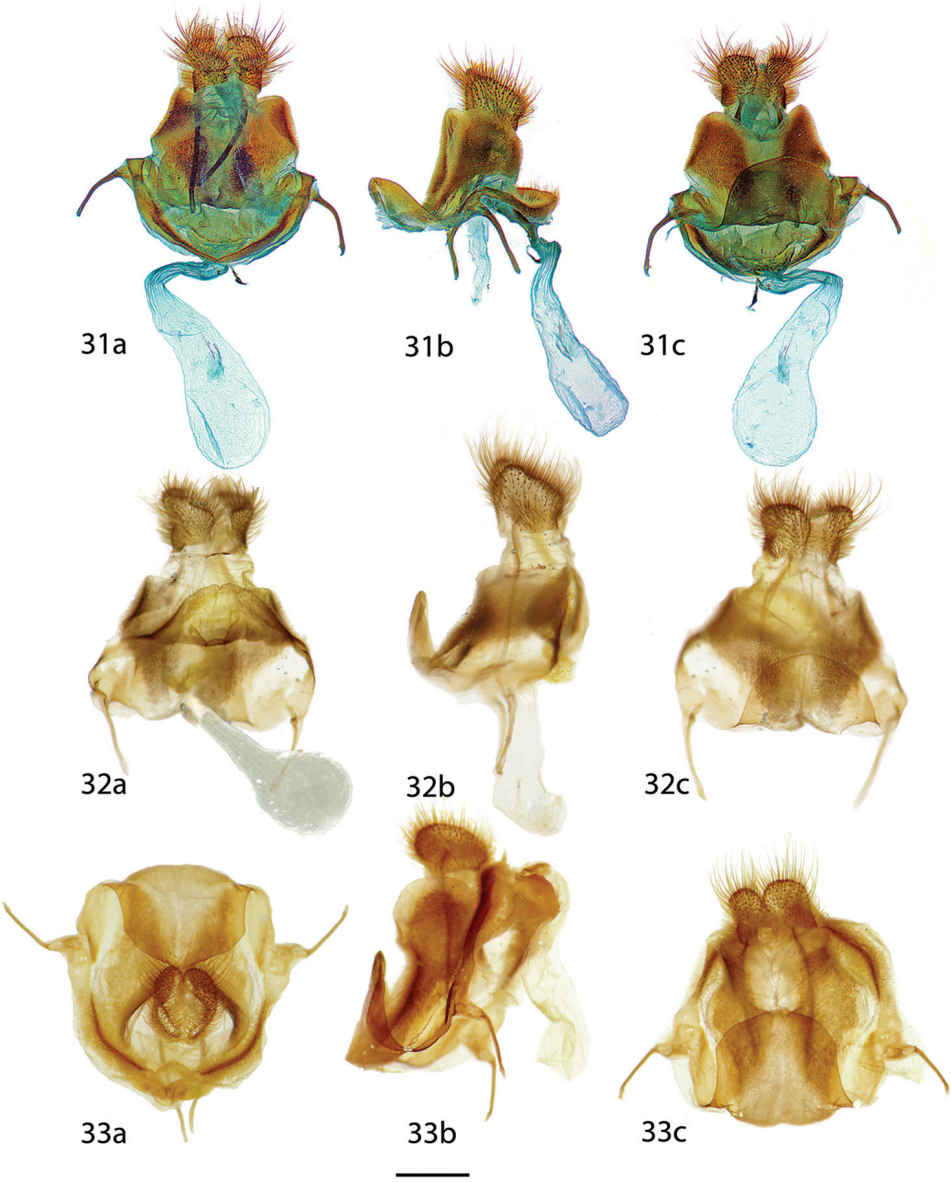
Reinmara minasa **Schaus, 1928**

Figs 17–19, 29, 33, 36

Reinmara minasa Schaus, 1928: 655, fig. ♂ 88b
Reinmara minasa; Gaede 1931
Reinmara minasa; Becker 1996
Reinmara minasa; Herbin and Mielke, 2014

Type material. Holotype, ♂. **BRAZIL: Minas Gerais:** Passa Quatro, Sul de Minas [SE of Minas Gerais], S.O. Brasilien, Jos. Zikán [leg.]/ [Holo]Typus/ No. [illegible] 6, 19-I-22/ *Reinmara minasa* Schaus type/ (MNHU, examined). Type locality: Brazil, Minas Gerais, Passa Quatro.

Additional specimens examined. (39 ♂, 2 ♀ total) **BRAZIL: Espírito Santo:** 1 ♂, No additional data, St Laurent diss.: 5-15-16:1 (CUIC). **Minas Gerais:** 1 ♂, Itamonte, Vargem Grande, 1600 m: 17.II.2010, [O.] Mielke & Casagrande leg. (DZUP). 1 ♂, Alto Caparaó, Tronqueira, 20°24'38"S, 41°50'07"W, 1994 m: 10.XI.2012, B. Vincent leg., BC-Her4979, genitalia prep. D. Herbin ref. H. 1132 (CDH). **Rio de Janeiro:** 3 ♂, [Itatiaia], Pico de Itatiaia: 28.III–1.IV.1958, H.B.D. Kettlewell [leg.], B.M. 1958–273 (NHMUK). 3 ♂, Itatiaia, L. 41, 1300 m: 3–8.II.1951, Trav[assos] & Albuquerque [leg.] (NHMUK, 2 ♂); 6–10.XII.1950, 270, USNM-Mimal: 2422, St Laurent diss.: 11-1-16:1 (1 ♂, USNM). 1 ♂, Itatiaia, 700 m: 3.IV.1927, J. Zikán leg., ex-Coll. Gagarin (DZUP). 1 ♂, Itatiaia, 1200 m: II.1960, H. Ebert leg. (ZSM). 2 ♂, Parque Nacional do Itatiaia, Lago Azul, 800 m: 19.III.1955, G. & H. Pearson leg., HRP No. 784, USNM-Mimal: 2381 (USNM); 14–17.IV.1956, Pearson & R. Barros [leg.], HRP No. 776, USNM-Mimal: 2382 (USNM). 1 ♂, [Itatiaia], Campo Bello [Campo Belo]: Zikán leg., USNM-Mimal: 1788 (USNM). **São Paulo:** 7 ♂, 1 ♀, Campos do Jordão [Santo An-



Figures 31–33. *Reinmara* female genitalia, **a** ventral **b** lateral **c** dorsal. **31** *R. enthona*, French Guiana, Kaw Rd., PK 37.5 + 2, 200 m, D. Herbin genitalia prep. H. 1103 (CDH) **32** *R. wolfei*, Brazil, Distrito Federal, Planaltina, 1000 m, C. Mielke genitalia prep. 6.879 (CPAC) **33** *R. minasa*, Brazil, São Paulo, Santo Antônio do Pinhal, Eugênio Lefèvre, 1200 m, C. Mielke genitalia prep. 28.071 (MZSP). Scale bar: 1 mm.

tônio do Pinhal], Eugênio Lefèvre, 1200 m: 13–20.XI.1952, L. Travassos Filho, D'Almeida, & Pd. Pereira [leg.]; 15–20.XII.1952, L. Travassos Filho & D'Almeida [leg.]; 14–17.I.1953, L. Travassos Filho & S. Medeiros [leg.]; 13–15.II.1953, L. Travassos

Filho & L. Travassos [leg.]; 22.III.1963, L. Travassos Filho, J. Guimarães, E. Rabello, & A. Barroso [leg.], MSZP Nos. 28065–28071, ♀ genitalia prep. MZSP 28071 (6 ♂, 1 ♀, MZSP); 16.XII.1952, D'Almeida & L. Travassos F. leg., Ex-coll. D'Almeida (1 ♂, DZUP). 1 ♂, Eugênio Lefèvre [train station, Santo Antônio do Pinhal], 1162 m: ex. Coll. Gagarin (DZUP). 2 ♂, Campos do Jordão, Umuarama, 1800 m: 3–15.II.1937 [DZ 33.014], 8–15.III.1937, Gagarin leg., ex. Coll. Gagarin (DZUP). 6 ♂, São José do Barreiro, Bocaina, 44°37'57"W, 22°43'37"S, 1539 m: 2–6.I.2016, C. Mielke leg., CGCM 31.240, CGCM 31.263, CGCM 31.274, CGCM 31.285, CGCM 31.310, CGCM 31.331 (CGCM). 1 ♂, São José do Barreiro, Bocaina, 44°39'49"W, 22°44'35"S, 1692 m: 9–10.X.2015, C. Mielke leg., CGCM 30.813 (CGCM). 1 ♂, Termas de Lindóia [Águas de Lindóia]: 27.I.1950, N. & R. D'Almeida leg., ex. Coll. D'Almeida (DZUP). 1 ♂, Anhembi, Faz. Bar. Rico: 1.III.1960, LTF A. Barroso (MZSP). 1 ♀, Termas de Lindoia [*recte* Aguas de Lindóia]: 10.II.1950, D'Almeida leg. (MNRJ). **Paraná:** 3 ♂, [Piraquara], Banhados, railroad from Curitiba to Paranaguá, 800 m: 11.II.1972, E.G., I. & E.A. Munroe [leg.], St Laurent diss.: 5-8-16:2 (CNC). 2 ♂, Tibagi, Guartelá, 975 m: 18.I.2012, 3.III.2012, C. Mielke leg. (CDH). **Santa Catarina**: 1 ♂, Serra do Panelão, Urubici, 27°53.989'S, 49°35.156'W, 1250 m: 26–27.II.2007 (CDH).

Diagnosis. This unique species of *Reinmara* can be recognized by the black suffusion along the entire length of the forewing postmedial line in males, which reaches the apex, darkening it. In both males and females there is a well-defined, narrow, pale pink suffusion along the postmedial line (outside of the black suffusion of the males, which is absent in females), leaving the remainder of the medial area mostly clear of pale pink suffusions. The male genitalia is recognizable by the uniformly narrow phallus with a usually distinctly backward splayed distal ventral tip, the uncus is quite broad. Among the species for which the female is known, *R. minasa* female genitalia is characterized by the largest dorsal projection of the tergite VIII as well as by the robustness of the lateral plates below the papillae anales.

Description. Male. *Head*: As for genus, coloration light brown. *Thorax*: Coloration as for head but with pale pink scales present on prothoracic collar and base of wings. *Legs*: Coloration as for thorax, but with additional, dark petiolate scales sparsely scattered amongst vestiture, tarsus yellower. *Forewing dorsum*: Forewing length: 16.5–21.0 mm, avg.: 18.1 mm, wingspan: 33.0–42.5 mm, n=9. Acutely triangular, narrow, outer margin concave; tornus deeply notched nearly until postmedial line, apex somewhat falcate. Ground color brown, very sparsely scattered with dark brown, tiny petiolate scales. Antemedial area with pale pink hue, medial area displaying narrow strip of ground color between pink hue of antemedial area and inner pink suffusion of postmedial line, submarginal area darker brown than medial area with pale gray lunule-like marking on margin and strong, black suffusion on outer edge of postmedial line, black suffusion becoming widest and more diffuse near tornus, extending along entire postmedial line to apex. Antemedial line hardly distinguishable but present as outwardly bent brown wave, postmedial line nearly straight. Discal mark variable from pale pink splotch with little to no black scales in center to almost entirely covered by black scales. Fringe coloration nearly white with darker scales at wing vein intersections. *Forewing ventrum*: As for genus but pale pink

scales along postmedial line broadly scattered, postmedial line as on dorsum straight, but only fainter, black suffusion replaces lunule-like submarginal shape of dorsum. *Hindwing dorsum*: Notch on anterior margin weak, patterning as for forewing dorsum, but antemedial line absent, discal mark nearly always absent, pale suffusion submarginally similar to forewing lunule-like area. *Hindwing ventrum*: Following same pattern as forewing ventrum but postmedial line wavier, discal mark present, pale pink suffusion widely expanded throughout medial and submarginal areas. *Abdomen*: As for genus. *Genitalia*: (Fig. 29) n=4. Typical of genus, differing in the relative shortness and (usual) broadness of uncus, generally more robust gnathos mesal extensions with particularly elongated fingerlike tips, phallus narrow and smoothly curved, somewhat boomerang shaped, tip of phallus splayed open with ventral edge forming backwardly angled lip. Vesica bulbous with distally extended narrower portion. **Female.** *Head*: As for male, but antenna dentate with very small pectinations along entire length of flagellum. *Thorax*: As for male. *Legs*: As for male. *Forewing dorsum*: Forewing length: 21 mm, wingspan: 43 mm, n=1. As for male but much broader, margin nearly straight. Coloration and patterning as for male except outer black suffusion along postmedial line absent. *Forewing ventrum*: Similar to dorsum but lighter, homogenous brown without distinctly different areas of wing except for darker brown region submarginally. Antemedial line absent, postmedial line very faint, discal mark more prominent, darker than on forewing dorsum. *Hindwing dorsum*: Similar to forewing dorsum, notch present on anterior margin, patterning as for forewing dorsum, but antemedial line and discal mark absent. *Hindwing ventrum*: Following same pattern as forewing ventrum. *Abdomen*: Similar to that of males but more robust overall. *Genitalia*: (Fig. 33) n=1. Very stout, robust; tergite of VIII forms elongated, posteriorly directed tongue-like overhang, VIII heavily sclerotized laterally forming curving plate encircling the papillae anales, curved plate weakly curling backward near papillae anales. Apophyses anteriores roughly half-length of apophyses posteriores. Lamella ante- and postvaginalis converge as a wide, bowl-like structure covered in setae. Ductus bursae short, narrow. Corpus bursae rather small in comparison to robust, heavily sclerotized remainder of genitalia, baglike. Papillae anales broad, rounded, covered in long, fine setae.

Distribution (Fig. 36). *Reinmara minasa* is endemic to southeastern to south Brazil, and is found in mountainous regions of the states of Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina, at elevations ranging from 700–2000 m.

Remarks. Until now, very little has been reported on this species. We figure and describe the female of *R. minasa* for the first time.

***Reinmara ignea* sp. n.**
http://zoobank.org/60EF2888-A2B1-43E5-AA6D-3D40BAF74821
Figs 20–22, 30, 34–36

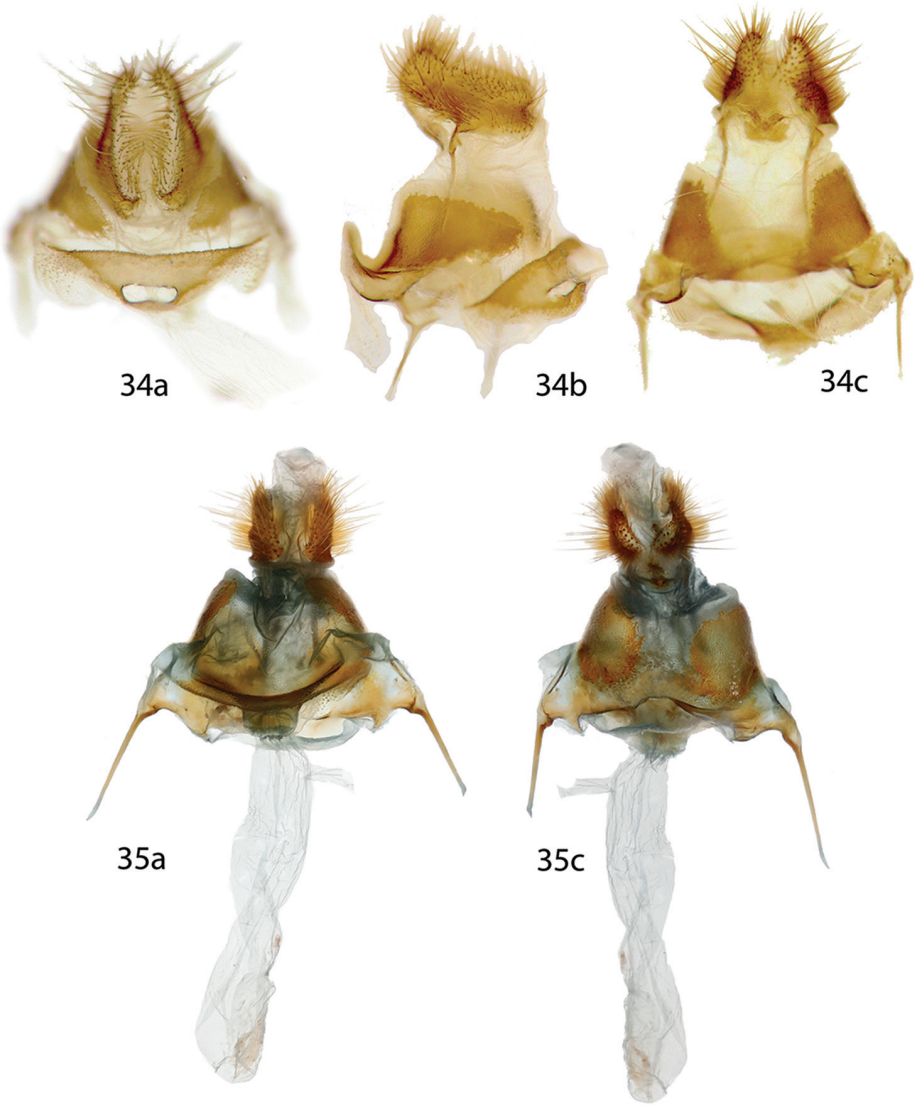
Type material. Holotype, ♀. **BRAZIL: Santa Catarina:** BRAZIL – SC, São Bento do Sul, Rio Natal, 550 m., (no date). I. Rank leg./ 20.982 Col. C. Mielke [dissec-

tion number equivalent]/ HOLOTYPE female *Reinmara ignea* St Laurent, Herbin, C. Mielke, 2017 [handwritten red label]/ (DZUP). Type locality: Brazil: Santa Catarina: São Bento do Sul, Rio Natal.

Paratypes. (1 ♂, 1 ♀ total) **BRAZIL: Santa Catarina:** 1 ♂, São Bento do Sul, Rio Vermelho, 968 m: 26.II.1973, A. & J. Razowski leg., St Laurent diss.: 5-6-16:1 (ISEZ). **Rio de Janeiro:** 1 ♀, Nova Friburgo, 1100 m: 21.I.1998, V.O. Becker leg., ex. Coll. Becker 112810, St Laurent diss.: 2-29-16:1 (USNM).

Diagnosis. This unique species cannot be confused with any other Mimallonidae. *Reinmara ignea* is the smallest species of *Reinmara*, bearing little outward resemblance to others of the genus. The tiny size, sharply acute and falcate forewings, thick postmedial and antemedial lines, narrow and curving phallus, are just the most immediately recognizable characters enabling the identification of this new species. We also note that this is the only species of *Reinmara* for which the female has bipectinate antennae like the male (albeit smaller overall), not dentate as in other female *Reinmara*.

Description. Male. *Head*: As for genus but coloration pale beige, antenna coloration pale brown due to scaling, but much darker brown beneath scales, vestigial proboscis not visible. *Thorax*: Coloration as for head. *Legs*: Coloration as for thorax, vestiture homogenously colored. *Forewing dorsum*: Forewing length: 12 mm, wingspan: 24 mm, n=1. Triangular, outer margin concave; tornus weakly notched, apex falcate. Ground color light orange-brown, speckling of tiny petiolate scales. Ante- and medial areas concolorous, darker brown than submarginal area, submarginal area much lighter orange-brown, appearing nearly yellow, faint pale lunule-like marking along margin below apex. Antemedial line defined, dark brown, slightly outwardly bowed, postmedial line also dark brown, slightly wider than antemedial line, barely curved. Discal mark as pale splotch, with obscured, darker central region. Fringe not well preserved. *Forewing ventrum*: Compared to forewing dorsum, more subdued tan brown, homogenous across all areas of wing, antemedial line absent, postmedial line as for dorsum, petiolate scaling heavier, especially antemedially, discal mark dark brown streak. *Hindwing dorsum*: Shape more rounded than forewing, outer margin convex except straight anterior margin, patterning as for forewing dorsum but both ante- and medial areas lighter, more similar to submarginal area in coloration, antemedial line absent, postmedial line as for forewing dorsum, well defined, discal mark present but weakly as pale streak. *Hindwing ventrum*: Following same pattern as forewing ventrum. *Abdomen*: As for genus. *Genitalia*: (Fig. 30) n= 1. Rather typical of genus, differing in smaller setae-filled sacks in diaphragm, which contain fewer setae, a more triangular, truncated uncus, gnathos round rather than rectangular, with triangular, dual mesal extensions that are fused together, extensions barely separated distally into short paired, fingerlike tips, sacculus fold particularly well developed and more symmetrical, phallus strongly curved, distally flattened and bent. **Female.** *Head*: As for male but slightly darker in color; antenna bipectinate and similar to that of male, but slightly smaller overall. *Thorax*: As for male but darker brown. *Legs*: As for male but darker brown overall with lighter yellow tarsus, tibial spurs more heavily clothed in scales. *Forewing dorsum*: Forewing length: 12–16 mm, avg.: 14 mm, wingspan:



Figures 34, 35. *Reinmara ignea* female genitalia, **a** ventral **b** lateral **c** dorsal. **34** Holotype ♀, Brazil, São Bento do Sul, Rio Natal, 550 m, C. Mielke genitalia prep. 20.982 (DZUP) **35** Paratype ♀, Brazil, Rio de Janeiro, Nova Friburgo, 1100 m, St Laurent diss.: 2-29-16:1 (USNM). Note: different orientation of two preparations obfuscates their actual similarity, in Fig. 34a the lamella ante- and postvaginalis are pressed downward. Scale bar: 1 mm.

27–31 mm, n=2. Shape essentially as for male but tornus slightly notched. Maculation as for male, but coloration darker orange-brown to red brown submarginally. Submarginal area proportionally wider. *Forewing ventrum*: Compared to forewing

dorsum, more subdued tan brown, homogenous across all areas of wing, antemedial line absent, postmedial line as for dorsum, petiolate scaling heavier, especially antemedially, discal mark dark brown streak. *Hindwing dorsum*: As for male but medial and submarginal areas more distinctly bicolored (similar to forewing dorsum). *Hindwing ventrum*: Following same pattern as forewing ventrum. Frenulum as multiple bristles. *Abdomen*: Similar to that of male but more robust overall. *Genitalia*: (Figs 34, 35) n=2. Tergite of VIII forming short, thin posteriorly directed extension, VIII sclerotized laterally forming curving plate, but not extended to encircle papillae anales. Apophyses anteriores roughly equal in length apophyses posteriores. Lamella ante- and postvaginalis converge as a wide, bowl-like structure. Ductus bursae short, rectangular. Corpus bursae elongate, tubular. Papillae anales somewhat narrow, covered in long, fine setae.

Distribution (Fig. 36). *Reinmara ignea* is so far known only from two nearby localities in São Bento do Sul, Santa Catarina, and a third locality in Rio de Janeiro State, Brazil. These two areas are separated by about 815 km and both fall in the mountainous region of the Brazilian Atlantic Forest.

Etymology. This new species is named for its fiery (*ignea* Latin) coloration, reminiscent of burning embers.

Remarks. Until the first author dissected the single male of this new species, proper generic placement was not clear to us, and we had originally considered *R. ignea* as belonging to an undescribed genus. Despite the outward uniqueness of both sexes, the genitalia of both sexes display characters fundamental to the diagnosis of the genus *Reinmara*. In the male, the structure and shape of the valves, the broad, mesally fused but distally separated gnathos, and balloon-like setae-filled sacs extending inward into the body cavity from the diaphragm are all typical of *Reinmara*, the gnathos character precluding *R. ignea* from placement in the related *Trogoptera*. Female genitalia are similar to those of other species of *Reinmara*, but the tergite VIII extension is particularly weakly sclerotized and thin (though present). We also note that this is the only species in the genus for which the female antennae are similar (bipectinate) to those of the male, just smaller, as in most mimallonid genera, not dentate as in the females of *R. enthona*, *R. wolfei*, and *R. minasa*.

We note minor difference in maculation of the two female specimens of *R. ignea* (compare Figs 21 and 22), as well as in their genitalia, but due to the otherwise close similarity (in comparison with other species in the genus) and the apparent rarity of this species, we include both specimens in the type species.

This species and *R. atlantica* may very well be of conservation concern due to the present state of fragmentation of the biome to which they are endemic (Ribeiro et al. 2009). The lack of specimens of *R. ignea* from this otherwise relatively well-collected region suggests that it may be rare and/or only weakly attracted to light. It is notable that most specimens of *R. ignea* are female. The opposite is true for other *Reinmara* where both sexes are known, where males far outnumber collected females.

Two additional female specimens were located in the collection of Ivo Rank, collector of the holotype, but they are not included in the type series.

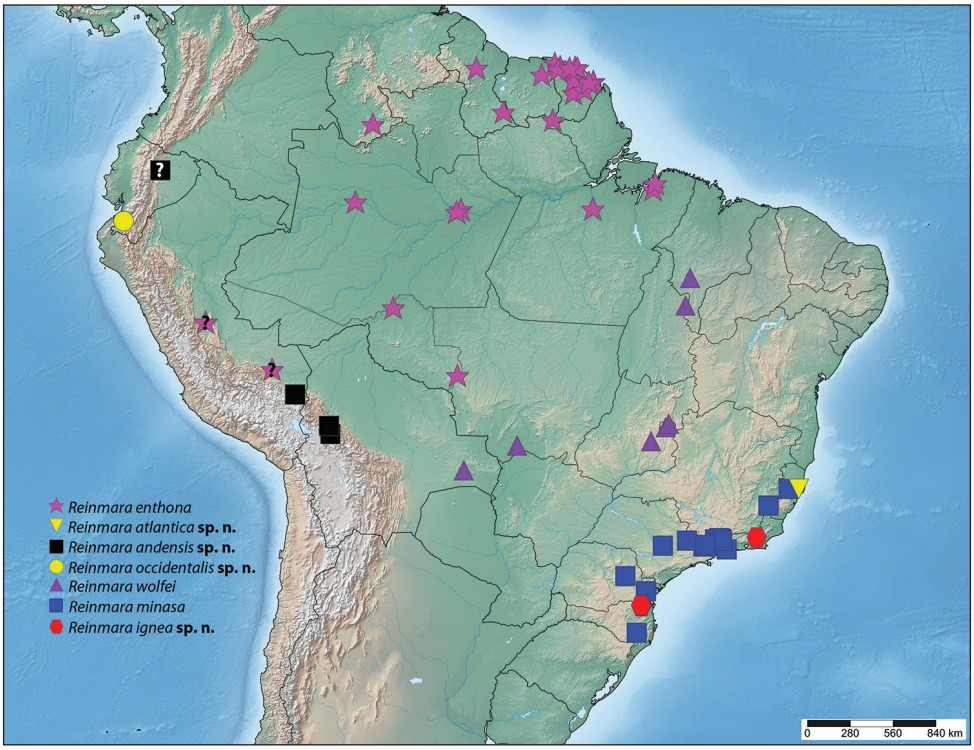


Figure 36. Known distribution of *Reinmara*.

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ted the reuse of the photo of the holotype of *R. wolfei* (Fig. 13). Fernando Maia Silva Dias (Brazil), Jason Dombroskie, and Christian Schmidt each offered helpful corrections and suggestions on the manuscript. Publication of this article was funded by the University of Florida Open Access Publishing Fund.

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Nomenclatural checklist for *Acromegalomma* species (Annelida, Sabellidae), a *nomen novum* replacement for the junior homonym *Megalomma* Johansson, 1926

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Abstract

Acromegalomma, *nomen novum*, is introduced as a replacement name for the polychaete genus *Megalomma* Johansson, 1926 (Annelida, Sabellidae), preoccupied by *Megalomma* Westwood, 1842 (Insecta, Coleoptera, Carabidae). The historical background of the homonymy and a full list with 36 new combinations in the new genus are included, while two species are considered as *species inquirenda*.

Keywords

Fan worms, polychaete, homonymy, new substitute name, nomenclature, taxonomy

Introduction

The genus *Megalomma* (Annelida, Sabellidae) was established by Johansson (1926) for the usage of *Branchiomma sensu* Claparède (1869), based on the species *Branchiomma koellikeri* Claparède, 1869. However, the name *Megalomma* is preoccupied by *Megalomma* Westwood, 1842 (Insecta, Coleoptera), a well-established genus of tiger beetles from the Mascarene Islands. *Megalomma* Johansson, 1926 has no known available or potentially valid synonyms, for which reason, and in accordance with Article 60.3 of the ICZN (1999), it must be replaced by a new substitute name.

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Historical background

The name *Megalomma* was first used as a subgenus of *Cicindela* Linnaeus, 1758 (Insecta, Coleoptera, Carabidae) by Westwood (1842: 203), for the Mauritian species *Cicindela* (*Megalomma*) *vigilans* Westwood, 1842, and raised to the generic level the following year by Lacordaire (1843: 113). The genus is well established and in current use (see Moravec 2007), comprising five species from the Mascarene Islands (West Indian Ocean): *M. fulgens* W. Horn, 1892; *M. janaki* Moravec, 2007; *M. oculatum* (Fabricius, 1799); *M. pierreorum* Deuve, 2000; and *M. viridulum* (Quensel *in* Schönherr, 1806), which includes as a synonym the type species of the genus, *M. vigilans* (Westwood, 1842).

A second genus *Megalomma* was created by Smith (1873: 405) in Hymenoptera (Insecta), to include three new species from Brazil: *Megalomma politum* Smith, 1873, *M. elegans* Smith, 1873, and *M. nigriceps* Smith, 1873. Later Schulz (1906: 200) pointed that it was a junior homonym of *Megalomma* Westwood, 1842 and replaced it by the new name *Megistommum* Schulz, 1906.

In polychaetes, the name *Megalomma* was first used by Johansson (1926: 10), as a replacement name for *Branchiomma sensu* Claparède (1869), based on a misinterpretation of Claparède's work. While discussing the validity of the name *Dasychone* introduced by Sars (1862) for sabellids with eyes on their radioles, Claparède (1869) stated that Kölliker (1858) had already used the name *Branchiomma* for the same group, to include *Amphitrite bombyx* Dalyell, 1853 (renamed as *Branchiomma dalyellii* Kölliker, 1858). However, instead of synonymizing the junior *Dasychone* into *Branchiomma*, Claparède (1869: 162) tried to retain both by redefining the genus *Branchiomma*, with the following justification:

Quoi qu'il en soit, le nom de Dasychone *a pris place dans la science, et celui de* Branchiomma *est à peu près oublié. Je pense pourtant pouvoir ressusciter celui-ci, en tenant compte des scrupules de M. Sars, et sans proscrire le nom de* Dasychone. *Dans son mémoire sur le genre* Branchiomma*, M. Kölliker décrit en outre de la* Dasychone Bombyx *une autre espèce qu'il n'a étudiée que d'une manière très-cursive, il est vrai, dans le golfe de Naples, et qui est caractérisée par des yeux à l'extrémité des branchies. Cette espèce que j'ai retrouvée n'est point une* Dasychone. *Elle pourra rester dorénavant l'espèce-type du genre* Branchiomma.

Hence, Claparède (1869) attempted to transfer *Amphitrite bombyx* Dalyell, 1853 to *Dasychone* (see Claparède 1869: 168), while making reference to a short comment by Kölliker (1858: 536) where he recorded that he had observed, but not named nor described in detail, an additional sabellid from Naples with eight compound eyes near the tips of the radioles:

Schon im Jahre 1842 kam mir in Neapel ein kleiner Kopfkiemer unter die Augen, der an seinen Kiemen 8 zusammengesetzte Sehorgane trug. Leider war es mir damals, da

ich gerade mit der Verfolgung der Entwicklung der Cephalopoden beschäftigt war, nicht möglich, diese interessante Annelide, von der ich ohnehin nur Ein Individuum erhalten hatte, näher zu verfolgen, und unterliess ich es daher, etwas über dieselbe zu veröffentlichen.

Consequently, Claparède described this species as *Branchiomma koellikeri* [original spelling *köllikeri* corrected here to *koellikeri* according to Article 32.5.2.1 of the ICZN (1999)], based on the specimens collected by him at the Gulf of Naples, citing (Claparède 1869: 164):

Je doute à peine que cette espèce soit la même que M. Kölliker a eue sous les yeux. Elle n'est en effet point rare dans le golfe de Naples. M. Kölliker n'indique, il est vrai, que huit filaments branchiaux, tandis que j'en ai compté jusqu'à trente-deux. Mais cela peut ne tenir qu'à une différence d'âge.

This leaves little doubt that Claparède considered his new species *Branchiomma koellikeri* to be the same species observed previously by Kölliker from Naples and, moreover, that he proposed *B. koellikeri* as the type of his emendation of Kölliker's genus with the sentence (Claparède 1869: 162): "*Elle pourra rester dorénavant l'espèce-type du genre* Branchiomma*.*"

Apparently Claparède's intention was simply to redefine the genus *Branchiomma* to restrict it to the unnamed Kölliker species (= *B. koellikeri* Claparède, 1869, the intended new type species of the redefined genus), as can be inferred by the fact that he wrote "*Genre* Branchiomma *Koellkr. char. em.*" (Claparède 1869: 162).

However, Johansson (1926: 10) considered erroneously that Claparède was formally establishing a new genus, an interpretation that was followed by other authors (e.g. Hartman 1959, Day 1967, Fauchald 1977).

In this way, Johansson (1926: 10) argued that the generic name *Branchiomma sensu* Claparède (1869), used for *Branchiomma koellikeri*, could not be accepted, as it was already preoccupied by Kölliker (1858) for the species *Amphitrite bombyx* Dalyell, 1853. A new replacement name was thus necessary, and Johansson introduced for the third time in Zoology the name *Megalomma*, emphasizing the large compound eyes of the genus (Johansson 1926: 10):

Als Claparède 1869 für seine Art Köllikeri *die Gattung* Branchiomma *bildete, war der Name schon präokkupiert. Die Gattung* Branchiomma *Claparède muss also einen neuen Namen erhalten. Ich schlage* Megalomma *vor, welcher Name wie* Branchiomma *auf die grossen zusammengesetzen Augen dieser Gattung hindedeutet, doch ohne ihren Charakter als Branchialaugen hervorzuheben* [...].

However, and as stated above, the name *Megalomma* Johansson, 1926 is itself preoccupied by *Megalomma* Westwood, 1842, and a replacement name is necessary. The name *Acromegalomma*, *nomen novum* is here proposed to accomplish this need.

Chronology of the genus-level name Megalomma

1842. Westwood (p. 203): *Cincidella* (*Megalomma*) new subgenus (Insecta, Coleoptera, Carabidae), for *Cicindella* (*Megalomma*) *vigilans* Westwood, 1842.
1843. Lacordaire (p. 113): *Megalomma* raised to generic level.
1858. Kölliker (p. 537): *Branchiomma* new genus (Annelida, Sabellidae), for *Amphitrite bombyx* Dalyell, 1853 (renamed as *Branchiomma dalyellii* Kölliker, 1858).
1869. Claparède (p. 162–163): *Branchiomma* redefined (Annelida, Sabellidae), for *Branchiomma koellikeri* Claparède, 1869. *Amphitrite bombyx* Dalyell, 1853 assigned to *Dasychone* Sars, 1862.
1873. Smith (p. 405): *Megalomma* new genus (Insecta, Hymenoptera, Crabronidae), for *Megalomma politum* Smith, 1873, *M. elegans* Smith, 1873, and *M. nigriceps* Smith, 1873.
1906. Schulz (p. 200): *Megistommum* new name (Insecta, Hymenoptera, Crabronidae), replacement name for *Megalomma* Smith, 1873.
1926. Johansson (p. 10): *Megalomma* new genus (Annelida, Sabellidae), to include *Branchiomma sensu* Claparède, 1869 (not *Branchiomma* Kölliker, 1858).
Present study. *Acromegalomma* new name (Annelida, Sabellidae), replacement name for *Megalomma* Johansson, 1926.

Material and methods

To establish the list of new combinations in *Acromegalomma* new name a list of valid *Megalomma* species was compiled based on WoRMS (Bellan 2008), and updated with Tovar-Hernández and Carrera-Parra (2011), Mikac et al. (2013), Capa and Murray (2015) and Giangrande et al. (2015). Synonymies were obtained from Tovar-Hernández and Carrera-Parra (2011). The type of synonymy and its author are provided inside square brackets, following the synonym.

Each new combination is accompanied by the reference of the original description, synonymies, type locality of the species and remarks, when necessary. Type locality is based on the original description, except where indicated. Geolocations of type localities are derived from the original descriptions, being considered an "original geolocation" when the authors provided the coordinates, or "estimated geolocation", when estimated using Google Earth (www.google.com/earth) from the general geographic limits described by the authors. All geolocations were converted to decimal degrees.

The whereabouts of type material of the new combinations were summarised by Tovar-Hernández and Carrera-Parra (2011) and following publications describing new species (Mikac et al. 2013, Capa and Murray 2015, Giangrande et al. 2015).

While the gender of *Megalomma* and *Acromegalomma* new name is neuter, some names in *Megalomma* had incorrect endings and needed to be emended. Following Article 31.2 of the ICZN (1999), the names of the new combinations and the *species inquirenda* were herein revised to assure they agreed in gender with the generic name

with which they are combined. Original names with incorrect endings are indicated with the remark "[*sic*]" following the specific epithet. Endings corrected herein are: *carunculatum* for *carunculata*, *inflatum* for *inflata*, *interruptum* for *interrupta*, *jubatum* for *jubata*, and *longoventrale* for *longoventralis*.

Systematics

Order Sabellida Latreille, 1825
Family Sabellidae Latreille, 1825

Genus *Acromegalomma*, *nomen novum*

Branchiomma [not Kölliker, 1858] — Claparède 1869: 162–163.
Megalomma [junior homonym, not Westwood, 1842] — Johansson 1926: 9–10; Johansson 1927: 130; Perkins 1984: 351–352; Fitzhugh 1989: 76; Knight-Jones 1997: 314; Fitzhugh 2003: 107; Tovar-Hernández and Salazar-Vallejo 2008: 1953–1954; Giangrande and Licciano 2008: 208; Capa and Murray 2009: 204–205; Tovar-Hernández and Carrera-Parra 2011: 14–15; Mikac et al. 2013: 1514; Capa et al. 2014: 27–28; Giangrande et al. 2015: 522–523.

Type species. The type species of the new genus is *Branchiomma koellikeri* Claparède, 1869 (junior synonym of *Sabella lanigera* Grube, 1846), according to recommendation 60A of the ICZN (1999). Type by monotypy, established by Johansson (1926).

Type material. Following his principle of basing observations and descriptions only on live organisms Édouard Claparède did not designate type material or deposit specimens in museums or collections (Fauchald 1989). However, Knight-Jones (1997) refers the existence of a type of *Branchiomma koellikeri* Claparède, 1869 deposited at the Zoological Museum of Berlin (currently the Museum für Naturkunde Berlin), with the reference number ZMB 6387. Tovar-Hernández and Carrera-Parra (2011) refer this specimen as being a syntype. Although the designation of a lectotype for *B. koellikeri* is desirable, it is out of the scope of the present work.

Etymology. The name of the new genus is composed by combining the Greek terms for *acro*, meaning "tip end" or "extremity of a body", *mega*, meaning "big" or "large", and the suffix –*omma*, a noun meaning "eye", and referring to the big compound eyes located on the radiolar subdistal region, typical of the genus.

Gender. Neuter.

Remarks. The publication date of the genus *Megalomma* Johansson should be considered as "1926". It was generally accepted as being "1927" until Tovar-Hernández and Salazar-Vallejo (2008) pointed out that the name had been introduced in a previous publication by the same author, referring the date as "1925". In fact, the last page of this publication states "*Tryckt den 5 november 1925*" ("Printed the 5 November 1925") and in the following line "*Uppsala 1925. Almquist & Wiksells Boktryckeri-A.-*

B." This date is also present in existing reprints of the paper. However, the bounded volume comprising the article provides the publication date as "*Häfte 2 inneh. A N:o 6-12,* [...] *utkom den 5 juni 1926*" ("Booklet 2 cont. A No. 6-12, [...] published 5 June 1926"). This booklet includes article 7A by Johansson, where the name *Megalomma* is introduced for polychaetes. Hence, the work was printed in 5 November 1925, but published only in the following year, on 5 June 1926.

The genus *Acromegalomma*, *nomen novum* is represented by 36 valid species, all of them new combinations.

List of new combinations in the genus *Acromegalomma* new name

Acromegalomma acrophthalmos (Grube, 1878) comb. n.

Sabella acrophthalmos Grube 1878: vii, 258–259.

Type locality. Singapore (1.25°, 103.85°; estimated geolocation) or Philippines (12.22°, 121.77°; estimated geolocation).

Remarks. The type locality of the species was first stated as being "probably Singapore" ("*wahrscheinlich von Singapore*"; Grube 1878: vii), and later in the same publication, as "Philippines" ("*Von den Philippinen*"; Grube 1878: 258).

Acromegalomma adriaticum (Giangrande, Caruso, Mikac & Licciano, 2015) comb. nov.

Megalomma adriaticum Giangrande et al. 2015: 526–528, figs 6–8.

Type locality. Brindisi, Italy, South Adriatic Sea (40.65°, 17.95°; original geolocation).

Acromegalomma bioculatum (Ehlers, 1887) comb. n.

Branchiomma bioculatum Ehlers 1887: 260–263, plate 53 figs 1–9.

Type locality. West of Dry Tortugas, Straits of Florida (24.6181°, -83.0517°; original geolocation).

Acromegalomma carunculatum (Tovar-Hernández & Salazar-Vallejo, 2008) comb. n.

Megalomma carunculata [*sic*] Tovar-Hernández and Salazar-Vallejo 2008: 1957–1961, figs 1–2.

Type locality. Punta Manzanillo, Acapulco, Guerrero, Mexican Pacific (16.842°, -99.910°; estimated geolocation).

Acromegalomma cinctum (Fitzhugh, 2003) comb. n.

Megalomma cinctum Fitzhugh 2003: 108–116, figs 1–10, 14C.

Type locality. Hungtou Yu (Orchid Island), northern coastline, about 1 km east of Langtao Village, Taiwan, Pacific Ocean (22.0794°, 121.5369°; original geolocation).

Acromegalomma circumspectum (Moore, 1923) comb. n.

Branchiomma circumspectum Moore 1923: 239–241, plate XVIII figs 41–42.

Type locality. Between S. 35° W, 3.5 miles (5.6 km) and S. 43° W, 5.2 miles (8.4 km) off Brockway Point, Santa Rosa Island, Channel Islands, California, Pacific coast of the USA (34.02°, -120.22°; estimated geolocation).

Acromegalomma claparedei (Gravier, 1906) comb. n.

Branchiomma claparedei Gravier 1906: 39–40.

Type locality. Syntypes collected at the reef of Marabout (11.611°, 43.132°; estimated geolocation), at Djibouti Bay, and the "Grand Récif" (11.736°, 43.235°; estimated geolocation), Moucha Islands, both at the Gulf of Tadjoura, Gulf of Aden, Indian Ocean.

Remarks. Gravier introduced the name *Branchiomma claparedei* as new twice, first in 1906 (Gravier 1906: 39) and again in 1908 (Gravier 1908b: 91). This caused some confusion, inducing some authors in error, by considering the correct publication date as being 1908, while overlooking the smaller 1906 publication (e.g. Tovar-Hernández and Carrera-Parra 2011). The correct publication date is therefore "1906" (see also Wehe and Fiege 2002).

Acromegalomma coloratum (Chamberlin, 1919) comb. n.

Potamilla colorata Chamberlin 1919b: 21.

Type locality. Laguna Beach, California, Pacific coast of the USA (33.542°, -117.786°; estimated geolocation).

Synonym. *Potamilla clara* Chamberlin 1919b: 20 [subjective synonymy by Tovar-Hernández and Carrera-Parra (2011)].

***Acromegalomma fauchaldi* (Giangrande, Licciano & Gambi, 2007) comb. n.**
Megalomma fauchaldi Giangrande et al. 2007: 46–47, fig. 2.

Type locality. Lagoon side of Carrie Bow Cay, Belize, Caribbean Sea (16.803°, -88.085°; estimated geolocation).

***Acromegalomma georgiense* (Tovar-Hernández & Carrera-Parra, 2011) comb. n.**

Megalomma georgiense Tovar-Hernández and Carrera-Parra 2011: 56–58, fig. 26A–L.

Type locality. Off Georgia, Atlantic coast of the USA (30.95°, -79.9667°; original geolocation).

***Acromegalomma gesae* (Knight-Jones, 1997) comb. n.**

Megalomma gesae Knight-Jones 1997: 318–319, fig. 3.

Type locality. La Herradura, Estero Jaltepeque, El Salvador, Pacific Ocean (13.303°, -88.902°; estimated geolocation).

Synonym. *Potamilla bioculata* Hartmann-Schröder 1959: 175–176, figs 183–188 [objective synonymy by Knight-Jones (1997); *Megalomma gesae* is a new name for *P. bioculata*].

***Acromegalomma heterops* (Perkins, 1984) comb. n.**

Megalomma heterops Perkins 1984: 359–363, figs 42–43.

Type locality. Hutchinson Island, Florida, Atlantic Ocean (27.345°, -80.2133°; original geolocation).

***Acromegalomma inflatum* (Capa & Murray, 2009) comb. n.**

Megalomma inflata [*sic*] Capa and Murray 2009: 217–218, figs 4G–H, 5D, 11.

Type locality. Southeast of Bate Bay, New South Wales, Australia (-34.0667°, 151.2167°; original geolocation).

***Acromegalomma interruptum* (Capa & Murray, 2009) comb. n.**

Megalomma interrupta [*sic*] Capa and Murray 2009: 210–212, figs 2J–M, 4E–F, 5B, 7, 8.

Type locality. One Tree Island, Queensland, Australia (-23.5°, 152.0833°; original geolocation).

***Acromegalomma jubatum* (Capa & Murray, 2015) comb. n.**

Megalomma jubata [*sic*] Capa and Murray 2015: 128–130, fig. 12.

Type locality. MacGillivray Reef, Lizard Island, Queensland, Australia (-14.6569°, 145.4947°; original geolocation).

***Acromegalomma kaikourense* (Knight-Jones, 1997) comb. n.**

Megalomma kaikourense Knight-Jones 1997: 320–321, fig. 5.

Type locality. Point Kean near Kaikoura, east coast of South Island, New Zealand (-42.425°, 173.715°; estimated geolocation).

***Acromegalomma lanigerum* (Grube, 1846) comb. n.**

Sabella lanigera Grube 1846: 51–53, plate II fig. 1.

Type locality. Unknown.

Synonyms. *Branchiomma köllikeri* Claparède 1869: 163–164, plate XXII fig. 4 [subjective synonymy by Knight-Jones (1997)]. *Branchiomma vesiculosum neapolitana* Claparède 1869: 164–166, plate XXII fig. 5 [subjective synonymy by Giangrande and Licciano (2008)].

Remarks. The species was described based on a single specimen (T-ZMB 136) deposited at the Zoological Museum of Berlin (currently the Museum für Naturkunde Berlin), from an unknown location (Grube 1846: 51).

***Acromegalomma lobiferum* (Ehlers, 1887) comb. n.**

Branchiomma lobiferum Ehlers 1887: 254–259, plate 53, figs 10–15 (figure 15 numbered as 16 in plate 53).

Type locality. Key West, Florida, Gulf of Mexico (24.54°, -81.80°; estimated geolocation).

Acromegalomma longoventrale **(Giangrande, Caruso, Mikac & Licciano, 2015) comb. n.**

Megalomma longoventralis [*sic*] Giangrande et al. 2015: 524–526, figs 3–5.

Type locality. Rovinj, coastal station near the Island Banjole, Croatia, North Adriatic Sea (45.095250°, 13.619283°; original geolocation).

Acromegalomma messapicum **(Giangrande & Licciano, 2008) comb. n.**

Megalomma messapicum Giangrande and Licciano 2008: 213–214, figs 5G–H, 6.

Type locality. Brindisi, Italy, Adriatic Sea (40.65°, 17.96°; estimated geolocation).

Acromegalomma miyukiae **(Nishi, 1998) comb. n.**

Megalomma miyukiae Nishi 1998: 53–54, figs 1–4.

Type locality. Ao Tang Khen, Phuket, Thailand, Andaman Sea (7.8185°, 98.4144°; estimated geolocation).

Acromegalomma modestum **(Quatrefages, 1866) comb. n.**

Sabella modesta Quatrefages 1866: 451–452.

Type locality. Lima, Peru, Pacific Ocean (-12.07°, -77.15°; estimated geolocation).
Synonym. *Potamilla anophthalma* Hartmann-Schröder 1960: 41–43, figs 89–91 [subjective synonymy by Knight-Jones (1997)].

Acromegalomma multioculatum **(Fitzhugh, 2002) comb. n.**

Megalomma multioculatum Fitzhugh 2002: 401–405, figs 34A–C, 35A–B, 36A–D, 37.

Type locality. Thailand, Andaman Sea (08.5°, 98.1°; original geolocation).

Acromegalomma mushaense **(Gravier, 1906) comb. n.**

Branchiomma mushaensis [*sic*] Gravier 1906: 40–41.

Type locality. "Grand Récif" (11.736°, 43.235°; estimated geolocation), Moucha Islands, Gulf of Tadjoura, Gulf of Aden, Indian Ocean.

Remarks. As in the case of *Branchiomma claparedei* explained above, Gravier introduced the name *Branchiomma mushaensis* [sic] as new twice, first in 1906 (Gravier 1906: 40) and again in 1908 (Gravier 1908b: 94). This incurred some authors into error (e.g. Tovar-Hernández and Carrera-Parra 2011). The correct publication date is "1906" (see also Wehe and Fiege 2002).

Acromegalomma nechamae (Knight-Jones, 1997) comb. n.

Megalomma nechamae Knight-Jones 1997: 319–320, fig. 4.

Type locality. El Bilaiyim (= Ghor Blayim) lagoons, Sinai Peninsula, Gulf of Suez (28.55°, 33.24°; estimated geolocation).

Acromegalomma pacifici (Grube & Örsted *in* Grube, 1859) comb. n.

Sabella pacifici Grube and Örsted in Grube 1859: 113.

Type locality. Punta Arenas, Gulf of Nicoya, Costa Rica (9.976°, -84.852°; estimated geolocation).

Synonym. *Pseudopotamilla panamica* Chamberlin 1919a: 268–269, plate 3 fig. 8 [subjective synonymy by Knight-Jones (1997)].

Remarks. The authorship of the species is here considered as "Grube & Örsted *in* Grube, 1859", according to Salazar-Vallejo and Eibye-Jacobsen (2012: 1398). The authorship appears clearly referred twice in the original publication as "*Gr. Örsd.*" (Grube 1859: 113, 120).

Acromegalomma perkinsi (Tovar-Hernández & Salazar-Vallejo, 2006) comb. n.

Megalomma perkinsi Tovar-Hernández and Salazar-Vallejo 2006: 43–45, fig. 11.

Type locality. Cape Lookout, North Carolina, Atlantic coast of the USA (34.62°, -76.54°; estimated geolocation).

Acromegalomma phyllisae (Capa & Murray, 2009) comb. n.

Megalomma phyllisae Capa and Murray 2009: 205–208, figs 2A–E, 3, 4A–B, 5A.

Type locality. Off Townsend Point, Corner Inlet, Victoria, Australia (-38.8°, 146.55°; original geolocation).

***Acromegalomma pigmentum* (Reish, 1963) comb. n.**

Megalomma pigmentum Reish 1963: 430–431, figs 15, 16A–I.

Type locality. Bahía de San Quintín, Baja California, Mexico, Pacific Ocean (30.456°, -115.958°; estimated geolocation).

Synonym. *Megalomma monoculata* [sic] Hartmann-Schröder 1965: 273–276, figs 276–278 [subjective synonymy by Knight-Jones (1997)].

***Acromegalomma pseudogesae* (Mikac, Giangrande & Licciano, 2013) comb. n.**

Megalomma pseudogesae Mikac et al. 2013: 1514–1515, fig. 3.

Type locality. 13 nautical miles off the coast of the Istrian Peninsula, Croatia, Gulf of Venice, Northern Adriatic Sea (45.2833°, 13.2667°; original geolocation).

***Acromegalomma quadrioculatum* (Willey, 1905) comb. n.**

Branchiomma quadrioculatum Willey 1905: 307, plate VII figs 168–169.

Type locality. Aripu (= Arippu) Coral Reef, Sri Lanka, Gulf of Manaar, Indian Ocean (08.78°, 79.87°; estimated geolocation).

***Acromegalomma roulei* (Gravier, 1908) comb. nov.**

Branchiomma roulei Gravier 1907: 526 (*nomen nudum*); Gravier 1908a: 44.

Type locality. Payta (= Paita), Peru, Pacific Ocean (-5.083°, -81.111°, estimated geolocation).

***Acromegalomma splendidum* (Moore, 1905) comb. n.**

Pseudopotamilla splendida Moore 1905: 564–566, plate XXXVII figs 23–27.

Type locality. Kasaan Bay, center of Round Island, S. 10d W., 0.4 miles, Clarence Strait, Prince of Wales Island, Alexander Archipelago, SE Alaska, North Pacific Ocean (55.51°, -132.39°; estimated geolocation).

Synonyms. *Pseudopotamilla anoculata* Moore 1905: 566–568, plate XXXVII figs 28–33 [subjective synonymy by Hartman (1959)]. *Branchiomma disparoculatum*

Treadwell 1914: 223–224, plate 12 figs 44–46 [subjective synonymy by Hartman (1956)]. *Branchiomma burrardum* Berkeley 1930: 71, fig. 1 [subjective synonymy by Knight-Jones (1997)].

Acromegalomma suspiciens **(Ehlers, 1904) comb. n.**

Branchiomma suspiciens Ehlers 1904: 62–63, plate IX figs 1–6.

Type locality. French Pass, between D'Urville Island and north end of South Island, New Zealand (-40.922°, 173.837°; estimated geolocation).

Acromegalomma trioculatum **(Reish, 1968) comb. n.**

Megalomma trioculatum Reish 1968: 226–228, fig. 5 (*1–10*).

Type locality. Lagoon side of Engebi (= Enjebi) Island, Enewetak (= Eniwetok) Atoll, Ralik Chain, Marshall Islands, Pacific Ocean (11.658°, 162.235°; estimated geolocation).

Acromegalomma vesiculosum **(Montagu, 1813) comb. n.**

Amphitrite vesiculosa Montagu 1813: 19–20, plate V fig. 1.

Type locality. Original type locality at Kingsbridge Estuary, Devon, England (50.263°, -03.765°; estimated geolocation). Neotype designated by Knight-Jones (1997: 314) from St. Anthony, Cornwall, England (50.15°, -5.2667°; original geolocation misplaced, corrected here to 50.152°, -5.006°).

Species inquirenda

Megalomma vigilans **(Claparède, 1870) [unreplaced junior secondary homonym]**

Branchiomma vigilans Claparède 1870: 501–503, plate XIV fig. 3.

Type locality. Gulf of Naples, Mediterranean Sea (40.7°, 14.3°; estimated geolocation).

Remarks. *Branchiomma vigilans* was described on the basis of three specimens from the Gulf of Naples, all of them found with their muddy tubes inserted among the dorsal chaetae of individuals of *Aphrodita aculeata* Linnaeus, 1758 (Claparède 1870). Afterwards the species was recorded on only a couple of occasions in the Western Mediterranean, first by Marion (1876), in the Gulf of Marseille and from 60–65 m

(no habitat details), and later by Soulier (1903), who observed about ten specimens collected off Séte (Gulf of Aigues-Mortes) among the chaetae of *A. aculeata* specimens. Rioja (1923) attributed an empty sandy tube found among the dorsal chaetae of an *A. aculeata* collected in the region of Valencia to this species, but this record is very dubious, as not only was the worm not present but also the nature of the tube differed from that described by Claparède (1870). Moreover, no type material of *B. vigilans* is known to exist (Knight-Jones 1997, Giangrande and Licciano 2008, Tovar-Hernández and Carrera-Parra 2011) as Claparède normally did not deposit specimens in museums or collections (Fauchald 1989).

The species was transferred to *Megalomma* by Hartman (1959: 550), creating a junior secondary homonym of the tiger beetle *Megalomma vigilans* (Westwood, 1842) (see above), and has since remained a poorly known but valid taxon (Knight-Jones 1997, Tovar-Hernández and Salazar-Vallejo 2008). Giangrande and Licciano (2008) considered the species as being quite rare, probably due to its peculiar habitat, and in spite of stating that its real status needed confirmation, they also observed that it was likely a valid species. However, the species was subsequently omitted from the discussions on new Mediterranean species of *Megalomma* by Mikac et al. (2013) and Giangrande et al. (2015). The most recent reference to the species seems to be by Tovar-Hernández and Carrera-Parra (2011: 5), who wrote:

Megalomma vigilans *(Claparède, 1870) was originally found as an epibiont of the sea mouse* Aphrodita aculeata *Linnaeus, 1758, in the Mediterranean Sea, however, no new records of this association exist.* [...] *In the case of* M. vigilans*, the description is poor, the type is lost and there are no additional records.*

The described habitat of *Megalomma vigilans* is unusual, and there are no references of similar cases in the family Sabellidae. It is possible that the habitat is an artefact resulting from the collection process, and that the presence of the species on individuals of *Aphrodita aculeata* was the consequence of the rough treatment and mixing suffered by the biological material collected by grabs and trawls, or even during the processing of the samples. So, the presence of *M. vigilans* on *A. aculeata* could be a post-collection phenomenon, and not the natural habitat of the worm. It is difficult or even impossible to know if the records by Marion (1876) and Soulier (1903) refer to the same species as that collected and described by Claparède (1870) without studying the material, if still existing. There is a possibility that *M. vigilans* is not as uncommon as it seems, but that for some reason it has not been collected or recognised. For the time being, *M. vigilans* is here considered as a *species inquirenda*.

Megalomma pacificum **Johansson, 1927**

Megalomma pacifica [*sic*] Johansson 1927: 130–131, textfig. 15.11.

Type locality. Syntypes collected at Aranuka Island, outside the coral reef (0.14°, 173.56°; estimated geolocation), and Tapeteuea (= Tabiteuea) Island, inside the lagoon (-1.5°, 175.0°; estimated geolocation), both at Gilbert Islands, Kiribati, Pacific Ocean.

Remarks. According to Fitzhugh (2002), *Megalomma pacificum* Johansson, 1927 probably belongs to the genus *Demonax* Kinberg, 1867 (a name recently replaced by *Parasabella* Bush, 1905 due to homonymy; see Tovar-Hernández and Harris 2010). The fact that the holotype has dried out (Knight-Jones 1997) and that the species has a remote type locality have likely prevented a formal redescription. The species was not included in the *Parasabella* species list given by Tovar-Hernández and Harris (2010), but its possible inclusion in *Parasabella* has been implicitly accepted by subsequent authors (Capa and Murray 2009, Tovar-Hernández and Carrera-Parra 2011).

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The advertisement call and comments on the distribution of *Eleutherodactylus bilineatus* Bokermann, 1975, an endemic frog of Bahia State, Brazil (Amphibia, Anura)

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Abstract

Advertisement calls can be used to aid solving taxonomic problems and understanding the evolution of certain groups. In this study, the advertisement call of *Eleutherodactylus bilineatus* is described. It is composed by two different notes with a total duration of 0.529–4.241 seconds and dominant frequency of 1.72–3.45 kHz. Additionally, new data is provided on the geographical distribution of *Eleutherodactylus bilineatus* and the most inland record for this species.

Keywords

Atlantic Forest, bioacoustics, vocalization, Holoadeninae, range extension

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Introduction

A recent research on the phylogenetic relationships within the anuran clade Terrarana, from the Brazilian Atlantic rainforest frog genus *Ischnocnema*, included *Eleutherodactylus bilineatus* as *incertae sedis*, likely close to the genus *Noblella* and *Barycholos* within the Holoadeninae (Canedo and Haddad 2012). Specimens of this species are small in size (snout–vent length of 20 mm in males and 26 mm in females) and inhabit the leaf litter of moist forests from the southern and central parts of Bahia, northeastern Brazil (Bokermann 1975, Frost 2016). It can be found up to 800 m above sea level and is occasionally encountered in cocoa plantations (Dias et al. 2014a,b, Juncá and Pimenta 2004).

Eleutherodactylus bilineatus (Figure 1) has a dark brown dorsal surface with two clear longitudinal stripes on each side of the body which inspire its popular name "Two-lined Robber Frog" (Bokermann 1975). It is not easily detected, and although their reproduction is presumably by direct development (Juncá and Pimenta 2004), there is limited information about its ecology and natural history. Here the advertisement call from two populations of *Eleutherodactylus bilineatus* is described and an updated map of the geographical distribution of this species provided, including new occurrence points.

Materials and methods

During the execution of the Project "Diversity and genetic structure of the amphibians of the Central Corridor of the Atlantic Forest of southern Bahia" supported by the Boticário Group Foundation for Nature Protection (Project n°.0991_20132), field expeditions were conducted lasting 7-8 days, using the same methodology and similar sampling efforts to nine different locations (Serra da Jibóia, Serra do Timbó, Wenceslau Guimarães, Serra do Corcovado, Pedra Lascada, Serra Bonita, Serra das Lontras, Macarani and PARNA Alto do Cariri), in the Atlantic Forest of Bahia. Specimens deposited in the Museum of Zoology of Universidade Estadual de Santa Cruz were also examined (Table 1), looking for new reports on the distribution of *Eleutherodactylus bilineatus*.

The advertisement call of *Eleutherodactylus bilineatus* was recorded at two sites in Bahia state: Serra da Jibóia, Santa Terezinha municipality (-12.728397; -39.569476, 790 m a.s.l.) and RPPN (Private Natural Heritage Reserve) Mata do Passarinho, Macarani municipality (-15.79071; -40.51927, 850 m a.s.l.). In the Serra da Jibóia the recordings were made on three different occasions: December 04, 1995, total of 10 calls from two males (air temperature = 21°C, 19:40h); April 21, 1997, four calls from one male (air temperature 20°C, 20:50h); and March 03, 2015, total of 36 calls from three males (air temperature 21.4°C, 18:15h). The advertisement call (n = 4) of one male from RPPN Mata do Passarinho (encountered in November 27, 2014) is also included in our analysis, recorded after it was placed in a plastic bag. These calls showed the same acoustic patterns as the calls from the males recorded in their natural environment.

Figure 1. Different individuals of *Eleutherodactylus bilineatus* showing some variation of the dorsal pattern of the species. **A** and **B** RPPN Mata do Passarinho, Macarani **C** Estação Ecológica Wenceslau Guimarães and **D** Serra do Corcovado, Almadina, Bahia, Brazil (photographs A, B and D Iuri R. Dias, C Rafael O. Abreu).

Recordings from 1995 and 1997 were made with a SONY WM-D6 Digital Audio Track (DAT) with a directional SONY microphone. For the recordings from 2014 and 2015 a Sennheiser ME45 microphone with a K6 power module connected to a Tascam DR1 digital recorder was used. All recordings were made from a distance of about 40 cm from the frogs. Calls were recorded at a resolution of 16 bit and 48 kHz sampling rate. Waveform and spectrogram were made using Raven Pro 1.4 and analyzed with a Fast Fourier Transformation of 256 points, 50% overlap for an entire call and Window Hamming. For all other configurations the "default" settings of Raven were used. Terminology follows Littlejohn (2001). Voucher specimens are deposited at the Museu de Zoologia da Universidade Estadual de Santa Cruz (MZUESC), under catalog numbers

Table 1. Distribution records of *Eleutherodactylus bilineatus* based on literature review, museum data (MZUESC) and field works.

Municipality	Localities	Latitude	Longitude	Reference	Voucher analyzed
Almadina	Serra do Corcovado	-14.7011	-39.6625	Dias et al. 2014b	MZUESC 17015
Amargosa	Serra do Timbó	-13.0365	-39.6325	Marciano-Jr et al. 2014	MZUESC 17026-17036
Arataca	Serra das Lontras	-15.1624	-39.3437	This study	MZUESC 17025
Barro Preto	Serra da Pedra Lascada	-14.7723	-39.5408	This study	MZUESC 17016
Boa Nova	–	-14.3591	-40.2383	Berneck et al. 2013	-
Cairu	Fazenda Subaúma	-13.5067	-38.9812	Silvano and Pimenta 2003	-
Camacan	RPPN Serra Bonita	-15.4413	-39.5189	Dias et al. 2014a	MZUESC 8616-17; 8359; 8457
Canavieiras	–	-15.6750	-38.9469	Berneck et al. 2013	-
Guaratinga	Fazenda Vista Bela	-16.4529	-40.0586	Silvano and Pimenta 2003	-
Igrapiúna	Reserva Ecológica da Michelin	-13.8585	-39.1728	Camurugi et al. 2010	MZUESC 14222-14223
Ilhéus	CEPLAC/UESC	-14.7867	-39.2249	Bokermann 1975	MUESC 8110
Jequié	–	-13.9654	-40.0002	This study	MZUESC 7961
Jussari	RPPN Serra do Teimoso	-15.1675	-39.5444	Pimenta and Silvano 2002	-
Macarani	RPPN Mata do Passarinho	-15.7907	-40.5192	This study	MZUESC 16979-16991
Nilo Peçanha	Fazenda São João	-13.6585	-39.1884	Pimenta and Silvano 2002	-
Itarantim	Serra do Mandim	-15.6295	-39.9803	This study	MZUESC 15095-15097, 15855-15856
Santa Teresinha	Serra da Jibóia	-12.7283	-39.5694	Juncá 2006	MZUESC 17007-17014; MZFS 309, 600
Uruçuca	Fazenda Provisão	-14.6512	-39.2232	This study	MZUESC 14444
Valença	RPPN Água Branca	-13.3791	-39.0916	This study	MZUESC 13658
Wenceslau Guimarães	Estação Ecológica de Wenceslau Guimarães	-13.6285	-39.6264	Pimenta and Silvano 2002	MZUESC 17017-17019

MZUESC 17007-17008 from Serra da Jibóia and MZUESC 16979-16991 (one of these specimens was recorded while specimens were kept in a plastic bag in Macarani) and Museu de Zoologia da Universidade Estadual de Feira de Santana (MZFS), under catalog number MZFS 309 and 600 from Serra da Jibóia.

Results and discussion

During field expeditions, 151 individuals of *Eleutherodactylus bilineatus* were registered in all locations sampled, except in PARNA do Alto do Cariri, municipality of Guaratinga, where the species was not found. The areas located more northwards revealed the largest abundances of this species: Serra do Timbó (n = 44), Serra da Jibóia (n = 43) and

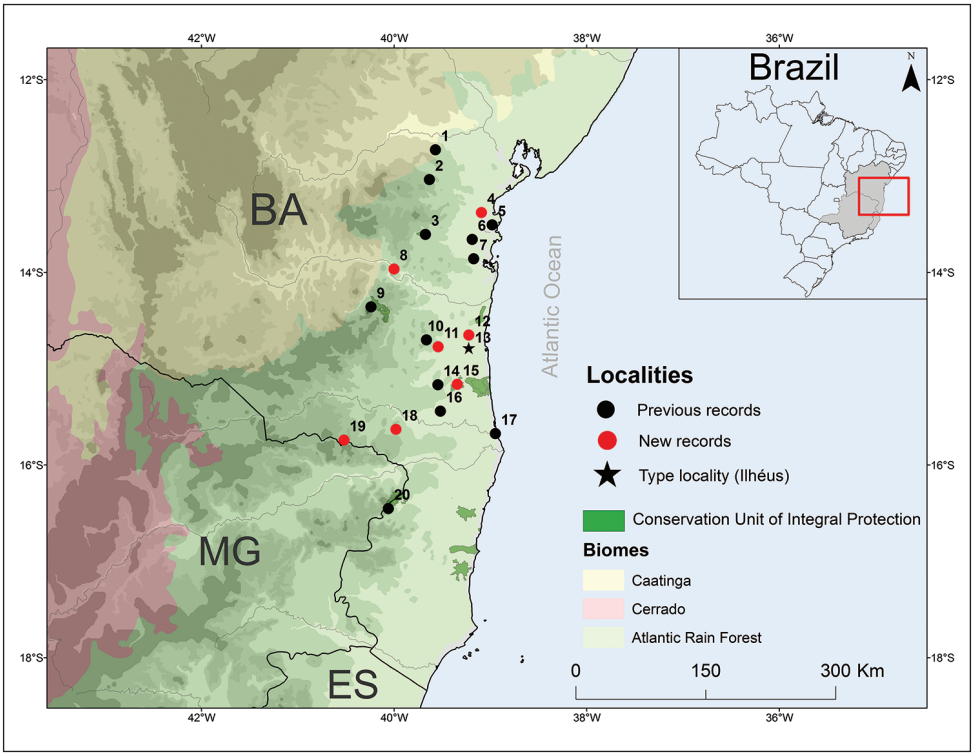

Figure 2. Distribution map of known localities for *Eleutherodactylus bilineatus*. Key: black star = type locality; red circle = new records; black circles = literature records. Municipalities = **1** Santa Teresinha **2** Amargosa **3** Wenceslau Guimarães **4** Valença **5** Cairu **6** Nilo Peçanha **7** Igrapiúna **8** Jequié **9** Boa Nova **10** Almadina **11** Barro Preto **12** Uruçuca **13** Ilhéus (Type Locality) **14** Jussari **15** Arataca, **16** Camacan **17** Canavieiras **18** Itarantim **19** Macarani and **20** Guaratinga. BA = state of Bahia; MG = state of Minas Gerais and ES = state of Espírito Santo. More details of the records are present in Table 1.

Wenceslau Guimarães (n = 35). In Macarani, located in the southeastern portion of Bahia we also encountered a high abundance with 24 individuals. At the other localities, records were limited to only one or two individuals.

Four new distribution records of specimens deposited in the Museum of Zoology of Universidade Estadual de Santa Cruz were found. Thus, the distribution map for the species is updated (Table 1, Figure 2), including seven new records and expanding the known distribution of *Eleutherodactylus bilineatus* in 110 km eastward of the RPPN Serra Bonita, in the municipality of Camacan (Dias et al. 2014a) to the RPPN Mata do Passarinho in the municipality of Macarani, representing the most inland record for the species. Thus, *Eleutherodactylus bilineatus* is distributed in rainforest areas, semideciduous seasonal Forest, and also in shaded cocoa plantations (locally known as "cabrucas"), from the Paraguaçu river to the surroundings of the Jequitinhonha river with its most inland records coming from Boa Nova and Macarani. The species can be found from sea level up to 900 meters.

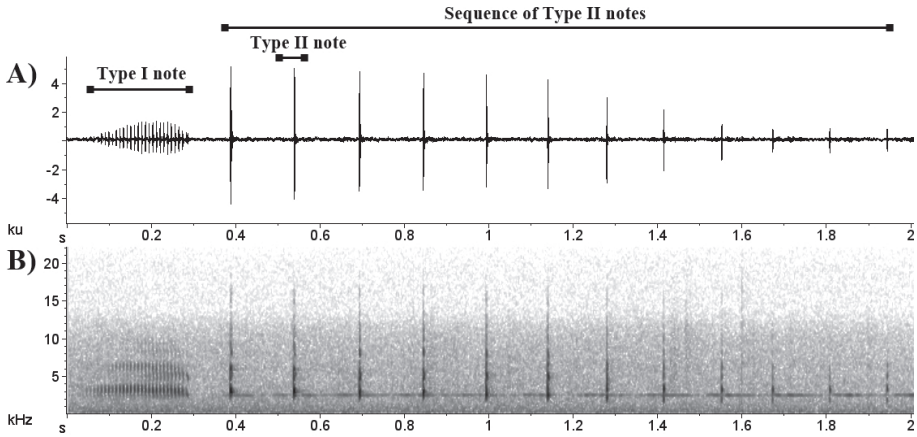

Figure 3. Advertisement call of *Eleutherodactylus bilineatus* (MZFS 600). (**A**) Waveform and (**B**) audio-spectrogram. Recorded on April 21, 1997 at 20h 50min. Air temperature during recording 20° C.

Males began calling in the early evening, at places with dense leaf litter on the forest floor, near fallen trunks and tabular roots. During our observations (March 03, 2015) several individuals (n = 5–10) were calling together at the sites of recording, and calling activity decreased after 8:00 pm. In the RPPN Mata do Passarinho the advertisement call was heard sporadically, especially during the early evening. However, after one night of heavy rain, several males could be heard calling between 15:00–16:00 h.

The advertisement call (Figure 3) of *Eleutherodactylus bilineatus* had a total duration of 0.529–4.241 s (2.06 ± 0.67, n = 54) and dominant frequency of 1.72–3.45 kHz (2.90 ± 473, n = 54). Two different notes composed the advertisement call; a longer one, here called "Type I" and a shorter one called "Type II". The two note types are emitted in sequence but in ~15% (n = 8) of the analyzed calls (n = 54) "Type I" was not issued. "Type I" note (or introductory note) had a total duration of 0.124–0.695 s (0.321 ± 0.133, n = 46) and consisted of 17–103 pulses (41 ± 19). The pulse duration of "Type I" note was 0.0035 ± 0.0007 s (0.001–0.006; n = 258) with interval between pulses of 0.005 ± 0.0008 s (0.003-0.007; n = 248). The dominant frequency of "Type I" note was between 2.41–3.27 kHz (3.07 ± 210).

Intervals of 0.07–0.116 s (0.09 ± 0.01, n = 45) separated the two different note types. "Type II" was emitted in a sequence of 6–31 notes (13.98 ± 4.89, n = 54) with duration of 0.001–0.02 s (0.004 ± 0.003, n = 664) each with an interval between notes ranging from 0.07 to 0.21 s (0.13 ± 0.015, n = 660). The dominant frequency of "Type II" notes was 1.72–3.96 kHz (2.91 ± 423) and oscillated between the first (n = 9) and second (n = 31) harmonic. Four harmonic bands could be discerned, with peaks between 1.57–2.07 kHz; the second peak between 2.76–3.45 kHz; the third peak between 4.24–5.02 kHz and the fourth peak between 5.75–614 kHz.

The recordings from Macarani lasted longer and had a higher number of "Type II" notes (more than twice the average) than the recordings from Serra da Jibóia. In Macarani individuals were recorded inside a plastic bag, where they had been placed

Table 2. Acoustic parameters of advertisement call of *Noblella* and *Barycholos*, genera more closely related with *Eleutherodactylus bilineatus* according to Canedo and Haddad (2012). Temporal variables in miliseconds (ms).

	Barycholos ternetzi	***Noblella carrascoicola***	***Noblella lochites***	***Noblella personina***
Number of Note	1	5–8 (6.0 ± 1.2)	6–8	5–11
Duration of Call	30–79 (49 ± 8)	254–436 (332.3 ± 62.6)	369–537 (428.53 ± 53.60)	570–1524 (1052 ± 307)
Duration of each note	–	12–20	6–17 (11.50 ± 2.90)	13–20 (16 ± 2)
Interval between notes	–	–	51–95 (60.39 ± 5.77)	103–166 (128 ± 14)
Pulses per call	4–12 (7.16 ± 1.47)	–	–	–
Dominant Frequency	3.35–4.31 (3.77 ± 1.75)	3.3–4.0	3.51–3.93 (3.73 ± 0.11)	3.91–4.39 (4.10 ± 0.13)
Reference	Lemes et al. 2012	Köhler 2000	Batalla and Brito 2014†	Harvey et al. 2013

† They considered that the call was formed by pulses.

together with other individuals of *Eleutherodactylus bilineatus*, as well as individuals from other species as *Ischnocnema verrucosa* and *Dendrophryniscus proboscideus*. The observed difference in acoustic parameters could be associated to some kind of social context (e.g. agonistic interactions) and should be further investigated.

The uncertain taxonomic position of this species hampers the comparison of the acoustic parameters with other closely related species. Following Canedo and Haddad (2012) this species would be more closely related with *Noblella* and *Barycholos*. From the 14 known species of these two genera four have had their advertisement calls described (see Table 2): *Barycholos ternetzi* (Lemes et al. 2012); *Noblella carrascoicola* (Köhler 2000), *N. lochites* (Batallas and Brito 2014) and *N. personina* (Harvey et al. 2013). The advertisement call of *B. ternetzi* is a trill consisting of a short multi-pulsed note (30-79 ms) with 4 to 12 pulses per call. The calls of the species belonging to the genus *Noblella* show between 5 and 11 notes lasting between 254–1524 ms with a dominant frequency varying between 3.30-4.39 kHz. The structure of the known calls of the genus *Noblella* is more similar with the "Type II" call of *Eleutherodactylus bilineatus*, with a call composed by series of notes with similar temporal and spectral acoustic parameters. However, none of the compared species showed two types of notes in the same call as in *E. bilineatus*.

The relationships within this clade (*E. bilineatus*, *Noblella*, *Barycholos*) require a more extensive approach, including morphological information in order to determine the taxonomic position of *E. bilineatus*, as well as the inclusion of molecular data into the phylogenetic analyses of other species of Holoadeninae (Canedo and Haddad 2012). As highlighted by Padial et al. (2014) the relationships within this subfamily provide insights on the possible connection between the Andes (*Noblella*), the Atlantic Forest of Northeastern Brazil (*E. bilineatus*), and the Cerrado (*Barycholos ternetzi*) deserving a more accurate exploration of the biogeography in the future.

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