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Identification Key

A trilingual key to genera and subgenera of the Scarabaeinae from the Brazilian Amazon (Coleoptera: Scarabaeidae)

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Abstract: Presented here is a trilingual (English, Portuguese, and Spanish) key to the 44 currently recognized genera and 37 subgenera of dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) occurring in the Brazilian Amazon. Photographs of all taxa are included.
Keywords: *Dung beetles; Identification; Morrone; Taxonomy.*

Chave trilíngue para gêneros e subgêneros de Scarabaeinae da Amazônia brasileira (Coleoptera: Scarabaeidae)

Resumo: Apresentamos aqui uma chave trilíngue (inglês, português e espanhol) dos 44 gêneros e 37 subgêneros atualmente reconhecidos de besouros rola-bosta (Coleoptera: Scarabaeidae: Scarabaeinae) que ocorrem na Amazônia brasileira. Fotos de todos os táxons estão incluídas.
Palavras-chave: *Besouros rola-bosta; Identificação; Morrone; Taxonomia.*

Introduction

The Amazon is the largest tropical forest on the planet, covering about 47% of South America and extending into nine countries. Brazil is the country with the largest area of this ecosystem, about 308 million hectares (73% of the total area) (Malhi et al 2008, Von Solinge 2013, Mapbiomas 2022). Of all land ecosystems, tropical forests have the greatest species diversity (Halffter and Favila 1993). Hot and humid temperatures give the Amazon Forest a unique abiotic system, contributing to its high level of insect biodiversity (Sobral-Souza and Lima-Ribeiro 2017) and making it the target of numerous studies. The Amazon has experienced a dramatic loss of forest cover over the last 35 years. It is estimated that about 20 to 25% of its extension has been lost, with the greatest loss concentrated in Brazil, where it is estimated that about 81% of the deforestation of this type of forest has occurred (Mapbiomas Brazil 2022).

The biogeographical regionalization of the Neotropics has a long and complex history (Morrone 2002, 2014). Based on land taxa, including previously defined areas, Morrone (2014) presented the regionalization of the Neotropical region, with definitions of areas and standardized nomenclature in four hierarchical levels. The regionalization proposal of Morrone will be adopted in this work to determine the areas called "Brazilian Amazon" (Figure 1) (for more details on this delimitation, see Morrone 2002, 2014 and 2022).

Popularly known in English as dung beetles, the Scarabaeinae have a well-known functional and morphological diversity, contributing worldwide to the maintenance of ecosystems (Halffter and Edmonds 1982, Hanski and Cambefort 1991). Currently, more than 6.500 species are recognized worldwide, belonging to 270 genera (Schoolmeesters 2023). The latest reference for Amazonia is the work of Vulcano and Pereira (1967), who considered the entire Amazon region and recorded about 400 species of dung beetles for the region. In recent years, countless ecological works have been carried out with the Scarabaeinae fauna of the Amazon, including conservation monitoring, pasture species, forest management (e.g. Tissiani, Vaz-de-Mello and Campelo-Júnior 2007, Barlow et al. 2010, Silva et al. 2014, França et al. 2016, Matavelli et al. 2018, Carvalho et al. 2020, Mora-Aguilar et al. 2023). To carry out works like these, it is necessary to correctly identify the genera and species. For this reason, in this paper we present a trilingual dichotomous key, adapted from others (see material and methods), for the genera and subgenera occurring in the Brazilian Amazon, together with high resolution photographs. Of 127 Scarabaeinae genera and subgenera listed for the Neotropics (Schoolmeesters 2023), 81 (genera and subgenera) are listed for the Brazilian Amazon.

As with any key, this contribution reflects our current knowledge and taxonomic opinions. It will certainly change as we discover more about the Brazilian Amazon fauna and reassess our taxonomic point of view.

Material and Methods

The material examined for the preparation of the key is deposited in two Brazilian collections. The names of the curators are given in parentheses:

CEMT = Coleção Entomológica de Mato Grosso Eurides Furtado, Cuiabá, Mato Grosso, Brazil (Fernando Z. Vaz-de-Mello)

INPA = Instituto Nacional de Pesquisas da Amazônia, Coleção de Invertebrados, Manaus, Amazonas, Brazil (José Albertino Rafael, Marcio Oliveira)

A literature review was carried out and catalogs were used (Catalogue of life, Taxonomic Catalog of the Brazilian fauna), in addition to CEMT databases and analysis of material in the collections to confirm the number of genera and subgenera in the Brazilian Amazon. This key is an adaptation of Vaz-de-Mello et al. (2011), Chamorro et al. (2018) and Vaz-de-Mello et al. (2020). In case of doubt about basic external morphology of dung beetles, see the final section of Vaz-de-Mello et al. (2011), which includes diagrams for general orientation. The characters used in the key are external and easily assessed using a stereomicroscope.

Photographs were prepared using a Leica model M205C (7.8× –160.0×) stereomicroscope with image capture system MC190 HD. The set of images was subsequently edited using Adobe Photoshop. Scale bars and body measurements (in mm) were made using Leica software. Photographs not prepared by the authors are indicated in the figure captions with their respective copyrights. The map was prepared using ArcGIS ver. 10.8 software.

Preceding the key, there is an alphabetical list of all 44 genera and 37 subgenera included with their authorship and year. Names with "asterisks" have important comments in the "Discussion and Additional Comments" section.

Results

1.Systematics

Class Insecta Linnaeus, 1758
Order Coleoptera Linnaeus, 1758
Superfamily Scarabaeoidea Latreille, 1802
Family Scarabaeidae Latreille, 1802
Subfamily Scarabaeinae Latreille, 1802

Taxa identified in the key

Agamopus Bates,1887
Anisocanthon Martínez & Pereira, 1956
Anomiopus Westwood, 1842
Ateuchus Weber, 1801
Ateuchus *incertae sedis*
***Ateuchus* (*Lobidion*)** Génier, 2010
Bdelyrus Harold, 1869
Besourenga Vaz-de-Mello, 2008
Bradypodidium Vaz-de-Mello, 2008
Canthidium Erichson, 1847
  ***Canthidium* (*Canthidium*)** Erichson, 1847
  ***Canthidium* (*Neocanthidium*)** Martínez et al., 1964
Canthon Hoffmannsegg, 1817
  ***Canthon* (*Canthon*)** Hoffmannsegg, 1817
  ***Canthon* (*Glaphyrocanthon*)** Martínez, 1948
  ***Canthon* (*Goniocanthon*)** Pereira & Martínez, 1956
  ***Canthon* (*Pseudepilissus*)** Martínez, 1954
  ***Canthon* (*Trichocanthon*)** Pereira & Martínez, 1959
  Canthon, *incertae sedis* (*sensu* Halffter & Martínez, 1977)
Canthonella Chapin, 1930
Canthotrypes Paulian, 1939
Copris Geoffroy, 1762
  ***Copris* (*Copris*)** Geoffroy, 1762
Coprophanaeus d'Olsoufieff, 1924
  ***Coprophanaeus* (*Coprophanaeus*)** d'Olsoufieff, 1924
  ***Coprophanaeus* (*Megaphanaeus*)** d'Olsoufieff, 1924
Cryptocanthon Balthasar, 1942
Deltochilum Eschscholtz, 1822
  ***Deltochilum* (*Aganhyboma*)** Kolbe, 1893
  ***Deltochilum* (*Calhyboma*)** Kolbe, 1893
  ***Deltochilum* (*Deltochilum*)** Eschscholtz, 1822
  ***Deltochilum* (*Deltohyboma*)** Lane, 1946
  ***Deltochilum* (*Hybomidium*)** Shipp, 1897
Deltorhinum Harold, 1867
Dendropaemon Perty, 1830
  ***Dendropaemon* (*Coprophanaeoides*)** Edmonds, 1972
  ***Dendropaemon* (*Crassipaemon*)** Cupello & Génier, 2017
  ***Dendropaemon* (*Dendropaemon*)** Perty, 1830
  ***Dendropaemon* (*Enicotarsus*)** Castelnau, 1831
  ***Dendropaemon* (*Eurypodea*)** Castelnau, 1831
  ***Dendropaemon* (*Glaphyropaemon*)** Génier & Arnaud, 2016
  ***Dendropaemon* (*Nigropaemon*)** Génier & Arnaud, 2016
  ***Dendropaemon* (*Rutilopaemon*)** Génier & Arnaud, 2016*
  ***Dendropaemon* (*Titthopaemon*)** Génier & Arnaud, 2016
Diabroctis Gistel, 1857
Dichotomius Hope, 1838
  ***Dichotomius* (*Cephagonus*)** Luederwaldt, 1929
  ***Dichotomius* (*Dichotomius*)** Hope, 1838
  ***Dichotomius* (*Selenocopris*)** Burmeister, 1846
Digitonthophagus Balthasar, 1959
Eurysternus Dalman, 1824
Eutrichillum Martínez, 1969
Feeridium Vaz-de-Mello, 2008
Genieridium Vaz-de-Mello, 2008
Gromphas Dejean, 1836
Hansreia Halffter & Martínez, 1977
Isocopris Pereira & Martínez, 1960
Malagoniella Martínez, 1961
  ***Malagoniella* (*Malagoniella*)** Martínez, 1961
Megatharsis Waterhouse,1891
Ontherus Erichson, 1847
  ***Ontherus* (*Caelontherus*)** Génier, 1996
  ***Ontherus* (*Ontherus*)** Erichson, 1847
Onthophagus Latreille, 1802
  ***Onthophagus* (*Onthophagus*)** Latreille, 1802
Oxysternon Castelnau,1840
  ***Oxysternon* (*Mioxysternon*)** Edmonds, 1972
  ***Oxysternon* (*Oxysternon*)** Castelnau, 1840
Phanaeus MacLeay, 1819

***Phanaeus* (*Notiophanaeus*)** Edmonds, 1994
Pseudocanthon Bates, 1887
Scatimus Erichson, 1847
Scybalocanthon Martínez, 1948
Sinapisoma Boucomont, 1928
Sulcophanaeus d'Olsoufieff, 1924
Sylvicanthon Halffter & Martínez, 1977
Tetraechma Blanchard, 1841
Trichillidium Vaz-de-Mello, 2008
Trichillum Harold, 1868
Uroxys Westwood, 1842
Zonocopris Arrow, 1932

Identification key to the genera and subgenera of Scarabaeinae from the Brazilian Amazon, based on Vaz-de-Mello et al. (2011)

1 Tip of mesoscutellum clearly visible between bases of elytra, exposed portion triangular, rounded, guttiform or pentagonal **(**Figure 2A)..... 2
– Mesoscutellum completely covered by elytra (Figure 2B)..... 3

2 (1) Body flattened dorsally, elongated, with parallel sides (Figure 3A). Mesocoxae parallel to the longitudinal axis of the body, positioned externally in relation to the metaventrite (Figure 3B). Length 5.5–25 mm..... ***Eurysternus*** Dalman, 1824
– Body slightly convex dorsally, usually oval (Figure 3C). Mesocoxae perpendicular or oblique to the longitudinal axis of the body (Figure 3D). Length 12–30 mm..... ***Malagoniella* (*Malagoniella*)** Martínez, 1961

3 (1) Body flattened and elongated (Figure 4A). Meso- and metatarsi strongly flattened (Figure 4B). Pygidium horizontal (Figure 4B). Apical meso- and metatarsomeres with strong spiniform process above insertion of claws. Length 6–10.5 mm..... ***Bdelyrus*** Harold, 1869
– Pygidium clearly vertical (Figure 4C), or apical meso- and metatarsomeres without spiniform process, or both..... 4

4 (3) Proleg with trochantofemoral fovea (Figure 5A)..... 5
– Proleg without anterior trochantofemoral fovea (Figure 5B)... 16

5 (4) Pronotum and elytra, at least laterally, covered by setae. Last abdominal ventrite greatly expanded in the middle, covering the entire disc of the abdomen; other ventrites visible only on the sides of the abdomen (Figure 6A)..... 6
– Pronotum and elytra may or may not have setae. Last abdominal ventrite not completely covering the disc, other ventrites visible and clearly distinguishable also in the middle of the abdomen (Figure 6B)..... 12

6 (5) Pseudoepipleuron forming two lateral sinuosities, the posterior one (which is at the level of the metacoxa) partially covering the true epipleuron and is often angulate. Length 3–5.3 mm (Figure 7A; B)..... ***Trichillum*** Harold, 1868
– Pseudoepipleuron forming at most a long sinuosity in the anterior half, which does not fold over the epipleuron (epipleuron may present an excavation close to the metacoxa) (Figure 7C)..... 7

7 (6) Pseudoepipleuron narrows abruptly posteriorly, from the level of the metacoxa, forming an angle in its narrowing (Figure 8A)... 8
– Pseudoepipleuron gradually narrows towards the apex, without an angle at the level of the metacoxa (Figure 8B)..... 9

8 (7) Clypeogenal suture clearly visible, extending completely to outer head margin. Head border incised at clypeogenal suture such that clypeus and gena appear separately rounded (Figure 9A). Elytral striae without carina (Figure 9B). Length 2.5–4.7 mm..... ***Eutrichillum*** Martínez, 1969
– Frontoclypeal and clypeogenal sutures indistinct. Head straight or slightly curved at clypeogenal suture (Figure 9C). Elytral striae carenate (Figure 9D). Length 2–3.5 mm..... ***Besourenga*** Vaz-de-Mello, 2008

9 (7) Protibia with two teeth confined to apical one-half or less of the lateral border (Figure 10A). Mesotibia gradually widened apically, apex with lateral brush of long, setae..... 10
– Protibia with three teeth occupying at least apical three-fifths of lateral border (Figure 10B), if more crowded toward apex, then mesotibia abruptly widened and with strong lateroventral tooth and sparse apical setae..... 11

10 (9) Head flat to weakly (and regularly) convex, without obvious concavities adjacent to eyes. Clypeal border straight to weakly curved outwards (Figure 11A). Elytral striae with widely separated punctures. Length 2.3–3.3 mm..... ***Bradypodidium*** Vaz-de-Mello, 2008
– Head distinctly, evenly convex with distinct concavities in front of eyes. Clypeal border curved inward (Figure 11B). Elytral striae bead-like at least posteriorly (puncture width double that of striae, punctures contiguous or nearly so along apical one-half of stria). Length 2–4.5 mm..... ***Trichillidium*** Vaz-de-Mello, 2008

11 (9) Eyes dorsally as wide as long, dorsal interocular space less than twice the width of an eye (Figure 12A). Disc of the pronotum separated from the hypomeron by a line of punctures, without carina. Length 4.5–5.2 mm..... ***Feeridium*** Vaz-de-Mello, 2008
– Dorsal portion of eyes very small, separated by more than ten times their width (Figure 12B). Disc of the pronotum separated from the hypomeron by continuous carina or interrupted by dots. Length 3.5–6.5 mm..... ***Genieridium*** Vaz-de-Mello, 2008

12 (5) Pygidium with transverse sulcus in the middle of the disc. Length 4.5–6.5 mm (Figure 13A)..... ***Agamopus*** Bates, 1887
– Pygidium without transverse sulcus in the middle of the disc, sometimes a basal sulcus (Figure 13B)..... 13

13 (12) Mesoventrite with two posterior foveae (Figure 14B). Apical meso- and metatarsomere with dentiform process above claw insertion (Figure 14C). Length 2.5–5 mm (Figure 14A)..... ***Zonocopris*** Arrow, 1932
– Mesoventrite without posterior foveae. Apical meso- and metatarsomere without dentiform process (Figure 14D)..... 14

14 (13) Side of pronotum with deep longitudinal sulcus. Length 3–7.4 mm (Figure 15A; B)..... ***Uroxys*** Westwood, 1842
– Side of pronotum without longitudinal sulcus (Figure 15C)..... 15

15 (14) Clypeus bidentate. Eyes exposed dorsally. Pronotum and apices of elytra glabrous. Length 4–8 mm (Figure 16A)..... ***Scatimus*** Erichson, 1847
– Clypeus with two to six teeth. Eyes not exposed dorsally. Pronotum and elytra setose. Length 3–4.2 mm (Figure 16B)..... ***Cryptocanthon*** Balthasar, 1942

16 (4) Length of the basal metatarsomere longer than the next three metatarsomere combined (Figure 17A); if subequal, then labial

palp with two palpomeres (rarely third very reduced). Metatarsus with five tarsomeres..... 17

– Length of the basal metatarsomere less than that of following three metatarsomere combined (Figure 17B); if subequal, then labial palp with one or three distinct palpomeres or metatarsus with fewer than five tarsomeres..... 18

17 (16) Hypomeron with oblique carina reaching lateral border next to anterior angle, forming an anterolateral tooth, rounded in males and acute in females (African species introduced). Length 7–13 mm (Figure 18A; B)..... ***Digitonthophagus*** Balthasar, 1959

– Hypomeron without anterolateral tooth near the anterior angle, insertion of the longitudinal (hypomeral) carina exactly under the anterior angle, or not reaching the pronotal edge. Length 4–12 mm (Figure 18C; D)..... ***Onthophagus*** Latreille, 1807

18 (16) Meso- and metatarsi lacking claws (Figure 19A).....19

– Meso- and metatarsi with claws (Figure 19B)..... 36

19 (18) Meso- and metatarsi with 2-4 tarsomeres. Length 6–22.5 mm (Figure 20A; B; C)..... ***Dendropaemon*** Perty, 1830..... 20

– Meso- and metatarsi with five tarsomeres (Figure 20D)..... 28

20 (19) Anterior margin of pronotum with a small tubercle adjacent to each eye (Figure 21A)..... ***Dendropaemon* (*Titthopaemon*)** Génier & Arnaud, 2016

– Anterior margin of pronotum without tubercle adjacent to each eye (Figure 21B)..... 21

21 (20) Meso- and metatarsi with two tarsomeres (Figure 20A)..... ***Dendropaemon* (*Dendropaemon*)** Perty, 1830

– Meso- and metatarsi with three or four tarsomeres (Figure 20B; C) 22

22 (21) Meso and metatarsi with four tarsomeres (Figure 20C) .....***Dendropaemon* (*Eurypodea*)** Castelnau, 1831

– Meso and metatarsi with three tarsomeres.....… 23

23 (22) Completely black, shiny surface and no metallic sheen (Figure 22A)..... ***Dendropaemon* (*Nigropaemon*)** Génier & Arnaud, 2016

– At least some metallic sheen on the pronotum and/or elytra (Figure 22B)..... 24

24 (23) First metatarsomere subcylindrical, about four times longer than second (Figure 23A). Pronotum entirely black ..... ***Dendropaemon* (*Enicotarsus*)** Castelnau, 1831

– First metatarsomere flattened, less than three times as long as the second (Figure 23B); and/or pronotum with metallic luster..... 25

25 (24) Body moderately dorsoventrally compressed. Large to moderate length (≅13 mm) (Figure 22B)..... ***Dendropaemon* (*Crassipaemon*)** Cupello & Génier, 2017

– Body strongly compressed dorsoventrally. Small to moderate length (≤10 mm)..... 26

26 (25) Posterior border of pronotum margined only medially, margination never appearing crenulate or interrupted by setose punctures (Figure 24A)…..... ***Dendropaemon* (*Glaphyropaemon*)** Génier & Arnaud, 2016

– Posterior border of pronotum usually completely margined, if margination more or less interrupted on each side then some setose punctures are present (Figure 24B)..... 27

27 (26) Clypeus sharply emarginate on either side of clypeal teeth ..... ***Dendropaemon* (*Rutilopaemon*)** Génier & Arnaud, 2016

– Clypeus unmodified or obtusely emarginated on either side of clypeal teeth (Figure 24B)..... ***Dendropaemon* (*Coprophanaeoides*)** Edmonds, 1972

28 (19) Meso- and metatarsi with basal tarsomere expanded, wider than long or nearly so (Figure 25A). Labial palps with one palpomere. Length ≅ 13 mm..... ***Megatharsis*** Waterhouse, 1891

– Meso- and metatarsi with basal tarsomere elongated, always much longer than wide (Figure 25B). Labial palps with three palpomeres..... 29

29 (28) Basal antennomere of antennal club not concave apically to receive the apical lamellae (Figure 26A). Metanepisternum simple, lacking tab. Length 9.3–20.3 mm..... ***Gromphas* Dejean, 1836**

– Basal antennomere of antennal club strongly concave apically to receive the apical lamellae (Figure 26B). Metanepisternum with posterior extension covering lateral margin of elytra..... 30

30 (29) Clypeal margin with deep, acutely median emargination, forming two acute teeth separated from adjacent lateral edge by external emarginations. Length 11–56 mm (Figure 27A)... ***Coprophanaeus*** d'Olsoufieff, 1924..... 31

– Clypeal margin without deep, acutely emargination, with at most two conspicuous middle teeth (Figure 27B)..... 32

31 (30) Elytral interstriae strongly sculptured (transverse carinae) (Figure 28A). Ventral surface of protibia with tufts of setae at bases of lateral teeth. Very large specimens, up to 56 mm long, rarely less than 25 mm..... ***Coprophanaeus* (*Megaphanaeus*)** d'Olsoufieff, 1924

– Elytral interstriae never strongly sculptured (Figure 28B). Ventral surface of protibia with a single row of setae at bases of lateral teeth. Small or medium-sized specimens, rarely larger than 25 mm ..... ***Coprophanaeus* (*Coprophanaeus*)** d'Olsoufieff, 1924

32 (30) Head with transverse frontal carina in addition to frontoclypeal carina. Length 20–32 mm (Figure 29A)..... ***Diabroctis*** Gistel, 1857

– Head with single horn or carina, never booth (Figure 29B)..... 33

33 (32) Metaventrite with long, dorsally curved, acute process extending between apices of procoxae. Length 8–27 mm (Figure 30A) ..... ***Oxysternon*** Castelnau, 1840 …..... 34

– Metaventrite simply angulate anteromedially, never spiniform (Figure 30B)..... 35

34 (33) Clypeal process reduced to small tubercle (Figure 31A). Lateral clypeal carinae absent. Metaventrite with row of large points adjacent to the mesocoxae (Figure 31B). Length less than 15 mm..... ***Oxysternon* (*Mioxysternon*)** Edmonds, 1972

– Clypeal process spiniform or transverse ridge (Figure 31C). Lateral clypeal carinae present. Metaventrite without row of large points (Figure 31D). Length more than 12 mm..... ***Oxysternon* (*Oxysternon*)** Castelnau, 1840

35 (33) Anterior portion of circumnotal carina entire, not interrupted behind each eye. Length 11–30 mm (Figure 32A)..... ***Sulcophanaeus*** d'Olsoufieff, 1924

– Anterior portion of circumnotal carina interrupted behind each eye. Length 6–20 mm (Figure 32B)..... ***Phanaeus* (*Notiophanaeus*)** Edmonds, 1994

36 (18) Body almost always very elongated, cylindrical (Figure 33A). Tarsal claws reduced, almost straight or slightly curved (Figure 33B). Hypomeron convex or slightly concave, never deeply excavated anteriorly. Head without transverse carina. Length 2.8–8.7 mm..... ***Anomiopus*** Westwood, 1842

– Body flattened, or oval, but not cylindrical (Figure 33C). Tarsal claws long, strongly curved, sickle-shaped or angled (Figure 33D). Hypomeron deeply excavated anteriorly, and/or head dorsally with transverse carina..... 37

37 (36) Tarsal claws with strong basal tooth (Figure 33D). Clypeus bidentate. Length 1.7–4.7 mm (Figure 33C)..... ***Canthonella*** Chapin, 1930

– Tarsal claws without basal tooth, at most only angulated basally (Figure 34A; B)..... 38

38 (37) Meso- and metatibiae not appreciably widened apically, or only weakly and gradually so (Figure 34A)..... 39

– Mesotibia, and usually also metatibia, widened apically (Figure 34B)..... 57

39 (38) Apex of elytral interstriae with short carinae or tubercle. Length 8–38 mm (Figure 35A)..... ***Deltochilum*** Eschscholtz, 1822..... 40

– Elytral interstriae without apical carinae or tubercles, at most with one lateral almost complete elytral carina (Figure 35B)... 44

40 (39) Head longer than wider, narrowed anteriorly. Metatibia sharply arched medially (Figure 36A; B)..... ***Deltochilum* (*Aganhyboma*)** Kolbe, 1893

– Head distinctly wider than long, not triangularly narrowed. Metatibia, when strongly arched, sinuous or widely arched, not sharply arched in the middle (Figure 36C; D)..... 41

41 (40) Ninth elytral interstria (on pseudoepipleuron) without carina, or with an inconspicuous carina (Figure 37A)..... ***Deltochilum* (*Calhyboma*)** Kolbe, 1893

– Ninth elytral interstria distinctly carinate (Figure 37B)..... 42

42 (41) Elytra dorsally flattened (Figure 38A). Carina on ninth interstria (on pseudoepipleuron) present on at least anterior three-fourths of interstria..... ***Deltochilum* (*Deltochilum*)** Eschscholtz, 1822

– Elytra not dorsally flattened (Figure 38B). Carina on ninth interstria extending at most one-half length of interstria..... 43

43 (42) Clypeus bidentate (Figure 39A). Metaventrite without tubercles posteriorly (Figure 39B)..... ***Deltochilum* (*Deltohyboma*)** Lane, 1946

– Clypeus quadridentate (Figure 39C). Metaventrite bituberculate posteriorly (Figure 39D)..... ***Deltochilum* (*Hybomidium*)** Shipp, 1897

44 (39) Posterior edge of head not margined between eyes, at most with short remnants in middle or near eyes (Figure 40A) (except for most specimens of *Sylvicanthon proseni*; see Cupello & Vaz-de-Mello 2018). Mesoventrite relatively long, not narrowed medially, completely horizontal (Figure 40B)..... 45

– Posterior margin of head clearly and completely margined between eyes (Figure 40C). Mesoventrite shorter medially than laterally, or positioned vertically and weakly visible from below (Figure 40 D) 47

45 (44) Protibiae with three teeth, at least the apical tooth in the shape of half-moon (falciform) (Figure 41A). Mesotibiae with the laterodorsal line of setae interrupted, or with an angulation near the central region, without any transverse tooth or keel on its lateral side. Metatibiae straight. Length 5–7 mm..... ***Tetraechma*** Blanchard, 1841

– Protibiae with two to four triangular teeth. Mesotibiae with laterodorsally line of setae, without interruption, at most with a small central agglomeration of setae, with or without tooth or transverse keel on its lateral side. Metatibiae straight or curved…. 46

46 (45) Elongate body. Clypeus with four acute teeth, with emargination between them (Figure 41B). Pronotum lateral edges nearly straight and subparallel (Figure 41B). Elytra surface coated with minute setae. Length 3–6 mm..... ***Pseudocanthon*** Bates, 1887

– Oval body. Clypeus with two or four teeth without emargination between them (Figure 41C). Pronotum with lateral edges forming a strong medial angle (Figure 41C). Glabrous elytral surface. Length 4.5–9.2 mm..... ***Sylvicanthon*** Halffter & Martínez, 1977

47 (44) Pronotum with sides explanate, with acute median tooth, denticulate anteroventrally. Elytra with strong, complete lateral carina. Color opaque brown (coriaceous) on elytra. Length 7.4–10.4 mm (Figure 42A)..... ***Hansreia*** Halffter & Martínez, 1977

– Sides of pronotum not explanate, not denticulate anteriorly. Elytra often carinate laterally, but if so, carina incomplete (effaced) anteriorly and pronotum and elytra similarly colored (Figure 42B)..... 48

48 (47) Head shaped as elongate triangle (Figure 43A). Meso- and metatibia with transverse carina, most visible in mesotibiae (Figure 43B). Dorsum bicolored. Length 6–6.5 mm..... ***Canthotrypes*** Paulian, 1939

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55 (52) Pygidium and propygidium not separated by transverse carina (Figure 49A)..... ***Canthon*** Hoffmansegg, 1817: *incertae sedis,* **grupo *septemmaculatus***

– Pygidium and propygidium at least partially separated by transverse carina (Figure 49B)..... 56

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– Clypeus with at least two (sometimes more) well-defined clypeal teeth; central teeth separated from each other by narrow emargination. Body usually not depressed around scutellum (Figure 50B)..... ***Canthon* (*Canthon*)** Hoffmannsegg, 1817

57 (38) Metatibia curved, only slightly widened apically, width at apex at most only slightly greater than one-fifth length of tibia. Inner apical angle of meso- and metatibiae produced beyond insertion of tarsus, bearing spur. Length 2.5–3 mm (Figure 51A) ..... ***Sinapisoma*** Boucomont, 1928

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61 (58) Inner apical angle of protibia ~ 90º or acute (Figure 55A). Mesoventrite usually very short, positioned almost vertically. Metaventrite usually convex (Figure 55B). Dilatation of meso- and metatibiae resulting from curvature of inner margin only; outer margin straight. Length 3–15 mm..... ..... ***Canthidium*** Erichson, 1847..... 62

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– Pronotum may be punctate posteriorly but lacks distinct row of larger punctures along posterior margin (Figure 56C). First and second elytral striae not joined apically to lateral striae (Figure 56D**)** ..... ***Canthidium* (*Canthidium*)** Erichson, 1847

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65 (64) Mesometaventral suture straight or feebly curved, never angulate (Figure 59A). Frontoclypeal suture always tuberculate.....***Ontherus* (*Caelontherus*)** Génier, 1996

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– Clypeus teeth margined with outer edge of the head strongly angled at junction of clypeus and gena (Figure 61C). Female sixth abdominal

ventrite with modifications at medial area (such as tubercles, rounded lobes or projections)..... ***Dichotomius* (*Cephagonus*)** Luederwaldt, 1929

Chave de identificação para os gêneros e subgêneros de Scarabaeinae da Amazônia brasileira baseada em Vaz-de-Mello et al. (2011)

1 Ponta do mesoescutelo claramente visível entre as bases dos élitros, porção exposta triangular, arredondada, gutiforme ou pentagonal (Figura 2A)..... 2
– Mesoescutelo completamente coberto pelos élitros (Figura 2B)... 3
2 (1) Corpo achatado dorsalmente, alongado, com laterais paralelas (Figura 3A). Mesocoxas paralelas ao eixo longitudinal do corpo, posicionadas externamente em relação ao metaventrito (Figura 3B). Comprimento 5.5–25 mm..... ***Eurysternus*** Dalman, 1824
– Corpo ligeiramente convexo dorsalmente, geralmente de forma oval (Figura 3C). Mesocoxas perpendiculares ou oblíquas ao eixo longitudinal do corpo (Figura 3D). Comprimento 12–30 mm..... ***Malagoniella* (*Malagoniella*)** Martínez, 1961
3 (1) Corpo achatado e alongado (Figura 4A). Meso- e metatarsômeros fortemente achatados (Figura 4B). Pigídio horizontal (Figura 4B). Meso- e metatarsômeros apical com forte processo espiniforme sobre a inserção das garras. Comprimento 6–10.5 mm..... ***Bdelyrus*** Harold, 1869
– Pigídio claramente vertical (Figura 4C), ou o meso- e metatarsômeros apical sem processo espiniforme, ou ambos..... 4
4 (3) Perna anterior com fóvea trocanto-femoral (Figura 5A)..... 5
– Perna anterior sem fóvea trocanto-femoral (Figura 5B)..... 16
5 (4) Pronoto e élitros, pelo menos lateralmente, coberto por pelos. Último ventrito abdominal grandemente expandido no meio, cobrindo todo o disco do abdome, demais ventritos visíveis apenas nas laterais do abdome (Figura 6A)..... 6
– Pronoto e élitros podendo ou não ter pelos. Último ventrito abdominal não cobrindo totalmente o disco, demais ventritos visíveis e diferenciáveis claramente também no meio do abdome (Figura 6B)..... 12
6 (5) Pseudoepipleura formando duas sinuosidades laterais, sendo que a posterior (que fica à altura da metacoxa) cobre parcialmente a verdadeira epipleura, e frequentemente é angulada. Comprimento 3–5.3 mm (Figura 7A; B)..... ***Trichillum*** Harold, 1868
– Pseudoepipleura formando no máximo uma longa sinuosidade na metade anterior, que não se dobra sobre a epipleura (epipleura pode apresentar uma escavação próxima à metacoxa) (Figura 7C)..... 7
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– Pseudoepipleura gradualmente estreitada para o ápice, sem ângulo à altura da metacoxa (Figura 8B)..... 9
8 (7) Sutura clípeo genal claramente marcada, completamente visível da sutura fronto-clipeal. Borda clípeo-genal com uma incisão, fazendo com que o clípeo e gena pareçam separadamente arredondados (Figura 9A). Estrias elitrais não carenadas (Figura 9B). Comprimento 2.5–4.7 mm..... ***Eutrichillum*** Martínez, 1969
– Suturas clípeo-genal e clípeo-frontal indistintas. Borda clípeo-genal reta a levemente sinuada (Figura 9C). Estrias elitrais carenadas (Figura 9D). Comprimento 2–3.5 mm..... ***Besourenga*** Vaz-de-Mello, 2008
9 (7) Protíbia com dois dentes laterais, distribuídos pela metade apical da protíbia ou menos (Figura 10A). Mesotíbia gradualmente alargada para o ápice, região apico-lateral coberta por escova de cerdas longas..... 10
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28 (19) Meso- e metatarsos com o tarsômero basal expandido, mais largo que longo ou quase (Figura 25A). Palpos labiais com um palpômero. Comprimento ≅13 mm..... ***Megatharsis*** Waterhouse, 1891

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– Interestrias elitrais nunca fortemente esculturadas, são microesculpidos (Figura 28B). Superfície ventral da protíbia com uma única fileira de cerdas nas bases dos dentes laterais. Exemplares pequenos ou médios, raramente com mais de 25 mm..... ***Coprophanaeus*** **(*Coprophanaeus*)** d'Olsoufieff, 1924

32 (30) Cabeça com carena transversal frontal, além da carena frontoclipeal. Comprimento 20–32 mm (Figura 29A)..... ***Diabroctis*** Gistel, 1857

– Cabeça apenas com corno ou carena frontoclipeal, nunca com as duas (Figura 29B)..... 33

33 (32) Metaventrito com forte processo espiniforme curvado dorsalmente, que se instala entre os ápices das procoxas. Comprimento 8–27 mm (Figura 30A)..... ***Oxysternon*** Castelnau, 1840…..... 34

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– Processo clipeal espiniforme ou em forma de carena transversal (Figura 31C). Carenas clipeais laterais presentes. Metaventrito sem fileira de pontos grandes (Figura 31D). Comprimento >12 mm ..... ***Oxysternon*** **(*Oxysternon*)** Castelnau, 1840

35 (33) Porção anterior da carena circumnotal inteira, não interrompida atrás de cada olho. Comprimento 11–30 mm (Figura 32A)... ..... ***Sulcophanaeus*** d'Olsoufieff, 1924

– Porção anterior da carena circumnotal interrompida atrás de cada olho. Comprimento 6–20 mm (Figura 32B)..... ..... ***Phanaeus* (*Notiophanaeus*)** Edmonds, 1994

36 (18) Corpo quase sempre muito alongado, cilíndrico (Figura 33A). Garras tarsais reduzidas, quase retas ou levemente curvada (Figura 33B). Hipômero convexo ou ligeiramente côncavo, nunca fortemente escavado acima. Cabeça sem carena transversal. Comprimento 2.8–8.7 mm..... ***Anomiopus*** Westwood, 1842

– Corpo achatado, hemisférico, arredondado ou oval, mas não cilíndrico (Figura 33C). Garras tarsais longas, fortemente curvas, em forma de foice ou angular (Figura 33D). Hipômero profundamente escavado anteriormente, e/ou cabeça dorsalmente com carena transversal..... 37

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38 (37) Meso- e metatíbias não alargadas para o ápice, ou apenas fraca e gradualmente (Figura 34A)..... 39

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– Interestrias elitrais sem carenas ou tubérculos apicais, no máximo uma carena lateral que pode ser quase completa (Figura 35B)... 44

40 (39) Cabeça mais longa do que larga, estreitada anteriormente. Metatíbias bruscamente arqueadas na metade (Figuras 36A; B) ..... ***Deltochilum* (*Aganhyboma*)** Kolbe, 1893

– Cabeça distintamente mais larga do que longa, não estreitada triangularmente. Metatíbias, quando fortemente arqueadas, são sinuosas ou largamente arqueadas, não bruscamente arqueadas na metade (Figuras 36C; D)..... 41

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– Nona interestria elitral distintamente carenada (Figura 37B)..... 42

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– Élitros não achatados dorsalmente (Figura 38B). Carena da nona interestria se estendendo no máximo até a metade anterior da interestria (Figura 39B)..... 43

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– Clípeo quadridentado (Figura 39C). Metaventrito posteriormente bituberculado (Figura 39D)..... ..... ***Deltochilum* (*Hybomidium*)** Shipp, 1897

44 (39) Bordo posterior da cabeça não marginado entre os olhos, no máximo com curtas indicações entre ou próximo aos olhos (Figura 40A) (Exceto em *Sylvicanthon proseni*; ver Cupello & Vaz-de-Mello 2018). Mesoventrito relativamente longo, não estreitado medialmente, completamente horizontal (Figura 40B)..... 45

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– Protíbia com dois a quatro dentes triangulares. Metatíbia com linha de cerdas sem interrupção, no máximo com pequena aglomeração central de cerdas, com ou sem dente ou quilha transversal na face lateral. Metatíbias retas ou curvas..... 46

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47 (44) Pronoto com os lados aplanados, com um dente mediano agudo, anteroventralmente denticulados. Élitros com carena lateral forte e completa. Cor parda opaca (coriácea) nos élitros. Comprimento 7.4–10.4 mm (Figura 42A)... ***Hansreia*** Halffter & Martínez, 1977

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Clave de identificación para los géneros y subgéneros de Scarabaeinae de la Amazonía brasileña, basada en Vaz-de-Mello et al. (2011)

1 Punta del mesoescutelo claramente visible entre la base de los élitros, porción expuesta triangular, redondeada o pentagonal (Figura 2A)... 2

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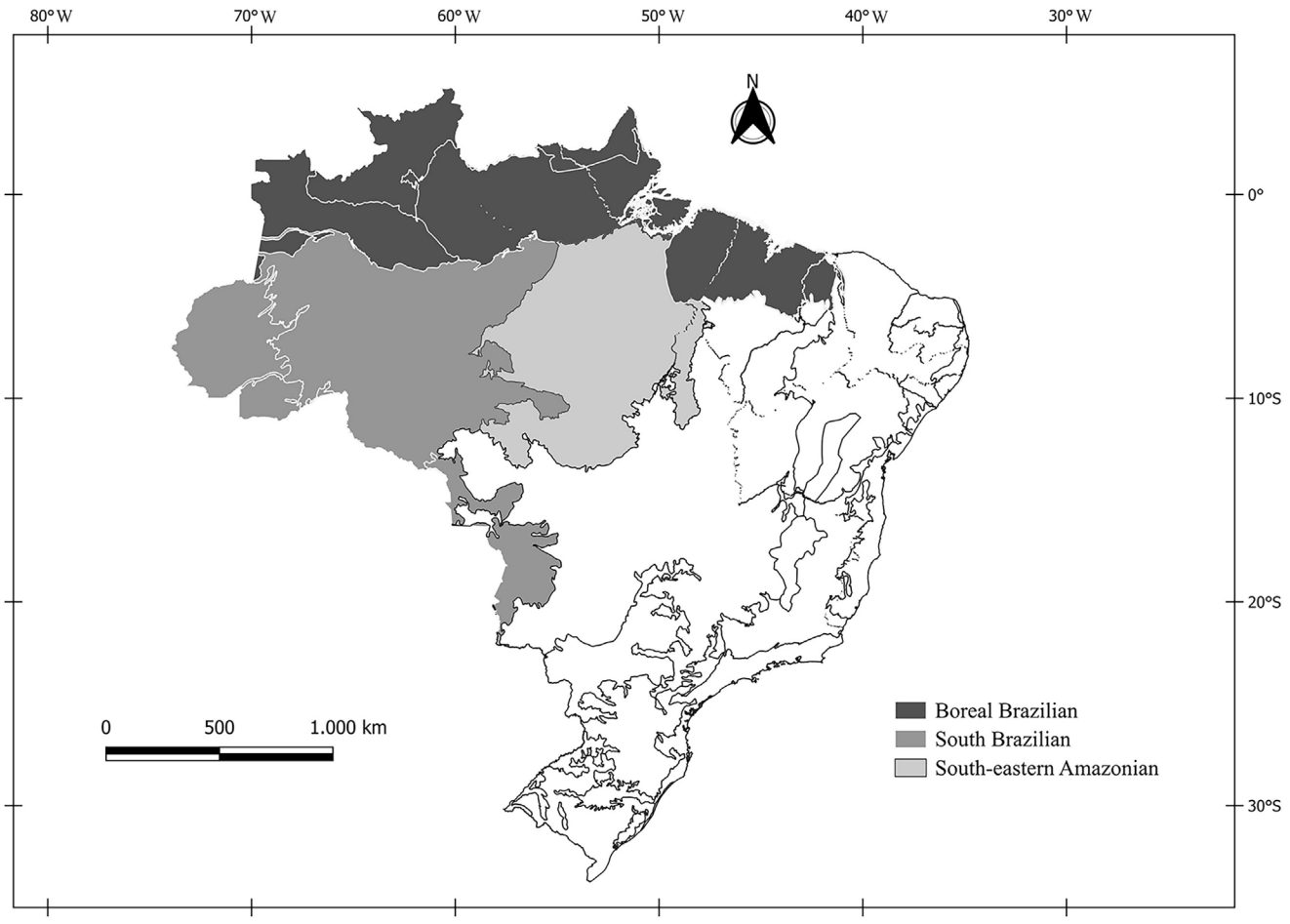
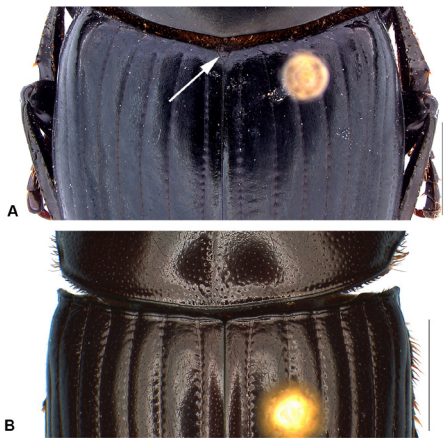


Figure 1. Brazilian Amazon based on Morrone et al. 2022.



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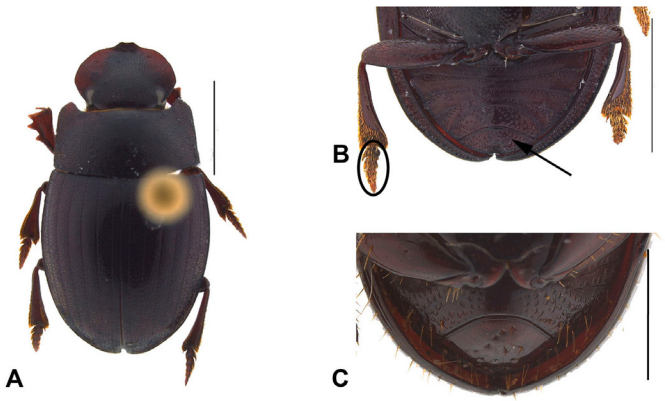

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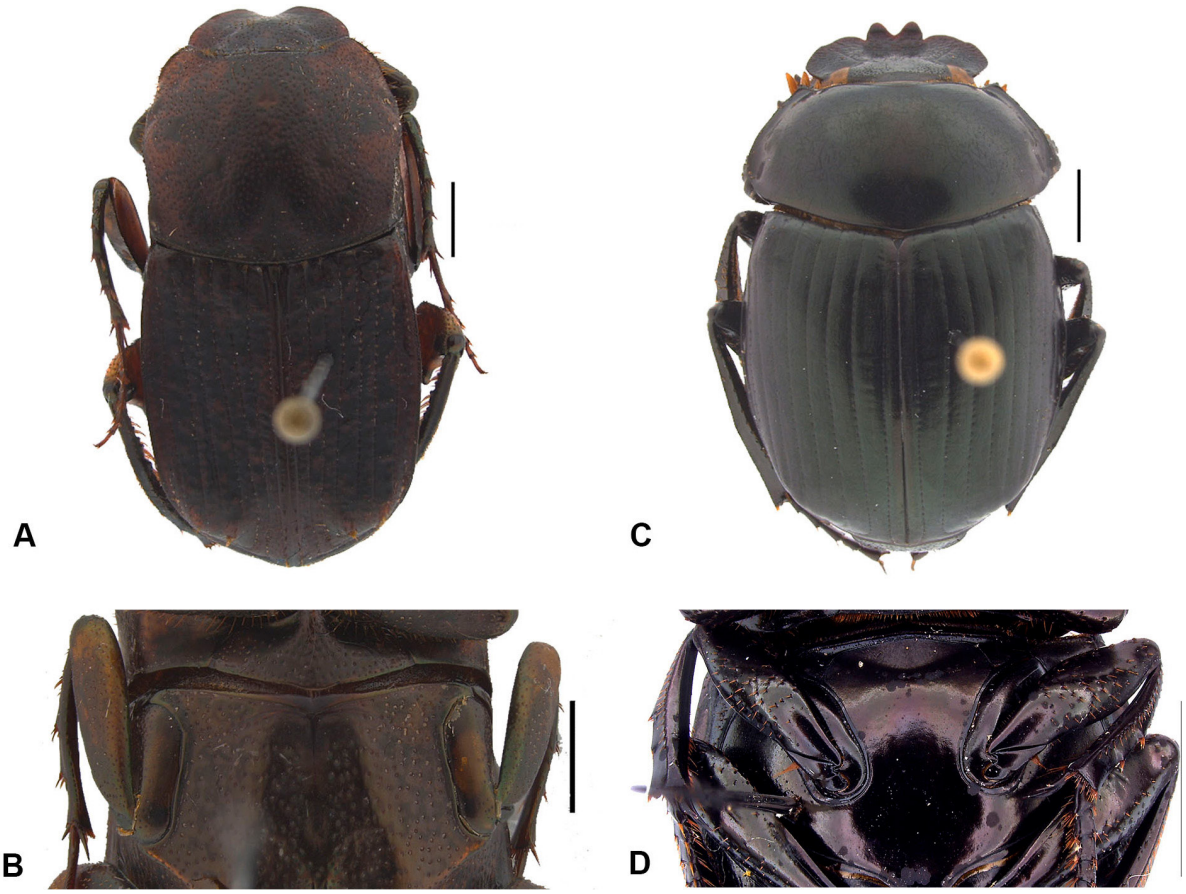

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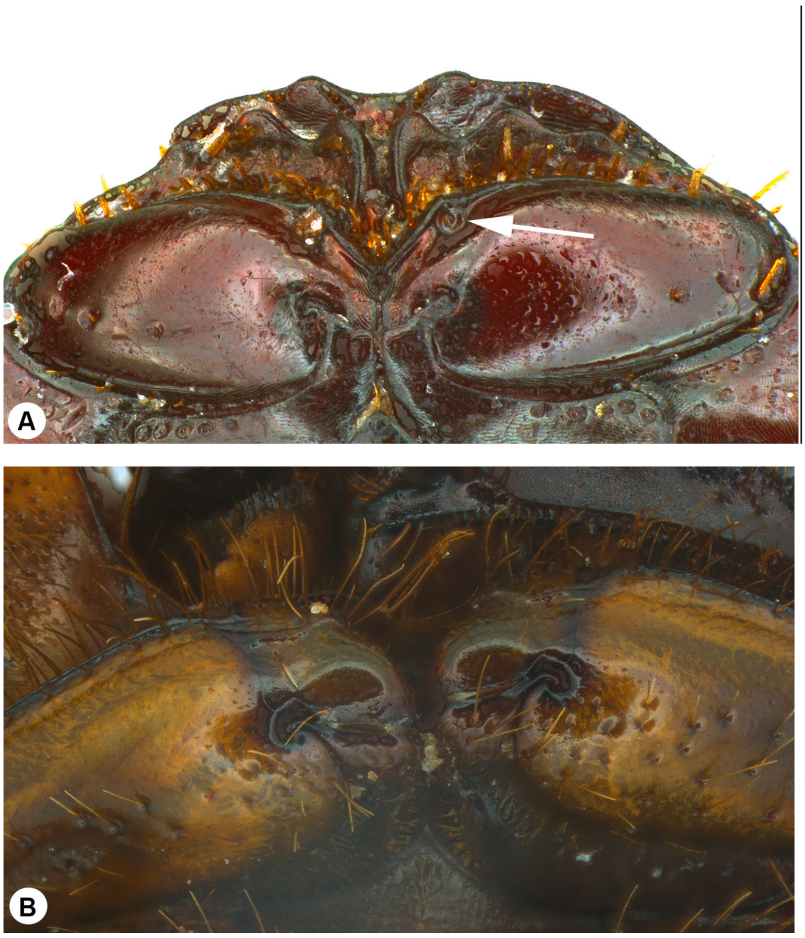

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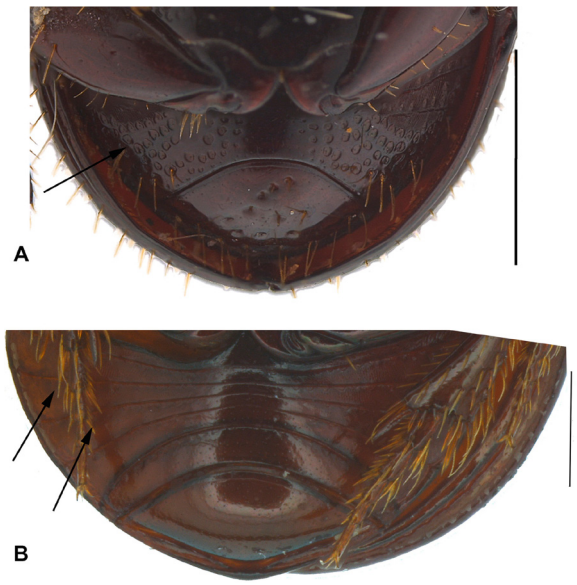

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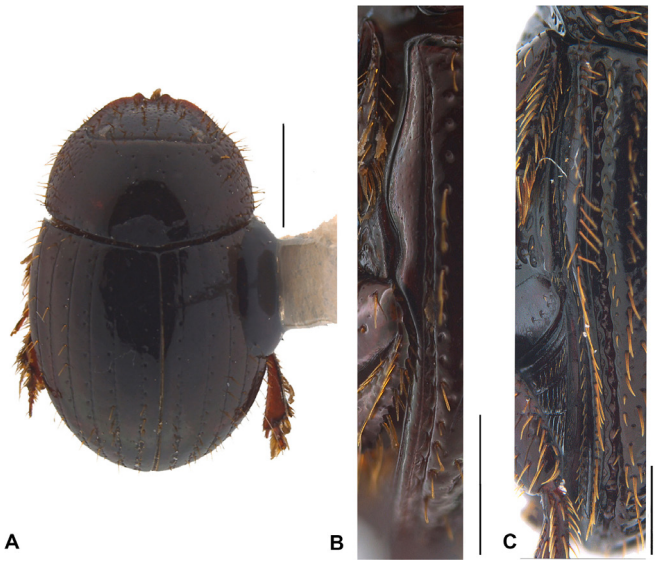

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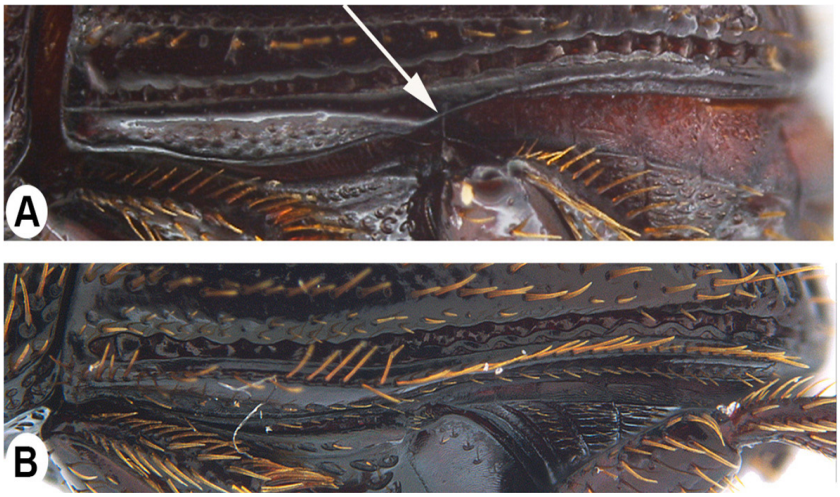

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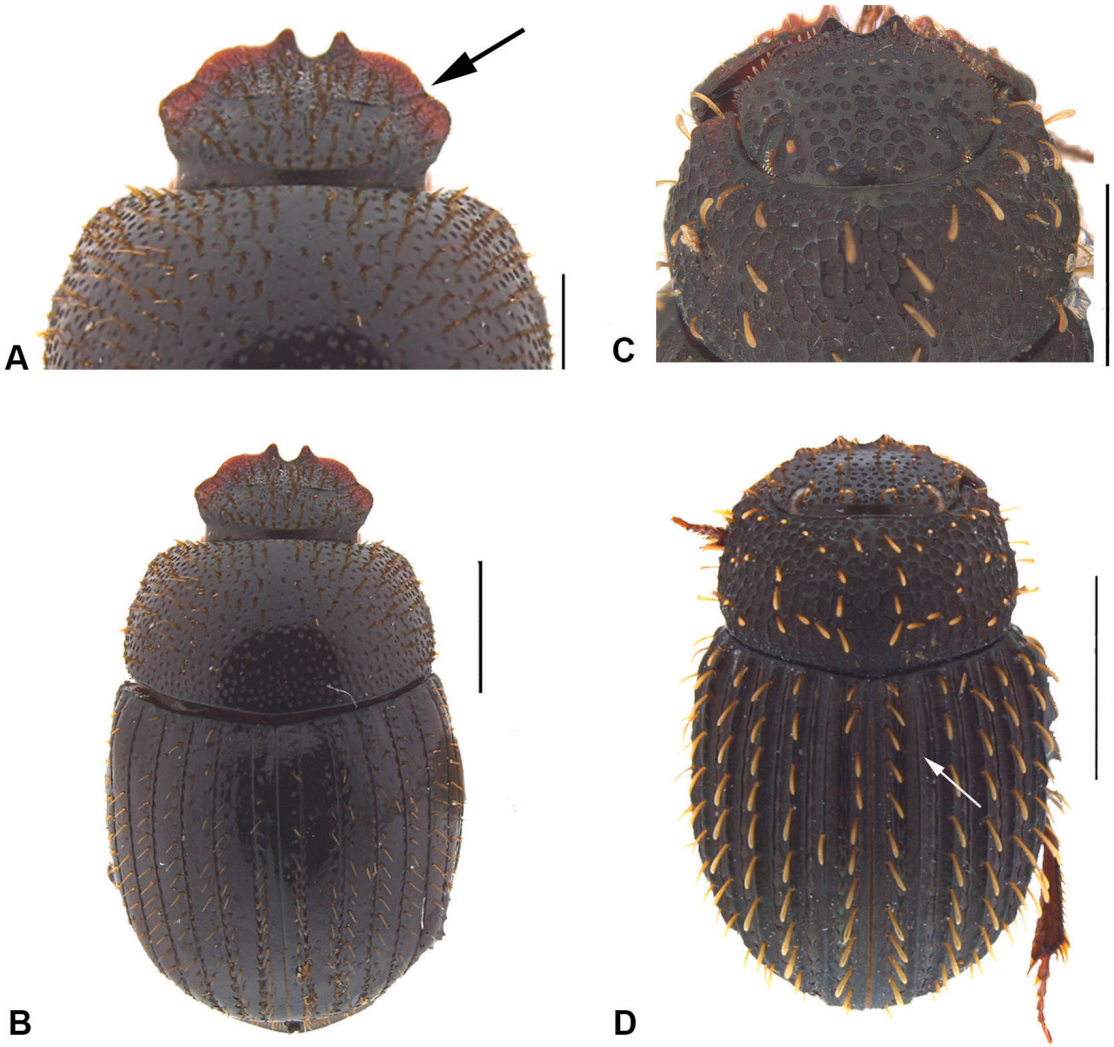

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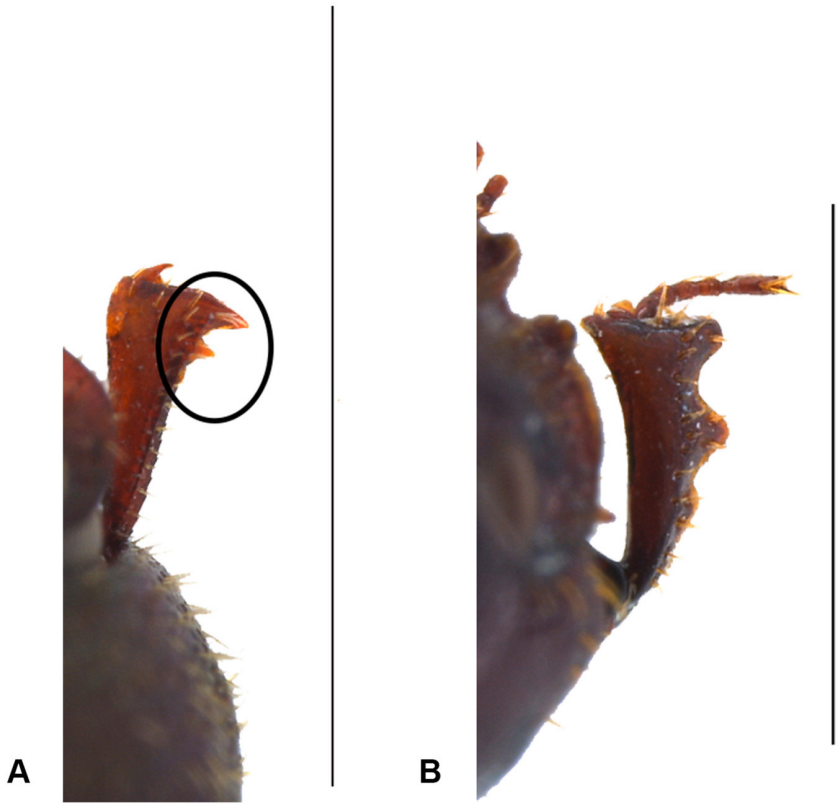

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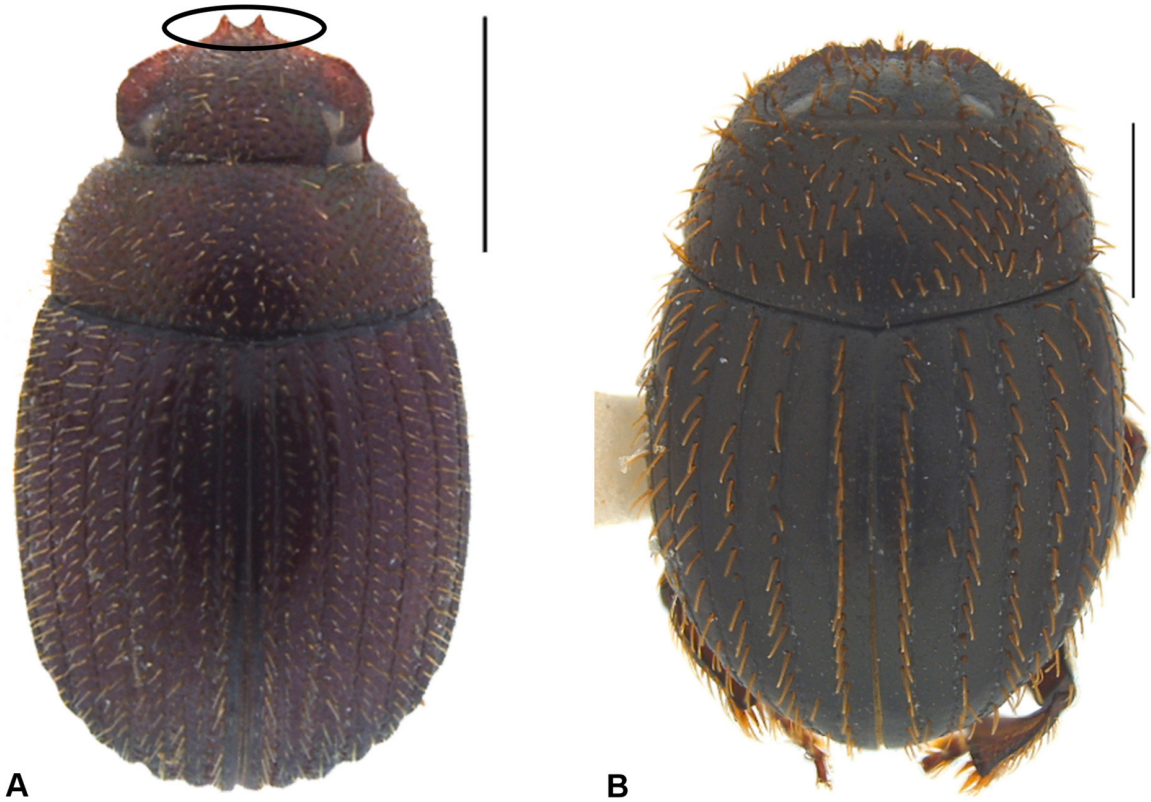

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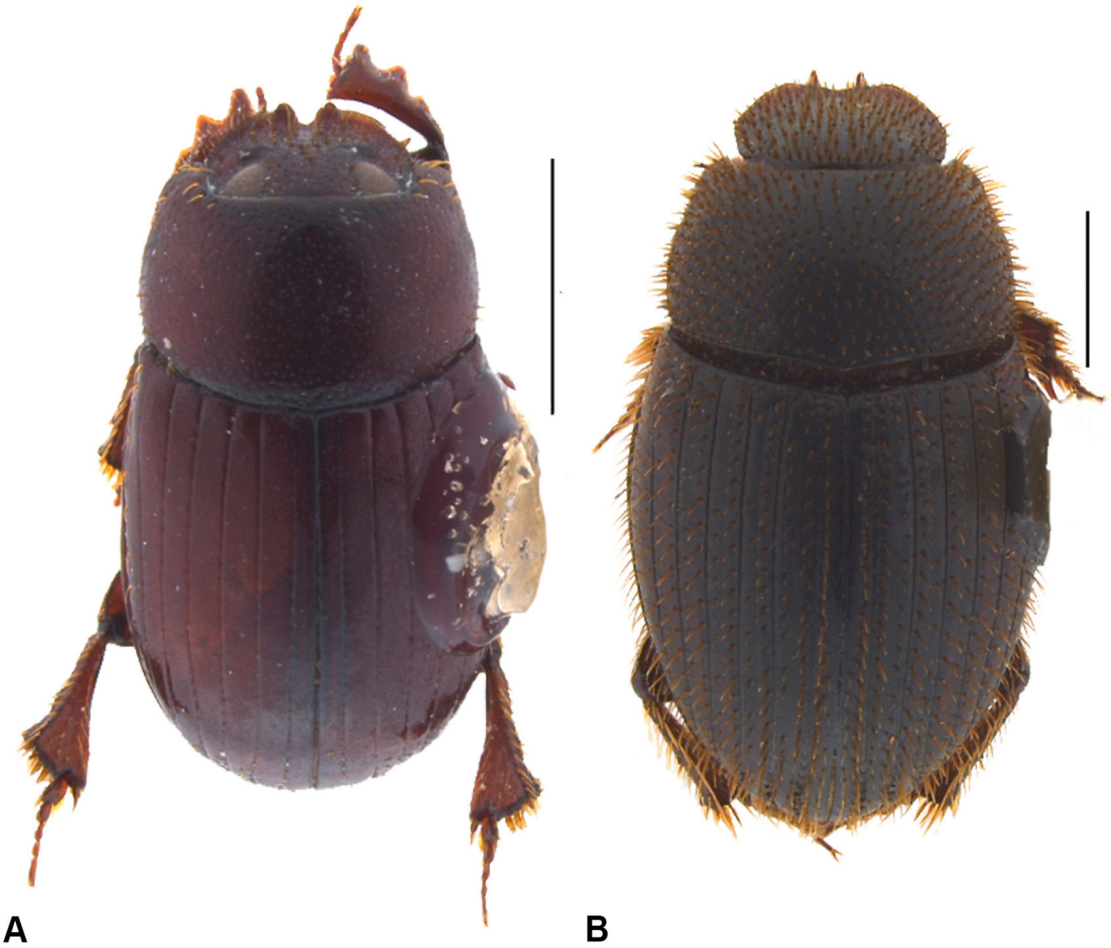

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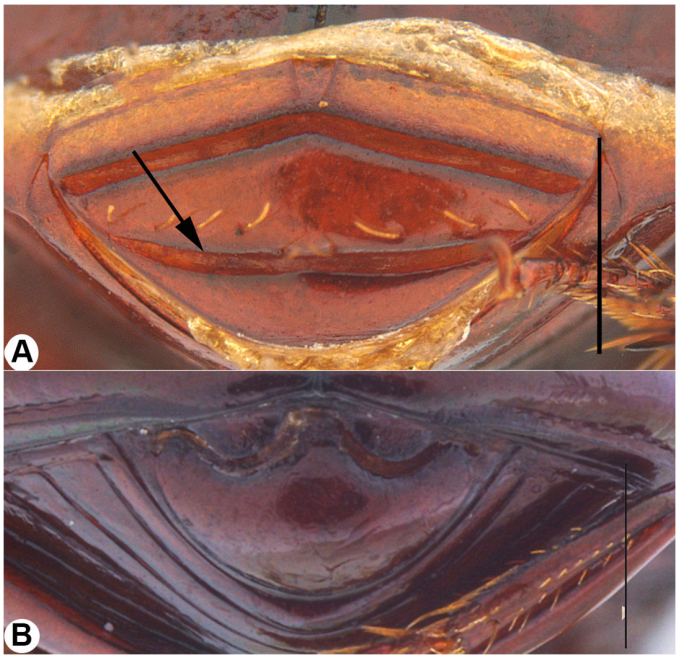

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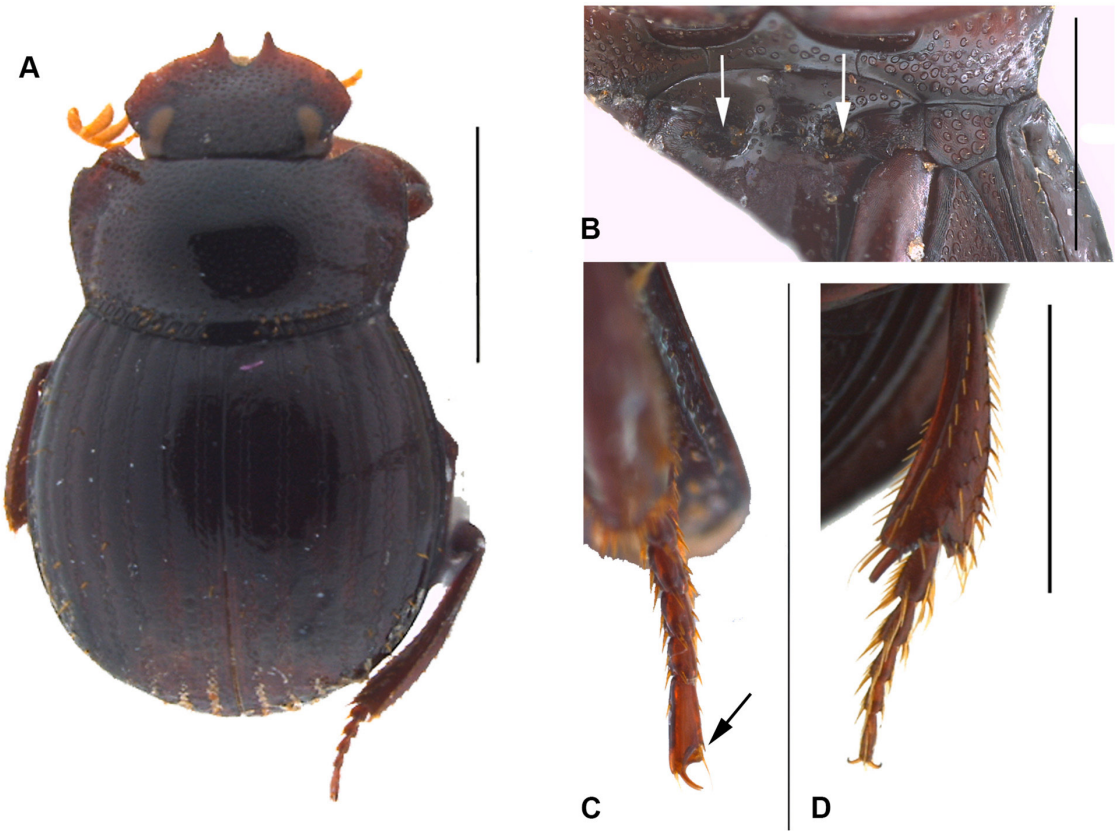

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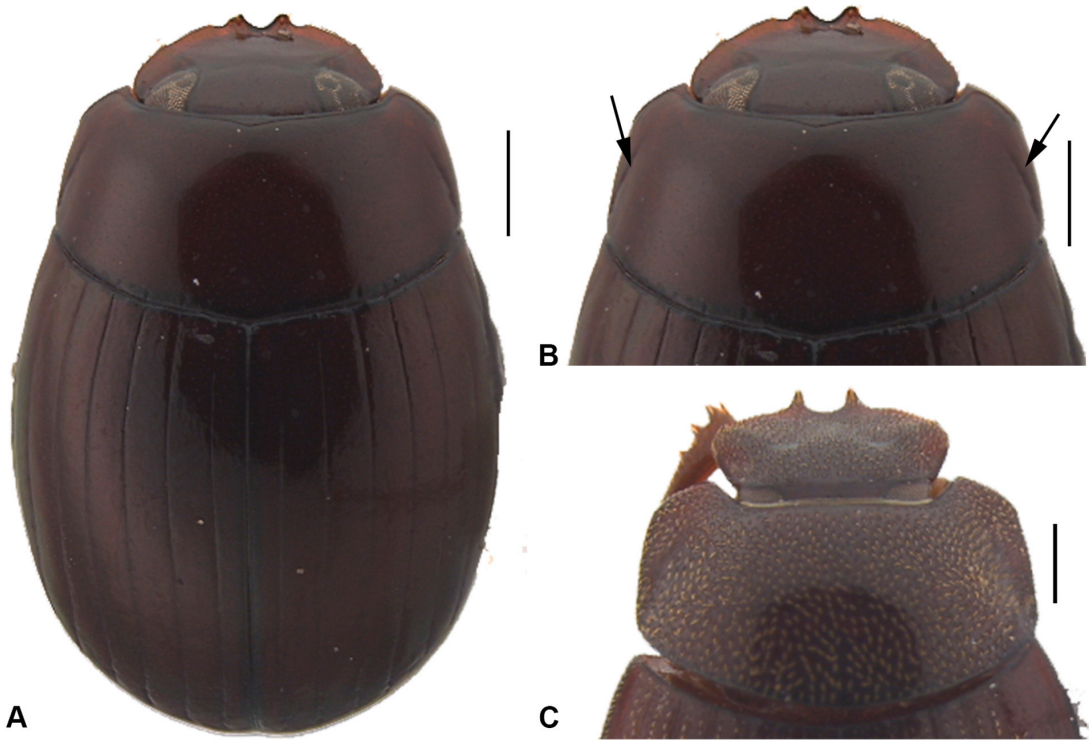

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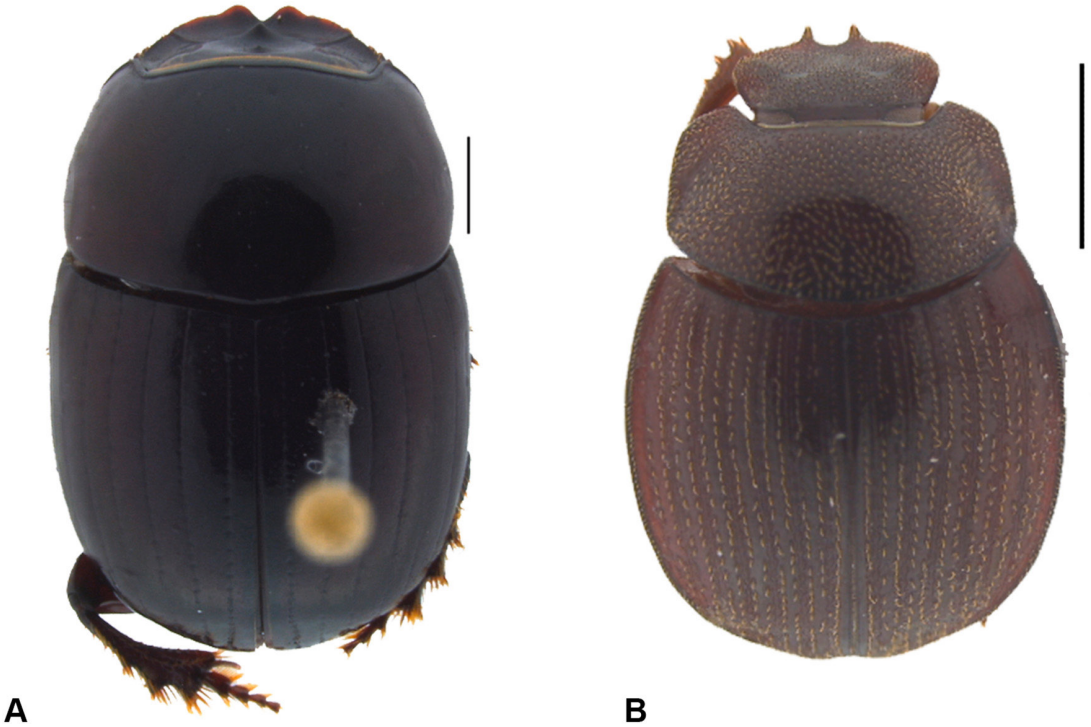

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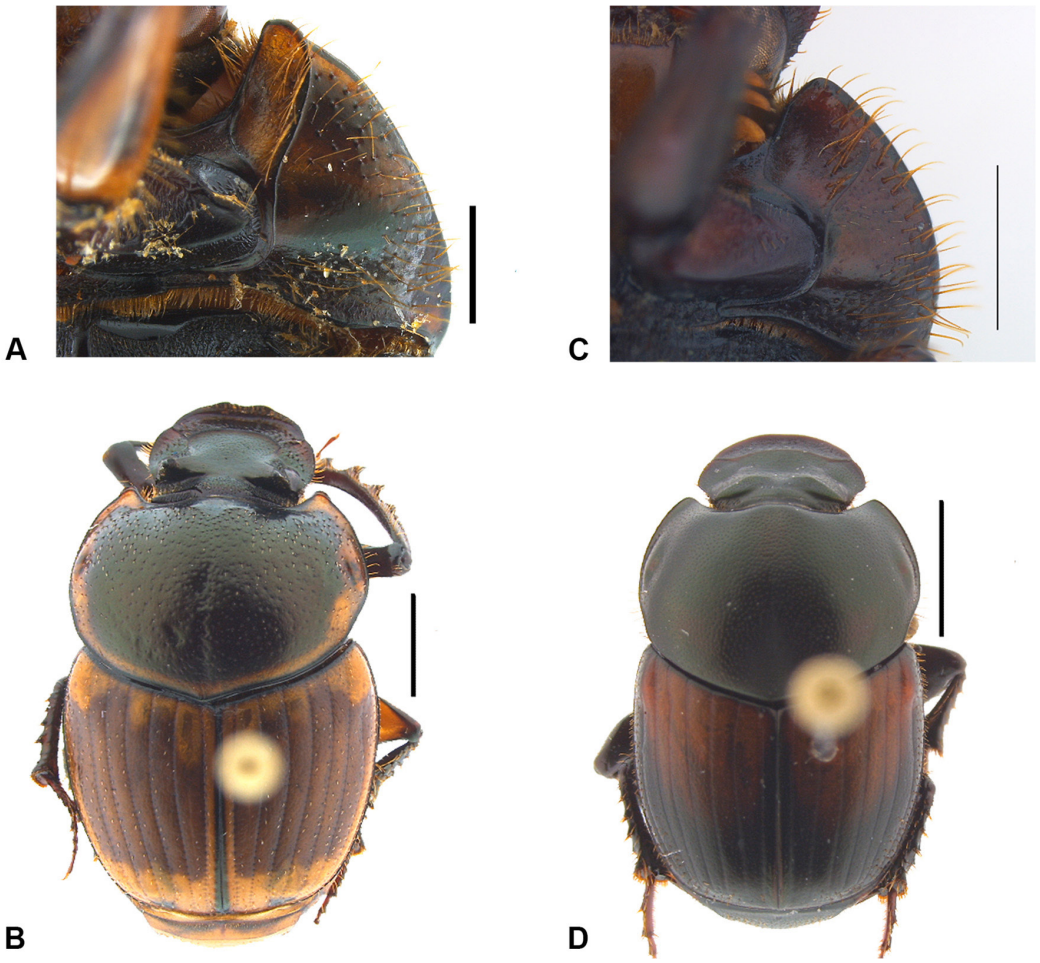

Figure 18. (A-B) *Digitonthophagus gazella* (Fabricius, 1787). (A) Hypomeron with oblique carina reaching lateral margin next to the anterior angle, forming an anterolateral tooth; (B) Dorsal view; (C-D) *Onthophagus* Latreille, 1802. (C) Hypomeron without anterolateral tooth near the anterior angle; (D) dorsal view. Scale bar: A, C – 1 mm; B, D – 2 mm.

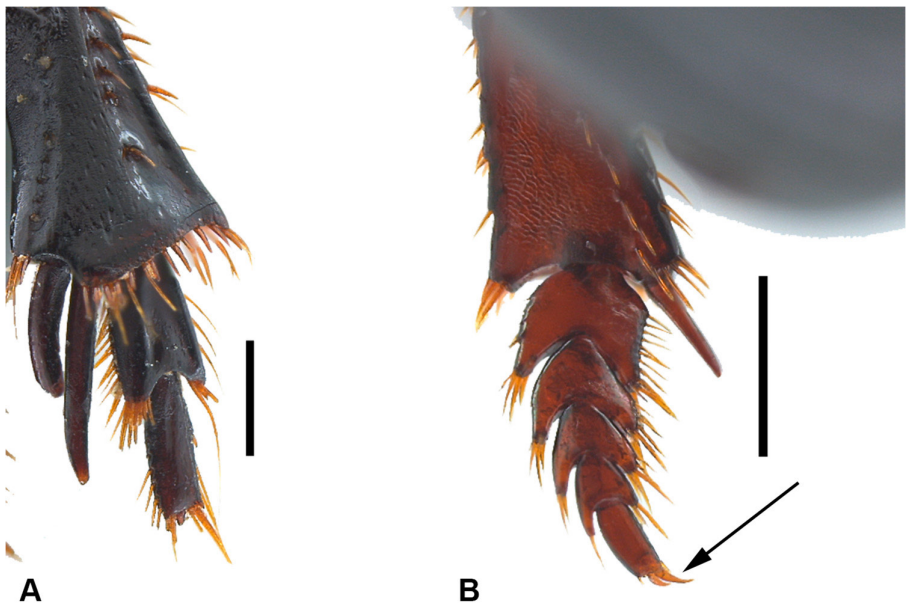

Figure 19. (A) *Dendropaemon* (*Glaphyropaemon*) *angustipennis* Harold, 1869, meso- and metatarsus lacking claws; (B) *Anomiopus* sp., meso- and metatarsus with claws (black arrow). Scale bar: 0.5 mm.

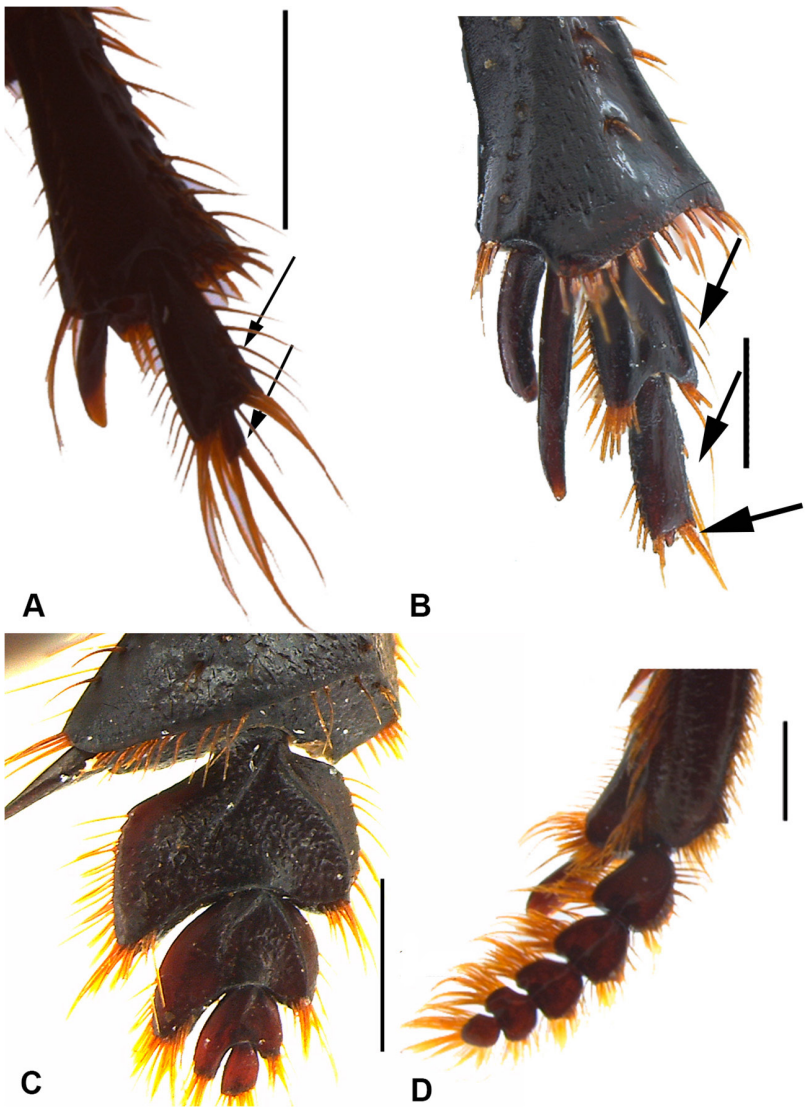

Figure 20. (A) *Dendropaemon* (*Dendropaemon*) *angustulus* Génier & Arnaud, 2016, meso-and metatarsus with 2 tarsomeres (black arrow); (B) *Dendropaemon* (*Glaphyropaemon*) *angustipennis* Harold, 1869, meso- and metatarsus with 3 tarsomeres (black arrow); (C) *Dendropaemon* (*Eurypodea*) *fredericki* (Klages, 1906), meso- and metatarsus with 4 tarsomeres. (D) *Megatharsis buckleyi* Waterhouse, 1891, meso- and metatarsus with five tarsomeres. Scale bar: 1 mm.

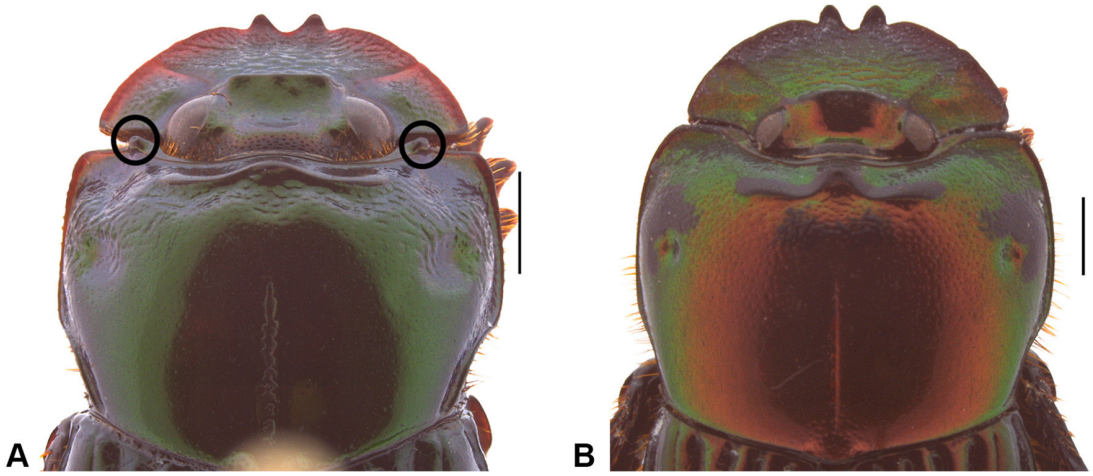

Figure 21. (A) *Dendropaemon* (*Titthopaemon*) *denticollis* Felsche, 1909, anterior margin of pronotum with a small tubercle adjacent to each eye; (B) *Dendropaemon* (*Glaphyropaemon*) *angustipennis* Harold, 1869, anterior margin of pronotum without tubercle adjacent to each eye. Scale bar: 1 mm.

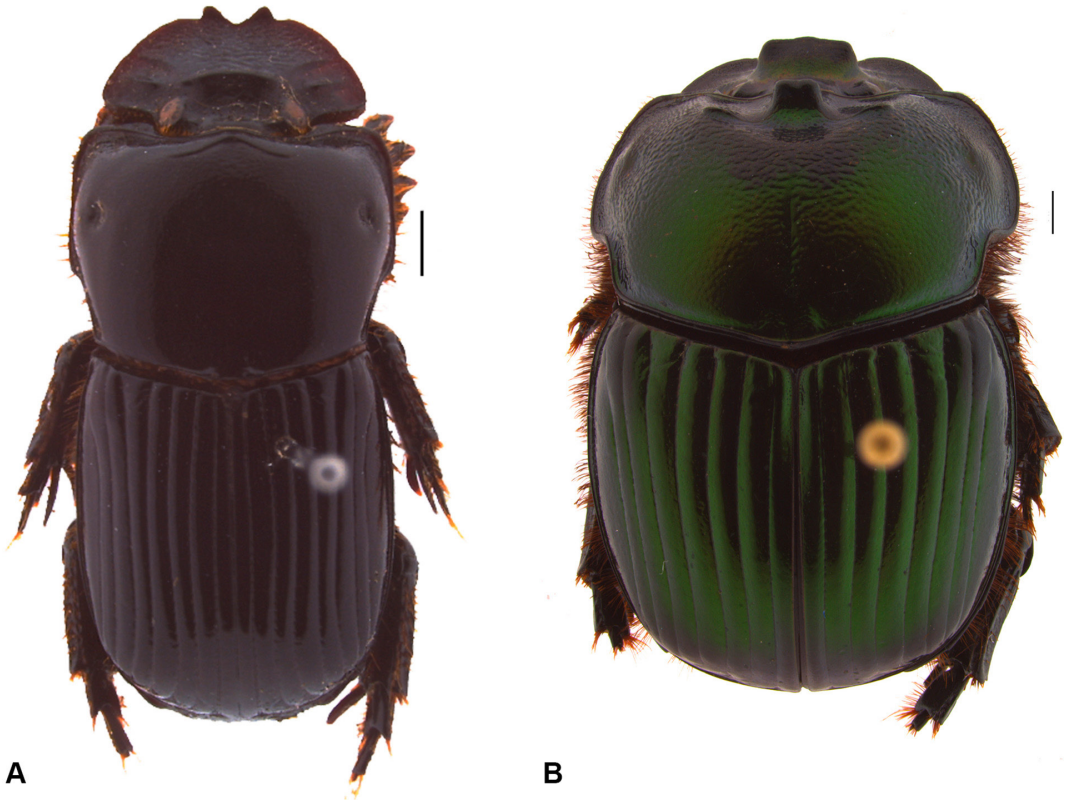

Figure 22. (A) *Dendropaemon* (*Nigropaemon*) *nigritulus* Génier & Arnaud, 2016, *habitus,* completely black, shiny surface, and no metallic sheen; (B) *Dendropaemon* (*Crassipaemon*) *lydiae* Génier & Arnaud, 2016, *habitus,* at least some metallic sheen on the pronotum and/or elytra. Scale bar: 1 mm.

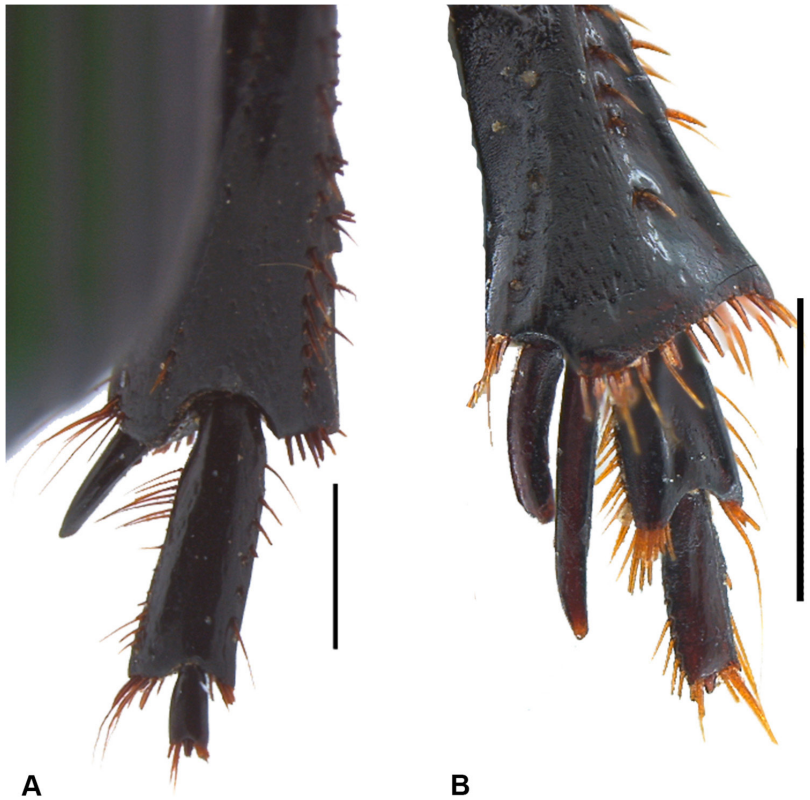

Figure 23. (A) *Dendropaemon* (*Enicotarsus*) *viridipennis* (Laporte, 1831), basal metatarsomere subcylindrical, about four times as long as the second; (B) *Dendropaemon* (*Glaphyropaemon*) *angustipennis* Harold, 1869, basal metatarsomere flattened, less than three times as long as the second. Scale bar: 1 mm.

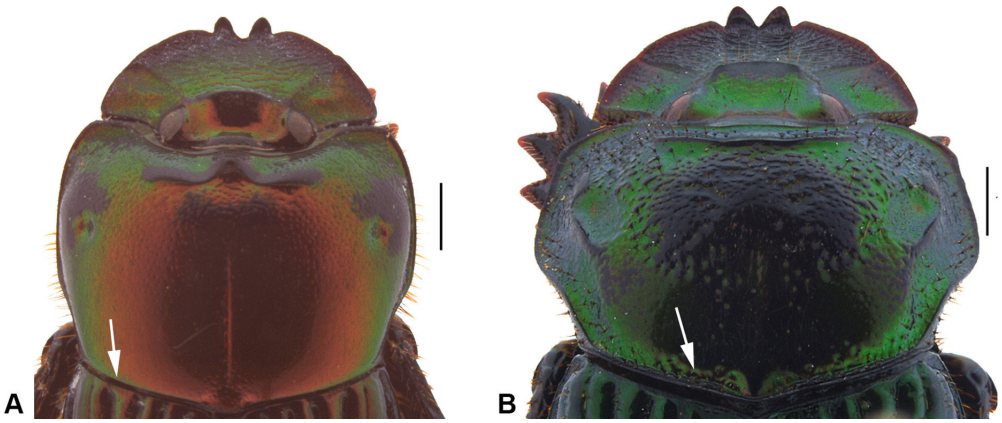

Figure 24. (A) *Dendropaemon* (*Glaphyropaemon*) *angustipennis* Harold, 1869, posterior border of pronotum margined only medially (white arrow); (B) *Dendropaemon* (*Coprophanaeoides*) *furtadoi* Génier & Arnaud, 2016, posterior margin of the pronotum usually complete, if margin more or less interrupted on each side then some setose punctures are present (white arrow). Scale bar: 1 mm.

Figure 25. (A) *Megatharsis buckleyi* Waterhouse, 1891, meso- and metatarsus with basal tarsomere expanded; (B) *Gromphas amazonica* Bates, 1870, meso- and metatarsus with basal tarsomere elongated, always much longer than wide. Scale bar: 1 mm.

Figure 26. (A) *Gromphas amazonica* Bates, 1870, basal antennomere of the antennal club not concave apically to receive the apical lamellae; (B) *Coprophanaeus* (*Coprophanaeus*) *telamon* (Erichson, 1847), basal antennomere of antennal club strongly concave apically to receive the apical lamellae. Scale bar: 1 mm.

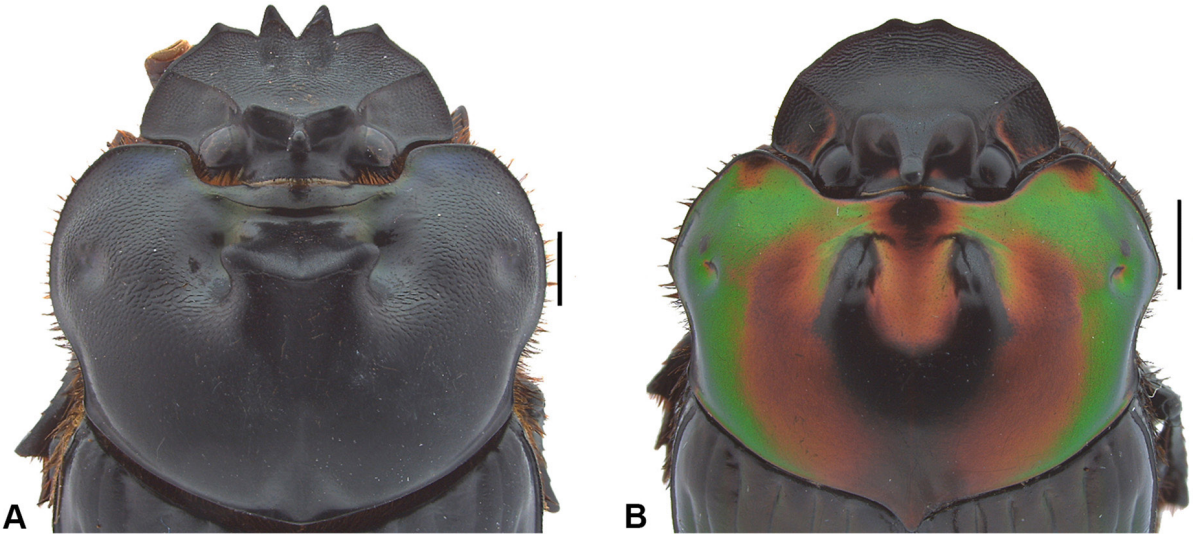

Figure 27. (A) *Coprophanaeus* (*Coprophanaeus*) *telamon* (Erichson, 1847), clypeal margin with deep, acutely median emargination; (B) *Oxysternon* (*Oxysternon*) *macleayi* Nevinson, 1892, clypeal margin without deep, acutely emargination, with at most two conspicuous middle teeth. Scale bar: 2 mm.

Figure 28. (A) *Coprophanaeus* (*Megaphanaeus*) *lancifer* (Linnaeus, 1767), elytral interstriae carinulate transversely, carinulae separated by transverse sulcus; (B) *Coprophanaeus* (*Coprophanaeus*) *dardanus* (MacLeay, 1819), microsculpted elytral interstriae. Scale bar: 1 mm.

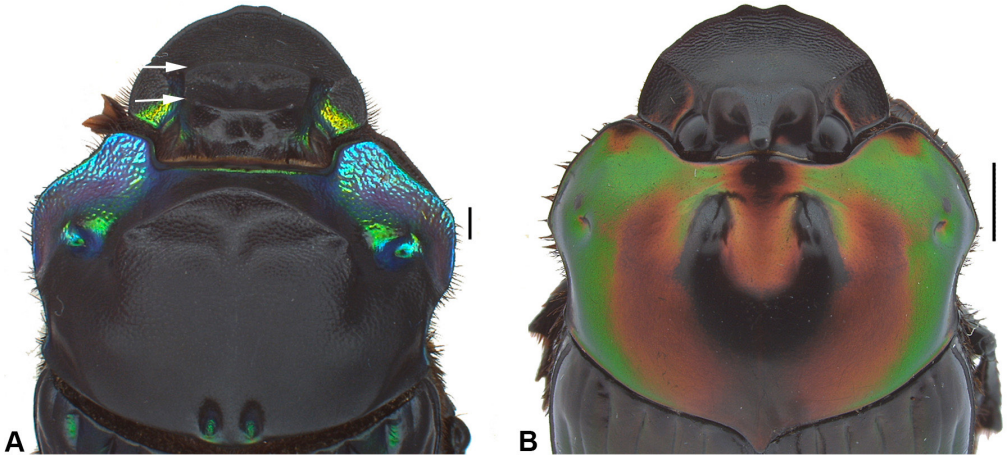

Figure 29. (A) *Diabroctis mimas* (Linnaeus, 1758), head with transverse frontal carina in addition to frontoclypeal carina (white arrow); (B) *Oxysternon* (*Oxysternon*) *macleayi* Nevinson, 1892, head with single horn or carina, never booth. Scale bar: A – 1 mm; B – 2 mm.

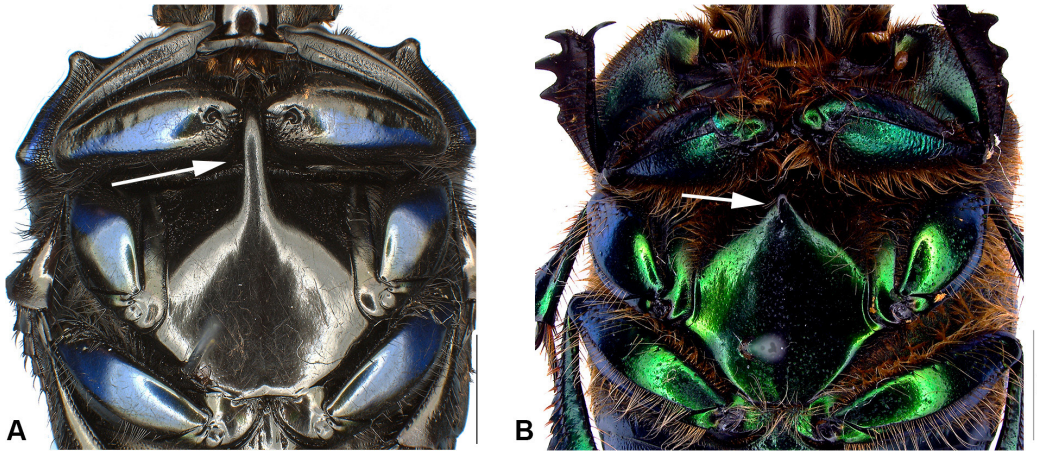

Figure 30. (A) *Oxysternon* (*Oxysternon*) *conspicillatum* (Weber, 1801), metaventrite with long, acute spiniform process (white arrow); (B) *Phanaeus* (*Notiophanaeus*) *kirbyi* Vigors, 1825, metaventrite simply angulate anteromedially, never spiniform (white arrow). Scale bar: 5 mm.

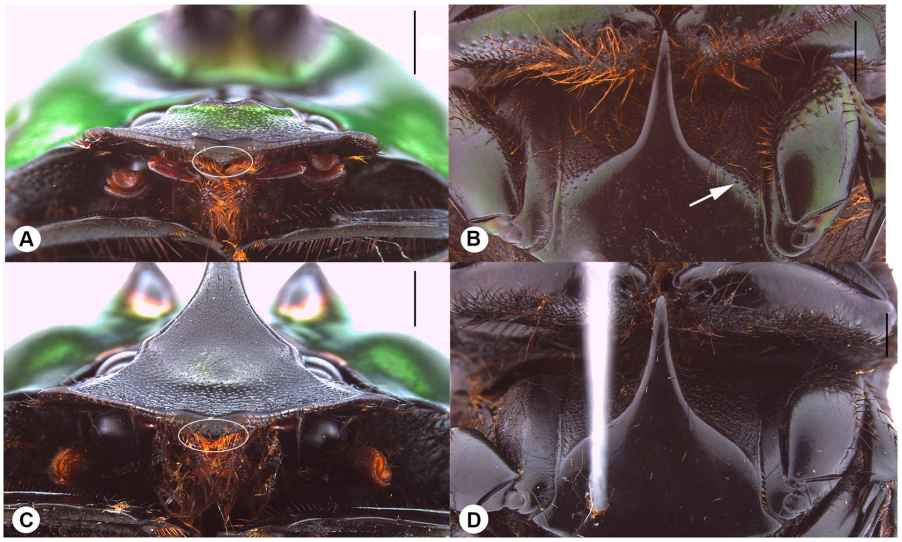

Figure 31. (A-B) *Oxysternon* (*Mioxysternon*) *spiniferum* Castelnau, 1840. (A) Clypeal process reduced to small tubercle (white circle); (B) Metaventrite with row of large points adjacent to the mesocoxae (white arrow); (C-D) *Oxysternon* (*Oxysternon*) *silenum* Castelnau, 1840. (C) Clypeal process spiniform or transverse ridge (white circle); (D) Metaventrite without row of large points. Scale bar: 1 mm.

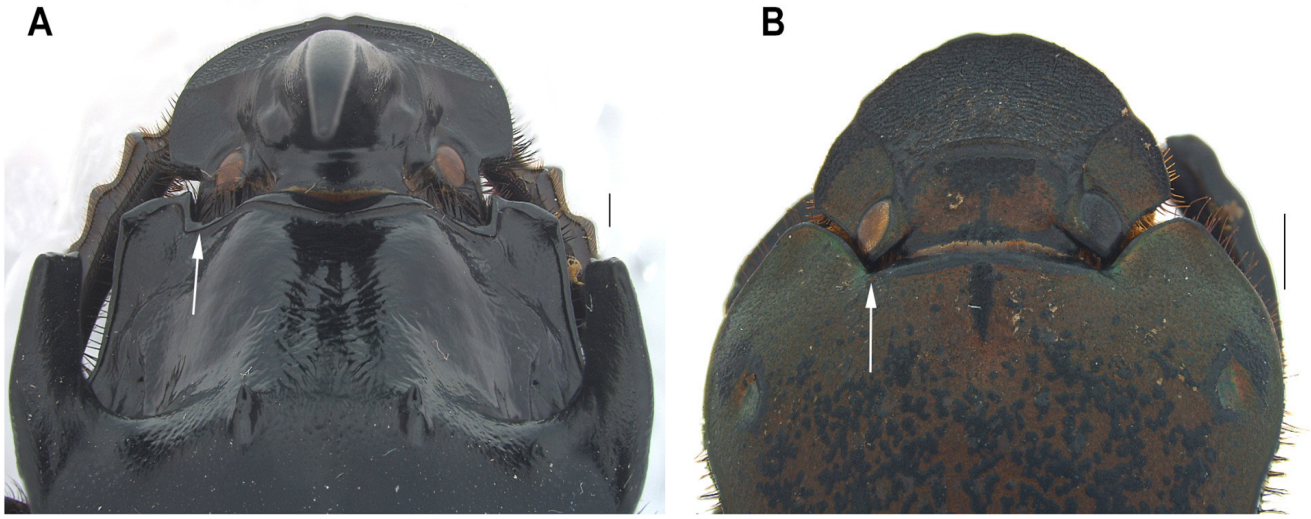

Figure 32. (A) *Sulcophanaeus faunus* (Fabricius, 1775), anterior portion of circumnotal carina entire (white arrow); (B) *Phanaeus* (*Notiophanaeus*) *chalcomelas* (Perty, 1830), anterior portion of circumnotal carina interrupted behind each eye (white arrow). Scale bar: 1 mm.

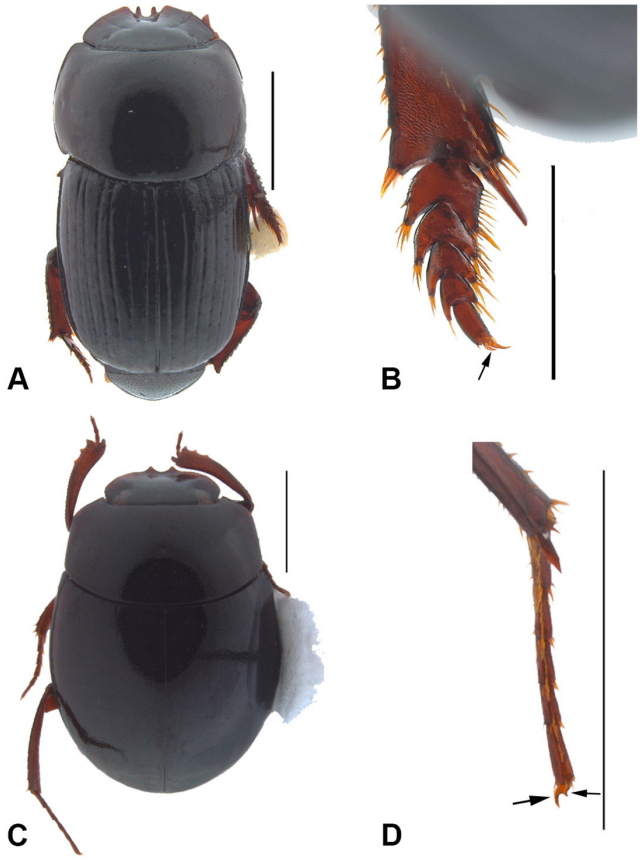

Figure 33. (A-B) *Anomiopus* sp. (A) *Habitus*; (B) Tarsal claws reduced, almost straight or slightly curved (black arrow); (C-D) *Canthonella* Chapin, 1930, (C) *Habitus*; (D) Tarsal claws with strong basal tooth (black arrow); clypeus bidentate. Scale bar: A – 2 mm; B, C; D – 1 mm.

Figure 34. (A-B) Tarsal claws without basal tooth (second black arrow). (A) *Deltochilum* (*Calhyboma*) *carinatum* (Westwood, 1837), meso- and metatibia not appreciably widened apically, or only weakly and gradually (first black arrow); (B) *Canthidium* Erichson, 1847, mesotibia, and usually also metatibia, widened apically (first black arrow). Scale bar: 1 mm.

Figure 35. (A) *Deltochilum* (*Aganhyboma*) *cupreicolle* (Blanchard, 1845), apex of elytral interstriae with short carinae or tubercle (white arrow); (B) *Pseudocanthon* sp., elytral interstriae without apical carinae or tubercles. Scale bar: 1 mm.

Figure 37. (A) *Deltochilum* (*Calhyboma*) *carinatum* (Westwood, 1837), ninth elytral interstria (on pseudepipleuron) without carina, or with an inconspicuous carina; (B) *Deltochilum* (*Deltohyboma*) gp *aspericolle,* ninth elytral interstria distinctly carinate (white arrow). Scale bar: 1 mm.

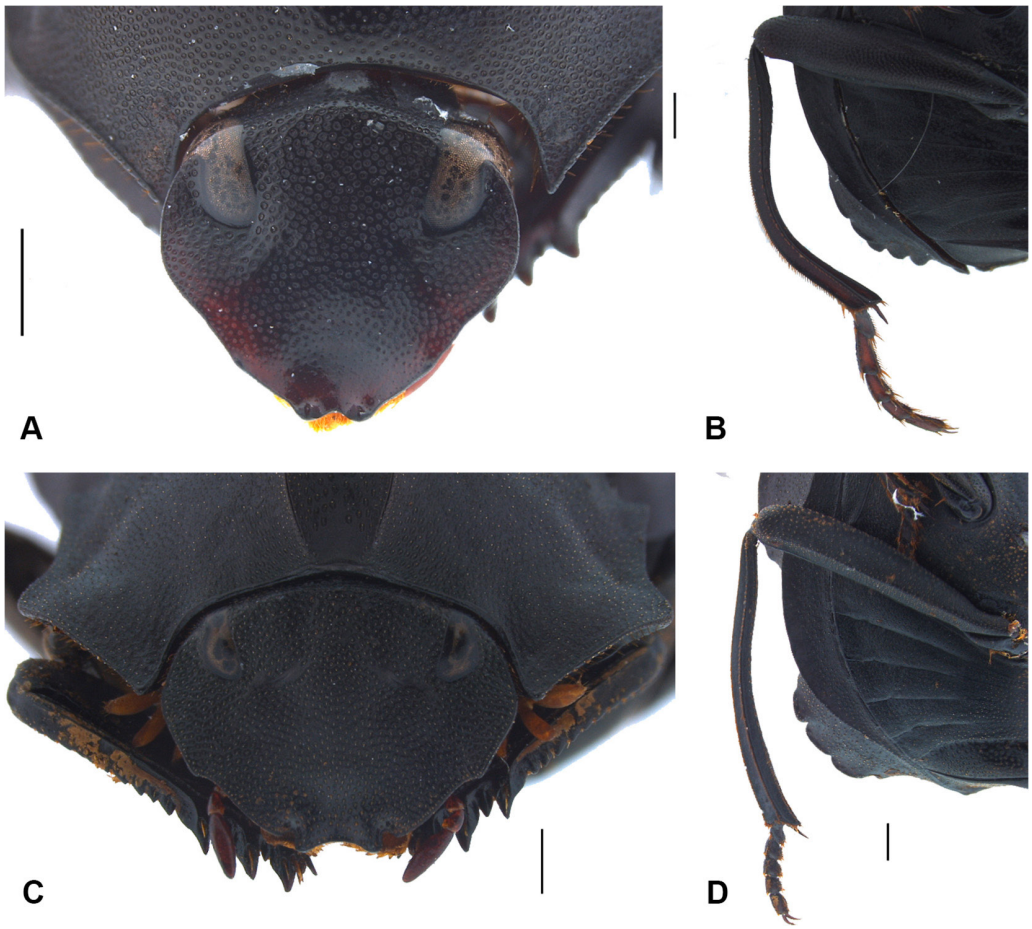

Figure 36. (A-B) *Deltochilum* (*Aganhyboma*) *schefflerorum* Silva, Louzada & Vaz-de-Mello, 2015. (A) Head longer than broad, narrowed anteriorly; (B) Metatibiae sharply arched medially; (C-D) *Deltochilum* (*Calhyboma*) *carinatum* (Westwood, 1837) (C) Head distinctly wider than long, not triangularly narrowed; (D) Metatibiae, when strongly arched, sinuous or widely arched, not sharply arched medially. Scale bar: 1 mm.

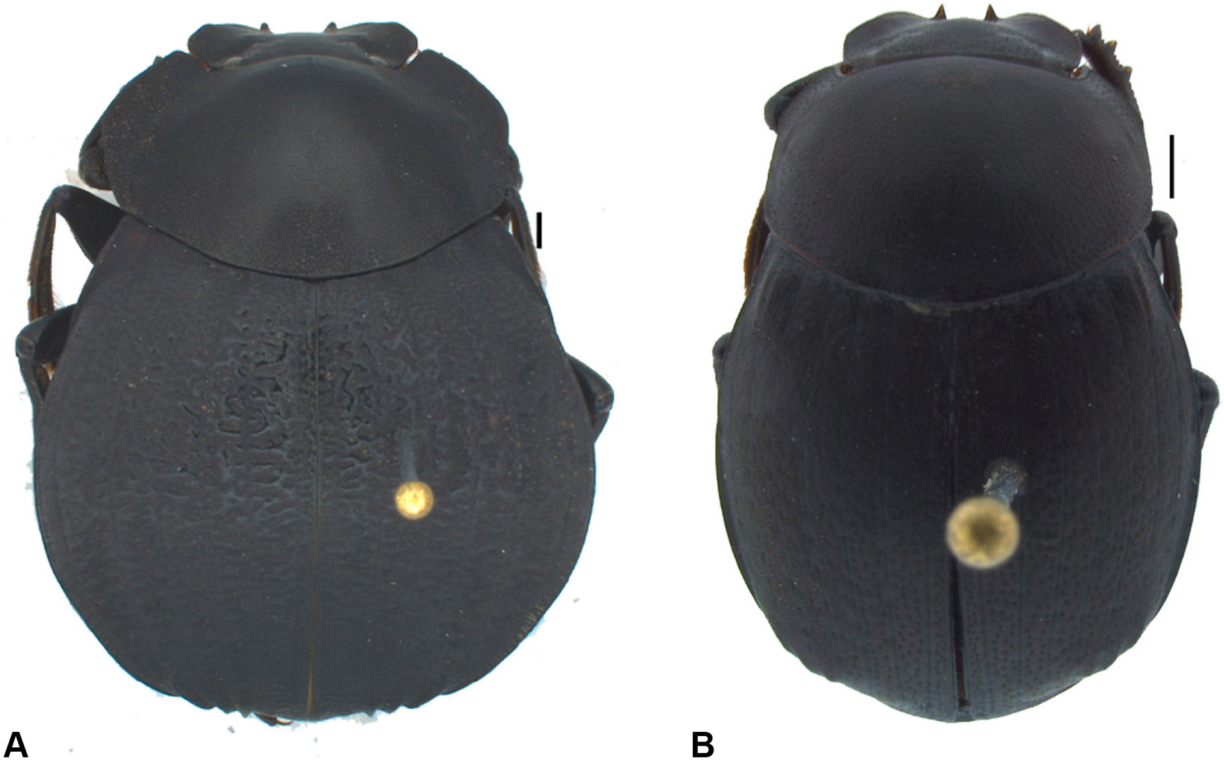

Figure 38. (A) *Deltochilum* (*Deltochilum*) *orbiculare* Lansberge, 1874, *habitus*, elytra dorsally flattened; (B) *Deltochilum* (*Deltohyboma*) gp *aspericolle,* elytra not dorsally flattened or nearly smaller than 20 mm. Scale bar: 1 mm.

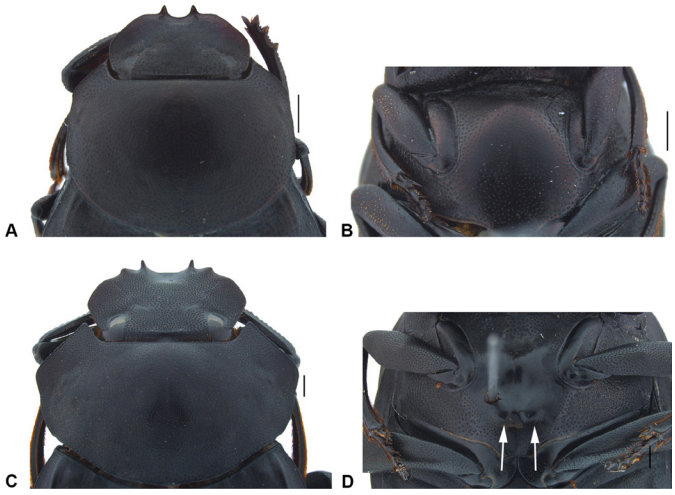

Figure 39. (A-B) *Deltochilum* (*Deltohyboma*) gp *aspericolle*. (A) Clypeus bidentate; (B) Metaventrite disc without tubercles posteriorly; (C-D) *Deltochilum* (*Hybomidium*) *orbignyi amazonicum* Bates, 1887. (C) Clypeus quadridentate; (D) Metaventrite disc bituberculate posteriorly (white arrow). Scale bar: 1 mm.

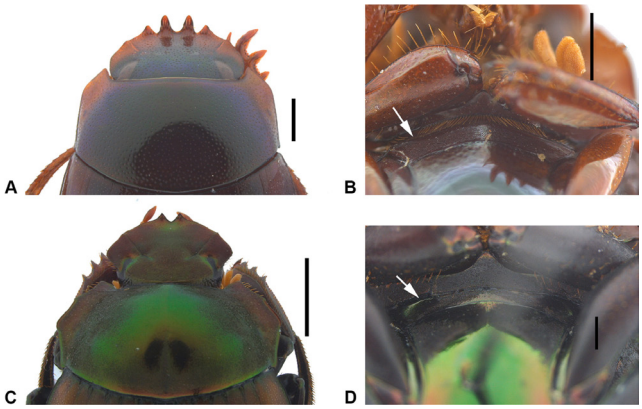

Figure 40. (A-B) *Pseudocanthon* sp. (A) Posterior margin of the head not margined between eyes and clypeus with four or six teeth (B) Mesoventrite relatively long, not narrowed medially, completely horizontal (white arrow); (C-D) *Hansreia* sp. (C) Posterior margin of the head clearly and completely margined between eyes; (D) Mesoventrite shorter medially than laterally or positioned vertically and weakly visible from below (white arrow). Scale bar: A, B, D – 0.5 mm; C – 2 mm.

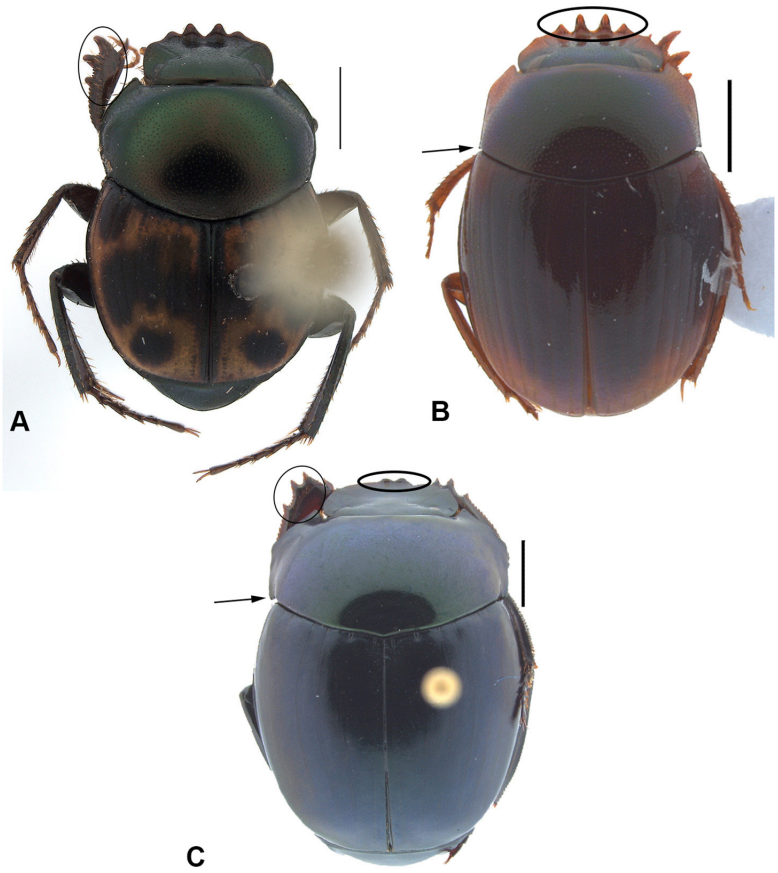

Figure 41. (A) *Tetraechma liturata* (Germar, 1813), *habitus,* clypeus bidentate; Protibia with three teeth, at least the apical tooth in the shape of half-moon (black circle) (B) *Pseudocanthon* Bates, 1887, *habitus*, clypeus quadridentate (black circle); Pronotum lateral edges nearly straight and subparallel (black arrow) (C) *Sylvicanthon proseni*, (Martínez, 1949) *habitus*, protibiae with two to four triangular teeth (black circle); Clypeus bidentate without emargination between the theeth (black circle); Pronotum with lateral edges forming a strong medial angle (black arrow). Scale bar: A – 2 mm, B, C – 1 mm.

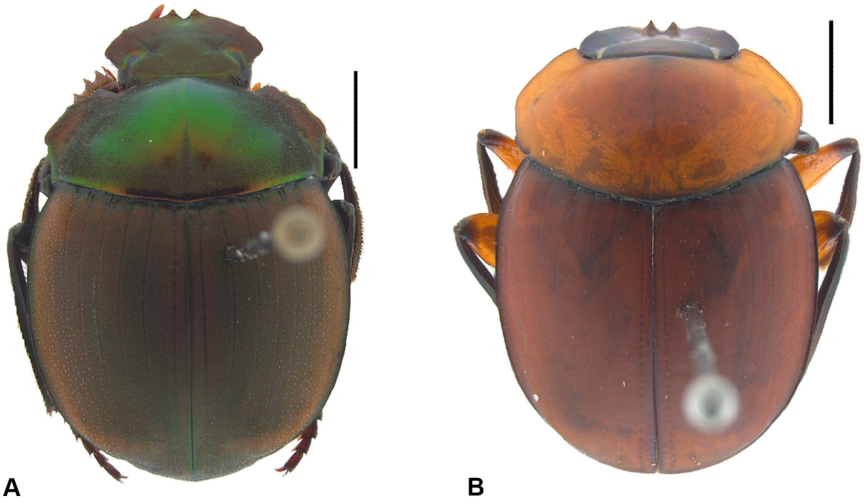

Figure 42. (A) *Hansreia* sp., *habitus,* pronotum with sides explanate; (B) *Scybalocanthon* sp., *habitus*, sides of pronotum not explanate. Scale bar: 2 mm.

Figure 43. (A-B) *Canthotrypes oberthuri* Paulian, 1939. (A) *Habitus,* head shaped as elongate triangle; (B) Meso- and metatibia with transverse carina, most visible in mesotibia; (C) *Scybalocanthon* sp., meso- and metatibia without transverse carinae, at most with inconspicuous median tubercle. Scale bar: 1 mm.

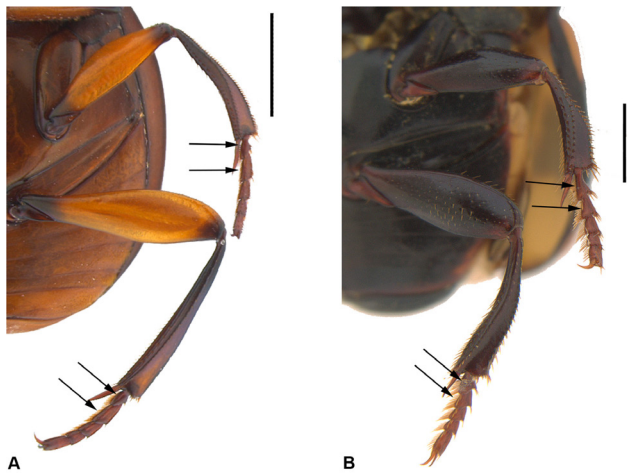

Figure 44. (A) *Scybalocanthon* sp., basal meso- and metatarsomeres about half as long as second tarsomere (black arrow); (B) *Canthon* sp., basal meso- and metatarsomeres subequal in length to second tarsomere (black arrow). Scale bar: A – 2 mm, B – 1 mm.

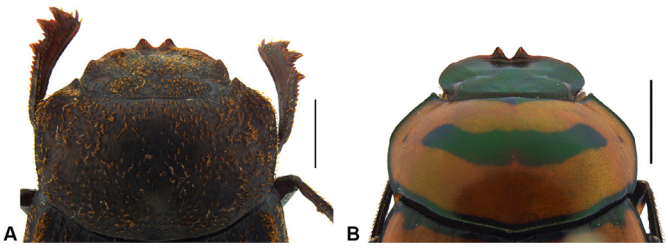

Figure 45. (A) *Anisocanthon* sp., dorsum with irregular sculpturing; (B) *Canthon:* grupo *septemmaculatus*, pronotum with evenly distributed sculpturing, at most with posteromedian depression, never with tubercles. Scale bar: A – 1 mm, B – 2 mm.

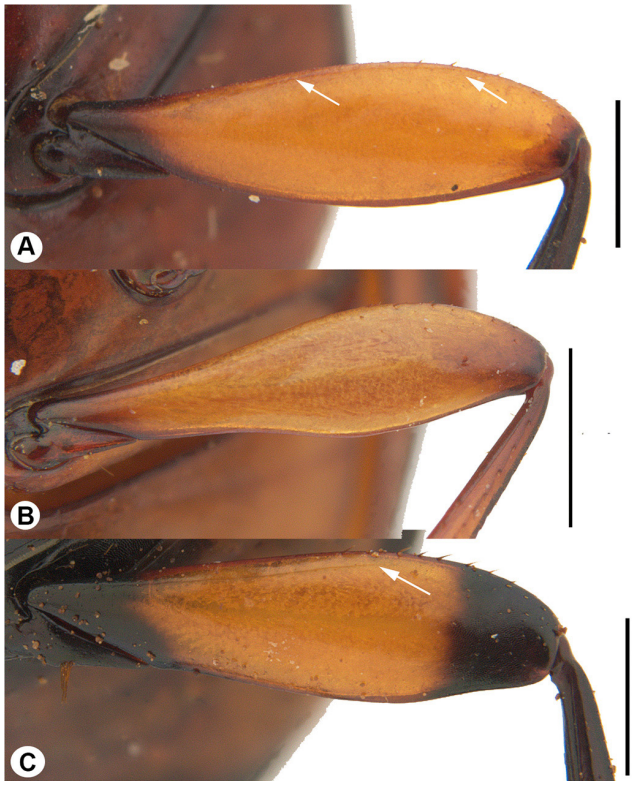

Figure 46. (A) *Canthon (Glaphyrocanthon*) *luteicollis* Erichson, 1847, ventral surface of metafemora carenated anteriorly (white arrow); (B) *Canthon* (*Trichocanthon*) *sordidus* Harold, 1868, ventral surface of metafemora not carenated anteriorly; (C) *Canthon*: grupo *septemmaculatus,* ventral surface of metafemora with fine carinae anteriorly (sometimes vanishing apically) (white arrow). Scale bar: 1 mm.

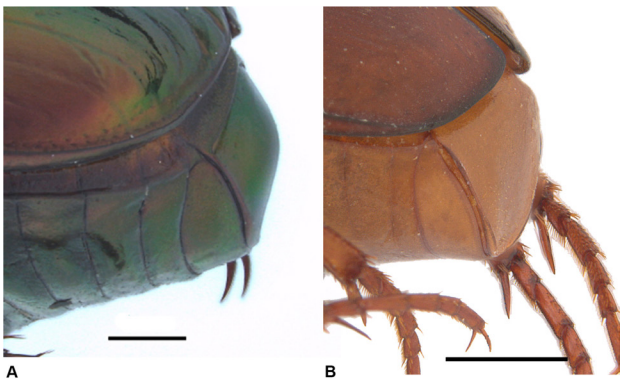

Figure 47. (A) *Canthon* (*Goniocanthon*) *fulgidus* Redtenbacher, 1868, pygidium strongly convex, very shiny; (B) *Canthon* (*Trichocanthon*) *sordidus* Harold, 1868, pygidium flat or slightly convex, dull, or slightly shiny. Scale bar: 1 mm.

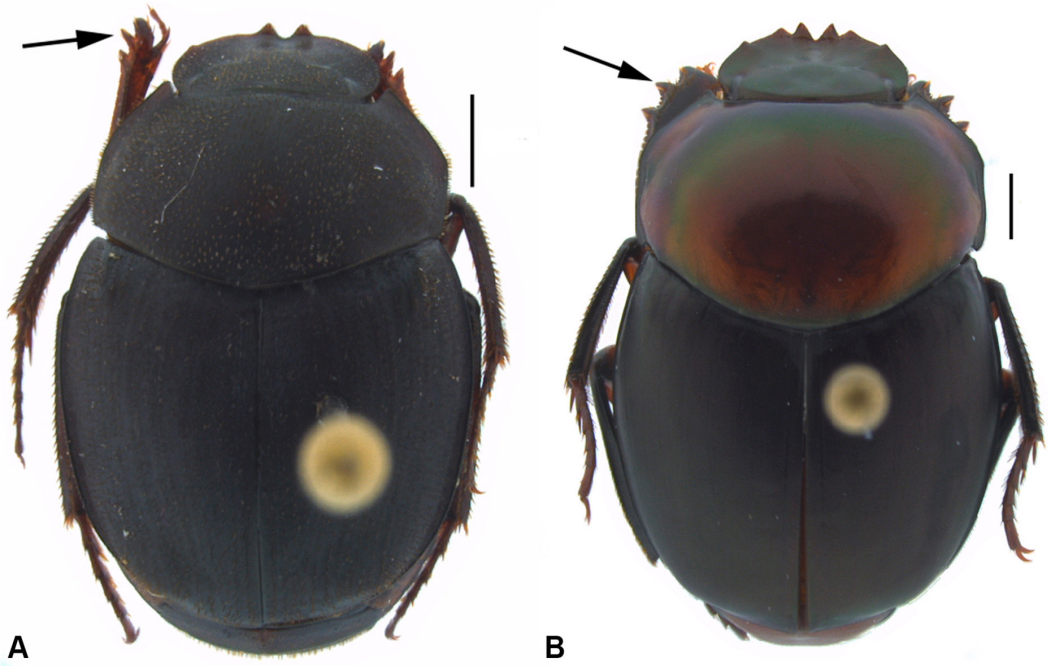

Figure 48. (A) *Canthon* (*Trichocanthon*) *sordidus* Harold, 1868, *habitus,* dorsum with distinct and dense uniform pubescence, protibial teeth closely set near the apex of tibia (black arrow); (B) *Canthon* (*Glaphyrocanthon*) *luteicollis* Erichson, 1847, *habitus,* dorsum either glabrous or with minute sparse pubescence, protibial teeth widely spaced along apical half of lateral margin (black arrow). Scale bar: 1 mm.

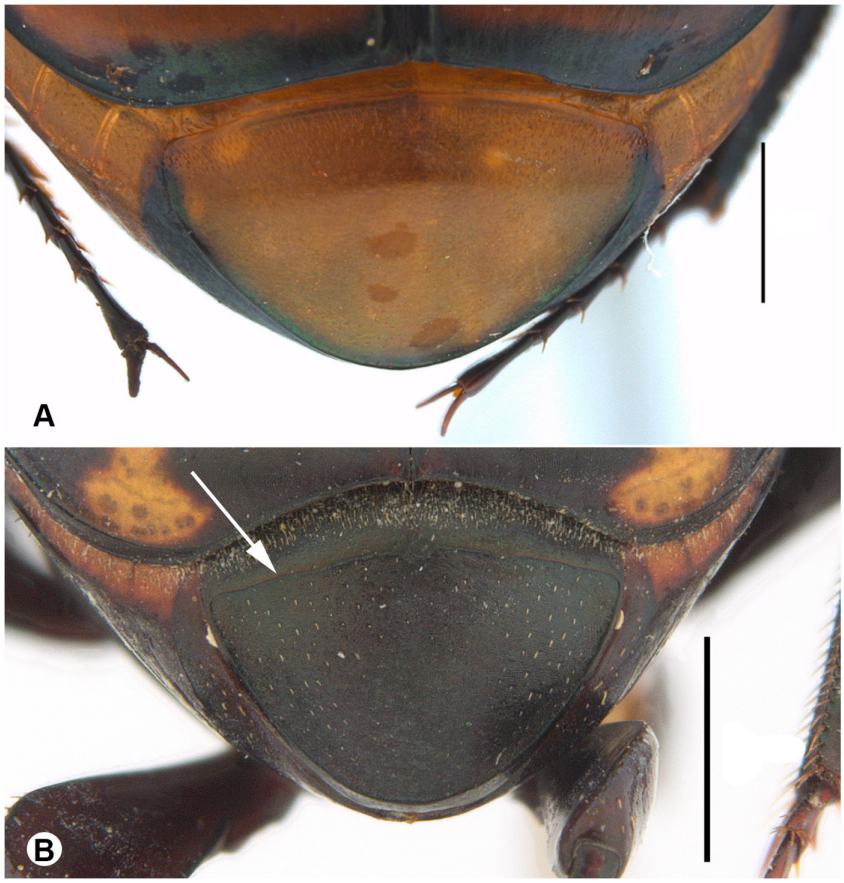

Figure 49. (A) *Canthon*: grupo *septemmaculatus*, pygidium and propygidium not separated by transverse carina; (B) *Canthon* (*Canthon*) aff. *mutabilis*, pygidium and propygidium at least partially separated by transverse carina (white arrow Scale bar). Scale bar: 1 mm.

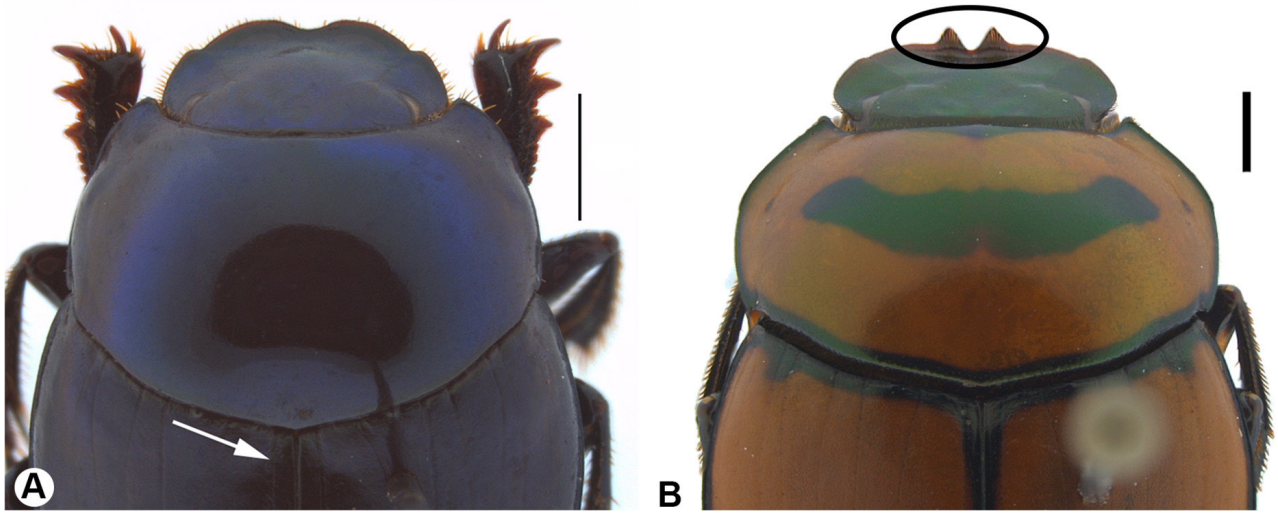

Figure 50. (A) *Canthon* (*Pseudepilissus*) Martinez, 1954, head anteriorly either sinuous or slightly emarginated, sometimes without clypeal teeth; scutellar area of the elytra depressed (white arrow); (B) *Canthon*: grupo *septemmaculatus*, clypeus with at least two (sometimes more) well-defined clypeal teeth (black circle); elytra not depressed over the scutellum. Scale bar: 1 mm.

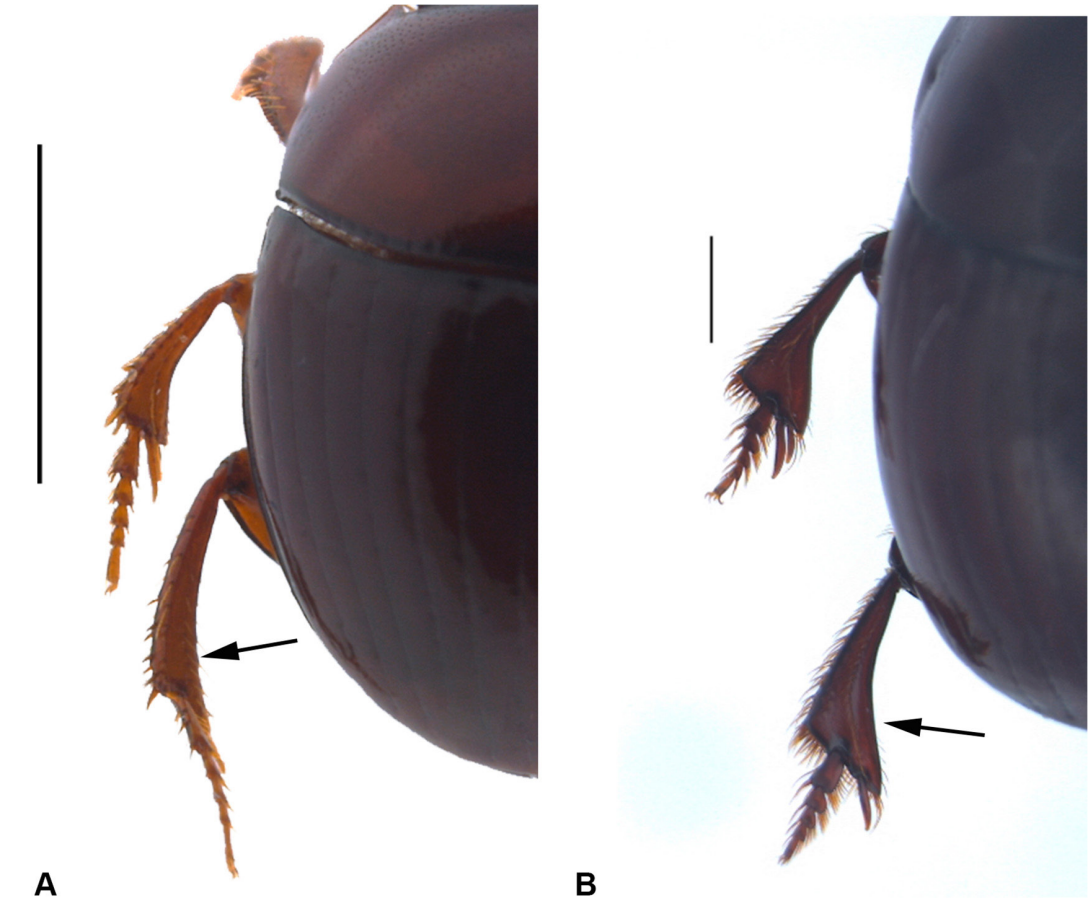

Figure 51. (A) *Sinapisoma minuta* Boucomont, 1928, inner apical angle of meso- and metatibia produced beyond insertion of tarsus, bearing spur (black arrow); (B) *Ateuchus substriatus* (Harold, 1868), metatibia strongly dilated apically, apical width clearly greater than one-fifth length of tibia, inner apical tibial angle not prolonged (black arrow). Scale bar: 1 mm.

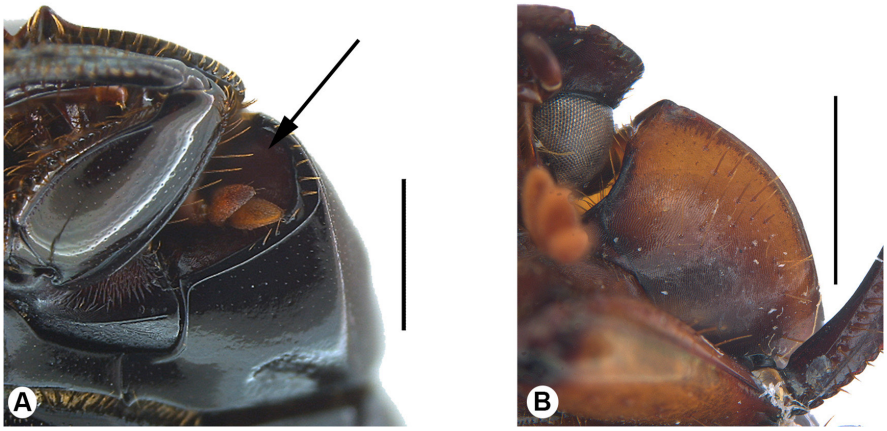

Figure 52. (A) *Ateuchus substriatus* (Harold, 1868), hypomeron deeply excavated anteriorly, excavation shaped posteriorly as vertical wall topped by strong carina (black arrow); (B) *Canthidium* sp., hypomeron only weakly excavated anteriorly, excavation not clearly defined posteriorly; transverse propleural carina almost always absent. Scale bar: 1 mm.

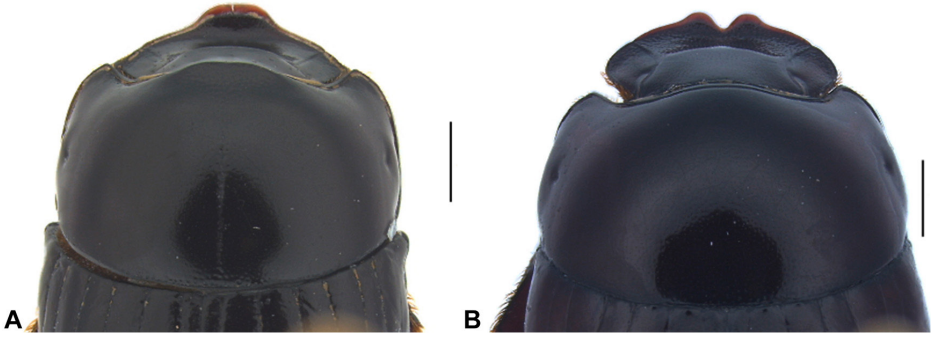

Figure 53. (A) *Deltorhinum genieri* Montoya-Molina & Vaz-de-Mello, 2019, pronotum anteriorly transversely uni-or bilobed over anterior margin or just behind it; head always with strong transverse carina and clypeus clearly triangular in shape; (B) *Ateuchus substriatus* (Harold, 1868), pronotum anteriorly simply convex behind anterior margin. Head with or without transverse carina. Scale bar: 1 mm.

Figure 54. (A) *Ateuchus* (*s. l.*), sixth abdominal ventrite lacking posterior process; (B) *Ateuchus* (*Lobidion) punctatissimum* Génier, 2010, sixth abdominal ventrite bearting one or two posterior processes. Scale bar: 1 mm.

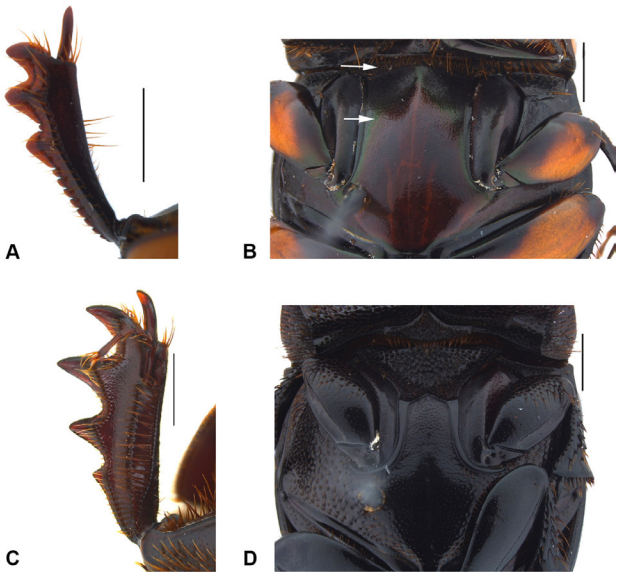

Figure 55. (A-B) *Canthidium* sp. (A) Inner apical angle of protibia ~ 90º or acute (black arrow); (B) Mesoventrite usually very short, positioned almost vertically (white arrow); metaventrite usually convex (white arrow); (C-D) *Ontherus* (*Ontherus*) *appendiculatus* (Mannerheim, 1828), (C) Inner apical angle of protibia usually > 90º (black arrow); (D) Mesoventrite well developed, horizontal; metaventrite usually flat. Scale bar: 1 mm.

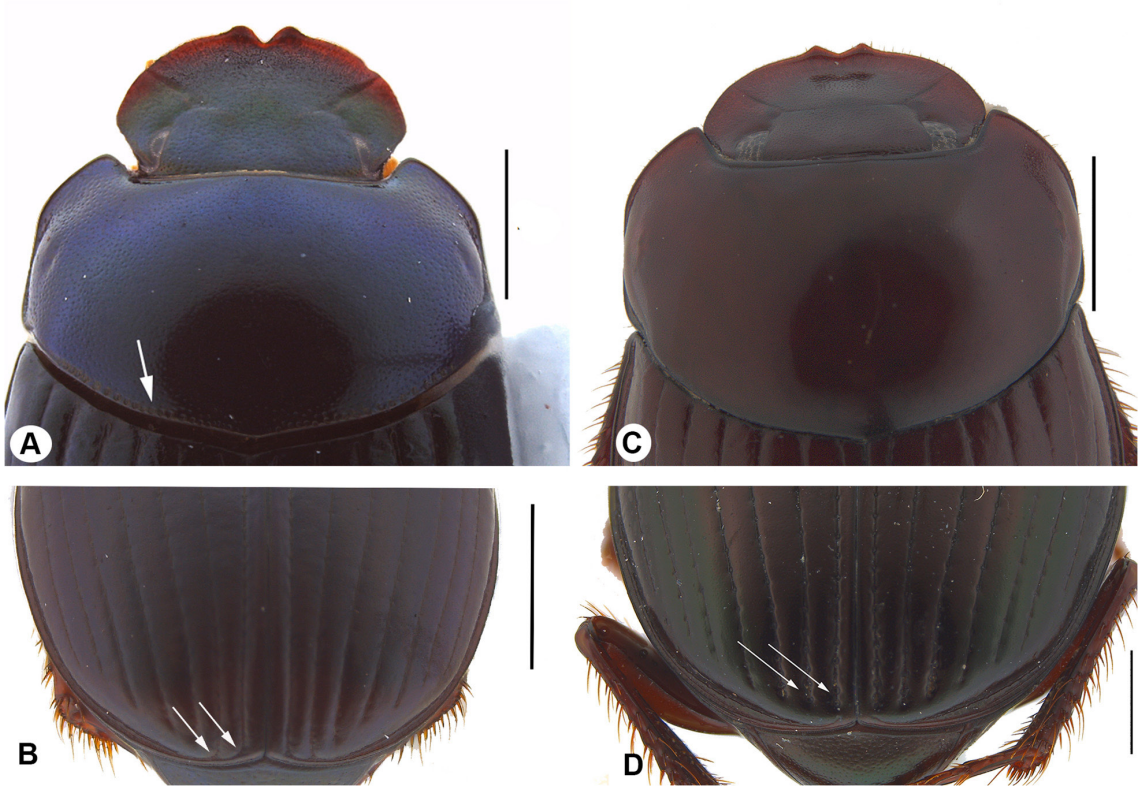

Figure 56. (A-B) *Canthidium* (*Neocanthidium*) *barbacenicum* (Preudhomme de Borre, 1886). (A) Posterior edge pronotum almost always paralleled by row of punctures distinctly larger than any adjacent punctures on pronotum, sometimes interrupted in the middle (white arrow); (B) First and second elytral striae joined apically to lateral striae.; (C-D) *Canthidium* (*Canthidium*) sp. (C) Pronotum may be punctate posteriorly but lacks distinct row of larger punctures along posterior edge; (D) First and second elytral striae not joined apically to lateral striae. Scale bar: 1 mm.

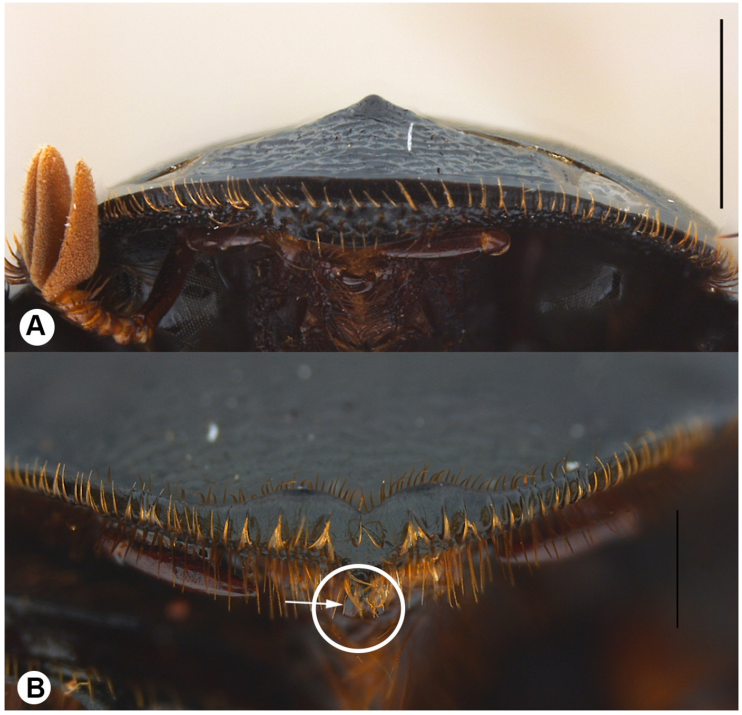

Figure 57. (A) *Ontherus* (*Ontherus*) *appendiculatus* (Mannerheim, 1828), clypeal process transverse, obtusely triangular or nearly rectangular, never dentate; (B) *Dichotomius* (*Selenocopris*) *nisus* (Olivier, 1789), clypeal process usually conical with bifurcate apex, sometimes embedded in longitudinal carina; rarely configured otherwise, but never a simple transverse ridge (white circle and arrow). Scale bar: 1 mm.

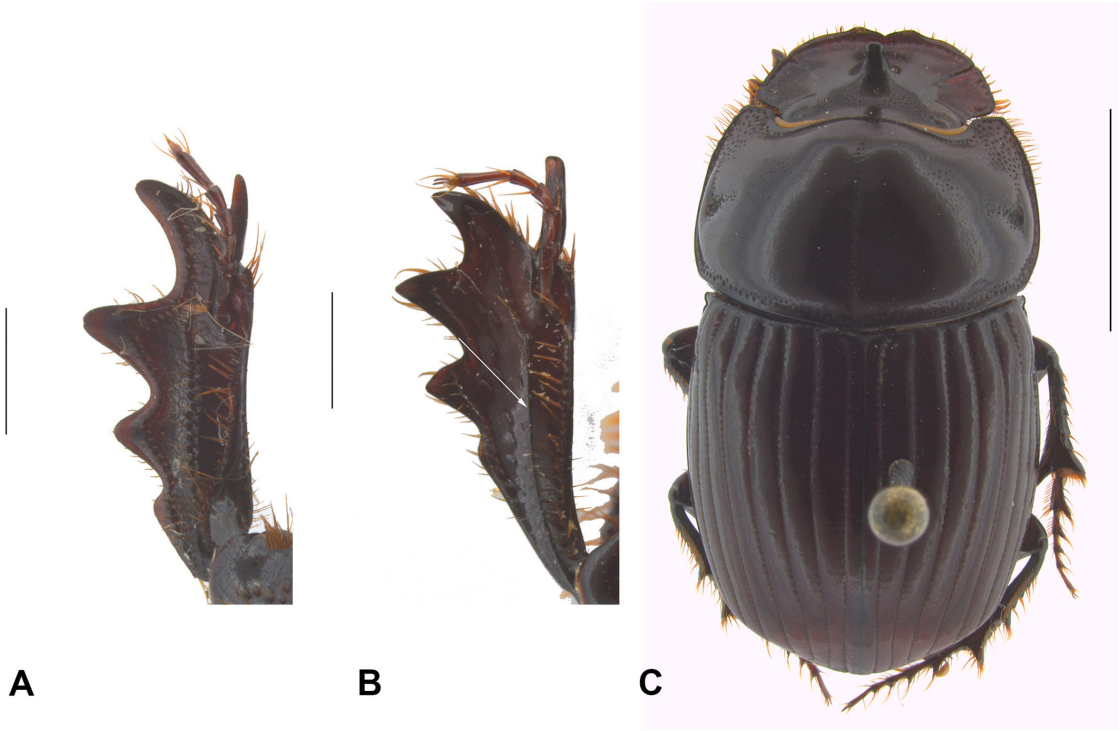

Figure 58. (A) *Ontherus* (*Ontherus*) *appendiculatus* (Mannerheim, 1828), ventromedial carina of protibia with intervening setae; (B-C) *Copris* (*Copris*) *amazonicus* Darling & Génier, 2018 (B) Ventromedial carina of protibia lacking intervening setae (white arrow); (C) *Habitus*. Scale bar: A, B – 1 mm, C – 5 mm.

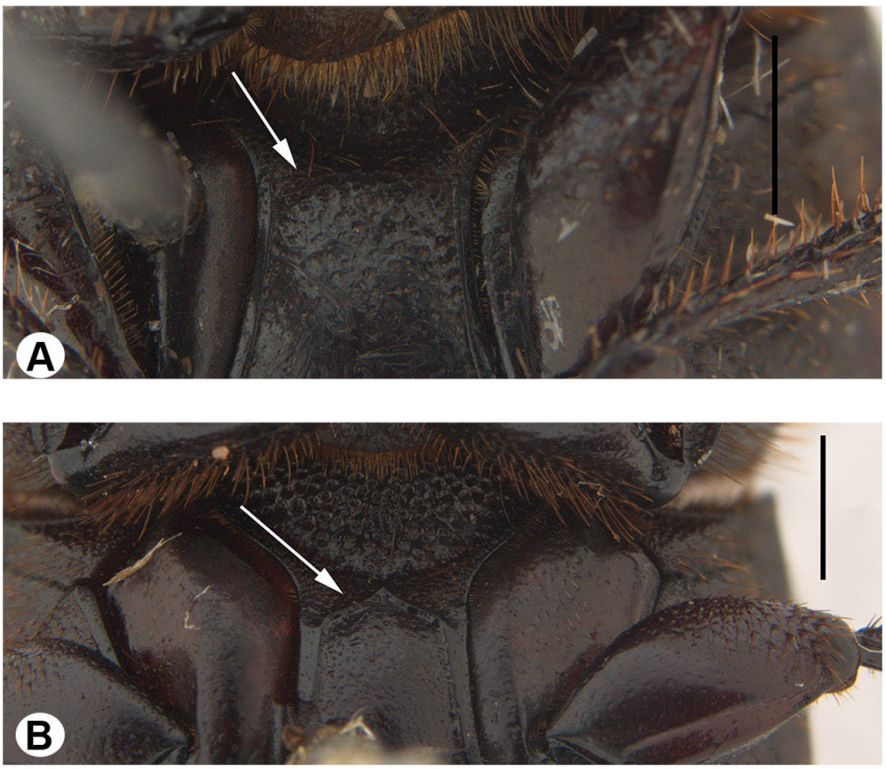

Figure 59. (A) *Ontherus* (*Caelontherus*) *laminifer* Balthasar, 1938, mesometaventral suture straight or feebly curved, never angulate (white arrow); (B) *Ontherus* (*Ontherus*) *appendiculatus* (Mannerheim, 1828), mesometaventral suture usually angulate medially (white arrow) Scale bar: 1 mm.

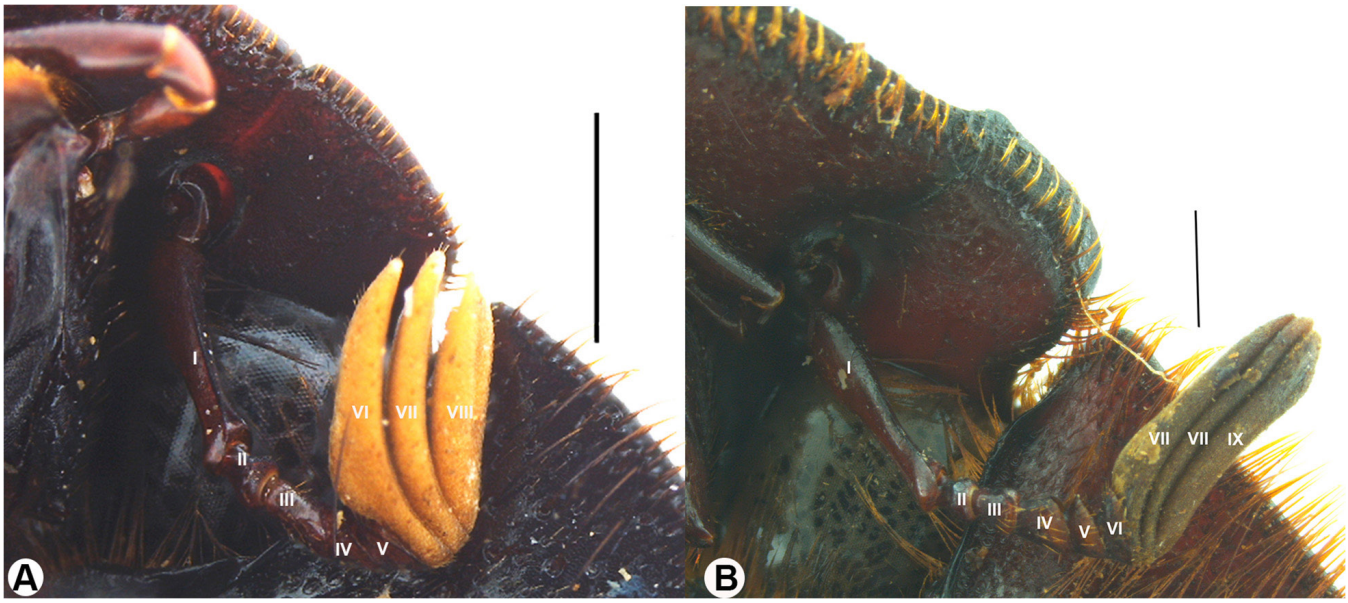

Figure 60. (A) *Isocopris nitidus* (Luederwaldt, 1922), antenna with eight antennomeres; (B) *Dichotomius (Dichotomius) boreus* (Olivier, 1789), antenna with nine antennomeres. Scale bar: 1 mm.

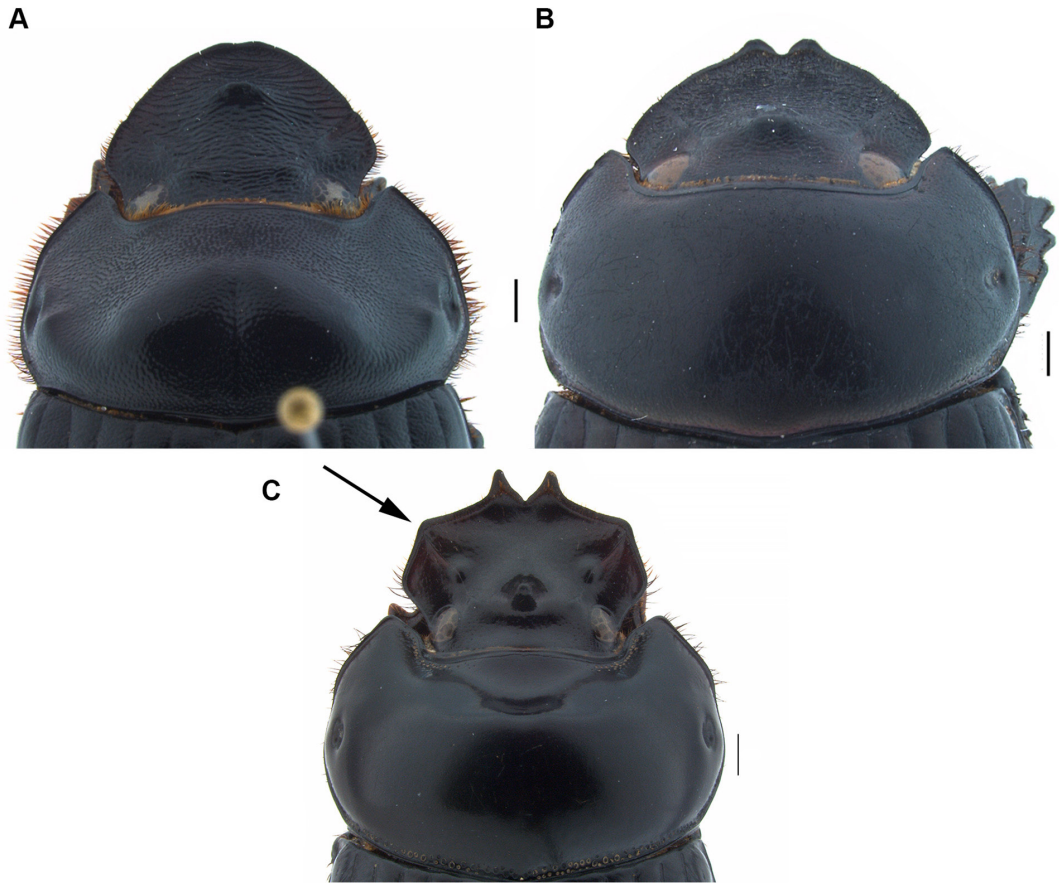

Figure 61. (A) *Dichotomius* (*Dichotomius*) *melzeri* (Luederwaldt, 1922), clypeal margin rounded or weakly emarginated; (B) *Dichotomius* (*Selenocopris*) *cuprinus* (Felsche, 1901), margined clypeal teeth; clypeogenal junction not angled; (C) *Dichotomius* (*Cephagonus*) sp., clypeal teeth well-defined; clypeogenal junction strongly angled (black arrow). Scale bar: 1 mm.

Discussion and Additional comments

As evidenced in Morrone's delimitation for the Neotropical region, it is noteworthy that a portion of what is commonly recognized as the Pantanal is included in the domain considered as the Amazon. Due to the acknowledgment of significant faunal divergence between the Pantanal and other regions (Daniel and Vaz-de-Mello, 2016), genera to this region have been deliberately excluded from this study (e.g. *Bolbites* Harold, 1868). For a more in-depth analysis of these genera and their diagnostic features see Mota et al. (2023). The same criterion was applied to some species present in transition zones, whose occurrence is restricted, for example, to open areas.

The subgenus *Dendropaemon* (*Rutilopaemon*) despite not having so far been recorded from the Brazilian Amazon was included in the key because it occurs in French Guiana and there is a great chance of occurring in the Brazilian Amazon as well. However, it was not possible to get a specimen to photograph, so for more information and photos see Génier and Arnaud (2016) and Boilly et al. (2016).

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Associate Editor

José Mermudes

Author Contributions

Edrielly Carvalho: conceptualization, identification of the specimens; production and editing of photographs; preparation of the keys and writing of the manuscript.

Jorge Arias-Buriticá: manuscript writing, translation of the key into Spanish and review.

Ruth Ferreira-Keppler: review.

Fernando Z. Vaz-de-Mello: conceptualization, funding acquisition, resources, supervision and validation.

Conflicts of Interest

All authors have seen and agree with the contents of the manuscript and there is no conflict of interest, including specific financial interest and relationships and affiliations relevant to the subject of manuscript.

Data Availability

Supporting data are available at <https://doi.org/10.48331/scielodata.PMITN>.

References

BARLOW, J., LOUZADA, J., PARRY, L., HERNANDEZ, M.I., HAWES, J., PERES, C.A., VAZ-DE-MELLO, F.Z. & GARDNER, T.A. 2010. Improving the design and management of forest strips in human-dominated tropical landscapes: a field test on Amazonian dung beetles. Journal of Applied Ecology 47(4):779–788. https://doi.org/10.1111/j.1365-2664.2010.01825.x.

BOILLY, O., LAPÈZE, J., DALENS, P.H., GIUGLARIS, J.L. & TOUROULT, J. (2016). Les Phanaeini de Guyane: liste commentée, clés et iconographie (Coleoptera, Scarabaeidae). ACOREP-France, 10:86–97.

CARVALHO, R.L., ANDRESEN, E., BARÔNIO, G.J., OLIVEIRA, V.H., LOUZADA, J. & BRAGA R.F. 2020. Is dung removal a good proxy for other dung beetle functions when monitoring for conservation? A case study from the Brazilian Amazon. Ecological Indicators 109:1–8. https://doi.org/10.1016/j.ecolind.2019.105841.

CHAMORRO, W., MARÍN ARMIJOS, D., GRANDA, V. & VAZ DE MELLO, F.Z. 2018**.** Checklist with a key to genera and subgenera of dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) present and supposed for Ecuador. Revista Colombiana de Entomología 44(1):72–100. https://hdl.handle.net/10893/20672.

CUPELLO, M. & VAZ-DE-MELLO, F.Z. 2018. A monographic revision of the Neotropical dung beetle genus *Sylvicanthon* Halffter & Martínez, 1977 (Coleoptera: Scarabaeidae: Scarabaeinae: Deltochilini), including a reappraisal of the taxonomic history of '*Canthon sensu lato*'. *E*uropean Journal of Taxonomy 467:1–205 https://doi.org/10.5852/ejt.2018.467.

DA SILVA, J.M.C., RYLANDS, A.B. & DA FONSECA, G.A. 2005. The fate of the Amazonian areas of endemism. Conservation Biology 19(3):689–694. https://doi.org/10.1111/j.1523-1739.2005.00705.x.

FRANÇA, F., BARLOW, J., ARAÚJO, B. & LOUZADA, J. 2016. Does selective logging stress tropical forest invertebrates? Using fat stores to examine sublethal responses in dung beetles. Ecology and evolution 6(23): 526–8533. https://doi.org/10.1002/ece3.2488.

GENIER, F. & ARNAUD, P. 2016. *Dendropaemon* Perty, 1830: taxonomy, systematics and phylogeny of the morphologically most derived phanaeine genus (Coleoptera: Scarabaeidae, Scarabaeinae, Phanaeini). Zootaxa 4099(1):1–125. http://doi.org/10.11646/zootaxa.4099.1.1.

HALFFTER, G. & EDMONDS, W.D. 1982. *The nesting behavior of dung beetles (Scarabaeinae). An ecological and evolutive approach.* Instituto de Ecología, Mexico.

HALFFTER, G. & FAVILA M.E. 1993. The Scarabaeinae an animal group for analyzing, inventorying and monitoring biodiversity in tropical rainforest and modified landscapes. Biology International 27:1521.

HANSKI, I. & CAMBEFORT, Y. 2014. *Dung beetle ecology.* Princeton University Press. New Jersey (v.1195, pp.3–480).

MALHI, Y., ROBERTS, J.T., BETTS, R.A., KILLEEN, T.J., Li, W. & NOBRE, C.A. 2008. Climate change, deforestation, and the fate of the Amazon. Science 319(5860):169–72. doi: 10.1126/science.1146961. Epub 2007Nov 29. PMID: 18048654.

MAPBIOMAS. 2022. Land use change on threatened biomes in South America and Indonesia. Availabe from MBI-factsheet-COP22-EN-digital-rev4_1.pdf (mapbiomas.org) Accessed November 11, 2023.

MATAVELLI, R.A. & LOUZADA, J.N.C. 2008. Invasão de áreas de savana intra-amazônicas por *Digitonthophagus gazella* (Fabricius, 1787) (Insecta: Coleoptera: Scarabaeidae). Acta Amazonica 38:153–158. https://doi.org/10.1590/S0044-59672008000100017.

MORA-AGUILAR, E.F., ARRIAGA-JIMÉNEZ, A., CORREA, C., DA SILVA, P.G., KORASAKI, V., LÓPEZ-BEDOYA, P.A., ... & NORIEGA, J.A. 2023. Toward a standardized methodology for sampling dung beetles (Coleoptera: Scarabaeinae) in the Neotropics: A critical review. Frontiers in Ecology and Evolution, 11:1096208.

MORRONE, J.J. 2002. Biogeographic regions under track and cladistic scrutiny. Journal of Biogeography 29:149–152. http://dx.doi.org/10.1046/j.1365-2699.2002.00662.x.

MORRONE, J.J. 2014. Biogeographical regionalisation of the neotropical region. Zootaxa 3782(1):1–110. https://doi.org/10.11646/zootaxa.3782.1.1.

MORRONE, J.J., ESCALANTE, T., RODRÍGUEZ-TAPIA, G., CARMONA, A., ARANA, M. & MERCADO-GÓMEZ, J.D. 2022. Biogeographic regionalization of the Neotropical region: New map and shapefile. Anais da Academia Brasileira de Ciências 94(1):1–5. https://doi.org/10.1590/0001-3765202220211167.

SCHOOLMEESTERS, P. 2023. World Scarabaeidae Database. Catalogue of Life Checklist (Version 2023-05-30). Available from https://www.catalogueoflife.org/data/dataset/1027 Accessed August 29, 2023.

SILVA, R.J., COLETTI, F., COSTA, D.A. & VAZ-DE-MELLO, F.Z. 2014. Rola-bostas (Coleoptera: Scarabaeidae: Scarabaeinae) de florestas e pastagens no sudoeste da Amazônia brasileira: Levantamento de espécies e guildas alimentares. Acta Amazonica 44:345–352. http://dx.doi.org/10.1590/1809-4392201304472.

SOBRAL-SOUZA, T. & LIMA-RIBEIRO, M. 2017. De volta ao passado: revisitando a história biogeográfica das florestas neotropicais úmidas. Oecologia Australis 21(2):93107. https://doi.org/10.4257/oeco.2017.2102.01.

TARASOV, S. & DIMITROV, D. 2016. Multigene phylogenetic analysis redefines dung beetles relationships and classification (Coleoptera: Scarabaeidae: Scarabaeinae). BMC evolutionary biology 16(1):1–19. https://doi.org/10.1186/s12862-016-0822-x.

TARASOV, S. & GÉNIER, F. 2015. Innovative bayesian and parsimony phlylogeny of dung beetles (Coleoptera, Scarabaeidae, Scarabaeinae) Enhanced by Ontology- Based Partitioning of Morphological Characters. PLoS ONE 10(3):1–86. https://doi.org/10.1371/journal.pone.0116671.

TISSIANI, A.S.D.O., VAZ-DE-MELLO, F.Z. & CAMPELO-JÚNIOR, J.H. 2017. Besouros rola-bostas das pastagens brasileiras e chave para identificação dos gêneros (Coleoptera: Scarabaeidae). Pesquisa Agropecuária Brasileira 52:401–418. https://doi.org/10.1590/S0100-204X2017000600004.

VON SOLINGE, T.B. 2023. *The Amazon Rainforest. A green criminological perspective.* International Handbook of Green Criminology (2th ed). Routledge Handbooks Online.

VAZ DE MELLO, F.Z., EDMONDS, W.D., OCAMPO, F.C. & SCHOOLMEESTERS, P. 2011. A multilingual key to the genera and subgenera of the subfamily Scarabaeinae of the New World (Coleoptera: Scarabaeidae). Zootaxa 2854:1–73. http://dx.doi.org/10.11646/zootaxa.2854.1.1.

VAZ-DE-MELLO, F.Z., NUNES, L.G.D.O.A. & Costa-Silva, V.D. 2020. A new species of the genus *Canthon* Hoffmannsegg (Coleoptera, Scarabaeidae, Scarabaeinae, Deltochilini) from central Brazil. Papéis Avulsos de Zoologia 60: 1–6. https://doi.org/10.11606/1807-0205/2020.60.special-issue.04.

VAZ-DE-MELLO, F.Z. & GROSSI, P. 2021. Scarabaeidae in Catálogo Taxonômico da Fauna do Brasil. PNUD. Available from: http://fauna.jbrj.gov.br/fauna/faunadobrasil/127498. Accessed August 29, 2023.

VULCANO, M.A. & PEREIRA, F.S. 1967. Sinopse dos Passalidae e Scarabaeidae S. STR. da região amazônica (Insecta, Coleoptera). Atas do Simpósio sobre a Biota Amazônica 3:533–603.

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