



## Taxonomic review of Athliini (Coleoptera: Scarabaeidae: Melolonthinae), a new tribe of scarab beetles endemic to South America

ANDREW B.T. SMITH<sup>1</sup> & ARTHUR V. EVANS<sup>2</sup>

<sup>1</sup>Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, Ontario, K1P 6P4, Canada. E-mail: [asmith@unl.edu](mailto:asmith@unl.edu)

<sup>2</sup>Department of Recent Invertebrate Zoology, Virginia Museum of Natural History, Martinsville, Virginia, 24112, United States of America. E-mail: [arthurevans@verizon.net](mailto:arthurevans@verizon.net)

### Abstract

Athliini Smith & Evans, **new tribe** (Coleoptera: Scarabaeidae: Melolonthinae) includes four genera that occur from southern South America through to the southeastern regions of Brazil: *Apteroathlia* Smith & Evans, **new genus**, *Athlia* Erichson, 1835, *Dihymenonyx* Gutiérrez, 1949, and *Ulata* Saylor, 1945. Justifications are provided for the new tribe and for the placement each genus in the new tribe. Keys to genera and species are presented along with distributional data and maps for all species. *Apteroathlia translucida* Smith & Evans, **new species** and *Apteroathlia nox* Smith & Evans, **new species** are described. Lectotypes are designated for *Athlia bruchi* Moser, 1924 and *Athlia rustica* Erichson, 1835. A neotype is designated for *Ulata argentina* Saylor, 1945.

**Key words:** Neotropics, nomenclature, taxonomy, classification, chafers, *Athlia*, *Dihymenonyx*, *Ulata*

### Introduction

Neotropical Melolonthinae (Coleoptera: Scarabaeidae) is a morphologically diverse group of plant-feeding chafers that are ubiquitous in terrestrial habitats. Some species have been reported as crop and forestry pests and a few species have become invasive to areas outside the Neotropics (for example, *Phyllophaga smithi* (Arrow, 1912) is invasive to Mauritius and *Plectris aliena* Chapin, 1934 is invasive to Australia and the United States of America). In spite of the diversity and importance of this group, the taxonomy is poorly understood—most tribes and genera have underdeveloped or undeveloped taxonomic frameworks and there are likely well over 1000 new species in need of description.

During the course of our studies on New World Melolonthinae, it has become clear that *Athlia* Erichson, 1835, *Dihymenonyx* Gutiérrez, 1949, and *Ulata* Saylor, 1945 all share similar morphological features not found in currently recognized tribes. We agree with Ahrens (2005) that *Athlia* should be excluded from the Sericini, which necessitates describing a new tribe. The purpose of this paper is to place the related genera *Athlia*, *Dihymenonyx*, and *Ulata* together in Athliini **new tribe**, and include *Apteroathlia* **new genus** and its two new species, and provide an identification guide to the species of Athliini.

*Athlia* was included within the Melolonthinae by Erichson (1835) without any discussion as to its nearest relatives. Blanchard (1850) refined the classification of this genus by placing it in the “Omalopliitae”, which is roughly the equivalent of the current tribe Sericini. This classification was more-or-less maintained for the next 95 years. Saylor (1945, 1946) considered *Athlia* and *Ulata* to be closely related and placed them in the Sericoidini, but offered no justification for this tribal placement. Gutiérrez (1949) described new species of *Athlia* and *Dihymenonyx* and discussed *Ulata*, but gave no indication of the tribal classification of these genera. Martínez (1959) stated that *Athlia* was classified in Sericinae: Liparetrini without elaboration. Later, Martínez (1967) discussed the classification of *Athlia* and *Dihymenonyx* in some detail and considered them as sister taxa in the tribe Sericini, but left *Ulata* in the tribe Liparetrini. Frey (1973) included *Athlia* and *Dihymenonyx* in a key to South American Sericini. Martínez (1974) synonymized *Dihymenonyx* with *Athlia* without discussing the tribal placement. Mondaca (2007) restored *Dihymenonyx* as a valid genus, reviewed the species, and compared it with *Athlia*. Smith (2008) removed all New World taxa from the Australian tribe Liparetrini and tentatively placed *Ulata* in Sericoidini, but stated that the tribal status of this genus was unclear and warranted further investigation.

Evans (2003) and Evans & Smith (2009) continued to maintain *Athlia* and *Dihymenonyx* in the tribe Sericini and *Ulata* in the tribe Sericoidini. Ahrens (2005) conducted a phylogenetic analysis of the tribe Sericini using morphological characters and concluded that *Athlia* did not belong in this tribe, but refrained from erecting a new tribe for the genus. The establishment of the tribe Athliini provides a natural taxon for these previously misplaced genera, thus stabilizing their classification and that of the New World Melolonthinae in general.

## Materials and methods

**Specimens.** Over 900 specimens were examined from the following entomology collections (with curator/ collection manager in brackets):

AMNH	American Museum of Natural History, New York, New York, United States of America (Lee Herman)
AVEC	Arthur V. Evans Collection, Richmond, Virginia, United States of America
BMNH	The Natural History Museum, London, United Kingdom (Max Barclay, Malcolm Kerley)
CASC	California Academy of Sciences, San Francisco, California, United States of America (Christopher Grinter, Jere Schweikert, Norman Penny [deceased])
CDFA	California Department of Food and Agriculture, Sacramento, California, United States of America (Chuck Bellamy [deceased], Andy Cline)
CMNC	Canadian Museum of Nature, Ottawa, Ontario, Canada (François Génier, Robert Anderson)
CNCI	Canadian National Collection of Insects, Ottawa, Ontario, Canada (Anthony Davies, Serge Laplante)
FMNH	Field Museum of Natural History, Chicago, Illinois, United States of America (Alfred Newton, Margaret Thayer)
FSCA	Florida State Collection of Arthropods, Gainesville, Florida, United States of America (Paul Skelley)
INHS	Illinois Natural History Survey, Urbana-Champaign, Illinois, United States of America (Edward DeWalt)
LEMQ	Lyman Entomological Museum, McGill University, Ste. Anne de Bellevue, Québec, Canada (Stéphanie Boucher)
MNHN	Muséum National d'Histoire Naturelle, Paris, France (Olivier Montreuil)
MNNC	Museo Nacional de Historia Natural, Santiago, Chile (Mario Elgueta)
TMSA	Ditsong National Museum of Natural History, Pretoria, South Africa (James Harrison, Ruth Müller)
UMCE	Universidad Metropolitana de Ciencias de la Educación, Santiago, Chile (Jaime Solervicens)
UMSP	University of Minnesota, St. Paul, Minnesota, United States of America (Robin Thomson, Ralph Holzenthal)
USNM	United States National Museum of Natural History, currently housed at the University of Nebraska State Museum, Lincoln, Nebraska, United States of America (M.J. Paulsen, Brett Ratcliffe)
VMDM	V. Manuel Diéguez M. Collection, Santiago, Chile

**Label data, specimen images, and maps.** The following is largely quoted from Smith (2016), as the materials and methods used were the same. “The verbatim label data is given for specimens in quotation marks with slashes to indicate a new line of text on the label. The specimen images were taken at the CMNC using Leica imaging equipment and the Leica Application Suite software. The maps were created using the SimpleMappr website ([www.simplemappr.net](http://www.simplemappr.net)). The specimen images and maps were modified and plates constructed in Adobe Photoshop ([www.photoshop.com](http://www.photoshop.com)).”

## Athliini Smith & Evans, new tribe

<http://zoobank.org/urn:lsid:zoobank.org:act:1EF3248F-813E-4307-AD07-43E4F3F75677>

**Type genus.** *Athlia* Erichson.

**Diagnosis.** Labrum transverse, originating below and fused to anterior clypeal margin so that they are coplanar; labroclypeal suture evident. Clypeus and frons are coplanar. Ocular canthus present, margin continuous with lateral clypeal margin. Antennae with 8 or 9 antennomeres, club with three short, thick, subequal lamellae. Mentum with insertions of labial palpi not exposed. Pronotum with anterior margin membranous. Abdomen with 6 ventrites, 2–5 equal in length and not strongly narrowed medially, 5 and 6 not separated by a membrane, with (*Apteroathlia*,

*Athlia*) or without carinae on sides, and a distinct propygidial-sternal suture. Propygidium plain, fused to tergite with suture more-or-less evident, spiracle not within or immediately adjacent to suture. Procoxae conical and protuberant, anterior height greater than basal width. Protibial spur present. Metepimeron triangular with a distinct ridge. Outer surfaces of mesotibiae and metibiae with indication of partial or complete (*Athlia*) transverse carinae. Metatibial apex transverse, inner margin distinctly notched with two spurs, each set above and below tarsal articulation so that the first tarsomere passes between them. Opposing claws symmetrical, incised, toothed, or simple, with a short and bisetose onychium; claws of *Dihymenonyx* with a fleshy lobe underneath each side of claw.

**Composition.** *Apteroathlia* Smith & Evans, **new genus**, *Athlia*, *Dihymenonyx*, and *Ulata*.

**Distribution.** Southern half of South America.

**Notes.** Athliini **new tribe** is distinguished from all Neotropical Sericoidini and Australian Liparetrini (and similar Australian tribes) by the distinct labrum that is fused to and coplanar with the anterior clypeal margin, a morphological feature that superficially resembles that found in the Sericini. Sexual dimorphism in this tribe is very subtle and difficult to detect. The antennal club is reduced in both sexes (generally less than half the length of the funicle) and there are no sexually dimorphic characters in the head or legs. The convexity of the abdomen is generally sexually dimorphic but the differences are subtle since the abdomen in both sexes appears convex or inflated.

Three of the genera in this tribe (*Apteroathlia*, *Athlia*, *Dihymenonyx*) include species with reduced or absent metathoracic wings, thus indicating a general evolutionary trend of flightlessness in this group for species living in arid habitats. Scholtz (2000) hypothesized that some scarab taxa have an increased evolutionary propensity towards flightlessness when they evolve in certain environments such as deserts, mountains, and islands.

The immature stages have not been described for any species in this tribe. Studying the larval natural history and morphology of this group may provide insights into the placement of this taxon among other Melolonthinae tribes.

### Key to the genera of Athliini new tribe

1. Each claw with fleshy lobe directly underneath (Fig. 59). Chile . . . . . *Dihymenonyx* Gutiérrez
- Claws without fleshy lobes, but instead with a short, setose onychium in between. . . . . 2
2. Antennae with 9 antennomeres. Argentina, Brazil, Chile. . . . . *Athlia* Erichson
- Antennae with 8 antennomeres. . . . . 3
3. Elytra with mottled appearance and distinctly setose; metatibial notch with upper apical spur set directly below tarsal articulation. Argentina (Neuquén, Río Negro), Chile. . . . . *Ulata* Saylor
- Elytra unicolored, glabrous; metatibial notch with apical spurs set on each side of tarsal articulation. Argentina (Buenos Aires), Uruguay. . . . . *Apteroathlia* Smith & Evans, **new genus**

### *Apteroathlia* Smith & Evans, new genus

<http://zoobank.org/urn:lsid:zoobank.org:act:778D2B0C-E445-46BC-84CB-338DA4F2F7F6>

**Type species.** *Apteroathlia translucida* Smith & Evans, **new species**, here designated.

**Description.** Length 5.9–9.4 mm. Ovate, widest behind middle of elytra; testaceous to black, or black with testaceous appendages and partly or entirely testaceous pronotum; surfaces moderately to strongly shiny, and mostly glabrous. Head: labrum wide, broadly emarginate, evenly and shallowly reflexed anteriorly, completely fused to and slightly below plane of clypeus exposing anterior clypeal margin; labroclypeal suture distinct and terminating in small, marginal notches. Mentum longer than wide, narrowly emarginate in front, with sides gradually converging posteriorly. Antennae with 8 antennomeres, club with 3 short, thick lamellae. Pronotum: convex, wider than long, widest medially. Elytra: convex and without costae or distinct interval, punctostriate. Metathoracic wings absent. Abdomen: with lateral carinae on ventrites. Legs: protibia weakly tridentate on outer margin, spur present and reaching to basal third or half of protarsomere 1. Claws symmetrical and toothed with a short, bisetose onychium in between. Metatibial apices with spurs set in notch, each set on either side of tarsal articulation, longest spur reaching about two-thirds to three-quarters the length of first tarsomere. Male genitalia: symmetrical parameres simple in form, not split or with strong sinuations, and subequal in length to phallobase.

**Etymology.** *Apteroathlia* means “wingless *Athlia*” to indicate the similarities with the genus *Athlia*. The name is feminine in gender to match *Athlia*.

**Composition.** *Apteroathlia nox* **new species** and *Apteroathlia translucida* **new species**.

**Remarks.** The two known species in this genus are both endemic to the region around Río de la Plata in Uruguay and Argentina.

### Key to species of *Apteroathlia* new genus

1. Anterior labral margin broadly concave and not upturned medially (Fig. 4), dorsal color black (pronotum sometimes medially or completely light brown/tan) (Figs. 1–2) . . . . . *Apteroathlia nox* Smith and Evans, **new species**
- Anterior labral margin narrowly concave and upturned medially (Fig. 9), dorsal color tan to light brown (Figs. 6–7) . . . . .  
. . . . . *Apteroathlia translucida* Smith and Evans, **new species**

### *Apteroathlia nox* Smith & Evans, new species

Figs. 1–5, 66.

<http://zoobank.org/urn:lsid:zoobank.org:act:70ABBE95-B0D0-4C43-A2DF-4038525D507C>

**Type locality.** Playas de Juancho, Madariaga, Buenos Aires, Argentina.

**Type series.** One male holotype, 4 male paratypes, and 2 female paratypes. Holotype male (Figs. 1–5) at CMNC labeled a) “ARGENTINA / BUENOS AIRES / Do MADARIAGA / Playas de Juancho / Coll. Martínez / Nov.-941” (handwritten), b) “H. & A. HOWDEN / COLLECTION / ex. A.Martínez coll.” (typeset with black border). Two male paratypes at CMNC labeled a) “ARGENTINA / BUENOS AIRES / Pdo. MADARIAGA / Playas de Juancho / Coll. Martínez / Nov.-941” (handwritten), b) “H. & A. HOWDEN / COLLECTION / ex. A.Martínez coll.” (typeset with black border). Two male paratypes and one female paratype at CMNC labeled a) “ARGENTINA / BUENOS AIRES / S. Ventana / Gallardo-leg. / Coll. Martínez / 11-VIII-61” (handwritten), b) “H. & A. HOWDEN / COLLECTION / ex. A.Martínez coll.” (typeset with black border). One female paratype at CMNC labeled a) “ARGENTINA / BUENOS AIRES / Villa Gesell / Horacio-leg. / Coll. Martínez / Ene.-976” (handwritten), b) “H. & A. HOWDEN / COLLECTION / ex. A.Martínez coll.” (typeset with black border). All paratypes listed above also bear a yellow paratype label and a database label with the database number and a barcode.

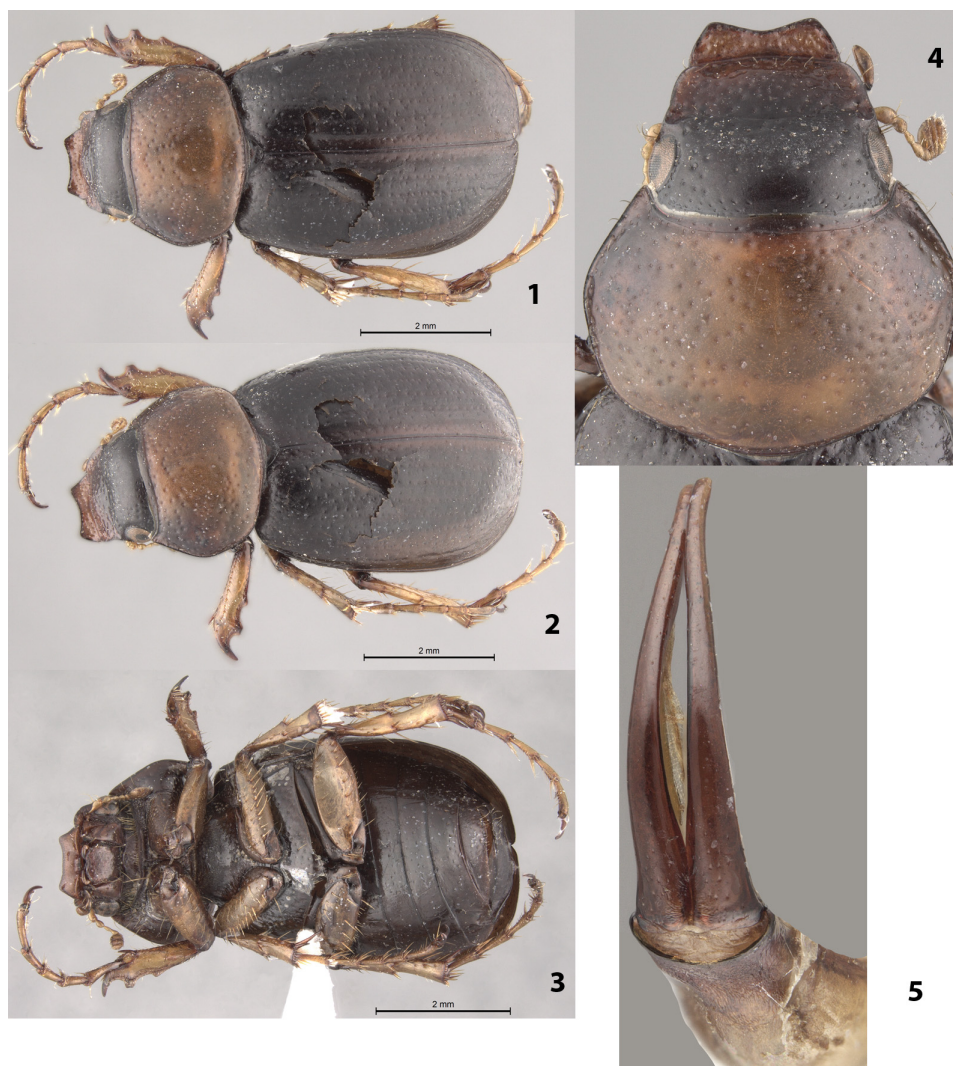
**Description of holotype** (Figs. 1–5). Male. Length 7.0 mm, width 3.1 mm. Head (at base), elytra, ventral surface black; head (apex), pronotum, legs dark tan. Dorsal surface glabrous (except sparse row of setae adjacent to apex of clypeus). *Head:* clypeus densely punctate, frons moderately punctate. Labrum with apex reflexed and concave medially; underside concave medially. Clypeus with apex straight, abutted to labrum. Frontoclypeal suture visible. Eyes round, weakly protruding laterally. Antennae with 8 antennomeres; antennal club with 3 antennomeres, club approximately half the length of antennomeres 1–5 combined, club surface with some setae. Maxillae robust, triangular, basal width slightly less than width of mentum; maxillary palpus with 4 palpomeres, length approximately half that of antennae. Mentum prominent, slightly longer than wide, apex straight, surface slightly convex; labial palpus reduced. *Pronotum:* surface moderately to sparsely punctate; apical angle slightly acute, basal angle rounded. Pronotum widest medially with smooth margins. *Elytra:* surface sparsely punctate, striae punctate but somewhat obscured by other surface punctures. *Wings:* apterous. *Venter:* metasternum with dense punctures. Pygidium flat; surface sparsely punctate with microsculpturing. *Legs:* protibia with 3 apical teeth on outer margin of apical half. Claws symmetrical, each with a minute medial tooth (metatarsal claws appear simple). Protibial spur present, metatibial spurs approximately equal in length. *Genitalia:* parameres long, curving and tapering into needle-like apices (Fig. 5).

**Variation.** Length 7.0–9.4 mm. Pronotum black, dark tan, or black lateral and dark tan/brown medially. Claws all appear simple on the paratype specimens. Females with slightly more inflated, convex abdominal segments.

**Etymology.** The Latin word *nox* means night and is used here in reference to the night-like darkness of the dorsal and ventral surfaces. This name is an adjective in the nominative singular.

**Distribution** (Fig. 66). ARGENTINA (7): Buenos Aires (7): Playas de Juancho, Sierra de la Ventana, Villa Gesell. **Temporal data.** January (1), August (3), November (3).

**Remarks.** *Apteroathlia nox* new species is endemic to the southern part of Buenos Aires Province, Argentina. The holotype specimen has claws with a minute, medial tooth but the tooth was not seen in other specimens. This perhaps indicates that the tooth is easily worn off.



**FIGURES 1–5.** *Apteroathlia nox* Smith & Evans, new species, holotype. 1, dorsal habitus; 2, oblique habitus; 3, ventral habitus; 4, head and pronotum; 5, parameres.

***Apteroathlia translucida* Smith & Evans, new species**

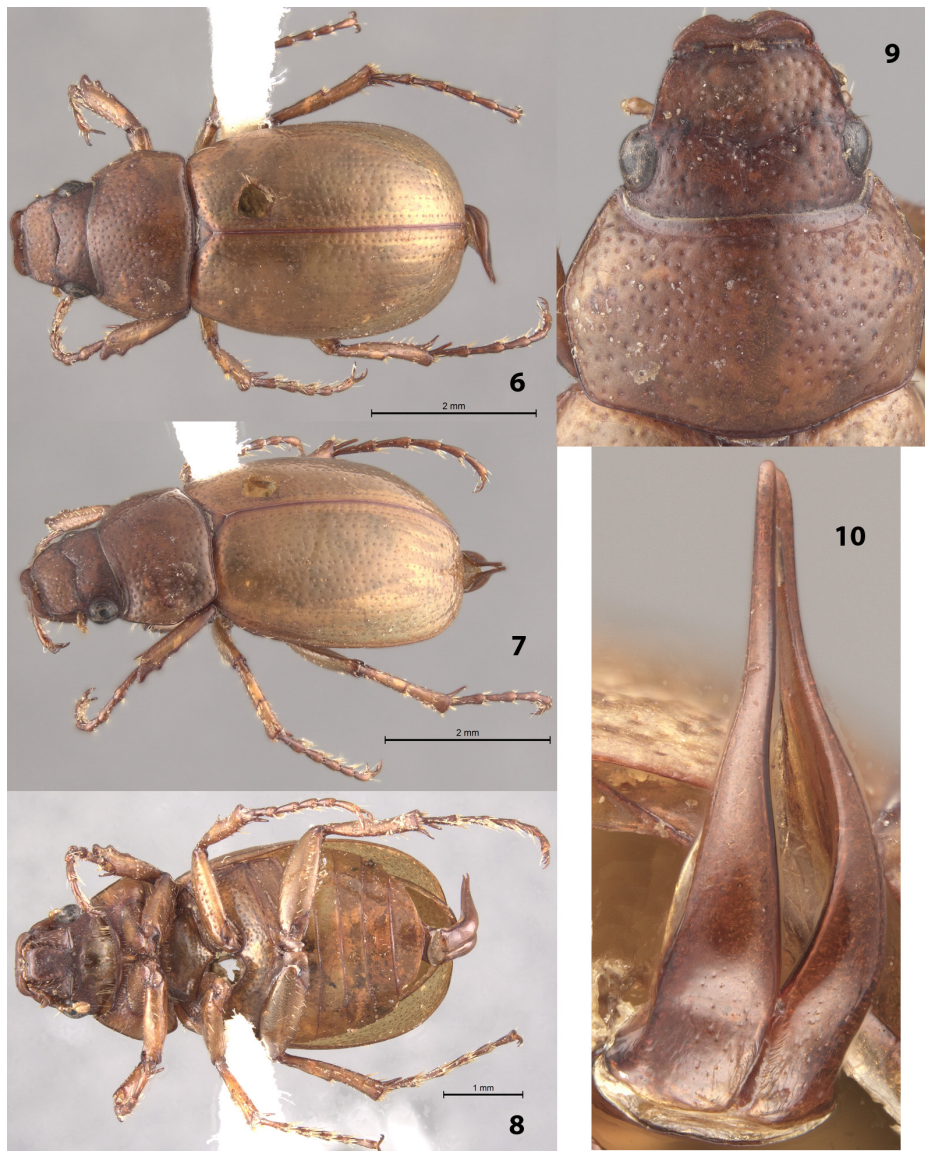
Figs. 6–10, 66.

<http://zoobank.org/urn:lsid:zoobank.org:act:D4F8FA09-1E22-41A0-91F1-CD2945005552>

**Type locality.** Cerro, Montevideo, Uruguay.

**Type series.** One male holotype, 14 male paratypes, and 14 female paratypes. Holotype male (Figs. 6–10) at CMNC labeled a) “Montevideo / Cerro / 1 . X . 33” (handwritten), b) “H. & A. HOWDEN / COLLECTION / ex. A.Martínez coll.” (typeset with black border), c) “Apterops / translucidus / (Cand. in litt.)” (handwritten). One paratype male at USNM labeled a) “Bs As / Azul / V.956. Daguerre” (handwritten), b) “ARGENTINA / 1968 Colln. / J.Daguerre” (typeset over red, white, and green background), c) “Apterops / translucidus / (in lit.) Cand. / Vialle det” (handwritten). One paratype male at CMNC and one paratype female at USNM labeled a) “Bs As / Azul / V.956. Daguerre” (handwritten), b) “ARGENTINA / 1968 Colln. / J.Daguerre” (typeset over red, white, and green background). Four male paratypes at CMNC (2) and USNM (2) and six female paratypes at CMNC (3) and USNM (3) labeled a) “ARGENTINA / Buenos Aires Prov. / Azul; V.1956 / J. Daguerre” (typeset). One male paratype at USNM labeled a) “Montevideo / Cerro / 12 IX 34” (handwritten), b) “Apterops / translucidus / (Chand. i. litt)” (handwritten). One paratype male at CMNC labeled a) “Montevideo / Cerro / 1 . X . 33” (handwritten), b) “H. & A. HOWDEN / COLLECTION / ex. A.Martínez coll.” (typeset with black border). Four male and two female paratypes at CMNC labeled a) “R. O. del / Uruguay” (typeset on faded green paper), b) “H. & A. HOWDEN / COLLECTION /

ex. A.Martínez coll.” (typeset with black border). One male paratype at BMNH labeled a) “18234” (handwritten), b) “La Plata / M Video” (handwritten), c) “Fry Coll. / 1905-100.” (typeset). One male paratype at BMNH labeled a) “Monte- / video” (typeset), b) “1909–74.” (typeset), c) “21.” (handwritten). One female paratype at BMNH labeled a) “Brazil” (handwritten), b) “2032.” (handwritten), c) “67-45” (handwritten), d) “inflat Reiche / Brasilia” (handwritten), e) “So named / in Reiches / Collection. / C.W.” (typeset). One female paratype at MNHN labeled a) “Plata / Dolle” (handwritten), b) “MUSÉUM PARIS / 1906 / Coll. Léon FAIRMAIRE” (handwritten). One female paratype at USNM labeled a) “Montevideo / Cerro / 24. IX. 33” (handwritten), b) “Apterops / translucidus / (Chand. i. litt.)” (handwritten), c) “OLCartwright / Collection / 1959” (typeset). Two female paratypes at USNM labeled a) “Montevideo / Cerro / 12 IX 34” (handwritten). All paratypes listed above also bear a yellow paratype label and a database label with the database number and a barcode.



**FIGURES 6–10.** *Apterathlia translucida* Smith & Evans, new species, holotype. 6, dorsal habitus; 7, oblique habitus; 8, ventral habitus; 9, head and pronotum; 10, parameres.

**Description of holotype** (Figs. 6–10). Male. Length 6.6 mm, width 3.1 mm. Dorsal and ventral color light brown, elytra translucent. Dorsal surface glabrous. *Head*: surface moderately punctate. Labrum with apex reflexed backward and convexly parabolic medially; underside concave medially. Clypeus with apex straight, abutted to labrum. Frontoclypeal suture visible. Eyes round, slightly protruding laterally. Antennae with 8 antennomeres; antennal club with 3 antennomeres, club distinctly shorter in length to antennomeres 1–5 combined, club surface thickly setose. Maxillae robust, triangular, basal width slightly less than width of mentum; maxillary palpus with 4

palpomeres, length approximately  $\frac{3}{4}$  that of antennae. Mentum prominent, slightly longer than wide, apex straight, surface slightly convex; labial palpus reduced. *Pronotum*: surface moderately to densely punctate; apical angle acute, basal angle squared. Pronotum widest medially with smooth margins. *Elytra*: surface moderately to densely punctate, striae punctate but obscured by other surface punctures. *Wings*: apterous. *Venter*: metasternum with dense punctures. Pygidium flat; surface moderately to sparsely punctate with microsculpturing. *Legs*: protibia with 3 apical teeth on outer margin of apical half; 3<sup>rd</sup> tooth weak. Claws symmetrical with medial tooth. Protibial spur present, metatibial spurs approximately equal in length. *Genitalia*: parameres long, slender, tapering into needle-like apices (Fig. 10).

**Variation.** Length 5.9–7.7 mm. Dorsal color tan to brown. Females with slightly more inflated, convex abdominal segments.

**Etymology.** This name is in reference to the translucent elytra and an homage to “*Apterops translucidus*”, which was used on older determination labels for some specimens but was never published. It should be treated as an adjective in the nominative singular.

**Distribution** (Fig. 66). URUGUAY (14): Montevideo (8): Cerro, Montevideo; no data (6). ARGENTINA (14): Buenos Aires (14): Azul, La Plata. NO DATA (1): “Brazil”.

**Temporal data.** May (13), September (4), October (2).

**Remarks.** *Apteroathlia translucida* new species is mainly found around the gulf shores of Río de la Plata in Uruguay and Buenos Aires Province, Argentina. One 19<sup>th</sup> Century specimen is labeled “Brazil”, but we consider this record doubtful and in need of further verification. The specimens collected in May were probably collected fresh while those obtained in September and October appear to have been found dead and dried. The conservation status of this species should be investigated since most of the specimens were collected from coastal habitats in highly populated urban areas.

## ***Athlia* Erichson, 1835**

*Athlia* Erichson, 1835: 266. Type species *Athlia rustica* Erichson, 1835 by monotypy.

**Synonym.** *Rivera* Germain, 1903: 392. Type species *Athlia plebeja* Burmeister, 1855 by monotypy.

**Redescription.** Length 6.5–17.0 mm. Elongate and robust, widest at about elytral declivity; uniformly pale to medium yellowish brown, or brown or reddish brown; dorsal surface dull, sometimes with a faint, glaucous coating on pronotal and elytral surfaces, or weakly shiny, sometimes faintly iridescent, and with or without short, scattered, and appressed setae. Head: labrum wide, broadly emarginate and evenly reflexed anteriorly, and completely fused to clypeus with labroclypeal suture more-or-less distinct and terminating in small, marginal notches. Mentum longer than wide, narrowly emarginate in front, with sides gradually converging posteriorly. Antennae with 9 antennomeres, club with 3 short, thick lamellae. Pronotum: convex, wider than long, widest medially or slightly behind middle. Elytra: disc of each with four weak and narrow costae, interstriae broad and confusedly punctate. Metathoracic wings fully developed or reduced in size (brachypterous). Abdomen: with lateral carinae on ventrites. Legs: protibia with three apical teeth on outer margin, spur present and shorter than protarsomere 1. Claws symmetrical and incised, with short, bisetose onychium in between. Metatibial apices with spurs set in notch, longest spur reaching half to three-quarter point of metatarsomere 1. Male genitalia: symmetrical parameres simple in form, not split or with strong sinuations, and somewhat shorter than phallobase.

**Composition.** All seven known species of *Athlia* are endemic to the southern half of South America.

**Remarks.** Saylor (1946b) and Martínez (1967, 1974) previously reviewed this genus but a detailed taxonomic inventory of all specimens in collections is needed. We predict that new species of *Athlia* will be found in southern Brazil and northern Argentina, where endemism is high and specimens are poorly represented in collections.

## **Key to species of *Athlia* (based on Saylor 1946b; Gutiérrez 1949; Martínez 1967, 1974)**

1. Metathoracic wings reduced and non-functional (slightly lift an elytron to check). Central Chile (VIII Región del Biobío to IX Región de la Araucanía) (Fig. 69). . . . . *Athlia plebeja* Burmeister
- Metathoracic wings full sized and functional . . . . . 2

2. Pronotum with basal angles evenly rounded, not protruding or angulate (Figs. 30, 34, 46) ..... 3
- Pronotum with basal angles protruding or angulate (Figs. 13, 17, 22, 26, 42, 52) ..... 5
3. Length less than 10 mm. Metatarsomere 1 noticeably shorter than metatarsomere 2 (Fig. 32). Southern Argentina (Neuquén to Chubut, Fig. 69) ..... *Athlia parvissima* Saylor
- Length greater than 10 mm. Metatarsomere 1 equal to or slightly shorter than metatarsomere 2 (Fig. 28) ..... 4
4. Labrum weakly curved, weakly elevated medially; lateral border of clypeus slightly reflexed; dorsal surface tan to chestnut brown. Central Chile (V Región de Valparaíso, Fig. 79) ..... *Athlia rotundata* Gutiérrez
- Labrum evenly curved and elevated medially; lateral border of clypeus strongly reflexed; dorsal surface light brown to light tan. Southern Argentina (Neuquén to Chubut) and southern Chile (Región de Aisén, Fig. 68) ..... *Athlia gaiii* Martínez
5. Labrum not reflexed, on the same plane as clypeal surface. Southeastern Brazil (Santa Catarina, Fig. 67) ..... *Athlia brasilica* Saylor
- Labrum reflexed above the plane of clypeal surface. .... 6
6. Pronotum surface with dense, even punctures (Figs. 22, 42, 52) ..... 7
- Pronotum surface with sparse, sometimes unevenly distributed punctures (Figs. 13, 26) ..... 9
7. Elytra evenly covered with setae; pronotum with long setae along lateral edges. Central Chile (IV Región de Coquimbo to IX Región de la Araucanía, Fig. 72) ..... *Athlia rustica* Erichson
- Elytra glabrous medially and sparsely setose laterally and apically; pronotum with long setae along lateral edge but mainly in apical half ..... 8
8. Elytra length less than twice the length of head and pronotum combined Northern and central Argentina (Jujuy to Río Negro, Fig. 67) ..... *Athlia bruchi* Moser
- Elytra length greater than twice the length of head and pronotum combined. Central Chile (IV Región de Coquimbo to Región Metropolitana de Santiago, Fig. 70) ..... *Athlia problematica* Gutiérrez
9. Length greater than 12 mm; apical and basal pronotal angles well developed (Fig. 26). Southern Brazil (São Paulo, Fig. 67) . . . . . *Athlia freyi* Martínez
- Length less than 12 mm; apical and basal pronotal angles weakly developed (Fig. 13). Northeastern Argentina (Buenos Aires, Fig. 67) ..... *Athlia bollei* Martínez

***Athlia bollei* Martínez, 1955**

Figs. 11–14, 67.

**Original combination.** *Athlia bollei* Martínez, 1955: 418.

**Type locality.** “Argentina, provincial de Buenos Aires, Partido de Tandill (Serra-nía)” (Martínez 1955).

**Type series.** Holotype at Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires, Argentina (not examined).

**Distribution.** Fig. 67. Argentina: Buenos Aires (based on specimens from CMNC).

***Athlia brasilica* Saylor, 1946**

Figs. 15–18, 67.

**Original combination.** *Athlia brasilica* Saylor, 1946: 23.

**Type locality.** “Nova Galicia, S. Catarina, Brazylja” (Saylor 1946).

**Type series.** Holotype at CASC labeled a) “Nowa Galicja / Brazylja, S. Catharina” (typeset), b) “HOLOTYPE / Athlia / BRASILICA / L.W.Saylor” (typeset and handwritten on red paper), c) “BRASILICA / Saylor / DET. / L.W. SAYLOR” (handwritten and typeset), d) “L.W. Saylor / Collection” (typeset), e) “California Academy / of Sciences / Type / No. 7922” (typeset and handwritten). One paratype at CASC (examined).

**Distribution.** Fig. 67. Brazil: Santa Catarina (based on specimens from CASC, CMNC).

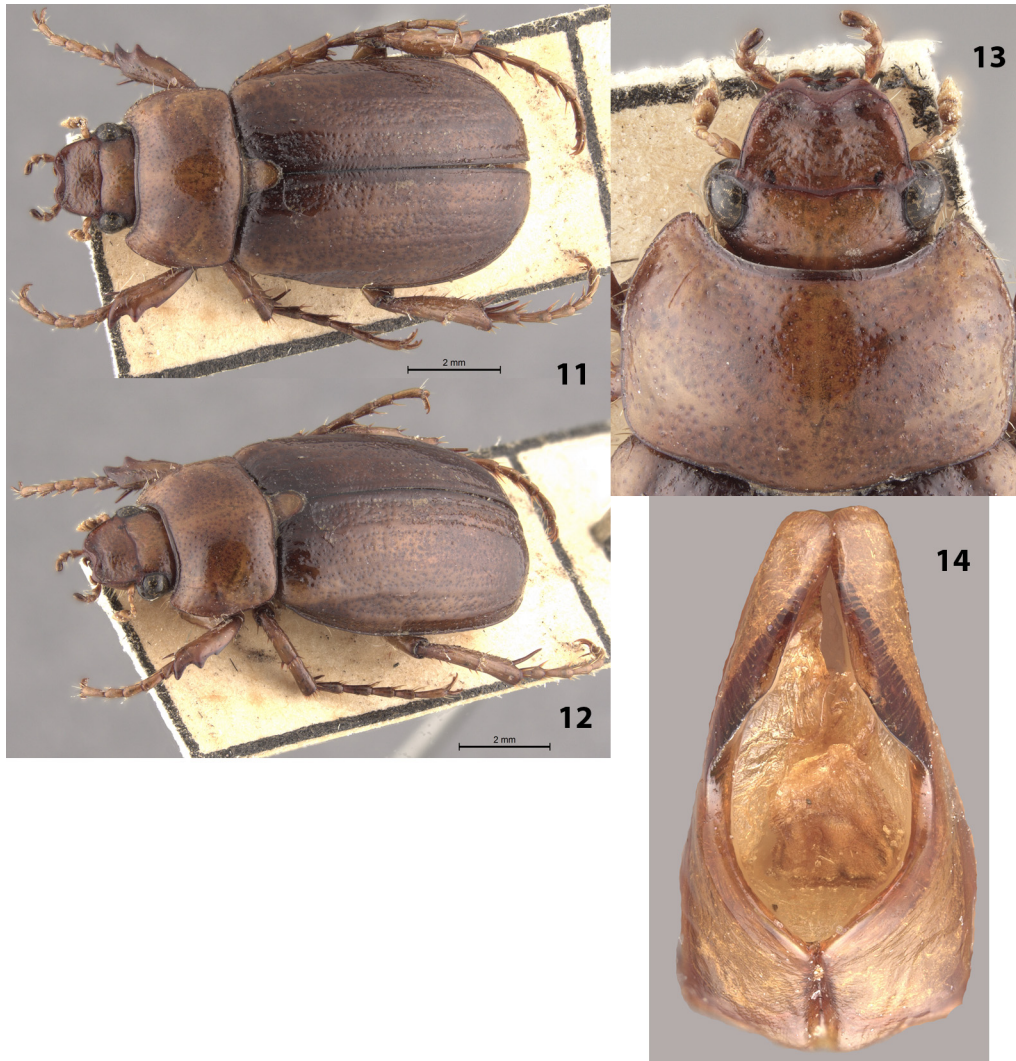
***Athlia bruchi* Moser, 1924**

Figs. 19–23, 67.

**Original combination.** *Athlia bruchi* Moser, 1924: 121.

**Type locality.** “Argentina: Cordoba” (Moser 1924).





**FIGURES 11–14.** *Athlia bollei* Martínez, 1955. 11, dorsal habitus; 12, oblique habitus; 13, head and pronotum; 14, parameres.

**Type series.** Lectotype (Figs. 19–23) at ZMHB labeled a) “Rep ARGENTINA / Prov. Cordoba / 1911 / C. Bruch” (typeset), b) “Athlia / Bruchi / Type Mos.” (handwritten), c) “Bruchi Mos.” (handwritten), d) “SYNTYPUS / Athlia / bruchi Moser, 1924 / labelled by MNHUB 2009” (typeset, orange label), e) “ATHLIA / BRUCHI / MOSER, 1924 / LECTOTYPE / A.B.T. SMITH” (handwritten and typeset, red label). **Lectotype here designated.** A lectotype is designated to preserve the stability of the nomenclature by selecting a single specimen as the name-bearing type for this species. Since Moser (1924) did not explicitly state how many specimens he examined, it is impossible to know the exact composition of the type series.

**Distribution.** Fig. 67. Argentina: Buenos Aires, Córdoba, Jujuy, La Pampa, Neuquén, Río Negro, San Luis (based on specimens from CASC, CMNC, ZMHB).

***Athlia freyi* Martínez, 1974**

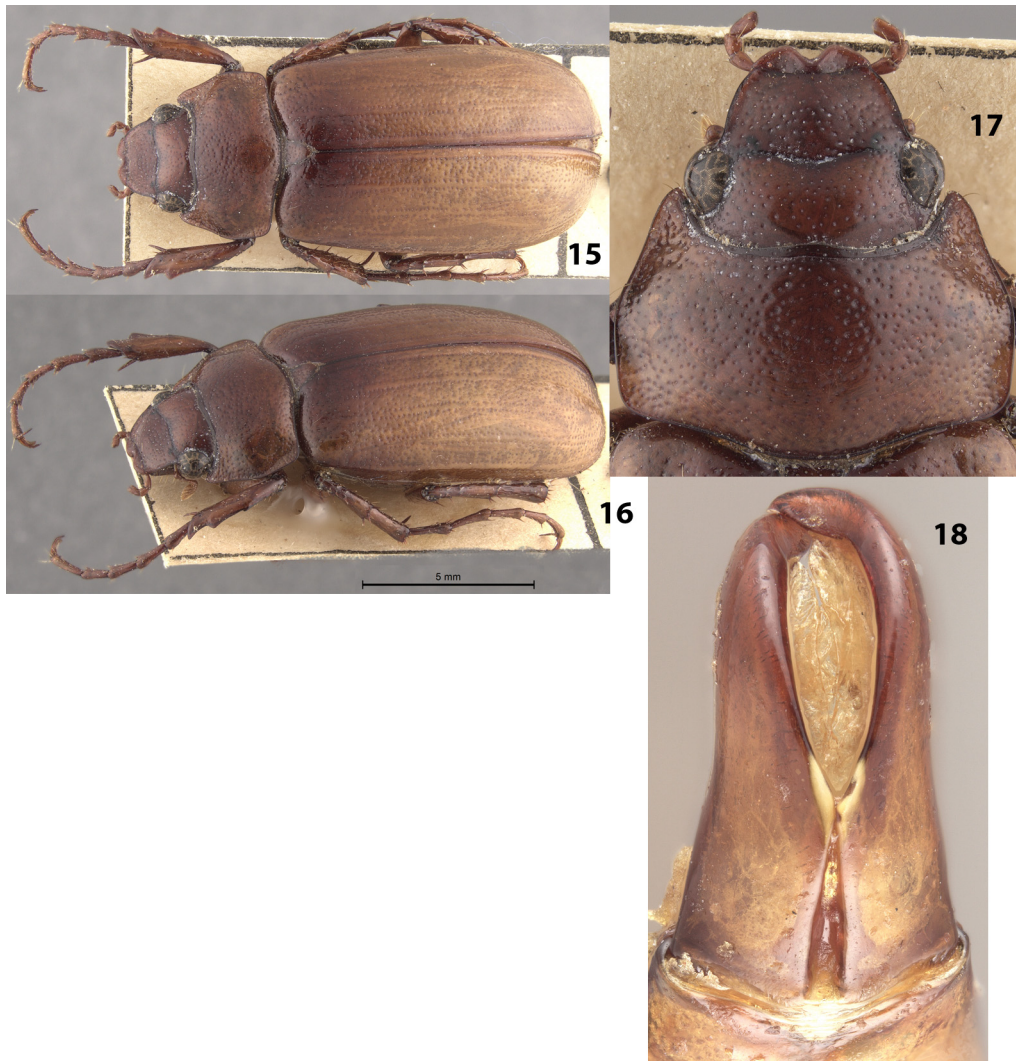
Figs. 24–27, 67.

**Original combination.** *Athlia freyi* Martínez, 1974: 347.

**Type locality.** “Brasil, estado de São Paulo, Serra da Bocaina, 1500 m” (Martínez 1974).

**Type series.** Holotype at Georg Frey Collection, Naturhistorisches Museum Basel, Switzerland (not examined). One paratype at CMNC was examined.

**Distribution.** Fig. 67. Brazil: São Paulo (based on specimens from CMNC).



**FIGURES 15–18.** *Athlia brasiliica* Saylor, 1946. 15, dorsal habitus; 16, oblique habitus; 17, head and pronotum; 18, parameres.

***Athlia gii* Martínez, 1959**

Figs. 28–31, 68.

**Original combination.** *Athlia gii* Martínez, 1959: 23.

**Type locality.** “Neuquén, Piedra del Aguila” (Martínez 1959).

**Type series.** Holotype at Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires, Argentina (not examined). Twenty paratypes at CMNC were examined.

**Distribution.** Fig. 68. Argentina: Neuquén, Río Negro, Chubut (based on specimens from CDFA, CMNC, LEMQ). Mondaca (2011) recorded specimens from Chile: XI Región de Aisén.

***Athlia parvissima* Saylor, 1946**

Figs. 32–35, 69.

**Original combination.** *Athlia parvissima* Saylor, 1946: 24.

**Type locality.** “Zapala, Neuquen, Argentina” (Saylor 1946).

**Type series.** Holotype at CASC labeled a) “Zapala, / Neuquen” (typeset), b) “Argentina / Dec 9 1920” (typeset), c) “HOLOTYPE / Athlia / PARVISSIMA / L.W.Saylor” (typeset and handwritten on red paper), d) “PARVISSIMA / Saylor / DET. / L.W. SAYLOR” (handwritten and typeset), e) “L.W. Saylor / Collection” (typeset), f) “California

Academy / of Sciences / Type / No. 7923” (typeset and handwritten), g) “Southern Neotropical Scarabs / database # AS2617613 / *Athlia parvissima* / Saylor, 1946 ♀ / DET: A.B.T.SMITH 2008” (typeset).

**Distribution.** Fig. 69. Argentina: Neuquén, Río Negro, Chubut (based on specimens from CASC, CDFA, CMNC, LEMQ).



**FIGURES 19–23.** *Athlia bruchi* Moser, 1924 lectotype. 19, dorsal habitus; 20, oblique habitus; 21, labels; 22, head and pronotum; 23, parameres.

***Athlia plebeja* Burmeister, 1855**

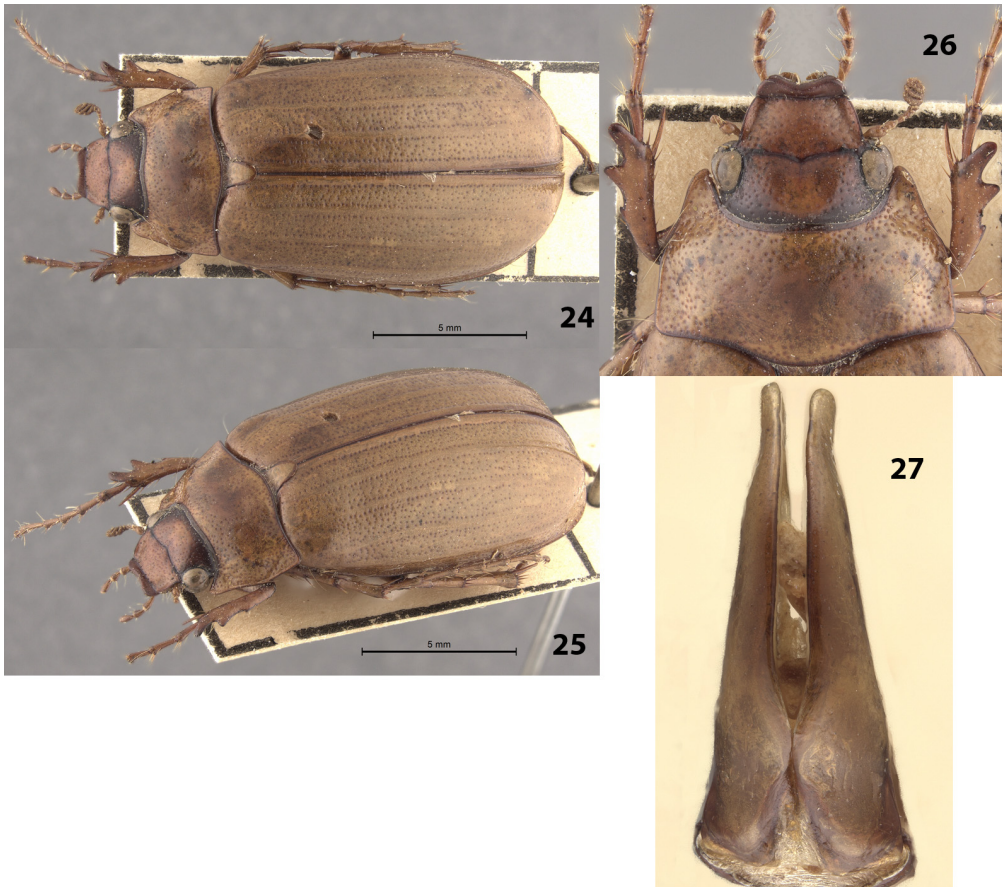
Figs. 36–39, 69.

**Original combination.** *Athlia plebeja* Burmeister, 1855: 125.

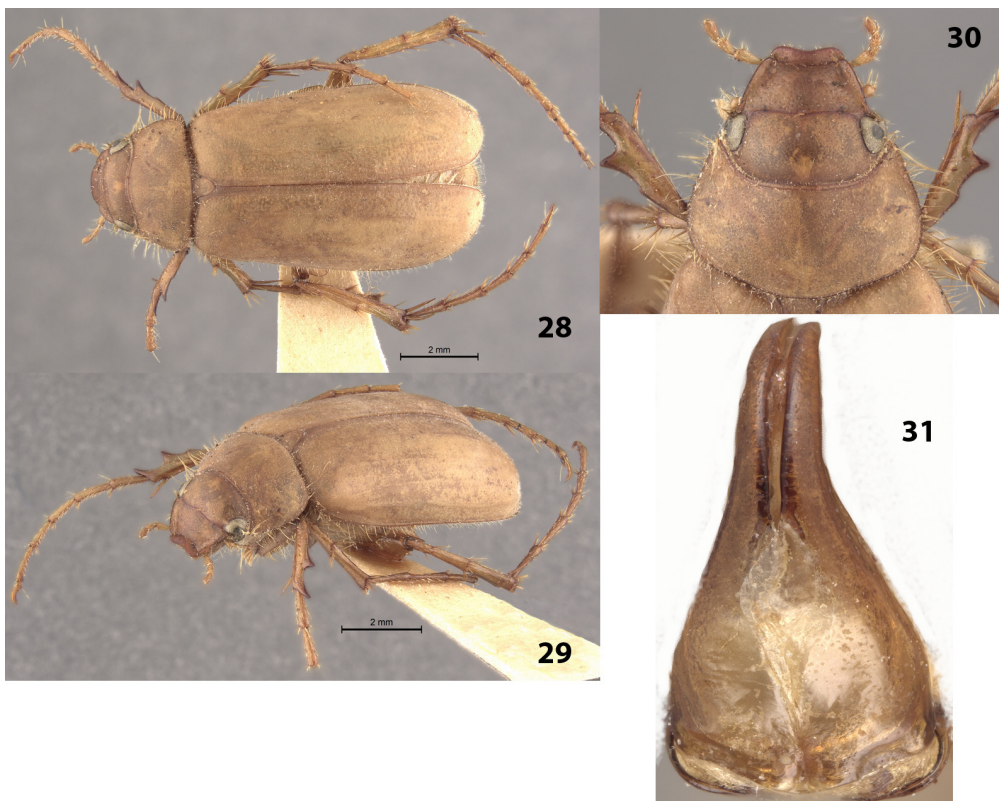
**Subsequent combination.** *Rivera plebeja* (Burmeister): Germain 1903: 392.

**Type locality.** “Chili” (Burmeister 1855).

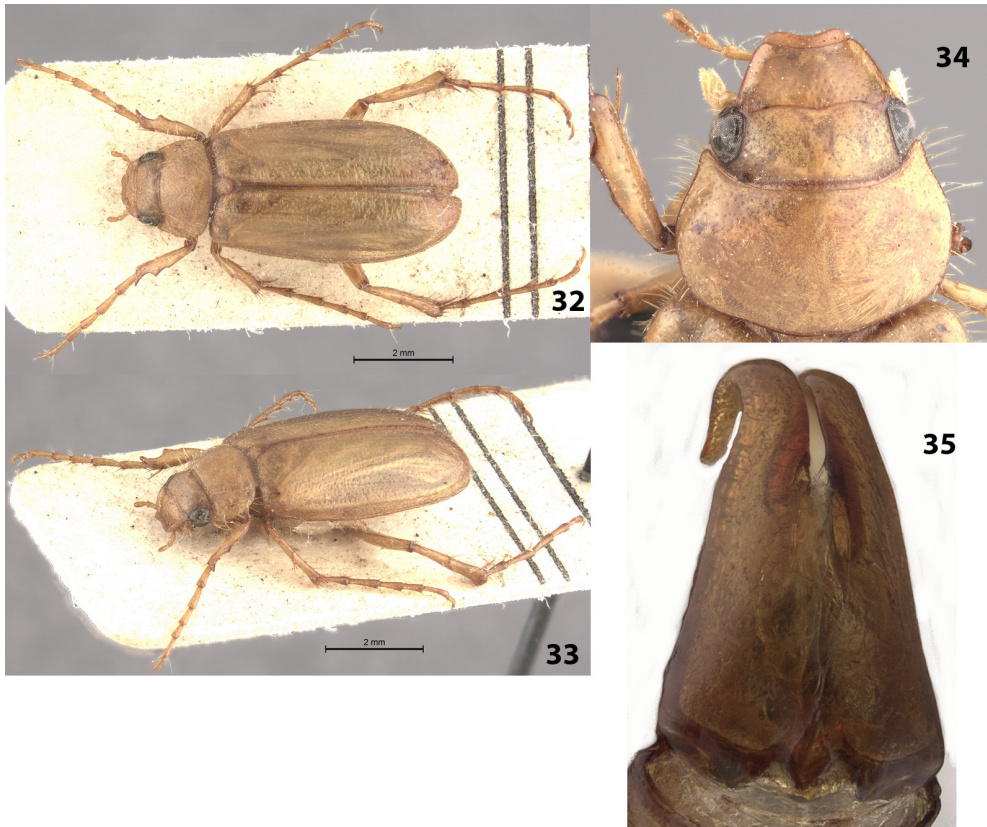
**Type series.** Syntypes presumably at Martin-Luther-Universität, Halle, Germany (not examined).



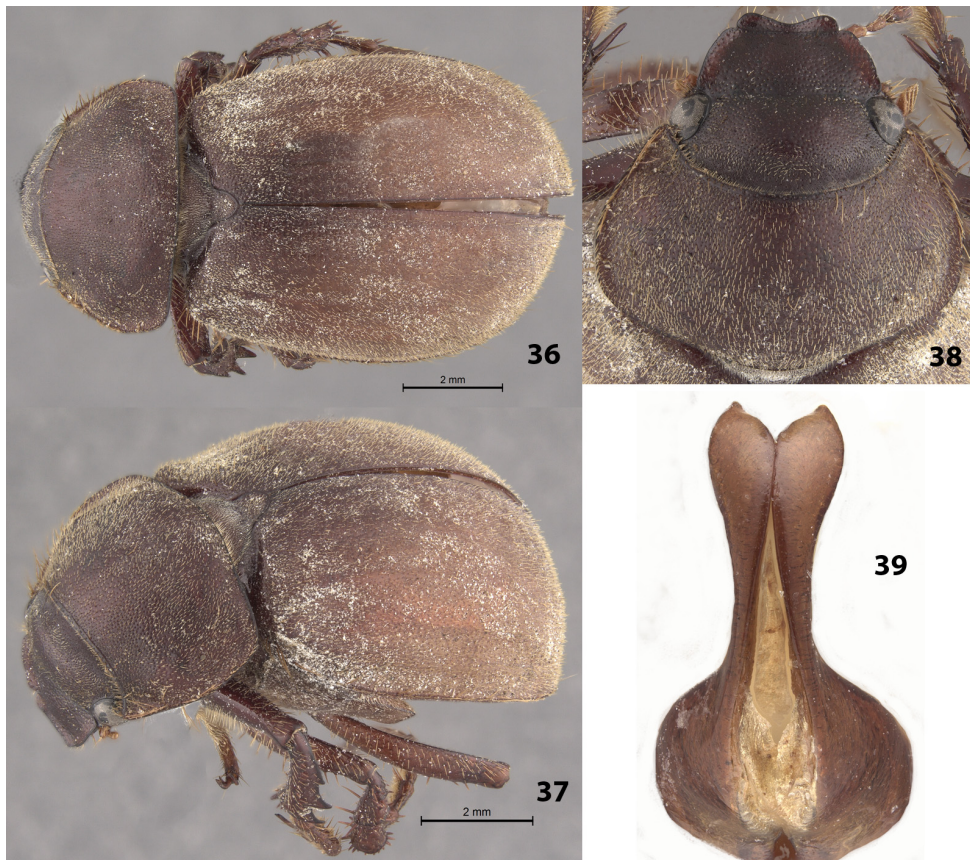
**FIGURES 24–27.** *Athlia freyi* Martínez, 1974. 24, dorsal habitus; 25, oblique habitus; 26, head and pronotum; 27, parameres.



**FIGURES 28–31.** *Athlia gaii* Martínez, 1959. 28, dorsal habitus; 29, oblique habitus; 30, head and pronotum; 31, parameres.



**FIGURES 32–35.** *Athlia parvissima* Saylor, 1946. 32, dorsal habitus; 33, oblique habitus; 34, head and pronotum; 35, parameres.



**FIGURES 36–39.** *Athlia plebeja* Burmeister, 1855. 36, dorsal habitus; 37, oblique habitus; 38, head and pronotum; 39, parameres.

**Synonym.** *Athlia rivera* Saylor, 1946: 23. Type locality: “Chile, Concepcion” (Saylor 1946). Type series: holotype male at CASC labeled a) “CHILE / Concepcion / P.HerbstS.” (typeset) on upperside and “30.x.04.” (handwritten) on underside, b) “Moser determ. / Athlia n.sp.” (typeset and handwritten), c) “HOLOTYPE / Athlia / RIVERA / L.W.Saylor” (typeset and handwritten on red paper), d) “RIVERA / Saylor / DET. / L.W. SAYLOR” (handwritten and typeset), e) “L.W. Saylor / Collection” (typeset), f) “California Academy / of Sciences / Type / No. 7924” (typeset and handwritten), g) “Southern Neotropical Scarabs / database # AS2617639 / *Athlia plebeja* / Burmeister, 1855 ♂ / DET: A.B.T.SMITH 2008” (typeset). One paratype at CASC erroneously labeled “Peru” (examined).

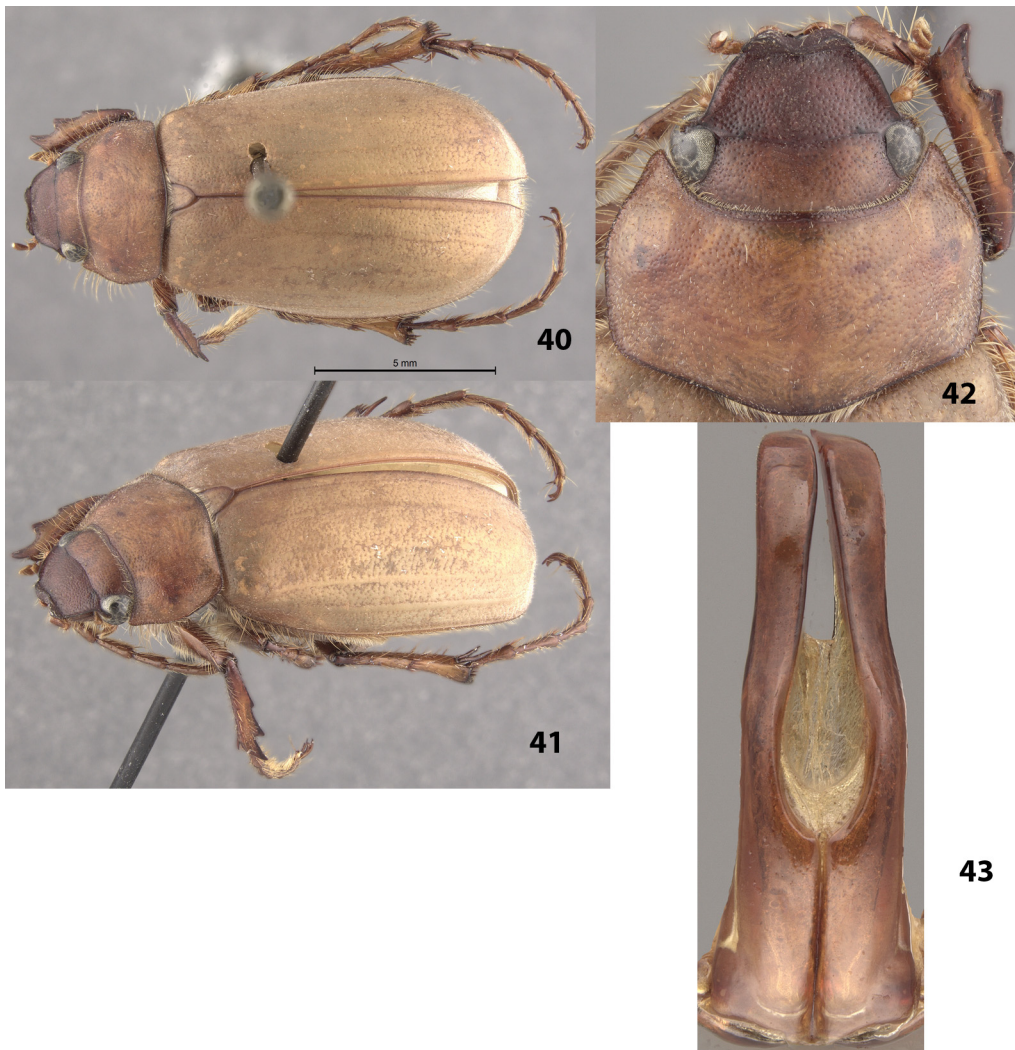
**Distribution.** Fig. 69. Chile: VII Región del Libertador General Bernardo O’Higgins, VIII Región del Biobío, IX Región de la Araucanía (based on specimens from BMNH, CASC, CMNC, FMNH, MNHN, USNM). Two century-old specimens were also seen labeled “Limache” (CASC) and “Valparaíso” (CMNC) but we consider these records as erroneous. The Valparaíso region is far outside the distribution of this species.

***Athlia problematica* Gutiérrez, 1950**

Figs. 40–43, 70.

**Original combination.** *Athlia problematica* Gutiérrez, 1950: 270.

**Type locality.** “Chile: Prov. Valparaíso, Concón” (Gutiérrez 1950).



**FIGURES 40–43.** *Athlia problematica* Gutiérrez, 1950. 40, dorsal habitus; 41, oblique habitus; 42, head and pronotum; 43, parameres.

**Type series.** Holotype, allotype, and eight paratypes at Museo de Zoología, Universidad de Concepción, Concepción, Chile (Cekalovic & Artigas 1969). Two paratypes at BMNH, one paratype at FMNH, and two paratypes at CMNC were examined.

**Distribution.** Fig. 70. Chile: IV Región de Coquimbo, V Región de Valparaíso, Región Metropolitana de Santiago (based on specimens from AMNH, BMNH, CASC, CMNC, FMNH, UMCE). The IV Región de Coquimbo record is based on a single AMNH specimen collected at Combarbalá on 11 November 1992 by Rosen, Sharkov, and Snyder. Additional specimens are needed to corroborate the Región de Coquimbo distributional record.

***Athlia rotundata* Gutiérrez, 1949**

Figs. 44–47, 71.

**Original combination.** *Athlia rotundata* Gutiérrez, 1949: 12.

**Type locality.** “Chile: Prov. Valparaíso, Concón” (Gutiérrez 1949).

**Type series.** Holotype, allotype, and nine paratypes at Museo de Zoología, Universidad de Concepción, Concepción, Chile (Cekalovic & Artigas 1969). Two paratypes were examined from CMNC and FMNH.

**Distribution.** Fig. 71. Chile: V Región de Valparaíso (based on specimens from CASC, CMNC, FMNH, UMCE).



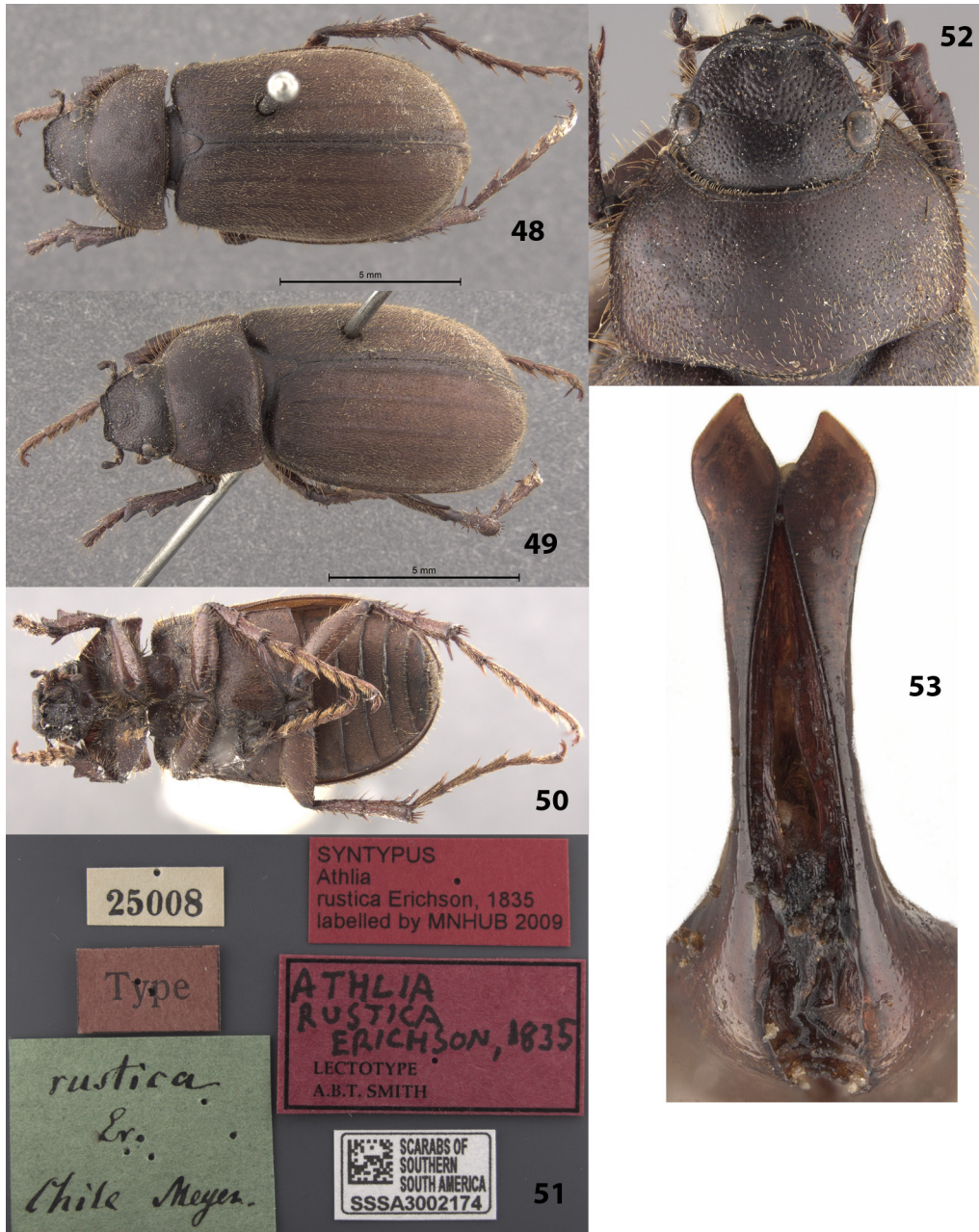
**FIGURES 44–47.** *Athlia rotundata* Gutiérrez, 1949. 44, dorsal habitus; 45, oblique habitus; 46, head and pronotum; 47, parameres.

*Athlia rustica* Erichson, 1835

Figs. 48–53, 72.

**Original combination.** *Athlia rustica* Erichson, 1835: 267

**Type locality.** “Chile” (Erichson 1835).



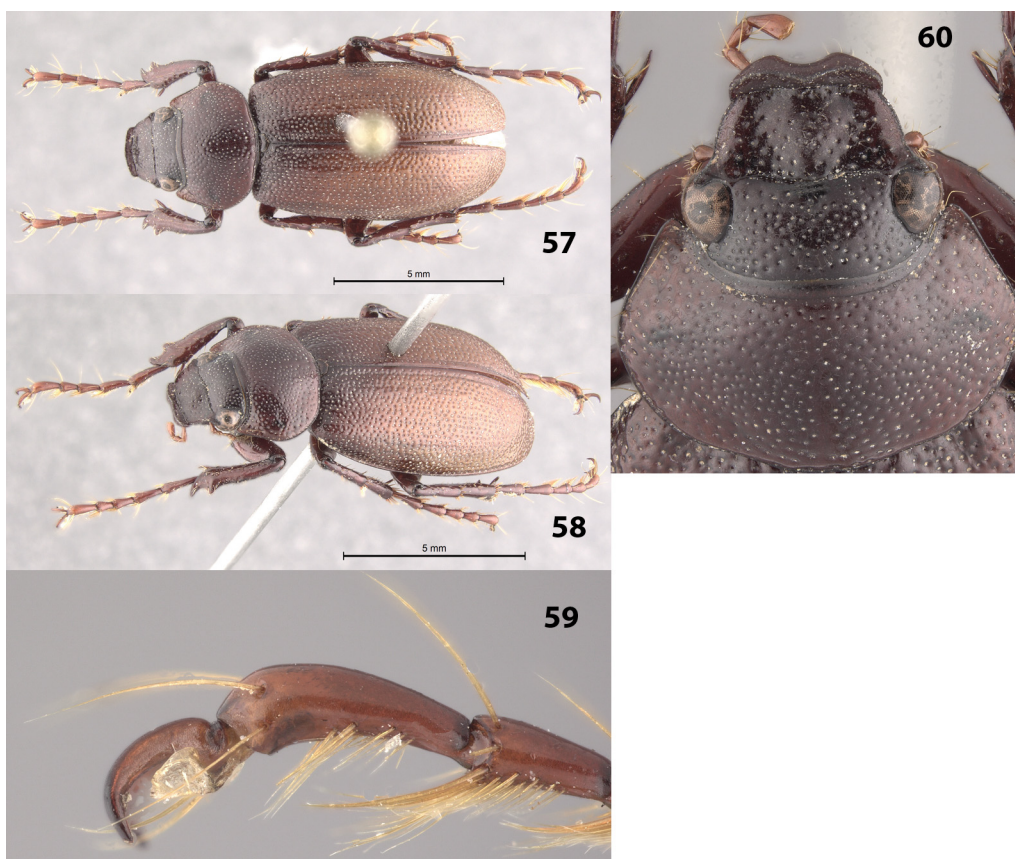
**FIGURES 48–53.** *Athlia rustica* Erichson, 1835 lectotype. 48, dorsal habitus; 49, oblique habitus; 50, ventral habitus; 51, labels; 52, head and pronotum; 53, parameres.

**Type series.** Lectotype (Figs. 48–53) at ZMHB labeled a) “25008” (typeset), b) “Type” (typeset, orange label), c) “rustica / Er. / Chile Meyen.” (handwritten, green label), d) “SYNTYPUS / Athlia / rustica Erichson, 1835 / labelled by MNHUB 2009” (typeset, orange label), e) “ATHLIA / RUSTICA / ERICHSON, 1835 / LECTOTYPE / A.B.T. SMITH” (handwritten and typeset, red label). **Lectotype here designated.** Four paralectotypes at ZMHB labeled a) “Type” (typeset, orange label), b) “Hist.-Coll. (Coleoptera) / Nr. 25008 / Athlia / rustica Erichs. / Chili, Meyen / Zool. Mus. Berlin” (typeset), c) “SYNTYPUS / Athlia / rustica Erichson, 1835 / labelled by MNHUB 2009” (typeset, orange label), d) “ATHLIA / RUSTICA / ERICHSON, 1835 / PARALECTOTYPE / A.B.T.



SMITH” (handwritten and typeset, yellow label). A lectotype is designated to preserve the stability of the nomenclature by selecting a single specimen as the name-bearing type for this species. Since Erichson (1835) did not explicitly state how many specimens he examined, it is impossible to know the exact composition of the type series.

**Distribution.** Fig. 72. Chile: IV Región de Coquimbo, V Región de Valparaíso, Región Metropolitana de Santiago, VI Región del Libertador General Bernardo O’Higgins, VII Región del Maule, VIII Región del Biobío, IX Región de la Araucanía (based on specimens from AMNH, AVEC, BMNH, CASC, CMNC, CNCI, FMNH, FSCA, INHS, LEMQ, MNHN, MNNC, UMCE, UMSP, USNM). One 19<sup>th</sup> century specimen is labeled “Valdivia” (BMNH) but we consider this record erroneous. The record from IX Región de la Araucanía is based on a single collecting event from “30 km NE Villarrica”, which might need further verification.



**FIGURES 57–60.** *Dihymenonyx micropterus* Mondaca, 2007. 57, dorsal habitus; 58, oblique habitus; 59, protarsus; 60, head and pronotum.

### *Dihymenonyx* Gutiérrez, 1949

*Dihymenonyx* Gutiérrez, 1949: 16. Type species *Dihymenonyx herrerae* Gutiérrez, 1949 by original designation.

**Redescription.** Length 9.0–13.0 mm. Elongate-oval, widest about middle of elytra; reddish brown, brown, or dark brown; dorsal and ventral surfaces shiny, glabrous. Head: labrum wide, broadly emarginate and evenly reflexed anteriorly, and completely fused to clypeus with labroclypeal suture more-or-less distinct and terminating in small, marginal notches. Mentum longer than wide, narrowly emarginate in front, with sides broadly arcuate, gradually converging posteriorly. Antennae with 9 antennomeres, club with 3 short, thick lamellae. Pronotum: convex, wider than long, widest medially or slightly behind middle. Elytra: convex and coarsely punctostriate. Metathoracic wings fully developed or reduced in size. Abdomen: without lateral carinae on ventrites. Legs: protibia with three apical teeth on outer margin, basal tooth weak, spur present and shorter than first tarsomere. Claws symmetrical and bifid, each pair flanked on both sides at base by a membranous flap, and with a short, bisetose onychium in

between. Metatibial apices with spurs set in notch, longest spur reaching about half the length of first tarsomere. Male genitalia: symmetrical parameres simple in form, not split or with strong sinuations, and somewhat subequal in length of phallobase.

**Composition.** All three species of *Dihymenonyx* are endemic to Chile (Fig. 73).

**Remarks.** *Dihymenonyx* was revised by Mondaca (2007).

### Key to species of *Dihymenonyx* (based on Mondaca 2007)

1. Male and female with wings developed, functional, longer than total body length. Elytral declivity with prominent preapical umbone. VIII Región del Biobío, Chile ..... *Dihymenonyx herrerae* Gutiérrez
- Male and female with wings reduced, nonfunctional. Elytral declivity without preapical umbone.....2
2. Dorsal color brown to dark brown. V Región de Valparaíso, Chile ..... *Dihymenonyx micropterus* Mondaca
- Dorsal color black. VIII Región del Biobío, Chile ..... *Dihymenonyx suboblongus* Mondaca

### *Dihymenonyx herrerae* Gutiérrez, 1949

**Original combination.** *Dihymenonyx herrerae* Gutiérrez, 1949: 16.

**Subsequent combination.** *Athlia (Dihymenonyx) herrerae* (Gutiérrez): Martínez 1974: 345.

**Type locality.** “Chile: Territorio de Magallanes, Punta Arenas” (Gutiérrez 1949). As mentioned in Mondaca (2007), this locality is erroneous.

**Type series.** Holotype at Museo de Zoología, Universidad de Concepción, Concepción, Chile (Cekalovic & Artigas 1969) (not examined).

**Distribution.** Fig. 73. Chile: VIII Región del Biobío (Mondaca 2007).

### *Dihymenonyx micropterus* Mondaca, 2007

**Original combination.** *Dihymenonyx micropterus* Mondaca, 2007: 18.

**Type locality.** “Chile, V Región de Valparaíso, camino a Quintay (33°10'32.7"S y 71°32'36.3"W)” (Mondaca 2007).

**Type series.** Holotype at MNNC (not examined). Six paratypes at CMNC were examined.

**Distribution.** Fig. 73. Chile: V Región de Valparaíso (based on specimens from CASC, CMNC and records from Mondaca 2007).

### *Dihymenonyx suboblongus* Mondaca, 2007

**Original combination.** *Dihymenonyx suboblongus* Mondaca, 2007: 20.

**Type locality.** “Chile, VIII Región del Biobío, Provincia de Ñuble, Cerro Cayumanqui (36°42'08.5"S y 72°30'36.2"W)” (Mondaca 2007).

**Type series.** Holotype at MNNC (not examined).

**Distribution.** Fig. 73. Chile: VIII Región del Biobío (Mondaca 2007).

### *Ulata* Saylor, 1945

*Ulata* Saylor, 1945: 441. Type species *Ulata argentina* Saylor, 1945 by original designation.

**Redescription.** Length 4.5–8.0 mm. Elongate, widest just behind middle of elytra; dorsal surface, ventral surface of thorax and posterior ventrite reddish brown, remainder of abdomen dark brown; surfaces shiny with scattered short, white, and appressed setae.

Head: labrum wide, broadly emarginate, evenly and shallowly reflexed anteriorly, completely fused to and

slightly below plane of clypeus exposing anterior clypeal margin; labroclypeal suture distinct and terminating in small, marginal notches. Mentum longer than wide, not emarginate in front, with sides somewhat straight, gradually converging posteriorly. Antennae with 8 antennomeres, club with 3 short, thick lamellae. Pronotum: somewhat convex, slightly wider than long, widest medially. Elytra: somewhat flat with four rows (including sutural interval) of slightly raised, irregular, dark, and glabrous patches. Metathoracic wings fully developed. Abdomen: without lateral carinae on ventrites. Legs: protibia with three apical teeth on outer margin, basal tooth weak, spur present and barely reaching base of first tarsomere. Claws symmetrical and incised with a short, bisetose onychium in between. Metatibial apices with spurs set in notch, upper spur set below tarsal articulation and reaching about half the length of first tarsomere. Male genitalia: symmetrical parameres simple in form, not split or with strong sinuations, and subequal in length to phallobase.

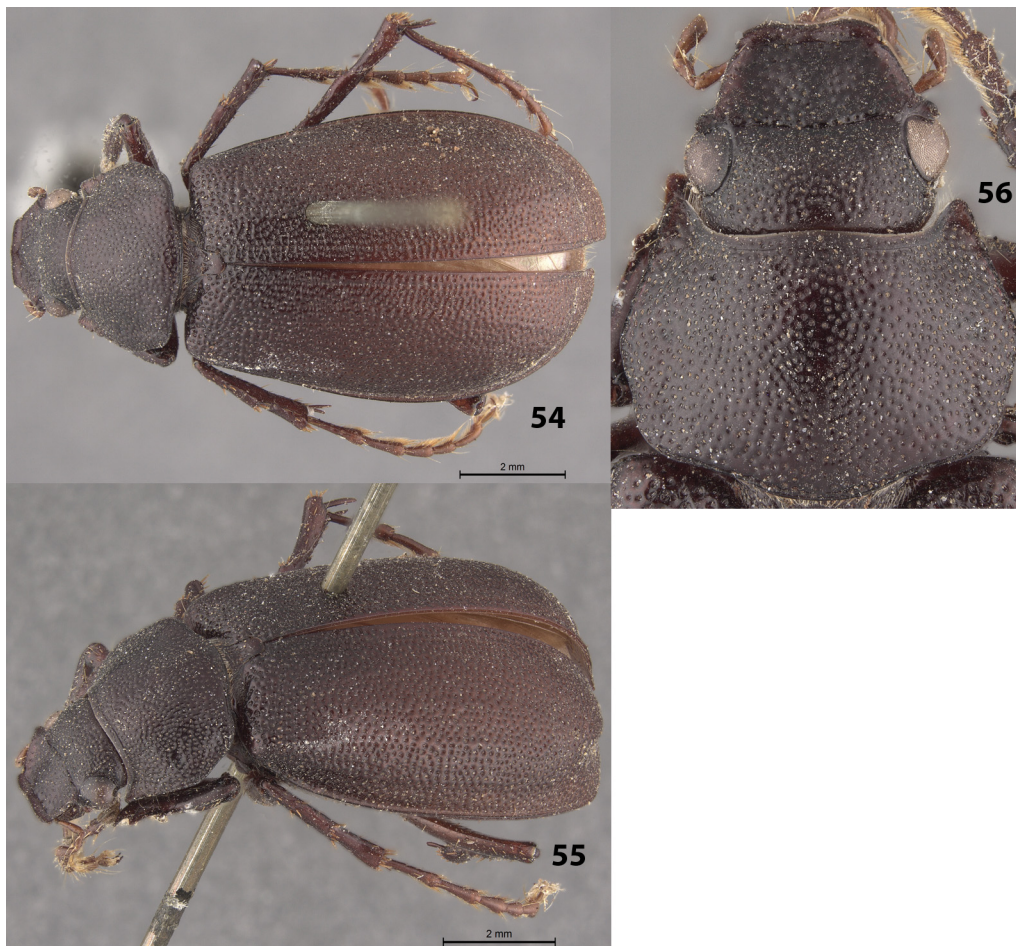
**Composition.** The only species, *U. argentina* Saylor, is known from Argentina and Chile.

***Ulata argentina* Saylor, 1945**

Figs. 61–65, 74.

**Original combination.** *Ulata argentina* Saylor, 1945: 442.

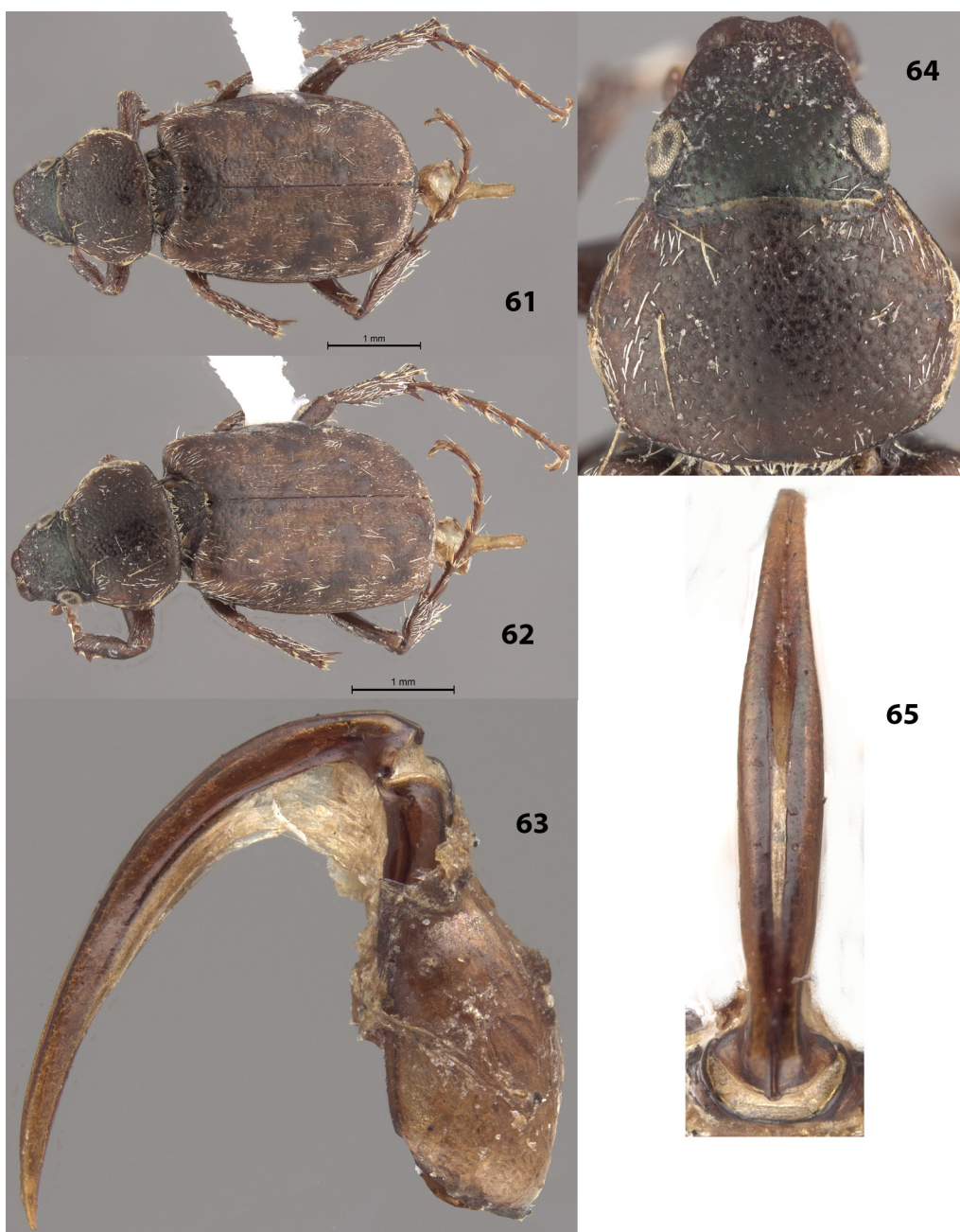
**Type locality.** Pucará, Lago Lacar, Neuquén, Argentina (approximately 40.16°S, 71.63°W). The original type locality was “Bariloche, Rio Negro, Argentina” (Saylor 1945).



**FIGURES 54–56.** *Dihymenonyx herrerae* Gutiérrez, 1949. 54, dorsal habitus; 55, oblique habitus; 56, head and pronotum.

**Type series.** Neotype at CMNC labeled a) “ARGENTINA / NEUQUEN / Lago Lacar / Pucará / Shajovskogleg. / Coll. Martínez.- / NOV.-964” (handwritten), b) “H. & A. HOWDEN / COLLECTION / ex. A.Martinez coll.” (typeset with black border), c) “*Ulata* ♂ / argentina / Saylor / A. MARTINEZ-DET. 1965” (handwritten and

typeset), d) “Southern Neotropical Scarabs / database # AS2615414 / *Ulata argentina* / Saylor, 1945 ♂ / DET: A.B.T.SMITH 2008” (typeset with black border), e) “ULATA / ARGENTINA SAYLOR, 1945 ♂ / NEOTYPE” (handwritten and typeset with black border on red paper). **Neotype here designated.** Saylor (1945) stated that this species was described using only the holotype, which was presumably deposited in his personal collection (although no collection deposition was explicitly stated it was Saylor’s common practice to keep holotypes in his personal collection). Saylor’s personal collection was donated to the CASC in 1963 (Ratcliffe 2016), but this institution has no record of the *Ulata argentina* holotype (the rest of Saylor’s primary types are catalogued and kept in the type collection). The first author carefully searched the entire CASC scarab collection for the holotype, but found nothing. Therefore, we conclude that the holotype has been lost. Due to the historic instability of the classification of this taxon, the neotype is designated with the express purpose of clarifying the taxonomic status of this species and genus. The neotype is consistent with the original description and originated from relatively close to the original type locality (less than 80 km distance).



**FIGURES 61–65.** *Ulata argentina* Saylor, 1945 neotype. 61, dorsal habitus; 62, oblique habitus; 63, lateral male genitalia; 64, head and pronotum; 65, parameres.

**Distribution.** Fig. 74. Argentina: Neuquén, Río Negro; Chile: V Región de Valparaíso, Región Metropolitana de Santiago, VIII Región del Biobío, IX Región de la Araucanía (based on the original type locality and specimens from AMNH, BMNH, CMNC, FMNH, TMSA, UMCE, VMMD).

## Acknowledgments

We thank the curators and collection managers listed in the Materials and methods section for allowing us to borrow and examine specimens in their care. We also thank Aleš Bezděk and José Mondaca for their helpful reviews of this work. This study was supported, in part, by a visiting scientist award to Evans from the Beaty Centre for Species Discovery, Canadian Museum of Nature during the summer of 2017. Evans also acknowledges the generosity of Andrew Smith, Robert Anderson, and Bruce Gill for providing very comfortable accommodations during his stay in Ottawa.

## References cited

- Ahrens, D. (2005) The phylogeny of Sericini and their position within the Scarabaeidae based on morphological characters (Coleoptera: Scarabaeidae). *Systematic Entomology*, 31, 113–144.  
<https://doi.org/10.1111/j.1365-3113.2005.00307.x>
- Blackwelder, R.E. (1944) Checklist of the coleopterous insects of Mexico, Central America, the West Indies, and South America. Part 2. *United States National Museum Bulletin*, 185, 189–341.
- Blanchard, C.E. (1850) Ordre des Coléoptères. In: Milne-Edwards, H., Blanchard, E. & Lucas, H. (Eds.), *Museum d'Histoire Naturelle de Paris. Catalogue de la collection entomologique. Classe des insectes*. Gide and Baudry, Paris, pp. 1–128.
- Burmeister, H.C.C. (1855) *Handbuch der Entomologie. Vierter Band. Besondere Entomologie. Fortsetzung. Zweite Abtheilung. Coleoptera Lamellicornia Phyllophaga chaenochela*. Theod. Chr. Friedr. Enslin, Berlin, x + 569 pp.
- Cekalovic, T. & Artigas, J.N. (1969) Catálogo de los tipos de Insecta depositados en la colección del Departamento de Zoología de la Universidad de Concepción (INCO) (Diciembre, 1968). *Boletín de la Sociedad de Biología de Concepción*, 41, 111–133.
- Erichson, W.F. (1835) Neue Südamerikanische Käfergattungen aus der familie der Blätterhörner. *Archiv für Naturgeschichte*, 1, 256–270.
- Evans, A.V. (2003) A checklist of the New World chafers (Coleoptera: Scarabaeidae: Melolonthinae). *Zootaxa*, 211 (1), 1–458.  
<https://doi.org/10.11646/zootaxa.211.1.1>
- Evans, A.V. & Smith, A.B.T. (2009) *An Electronic Checklist of the New World Chafers (Coleoptera: Scarabaeidae: Melolonthinae). Version 3*. Available from: [www.museum.unl.edu/research/entomology/SSSA/NW-Melo-v3.pdf](http://www.museum.unl.edu/research/entomology/SSSA/NW-Melo-v3.pdf) (accessed 5 July 2018)
- Frey, G. (1973) Synopsis der südamerikanischen Sericinen (Col., Scarab., Melolonth.). *Entomologische Arbeiten aus dem Museum G. Frey*, 24, 315–366.
- Germain, P. (1903) Apuntes entomológicos. *Anales de la Universidad. Republica de Chile*, 112–113, 391–445.
- Gutiérrez, R. (1949) Notas sobre Scarabaeidae neotrópicos (Coleoptera Lamellicornia). *Anales de la Sociedad Científica Argentina*, 148, 9–35.
- Gutiérrez, R. (1950) Notas sobre Scarabaeidae Chilenos (Coleoptera Lamellicornia). *Arthropoda*, 1 (2/4), 267–278.
- Martínez, A. (1955) Una nueva especie de *Athlia* de la Argentina (Col. Scarab. Melolonth. Sericinae). *Revista Ecuatoriana de Entomología y Parasitología, Guayaquil*, 2, 417–423.
- Martínez, A. (1959) Scarabaeoidea neotropica. VI. Algunos Melolonthidae nuevos o poco conocidos (Col.). *Neotropica*, 5 (16), 23–29.
- Martínez, A. (1967) El género *Athlia* Erichson (Col. Scarabaeidae, Sericinae). *Entomologische Arbeiten aus dem Museum G. Frey*, 18, 327–372.
- Martínez, A. (1974) Nuevas consideraciones sobre el Genero *Athlia* Erichson, 1835 (Col., Scarabaeidae, Sericinae). *Entomologische Arbeiten aus dem Museum G. Frey*, 25, 343–353.
- Mondaca, J. (2007) Revisión del género *Dihymenonyx* Gutiérrez (Scarabaeidae: Melolonthinae: Sericini) con descripción de dos nuevas especies de Chile. *Revista Chilena de Entomología*, 32, 13–29. [dated 2006]
- Mondaca, J. (2011) Presencia de *Athlia giai* y *Myloxena patagonica* (Coleoptera: Scarabaeidae: Melolonthinae) en la Patagonia occidental, Chile. *Revista Chilena de Entomología*, 36, 43–49.
- Moser, J. (1924) Beitrag zur Kenntnis der Melolonthiden (Col.). (XIII). *Stettiner Entomologische Zeitung*, 84, 114–136.
- Ratcliffe, B.C. (2016) Lawrence W. Saylor, coleopterist extraordinaire. *Coleopterists Bulletin*, 70, 279–287.  
<https://doi.org/10.1649/0010-065X-70.2.279>
- Saylor, L.W. (1945) Studies in the melolonthine scarab beetle genera of the American continents. No. IV. A new genus from Argentina. *Revista de Entomología*, 16, 441–444.

- Saylor, L.W. (1946) Studies in the melolonthine scarab beetle genera of the American continents. I. Revision of the genus *Athlia*. *Proceedings of the Entomological Society of Washington*, 48, 18–25.
- Scholtz, C.H. (2000) Evolution of flightlessness in Scarabaeoidea (Insecta, Coleoptera). *Mitteilungen aus dem Museum für Naturkunde in Berlin. Deutsche Entomologische Zeitschrift*, 47, 5–28.
- Smith, A.B.T. (2008) South American Melolonthinae (Coleoptera: Scarabaeidae) classification and nomenclature: some problems and solutions. *Insecta Mundi*, 60, 1–28.
- Smith, A.B.T. (2016) Five new species of *Trigonopeltastes* Burmeister and Schaum from Central America with new country records for other New World Trichiini (Coleoptera, Scarabaeidae, Cetoniinae). *ZooKeys*, 617, 91–127. <https://doi.org/10.3897/zookeys.617.9178>



**FIGURE 66.** Distribution map of *Apteroathlia nox* Smith & Evans, new species (black circles) and *Apteroathlia translucida* Smith & Evans, new species (red circles).



**FIGURE 67.** Distribution map of *Athlia bollei* Martínez, 1955 (red circle), *Athlia brasílica* Saylor, 1946 (green circle), *Athlia bruchi* Moser, 1924 (black circles), and *Athlia freyi* Martínez, 1974 (blue circle).



FIGURE 68. Distribution map of *Athlia giarii* Martínez, 1959 (black circles).





**FIGURE 69.** Distribution map of *Athlia parvissima* Saylor, 1946 (black circles) and *Athlia plebeja* Burmeister, 1855 (red circles).



**FIGURE 70.** Distribution map of *Athlia problematica* Gutiérrez, 1950 (black circles).



**FIGURE 71.** Distribution map of *Athlia rotundata* Gutiérrez, 1949 (black circles).



**FIGURE 72.** Distribution map of *Athlia rustica* Erichson, 1835 (black circles).



**FIGURE 73.** Distribution map of *Dihymenonyx herrerae* Gutiérrez, 1949 (black circle), *Dihymenonyx micropterus* Mondaca, 2007 (red circles), and *Dihymenonyx suboblongus* Mondaca, 2007 (green circle).



**FIGURE 74.** Distribution map of *Ulatia argentina* Saylor, 1945 (black circles).