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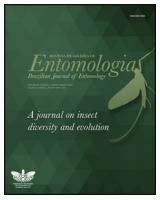

The taxonomic status of *Pelidnota gounellei* (Ohaus, 1908) and *Pelidnota ludovici* Ohaus, 1905 (Coleoptera: Scarabaeoidea: Melolonthidae)

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ABSTRACT

The taxonomic status and the geographic distribution of two species, *Pelidnota gounellei* (Ohaus, 1908) and *P. ludovici* Ohaus, 1905, is revised and the species are revalidated. A lectotype for *Pelidnota tricolor* Nonfried, 1894 is designated. The taxonomy of the species is briefly discussed, and a distribution map for the reviewed species is also provided. The distribution range of *P. gounellei* is expanded to the Minas Gerais state, Brazil.

Introduction

Pelidnota MacLeay, 1819 is one of the most specious genera in Rutelinae (Coleoptera, Scarabaeidae, Rutelinae, Rutelini) (Bouchard et al., 2011), with 198 species and subspecies recorded in the Americas (Moore et al., 2017; Ferreira et al., 2017; Ferreira et al., 2021a). According to Moore et al. (2017), Ferreira et al. (2017) and Ferreira et al. (2021a), 64 species and 31 subspecies are recorded from Brazil. However, according to Vaz-de-Mello and Grossi (2022) there are 69 species and 25 subspecies of *Pelidnota* in Brazil.

Pelidnota species can be identified by the labrum and clypeus not fused, frontoclypeal suture absent or incomplete, outer margin of mandible crenate or sinuous, antenna with 10 antennomeres, proximal margin of pronotum completely beaded (except in the *Pelidnota lucida* species group), tarsal claws simple, and elytral margin non-membranous (Ohaus, 1934; Hardy, 1975). Here, we follow the species delimitation of *Pelidnota* according to the set of characters proposed by Moore et al. (2017).

The genus *Pelidnota* was described by MacLeay (1819) and posteriorly revised by Bates (1904) and Ohaus (1918, 1934). Hardy (1975) revised the species of America north of Panama; most recent studies, Soula (2006, 2009) proposed many new combinations and subgeneric synonyms with the description of dozens of new species and subspecies within *Pelidnota*. Moore et al. (2017) provided a synopsis of the pelidnotine scarabs and an annotated catalog of the species and subspecies with new combinations and synonyms in the genus, reviewing the names proposed by Soula (2006, 2009); Ferreira et al. (2017, 2021a) proposed four new species of *Pelidnota* from Brazil.

Pelidnota gounellei was described by Ohaus (1908) based on a unique male specimen, collected in southwestern Bahia [Santo Antônio da Barra currently the municipality of Condeúba] (IBGE, 2022 – Available at: https://cidades.ibge.gov.br/brasil/ba/condeuba/historico). After studying the type material of *P. gounellei,* Soula (2006) proposed its junior synonymy with *Pelidnota ebenina* (Blanchard, 1842); *P. ebenina* was described from Bolivia (Santa Cruz de La Sierra) based on a female specimen. Recently, the synonymy of *P. gounellei* with *P. ebenina* was reviewed and maintained by Moore et al. (2017).

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Another South American species, *Pelidnota ludovici* Ohaus, 1905 was also described based on a unique male specimen, and it was collected in the state of Espírito Santo on the bank of Rio Doce between Baixo Guandu and Timbuhy. Recently, based mainly on the dorsal and ventral coloration of the body, and strong resemblence of male genitalia and other characters not specified, Moore et al. (2017) proposed *P. ludovici* as a new junior synonym of *P. burmeisteri tricolor* Nonfried, 1894 (described from Mato Grosso).

Here, based on 46 specimens examined of *Pelidnota gounellei* (Ohaus, 1908) and 12 specimens of *P. ludovici* Ohaus, 1905 and according to the data presented in the study proposed by Moore et al. (2017), we review the taxonomic status of the above-mentioned species and withdraw them from synonymy. Additionally, male and female of the species are illustrated, and additional characters and comments on the taxonomy of the species are provided. Finally, the lectotype and paralectotype of *Pelidnota tricolor* Nonfried, 1894 are also designated and a distribution map is presented for all revised species.

Material and methods

This study was based on 46 specimens of *P. gounellei* (Ohaus); 1 specimen of *P. ebenina* (Blanchard), 12 specimens of *P. ludovici* Ohaus; 51 specimens of *P. burmeisteri burmeisteri* Burmeister; 2 specimens of *P. burmeisteri tricolor* Nonfried, obtained from the following collections (acronyms based on Evenhuis (2020), when available, with curators/collection managers in brackets): **CERPE –** Coleção Entomológica da Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brazil (Paschoal Grossi); **EPGC –** Coleção Entomológica Everardo & Paschoal Grossi, Nova Friburgo, Rio de Janeiro, Brazil (Everardo J. Grossi); **MNHN –** Muséum National d'Histoire Naturelle, Paris, France (Olivier Montreuil); **MSPC –** Matthias Seidel Personal Collection, Vienna, Austria (Matthias Seidel); **MZFS –** Coleção Prof. Johann Becker, Museu de Zoologia da Universidade Estadual de Feira de Santana, Bahia, Brazil (Freddy Bravo); **NHMW –** Naturhistorisches Museum Wien, Vienna, Austria (Matthias Seidel); **RBINS** – Royal Belgian Institute of Natural Sciences, Brussels, Belgium (Pol Limbourg); **WBWC –** William B. Warner Personal Collection, Chandler, Arizona, USA; **ZMHB** – Museum für Naturkunde, Berlin, Germany (Joachim Willers); **ZSM** – Zoologische Staatsammlung, München, Bayern (Michael Balke).

The morphological terminology follows Beutel and Lawrence (2005) supplemented by Lawrence et al. (2010), and the body measurements, puncture density, puncture size and density of setae follow Jameson and Ratcliffe (2011). Color pictures of the specimens were taken using a Leica MC170 HD digital camera attached in stereomicroscope Leica SAPO with the software Leica Application Suite LAS EZ Version 3.4.0, using the lighting system developed by Ferreira et al. (2021b).

Geographical coordinates, when not available on the label of the specimen, were obtained from Google Maps (www.google.com.br/maps). The distribution records mentioned in the literature, with only the federal state in Brazil, without specifying an accurate locality, were plotted on the map with a question mark. The final editing of the distributional map and the images were made using GIMP version 2.10.22 (https://www.gimp.org/downloads). The labium line was drawn using INKSCAPE version 1.0.2 (https://inkscape.org/release/inkscape-1.0.2).

Label information was recorded as follows: sex, COUNTRY, State: ("Locality"; [additional information], (Geographical Coordinates), Date, Collector's name (MUSEUM ACRONYM# voucher number) (MUSEUM ACRONYM where the specimen was deposited). Type material was cited verbatim using a single slash "/" for line separation and double slash "//" for label separation.

The following abbreviations are used in the taxonomic history of the species and in all the text: rev. stat. = revised status; syn. = synonym.

Results

Pelidnota burmeisteri burmeisteri Burmeister, 1844

(Figs. 1A-1F, 2A-2G, 3A-3F and 4A-4G)

Pelidnota burmeisteri Burmeister, 1844: 409 [original description].

Pelidnota (*Pelidnota*) *burmeisteri* Burmeister [new subgeneric combination by Ohaus 1918: 25].

Pelidnota burmeisteri Burmeister [removal of subgeneric classification by Soula (2009):37–38].

synonym. *Aglycoptera lacerdae* Sharp, 1885

Aglycoptera lacerdae Sharp, 1885: 23–24 [original combination].

Pelidnota (*Pelidnota*) *burmeisteri* Burmeister [syn. by Ohaus (1918), p. 25].

Type material: According to Moore et al. (2017), the type of *Pelidnota burmeisteri burmeisteri* is not at MLUH and is possibly lost (Soula, 2009) [see Moore et al. (2017, p. 169)]. Specimen from MSPC is photographed [see Figure 56 in Moore et al. (2017, p. 171)].

Examined material: BRASIL: Minas Gerais: Berizal, Fazenda Veredão (8 males, 9 females) (CERPE); 09-16.xii.2012, E.J. Grossi, E. & P.C. Grossi legs. (7 males, 2 females) (CERPE); Águas Vermelhas, 5km, Norte de Águas Vermelhas. 15.xii.2012, E.J. Grossi & P.C. Grossi legs. (1 female) (CERPE). Bahia: Estrada Divisópolis (Minas Gerais) - Encruzilhada (Bahia), 17.xii.2012, em Canafístula P.C. Grossi & G.A.R. Melo legs. (1 male, 3 females) (CERPE). Encruzilhada, Estrada O. 20.xii.2012 P.C. Grossi & G.A.R. Melo legs. (1 female) (CERPE); 09-12.xii.2012, luz, E.J.

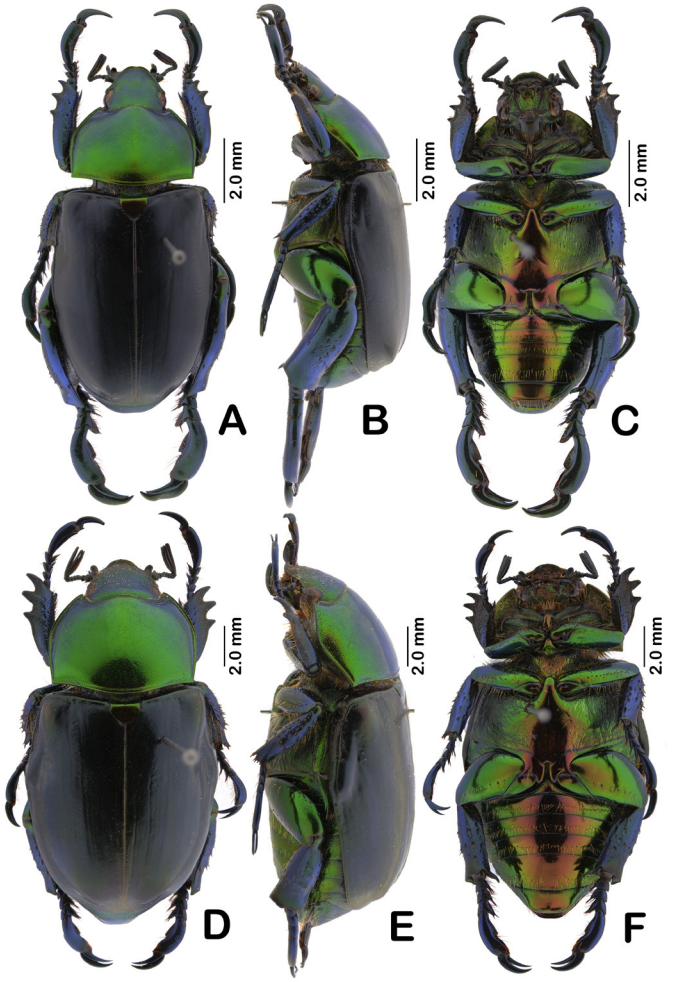

Figure 1 *Pelidnota burmeisteri burmeisteri* Burmeister, 1844: **A-C**, male (dorsal, lateral, ventral); **D-F**, female (dorsal, lateral, ventral).

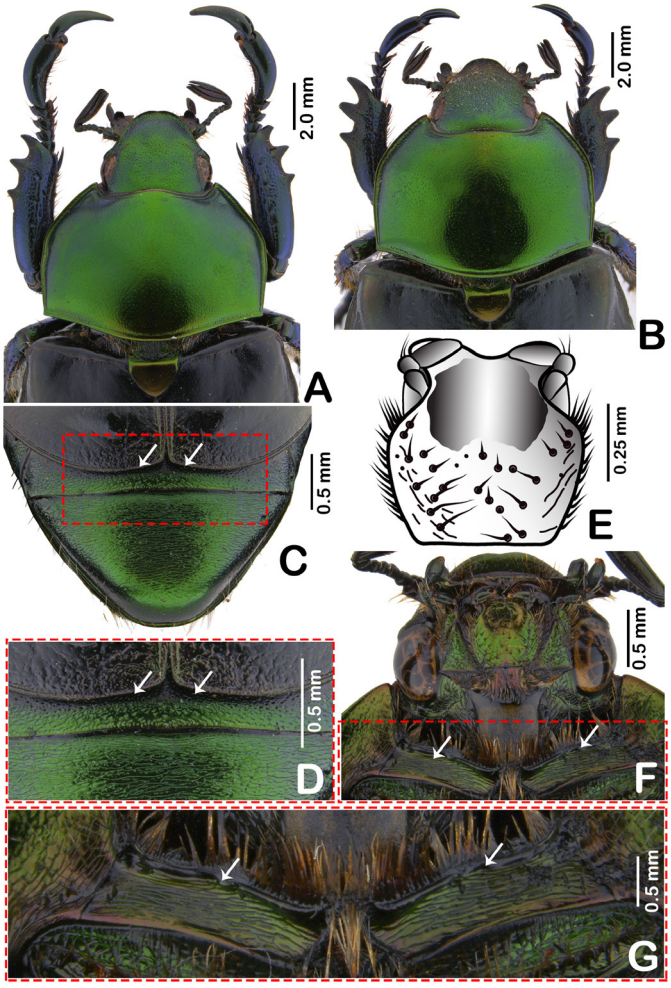

Figure 2 *Pelidnota burmeisteri burmeisteri* Burmeister, 1844: **A**, male head (dorsal); **B**, female head (dorsal); **C**, pygidium (frontal); **D**, male pygidium in detail (frontal); **E**, male labium (dorsal); **F**, male mouthparts and prosternum (dorsal); **G**, prosternum in detail (dorsal).

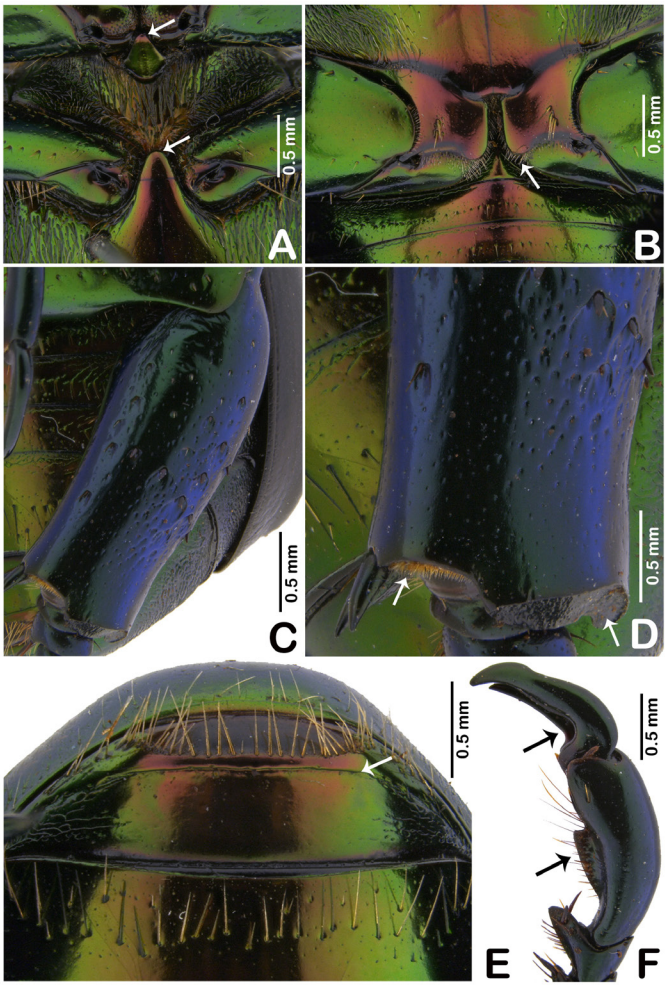

Figure 3 *Pelidnota burmeisteri burmeisteri* Burmeister, 1844: **A**, male prosternal and mesoventral processes (dorsal); **B**, male posterior angle of metacoxa in detail (dorsal); **C**, male metatibia (lateral); **D**, apex of metatibia in detail (lateral); **E**, male abdominal ventrite VI (dorsal); **F**, male metarsomere V and outer metatarsal claw (lateral).

Grossi & P.C. Grossi legs., luz (10 males, 6 females) (CERPE). Bahia: Maracás, 19.xii.2012, Becker, J. leg. (1 female) (MZFS).

Distribution: BRAZIL: Bahia, Minas Gerais (Ohaus, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Krajcik, 2008; Soula, 2009; present study), Mato Grosso (WBWC) (Moore et al., 2017) (Fig. 18).

Pelidnota burmeisteri tricolor **Nonfried, 1894** (Fig. 5A-5I)

Pelidnota tricolor Nonfried, 1894: 123–124 [original description].

Pelidnota sumptuosa var. *tricolor* Nonfried [new infrasubspecific status by F. Bates 1904: 260].

Pelidnota burmeisteri var. *tricolor* Nonfried [revised infrasubspecific status by Ohaus 1905: 317].

Pelidnota (*Pelidnota*) *burmeisteri* var. *tricolor* Nonfried [new subgeneric combination by Ohaus 1918: 25].

Pelidnota burmeisteri tricolor Nonfried [new combination and new subspecific status by Soula (2009, pp. 38-39)].

Type material: 1 male lectotype (present designation) of *Pelidnota tricolor* Nonfried at ZMHB [see Moore et al. (2017, p. 170)], see Figure 57 in Moore et al. (2017, p. 172), 1 male lectotype: "Coll. Nonfried. / Brasilia // Pelidnota / tricolor / Nonfried // Type // LECTOTYPE / Pelidnota burmeisteri tricolor / Nonfried, 1894 / des. Ferreira, Grossi & Seidel 2022". 1 male syntype at ZSM: "Coll. Nonfried. / Brasilia. // Pelidnota / tricolor / Nonfr. Cotype // Staatssammlung / München, 1975 / Erwerb Coll. / Machatschke // SYNTYPE / Pelidnota tricolor / Nonfried, 1894 / det. M. Seidel 2019 // WORLD / SCARAB. / DATABASE / WSD00344828" // PARALECTOTYPE / Pelidnota burmeisteri tricolor / Nonfried, 1894 / des. Ferreira, Grossi & Seidel 2022 (Fig. 5E).

Examined material: No additional material examined.

Distribution: BRAZIL: Mato Grosso (Ohaus, 1905, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Krajcik, 2008; Soula, 2009; Moore et al., 2017) (Fig. 18). As far as we have noticed there are only the syntypes of this subspecies, and no other specimen from Mato Grosso state was collected, or has been published.

Pelidnota ludovici **Ohaus, 1905** rev. stat. (Figs. 6A-6I, 7A-7F, 8A-8G, 9A-9F and 10A-10I)

Pelidnota ludovici Ohaus, 1905: 317 [original description].

Pelidnota (*Pelidnota*) *ludovici* Ohaus [new subgeneric combination by Ohaus (1918, p. 25)].

Pelidnota ludovici Ohaus [removal of subgeneric classification by Soula (2009, pp. 39-40)].

Type material: 1 male holotype (Fig. 6A-6C) of *Pelidnota ludovici* at ZSM: "Espirito Sto. / Timbuhy / L. Ohaus S. // 21.xii.98. // 1 // Pelidnota / Ludovici / Cotype Ohs. // Staatssammlung / München, 1975 / Erwerb Coll. / Machatschke // HOLOTYPE / Pelidnota ludovici / Ohaus, 1905 /

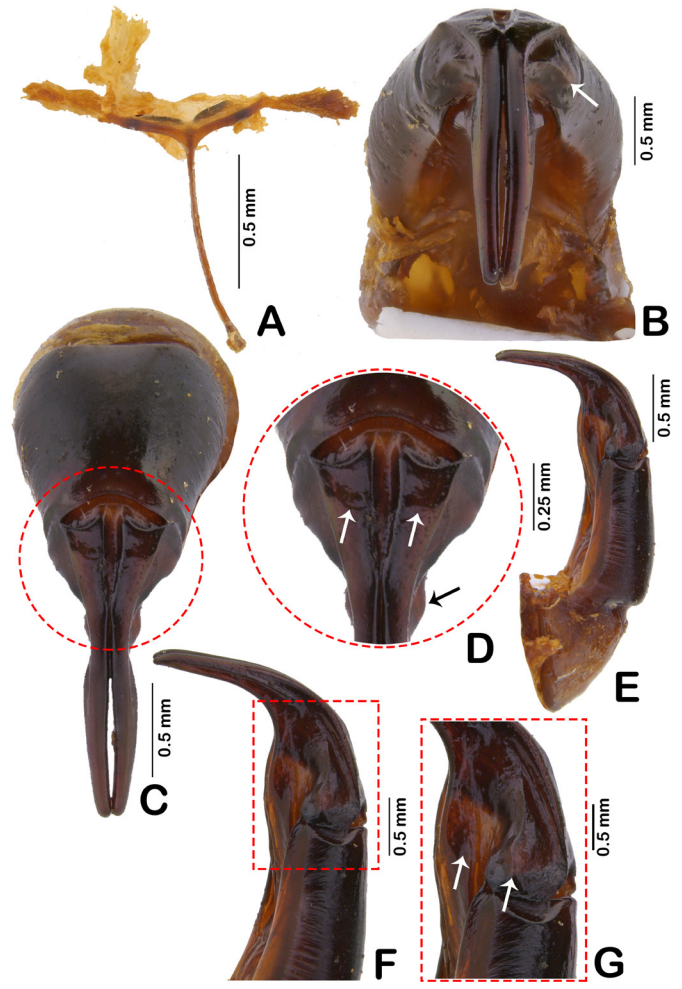

Figure 4 *Pelidnota burmeisteri burmeisteri* Burmeister, 1844: **A**, spiculum gastrale (dorsal); **B-G**, parameres; **B**, lateral carinae in detail (frontal); **C-D**, excavated aerea in surface and enlarged lateral area in lateral margin in detail (dorsal); **E**, aedeagus (lateral); **F-G**, lateral carinae and excavated aerea in lateral surface in detail.

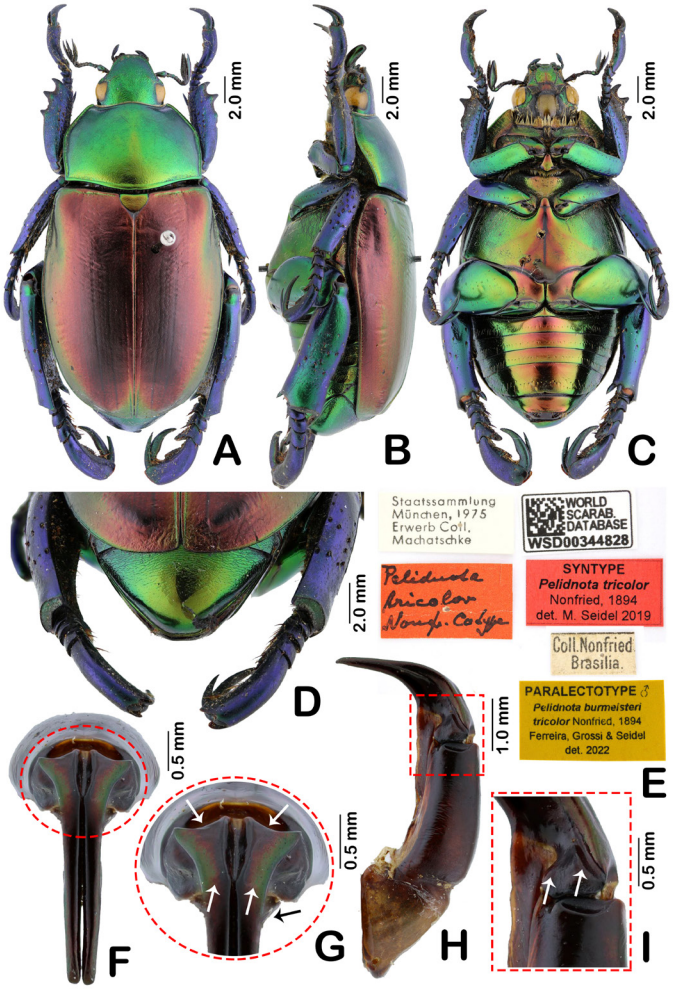

Figure 5 Paralectotype of *Pelidnota burmeisteri tricolor* Nonfried, 1894: **A-C**, male (dorsal, lateral, ventral); **D**, male pygidium in detail (frontal); **E**, type labels; **F-G**, excavated aerea in surface and enlarged lateral area in lateral margin in detail (dorsal); **H-I**, lateral carinae and excavated aerea in lateral surface in detail (lateral).

det. M. Seidel 2019 // WORLD / SCARAB. / DATABASE / WSD00344827" (Fig. 6E).

Examined material: BRASIL: Bahia: Itamaraju, 26.x.1985, Becker, J. leg. (1 female) (MZFS); 28.x1985, Becker, J. leg. (4 males) (MZFS); 31.x.1985, Becker, J. leg. (3 males); 31.x.1985, Becker, J. leg. (1 male, 1 female) (CERPE).

Distribution. BRAZIL: Bahia, Espírito Santo (Ohaus, 1905, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Krajcik, 2008; Soula, 2009; Moore et al., 2017) (Fig. 18).

Remarks. *Pelidnota ludovici* was described by Ohaus (1905), likely named after the brother of Ohaus "L. [=Ludovic or Ludwig] Ohaus", based on a unique male specimen collected in the state of Espírito Santo: "... Ufer des Rio Doce zwischen Baixo Timbuhy und Guandú gefunden...", right bank of the Rio Doce, between Baixo Guandu [Baixo Guandú] and Timbuhy [Timbui, today is the District of the municipality of Fundão]. In the original description the author compared *P. ludovici* with *P. burmeisteri* and recently, based principally in the dorsal and ventral coloration of the body, and in male genitalia and other characters not specified by the authors, Moore et al. (2017) proposed *P. ludovici* as a new synonym of *P. burmeisteri tricolor* Nonfried, 1894. According to Moore et al. (2017), specimens of *P. ludovici* examined by the authors present the following set of characters: ventral surface metallic rufous with metallic green shine (black with metallic green shine in *P. burmeisteri*); legs metallic rufous or purple (black in *P. burmeisteri*); head shiny, metallic green (also in *P. burmeisteri*); pronotum, scutellar shield, and elytra metallic rufous with green shine (pronotum and scutellar shield metallic green, elytra black and shiny in *P. burmeisteri*). Finally, Moore et al. (2017), based on comparison of specimens of *P. ludovici* and a lectotype of *P. burmeisteri tricolor* in ZMHB (male genitalia and other characters, not specified by the authors), considered these taxa to be conspecific. The holotype of *P. ludovici* has recently been discovered in ZSM, where it was obtained in 1975 with the purchase of the Machatschke collection. It is unclear if the holotype legitimately belonged to Machatschke or the SDEI (Senckenberg Deutsches Entomologisches Institut, Müncheberg, Berlin) which was Machatschke's former workplace. Soula (2009) only cites the locality from Ohaus (1905) and did not see the type at ZMHB, as mistakenly interpreted by Moore et al. (2017).

Here, we present a new set of characters, based on a series of *P. ludovici* (Figs. 6A-6I, 7A-7F, 8A-8G, 9A-9F and 10A-10I) specimens, followed by the characters in parentheses referring to *P. burmeisteri* (Figs. 1A-1F, 2A-2G, 3A-3F and 4A-4G) examined in our study: dorsal (Figs. 6A-6B, 7A-7D and 8A-8B) and ventral side rufous (Figs. 6C and 7C-7F) with metallic green reflections, elytron with lateral margin and apex purple (Fig. 1A-1D) (head, pronotum (Figs. 1A-1D and 2A-2B) and pygidium (Fig. 2C) metallic green with purple reflections on lateral margins, scutellar shield (Fig. 1A-1D) and ventral side rufous with metallic green reflections (Fig. 1C-1F), elytron black (Fig. 1A-1D)); legs metallic purple (Fig. 7A-7F) (coxa, trochanter and femur metallic green, tibia and tarsus metallic purple (Fig. 1A-1F)); propygidium with longitudinal

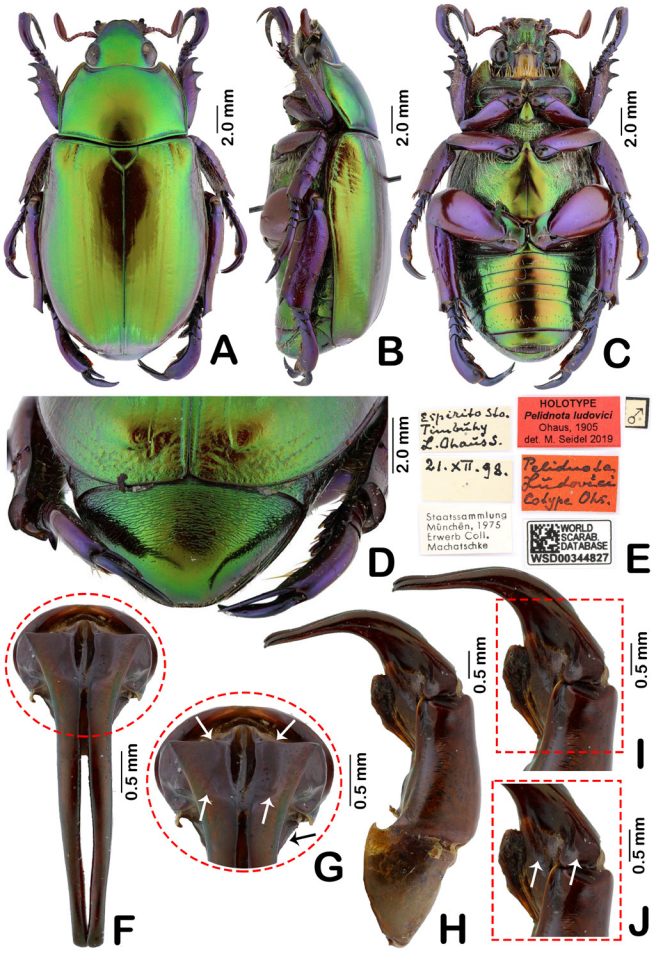

Figure 6 Holotype of *Pelidnota ludovici* Ohaus, 1905: **A-C**, male (dorsal, lateral, ventral); **D** male pygidium in detail (frontal); **E**, type labels; **F-G**, excavated aerea in surface and enlarged lateral area in lateral margin in detail (dorsal); **H**, aedeagus (lateral); **I-J**, lateral carinae and excavated aerea in lateral surface in detail.

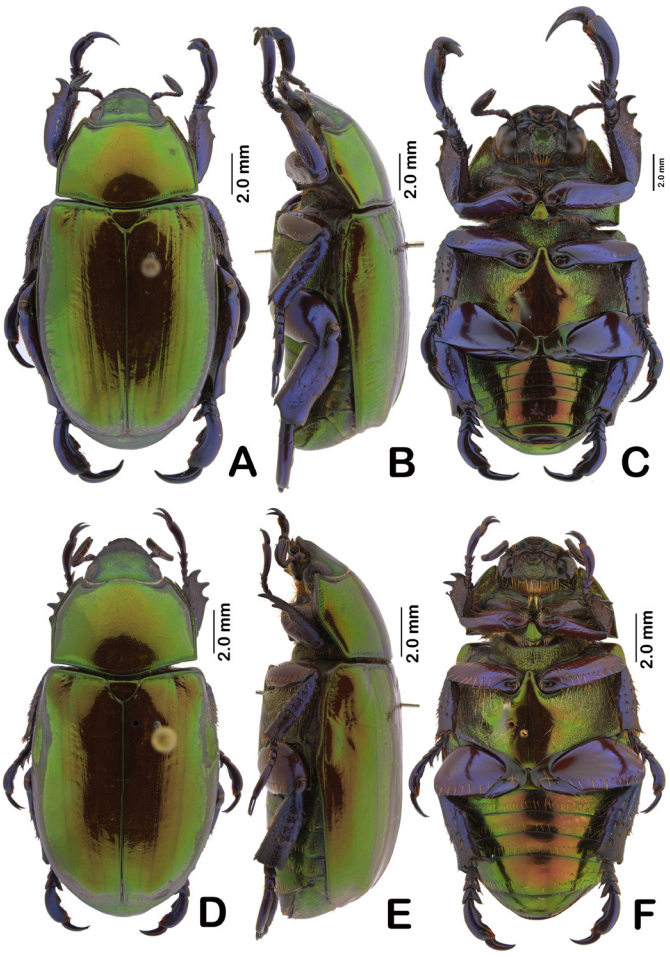

Figure 7 *Pelidnota ludovici* Ohaus, 1905 (additional material at MZFS): **A-C**, male (dorsal, lateral, ventral); **D-F**, female (dorsal, lateral, ventral).

carinae in dorsal surface, distal margin with smooth surface and sparse setae in medial region (Fig. 8C-8D) (propygidium without longitudinal carinae in dorsal surface, distal margin with surface densely punctate, glabrous surface (Fig. 2C-2D)); labium with excavated area in dorsal surface of distal portion occupying more than 1/3 of disc surface, lateral margin rounded, palpomere III subfusiform and elongate, longer than palpomeres I–II combined (Fig. 8E-8F) (labium with excavated area in dorsal surface in the distal portion occupying less than 1/3 of disc surface, lateral margin substraight, palpomere III fusiform and elongated, length equal to palpomeres I–II combined (Fig. 2E-2F)); prosternum with dorsal surface densely striated transversely, space between striae less than width of one stria (Fig. 8F-8G) (prosternum with dorsal surface densely striated transversely, space between striae bigger than width of one stria (Fig. 2F-2G)); prosternal process elongated, extending beyond distal margin of pro-trochanter (Fig. 9A) (prosternal process elongated, but not extending beyond distal margin of pro-trochanter (Fig. 3A)); mesoventral process elongate, extending slightly beyond proximal margin of mesocoxa (Fig. 1A) (mesoventral process elongated, but not extending beyond proximal margin of mesocoxa (Fig. 3A)); posterior angle of metacoxa with rounded apex, divergent, elongated, extending beyond lateroinner margin of metatrochanter (Fig. 9B) (posterior angle of metacoxa straight, with rounded apex, elongated but not extending beyond lateroinner margin of metatrochanter (Fig. 3B)); metatibia with distal margin of external surface strongly concave, concave distal surface (Fig. 9C-9D) (metatibia with distal margin of external surface weakly concave, flat distal surface (Fig. 3C-3D)); male abdominal ventrite VI with enlarged transversal carinae in dorsal surface, not extending to lateral margins of disc, membranous area in distal margin with length greater than 1/3 the length of anterior portion of disc, elongated setae only in lateral margin (Fig. 9E) (narrow transversal carinae, extending to lateral margins of disc, membranous area with length equal to 1/3 the length of anterior portion of disc, elongated setae in lateral and distal margin (Fig. 3E)); male metatarsomere V with protuberance laterally enlarged in inner margin, protuberance length slightly bigger than 1/3 of tarsomere length, outer metatarsal claw with excavated and enlarged area in inner margin (Fig. 9F) (protuberance laterally enlarged in inner margin, protuberance length slightly smaller than 1/3 of tarsomere length, outer metatarsal claw with strongly excavated and narrow area in inner margin (Fig. 3F)); spiculum gastrale T-shaped, with straight lateral branches combined with a recurved medial branch, non-enlarged apex (Fig. 10A) (spiculum gastrale T-shaped, with straight lateral branches combined with a weakly recurved medial branch, slightly enlarged apex (Fig. 4A)); parameres with variation, symmetrical, convex in dorsal view (Fig. 10B-10C-10E), proximal margin convex (Fig. 10C-10E), distal margin rounded (Fig. 10B-10C-10E), inner margin with concave area in the proximal dorsal surface, substraigth medial region and touching apexes (Fig. 10B-10C) or with medial region divergent and free apexes (Fig. 10E), outer margin without lateral enlarged area between basal and medial region (Fi. 10C-10D), excavated area absent at base of dorsal surface (Fig. 10C-10E), laterally arched (Fig. 10E-10F-10I), short

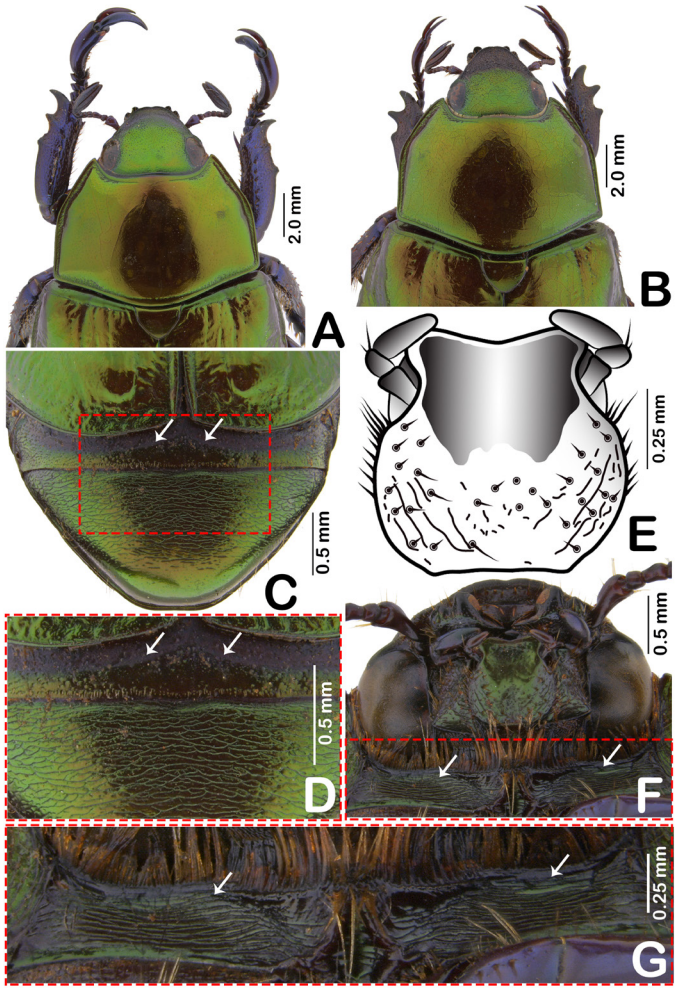

Figure 8 *Pelidnota ludovici* Ohaus, 1905: **A**, male head (dorsal); **B**, female head (dorsal); **C**, pygidium (frontal); **D**, male pygidium in detail (frontal); **E**, male labium (dorsal); **F**, male mouthparts and prosternum (dorsal); **G**, prosternum in detail (dorsal).

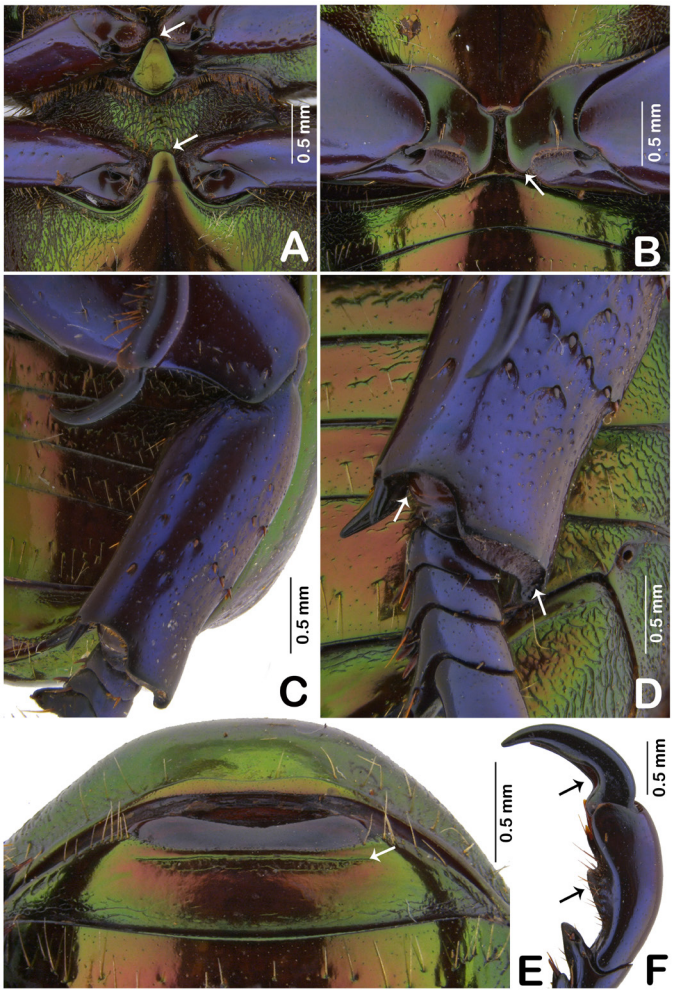

Figure 9 *Pelidnota ludovici* Ohaus, 1905: **A**, male prosternal and mesoventral processes (dorsal); **B**, male posterior angle of metacoxa in detail (dorsal); **C**, male metatibia (lateral); **D**, apex of metatibia in detail (lateral); **E**, male abdominal ventrite VI (dorsal); **F**, male metarsomere V and outer metatarsal claw (lateral).

lateral carinae (Fig. 10B-10F-10I) and excavated area present at base (Fig. 10F-10H) excavated area can be more (Fig. 10G-10H) or slightly less deep (Fig. 10I) (parameres without pronounced variation, symmetrical, convex in dorsal view (Fig. 4B-4C), proximal margin strongly convex (Fig. 4C-4D), distal margin rounded (Fig. 4B-4C), inner margin with concave area in proximal dorsal surface and straight medial region and touching apexes (Fig. 4C), outer margin with lateral enlarged area between the basal and medial region (Fig. 4C-4D), excavated area present at the base of dorsal surface (Fig. 4C-4D), laterally arched (Fig. 4E-4F), elongated lateral carinae (Fig. 4B-4F-4G) and excavated area present at base (Fig. 4E-4G)). All specimens of *P. ludovici* were dissected to analyze the variation among the parameres. There was no variation in the external morphological characters of the body as recorded in the parameres. According to the set of characters presented here, we propose a **revised status** of *Pelidnota ludovici* Ohaus, as a valid species, and not as junior synonym of *Pelidnota burmeisteri tricolor* Burmeister.

***Pelidnota ebenina* (Blanchard, 1842)** (Figs. 11A-11C, 12A-12G, 13A-13D and 14A-14G)

Anomala ebenina Blanchard, 1842: plate 11 [original description].

Odontognathus ebeninus (Blanchard) [new combination by Blanchard (1851, p. 215)].

Strigidia ebenina (Blanchard) [new combination by Lacordaire (1856, p. 355)].

Odontognathus ebeninus (Blanchard) [revised combination by Harold (1869, p. 1221)].

Pelidnota (*Ganonota*) *ebenina* (Blanchard) [new combination and new subgeneric combination by Ohaus (1918, p. 26)].

Pelidnota (*Strigidia*) *ebenina* (Blanchard) [new subgeneric combination by Machatschke (1970, p. 157)].

Pelidnota (*Odontognathus*) *ebenina* (Blanchard) [new subgeneric combination by Hardy (1975, p. 4)].

Strigidia ebenina (Blanchard) [revised combination by Soula (2006, pp. 16-17)].

Pelidnota (*Strigidia*) *ebenina* (Blanchard) [revised combination and revised subgeneric combination by Özdikmen (2009, p. 145)].

Pelidnota ebenina (Blanchard) [removal of subgeneric classification by Soula (2009, p. 115)].

Type material: 1 female holotype (lacking head) of *Pelidnota ebenina* (Blanchard) at MNHN: "743 / 34. // MUSEUM PARIS / SANTA CRUZ / DE LA SIERRA / D'ORBIGNY / 1834 // A. ebenina / Blanch. / Santa Cruz (Bolivien) / A. D'Orbigny // ANOMALA / EBENINA BLANCHARD / det. Jameson 2004 / HOLOTYPE ♀ // PELIDNOTA / EBENINA / (BLANCHARD) ♀ / det. M. E. Jameson 2004 // HOLOTYPE // MNHN / EC7093" (Fig. 11D).

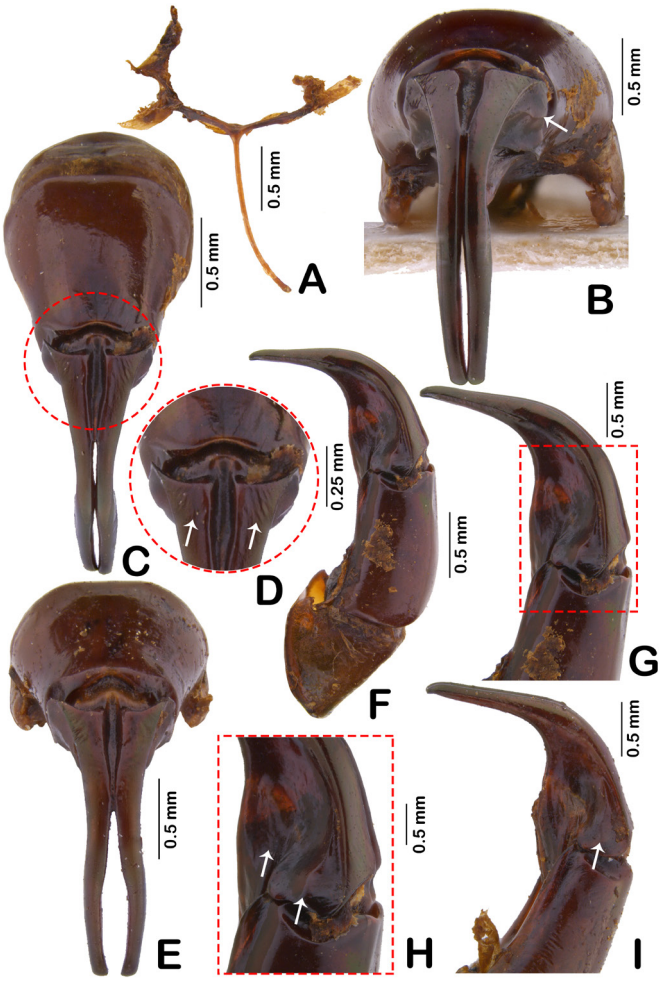

Figure 10 *Pelidnota ludovici* Ohaus, 1905: **A**, spiculum gastrale (dorsal); **B-G**, parameres; **B**, lateral carinae in detail (frontal); **C-D**, basal region of dorsal surface in detail; **E**, morphological variation of the parameres, inner margin divergent and free apex (frontal); **F**, aedeagus (lateral); **G-I**, lateral carinae and excavated aerea in lateral surface in detail.

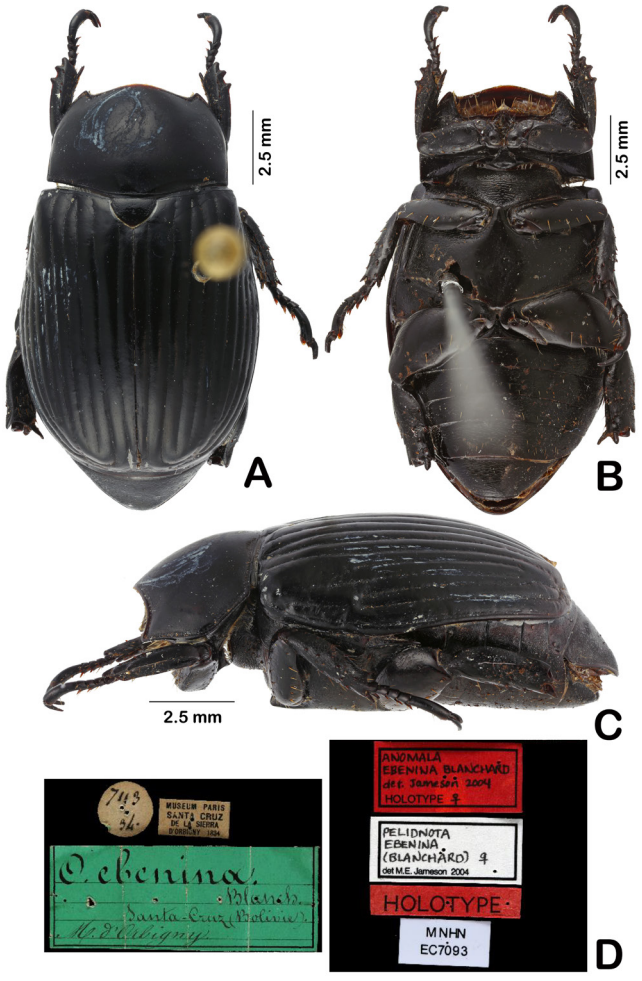

Figure 11 Holotype of *Pelidnota ebenina* (Blanchard, 1842) at MNHN: **A-C**, female (dorsal, ventral, lateral); **D**, type labels (available at: http://coldb.mnhn.fr/catalog-number/mnhn/ec/ec7093).

Examined material: ARGENTINA: Jujuy, Prov. [Province], Parque Nacional Calilegua, 3km, NW of campground, S23°44.149' W064°51.044', 777m, 15.i.2008, Light trap. L.R.R. Faria Jr. Leg. (1 male) (CERPE); Salta Province, S of Salta (50km), E of Coronel Moldes, 23.i.2009, Snížek leg. (2 females) (RBINS, NHMW). BOLIVIA: Santa Cruz dpt, Ñuflo de Chávez pr. 18.xi.-5.xii. 2011, Concepción-FCBC Alta Vista, 16°08.1'S, 61°56.1'W, 425m, at light, L. Sekerka & D. Windsor lgt. (1 female) (MSPC).

Distribution: ARGENTINA: Salta (Soula, 2006; Moore et al., 2017), Jujuy (new record). BOLIVIA: Santa Cruz (Blanchard, 1851; Ohaus, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Soula, 2006; Krajcik, 2008; Moore et al., 2017) (Fig. 18).

***Pelidnota gounellei* (Ohaus, 1908)** rev. stat. (Figs. 15A-15G, 16A-16 D and 17A-17G)

Odontognathus gounellei Ohaus, 1908: 307 [original description].

Pelidnota (*Ganonota*) *gounellei* (Ohaus) [new combination and new subgeneric combination by Ohaus (1918, p. 26)].

Pelidnota (*Strigidia*) *gounellei* (Ohaus) [new subgeneric combination by Machatschke (1970, p. 157)].

Pelidnota (*Odontognathus*) *gounellei* (Ohaus) [new subgeneric combination by Hardy (1975, p. 4)].

Strigidia ebenina (Blanchard) [syn. by Soula (2006, p. 17)].

Pelidnota (*Strigidia*) *gounellei* (Ohaus) [revised subgeneric combination and revised species status by Özdikmen (2009, p. 145)].

Pelidnota ebenina (Blanchard) [revised synonymy by Moore et al. (2017, p. 192)].

Type locality: BRAZIL: Bahia (San Antonio da Barra [= Condeúba]).

Examined material: BRASIL: Minas Gerais: Águas Vermelhas, 7 km ao Norte da Fazenda Faceira, 12-14.xii.2012, luz (13 males, 5 females); 15.xii.2012, E.J. Grossi & P.C. Grossi legs., luz (6 males, 3 females); same but, 16.xii.2012, E.J. Grossi, E. & P.C. Grossi, P.C. legs., luz (4 males, 4 females); Jissaras [Giçaras], área de Cerrado, 13.xii.2012 J.A. Rafael, G.A.R. Melo, E.J. Grossi, E. & P.C. Grossi, P.C. legs. (6 males CERPE); Berizal, Fazenda Veredão, 09-12.xii.2012, E.J. Grossi, E. & P.C. Grossi legs. (1 male). Bahia: Encruzilhada, 11.xii.2007, 800m, luz, 15°32'25"S 40°50'12"W, P.C. Grossi, J.A. Rafael & D.R. Parizotto legs. (1 male) (CERPE).

Distribution: BRAZIL: Pará (Ohaus, 1908, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Soula, 2006; Krajcik, 2008; Moore et al., 2017), Bahia (Ohaus, 1908, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Soula, 2006; Krajcik, 2008; Moore et al., 2017; present study), Minas Gerais (new state record) (Fig. 18).

Remarks: *Pelidnota gounellei* was described by Ohaus (1908) based on a unique male specimen collected in the state of Bahia (San Antonio da Barra) [Santo Antônio da Barra is an old District, that currently belongs to

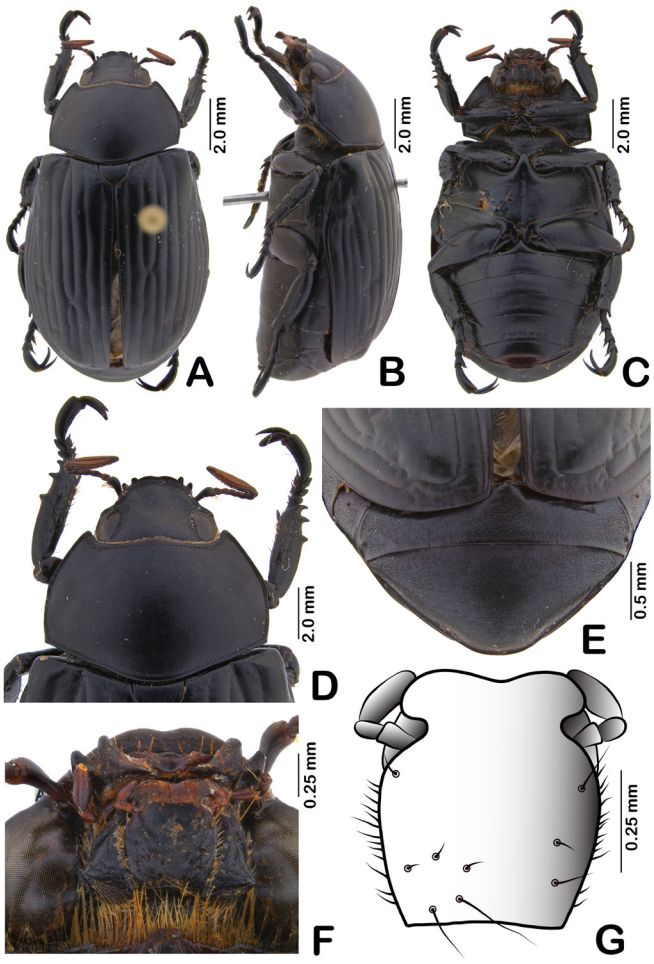

Figure 12 *Pelidnota ebenina* (Blanchard, 1842): **A-C**, male (dorsal, lateral, ventral); **D**, male head (dorsal); **E**, male pygidium (frontal); **F**, male mouthparts (frontal); **G**, male labium (dorsal).

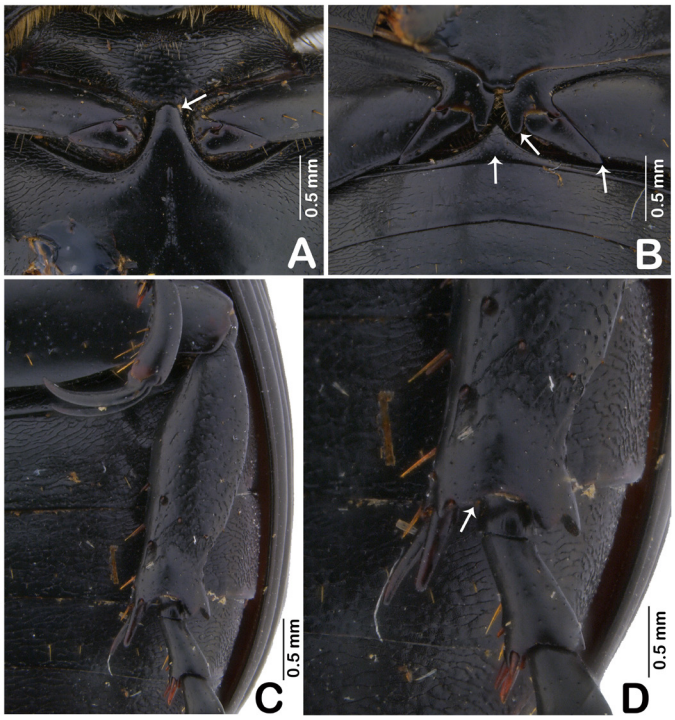

Figure 13 *Pelidnota ebenina* (Blanchard, 1842): **A**, male mesoventral process (dorsal); **B**, male posterior angle of metacoxa, metatrochanter and abdominal ventrite I in detail (dorsal); **C**, male metatibia (lateral); **D**, apex of metatibia in detail (lateral).

the municipality of Condeúba, in southwest of Bahia] (IBGE, 2022 – Available at: https://cidades.ibge.gov.br/brasil/ba/condeuba/historico). In the original description of the species, Ohaus (1908) compared *P. gounellei* with *P. cuprea fulvipennis* (Germar, 1824) (according to him, this species has a very variable shape) and suggested that *P. gounellei* is a western Brazilian variety of *P. cuprea fulvipennis*. Recently, Soula (2006) synonymized *P. gounellei* (Figs. 15A-15G, 16A-16D and 17A-17G) with *P. ebenina* (Blanchard, 1842) (Figs. 11A-11C, 12A-12G, 13A-13D and 14A-14G) and described this species based on a single female specimen from Santa Cruz de la Sierra (Bolivia). Moore et al. (2017), considered both species very similar based on outer appearance only, without presenting comparative characters. Furthermore, Moore et al. (2017) pointed out the differences on type localities of both species (*P. ebenina* from the western slopes of the Andes in Bolivia and Argentina; *P. gounellei* from Bahia and Minas Gerais in eastern Brazil). Moreover, Moore et al. (2017) stated that the type specimens associated with these three names (*P. ebenina*, *P. gounellei*, and *P. cuprea fulvipennis*) will assist in clarifying the validity of these species. However, Moore et al. (2017) followed Soula (2006) and considered *Pelidnota gounellei* as a revised synonymy of *Pelidnota ebenina*.

Here, we present a set of new characters, based on a series of *P. gounellei* (Figs 15A-15G, 16A-16D and 17A-17G) specimens followed by the characters in brackets referring to *P. ebenina* (Figs. 11A-11C, 12A-12G, 13A-13D and 14A-14G) examined in our study: dorsal (Fig. 15A), lateral (Fig. 15B) and ventral sides (Fig. 15C) brownish black (dorsal (Figs. 11A and 12A), lateral (Figs. 11C and 12B) and ventral sides (Figs. 11B and 12C) black); legs brownish black (Fig. 15A-15C) (black (Figs. 11A-11C and 12A-12C)); pygidium brownish black (Fig. 15E) (black (Fig. 12E)); labium with inverted "V" shaped carinae in dorsal surface of distal portion extending from base of the labial palp insertion to distal margin of disc, insertion area of labial palp more excavated, palpomere III fusiform and elongated, equal to palpomeres I–II combined, concave distal margin and rounded lateral margin (Fig. 15F-15G) (labium without carinae on dorsal surface of distal portion, insertion area of labial palp less excavated, palpomere III fusiform and elongated, longer than palpomeres I–II combined, distal margin weakly concave and slightly rounded lateral margin (Fig. 12F-12G)); mesoventral process elongated, not extending beyond the proximal margin of mesocoxa (Fig. 16A) (mesoventral process elongated extending slightly beyond proximal margin of mesocoxa (Fig. 13A)); posterior angle of metacoxa with rounded apex, divergent, elongated, extending beyond lateroinner margin of metatrochanter (Fig. 16B) (posterior angle of metacoxa straight, with rounded apex, elongated extending beyond lateroinner margin of metatrochanter (Fig. 13B)); metatrochanter elongated, apex exceeding distal margin of metafemur slightly (Fig. 16B) (apex exceeding distal margin of metafemur (Fig. 13B)); metatibia with distal margin of external surface strongly concave in the area of insertion of trochanter (Fig. 16C-16D) (metatibia with distal margin of external surface concave (Fig. 13C-13D)); male abdominal ventrite I with smooth surface (Fig. 15B) (surface moderately striated transversely (Fig. 12B); male abdominal ventrite VI with transversal carinae in dorsal surface, membranous area in distal margin with length subequal to length of anterior portion of disc (Fig. 17A) (carinae not evident, membranous area with length less than length of anteriorportion of disc (Fig. 14A)); male metatarsomere V with protuberance absent in inner margin, outer metatarsal claw with length less than length of metatarsomere (Fig. 17B) (male metatarsomere V with protuberance weakly present in inner margin, outer metatarsal claw with length subequal to length of metatarsomere (Fig. 14B)); spiculum gastrale T-shaped, with straight lateral branches combined with straight medial

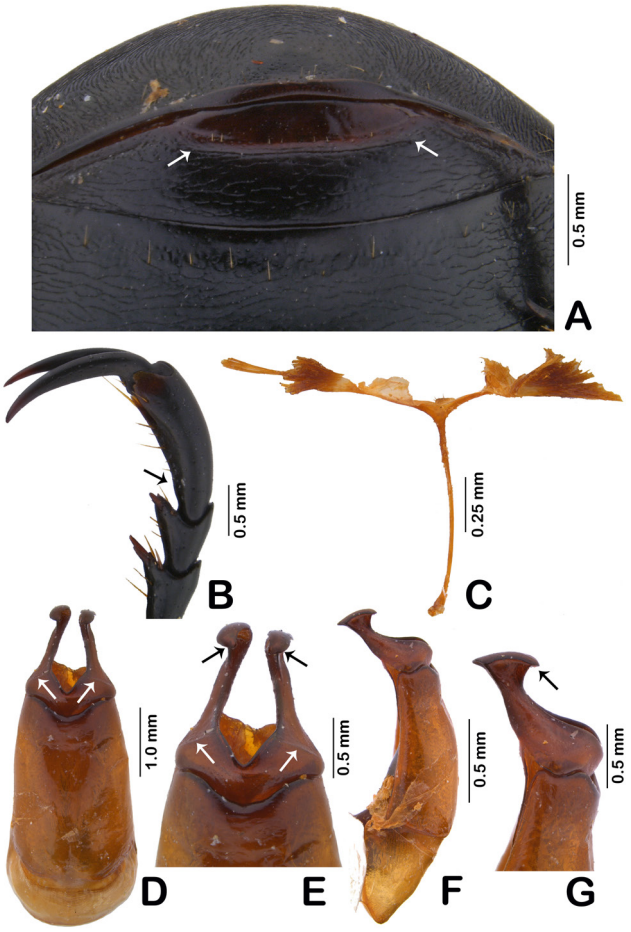

Figure 14 *Pelidnota ebenina* (Blanchard, 1842): **A**, male abdominal ventrite VI (dorsal); **B**, metatarsomere V and outer tarsal claw (lateral); **C**, spiculum gastrale (dorsal); **D-G**, parameres; **D-E**, dorsal; **E**, transversal carinae in basal surface and acute and dorsally produced apex in detail; **F**, aedeagus (lateral); **G**, hammer-shaped apex in detail.

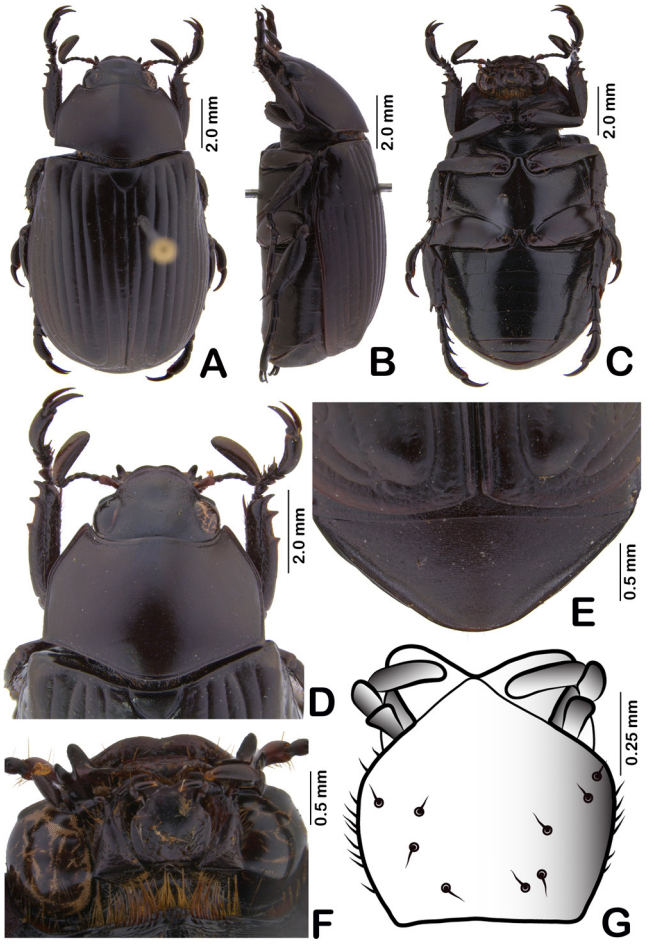

Figure 15 *Pelidnota gounellei* (Ohaus, 1908): **A-C**, male (dorsal, lateral, ventral); **D**, male head (dorsal); **E**, male pygidium (frontal); **F**, male mouthparts (frontal); **G**, male labium (dorsal).

branch, slightly enlarged apex (Fig. 17C) (spiculum gastrale T-shaped, with straight lateral branches combined with a weakly curved medial branch, slightly enlarged apex (Fig. 14C)); parameres symmetrical, fused only at base, enlarged basal region without carinae in surface, narrow medial region and apical region spatuliform, sinuous proximal margin, concave lateral margin and subelliptical inner margin in dorsal view (Fig. 17D-17E), in lateral view (Fig. 17F-17G) irregular surface with laterobasal and dorsal margins sinuous, lateroventral margin almost straight and acute apex (Fig. 17F-17G) (parameres symmetrical, fused only at base, enlarged basal region with a transversal carinae in surface of medial portion, narrow medial and apical region, acute and dorsally produced apex, sinuous proximal margin, straight lateral margin and sub diamond-shaped inner margin in dorsal view (Fig. 14D-14E), in lateral view (Fig. 14F-14G) irregular surface with sinuous laterobasal and dorsal margins, almost straight lateroventral margin and hammer-shaped apex (Fig. 14F-14G)). According to the set of characters presented here, and following Özdikmen (2009), we propose the **revised status** of *Pelidnota gounellei* (Ohaus), as a valid species, different from *Pelidnota ebenina* (Blanchard).

Discussion

The taxonomic status of *Pelidnota ludovici* Ohaus, 1905 and *Pelidnota gounellei* (Ohaus, 1908) are revised. Although these two species are very similar to its congeners as mentioned in the original descriptions by Ohaus (1905, 1908), the species revised present a set of morphological divergent comparative characters. Besides the morphological characters to distinguish *P. ludovici* from *P. burmeisteri*, and *P. gounellei* from *P. ebenina*, the species also differ with respect to their geographic distribution. *Pelidnota burmeisteri burmeisteri* Burmeister, 1844 was described from Bahia, Brazil, and it is currently distributed in the states of Bahia, Minas Gerais (Ohaus, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Krajcik, 2008; Soula, 2009; present study) and Mato Grosso (WBWC) (Moore et al., 2017) (Fig. 18). *Pelidnota burmeisteri tricolor* Nonfried, 1894 was described from "Brasilia" [Brazil] (Nonfried, 1894), and currently has distribution records only from Mato Grosso (Ohaus, 1905, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Krajcik, 2008; Soula, 2009; Moore et al., 2017) (Fig. 18). *Pelidnota ludovici* Ohaus (1905) was described from the state of Espírito Santo (Ohaus, 1905), and is also known from Bahia state (Ohaus, 1905, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Krajcik, 2008; Soula, 2009; Moore et al., 2017) (Fig. 18). *Pelidnota ebenina* (Blanchard, 1842) was described from Santa Cruz de la Sierra in Bolivia (Blanchard, 1842), and currently, has also been recorded from Argentina in Salta Province (Soula, 2006; Moore et al., 2017; present study), and Jujuy Province (present study) (Fig. 18). *Pelidnota gounellei* (Ohaus, 1908) was described from San Antonio da Barra [municipality of Condeúba] in the state of Bahia, the states of Pará, (without specific locality) (Ohaus, 1908, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Soula, 2006;

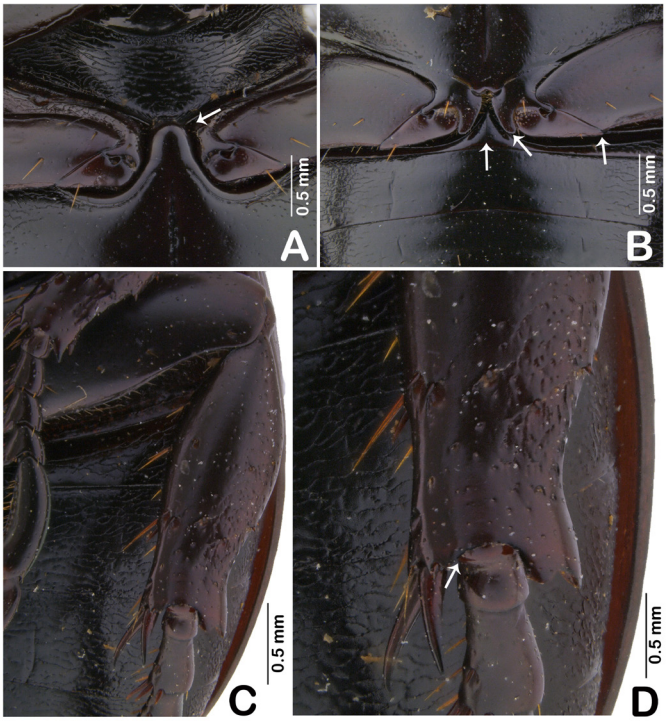

Figure 16 *Pelidnota gounellei* (Ohaus, 1908): **A**, male mesoventral process (dorsal); **B**, male posterior angle of metacoxa, metatrochanter and abdominal ventrite I in detail (dorsal); **C**, male metatibia (lateral); **D**, apex of metatibia in detail (lateral).

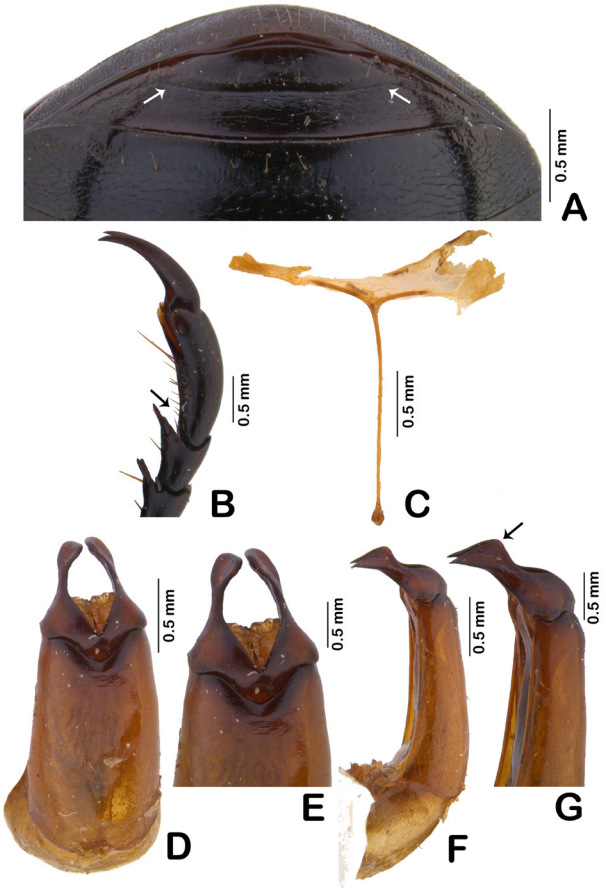

Figure 17 *Pelidnota gounellei* (Ohaus, 1908): male abdominal ventrite VI (dorsal); **B**, metatarsomere V and outer tarsal claw (lateral); **C**, spiculum gastrale (dorsal); **D-G**, parameres; **D-E**, dorsal; **E**, apex in detail; **F**, aedeagus (lateral); **G**, apex in detail.

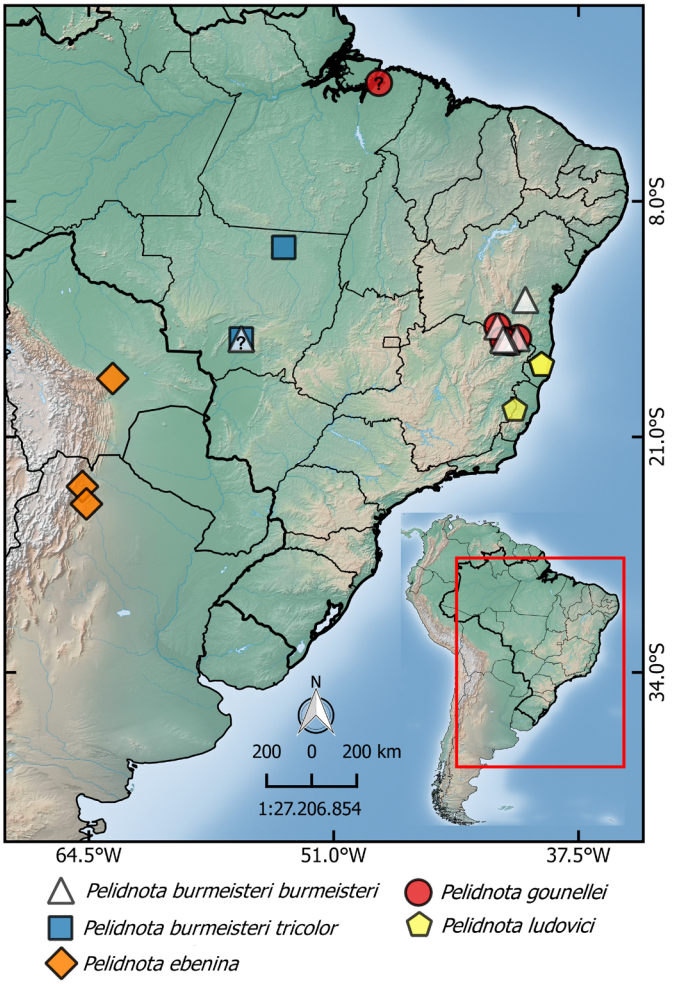

Figure 18 Distribution records for four species of *Pelidnota*.

Krajcik, 2008; Moore et al., 2017), Bahia (Ohaus, 1908, 1918, 1934; Blackwelder, 1944; Machatschke, 1972; Soula, 2006; Krajcik, 2008; Moore et al., 2017; present study) and our new records from Minas Gerais state (present study) (Fig. 18).

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Conflicts of interest

The authors declare no conflicts of interest.

Author contribution statement

All authors contributed to taxonomic revision and decisions in this work. ASF: Conceptualization, Data curation, Methodology, Writing-Original draft preparation. PCG: Conceptualization, Resources, Data curation, Supervision, Reviewing and Editing. MS: Data curation, Methodology, Reviewing and Editing. All authors have read and approved the final version of the manuscript.

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