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Taxonomic and Ecological Aspects of the Horned Beetles Agaocephalini of Colombia (Coleoptera: Melolonthidae: Dynastinae)

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Abstract

Objective: To identify the species of Agaocephalini beetles (Coleoptera: Melolonthidae: Dynastinae) present in Colombia and to contribute preliminary taxonomic and ecological aspects. Scope: To publish a review of the horned beetles Agaocephalini from Colombia, providing updated taxonomic keys, systematic novelties, and detailed distribution of the species documented for Colombia. Methodology: The research included a literature review, a taxonomic study of specimens, and compilation of information available from specimen labels in various museum collections. Results: Six genera and 15 species were recorded in Colombia: *Aegopsis curvicornis* Burmeister, *Brachysiderus tridentiger* (Prell), *Horridocalia delislei* Endrödi, *Lycomedes. burmeisteri* Waterhouse, *L. enigmaticus* Neita and Ratcliffe, *L. hirtipes* Arrow, *L. lydiae* Arnaud *Stat Rev*., *Lycomedes ramosus* Arrow, *L. reichei* Brême, *L. salazari* Pardo-Locarno, Villalobos and Stechauner, *L. velutipes* Arrow, *Mitracephala humboldti* Thomson, *Spodistes angulicollis* Dechambre, *S. grandis* Sternberg and *S. hopei* Arrow. For each species, descriptions, identification keys, and distribution maps are provided. Significant taxonomic updates include: confirmation of *Brachysiderus tridentiger* (Prell), for Colombia (previously recorded as *B. quadrimaculatus tridentiger*); restored to *L. lydiae* Arnaud (Stat. Rev) from synonymy with *L. reichei* Brême; *L. ramosus*, *L. reichei* and *L. enigmaticus*, highlighting allometric morphological variations; a discussion of a *H. delislei* specimen from Peru, with its distribution now confirmed along the Pacific coast of Chocó, Valle and Nariño (Colombia) and the Esmeraldas Province (Ecuador); confirmation of *Spodistes hopei* Arrow, 1902 confirmed for Colombia, based on specimens from Santander and Antioquia; and confirmation of *Spodistes angulicollis* Dechambre for the Amazon and Colombian Orinoquia, with prior descriptions of the supposed female excluded. Conclusions: The results reveal that distribution patterns for many species are highly localized and, in some cases, relictual, associated with humid forest formations of the Pacific, Andean, and portions of the Orinoquian and Amazonian regions. Many species exhibit medium to high levels of research and conservation priority. This study further highlights the precarious state of knowledge regarding most of the recorded species.

Keywords: Beetles, distribution, descriptions, Nootropics.

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Aspectos taxonómicos y ecológicos de los Escarabajos Cornudos Agaocephalini de Colombia (Coleoptera: Melolonthidae: Dynastinae)

Resumen.

Objetivo: Reconocer las especies de escarabajos Agaocephalini (Coleoptera: Melolonthidae: Dynastinae) en Colombia y contribuir con aspectos taxonómicos y ecológicos preliminares. Alcance: Publicar una revisión de los escarabajos cornudos Agaocephalini de Colombia, aportando claves taxonómicas novedades sistemáticas y detalles sobre la distribución de las especies registradas para Colombia. Metodología: se articuló revisión de literatura, el estudio taxonómico de ejemplares y la toma de la información de colecta disponible en los rótulos de los ejemplares de los museos visitados. Resultados: Se registraron seis géneros y 15 especies: *Aegopsis curvicornis* Burmeister, *Brachysiderus tridentiger* (Prell), *Horridocalia delislei* Endrödi, *Lycomedes burmeisteri* Waterhouse, *L. enigmaticus* Neita and Ratcliffe, *L. hirtipes* Arrow, *L. lydiae* Arnaud *Stat Rev*., *L. ramosus* Arrow, *L. reichei* Brême, *L. salazari* Pardo-Locarno, Villalobos and Stechauner, *L. velutipes* Arrow, *Mitracephala humboldti* Thomson, *Spodistes angulicollis* Dechambre, *S. grandis* Sternberg y *S. hopei* Arrow. Una clave para géneros y especies, así como algunas redescripciones y mapas de distribución han sido aportadas. Se registra el nuevo estatus para *Brachysiderus tridentiger* (Prell), para Colombia (antes registrada como *B. quadrimaculatus tridentiger*); se restableció a *L. lydiae* Arnaud (*Stat. Rev*) de la sinonimia con *L. reichei* Brême; *L. ramosus*, *L. reichei* y *L. enigmaticus* fueron redescritos expresando significativas variaciones morfológicas alométricas; *Horridocalia peruviana* Sobral and& Grossi 2023 se incluye en la sinonimia de *H. delislei* Endrodi 1974, la cual queda confirmada por ahora para la costa pacifico de Chocó, Valle del Cauca y Nariño (Colombia) y la Provincia de Esmeraldas (Ecuador); *Spodistes hopei* Arrow, 1902 es confirmado para Colombia, basado en ejemplares de Santander y Antioquia; *Spodistes angulicollis* Dechambre es confirmado para la Amazonia y Orinoquia colombiana. Conclusiones: La información obtenida, novedosa en varios casos, apunta a que los patrones de distribución son localizados y, en algunos casos, relictuales, asociados a formaciones selváticas húmedas de la región pacifico, andina y parcialmente piedemonte de la orinoquia y amazonia, por lo que muchas de las especies presentan niveles medios a altos en cuanto a prioridad de investigación y de conservación, evidenciándose lo precario que sigue siendo la información de la mayoría de las especies registradas.

Palabras clave: escarabajos, distribución, descripciones, neotrópico.

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Introduction

Horned beetles of the tribe Agaocephalini (Coleoptera: Melolonthidae: Dynastinae) constitute a taxon with an exclusively Neotropical distribution, comprising approximately 13 genera and 55 species distributed across Central and South America (Endrödi, 1970, 1985; Gasca-Álvarez and Amat-García 2010; Krajcik 2005; Milani, 2017, 2018; Pardo-Locarno *et al.*, 2020; Sobral, 2023). The composition of the tribe has undergone substantial revision in recent years, with significant contributions from

recent taxonomic studies (Milani, 2018; Sobral, 2023). In the case of Colombia, the species composition and biological attributes of this group have also been the subject of important research over the past few decades (Arnaud, 2012; Gasca-Álvarez and Amat-García, 2010; Milani, 2017; Neita-Moreno and Ratcliffe, 2019; Pardo-Locarno and Morón, 2006; Pardo-Locarno *et al.*, 2015, 2020).

The most recent national synthesis (Pardo-Locarno *et al.*, 2020) reported six genera and 14 species in Colombia. However, this annotated list also underscored the limited information available on species distribution, biology, and ecology, and highlighted potential conservation concerns problems for many species. Given this context, this research aimed to recognize the species of Agaocephalini horned beetles (Coleoptera: Melolonthidae) of Colombia, provide descriptions, taxonomic keys, ecological observations, and preliminary conservation priorities.

Materials and methods

The methodology included a literature review, focusing on key references documenting Colombian Agaocephalini species (Endrödi, 1970, 1985; Dechambre, 1992; Joly, 1992; Restrepo *et al.*, 2003; Krajcik, 2005; Arnaud, 2012; Pardo-Locarno, 1998; Pardo-Locarno and Morón, 2006; Pardo-Locarno *et al.*, 2015; Gasca-Álvarez and Amat-García, 2010, Milani, 2017; Neita-Moreno and Ratcliffe, 2019; Ratcliffe *et al.*, 2020; Pardo-Locarno *et al.*, 2020; Sobral, 2023 and Choi *et al.*, 2023). The bibliography also draws on additional primary sources and broader taxonomic references, cited as appropriate throughout the text.

Research projects

The main source of information was a series of research projects led or co-led by the first author. These projects (detailed in Annex 1) span the period from 1982 to 201, and were conducted under the auspices of various academic and institutional affiliations.

Collections consulted

The study examined material from a wide range of museum and institutional collections (listed. In Annex 2), which provided specimens, photographs, and associated data. The study also included contributions from undergraduate thesis projects, with some material deposited in the CFPL-COL (Albarracín and Solanilla, 1995; Cuenca and Preciado, 1994; Izquierdo, 2001).

Specimen Preparation and Study

Specimens available at the Palmira laboratory (CFPL-COL) were prepared and examined following standard taxonomic procedures. Genitalia were dissected where required for species-level identification and comparative study. High-resolution photographs were taken using a digital camera mounted on a stereomicroscope during the period 2022-2023.

Results and discussion

This study documented six genera and 15 species of horned beetles belonging to Agaocephalini from Colombia (Endrödi, 1985; Restrepo-Giraldo *et al.*, 2003; Krajcik, 2005; Pardo-Locarno and Morón, 2006; Pardo-Locarno *et al.*, 2015; Gasca-Álvarez and Amat-García, 2010; Neita-Moreno and Ratcliffe, 2019; Milani, 2017, 2018; Sobral *et al.*, 2018, 2019; Sobral, 2023 and Choi *et al.,* 2023). Descriptions, identification keys, and data for each genus and species are presented below, organized in alphabetical order.

Key to the Genera and Species of Horned Beetles (Agaocephalini) from Colombia.

(Modified from Endrödi, 1985; Sobral, 2023)

1. Surface strongly or weakly shiny, bare or sparsely setose, never covered with grey or brownish tomentum; mandibles with two teeth at apex or two or three teeth on outer edge (Figures 1-3). 2

1′ Surface with grey or brownish tomentum (at least elytra, matt); mandibles with three teeth on outer edge (Figures 4-8). 4

2. Very big species (35 - 45 mm); males with head bearing a very thick, apically emarginated, backward-pointing, blunt-tipped horn, pronotum with conical, forward-directed knob; females with unarmed head and pronotum; body dark brown, elytra yellowish-brown, with black suture and shoulder spots (Figure 1)
Mitracephala Thomson, 1859 (*M. humboldti* J. Thomson, 1859).

2′ Smaller species; dorsum uniformly black, dark brown, or bicolored black and dark yellow (Figures 2-3). 3

3. Dorsum bicolored, black and dark yellow; elytra strongly and densely punctate; males with unarmed pronotum and head bearing large forward-directed horn; eye canthus large, projecting forward; females lacking cephalic horns; cephalic disc with a pit surrounded by lateral carinae; elytra yellowish-brown with black punctures on humerus and apical callus (Figure 2).
Brachysiderus Waterhouse, 1881 (*B. tridentiger* (Prell, 1934)).

3′ Dorsum uniformly black or dark brown; elytra always very finely punctate, occasionally nearly mat; males with strong, forward-directed pronotal horn and head with two short, curved horns; females with unarmed head and pronotum (Figure 3). *Aegopsis* Burmeister, 1847 (*A. curvicornis* Burmeister, 1847).

4 Males with cephalic horn bifurcated at the apex; minor form with unarmed, densely punctate black pronotum major form with wide, truncated prothoracic horn, in the shape of a transverse carina (Figure 4A, B); mandibles deeply and broadly emarginate at apex; elytra with brownish tomentum and circular punctures arranged in dense rows; prosternal process high, females lacking horns; pronotum densely punctured black: elytra velvety-brown with rows of punctures. Inner edge of pronotum straight (Figure 4C). *Horridocalia* Endrödi, 1974 (*H. delislei* Endrödi, 1974).4′ Males with bi or trifurcated cephalic horn; prothoracic horn narrow, directed upwards or forwards; prosternal process short or medium; pronotum and elytra with velvety brown tone; females lacking horns; elytra usually velvety, only one species with black elytra (Figures 7, 18, 19). 5

5. Thoracic horn of males directed upward, flattened both anteriorly and posteriorly with rounded or slightly emarginated apex[1]; bi- or tri-furcated cephalic horn; females with straight anterior edge of pronotum; prosternal process usually well developed; eye canthi usually black (Figures 7-12). *Lycomedes* Brème, 1847. 6

5′ Thoracic horn of males acuminate, directed forward; prosternal process absent or poorly developed; females with anterior pronotal margin markedly projected; eye canthi at least partially velvety (Figures 18-19). *Spodistes* Burmeister, 1847. 13

6. Males with acute forward-directed horn attached to ocular canthus; ; clypeus with lateral angularity; pronotum black, densely punctured with large greyish punctures; paramera very short with widened, curved sides and oblique dorsal carina (Figure 22D); females with black pronotum and elytra, densely punctured (Figures 7A, 8) *L. salazari* Pardo-Locarno, Villalobos and Stechauner

6′ Males lacking acute forward-directed horn on ocular canthus; pronotum velvety greyish with few visible punctures; females bicolored dorsally (black pronotum, velvety greyish-brown elytra) (Figures 7B–C, 14C). 7

7. Eye canthi in both sexes very thick, as large as or slightly smaller than eye diameter; outer edge of canthus slightly projected, apex angular; anterior edge of canthus oblique or straight (Figures 7B–D) 8

[1] In *Lycomedes velutipes,* the prothoracic horn is directed obliquely forward, but the cephalic horn is bifurcated at the apex.

7′ Eye canthi in both sexes narrow (half or less than eye diameter); outer edge of canthus with small forward-directed horn; anterior edge concave or sinuate (Figures 14B, 15C–D) 9

8. Males with bicarinate longitudinal groove on cephalic disc (minor males, Figures 7B, 9C) or angular groove (major males, Figure 9D); clypeus with truncate anterior edge and acute corners (Figure 7B); paramera long, apex glabrous (Figure 21B); females with black scutellum, anterior half smooth, posterior half with small punctures (Figures 9B, E). *L. reichei* Breme

8′ Males with transverse forked horn on cephalic disc (Figures 7C–D, 10); clypeus with truncate, smoothly projected anterior edge and rounded corners; paramera long, apex glabrous (Figure 21C); females unknown. *L. lydiae* Arnaud.

9. Prothoracic horn of males obliquely directed forward (Figure 11D); cephalic disc with wide bicarinate groove (Figure 11E); paramera short, outer edge double-sinuate, apex glabrous (Figure 22D); females with elytral grooves with large punctures (8–10 grooves) (Figures 11B–C); scutellum half black, half velvety. *L velutipes* Arrow.

9′ Prothoracic horn vertical, directed upward; cephalic disc differently shaped; females with velvety greyish elytra and inconspicuous puncture rows; scutellum distinct. 10

10. Males with cephalic horn base bearing vertical projection (Figures 12B–C), acuminate (minor males, Figure 12D) or bifurcated (major males, Figure 12E); prothoracic horn thick, poorly developed, gently forked at apex; paramera with excavated base, apex glabrous (Figure 22B); females unknown. *L. ramosus* Arrow.

10′ Males with different cephalic horn conformation; prothoracic horn narrow, tall, vertical. 11

11. Frontal horn long, keeled posteriorly, not furrowed or bicarinate (Figure 14A); apex of pronotal horn tall and acuminate; pronotum densely punctured with large greyish punctures; paramera short, apex glabrous (Figure 22A); females with black punctate scutellum and clypeus with gently sinuate anterior edge and toothed corners (Figures 13B, 14C–D); elytra greyish with black margins. *L. burmesisteri* Waterhouse.

11′ Frontal horn and head with longitudinal furrow; pronotal horn otherwise shaped. 12

12. Males with long cephalic groove starting from proximal head (Figure 15D); prosternal process apex densely setose with long yellow setae (Figure 17C); paramera with distinct internal and external carinae (Figure 21A); females with similarly setose prosternal process (Figure 17C). *L. hirtipes* Arrow.

12′ Males with shorter cephalic groove starting from mid-head (Figure 15E); prosternal process apex glabrous or sparsely setose (Figure 17D); paramera with attenuated carinae (Figure 21D); females with glabrous or slightly setose prosternal process (Figures 16C, 17B, D). *L. enigmaticus* Neita and Ratcliffe.

13. Anterior margin of clypeus emarginate; known from Ecuador and Colombia (Pacific side) (Figure 18). *S. grandis* Sternberg

13′ Anterior margin of clypeus rounded. 14

14. Lateral pronotal margins regularly rounded (Figures 19A–B); lateral angles of clypeus prominent and strongly curved; paramera progressively enlarged (Figure 23B); Panama and Colombia (new record). *S. hopei* Arrow

14′ Lateral pronotal margins strongly angulate (Figure 19D); lateral angles of clypeus weakly salient and slightly curved; paramera abruptly enlarged near mid-length (Figure 23A); Colombia (Orinoquia and Amazonia). *S. angulicollis* Dechambre.

Aegopsis Burmeister, 1847

The composition of this genus has varied considerably over time (Endrödi, 1970, 1985). In the most recent revision, four species are currently recognized (Sobral *et al.*, 2018), of which *Aegopsis curvicornis* Burmeister is the only species recorded from Colombia.

The genus has been described in detail by Endrödi (1985) and more recently by Sobral (2023) and Sobral *et al.* (in prep.). The diagnostic characters provided in the identification key and accompanying illustrations allow for a clear differentiation of this distinctive group.

Aegopsis curvicornis Burmeister, 1847 (Figure 3, 20C, 24).

Burmeister, 1847. Hand. Ent. V: 282

Known distribution. Costa Rica, Panama, Colombia, Ecuador, Venezuela, Trinidad and Brazil (Endrödi, 1985; Krajcik, 2005; Gasca-Álvarez and Amat-García, 2010; Pardo-Locarno *et al.*, 2020; Ratcliffe, 2003; Restrepo *et al.*, 2003; Sobral *et al.*, 2018; Choi *et al.*, 2023).

Based on Endrödi's (1985) revision and examined specimens, this species can be characterized as follows: Size: moderately large (20-38 mm). Coloration: Pronotum and elytra dark brown, with occasional variations in some aberrant phenotypes. Elytra shiny; pygidial disc glossy, finely and sparsely punctate, and glabrous. Head: Clypeal horns curved and directed upwards, with a triangular emarginate apex;

mandibles covered. Pronotum: Sides finely and densely rugose; median line with widely scattered and fine punctures. Elytra: Disc sparsely and finely punctate. Legs: Protibia with four strong teeth. Male protarsus very slightly thickened; last tarsomere as long as the preceding four combined.. Male genitalia: Paramera distinctly narrowed medially along the outer edge; apices gently tapering and convergent (Figure 20C). Males exhibit marked allometric variation. Major males (Figures 3A–B) display well-developed clypeal horns, while minor males (Figure 3C) are smaller and bear much shorter horns. Females (Figure 3D) are externally very similar to males but lack cephalic and prothoracic horns. Genitalia: The aedeagus features short, thick paramera, curved apically inwards, with oblique apices (Figure 20C).

Material examined: 98 specimens. Tolima: Espinal: 1 ♂ (30 mm), attracted by light, Nov 1992, M. Bonis leg; 1 ♂ (36 mm); 1 ♂ (30 mm); 1 ♂ (36 mm); 1 ♀ (26 mm), in rice, Oct 1 1992. China Alta, Ibagué: 1 ♀ (23 mm), daytime collection, Oct 10-11 1994, L. Sanabria; 1 ♂ (24 mm); 1 ♀ (24 mm), Franklin Núñez; 1 ♀ (20 mm), L. Sanabria; 1 ♂ (36 mm), on the ground, Oct 12-13 1994, L. Sanabria; 1 ♂ (35 mm); 1 ♂ (36 mm); 1 ♀ (23 mm), F. Núñez; 1 ♂ (34 mm), Arabia, Sep 1991, M. Rubiano. Ibagué: 1 ♂ (35 mm), urban perimeter, Oct 1989, Pedro Galeano; 1 ♂ (25 mm), attracted by light, Sep 10-23 1993, V. H. Preciado; 1 ♀ (27 mm), urban perimeter, on ground, Mar 18 1993, L.C. Pardo-Locarno; 1 ♀ (28 mm), Cerro La Martinica, on ground, L.C. Pardo-Locarno; 2 ♀♀ (27 mm), attracted by light, Oct 5-18 1993, V.H. Preciado; 1 ♂ (32 mm), attracted by light, Sep 10-23 1993, V.H. Preciado; 1 ♂ (35 mm); 1 ♀ (30 mm), urban perimeter, attracted by light, Oct 10 1992, C. Sierra; 1 ♂ (24 mm), on tree, May 1982, N. Mana; 1 ♂ (38 mm), urban perimeter, Nov 1976, C. Urrego; 1 ♂ (33 mm), on ground, Jun 2 1994, V. Vargas; 1 ♀ (27 mm), on soil, Feb 16 1992, O. Vega; 1 ♂ (30 mm), on ground, Sep 4 1991, J. David; 2 ♂♂ (27, 28 mm), Oct 1992, C. Ávila; 2 ♂♂ (29, 32 mm), urban perimeter, Mar 1992, D. Vega; 1 ♀ (28 mm), in undergrowth, Feb 1994, O. Sarmiento; 1 ♂ (34 mm), urban perimeter, Nov 1976, J.O.J.M.; 1 ♂ (37 mm), Salado, Oct 17 1980, W. Nury; 2 ♂♂ (35 mm), Chicoral, attracted by light, Apr 6 1988 and 1993, C. Camacho; 1 ♂ (32 mm), Armero, Mar 12 1994, M. Castro; 1 ♀ (26 mm), Picaleña, attracted by light, Oct 26 1992, J. Jiménez. Huila: Ikira: 1 ♀ (27 mm), on ground, 1998, L.C. Pardo-Locarno. Rivera: 1 ♂ (30 mm), attracted by light, Nov 15 1993, H. Bonilla. Yaguará: 3 ♂♂ (26, 27, 31 mm), attracted by light, Nov 1993, H. Bonilla. Gigante: 3 ♂♂ (26, 31, 35 mm), attracted by light, Oct-Nov 1993, H. Bonilla; 1 ♀ (20 mm), attracted by light, Nov 11 1993, H. Bonilla. Villavicencio, Meta, attracted by light, November 1995, C. E. López (30mm); 1♀, Villavicencio Meta, attracted by light, April 1996, C. E. López (20 mm); 1♂, Villavicencio Meta, attracted by light, April 1996, C. E. López (28 mm); 1 ♂, Villavicencio, Meta, attracted by light, October 27, 1994, H. Martin (30 mm); 1 ♂ Villavicencio, Meta, attracted by light, November 8, 1994, C. Restrepo (30mm); 1 ♂, Villavicencio Meta, May 1990 (27 mm); 1♂ Villavicencio Meta, October 1997 (28 mm); 1♂;

Villavicencio, Meta, attracted by light, November 8, 1994, C. Restrepo (31 mm); 1 ♂ Villavicencio, Meta, attracted by light, October 1997, L.C Pardo-Locarno (28 mm); 1♂, Villavicencio Meta attracted by light, October 19, 1994, H. Martin (25 mm); 1 ♀, Villavicencio, Meta, attracted by light, April 1997, L.C Pardo-Locarno (23 mm); 1 ♂, Villavicencio Meta, attracted by light, October 1997, L.C Pardo Locarno (30 mm); 1♂, Villavicencio, Meta attracted by light, October 1997, L.C. Pardo-Locarno (30 mm); 1 ♂, Villavicencio, Meta attracted by light, October 1997, L.C Pardo-Locarno (31 mm); 1♂, Villavicencio Meta attracted by light, Apr-1996, (30 mm); 1♂, Villavicencio, Meta, attracted by light, October 27, 1994, H. Martin (31 mm; several males mm); several males with different measurements (♂♂ 30, 30, 28, 25, 27, 26, 29, 30 mm), Villavicencio, Meta, attracted by light, April 1997, L.C. Pardo- Locarno; 1♂, Villavicencio, Meta, attracted by light, October 1997 (30 mm); 1♂, Villavicencio, Meta, attracted by light, October 1997 (23 mm); 1♂, Villavicencio, Meta, attracted by light, October 1997, (31 mm); 1♂, Villavicencio, Meta, attracted by light, October 1997, (28 mm); 1♂, Villavicencio, Meta, attracted by light, October 1997, (32 mm); 1♂, Villavicencio, Meta, attracted by light, October 1997 (27 mm); 1♂, Villavicencio, Meta, attracted by light, October 1997 (24 mm); 2 ♂♂, Villavicencio, Meta, attracted by light, April 1997 (24 mm); 2♂♂, Villavicencio, Meta, attracted by light, October 1997 (23 mm); Casanare: Yopal: 1 ♀ (22 mm), Dec 4 2001, S. Vega and A. López; 1 ♂ (29 mm), attracted by light, 1999, J.J. Arias. Cundinamarca: Machetra, Vereda Las Cuadras: 1 ♂ (26 mm), Apr 17 1997, M. Uribe. Guachetá: 1 ♀ (25 mm), Apr 1988. Turileque: 1 ♂ (30 mm), Jul 7 1990. Boyacá: Territorio Vásquez: 1 ♂ (28 mm), Apr 1989. Tunja: 2 ♂♂ (27, 33 mm), Mar-Apr 1989, P. Fonseca and L.A. Barrera. Soatá: 1 ♂ (22 mm), Mar 23 1989, J. Moreno. 4 ♂♂ (28–31 mm), A.L. Varela, 2003. Meta: San Martín: 1 ♂ (28 mm), Jun 21 1980, A. Gualteros; The distribution of *Aegopsis curvicornis* is illustrated in Figure 24. This species has been reported in Colombia from the departments of Caquetá, Casanare, Cundinamarca, Huila, Meta, Putumayo, and Tolima (Pardo-Locarno *et al.*, 2020; Restrepo *et al.*, 2003), occurring at elevations ranging between 250 and 1,800 meters above sea level, primarily within tropical humid forests. Reports of its occurrence in Tunja, Boyacá, and other locations above 2,200 masl likely result from labeling inaccuracies. Field observations suggest two reproductive peaks, coinciding with rainy seasons: one during April–May and a more pronounced period in September–November (Moreno and Bonilla-Guzmán, 1994). Additionally, Neita *et al.* (2014) described the larval and pupal stages from specimens collected in La Mesa, Cundinamarca, thereby contributing valuable insights into the species' biology (Pardo-Locarno *et al.*, 2020).

Brachysiderus Waterhouse 1881

Initially subdivided into the subgenera *Brachysiderus* and *Minisiderus* by Endrödi (1970, 1985), recent taxonomic revisions (Milani, 2018) support the elevation of *Minisiderus* to genus rank based on distinct morphological features. The genus *Brachysiderus*, as currently interpreted (Sobral *et al.*, in prep), is characterized by a thickened protarsomere V, a subtriangular protarsomere IV, a cephalic horn in males, an unarmed pronotum, symmetrical protarsal claws, and a simply curved internal claw (see Figure 2). Four species are currently recognized within this genus (Sobral *et al.*, in prep3), one of which is confirmed for Colombia (Joly, 1992; Gasca-Álvarez and Amat-García, 2010; Pardo-Locarno *et al.*, 2020).

Brachysiderus tridentiger **(Prell, 1934) (Figures 2, 20B, 24)**
Prell, 1934, Entomologische Blätter. Krefeld 30(2) p 58, 59.

Originally described as a subspecies (*Brachysiderus quadrimaculatus tridentiger*) by Prell (1934), this taxon has been reinstated as a valid species by Sobral *et al.* (in prep), following reevaluation of diagnostic morphological traits. The species is characterized by a robust, oval-shaped male body with a soft luster and dark brown coloration. The head bears a bifurcated horn with a small basal tooth within the furcation; ocular canthi are broad with gently convex margins, forming small anteriorly directed horns. The cephalic disc features a shallow longitudinal groove bordered by low carinae. The pronotum is reddish brown with curved sides; the elytra are yellowish brown, marked with black sutures and four elongate maculae (on the humeral and apical calli). The pygidium is densely and finely rugose. Foretibiae are tridentate; tarsal claws are robust and unequal, with the inner claw slightly larger and more curved (see Figure 2). The aedeagus has parameres that taper obliquely at the apex, each bearing a tuft of setae and forming a wide oval opening in frontal view (Figure 20B).

Females share the general morphology and coloration of males but lack cephalic armature. The clypeus is angled upward with angular lateral teeth, and the cephalic disc bears a rounded, shallow depression flanked by low carinae. Tarsal claws in females are smaller and more symmetrical.

Material examined: Three specimens: 1 ♂ (31.5 mm), Mocoa, Putumayo, Centro Experimental Amazónico (CEA), September 14, 2006, Julián Salazar leg. 1 ♂ (30 mm), Mocoa, Putumayo, collected on the ground, July 2022, J. Manrique leg. 1 ♀ (29 mm), Alto del Tigre, Gigante, Huila, May 1997, L. Jaramillo leg.

Discussion: This species has previously been recorded under its subspecific name by Joly (1992), with confirmed occurrences in Gigante (Huila) and Mocoa (Putumayo) (Gasca-Álvarez and Amat-García, 2010; Pardo-Locarno *et al.*, 2020). Its distribution

appears limited to the eastern slopes of the Eastern Cordillera, although little is currently known about its life history or ecological requirements.

Horridocalia Endrödi, 1974

This monotypic genus was established by Endrödi (1974) based on a single male specimen reportedly collected in Cali, Colombia. Despite subsequent doubts regarding the accuracy of the locality (Pardo-Locarno *et al.*, 2014), the name *Horridocalia*—derived from *horridus* («monstrous») and *calia* (a nod to Cali)—was retained. The sole species, *H. delislei*, is distinguished by its unique morphology (see key and Figure 4), and its characters have been described and illustrated based on additional specimens (Pardo-Locarno *et al.*, 2014).

Horridocalia delislei Endrödi, 1974 (Figures 4, 5, 6, 20D, 24)

Endrödi, 1974. Folia Ent. Hung. (Series nova) 27 (1): 50

Originally described from a single male specimen by Endrödi (1974), subsequent observations and collections have expanded knowledge of the species' morphology and potential distribution. The species exhibits remarkable sexual dimorphism and variability in horn development (see key).

Material examined: Six males and one female (in natura), as well as one photographic record. Full specimen details are provided below: Valle del Cauca: 1 ♂ (40 mm), Quebrada El Cuzumbo, Río Calima, 950 m, November 1993, attracted to light, L. C. Pardo-Locarno and Libia Puerta leg. 1 ♂ (51 mm), Quebrada Triana, Río Dagua, Buenaventura, 220 m, April 2010, L. C. Pardo-Locarno and Yan M. Ibarra leg. 1 ♂ (32 mm), Quebrada Pericos, Río Dagua, Buenaventura, 260 m, June 2012, attracted to light, Amparo Bubú leg. 1 ♀ (32 mm), Escalarete, San Cipriano, Río Dagua, 170 m, November 1992, Clemente Caicedo leg. Chocó: 1 ♂ (36 mm), Río Mondocito, vereda El Tabor, Río San Juan, Tadó, 250 m, April 2008, collected from foliage, E. Duave Valencia leg. 1 ♂ (53 mm), El Tabor, Río San Juan, Tadó, April 2008, collected on the ground, E. Oqui Duave, L. C. Pardo-Locarno and C. A. Torres leg. 1 ♂ (approx. 41–42 mm), photographic record only. A photographic record of a male specimen from Río Mataje, Nariño, collected in June 2023, is available in the photo gallery of the Natural History Museum of Caldas, Manizales. This image was kindly provided by J. Salazar (Figure 24). Additionally, according to the reviewed literature, two further specimens are documented: one male :1♂ (35 mm) and one female (34 mm), both labeled "Peru" as the locality, currently housed in the Natural History Museum of Basel (NHMB).

Discussion

We critically examined the information presented by Sobral (2023) in his doctoral thesis regarding the proposed new species *H. peruviana*. Based on our comparative analysis, we hypothesize that the two specimens examined by Sobral *et al.* (in prep.)—a male and a female labeled only as originating from "Pérou"—are in fact a minor male and a female of *Horridocalia delislei*. Both specimens are housed in the NHMB (Basel, Switzerland) , but their labels lack legible locality data, and the identity of the original collector remains unknown. Given the uncertainty surrounding the precise origin of these specimens, we consider it unlikely that *H. delislei* occurs in the eastern Peruvian Andes. Instead, a distribution restricted to the very humid forests of the Pacific lowlands of Colombia and Ecuador is more plausible.

Morphological aspects: The examined male specimen from Peru (Fig. 5C), measuring 35 mm, shows no diagnostic differences from a male of similar size in our Colombian collections. Its cephalic horn (Fig. 6G) bears a dorsal groove identical to that observed in our reference specimen (Figs. 4A–C), and the pronotal structure, including the horn (Figs. 6A, 6F), exhibits the same morphological traits expected within the known allometric variation in Colombian males. In lateral view (Fig. 6E), the pronotal horn and prosternal process are consistent with those seen in minor males from Colombia (Figs. 4A, 6A), and the mandibular appendages are also highly similar (Fig. 6D). The male genitalia (Fig. 20D) further support this interpretation: the parameral structures shown in Fig. 6H are virtually identical to those in Colombian specimens.

The Peruvian female likewise conforms to the morphological characters described by Pardo-Locarno *et al.* (2014) and illustrated in Figures 4C and 5B of this study. These findings strongly support the conclusion that both Peruvian specimens belong to *H. delislei* rather than representing a distinct taxon.

Originally, *H. delislei* was known only from the Pacific coast of Valle del Cauca, Colombia, specifically from the Calima River basin (Pardo-Locarno, 1993; Restrepo *et al.*, 2003). Subsequent records have expanded the known range to the departments of Chocó and Nariño (Pardo-Locarno *et al.*, 2014, 2020), with recent evidence confirming its presence near the Ecuadorian border in the Río Mataje region (Nariño) (Figure 24). The species has also been recorded in Esmeraldas Province, Ecuador, at low elevation (18 m) (Ratcliffe *et al.*, 2020; Choi *et al.*, 2023). In Colombia, the species occurs across an altitudinal gradient from 75 to 1,200 m a.s.l., with confirmed localities along the Calima and Dagua Rivers (Valle del Cauca), the Munguidó and San Juan Rivers (Chocó), and the Mira River (Nariño).

The available distributional data, including additional specimens from collections (e.g., Anchicayá River in Valle del Cauca and Mira River in Nariño), suggest that *H. delislei* is narrowly endemic to the Chocó Biogeographic Region spanning parts of Colombia and northwestern Ecuador. While some ecological insights and observations of captive individuals have been provided (Pardo-Locarno *et al.*, 2014), the immature stages of this elusive species remain unknown. The rarity of collection events, combined with its apparent habitat specialization and biogeographic restriction, underscores the need for further research and highlights the species as a candidate for high conservation priority.

Lycomedes Brême, 1844

The genus *Lycomedes* currently comprises eleven recognized species, eight of which are known to occur in Colombia (Gasca-Álvarez and Amat, 2010; Milani, 2017; Neita and Ratcliffe, 2019; Pardo-Locarno *et al.*, 2015, 2020; Sobral, 2023). Diagnostic features of the genus include a dark dorsum typically covered with a grayish-brown tomentum, the presence of cephalic and pronotal horns in males—often directed upwards—tridentate protibiae, asymmetrical protarsal claws in males (with the inner claw slightly larger), and symmetrical claws in hornless females. The antennae are 10-segmented, with a consistently short club. The prosternal process varies in length across species. The propygidium lacks or has a poorly developed stridulatory area, and the posterior tibiae are simple, lacking distinct transverse carinae (Endrödi, 1985).

Lycomedes burmeisteri Waterhouse, 1879

Waterhouse, 1879. Cist. Ent. II: 422.
(Figures 13, 14, 22A, 24).

Several authors have described this species (Endrödi, 1985; Milani, 2017), and our observations confirm considerable morphological similarity with *L. ohausi*, particularly among males. Both species exhibit a long, apically bifurcated cephalic horn and a robust, vertical pronotal horn, which may have a shallow dorsal groove. The dorsum, including the head, pronotum, scutellum, and elytra, is covered in a grayish-brown to greenish secretion. Females are morphologically similar in both species, lacking horns and featuring a dark head and pronotum (Choi *et al.*, 2023).

According to Endrödi (1970, 1985), *L. burmeisteri* can be distinguished from *L. ohausi* by several subtle characters: the last four abdominal segments are tomentose along the base; the head is less setose; the clypeal margins are less projected and rounded; and the ocular carinae are sharply produced anteriorly. The posterior margin of the cephalic horn bears a smooth keel, and the pronotal horn, when viewed from the front, is simply acuminate without apical widening. The prosternal process in *L. burmeisteri* is short, shell-like, and only slightly setose—compared to the taller and more densely pubescent process in *L. ohausi*. Genital morphology is very similar, though the paramera in *L. burmeisteri* appear slightly shorter.

Material examined.

Four adults: Holotype: BMNH ♂, "Type Medellin 78 39" *Lycomedes burmeisteri* ♂ Type, C. Waterh. 1 ♂: Paratype, Medellín, Colombia, same data (W. Choi, photograph). 1 ♂: Tulcán, Carchi, Ecuador, September 2022 (29.5 mm). 1 ♀: idem loc. (27.4 mm). Compared with four specimens of *Lycomedes ohausi*: 1 ♂, 28 mm, and 1 ♀, 27 mm, Tungurahua Province, near Cotopaxi (2500 m), Ecuador. 1 ♂, Maldonado, Carchi, Ecuador, December 2020 (30 mm). 1 ♂, idem loc. (26 mm).

Discussion.

Additional specimens examined by various authors (Endrödi, 1970, 1985; Sobral *et al.*, in prep.) have conclusively confirmed the diagnostic morphological traits of *Lycomedes burmeisteri*. However, the precise distribution of this species remains poorly understood due to the historical nature of most available records. The original specimens described by C. Waterhouse, later examined by Endrödi (1970), originated from Medellín, Antioquia, possibly dating back to 1878. Sobral *et al.* (in prep.) also studied two additional males collected by G. Lewis in Medellín in 1915.

The first confirmed record of *L. burmeisteri* outside Colombia was made by Milani (2017) in Ecuador. Furthermore, a male specimen from Gigante, Huila (Colombia), currently housed in the private collection of W. Choi (pers. comm.), contributes valuable evidence to our understanding of the species' geographic range. Despite the absence of more recent Colombian specimens, the taxonomic and distributional data currently available suggest that *L. burmeisteri* is found across the Central Andes of Colombia and extends into northern Ecuador, particularly in the province of Carchi (Figure 24) (Milani, 2017; Pardo-Locarno *et al.*, 2020; Ratcliffe *et al.*, 2020; Sobral *et al.*, in prep.).

Lycomedes enigmaticus Neita and Ratcliffe, 2019

Neita and Ratcliffe, 2019. Coleopterists Bulletin, 73(4): 1049
(Figures 15E, 16, 17D, 21D, 24).

Lycomedes enigmaticus is a recently described species, initially known from a single male–female pair collected in Ibagué, Tolima. The original holotype male was unusually small and exhibited morphological features that differed significantly from those of larger males in the genus, prompting the need for a redescription (Pardo-Locarno *et al.*, 2020). Subsequent studies (Sobral *et al.*, in prep.; Choi *et al.*, 2023) confirmed this disparity and provided clarification on the species' allometric variation and diagnostic traits.

Redescription. ♂ range in size from 29 to 34 mm in length. Notable features include a greyish dorsum with darker nebulous macules and darker horn apices and legs.

The cephalic horn is erect and bifurcated at the apex, with a distinct basal groove originating on the frons and bordered by raised carinae. The ocular canthus is long and narrow, terminating in a spiny projection. The clypeal margin is truncate, with projected corners; the head width at eye level spans approximately four eye diameters. The antennae comprise ten segments, with segment I being 2.5–2.7 times longer than segment II; segments II–VII are subequal and gradually decrease in size; the antennal club segments are laterally 4.4–4.8 times longer than the preceding segments. The mandibles are bidentate apically.

Thorax. The pronotum features a dorsally projected horn, flattened and parabolic in large males or rounded in smaller ones. Its anterior edge is black with sparse setae, while the posterior region is shallowly grooved. The tomentose dorsal surface is pale grey with darker cloud-like spots. Lateral pronotal edges are angular and notched in larger males. The scutellum is subequilateral with a punctured apex. Elytra are pale grey with nebulous patches, with initially parallel sides that widen posteriorly. The humeral callus is prominent, and apical umbons are large and raised. The pygidium is convex and marked with pale setae along the posterior margin.

Legs. The protibia is robust and tridentate, with the apical teeth closely spaced and separated from a third basal tooth. The first four protarsomeres are subequal and short; the fourth is triangular, and the fifth is four times longer, with a curved outer edge and toothed inner margin. The inner protarsal claw is large, forked, and curved; the outer claw is shorter but similarly curved. The metatibia is flattened, rectangular, and multisetose, ending in a tridentate apex with a strongly developed articulated inner tooth. Tarsomere I is short and angular with a spiny projection; tarsomeres II–IV are shorter and subrectangular, while V is 2–2.5 times longer. The mesotibia is morphologically similar to the metatibia.

Venter. The prosternal process is narrowly projected, with a glabrous or slightly setose apex.

Aedeagus. The paramera are long, laterally grooved at the base, gently sinuate, and rounded at the apex (Figure 21D).

Female. ♀. (25–25.5 mm) resemble males but lack cephalic and pronotal horns. The pronotum is black, thick, and densely punctate. The dorsal surface of the head is deeply excavated, with the clypeus bearing a narrow apex and angular, elevated corners. Ocular canthi are subrectangular with a short ridge on the outer edge. The mandibles are tridentate, with two sharp apical teeth and a slightly rounded posterior tooth. The protibia is tridentate; protarsomeres II–IV are similar in size, while V is longer but simple. Tarsal claws are symmetrical. The venter is black with dense yellow setae. The pygidium is moderately convex and transversely grooved at the apex.

Material examined: Four specimens. Tolima: 1 ♂, 28.5 mm, Saldaña, on weeds, November 3, 1985, O. Marín leg. 1 ♂, 26 mm, China Alta, Ibagué, water trap, November 7, 1990, F. Mejía leg. 1 ♀, 25.5 mm, Ibagué, at light, September 10, 1993, Nuñez and Sanabria leg. 1 ♀, 25 mm, China Alta, Ibagué, September 1992 (CFPL-COL).

As previously noted, *L. enigmaticus* was recently redescribed based on new specimens and insights into its morphological variability (Sobral, 2023, pp. 404–406; Choi *et al.*, 2023). Sobral *et al.* (in prep.) incorporated into their analysis a large male specimen from the Nonfried Collection, housed at the Hungarian Natural History Museum (HNHM), which facilitated further clarification of intraspecific allometric variation. The new material, including both large and medium-sized males, enabled a more comprehensive assessment of morphological traits and variability within the species.

Moreover, the additional specimens provided more accurate locality data, allowing the inference of an altitudinal distribution between 1,500 and 1,800 meters above sea level. Despite these advances, *L. enigmaticus* remains known only from a limited geographical range within the Department of Tolima. This restriction, combined with the extensive deforestation and landscape transformation associated with coffee cultivation in the region (Cuenca and Preciado, 1992; Nuñez and Sanabria, 1995; Pardo-Locarno *et al.*, 2020), suggests that the species may be vulnerable to habitat degradation and warrants conservation attention.

***Lycomedes hirtipes* Arrow, 1902**

Arrow, 1902. Ann. Mag. Nat. Hist. (7) X: 144
(Figures 15A, B, C, 17A, C, 21A, 24).

Lycomedes hirtipes is arguably the most widely distributed species of the genus in Colombia (Milani, 2017; Pardo-Locarno *et al.*, 2020; Pardo-Locarno and Morón, 2006; Restrepo *et al.*, 2003). The species has been described and diagnosed based on a substantial number of specimens examined by various authors (Arrow, 1902; Endrödi, 1970, 1985; Sobral *et al.*, in prep.). Given the extensive existing literature, we limit ourselves here to presenting the essential diagnostic features and corresponding illustrations (Figures 15A–C, 17A, C, 21A, 24).

Material examined. 84 specimens. Caldas: 1 ♂ (deteriorated, only head and thorax), Villamaría, November 1993, G. Albarracín leg; 1 ♂, 25 mm, Santágueda, Palestina, October 6, 2017, Aranzazu and Riveros leg; 1 ♂, 25 mm, Río Sucio, 1700 m, on the ground, January 2023, J. Salazar; 2 ♀♀, 21.5–23 mm, Río Sucio, 1700 m, on the ground, January 2023, J. Salazar; 1 ♀, 24.5 mm, Manizales, 2150 m, J. Salazar leg.

Cauca: 1 ♀, 23 mm, Popayán, November 1997, L.C. Pardo-Locarno leg; 2 ♀♀, 22 mm, Caldono, October 2010, L.C. Pardo-Locarno leg; 2 ♀♀, 24 mm, La Sierra,

September 5, 1993, W. Cruz leg; 1 ♂, 23 mm, La Sierra, September 8, 1993, W. Cruz leg. Valle del Cauca: Farallones de Cali, Pance: 1 ♂, 23 mm, October 3–13, 1990, L.C. Reyes leg, Det: R.P. Dechambre; 1 ♂, 24 mm, October 20, 1989, L.C. Reyes leg; 1 ♀, 24 mm, October 1991, L.C. Pardo-Locarno leg, Det: R.P. Dechambre (code ZCOF-186); 1 ♂, 26 mm, Puente Tierra, Medio Calima, October 1991, L.M. Valderrama leg, Det: R.P. Dechambre; 1 ♀, 26 mm, October 17–27, 1990, L.C. Reyes leg; 1 ♀, 23 mm, Mateguadua, Tuluá, August 1999, L.C. Pardo-Locarno leg; 1 ♀, 24 mm, October 3–13, 1990, L.C. Reyes leg; 1 ♀, 26 mm, October 17–27, 1990, L.C. Reyes leg; 1 ♂, 22 mm, October 3–13, 1990, L.C. Reyes leg; 1 ♂, 25 mm, September 29–October 2, 1990, L.C. Reyes leg; 6 ♂♂, 21–25 mm, October 3–13, 1990, L.C. Reyes leg; 1 ♀, 24 mm, October 17–27, 1990, L.C. Reyes leg; 3 ♂♂, 20–23 mm, October 17, 1990, L.C. Reyes leg; 1 ♂, 20 mm, October 27–November 6, 1990, L.C. Reyes leg; 1 ♂, 23 mm, November 6, 1990, L.C. Reyes leg; 1 ♂, 24 mm, October 27–November 6, 1990, L.C. Reyes leg; 1 ♂, 24 mm, January 2–6, 1991, L.C. Reyes leg; 1 ♂, 23 mm, January 2–6, 1991, L.C. Reyes leg; 1 ♂, 25 mm, January 7–12, 1991, L.C. Reyes leg; 1 ♂, 22 mm, October 27–November 1990, L.C. Reyes leg; 1 ♂, 24 mm, October 20, 1989, L.C. Reyes leg; 1 ♂, 22 mm, August 1990, L.C. Reyes leg; 1 ♀, 23 mm, October 14–16, 1990, L.C. Reyes leg; 1 ♂, 21 mm, July 6–12, 1991, L.C. Reyes leg; 1 ♂, 24 mm, September 16–18, 1990, L.C. Reyes leg; 1 ♂, 24 mm, June 30–July 31, 1991, L.C. Reyes leg; 1 ♂, 24 mm, November 24, 1990, L.C. Reyes leg; 1 ♀, 24 mm, Topacio, April 1990, L.C. Reyes leg; 2 ♂♂, 22–23 mm, October 17–27, 1990, L.C. Reyes leg; 1 ♂, 24 mm, January 2–6, 1991, L.C. Reyes leg; 1 ♂, 23 mm, November 24, 1990, L.C. Reyes leg. Saladito, Cerro San Antonio: 1 ♀, 24 mm, May 28, 1969, H. Salazar and P. Gonin leg; 1 ♀, 24 mm, May 1986, L.C. Pardo-Locarno leg (ZCOF-186); 1 ♀, 23 mm, May 28, 1986, L.C. Pardo-Locarno leg; 1 ♂, 26 mm, December 1984, L.C. Pardo-Locarno leg; 1 ♀, 24 mm, March 26, 1991, L.C. Pardo-Locarno leg. El Diamante, Felidia: 1 ♂, 25 mm, October 12–14, 1996, L.C. Pardo-Locarno leg. Mateguadua, Tuluá: 1 ♂, 24 mm, August 1999, S. Izquierdo and L.C. Pardo-Locarno leg; 1 ♀, 26 mm, August 1999, S. Izquierdo and L.C. Pardo-Locarno leg; 1 ♂, 23 mm, August 1999, S. Izquierdo and L.C. Pardo-Locarno leg; 2 ♀♀, 25–26 mm, August 1999, L.C. Pardo-Locarno leg. Palmira, La Buitrera: 3 ♂♂, 21–24 mm, September 22, 2001, L.C. Pardo-Locarno and A.F. Serna leg; 2 ♂♂, 21–24 mm, El Mesón, November 1986, H. Echeverry leg; 1 ♀, 24 mm, El Mesón, November 1986, H. Echeverry leg. La Nevera: 1 ♂, 24 mm, November 2–4, 1996, L.C. Pardo-Locarno leg; 1 ♀, 24 mm, November 2–4, 1996, L.C. Pardo-Locarno leg. La Palmera, Río Calima: 1 ♂, 24 mm, June 1997, L.C. Pardo-Locarno leg; 1 ♀, 25 mm, June 1997, L.C. Pardo-Locarno leg. Nariño: 2 ♀♀, 23–24 mm, La Unión, October 18, 1993, A. Cifuentes leg. Risaralda: 1 ♂, 24 mm, Pueblo Rico (photo, Coll. UNISARC).

When *L. hirtipes* was originally described, Arrow (1902) placed it within a group of species characterized by a dorsally bilaminate cephalic horn and nearly glabrous black legs. His diagnosis was based on a dozen specimens, collected in Manizales, Caldas

(Patiño leg.). Later, Endrödi (1970) recorded an additional 24 specimens from Cali, San Antonio, Villa Elvira, Río Aguacatal, and Río Cauca—localities considered part of the core range of the species.

To date, *L. hirtipes* has been recorded from the departments of Antioquia, Boyacá, Caldas, Cauca, Huila, Quindío, Nariño, Tolima, Risaralda, and Valle del Cauca (Pardo-Locarno *et al.*, 2020), making it the most widely distributed species of the genus within the Cauca River basin, between the Central and Western Cordilleras (Restrepo *et al.*, 2003; Pardo-Locarno and Morón, 2006; Pardo-Locarno *et al.*, 2020). Distributional data suggest an altitudinal range between 1,050 and 2,450 m a.s.l., following a distinctly orogenic pattern and closely tied to forest fragments (Milani, 2017; Pardo-Locarno, 1993; Pardo-Locarno *et al.*, 1995; Pardo-Locarno and Morón, 2006; Pardo-Locarno *et al.*, 2020).

Notably, specimens collected in Mateguadua, Tuluá (Valle del Cauca), within the secondary forest of a botanical garden, were recorded near 1,000 m a.s.l., suggesting the species' presence in low-elevation remnants of tropical dry forest along the Cauca River. This occurrence highlights the potential local extinction of *L. hirtipes* in areas heavily transformed by monocultures such as sugarcane (Pardo-Locarno, 2014). Collection records indicate adult emergence during the second rainy season, primarily from August to November (Izquierdo, 2001; Reyes-Usuga, 1995; Pardo-Locarno *et al.*, 1994). Studies also support a univoltine life cycle, with larvae developing in organic-rich upper soil layers and leaf litter under canopy cover (Pardo-Locarno and Morón, 2006).

***Lycomedes lydiae* Arnaud, 2012** *Stat. Rev.*

Arnaud, 2012. Besoiro 21: 2.
Neita and Ratcliffe, 2019, *Synonymous*
(Figures 7C, D, 10, 21C, 24)

We previously expressed concern over the premature synonymization of *L. lydiae* with *L. reichei* by Neita-Moreno and Ratcliffe (2019) and highlighted the need for a re-evaluation based on a more comprehensive review of specimens in national collections (Pardo-Locarno *et al.*, 2020). Arnaud's original description (2012) was notably brief and relied primarily on comparisons with type specimens housed in the Muséum national d'Histoire naturelle, Paris.

Redescription. ♂ Length 24.5-30.5 mm. Humeral width 16-17 mm. Cephalic horn 12-12.5 in major male. Dorsum. Covered with a pale grayish epicuticle, with darker irregular patches; cephalic horn apices and legs black.

Head. Frons/clypeus with a distinct, slightly curved vertical horn, apically bifurcate with shallow divergence; basal portion flattened and oval, marked by a longitudinal carina in

the basal third. A secondary short, laminar, transverse, bifid horn is present on the frons. Anterior clypeal margin straight, less projected than in *L. reichei*, with smaller corners; in major males, the clypeus is barely visible. Ocular canthus thick, nearly twice the width of an eye; edges bear a small thorn. Ocular width: 4–4.5 eye diameters. Mandibles inconspicuous, tridentate at apex. Antennae 10-segmented; scape large, rounded, multisetose with yellow setae; antennomeres II–VII tapering; antennal club (VIII–X) with asymmetrical lamellae 7–8 times longer than preceding segments.

Thorax. Pronotal disc with a vertical laminar projection, apex widened and parabolic, anterior margin black with yellow setae. Remaining disc with scattered punctures and shallow sculpturing. Anterior margin angular, accommodating the head. Elytra tomentose, irregularly punctate, with subparallel sides slightly widening apically; prominent humeral and apical calli, the latter angular. Pygidium convex, black-setose.

Legs. Femora and tibiae coated with grayish secretion; tarsi setose. Protibiae tridentate; apical spines nearly contiguous, third tooth midway along shaft. Tarsomeres I–IV slightly widened, IV triangular; V as long as the previous four combined, outer margin concave, inner edge convex with two basal teeth; inner claw long, curved; outer claw shorter and simpler. Mesotibiae and metatibiae flattened, longitudinally carinate, apically truncated with two articulated and one non-articulated spine. Tarsomere I short with apical spinose projection overlapping tarsomere II.

Venter. Prosternal process subcylindrical, apex parabolic and glabrous.
Paramera. Deeply grooved and carinate basally, apices smooth and nearly parallel (Figure 21C).

Material studied and distribution: Three specimens examined:
1 ♂ (29.5 mm, cephalic horn 12 mm), Sabana Grande, Santander, Colombia, on the ground, May 1996 (CFPL-COL); 1 ♂ (30.5 mm, cephalic horn 12.5 mm), Sabana Grande, Santander, Colombia, H. Vargas leg., May 2004 (Coll. R. Wanninger); 1 ♂ (24.5 mm, cephalic horn 6.5 mm), Guacamayo, Santander, Colombia, December 2011 — *Lycomedes lydiae* n. sp., det. P. Arnaud, paratype, red label (Coll. Patrick Arnaud).

Thanks to the collaboration of various contributors, three males of *L. lydiae* were made available for this study, including a paratype kindly provided by P. Arnaud to co-author W. Choi. Based on the examination of these specimens, we support the revalidation of *L. lydiae* as a distinct species, primarily due to several key morphological characters that set it apart from *L. reichei*. Notable features include a narrowly bifurcated cephalic horn, a small lamellar transverse horn (forked at the apex) located directly on the head, a more prominent and glabrous prosternal process, and highly developed, angular apical elytral calli.

A crucial element in this taxonomic discussion is the condition of the cephalic horn. As described by Brême (1844), Arrow (1902), Endrödi (1970, 1985), and Arnaud (2012), and further illustrated by Sobral *et al.* (in prep.), *L. reichei* presents a distinctive posterior basal projection of the cephalic horn, described by Arrow as a "cephalic horn toothed at base... basal tooth small." This feature is absent in *L. lydiae*, where the laminar horn sits independently on the head and remains distant from the base of the anterior cephalic horn. This structural difference has been consistently observed in both major and medium-sized males.

In light of these diagnostic characters, we consider *L. lydiae* a valid species and remove it from synonymy with *L. reichei*. This taxon also represents an important component of the faunal diversity of the middle Magdalena River basin, a region recognized for its richness across various zoological groups (Figure 24). However, the species' biology remains unknown. The limited availability of specimens in national collections and the lack of ecological data highlight the need for urgent conservation assessments (Milani, 2017; Pardo-Locarno *et al.*, 2020).

***Lycomedes ramosus* Arrow, 1902**

Arrow, 1902. Ann. Mag. Nat. Hist. (7) X: 143.
(Figures 12, 13, 22B, 24).

Since its discovery, *L. ramosus* has been considered the most emblematic Colombian representative of the tribe Agaocephalini. Arrow (1902) described it as "the finest of its genus, both from the great development of its double-branched cephalic horn and the conspicuous marbling of its upper surface" (Arrow, 1902, 1951: 104). Several authors have subsequently redescribed the species (Endrödi, 1970, 1985; Sobral *et al.*, in prep.), although they primarily relied on the original type series, consisting of a major male whose morphology does not fully capture the species' intraspecific variation. We provide a redescription based on new material to enhance the diagnostic key.

Redescription (male): Based on 1 ♂, 29 mm, collected in Cumacá, Tibacuy, Cundinamarca, attracted to light on 2 October 1993 by C. Villamil (CFPL-COL), and supported by photographs of additional males listed under "Material studied."
♂ Total length: 29 mm (from clypeus to pygidium).

Humeral width: 17 mm.
Cephalic horn length: 7 mm (basal cephalic horn: 4.5 mm).
Coloration: Dorsum grayish-brown, except at horn apices; legs black.
Head: Clypeus slightly projected, truncate with obtuse and slightly protruding angles. Ocular canthus narrow, front edge concave, apex bearing a small horn. Cephalic horn bifurcate at apex, with a secondary basal horn; in large males (>31 mm), the basal horn is forked and tall, while in smaller specimens it is simple or acuminate.

Thorax: Pronotum much wider than long, broadest at midline. Pronotal disc bears a robust hump-shaped horn, bifid at apex. Posterior half with a broad, shallow longitudinal groove. Lateral margins unmodified; two small bare patches laterally reveal coarse punctation. Scutellum triangular, tomentose on posterior half. Elytra slightly longer than wide, bearing faint puncture rows and subtle punctation near the suture. Humeral calli moderately developed; apical calli more prominent. Elytral margins parallel. Pygidium modestly protruding, densely clothed with short pale setae.

Prosternal process: Short but broad, subcylindrical to oval, apex slightly concave, with surrounding pale setae.

Legs: Similar to other *Lycomedes* species. Legs robust and black; protibiae thickened with three teeth on the outer edge—two apical and closely spaced, the third positioned medially. Protarsi short; tarsomeres I–IV short and subequal, collectively shorter than tarsomere V, which is long and inwardly convex with a prominent basal tooth. Meso- and metatibiae stout, quadrangular, not apically broadened, with two strong apical spines. Tarsomere I short, with an apical spine overlapping tarsomere II. Tarsomeres III and IV similar in size.
Pygidium: Slightly convex, densely setose.
Aedeagus: Parameres long, sinuate laterally, with basal and apical grooves, delimited by distinct carinae (Figure 22B).

Material studied: 3 specimens. Cundinamarca: 1 ♂, 26.9 mm, Cumacá, Tibacuy, attracted to light, 2 October 1993, C. Villamil leg. (CFPL-COL). Photographic records: Boyacá: 1 ♂, 33 mm, Otanche (photograph by R. Wanninger); 1 ♂, 29.5 mm, photographed by Choi Wonseok (BM-NHM); 1 ♂, no associated data, photograph by E. Abadie.

Recent studies on *Lycomedes* have consistently characterized *L. ramosus* by the presence of a prominent basal structure on the cephalic horn. Endrödi (1985: 222, Fig. 952) described this feature as a "horn of head on hind edge, near to base with a high, also bifurcate branching," while Arrow (1902: 143) referred to it as "cephalic horn toothed at base… basal tooth large bifid." This interpretation has been maintained in subsequent works, including Milani (2017, Fig. 5). However, the present study documents a noteworthy morphological variation in male specimens of this species. In particular, a male collected in Tibacuy (Cundinamarca) and measuring 26.9 mm in body length—smaller than the type specimen (29 mm) and others photographed for this study—exhibits a cephalic horn with a simple, acuminate basal portion that is *not* bifid (Figure 12A, B). This observation is novel and contributes additional data to the proposed identification key, highlighting the allometric variability of this taxonomic character within the species.

It is also necessary to clarify a previous mischaracterization: in the taxonomic key proposed by Neita and Ratcliffe (2019: 1062), *L. ramosus* was described as having a "cephalic horn trifurcate at the apex and with an additional tall, erect and bifurcated horn at the base." This diagnosis is inaccurate. Our findings confirm that the cephalic horn of *L. ramosus* is distinctly *bifurcate* at the apex, not trifurcate, and the basal projection—when present—is separate and also bifurcate in large males.

Regarding distribution, records of *L. ramosus* remain scarce (Arrow, 1902; Endrödi, 1970, 1985; Restrepo *et al.*, 2003; Pardo-Locarno *et al.*, 2020). However, the data gathered here expand the known range from its original locality in the department of Cundinamarca to the neighboring department of Boyacá (Figure 24), suggesting an altitudinal range of approximately 1,700–2,200 meters above sea level. Additional anecdotal information from E. Abadie (pers. comm.) indicates the presence of a male collected in Otanche at an elevation of 1,200 m. R. Wanninger also obtained a specimen using a light trap (pers. comm.). As a Colombian endemic and the most emblematic species of the genus (Arrow, 1902; Sobral *et al.*, in prep.), *L. ramosus* remains poorly understood. Its biology is virtually unknown, underscoring its status as a national research and conservation priority.

***Lycomedes reichei* Brême, 1844**

Brême, 1844. Ann. Soc. Ent. France (2) II: 299
(Figures 7B, 9, 24).

Lycomedes reichei was the first species described within the genus *Lycomedes*, thus serving as the basis for its establishment. Brême (1844) based his description on one male and two females. This species belongs to the group characterized by a cephalic horn that is bifurcated at the apex, a tooth located near the base on the posterior edge of the frontal horn, and a narrow longitudinal furrow running along the edge and the basal tooth (Endrödi, 1970, 1985).

We provide a redescription of *L. reichei*, considering its taxonomic significance as the type species of the genus and its continued recognition as a Colombian endemic. This redescription is based on a comparative review of specimens and on previous descriptions by Endrödi (1970, 1985).

The available specimens have been listed in the material studied. ♂ 24-26 mm.
Coloration: Dorsum covered with a pale grayish secretion, with faint darker streaks. Legs and horn tips distinctly black. Pygidium densely covered with short, pale setae.
Head: Clypeus broad, anterior margin nearly straight with laterally projecting and slightly upturned angles. A notched path connects the clypeus to the ocular canthus. As noted by Endrödi (1985), the posterior edge of the frontal horn bears a tooth and a longitudinal groove that extends from the base to the middle third or halfway up

the posterior face of the cephalic horn. From this point, the cephalic horn ascends and ends in a distinctive bifurcation.

Pronotum: Wider than long. The anterior margin features a transverse concavity accommodating the head, flanked by two blunt lateral projections. The pronotum has a continuous dark marginal line. Lateral sides are arched with shallow anterior and posterior concavities; posterior angles are shortly rounded. The pronotal disc bears a robust, erect, slightly flattened horn with a short, wide posterior groove, dark anterior edge, fine pubescence, and a notched apex. Two irregular bald spots on each side of the disc expose coarse punctation; other punctures remain partially concealed under the tomentose secretion, spaced at 1–1.5 diameters. Posterior region with a faint median indentation. Scutellum triangular with a rounded apex, darkly pigmented, irregularly punctured, and bearing a faintly defined "V"-shaped secretion along the lateral margins.

Elytra: Slightly longer than wide (length-to-width ratio ~16:14, Endrödi, 1970), initially parallel-sided, broadening slightly in the middle. Humeral callus of medium length and thickness. Umbones prominent. Elytral suture fine and black. Elytra clearly punctured. Pygidium convex, densely setose with short yellow setae, and apically shallowly grooved.

Legs: Protibiae tridentate, with two apical teeth close together and the third placed mid-length on the outer edge. Protarsus thickened; tarsomere I very short and ridged, II–IV broader than long (IV slightly longer), and V longer than the previous segments combined, with a convex outer edge and concave inner edge bearing two basal teeth. Inner tarsal claw large and slightly sinuate; outer claw shorter and simpler. Meso- and metatibiae gracile, rectangular, with longitudinal carinae and fine setae; apex truncate and tridentate with long articulated spines. Mesotarsus and metatarsus similar, with tarsomere I short and apically ridged; its spine often projecting to mid-length or beyond tarsomere II. Tarsomeres II–IV are subequal and twice the length of I; tarsomere V equals the combined length of the preceding ones. Tarsal claws simple.

Venter: Prosternal process robust, cylindrical, with a concave apex, glabrous and fringed by a subapical band of pale setae.
Genitalia: Parameres long and nearly parallel, slightly emarginate laterally, oblique at the apex, with a central carina converging medially and a divergent lateral carina terminating subapically (Figure 21B).

♀ 23-26 mm. Largely conforming to the original description by Brême (1844). This sex was not included in Endrödi's keys (1970, 1985). Females resemble males but lack cephalic and pronotal armature. The clypeal apex is more narrowed. The prosternal process ends in a pointed apex and bears few setae. Scutellum displays fine, scattered punctures (Figure 9B).

Material studied: 23 specimens with the following label data:
1 ♂, 25 mm, La Belleza, April 2004, L. C. Pardo-Locarno leg; 1 ♂, 24 mm, Berbeo, Provincia de Lenguapá, Boyacá, March 2004, H. Vergara leg, det. L. C. Pardo-Locarno;1 ♀, 24 mm, Berbeo, Provincia de Lenguapá, Boyacá, February 8, 2004, F. Vargas leg;1 ♀, 25 mm, Berbeo, Bolívar, April 2004, H. Vargas leg; 1 ♀, 22 mm, Berbeo, Provincia de Lenguapá, Boyacá, February 8, 2004, F. Vargas leg; 1 ♂, 28 mm, Piedecuesta, October 19, 1982; 1 ♂, 23 mm, Florián, April 11, 2004, H. Vargas leg; 1 ♂, 23 mm, Berbeo, Bolívar, April 2004, H. Vargas leg; 1 ♂, 23 mm, Berbeo, Provincia de Lenguapá, Boyacá, February 8, 2004, F. Vargas leg; 1 ♀, 25 mm, Berbeo, Provincia de Lenguapá, Boyacá, April 2004, F. Vargas leg; 1 ♀, 24 mm, Vereda La Paz, Vélez, May 27, 2004, L. C. Pardo Locarno leg; 4 ♀♀, 23, 24, 26 mm, Sabana Grande, April–May 1996; 1 ♂, 25 mm, San Antonio de Leones, Florián, April 1, 2004; 1 ♂, 25 mm, Sabana Grande, April–May 1996, A. Varela leg; 1 ♂, Vereda La Paz, Vélez, May 27, 2004, L. C. Pardo-Locarno leg; 4 ♂♂, 24, 26, 27 mm, Vereda La Paz, Vélez, Santander, May 27, 2004, L. C. Pardo-Locarno leg.

Discussion.

The taxonomic analysis of the specimens available for comparison with descriptions by previous authors reveals several inconsistencies that merit discussion. The limited material available to Brême (1844) was sufficient to establish the genus and describe its first species, yet his description was based solely on a major male. When a larger series of specimens from different locations— including minor males—was later examined, considerable morphological variation was evident, diverging from the original description and subsequent works (Brême, 1844; Arrow, 1902; Endrödi, 1970, 1985).

Brême (1844) also offered a general description of the female, which Endrödi (1970, 1985) failed to incorporate into his keys. Neita and Ratcliffe (2019) briefly referenced *L. reichei* based on 17 specimens from Toguí (Boyacá), Villa de Leyva (Boyacá), and La Belleza (Santander) (CTN Luis María Murillo). However, they neither redescribed males nor females, though they did include both sexes in their identification keys. Notably, they speculated on the synonymy of *L. lydiae* with *L. reichei* without having examined any *L. lydiae* specimens for comparative purposes.

The character most frequently cited by authors (Brême, 1844; Arrow, 1902; Endrödi, 1970, 1985, fig. 953) to distinguish *L. reichei* is the «posterior edge of the cephalic horn, near the base with a tooth, edge and tooth with a narrow longitudinal groove." Arrow (1902) described it as a "cephalic horn toothed at base… basal tooth small." However, this study demonstrates that this character varies greatly across male size classes: in smaller males, the basal tooth becomes vestigial, with only a short basal groove remaining on the cephalic horn. These small males show striking similarity to *L. hirtipes*, yet can be distinguished by the notably thick and unique ocular canthus of *L. reichei*.

This variability has been perpetuated without clarification in more recent works and keys (e.g., Milani, 2017, fig. 6; Neita and Ratcliffe, 2019). Therefore, the key proposed in this study deprioritizes the basal horn character and instead emphasizes the shape of the ocular canthus as a more reliable diagnostic feature for this species. Current data suggest that *L. reichei* is distributed in humid forest zones of the eastern Andes, particularly in the middle Magdalena River basin, across the departments of Boyacá and Santander (Pardo-Locarno *et al.*, 2020). Collection labels indicate that adults have been found in April, May, and June, likely coinciding with the region's first rainy season and potentially marking the species' reproductive period. However, further field research is required to confirm this. Available records suggest an altitudinal range from 1650 to 2300 meters above sea level.

Lycomedes salazari Pardo-Locarno, Villalobos and Stechauner, 2015

Pardo-Locarno, Villalobos and Stechauner. 2015. Insecta Mundi 0455: 1–14
(Figure 7A, 8, 24).

This is one of the most recently described species and is currently known only from its type locality in the Páramo de Santurbán, Santander (Pardo-Locarno *et al.*, 2020). In addition to the distinguishing features presented in the identification key, this species can be summarized as follows: males possess a basally widened cephalic horn, apically bifurcate, lacking dorsal projections or grooves; the prothorax bears a small, weakly developed hump; the pronotum is densely punctate with irregular punctures, both isolated and coalescent. The inner claw of the protarsus is apically notched. Females can be recognized by the shape of the clypeus, which at the base near the ocular canthus is approximately twice as wide as long, slightly tapered toward the apex. The ocular canthus is strongly oblique and offset from the margin of the head. Elytra are almost entirely black, except for a greyish-brown rim over the upper epipleural margin; the surface is heavily punctate and rugose, with large, often coalescent punctures arranged in irregular rows. The frontoclypeal and interocular regions are also heavily punctate and rough. The aedeagus features short parameres with a curved outer edge, oblique frontal carina, and rounded apices (Figure 22C; Pardo-Locarno *et al.*, 2015).

Material examined: 28 specimens. Santander: 1 ♂, 27 mm, Municipio de California, Páramo de Santurbán, 2013, P. Rueda; 3 ♂♂, 23–25 mm, February 2013, A. Villalobos and I. Gómez; 1 ♂, 26 mm, idem, March 2013, P. Rueda; 7 ♂♂, 25–27 mm, idem, 2800 m, May 2013; 12 ♂♂, 25–27 mm; 4 ♀♀, California, February and March 2013, collected from ground and light traps, between 2377 and 2800 m, A. Villalobos and J. Gómez leg.

Discussion.

Field observations have confirmed its presence at elevations between 2300 and 2800 meters (Villalobos-Moreno *et al.*, 2016), considered perhaps the upper altitudinal limit for the genus (Pardo-Locarno *et al.*, 2015, 2020). Morphologically, *L. salazari* bears resemblance to *L. buckleyi* from Ecuador but differs in distinct male and female characters (Pardo-Locarno *et al.*, 2015).

Lycomedes velutipes Arrow, 1902

Arrow, 1902. Ann. Mag. Nat. Hist. (7) X: 144.
(Figures 11, 22D, 24)

This species has been added to the Colombian fauna based on records by Sobral *et al.* (in prep.), who cited specimens housed in a European museum. The species has been thoroughly described and illustrated by Sobral *et al.* (in prep.) and Choi *et al.* (2023), so only key diagnostic traits are referenced here.

Material examined: 5 specimens — Ecuador: 1 ♂, 27.6 mm, Esmeraldas, Quinindé, 190–300 m, May 2005; 1 ♂, 27.8 mm, Esmeraldas, Río Chuchubí, 860 m, July 2018; 1 ♀, 26.5 mm, Esmeraldas, Quinindé, 190–300 m, May 2005; 1 ♀, 28 mm, Esmeraldas, Río Chuchubí, 860 m, July 2018; 1 ♂, 35.5 mm, Napo, Azuela, 16 August 2005, 1620 m, V. Carvajal leg, code MEPNINV 44545.

Discussion.

Sobral *et al.* (in prep.) cite one male and one female as the "first record of this species in Colombia." The environmental characteristics of the Ecuadorian localities (Quinindé and Río Chuchubí, Esmeraldas) closely match those of the Colombian locality mentioned, all being hot and humid rainforest ecosystems (IGAC, 2002; Mera-Valenzuela and Ruiz-Forero, 2010). This supports the validity of the Colombian record (Figure 24). The absence of native specimens in Colombian collections is unsurprising due to several compounding factors: (1) very limited investment in taxonomic research; (2) the Pacific coast of Cauca and Nariño remains one of the least explored regions in Colombia; and (3) legal and bureaucratic complexities surrounding specimen collection and exchange in Colombia, which remain formidable obstacles. The few available specimens obtained by the authors—despite these challenges—have helped address some of the gaps in Colombian entomological collections.

Mitracephala J. Tomson 1859

This genus comprises two species, with only one recorded in Colombia to date (*Mitracephala humboldti*) (Dechambre, 1992; Pardo-Locarno *et al.*, 2020). The diagnostic characters

of *Mitracephala* have been described by several authors (Endrödi, 1970, 1985; Choi *et al.*, 2023), including recent updates. Therefore, for the purposes of this work, we refer to the characters summarized in the identification key presented at the beginning of this study.

***Mitracephala humboldti* J. Tomson 1859**

J. Tomson 1859, Arcana Naturae p 34.
(Figures 1, 20A, 24)

As described in the key, this species is notably large (35–45 mm). Males exhibit a thick, apically emarginate, posteriorly directed cephalic horn with blunt teeth, and a conical pronotal knob projecting forward. In contrast, females are unarmed; the head and pronotum are simple. The coloration is distinctive: the body is dark brown, the elytra are yellowish-brown with a black suture and a dark spot on the humeral region (Figure 1).

Material studied: Eight specimens: 1 ♂ (43 mm), Sibundoy, Putumayo, on the ground, 1 March 1990, A. Dávila leg. 1 ♂ (34.5 mm), Valle del Sibundoy, Putumayo, on the ground, April 2019, L. Jaramillo leg. 1 ♂ (35 mm), Valle del Sibundoy, Putumayo, on the ground, April 2019, L. Jaramillo leg. 1 ♂ (33.5 mm), Pasto, Nariño, on the ground, 4 April 1990, A. Dávila leg. 1 ♂ (40.5 mm), Pasto, Nariño, May 1991. 1 ♂ (37 mm), Pasto, Nariño, 27 October 1989, A. Guerrero leg. 2 ♀♀ (37, 38 mm), Valle de Lanceros, Sibundoy, Putumayo, on the ground, April 2019, L. Jaramillo leg.

Discussion.

Mitracephala humboldti is a relatively old species, historically known from Ecuador, Bolivia, and Peru (Endrödi, 1970, 1985). Its presence in Colombia was not confirmed until more recent contributions (Dechambre, 1992; Gasca-Álvarez and Amat, 2010; Joly, 1992; Lachaume, 1992; Pardo-Locarno *et al.*, 1998, 2020). The first detailed records in Colombia were published by Joly (1992), who reported its occurrence in Gigante, Huila: "VII-1979, XI-1979, 4-VI-1981, 4-VIII-1981, O. Rojas, 2 ♂, 5 ♀♀; Llanura del Río Magdalena, O. Rojas, 1 ♀; idem, Parte alta de la Cordillera, 11-VI-1982" (see also Pardo-Locarno *et al.*, 2020). These remain the northernmost confirmed localities for the species (Figure 24).

The new data provided here, from eight specimens collected in Nariño and Putumayo (Figure 24), suggest that the Colombian distribution of *M. humboldti* is restricted to the cooler, high-altitude regions of the eastern slopes of the Andes, particularly in Nariño, Putumayo, and Huila. The estimated altitudinal range is between 1800 and 2500 meters above sea level, with specimens from Sibundoy (2100 m, 15°C) offering the most reliable ecological context. Despite its popularity among collectors and frequent online depictions, the species remains scarce in national collections and poorly known in terms of its biology.

Spodistes Burmeister, 1847

The genus *Spodistes* currently includes eight species distributed from southern Mexico and Central America to Colombia and Ecuador (Endrödi, 1985; Ratcliffe, 2003). Males are superficially similar to those of *Dynastes*, though smaller, and are characterized by a velvety, greyish-black dorsal and ventral surface. Males bear prominent horns on the head and pronotum. The mandibles are tridentate on the outer edge, and the antenna has 10 segments with a short club. The prosternal process is absent. The propygidium has a poorly developed stridulatory area. The protibia is tridentate, and the hind tibiae are not dilated apically. Male protarsi have moderately enlarged claws.

Females are similar in size and general appearance, also exhibiting a velvety and khaki-colored dorsum. However, they lack cephalic and pronotal horns. The pronotum is black, heavily punctate, and rough; the cephalic disc is concave with a clypeus that is elevated and bilobed into two spines at the corners. In Colombia, three species have been confirmed (Endrödi, 1970, 1985; Dechambre, 1992; Gasca-Álvarez and Amat, 2010; Pardo-Locarno *et al.*, 2020; Ratcliffe *et al.*, 2020; Restrepo *et al.*, 2003).

Spodistes angulicollis Dechambre, 1992

Dechambre, 1992. In G. Lachaume, Les Coleop. du Monde, 14: 79
(Figures 19D, 23A, 24)

According to Dechambre (1992), this species was originally described from eastern Colombia. Only a few specimens are known globally, including one from the Naturkundemuseum in Berlin and another from the Hungarian Museum of Natural History in Budapest. Both had previously been misidentified as *Spodistes hopei* by S. Endrödi. To clarify the identity of this taxon, we provide a redescription based on two additional specimens found in Colombian collections.

Redescription (based on two males). ♂: Body robust, convex, slightly expanded posteriorly. Dorsal surface entirely tomentose, unicolorous grayish-brown except for the black horn tips. Clypeus broadly rounded with slightly emarginate lateral margins. Ocular canthus narrow, short, and sharply pointed. Cephalic horn long, directed forward and upward, apex tridentate; basal region dorsally keeled. Pronotum convex, with vertical anterior margin and no carina, bearing a small horn projecting forward and then downward. Prothoracic margins distinctly angulate at midlength. Pronotum has a medial and basal ridge. Prosternal process wide and subcylindrical, apex flanged, lacking setae. Scutellum broader than long, tomentose, unpunctate. Elytra slightly longer than broad; humeral calli small, apical calli prominent. Elytral suture thinly pigmented. Legs robust. Protibiae large, apically widened, outer edge tridentate; apical teeth large and close together, third tooth small and located mid-

tibia. Protarsi moderately enlarged; tarsomere V longer than I–IV combined, with internal concavity and small basal tooth; inner claw slightly larger than outer. Meso- and metatibiae nearly as long as corresponding tarsi, with external ridge bearing three spines. Tarsus I short, with apical lateral spine; II–IV twice as long, simple; V equal in length to I–IV combined. Venter covered in silky yellow setae. Sternite V longest. Pygidium convex, weakly projecting, densely pubescent. Aedeagus with long parameres, oval sides, and a long-oval inner cavity (Figure 23A).

♀**: Unknown.**

Material studied: 2 specimens: Meta: 1 ♂ (29.5 mm), Villavicencio, on the ground, May 1999, C.E. López Ríos leg (CFPL-COL). 1 ♂ (31.5 mm), Villavicencio, Cerro Bavaria, on the ground, April 1998, M. Castro Garrido leg (CFPL-COL).

Discussion.

Spodistes angulicollis is exceedingly rare in Colombian entomological collections. Only three males have been available for study. The new specimens confirm the species' distribution in the Colombian Orinoquía, extending Dechambre's (1992) original range for eastern Colombia. Thus, its presence can now be confirmed in both the Amazonian and Orinoquían biogeographic regions (Figure 24). At present, the species appears to be a rare Colombian endemic. The records previously attributed to Antioquia by Restrepo *et al.* (2003) should likely be corrected, as no verified specimens exist from that department. The biology of *S. angulicollis* remains entirely unknown.

***Spodistes grandis* Sternberg, 1903**

Sternberg, 1903. Deutsche Ent. Zeit.: 302.
(Figures 18, 23C, 24)

This species was originally described by Sternberg (1903) based on a 53 mm male collected by Rosenberg in 1897 in Cachabé, northwestern Ecuador. It was later recorded for Colombia by several authors (Lachaume, 1992; Joly, 1992; Restrepo *et al.*, 2003; Pardo-Locarno *et al.*, 2020). Endrödi (1970, 1985) had very limited material for study—apparently only the holotype male. A brief redescription and Ecuadorian distribution data were provided by Ratcliffe *et al.* (2020). In the present work, we offer a more detailed redescription based on additional Colombian specimens.

Description: ♂ (Figures 18A, B): Large, robust beetles. Dorsum uniformly greyish-brown; cephalic horn tips black. Cephalic horn with trifurcate apex; base unarmed. Clypeus broadly emarginate with a central notch; sides of the head convex. Pronotum with a midline cavity featuring a vertical black carina in most specimens examined. Apical pronotal horn long and forward-directed; lateral margins of pronotum gently

curved. Scutellum almost as long as wide, densely tomentose. Elytra slightly longer than wide; suture inconspicuous. Humeral callus poorly developed; apical callus elongated, ending in a small tubercle.

Legs robust. Protibiae slightly widened apically, tridentate along outer margin with two large contiguous apical teeth and a much smaller middle tooth. Protarsi: tarsomere V nearly equal in length to I–IV combined. Internal claw larger than external. Meso- and metatibiae nearly as long as corresponding tarsi, bearing one or two lateral spines on an external carina. Tarsomere I short with apical spine; II–IV longer, subequal; V nearly equal to II–IV combined. Prosternal process short, laminar, with pointed apex. Pygidium convex, smooth-oval, densely covered with minute setae. Aedeagus (Figure 23C): Parameres long, laterally convex, gently curved, with soft dorsal keeling; internal cavity long-oval.

♀ (Figure 18C): Similar in general habitus to the male, though smaller (28–30 mm). Pronotum black, thickened, and densely punctate. Dorsum greyish-tomentose. Frons and clypeus densely punctate and rough. Clypeal apex slightly elevated, deeply concave anteriorly, exposing long lateral clypeal teeth. Frontal preapical area shallowly excavated. Scutellum often bicolored, with a greyish or khaki posterior half. Legs predominantly grey or khaki with blackened apices. Pygidium with a preapical row of setae.

Material studied: 40 specimens: Chocó: 1 ♀ (30 mm), Quebrada Mondó, Tadó, October 2001, attracted to light, L.C. Pardo-Locarno leg. 3 ♂♂ (47, 47, 36 mm), same locality, April 2008, light trap, L.C. Pardo-Locarno leg. 1 ♀ (30 mm), same locality, April 2008, L.C. Pardo-Locarno leg. 1 ♀ (32 mm), October 2001, same locality, L.C. Pardo-Locarno leg. 2 ♂♂ (50, 45 mm), October 2001, same locality, L.C. Pardo-Locarno leg. 1 ♀ (30 mm), San José del Palmar, 950 m, January 1987, light trap, L.C. Pardo-Locarno leg. Nariño: 1 ♂ (50 mm), Río Mataje, 35 m a.s.l.; 2 ♀♀ (photographs by R. Wanninger). Valle del Cauca: Anchicayá Basin, Buenaventura: 1 ♀ (30 mm), January 1986; 1 ♀ (30 mm), July 1985; 1 ♂ (50 mm), January 1986; 1 ♀ (30 mm), Danubio, January 1999; 1 ♂ (43 mm), May 1997; 1 ♂ (30 mm), Río Anchicayá, 4 March 1996—all collected by L.C. Pardo-Locarno. La Delfina, Río Dagua, Buenaventura: 1 ♀ (30 mm), May 2012, fruit trap; 1 ♂ (43 mm), 27 April 2012, light trap; 1 ♂ (50 mm), 1 December 2011, fog net. Cisneros, Río Dagua: 1 ♀ (30 mm), March 2010, light trap. Quebrada Triana, Río Dagua: 1 ♂ (45 mm), 6–7 April 2010, light trap; 1 ♀ (28 mm), same date and location. Escalerete, San Cipriano, Río Dagua: Multiple specimens (♂♂ 36, 42, 45, 50 mm; ♀♀ 28–34 mm) collected between 1990–1997 using light traps, fog nets, and manual collection during the day (L.C. Pardo-Locarno, C. Caicedo, J. Rivas leg.). Pichindé, Farallones de Cali: 1 ♀ (30 mm), 2100 m a.s.l., February 1989, light trap, S. Sadeghian leg.Lago Calima, Calima Darién: 1 ♂ (40 mm), 1 ♀

(30 mm), 1450 m, April 1990, light trap, C. Cabrera and L.C. Pardo-Locarno leg. La Cristalina, Campoalegre, Río Calima: 1 ♀ (29 mm), August 1991, light trap, L.C. Pardo-Locarno leg.

Discussion.

Spodistes monzoni is the largest species in the genus. Although originally known only from Ecuador, it was formally recorded in Colombia by Joly (1992). However, the cited record ("Cali, 1,100 m, L. Dehnez, 1 male") is incorrect, as the city of Cali does not provide a suitable habitat for this species. The extensive material examined in this study confirms its presence in the Pacific regions of Colombia, particularly in Chocó, Valle del Cauca, and parts of Nariño.

This species is consistently associated with low to mid-elevation humid forests, typically between 35 and 2100 meters above sea level. Most specimens were collected at night using light traps or fog nets, and rarely during the day on foliage. Despite its size and distinctive morphology, it remains infrequent in Colombian collections. Its precise ecological role and life history are still poorly understood.

***Spodistes hopei* Arrow, 1902**

Arrow, 1902. Ann. Mag. Nat. Hist. p 146
(Figures 19A, B, C, 23B, 24)

Spodistes hopei was originally described by Arrow (1902) based on specimens collected from the region now recognized as Panama (Lachaume, 1992; Ratcliffe, 2003). For many years, the species was believed to be absent from the current territory of Colombia (Dechambre, 1992; Lachaume, 1992). However, its occurrence in Colombia has since been confirmed, prompting the need for a redescription and update on its distribution and biology (Pardo-Locarno *et al.*, 2020).

Redescription: ♂ (Figures 19A, B): Stout body, 36–39 mm in length (up to 52–53 mm including horns), convex. Dorsum greyish-brown, with black horn tips. Clypeal apex gently convex, with long lateral projections followed by a pronounced concavity. Head bears a long horn directed upward and forward, terminating in a tridentate apex. Ocular canthus triangular, short, and sharply pointed. Pronotum tall, with a short but stout anterior horn; anterior edge vertical, lacking a carina; lateral edges gently rounded. Scutellum greyish, nearly as wide as long. Elytra moderately convex, slightly longer than broad, with a very thin, black elytral suture; puncture rows absent or indistinct. Humeral callus slightly pronounced; apical callus long and elevated.

Protibiae robust, tridentate; apical teeth large and contiguous, with a smaller intermediate tooth. Tarsomeres I–IV relatively short, progressively enlarged; tarsomere V nearly as long as I–IV combined, thickened, with a convex outer margin and concave inner edge, ending in two claws—the inner claw larger and sinuous. Meso- and metatibiae robust and almost equal in length to their respective tarsi; tibiae bear outer carinae with a few small spines. Tarsomere I short, with a spine-like awned apex; II–IV nearly twice as long, subequal; V longer than the previous three combined, with long, simple claws.

Venter: Prosternal process triangular, obliquely oriented, with pointed, asetose apex and a transverse, smooth depression in the central region. Meso- and metasternum densely setose, with long, pale setae. Sternite V longest. Pygidium strongly convex, with small punctures and minute setae.

Aedeagus (Figure 23B): Parameres long, strongly curved with convex sides; internal cavity oval and laterally expanded.

♀ (Figure 19C): Similar in general appearance to the male but smaller (28–31 mm). Dorsum greyish and tomentose. Head with densely punctate and rough frontal and clypeal regions. Clypeal apex strongly elevated, with a concave anterior edge and slightly projecting corners. Preapical frontal region deeply excavated. Pygidium with a preapical row of fine setae.

Material Examined: 15 specimens. Antioquia: 1 ♂ (36 mm), Puerto Pinzón, December 2003, L.C. Pardo-Locarno leg. Boyacá: 4 ♂♂ (35–40 mm), Otanche, May 1995, J. Urbina leg; 3 ♀♀ (26–30 mm), same locality and date. Santander: 2 ♂♂ (33–36 mm), La Belleza, attracted to light, 28 December 2003, H. Vargas leg; 4 ♀♀ (26–30 mm), La Belleza, attracted to light, April–May 2004, H. Vargas leg. Discussion: Although the distribution of *S. hopei* in Panama has been well documented (Dechambre, 1992; Lachaume, 1992; Ratcliffe, 2003), little was known about its presence in Colombia until recently (Pardo-Locarno *et al.*, 2020). The species was not included in the Colombian checklist of Restrepo *et al.* (2003), which only recognized three *Spodistes* species for the country. Our new data confirm its presence in the middle Magdalena River basin, including localities in Boyacá and Santander, and extend its known range to the Antioquia region (Figure 24). Previous records from western Colombia (e.g., Río Negro and Villavicencio) by Endrödi (1970, 1985) were later determined to pertain to the recently described *S. angulicollis* Dechambre. A specimen collected in Puerto Pinzón with a light trap and kept in captivity was observed feeding on fresh fruit. Beyond this, little is known about the biology of this species.

Conclusions: As previously noted (Pardo-Locarno *et al.*, 2020), information on most *Agaocephalini* species remains sparse and insufficient to develop reliable distribution maps. It is likely that stenotypic habitat requirements, combined with widespread deforestation, have fragmented populations and obscured our understanding of their actual ranges. Many species show relictual distributions tied to montane forest environments. The biology and ecology of most *Spodistes* species remain largely unknown. Immature stages are undocumented for the majority (Pardo-Locarno and Morón, 2006; Neita *et al.*, 2014), reinforcing the need for further research and highlighting the group as a national conservation priority.

Authors' Contributions: Luis Carlos Pardo-Locarno: Compilation, editing, reference collection curation, specimen photography, bibliography, graphic design. Choi Wonseok: Compilation, contribution of reference material, museum visits in England and Paris, photographs, bibliography. Rafael Sobral: Review, co-editing, bibliography. Paschoal C. Grossi: Review, co-editing, bibliography. María Cristina Gallego-Ropero: Review, contribution of reference material from the Entomological Museum at Universidad del Cauca, graphic design. Adrián Troya: Contribution of reference material from the National Polytechnic School Museum (Ecuador), graphic design, review.

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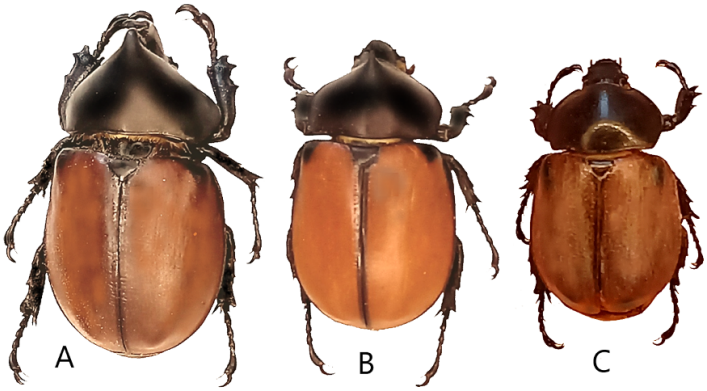

Figura 1. Dorsal view of *Mitracephala humboldti* (A: major male; B: Minor male; female).

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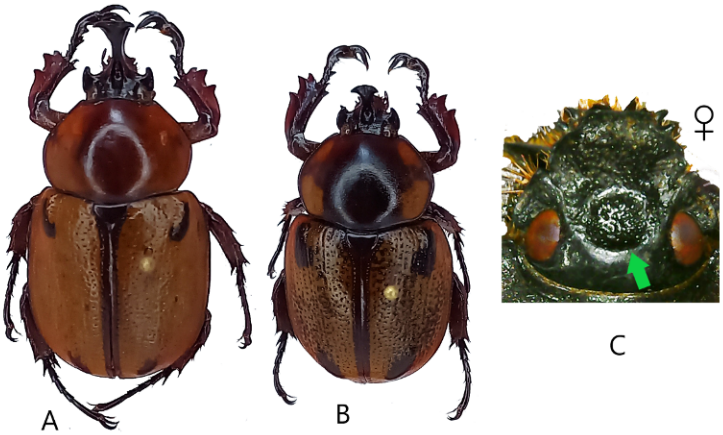

Figura 2. Dorsal view of *Brachysiderus tridentiger* (A: major male; B: Medium male; C: Female, frontal hollow).

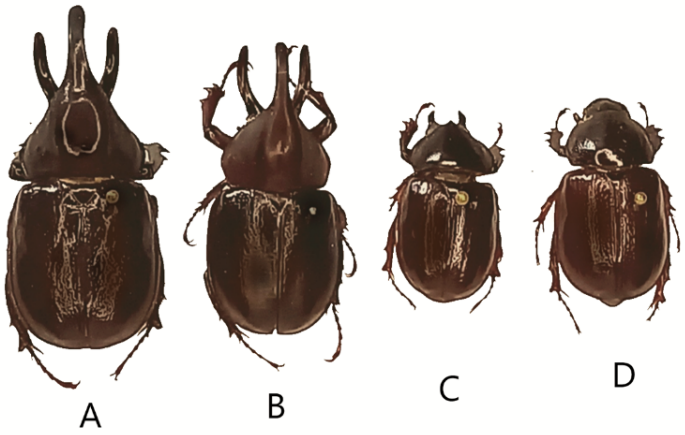

Figura 3. Dorsal view of *Aegopsis curvicornis* (A: major male; B: Medium male, C: minor male; D: female).

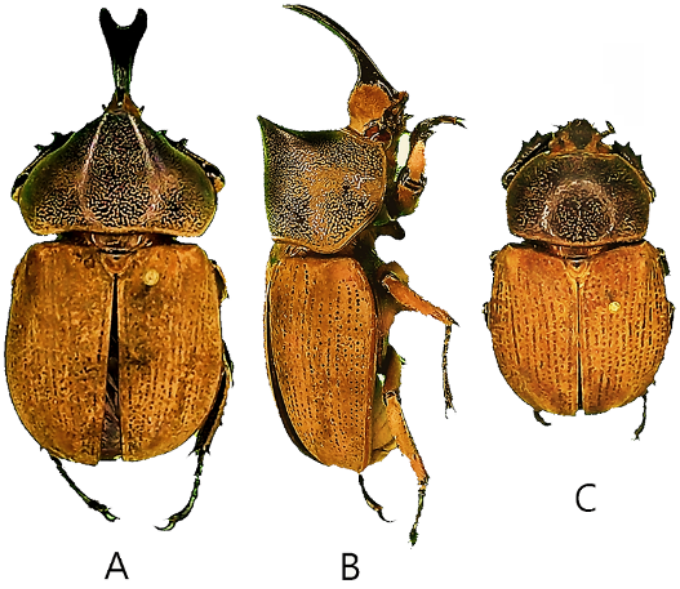

Figura 4. Dorsal view of *Horridocalia delislei* (A: major male, frontal view; B: Medium male side view, C: female, frontal view).

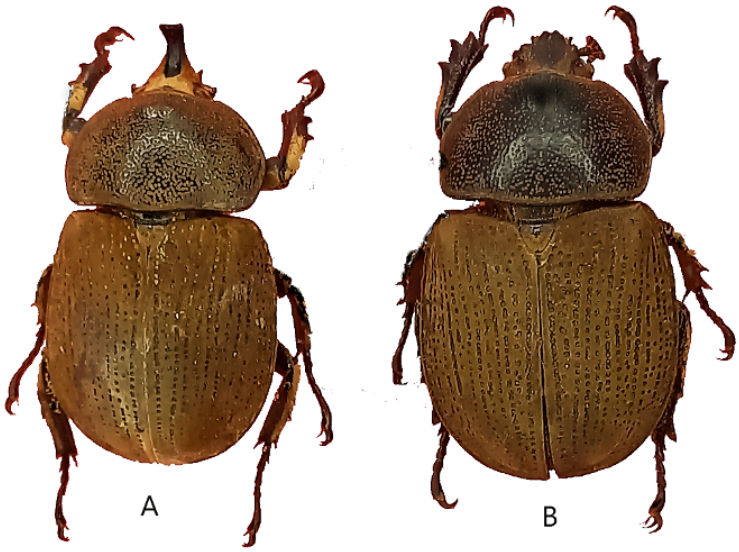

Figura 5. Dorsal view of *Horridocalia delislei* (A: minor male; B: female).

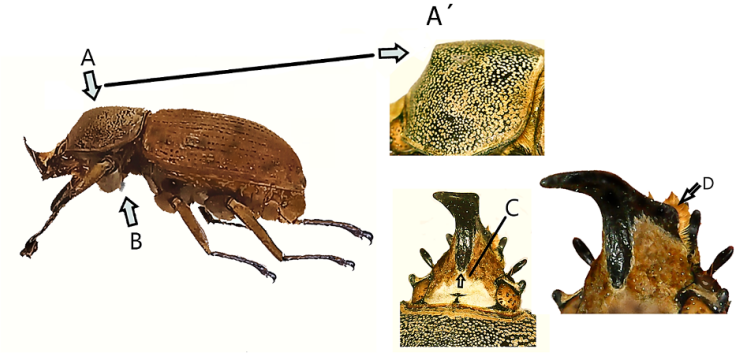

Figura 6. *Horridocalia delislei* (A: minor male, side view; B: Minor male pronotum; C: Dorsal Groove of cephalic horn; D: Clypeal apex and mandibular appendage's).

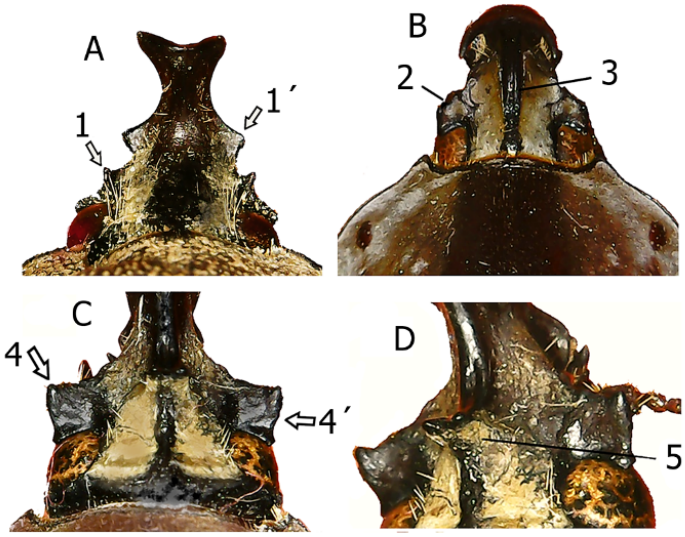

Figura 7. *Dorsal view. A: Lycomedes salazari; B: L. reichei; C and D: L. lydiae (A1: Horn attached to canthus; A1´: Angular lateral projection of the clypeus; B2: Ocular canthus width; B3: Cephalic frontal sulcus; C4: apex canthus; C4´: canthus lateral width; D5: Bifurcated cephalic horn.*

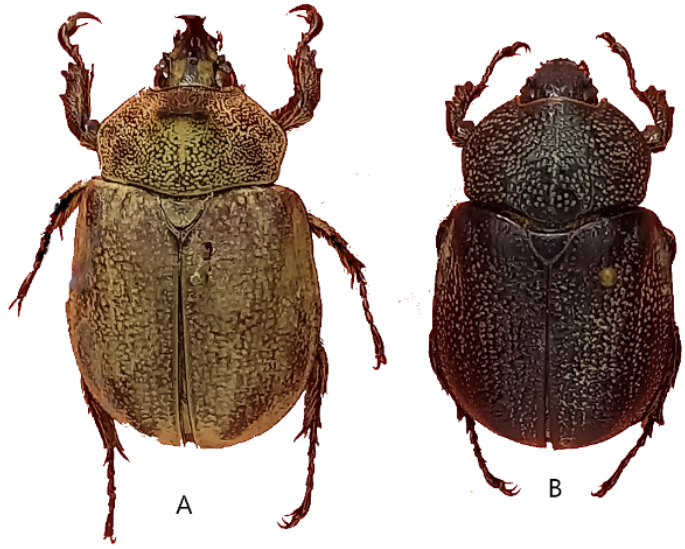

Figura 8. *Dorsal view of Lycomedes salazari (A: Male; B: Female).*

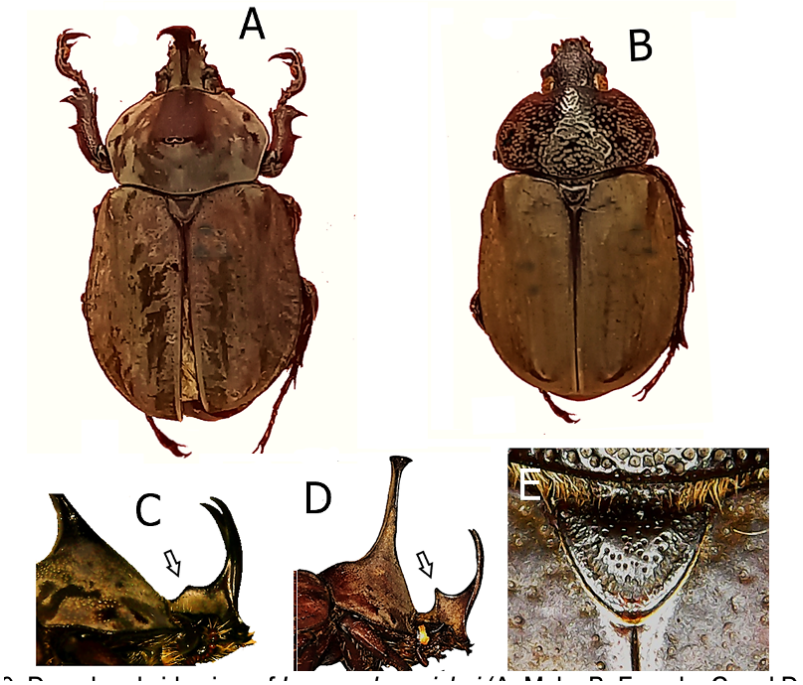

Figura 9. *Dorsal and side view of Lycomedes reichei (A: Male; B: Female; C and D: Side view of male medium and holotypus; E: Female scutellum).*

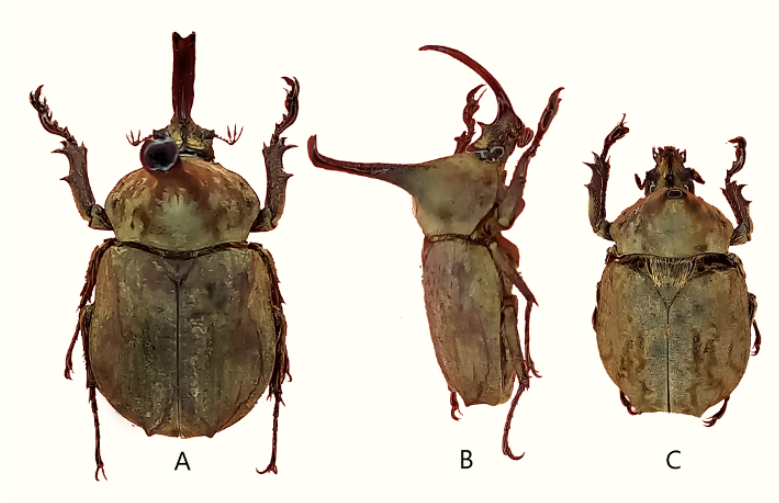

Figura 10. *Dorsal view of Lycomedes salazari (A: Male; B: Female).*

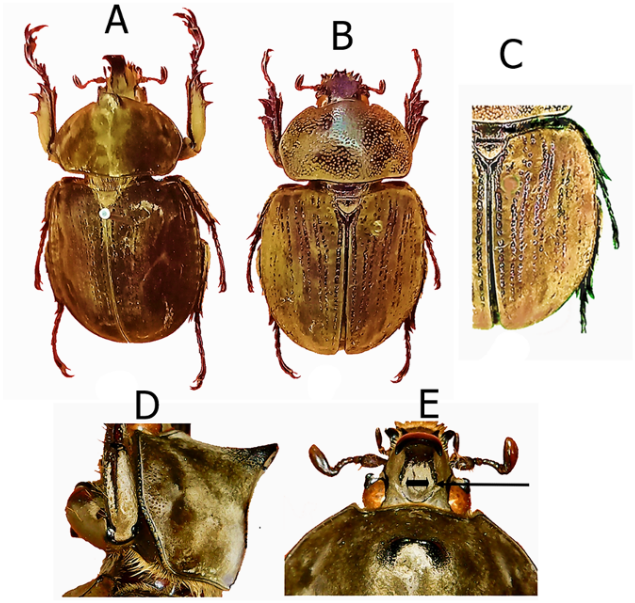

Figura 11. *Dorsal and side view of Lycomedes reichei (A: Male; B: Female; C and D: Side view of male medium and holotypus; E: Female scutellum).*

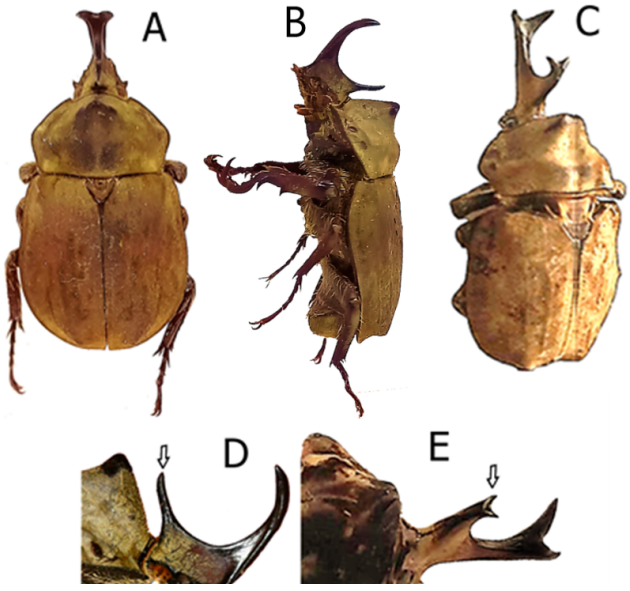

Figura 12. Dorsal and side view of *Lycomedes ramosus* (A and B: minor male; C: Major male; D: Lateral view of the cephalic basal horn of the minor male; E: Lateral view of the cephalic basal horn of the major. Arrow points to cephalic basal horn).

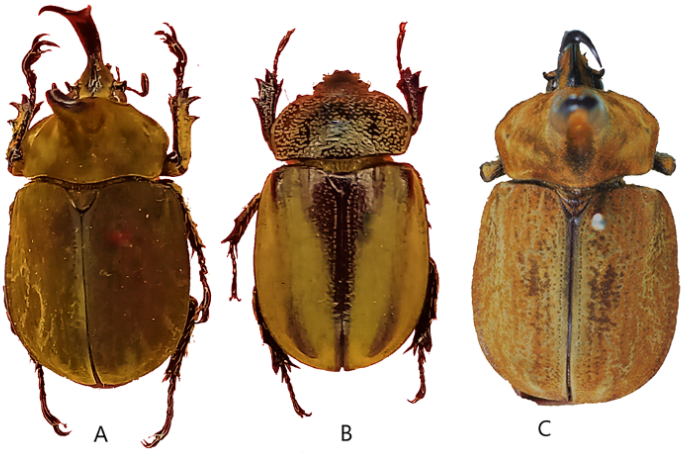

Figura 13. Dorsal view of *Lycomedes burmeisteri* (A: Male; B: Female; C: Holotypus NHM, photographed by W. Choi).

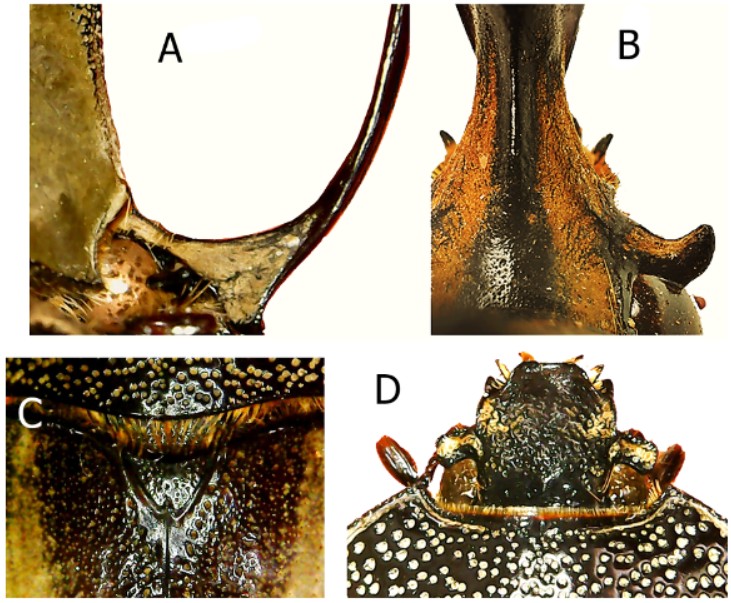

Figura 14. *Lycomedes burmeisteri.* A: Side view of cephalic horn; B: Frontal view of cephalic horn and ocular canthus; C: Female scutellum; D: Dorsal view of the head and anterior part of the pronotum of the female.

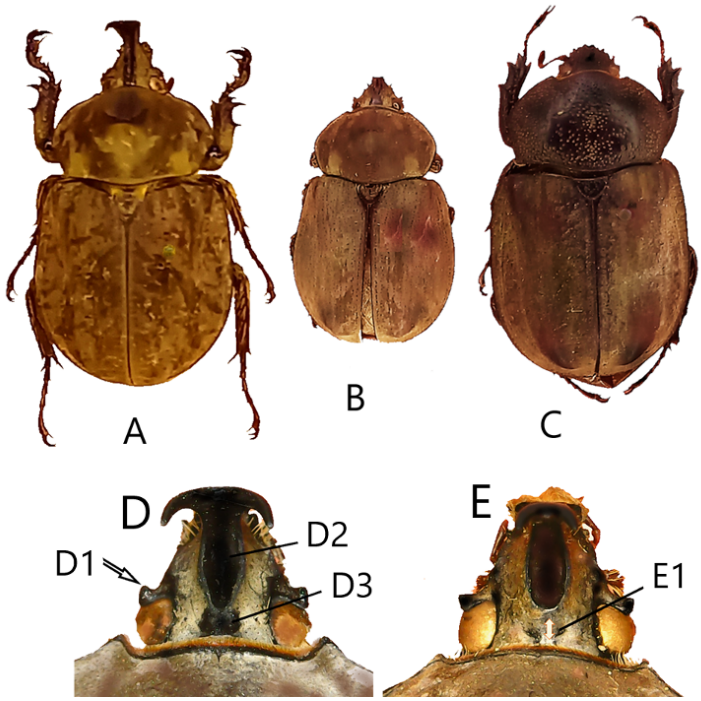

Figura 15. *Frontal view of Lycomedes hirtipes. A: Major male; B; Minor male; C: Female; D: L. hirtipes, dorsal view of the head and anterior part of the pronotum of the male (D1: ocular canthus; D2: Cephalic sulcus; D3: black spot of the cephalic sulcus; D: L. enigmaticus, dorsal view of the head and anterior part of the pronotum of the male (E1: Anterior portion of head without cephalic sulcus spot).*

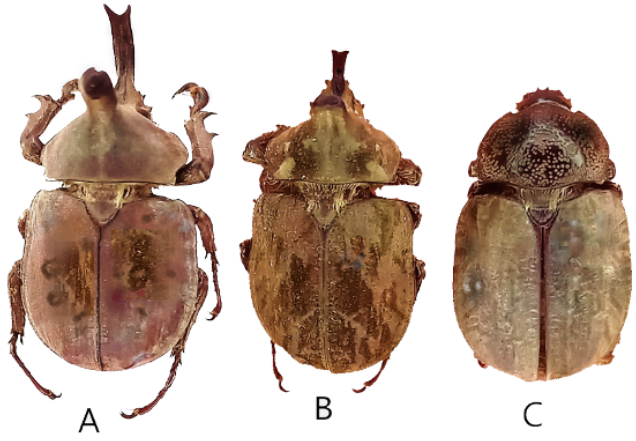

Figura 16. Dorsal view of *Lycomedes enigmaticus.* A: *Major* male; B; *Minor* male; C: Female.

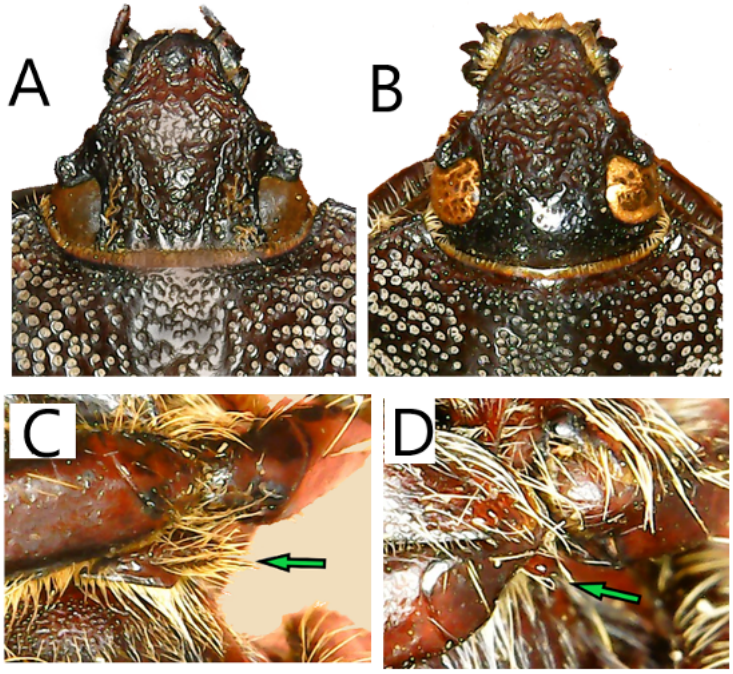

Figura 17. *: A: Head of L. hirtipes, B: Head of L. enigmaticus; C: Prosternal process of L. hirtipes; D: Prosternal process of L. enigmaticus (arrow points in each case).*

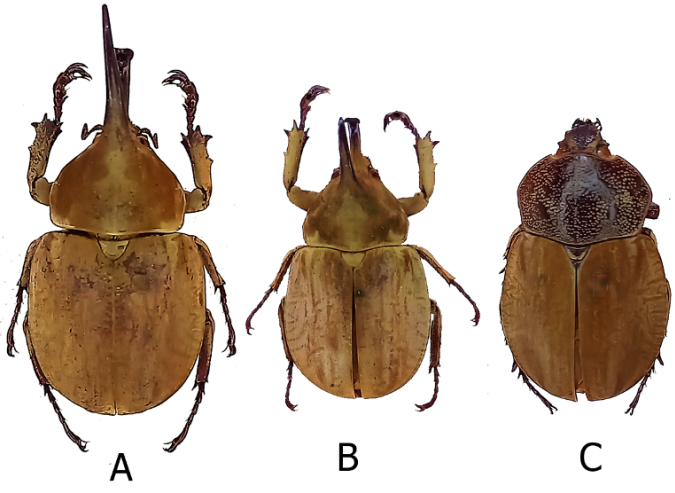

Figura 18. : Dorsal view of *Spodistes grandis.* A: Major male; B; Minor male; C: Female.

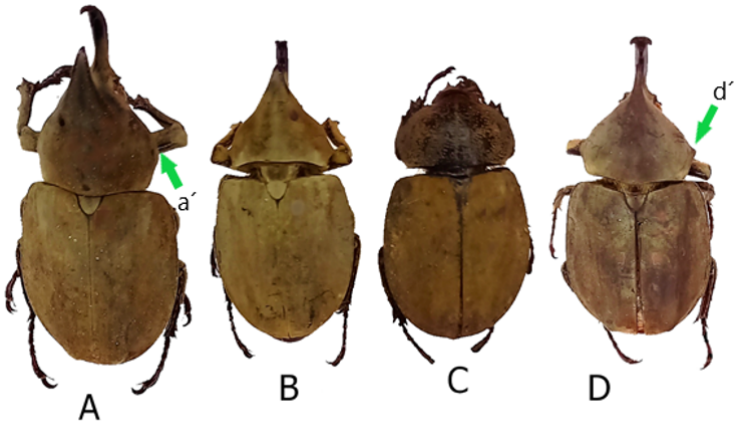

Figura 19. A, B and C Dorsal view *of Spodistes hopei*. A: Major male; B; Minor male; C: Female; D: Dorsal view of *Spodistes angulicollis* (a´ arrow indicates curved pronotal angle; d´ arrow indicates acute pronotal angle).

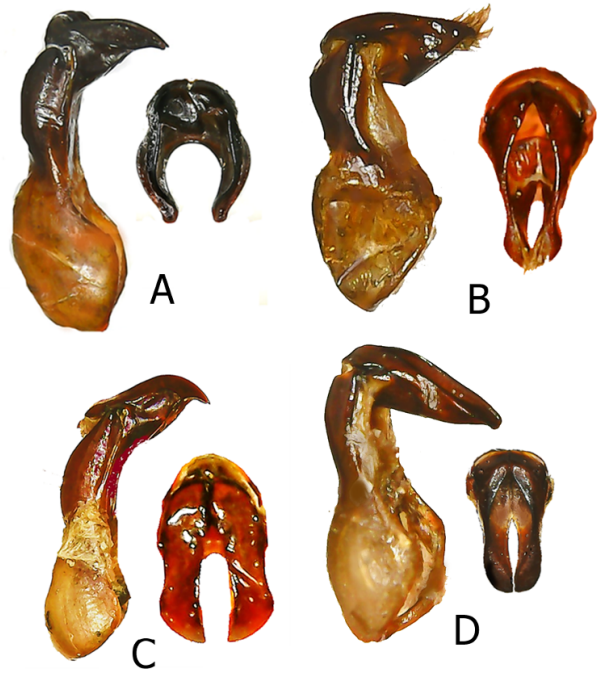

Figura 20. Aedeagus. A: *Mitracephala humboldti*; B: *Brachysiderus tridentiger*; C; *Aegopsis curvicornis*; D: Horridocalia delislei (Left: Side view of aedeagus; species.

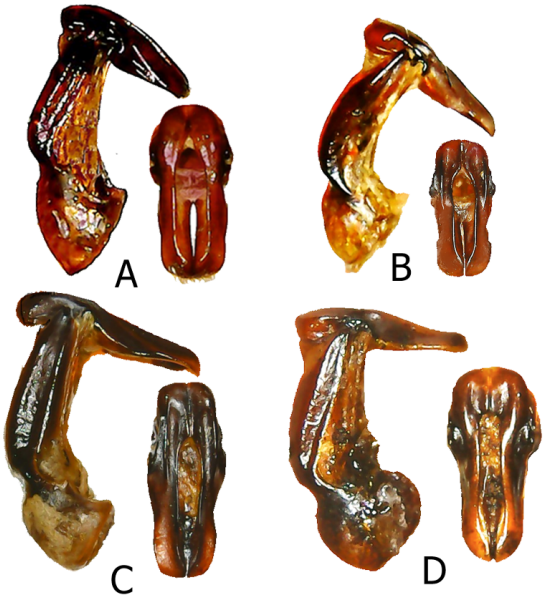

Figura 21. Aedeagus. A: Lycomedes hirtipes; B: L. reichei; C: L. lydiae; D: L. enigmaticus (Left: side view of aedeagus; Right: Dorsal view of paramera).

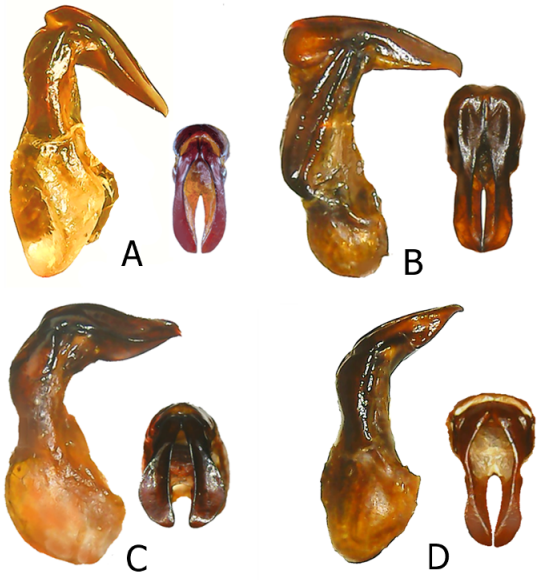

Figura 22. Aedeagus. A: *Lycomedes burmeisteri*; B: *L. ramosus;* C; *L. salazari*; D: *L. velutipes* (Left: side view of aedeagus; Right: Dorsal view of paramera).

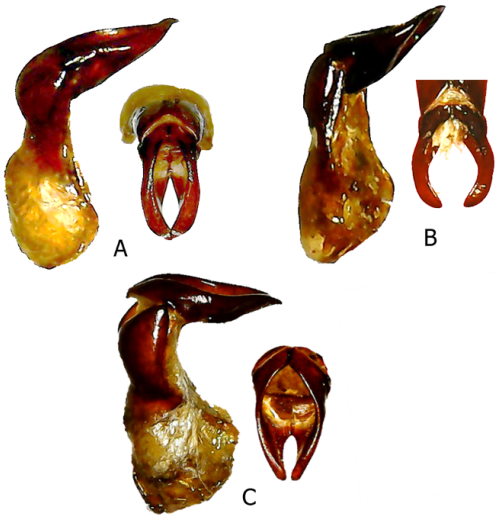

Figura 23. Aedeagus. A: *Spodistes angulicollis* B: *S hopei*; C; *S. grandis* (Left: Side view of aedeagus; Right: Dorsal view of paramera).

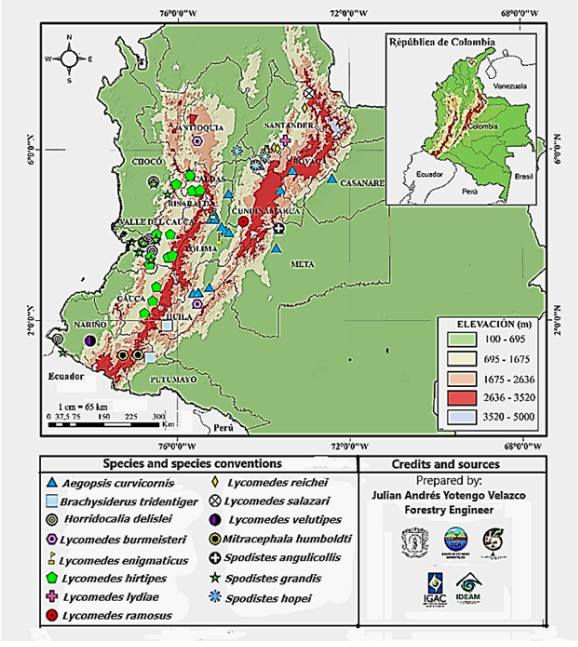

Figura 24. Map of Colombia, species and registered distribution of Agaocephalini species.

References

Abadie, E. I., Grossi, P. C., & Wagner, P. S. (2008). *A field guide of the Dynastinae family of the south of South America. Argentina.*

Albarracín, G. L., & Solanilla, O. L. (1995). *Estudio exploratorio de los Lamellicornios familias Passalidae, Scarabaeidae, Melolonthidae y Lucanidae (Coleoptera) de algunas zonas del departamento de Caldas* [Undergraduate thesis, Universidad del Tolima].

Arnaud, P. (2012). Une nouvelle espèce de *Lycomedes*. *Besoiro, 21*, 2–3.

Arrow, G. J. (1902). A revision of the genus *Lycomedes* and its allies. *Annals and Magazine of Natural History, 10*(7), 142–147.

Bates, H. W. (1888). Pectinicornia and Lamellicornia, Family Dynastinae. In F. D. Godman & O. Salvin (Eds.), *Biologia Centrali-Americana, Insecta, Coleoptera* (Vol. II, Part 2, pp. 296–342).

Bonilla-Guzmán, H., & Moreno-Páez, J. (1994). *Reconocimiento exploratorio de lamellicornios (Coleópteros) familias Passalidae, Lucanidae y Scarabaeidae en el Departamento del Huila* [Undergraduate thesis, Universidad del Tolima].

Brème, F. M. (1844). Insectes Coléoptères nouveaux ou peu connus. *Annales de la Société Entomologique de France , 2*(2), 287–313.

Burmeister, H. (1847). *Handbuch der Entomologie. Fünfter Band. Besondere Entomologie. Fortsetzung*. Coleoptera Lamellicornia Xylophila et Pectinocornia. Enslin.

Choi, W., Abadie, E. A., Pardo-Locarno, L. C., & Warner, P. S. (2023). *Agaocephalini of the World* (Vol. 2, E. Kim, Ed.). Stag Lab.

Cuenca, Y., & Preciado, V. H. (1994). *Estudio entomológico preliminar de los Lamellicornios Familias Passalidae, Scarabaeidae y Lucanidae (Coleoptera) en el Municipio de Ibagué, Tolima, Colombia* [Undergraduate thesis, Universidad del Tolima].

Dechambre, R. P. (1992). Nouveaux Dynastidae de la tribu Agaocephalini (Col. Scarabaeoidea). In *Les Coléoptères du Monde* (Vol. 14, pp. 77–81).

Endrödi, S. (1970). Monographie der Dynastinae (Coleoptera). 3. Tribus: Agaocephalini. *Acta Zoologica Academiae Scientiarum Hungaricae , 16*, 27–96.

Endrödi, S. (1974). *Horridocalia delislei* gen. sp. nov. (Coleoptera: Melolonthidae: Dynastinae). *Folia Entomologica Hungarica , 27*, 19–52.

Endrödi, S. (1985). *The Dynastinae of the World*. Dr. W. Junk Publisher.

Gasca-Álvarez, H. J., & Amat-García, G. (2010). Synopsis and key to the genera of Dynastinae (Coleoptera, Scarabaeoidea, Scarabaeidae) of Colombia. *ZooKeys , 34*, 153–192. https://doi.org/10.3897/zookeys.34.309

Gasca-Álvarez, H. J., López-García, M., & Ratcliffe, B. (2018). Dynastinae de Colombia (Coleoptera: Scarabaeidae): estado actual de conocimiento. In C. Deloya & H. J. Gasca-Álvarez (Eds.), *Escarabajos del Neotrópico* (pp. 98–128). Sociedad Mexicana de Entomología.

Joly, L. J. (1992). Agaocephalini: especies venezolanas, descripción de la hembra de *Agaocephala bicuspis* Erichson, 1848, nuevos registros y datos faunísticos sobre otras especies (Coleoptera: Melolonthidae: Dynastinae). *Boletín de Entomología Venezolana, 7*(1), 49–58.

Krajcik, M. (2005). Dynastinae of the World Checklist (Coleoptera: Scarabaeidae: Dynastinae). *Animma X* , Supplement No. 2, 1–122.

Lachaume, G. (1992). Dynastidae américains . *Les Coleopteres du Monde, 14*. Science Nat.

Milani, L. (2017). Sinopsi del genere *Lycomedes* Brême (Coleoptera, Scarabaeidae, Dynastinae, Agaocephalini) con ridescrizione de *Lycomedes ohausi* Arrow maschio, descrizione de *Lycomedes* ohausi femmina e di una nuova specie dall'Ecuador. *Giornale Italiano de Entomologia , 14*, 755–774.

Milani, L. (2018). Sinopsi del bonum genus Minisiderus Endrödi, differenze con il genera Brachysiderus Waterhouse e descrizione de *Minisiderus alyanae* Dechambre fminne (Coleoptera: Scarabaeidae: Dynastinae: Agaocephalini). *Giornale Italiano de Entomologia, 15*, 75–94.

Neita-Moreno, J. C., De Oliveira, M., & Morón, M. A. (2014). Larval and pupal descriptions of two *Aegopsis* species (Coleoptera: Melolonthidae: Dynastinae). *Florida Entomologist, 97*, 114–125.

Neita-Moreno, J. C., & Ratcliffe, B. C. (2019). The genera of Agaocephalini (Coleoptera: Scarabaeidae: Dynastinae) of Colombia, with description of a new species of *Lycomedes* Brême. *The Coleopterists Bulletin , 73*(4), 1049–1063.

Nuñez, J. F., & Sanabria, L. H. (1995). *Estudio preliminar de los escarabajos de interés agrícola y forestal de la Cuenca Alta del Río La China, Tolima* [Undergraduate thesis Universidad del Tolima].

Oliveira, C. M., Morón, M. A., & Frizzas, M. R. (2008). *Aegopsis bolboceridus* (Coleoptera: Melolonthidae): An important pest on vegetables and corn in central Brazil. *Florida Entomologist , 91*, 324–327.

Pardo-Locarno, L. C. (1993). Estudio preliminar de las especies de Melolonthidae del Valle del Cauca, con énfasis en la cuenca Calima San Juan (Valle-Chocó), Colombia. In M. A. Morón (Ed.), *Diversidad y manejo de plagas subterráneas* (pp. 83–90). Sociedad Mexicana de Entomología e Instituto de Ecología de México.

Pardo-Locarno, L. C., Reyes U., L. C., & Franco, P. (1995). Escarabajos (Coleóptera-Scarabaeoidea) de la Cuenca Alta del Río Pance, Farallones de Cali, Valle. *Cespedesia, 20*(66), 189–197.

Pardo-Locarno, L. C. (1998). Escarabajos Agaocephalini (Coleoptera: Melolonthidae-Dynastinae) de Colombia, composición y observaciones biológicas. In *Resúmenes XXV Congreso de la Sociedad Colombiana de Entomología* (SOCOLEN) (p. 26). Cali.

Pardo-Locarno, L. C., & Morón, M. A. (2006). Description of the third instar larva and pupa of *Lycomedes hirtipes* Arrow (Coleoptera: Dynastinae: Agaocephalini) with notes on its biology and distribution in Colombia. *Proceedings of the Entomological Society of Washington, 108*(3), 661–671.

Pardo-Locarno, L. C., Grossi, P. C., & Stechauner, R. (2014). El escarabajo rinoceronte *Horridocalia delislei* Endrödi, 1974 en Colombia: nuevos registros, redescripción del macho y descripción de la hembra (Coleóptera, Scarabaeoidea, Dynastinae). *Boletín Científico Centro de Museos, Museo de Historia Natural, 18*(1), 165–174.

Pardo-Locarno, L. C., Villalobos-Moreno, A., & Stechauner, R. (2015). Nueva especie de *Lycomedes* Brème, 1844 (Coleoptera: Melolonthidae: Dynastinae) de los Andes colombianos y clave para identificación de las especies. *Insecta Mundi, 0455*, 1–14.

Pardo-Locarno, L. C., Villalobos-Moreno, A., & Delgado Ruiz, H. (2020). Adiciones a los escarabajos Agaocephalini de Colombia (Coleóptera: Melolonthidae: Dynastinae). In L. C. Pardo-Locarno, M. C. Gallego-Ropero, & J. Montoya-Lerma (Eds.), *Memorias VII Curso Sobre Taxonomía, Biología y Ecología de Escarabajos de Colombia (Coleóptera: Scarabaeoidea)* (pp. 83–90). Universidad del Cauca.

Peña, S., & Victoria, J. J. (2001). *Escarabajos melífagos (Melolonthidae) en tres circunstancias ambientales (bosque secundario, matorral, potrero) en el bosque seco tropical, corregimiento de Mateguadua (Tuluá, Valle)* [Undergraduate thesis, Universidad Central del Valle].

Pérez-Aroca, S., & Rubiano, M. (1991). *Estudio entomológico del orden Coleóptera, estrato inferior (nivel del suelo hasta dos metros de altura), bosque primario, colinas bajas, Bajo Calima, Valle, Colombia* [Undergraduate thesis, Universidad del Tolima].

Prell, H. (1934). Beiträge zur Kenntnis der Dynastiden. Beschreibungen und Bemerkungen. *Entomologische Blätter, 30*(2), 55–60.
Ratcliffe, B. C. (2003). The dynastine scarab beetles of Costa Rica and Panama (Coleoptera: Scarabaeidae: Dynastini). *Bulletin of the University of Nebraska State Museum, 16*, 1–506.
Ratcliffe, B. C., & Cave, R. D. (2006). The dynastine scarab beetles of Honduras, Nicaragua and El Salvador (Coleoptera: Scarabaeidae: Dynastinae). *Bulletin of the University of Nebraska State Museum, 28*, 1–424.
Ratcliffe, B. C., Cave, R. D., & Paucar-Cabrera, A. (2020). The dynastine scarab beetles of Ecuador (Coleoptera: Scarabaeidae: Dynastinae). *Bulletin of the University of Nebraska State Museum, 32*, 1–586.
Restrepo-Giraldo, H., Morón, M. A., Vallejo, F., Pardo-Locarno, L. C., & López-Avila, A. (2003). Catálogo de Coleóptera Melolonthidae (Scarabaeidae Pleurosticti) de Colombia. *Folia Entomológica Mexicana, 42*, 239–263.
Reyes, L. C. (1995). *Estudios de coleopterofauna rizófaga (plagas consumidoras de las raíces de las plantas cultivadas) en la parte media y alta de la cuenca del Río Pance* [Undergraduate thesis Universidad Nacional de Colombia].
Sobral-Alves, R. (2023). *Taxonomia de Agaocephalini Burmeister, 1847 (Coleoptera: Melolonthidae: Dynastinae)* [Master thesis, Instituto Nacional de Pesquisas da Amazônia – INPA].
Sobral-Alves, R., Grossi, P. C., & De Morais, J. W. (2018). Two new species of Aegopsis Burmeister, 1847 (Coleoptera: Scarabaeidae: Dynastinae) from the Central Brazilian Cerrado. *Zootaxa, 4526*(2), 175–194.
Sobral, R., Morais, J. W., & Grossi, P. C. (2019). A new species of Colacus Ohaus, 1910 (Coleoptera: Scarabaeoidea: Dynastinae) from the Mata Seca biotope of Brazil, and notes on Colacus morio Ohaus, 1910. Zootaxa, 4092(2), 159–167.
Sternberg, C. (1903). Gattung Lycomedes de Brême. *Deutsche Zeitschrift, 1903*, 300–304.
Villalobos-Moreno, A., Pardo-Locarno, L. C., Cabrero-Sañudo, F. C., Ospina- R., & Gómez-Murillo, I. J. (2016). Inventario preliminar de los escarabajos de la familia Melolonthidae (Coleoptera: Scarabaeoidea) en un robledal del nororiente de los Andes colombianos. *Boletín de la Sociedad Entomológica Aragonesa, 58*, 159–167.
Waterhouse, C. O. (1879). Descriptions of new Coleoptera from Medellin, Colombia, recently added to the British Museum Collection. *Cistula Entomologica, 2,* 421–429.

Annex 1. Projects, institutions and research periods

Project/authorship/year	Project
Thesis. Pardo-Locarno, 1988.	Registro taxonómico y observaciones ecológicas de las familias de Coleóptera del Valle del Cauca (Colombia). Undergraduate thesis, Unal-Palmira.
INCIVA, 1990-1994	Coleópteros del Calima-San Juan Valle-Chocó (código 2108-05-005.89), INCIVA, COLCIENCIAS e INDERENA.
BIOPACIFICO, 1995-1996	Estudios Bioecológicos Preliminares de la Coleopterofauna Chocó Biogeográfico I Cuenca Calima-Bajo San Juan (Valle-Choco). BIOPACIFICO, Ministerio del Ambiente GEF-PNUD/COL/92/G31.
CVC-1996-enero 1997	"Registros y notas ecológicas de los escarabajos (Col., Scarabaeoidea) de Felidia y El Saladito, Valle, Colombia" C.V.C Subdirección Patrimonio Ambiental. OTG. VS 009
Fondo FEN 1997-1998	Estudio comparativo de los Rhopalocera (Lepidoptera) y Melolonthidae (Coleoptera) en dos regiones protegidas de la cuenca del río Anchicayá, Valle, Colombia
CVC-1997-1998	Zoocria de Coleópteros en el Pacífico Vallecaucano. Fase I San Cipriano Bajo Dagua" CVC Subdirección Patrimonio Ambiental. OTGVS 038.
IIAP-MMA, 1998-2003	Coleopterofauna de la Cuenca Calima-Bajo San Juan, Valle-Choco, Colombia II"
CVC-CIPAV, 2005-2006	Zoocria de coleópteros en el Pacífico Vallecaucano. Fase II. CVC-CIPAV. 2005-diciembre 2006. CVC ODT 641-2006.
Ecofondo-CVC, 2006	"Protección de la biodiversidad mediante la implementación de estrategias productivas sustentables en el Río Anchicayá, Buenaventura" Convenio Ecofondo-CC Llano Bajo. Convenio ECOFONDO-003.

INVIAS-Fundación Danza y Vida, 2010-2011.	Caracterización para la Planificación Ambiental del Alto y Medio Dagua" … corredor doble calzada Buga-Buenaventura secciones 2 y 3… enero-agosto de 2010 y etapas posteriores
INVIAS-Fundación Danza y Vida, 2010-2012.	Macroinvertebrados edáficos (norma ISO 23611-1), escarabajos peloteros y escarabajos sapromelífagos del dosel por unidades de paisaje o vegetación del territorio colectivo. 11- Project "Caracterización para la Planificación Ambiental del Alto y Medio Dagua… corredor doble calzada Buga-Buenaventura

Annex 2. Museums, entomological collections and suppliers of material.

Collection/author	Institution/ responsable/Source
Unillanos 1997-1998	Universidad de los Llanos-Unillanos, Villavicencio (Manuel Castro Garrido (†) and Carlos Edgardo López-Ríos)
UPTC-Tunja, 2002-2003	Universidad Pedagógica y Tecnológica-UPTC, Tunja, Boyacá (Adolfo León Varela (†)
Unitolima, 1991-1994	Universidad del Tolima, Ibagué, Tolima (Mary Cuadros de Chacón and Pedro Galeano)
Museo Gallego, 1991-2003	Museo Francisco Luis Gallego, Medellín, Antioquia (Raúl Vélez Ángel (†), Francisco Cristóbal Yepes Yepes (†)
Univalle, 2004-2005	Universidad del Valle (James Montoya, Carmen Elisa Poso)
Albarracín & Solanilla, 1995	Estudio exploratorio de los Lamellicornios familias Passalidae, Scarabaeidae, Melolonthidae y Lucanidae (Coleoptera) de algunas zonas del departamento de Caldas. Undergraduate thesis. Universidad del Tolima. Ibagué.
Cuenca & Preciado, 1994	Estudio entomológico preliminar de los Lamellicornios Familias Passalidae, Scarabaeidae y Lucanidae (Coleoptera) en el Municipio de Ibagué, Tolima, Colombia. Undergraduate thesis, Facultad Ingeniería Forestal, Universidad del Tolima.
Peña & Victoria, 2001	Escarabajos Melífagos (Melolonthidae) en tres Circunstancias Ambientales (Bosque Secundario, Matorral, Potrero) en el Bosque Seco Tropical, Corregimiento de Mateguadua (Tuluá, Valle). Undergraduate thesis Universidad Central del Valle. Tuluá. 82 p.
Nuñez & Sanabria, 1995	Escarabajos de la Cuenca Alta del Río La China, Tolima
Reyes-Usuga, 1995	Escarabajos del Río Pance, Santiago de Cali, Valle, Colombia
Unisarc, 2020	Universidad Santa Rosa de Cabal-Unisarc, Risaralda (photos by Shirley Palacios Castro 2020)
Uniantioquia, 2020	Colección Entomológica de la Universidad de Antioquia, Medellín (photos by Martha Wolf)
CEU Nariño, 1994-1995	Colección Entomológica de la Universidad de Nariño, Pasto, Nariño (Guillermo Castillo, specimens shared)

Museo Unicauca, 2020-2023	Museo Universidad del Cauca, Popayán (María Cristina Gallego Ropero, several visits and potos)
Museo HN Unicaldas 2020-2023	Museo de Historia Natural, Universidad de Caldas (Julián Salazar, curador, photos and specimens shared)
R. Whited	Richard Whited, Museo Forestal, San José, Costa Rica, 1996
L. Delgado, 1993, 2003	Leonardo Delgado-Castillo, INECOL Xalapa, Veracruz, México
F. Zaguri Vaz de Mello, 1995	Personal Coll. F. Zaguri Vaz de Mello, Brazil
Everardo and P. Grossi, 1995	Personal Coll. Everardo Grossi, Brazil
E Abadie and P. Warner, 2023	Esteban Abadie and P. Warner (Argentina).
CFPL-COL	Colección Familia Pardo-Locarno-CFPL, Palmira (Curadores Luis Carlos Pardo-Locarno, Gloria Patricia López Valencia).
Choi Wonseok	Seoul, South Korea (Photos and specimens shared in 2022-2023; visited and took photos in the museums of London-BM, the Museum of Natural History of Paris-MNHN and personal collection of Patrick Arnaud (Paris, France).
EPN-Quito	Colección de entomología, Departamento de Biología, Escuela Politécnica Nacional, Quito Ecuador, Adrián Troya (provided some copies, photos and other valuable data for the study).
R. Wanninger Col.	Germany (photos and specimens shared in 2004-2021).
P. Arnaud	Paris, France, photos, specimens and paratype shared in several years.