



Monograph

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A look beyond the colour: taxonomic revision of *Coilodes* Westwood, 1846 (Coleoptera, Hybosoridae), with the description of six new species

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Abstract. *Coilodes* Westwood, 1846 is a Neotropical genus of Hybosorinae. Despite being a morphologically homogeneous genus, it presents a great deal of intraspecific variation, especially with reference to the colour of integuments. This makes identification of species even more difficult, since the majority of original descriptions present the colour as the main diagnostic character. To solve this problem, the first taxonomic revision of *Coilodes* is presented. The genus now comprises 13 species. Redescriptions of *C. castaneus* Westwood, 1846, *C. fumipennis* Arrow, 1909, *C. humeralis* (Mannerheim, 1829), *C. niger* (Mannerheim, 1829), *C. ovalis* Robinson, 1948, *C. parvulus* Westwood, 1846, and *C. punctipennis* Arrow, 1909 are presented. *Coilodes niger* (Mannerheim, 1829) has its status revalidated and three new synonyms are proposed: *C. gibbus* (Perty, 1830) and *C. chilensis* Westwood, 1846 with *C. humeralis*, and *C. nigripennis* Arrow, 1903 with *C. castaneus*. Biological and geographical distribution data are expanded. Lectotypes are designated for *C. humeralis* and *C. niger*. Six new species are described: *C. bezerrai* Basílio & Vaz-de-Mello sp. nov., *C. edeiltae* Basílio & Vaz-de-Mello sp. nov., *C. lunae* Basílio & Vaz-de-Mello sp. nov., *C. mayae* Basílio & Vaz-de-Mello sp. nov., *C. ravii* Basílio & Vaz-de-Mello sp. nov., and *C. skellei* Basílio & Vaz-de-Mello sp. nov. An identification key for the males of the species is presented.

Keywords. Description, identification key, morphology, Neotropical, Scarabaeoidea.

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Introduction

Coilodes Westwood, 1846 (Scarabaeoidea: Hybosoridae: Hybosorinae) was created for the Neotropical species previously described in *Hybosorus* MacLeay, 1819 [*C. humeralis* (Mannerheim, 1829), *C. niger* (Mannerheim, 1829) and *C. gibbus* (Perty, 1830)] plus three new species (*C. castaneus* Westwood, 1846; *C. chilensis* Westwood, 1846 and *C. parvulus* Westwood, 1846). Later, four more species were included in this genus (*C. nigripennis* Arrow, 1903; *C. punctipennis* Arrow, 1909; *C. fumipennis* Arrow, 1909 and *C. ovalis* Robinson, 1948) and *C. niger* was synonymized with *C. humeralis*. Thus, the genus *Coilodes* currently comprises nine species (Ocampo & Ballerio 2006).

Coilodes differs from other Hybosorinae in its sexual dimorphism, the male having the pronotum excavated and tarsal claws with a medial tooth, and the female has a convex pronotum and simple tarsal claws (Westwood 1846). *Coilodes* and *Frolovius* Basílio, Vaz-de-Mello & Almeida, 2022 are phylogenetically more closely related to Oriental and Palearctic Hybosorinae than to any Neotropical genera within this subfamily (Ocampo & Hawks 2006; Basílio *et al.* 2023).

Little information is known about the biology and behaviour of *Coilodes*. However, copronecrophagous habits have been recorded for its species (Cornaby 1974; Orozco & Pérez 2008; Rodrigues *et al.* 2013); they are good flyers, they can easily be found during the day in sandy places (Lacordaire 1856); and they can be collected in direct association with decomposing vertebrate carcasses (first author, personal observation).

Coilodes is reported from Costa Rica to Chile (even though the record from Chile is doubtful) (Ocampo & Ballerio 2006). Despite the wide distribution of *Coilodes* in the Neotropical region, many studies have reported issues with identification of species (Escobar 1997; Orozco & Pérez 2008; Rodrigues *et al.* 2013; Ballerio & Grebennikov 2016). These difficulties are because many of them have always been distinguished almost exclusively by colouring (Mannerheim 1829; Westwood 1846; Arrow 1909). However, this is a plastic character within species and, therefore, unreliable. Furthermore, the broad variation in their intraspecific morphology is also an obstacle in delimiting each species.

To solve this problem, we revised the taxonomy of all species of *Coilodes* based on genitalia and external morphology. Six new species were found, while three new synonyms and one revalidation are proposed. Lectotypes are designated for *C. humeralis* and *C. niger*; and new information expanding the known distribution and biological data of *Coilodes* species are provided.

Material and methods

The external morphology and male genitalia of 1324 specimens were examined (labels verbatim in Supp. file 1). In order to dissect the genitalia, specimens were boiled in distilled water for five minutes, and the genitalia were boiled in KOH for five more minutes. Genitalia and external morphology examinations were made using a ZEISS SteREO Discovery V20 stereo microscope. Photographs were taken using a Leica M205C stereo microscope with a coupled Leica DMC 2900 digital camera. The assembly of stack images was made using Leica LAS Multifocus software. The plates were made using CorelDRAW® and Corel PHOTO-PAINT® Home & Student 2018.

Measurements of body length were calculated as the sum of the head (from frons base to clypeus apex), pronotum and elytra length. Width measures were obtained at the longest distance between the outer margins of the elytra. The terminology used follows Grebennikov *et al.* (2004), Ocampo (2006), Bai *et al.* (2015), Ballerio & Grebennikov (2016) and Cristóvão & Vaz-de-Mello (2020). The acronym “FIT” in the list of material examined stands for “Flight Interception Trap”. The first and second authors of this paper, Daniel S. Basílio and Fernando Z. Vaz-de-Mello, are responsible for coining the names of the new species.

New records of geographical distribution are underlined. The maps were made using the GPSTrackMacker® Version 13.9.596 software, Google Earth and the simplemappr.net website (Shorthouse 2010). When present, geographic coordinates were obtained from the labels; otherwise, coordinates of cities or states were used.

Institutional abbreviations

- CEMT = Setor de Entomologia da Coleção Zoológica UFMT, Cuiabá, Mato Grosso, Brazil
 CERPE = Coleção Entomológica da Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brazil
 CUIC = Cornell University Insect Collection, Ithaca, New York, USA
 DZUP = Coleção Entomológica Pe. J. S. Moure, Universidade Federal do Paraná, Curitiba, Paraná, Brazil
 FSCA = Florida State Collection of Arthropods, Gainesville, Florida, USA
 MNNC = Museo Nacional de Historia Natural de Chile, Santiago, Chile
 NHMUK = The Natural History Museum, London, England
 OUMNH = Oxford University Museum of Natural History, Oxford, England
 UCCC = Museo de Zoología de la Universidad de Concepción, Concepción, Chile
 ZIN = Russian Academy of Sciences, Zoological Institute, St. Petersburg, Russia
 ZSM = Zoologische Staatssammlung München, Munich, Germany

Results

Class Insecta Linnaeus, 1758
 Order Coleoptera Linnaeus, 1758
 Superfamily Scarabaeoidea Latreille, 1802
 Family Hybosoridae Erichson, 1847
 Subfamily Hybosorinae Erichson, 1847

Genus *Coilodes* Westwood, 1846
 Figs 1–14

Coilodes Westwood, 1846: 163 (original description).

Coilodes – Erichson 1847: 717 (taxonomy). — Lacordaire 1856: 135 (redescription). — Scudder 1882: 73 (catalogue). — Lucas 1920: 195 (catalogue). — Blackwelder 1944: 217 (checklist). — Allsopp 1984: 106 (checklist). — Escobar 1997: 422 (ecology). — Ratcliffe & Ocampo 2001: 352 (taxonomy). — Ocampo 2002: 125 (taxonomy). — Ratcliffe 2002: 7 (checklist). — Ocampo & Ballerio 2006: 191 (checklist). — Ocampo & Hawks 2006: 8 (molecular phylogeny). — Orozco & Pérez 2008: 38 (ecology). — Ocampo 2010: 201 (taxonomy). — Otavo *et al.* 2013: 741 (ecology). — Rodrigues *et al.* 2013: 213 (ecology). — Ballerio & Grebennikov 2016: 49 (phylogeny). — Basílio *et al.* 2023: 5 (phylogeny).

Coelodes – Erichson 1847: 717 (incorrect subsequent spelling: taxonomy). — Lacordaire 1856: 135 (redescription). — Gemminger & Harold 1869: 1075 (catalogue). — Arrow 1912: 37 (catalogue). — Paulian 1938: 230 (key). — Howden & Gill 1987: 2074 (taxonomy). — Feer 2000: 33 (ecology). — Uchoa & Rodrigues 2019: 21 (ecology).

Gnombolbus – Prokofiev 2013a: 1 (original description); Prokofiev 2013b: 1 (synonymy).

Type species

Hybosorus gibbus Perty, 1830 (junior synonym of *Coilodes humeralis*) by original designation.

Diagnosis

Coilodes is distinguished from other Neotropical Hybosorinae in the body shape being strongly convex, the elytra having sparse twin lines composed of punctures and the mandible being dorsally excavated. In addition, this genus is distinguished from the other Hybosoridae by the presence of sexual dimorphism both in the pronotum (convex in females and excavated in males) and in the tarsal claws (simple in females and with a middle tooth in males).

Etymology

The name “*Coilodes*” is masculine in gender, as it was treated in the original description (Westwood 1846). This term comes from the Greek κοιλότης (koîlotes) derived from κοίλος (koîlos). Although it was stated by Westwood (1846) as “convexitas”, it means concave.

Redescription

Male

MEASUREMENTS. Length 4.4–8.7 mm. Width 2.6–5.1 mm. Body convex, oval and shiny.

HEAD. Surface smooth or strigulate. Frons, in dorsal view, subrectangular; two small tubercles in the middle or one long tubercle formed by the fusion of the small ones; proximal border rounded; lateral margin variable. Canthus strong; distinct area expanded downwards with erect bristles; groove inconspicuous, medially extending up to the lateral margin of the frons. Clypeus subtrapezoidal or subrectangular; lateral margins weakly rounded; apex usually straight; thin and sparse setae throughout the anterior margin dorsally; frontoclypeal suture absent. Labrum semicircular; sparse setae spread along the entire dorsal margin; surface without punctures. Mandibles dorsally excavated, protruding beyond the apex of labrum; lateral margin smooth; setae on the basal half; one tooth at the inferior area of the mandibular apex. Labium with mentum subquadrate or subrectangular; labial palps with four palpomeres; basal palpomere twice as wide as long; second and third palpomeres subglobose; distal palpomere barrel-shaped, length equal to the second and third palpomeres combined. Maxilla subtriangular; long setae throughout surface; maxillary palp with four palpomeres; basal palpomere curved; second and third palpomeres longer than wide; distal palpomere barrel-shaped, length equivalent to the sum of the previous three. Antenna with 10 antennomeres; scape with long and erect setae; antennal club with three antennomeres; club with basal antennomere cupuliform, pubescent distally, sparse, short setae on its base.

PRONOTUM. Convex; excavated medially; usually subtrapezoidal, posterior margin wider than anterior margin or equal in size; medial length usually longer than the anterior and posterior margins; anterior margin with subacute angles; posterior margin rounded and weakly produced medially; lateral margin convex, setae and punctures usually absent.

SCUTELLAR SHIELD. Subtriangular, twice as long as wide; mostly without punctures; apex punctate.

ELYTRA. Double row of longitudinal punctures, sutural stria usually complete; elytral disc glabrous; external margins with short setae; elytral epipleuron complete, wider at the apex; posterior margin of elytra entirely covering tergite 8 (pygidium).

VENTER. Hypomeral surface strigulate, setose; prosternum with midlength elevated, transversally grooved; anterior margin variable in shape, mesoventrite and metaventrite usually smooth.

LEGS. Procoxa conical; surface strigulate. Protochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate; surface smooth, with sparse setae. Protibia with inner margin convex; surface with long setae; carinate; single spur; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second

tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex, inner spur as long as the protibial spur; outer spur $\frac{1}{3}$ longer than the inner one. Tarsi with five tarsomeres, each tarsomere twice as long as wide, distal tarsomere twice as wide as the previous; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA. Parameres asymmetrical; tegmen with or without a dorsal lobe.

Female

Length 5.1–8.3 mm. Width 3.0–4.7 mm. As the male except by pronotal excavation absent and tarsal claws simple.

Taxonomic history of *Coilodes* Westwood, 1846

Mannerheim (1829) described two *Hybosorus* species: *H. humeralis* and *H. niger* in “Description de quarante nouvelles espèces de Scarabéides du Brésil”, published in *Mémoires de la Société impériale des Naturalistes de Moscou*. According to the author, even though the generic attribution was doubtful, he decided to include them in the genus *Hybosorus*.

Perty (1830) described *Hybosorus gibbus*, a species from Brazil, but he also questioned its position in this genus. In 1840, Laporte (alias Castelnau) succinctly described four more species of *Hybosorus*, amongst them *H. brasiliensis*, this also from Brazil.

The name *Coilodes* appeared for the first time when Westwood (1846) merged a small group of South American species previously included in *Hybosorus*. According to this author, these two genera differ from each other, besides in their distribution, by the mandible shape and the presence of sexual dimorphism. The dimorphism involves the excavated pronotum and the tarsal claws with one medial tooth in males, and convex pronotum and simple tarsal claws in females. Westwood (1846) designated *Coilodes gibbus* as the type species, accompanied by drawings of mouthparts, protibia and the male tarsal claw. He also described three new species: *C. parvulus* (Brazil), *C. castaneus* (Colombia) and *C. chilensis* (Chile). Westwood also synonymized *Hybosorus brasiliensis* and *H. geminatus* (the latter is a *nomem nudum*; this name was cited in Dejean’s catalogues, in 1833 and 1837, but without a description) with *C. gibbus*. Based on the species distribution, he suggested that many other *Hybosorus* from Central and South America should be transferred to *Coilodes*. The seven species transferred to *Coilodes* were: the two described by Mannerheim (1829), *H. humeralis* and *H. niger* (misspelled by Westwood as *H. auger*); *H. rufulus* (Castelnau, 1840); and the four cited in Dejean’s catalogues (Dejean 1833, 1837), *H. testaceus* and three *nomina nuda*, *H. discus*, *H. granarius*, and *H. minutus*.

Erichson (1847) proposed the name Hybosoridae for the family, based on the number of antennal segments (10) and the presence of strongly fused abdominal segments. This author included six genera: *Hybosorus* MacLeay, 1819; *Phaeochrous* Laporte, 1840; *Coilodes* Westwood, 1845; *Chaetodus* Westwood, 1845; *Dicraeodon* Erichson, 1847; and *Apalonychus* Westwood, 1845, and suggested changes in the names of two genera, *Coilodes* to ‘*Coelodes*’, and *Apalonychus* to ‘*Hapalonychus*’. Lacordaire (1856) used the same names proposed by Erichson and redescribed Hybosoridae and its six genera.

MacLeay (1864) described *C. bimaculatus* in *Coelodes* [sic], for an Australian species from Port Denison. Despite the discrepant distribution, the author stated doubts about the generic position of this species due to the lack of sexual dimorphism in the pronotum and the tarsal claws, used by Westwood (1846) as diagnostic for the genus.

In the catalogue of Coleoptera by Gemminger & Harold (1869), *Coilodes* was composed by eight species: *C. bimaculatus* MacLeay, 1864; *C. castaneus* Westwood, 1846; *C. chilensis* Westwood 1846; *C. gibbus* (Perty, 1830); *C. humeralis* (Mannerheim, 1829); *C. niger* (Mannerheim, 1829); *C. parvulus* Westwood, 1846 and *C. rufulus* (Castelnau, 1840) (included in *Coilodes* after suggestion of Westwood 1846). Five years later, Harold (1874) transferred *C. bimaculatus* to *Liparochrus* Erichson, 1848. Then, Preudhomme de Borre (1886) transferred *C. rufulus* to *Apalonychus*, which was synonymized years later with *A. waterhousei* by Arrow (1909).

Bates (1887) cited new distribution records for *C. castaneus* (Nicaragua and Costa Rica) and a small unidentified specimen from Guatemala, but without any further information about it.

Arrow (1903) described three other species of *Coilodes* (still using the ‘*Coelodes*’ spelling): *C. nigripennis* (from St. Vincent, Leeward side), *C. punctipennis* (from Ecuador) and *C. fumipennis* (from Amazonas, Brazil). In his catalogue of Coleoptera (Arrow 1912) the same author updated the composition of ‘*Coelodes*’ to nine species: *C. castaneus*; *C. chilensis*; *C. gibbus*; *C. humeralis*; *C. niger*; *C. parvulus*; *C. fumipennis*; *C. punctipennis* and *C. nigripennis*.

Lucas (1920) redressed the spelling to “*Coilodes*”. However, Pic (1928) resumed the use of the spelling “*Coelodes*”, which was also reproduced by Paulian (1938). The former also indicated the existence of a variety of *C. gibbus* (“*Coelodes gibbus* v. nov. *testaceus*”). Blackwelder (1944) used the original spelling for the genus in his checklist, and included within *Coilodes* the same nine species cited by Arrow (1912). The author also attributed a feminine grammatical gender to its names (*C. gibba*, *C. parvula*). However, the name “*Coilodes*” is masculine in gender in its original description (see also Art. 30.1.4.4 of the ICZN Code; ICZN 1999). Four years later, Robinson (1948) described *C. ovalis* from Venezuela, based only on female specimens, using once more the generic spelling suggested by Erichson (‘*Coelodes*’).

The first checklist of Hybosoridae was published by Allsopp (1984), where the author ranked the group as a subfamily of Scarabaeidae (Hybosorinae). Supported by the International Code of Zoological Nomenclature (which came into effect in 1958), Allsopp (1984) resumed the original (and current) spelling of *Coilodes* and listed ten species in the genus: the nine cited by Arrow (1912) and Blackwelder (1944), plus *C. ovalis*.

In the molecular phylogeny of Hybosoridae by Ocampo & Hawks (2006), *Coilodes* was found to be more closely related to the Oriental genus *Phaeochroops* Candèze, 1876 than to *Hybosorus* or even to *Metachaetodus* Preudhomme de Borre, 1866, although that was the only other Neotropical genus of Hybosorinae used in the analysis. In their catalogue of Hybosoridae, Ocampo & Ballerio (2006) synonymized *C. niger* with *C. humeralis*, differing from Allsopp (1984) only in this synonymy.

Prokofiev (2013a) described *Gnombolbus orosi*, a new genus and species of Bolboceratinae (Geotrupidae), but in the same year, he synonymized this genus with *Coilodes*, and the species became a junior synonym of *Coilodes castaneus* (Prokofiev 2013b).

Finally, in the most recent morphological phylogeny proposed by Basílio *et al.* (2023) including all Hybosorinae genera, *Coilodes* was recovered as the sister group of *Frolovius* (a monospecific Neotropical genus), but distant of all other Neotropical Hybosorinae genera.

Taxonomic discussion

Coilodes is distinguished from other Central and South American genera within Hybosorinae by the presence of an excavated mandible. This character can be observed in African and Asian genera such as *Hybosorus* MacLeay, 1819; *Phaeochridios* Lansberge, 1887; *Phaeochroops* Candèze, 1876; *Phaeochrous* Castelnau, 1840 and *Seleucosorus* Kuijten, 1983. This divergence among the Neotropical genera of the

subfamily was recovered in the analysis performed with molecular data by Ocampo & Hawks (2006) that shows *Coilodes* as more closely related to *Phaeochroops* than to the Neotropical genus *Metachaetodus*. In the morphological hypothesis proposed by Basílio *et al.* (2023), except for the close relationship with *Frolovius*, the divergence from the other Neotropical genera was also recovered. In that study, *Coilodes* and *Frolovius* are considered sister groups, closely related to *Seleucosorus* and the Palearctic genus *Hypseloderus* Faimaire, 1893 (Basílio *et al.* 2023).

Geographical distribution

Coilodes occurs in the Neotropical Region, from Central America (Nicaragua, Costa Rica, Panama and the Antilles) to South America (French Guiana, Venezuela, Colombia, Ecuador, Chile, Peru, Bolivia, Brazil, Paraguay and Argentina). However, the record from Chile is doubtful. No records are yet known from Guyana, Suriname, or Uruguay (Fig. 14).

Biological data

Coilodes usually presents copronecrophagous habits. It is commonly collected using vertebrate faeces or meat in bait traps. Some authors reported the association of adults with carcasses of many kinds of vertebrate, including mammals (monkey, sloth, pig, hedgehog, opossum, rabbit, and mouse), birds (chicken), reptiles (lizard), amphibians (frog), and fishes (Cornaby 1974; Wehncke & Dalling 2005; Young 1983; label data, personal observation). This association mostly occurs in the first stages of decomposition. In addition, specimens were collected in carcasses of invertebrates (ant, shrimp, squid, and earthworm), in fungi, and a few times in decomposing fruit (Young 1983; label data). They are considered good flyers (Lacordaire 1856), with diffuse distribution and diurnal habits (Young 1983). There are records of adult specimens of *Coilodes* collected using light traps, which suggests attraction to light (label data). They also bury themselves quickly when threatened (personal observation). In addition, stridulating behaviour has been observed in adults of *C. humeralis* (personal observation).

Identification key to males of *Coilodes* species

1. Aedeagus with dorsal lobe of tegmen (Fig. 5F, J–K) 2
 - Aedeagus without dorsal lobe of tegmen (Fig. 4F, J–K) 7
2. Aedeagus with the dorsal lobe base in the middle of tegmen (Fig. 5F, J) 3
 - Aedeagus with the dorsal lobe base on the right side of tegmen (Fig. 12F, J) 5
3. Clypeus subtrapezoidal in shape with angulate ends (Fig. 5C); lobe of tegmen long, reaching the base of the parameres (Fig. 5F, J–K) 4
 - Clypeus subrectangular in shape with rounded ends (Fig. 8C); lobe of tegmen short, less than one half the distance between the base of the lobe and the base of the parameres (Fig. 8F, J–K). Brazil..... *Coilodes niger* (Mannerheim, 1929) stat. rev.
4. Pronotum subelliptical with lateral margins strongly rounded and posterior margin as wide as the anterior one (Fig. 5E); colour ranging from dark brown to black (Fig. 5A). Brazil, Paraguay and Argentina *Coilodes humeralis* (Mannerheim, 1929)
 - Pronotum subtrapezoidal in shape, with lateral margins straight and posterior margin wider than anterior one (Fig. 3E); yellowish brown in colour (Fig. 3A). Brazil.....
 - *Coilodes edeiltae* Basílio & Vaz-de-Mello sp. nov.
5. Lobe of tegmen with apex sharp (Fig. 12J) 6
 - Lobe of tegmen with apex rounded (Fig. 13J). Brazil and Peru.....
 - *Coilodes skelleyi* Basílio & Vaz-de-Mello sp. nov.

6. Lobe of tegmen long, reaching the base of the parameres (Fig. 12J). Ecuador *Coilodes ravii* Basílio & Vaz-de-Mello sp. nov.
 – Lobe of tegmen short, less than one half the distance between the base of the lobe and the base of the parameres (Fig. 1J). Colombia..... *Coilodes bezerrai* Basílio & Vaz-de-Mello sp. nov.
7. Right paramere with distinctly rounded apex (Fig. 4H, J) 8
 – Right paramere with straight or almost straight apex (Fig. 6H, J) 10
8. Left paramere placed ventrally (Fig. 11G, K)..... 9
 – Left paramere fully located on the left side (Fig. 9G, K). Colombia, Trinidad and Tobago and Venezuela..... *Coilodes ovalis* Robinson, 1948
9. Tegmen with small, sharp projection next to the base of the right paramere (Fig. 4J). Colombia, French Guiana and Brazil *Coilodes fumipennis* Arrow, 1909
 – Tegmen without a sharp projection and with a more sclerotized region next to the right paramere base (Fig. 11J). Ecuador, Peru and Bolivia..... *Coilodes punctipennis* Arrow, 1909
10. Right paramere with at least one of the lateral margins arched (Fig. 6H, J)11
 – Right paramere with both lateral margins straight (Fig. 2H, J). Nicaragua, Costa Rica, Panama, Saint Vincent and the Grenadines, Colombia and Ecuador *Coilodes castaneus* Westwood, 1846
11. Clypeus subrectangular, wider than long (Fig. 6C); left paramere curved at the apex, with curvature area rounded (Fig. 6I, K). Brazil..... 12
 – Clypeus subtrapezoidal, as wide as long (Fig. 10C); left paramere curved at the apex, with curvature area angulated (Fig. 10I, K). Brazil *Coilodes parvulus* Westwood, 1846
12. Right paramere with transparent region on its distal half (Fig. 6H, J). Brazil
 *Coilodes lunae* Basílio & Vaz-de-Mello sp. nov.
 – Right paramere without transparent region on its distal half (Fig. 7H, J). Brazil
 *Coilodes mayae* Basílio & Vaz-de-Mello sp. nov.

***Coilodes bezerrai* Basílio & Vaz-de-Mello sp. nov.**

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Figs 1, 14A

Diagnosis

Similar to *Coilodes castaneus*, it is distinguished by having a more convex body, labium with subquadrate mentum and the presence of a dorsal lobe on the tegmen.

Etymology

Noun in the genitive singular. *Coilodes bezerrai* Basílio & Vaz-de-Mello sp. nov. is named in honour of Dr. Eduardo Barbosa Bezerra, entomologist, and professor at Universidade Estadual da Paraíba, Brazil. He was the first advisor of the first author of this species. This honour is a way to immortalize a researcher and professor who unfortunately had his career interrupted, but who managed to perpetuate his teachings.

Type material

Holotype

COLOMBIA • ♂; Santander, Serrania de las quinchas, Reserva El paujil; Nov. 2006; Santos-Zarate leg.; “Trampa de calda, Cebo heces de *A. hybridus*”; CEMT.

Paratypes (1 ♂ and 1 ♀)

COLOMBIA • 1 ♂; same collection data as for holotype; DZUP • 1 ♀; same collection data as for holotype; “Cebo heces de *A. seniculus*”; CEMT.

Description

Male (holotype)

MEASUREMENTS. Length 5.8 mm. Width 4.2 mm. Body (Fig. 1A–B) convex, oval and shiny.

COLOUR. Body yellowish brown.

HEAD (Fig. 1C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; two tubercles in the middle; proximal border rounded; posterior margin narrower than the anterior; lateral margin darker and

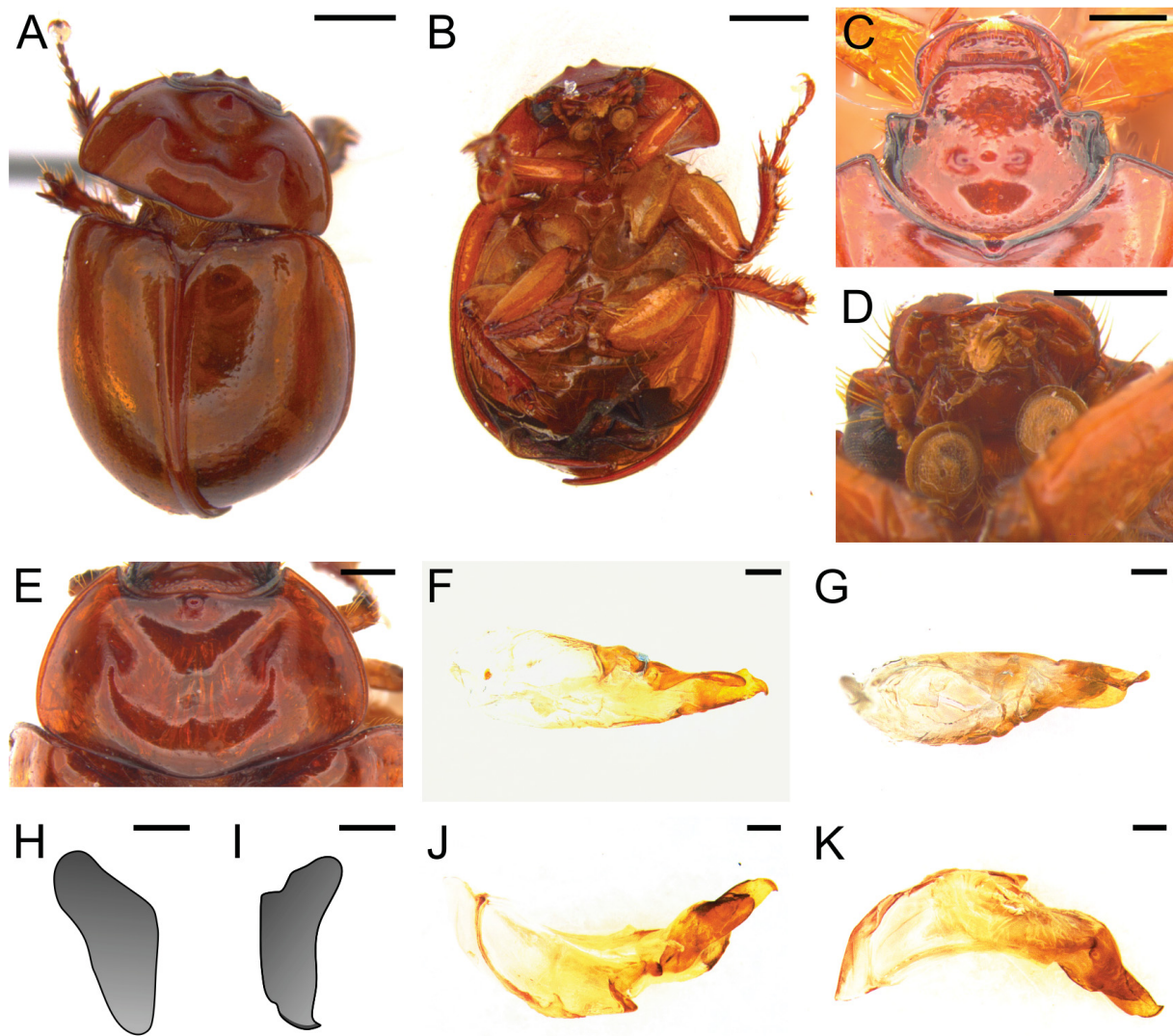


Fig. 1. *Coilodes bezerrai* Basílio & Vaz-de-Mello sp. nov., paratype ♂ at DZUP (A, B, D), holotype ♂ (C, E–G, J–K), and graphical representation (H–I). A. Body, dorsal view. B. Body, ventral view. C. Head, dorsal view. D. Head, ventral view. E. Pronotum, dorsal view. F–K. Male genitalia. F. Dorsal view. G. Ventral view. H. Right paramere. I. Left paramere. J. Right side. K. Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

straight; sparse and thin punctures. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders rounded; apex usually straight; setae thin and sparse, throughout the anterior margin dorsally; sparse and thick punctures. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior and lateral margins straight and anterior margin curved in the middle; disc strigulate, long setae on the margins. Maxilla subtriangular, twice as long as wide; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 1E). Convex; strongly excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae and punctures absent.

SCUTELLAR SHIELD. Subtriangular; thin setae; punctures absent; apex punctate.

ELYTRA. Double row of thick longitudinal punctures, sutural stria complete, formed by thick punctures.

VENTER (Fig. 1B). Hypomerall surface strigulate, setose; prosternum (Fig. 1B, D) elevated at midlength, transversally grooved; anterior margin rounded and jagged, mesoventrite and metaventrite slightly strigulate.

LEGS. Procoxa conical; surface strigulate. Protochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular, with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 1F–K). Lobe of tegmen shorter than half the distance between the lobe base and paramere base; parameres asymmetrical; right paramere with rounded edges, measuring $\frac{2}{3}$ the size of the left paramere; left paramere with sickle-shaped apex, curved to middle.

Female

Length 6.3 mm. Width 3.8 mm.

Variation

Length ranging from 5.8 to 6.4 mm. Width ranging from 3.8 to 4.2 mm.

Geographical distribution

Colombia (Santander) (Fig. 14A).

Biological data

Collected in faeces of *Ateles hybridus* I. Geoffroy Saint-Hilaire, 1829 and *Alouatta seniculus* (Linnaeus, 1766) (Mammalia: Primates) (label data).

Coilodes castaneus Westwood, 1846

Figs 2, 14A

Coilodes castaneus Westwood, 1846: 165 (original description).

Coilodes nigripennis Arrow, 1903: 516. **Syn. nov.**

Gnombolbus orosi Prokofiev, 2013a: 1.

Coelodes castaneus – Gemminger & Harold 1869: 1075 (incorrect subsequent spelling: catalogue);

Harold 1880: 43 (taxonomy). — Bates 1887: 108 (taxonomy). — Arrow 1912: 37 (catalogue). —

Ratcliffe 2002: 7 (checklist). — Wehncke & Dalling 2005: 80 (ecology).

Coelodes nigripennis – Arrow 1903: 516 (original description). — Arrow 1912: 37 (catalogue).

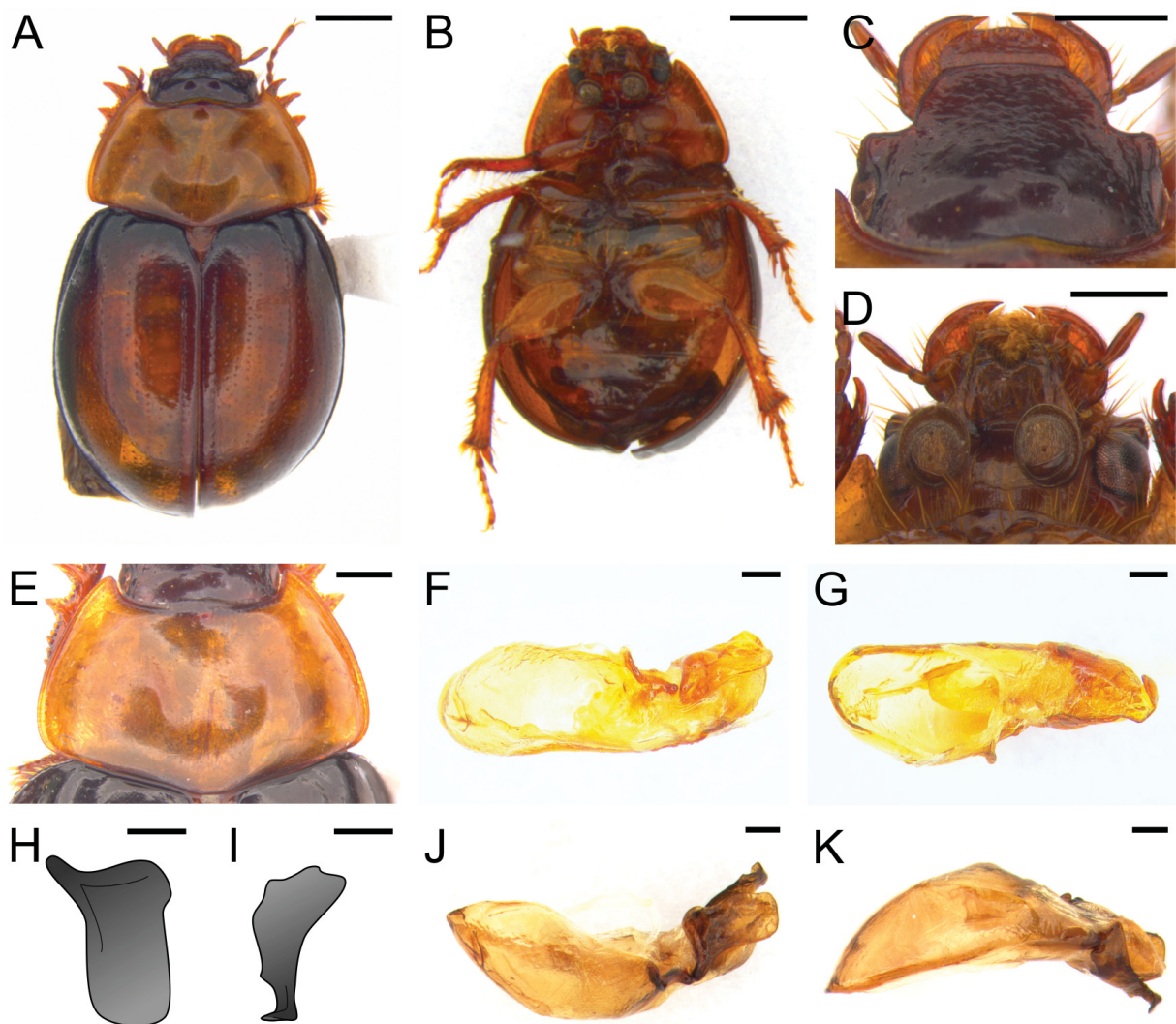


Fig. 2. *Coilodes castaneus* Westwood, 1846, ♂ at CEMT from Cerro Campana, Panama (A, C–E), ♂ at DZUP from Puntarenas, Costa Rica (B), ♂ at DZUP from Canal Zone, Panamá (F–G, J–K), and graphical representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

Coilodes castanea – Blackwelder 1944: 217 (incorrect subsequent spelling: checklist). — Cornaby 1974: 60 (ecology). — Young 1983: 247 (ecology).
Coilodes nigripennis – Blackwelder 1944: 217 (checklist). — Allsopp 1984: 107 (checklist). — Ocampo 2002: 123 (taxonomy). — Ocampo & Ballerio 2006: 191 (checklist).
Coilodes castaneus – Allsopp 1984: 107 (checklist). — Ocampo 2002: 3 (taxonomy); 2006: 17 (phylogeny). — Ocampo & Ballerio 2006: 191 (checklist). — Ocampo & Hawks 2006: 8 (molecular phylogeny). — Otavo *et al.* 2013: 742 (ecology).
Coeloides nigripennis – Perk 2010: 25 (incorrect subsequent spelling: checklist).
Gnombolbus orosi – Prokofiev 2013b: 1 (synonym).

Diagnosis

Coilodes castaneus presents a variable colouring pattern that can be similar to that of *C. fumipennis*, *C. skellei* sp. nov., and *C. bezerrai* sp. nov. It is distinguished from *C. fumipennis* by the absence of a small sharp projection on the right side of tegmen next to the base of parameres. It is also distinguished by the subrectangular shape of the right paramere. It is distinguished from *C. skellei* sp. nov. and *C. bezerrai* sp. nov. by the mentum being longer than wide with superior margin strongly curved and by the lobe of tegmen being absent.

Type material

Lectotype of *C. castaneus*

COLOMBIA • ♀; OUMNH.

Lectotype of *C. nigripennis*

SAINT VINCENT AND THE GRENADINES • ♂; St. Vincent, Leeward side; NHMUK.

Holotype of *Gnombolbus orosi*

Holotype examined from the image in the original description (Prokofiev 2013a).

Additional material examined (25 ♂♂ and 29 ♀♀)

COLOMBIA • 1 ♀; Tolima, Ibagué, Quebrada La Honda; 4°19'38" N, 75°05'39" W; alt. 790 m; Oct. 2005; J. Noriega leg.; bosque, pitfall; CEMT • 1 ♀; Chocó, P.N.N. Ensenada de Utría; 10 Jun.–3 Jul. 1997; Llanos-Jurado leg.; “selva-noche, P.t. all. camarón podri”; CEMT.

COSTA RICA • 1 ♀; Provincia Guanacaste, Parque Nacional, Santa Rosa; 1 Sep. 1977; A. Forsyth leg.; CEMT • 1 ♂; Provincia Guanacaste, Rincon de La Vieja NP; 10°46'05.5" N, 85°16'46.4" W; alt. 778 m; 29 Jun. 2004; Dostal and Uhler leg.; CEMT • 1 ♀; Alajuela, Monteverde; 6 Jun. 1990; L. A. Stange leg.; CEMT • 1 ♂; same collection data as for preceding; 28 May 1977; A. Forsyth leg.; CEMT • 1 ♀; same collection data as for preceding; 24 May 1979; A. Forsyth leg.; [dung trap]; CEMT • 4 ♂♂; Putarenas, Est Biol Las Cruces; 8°47' N, 82°57' W; 18–20 Jun. 2005; M. Forro leg.; FIT; CEMT • 1 ♂; same collection data as for preceding; DZUP • 2 ♀♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; DZUP • 1 ♀; Savegre, Providencia La Piedra, Finca MORA, Bosque Excr.; 11–13 Jul. 2002; J. Zamora leg.; CEMT.

NICARAGUA • 3 ♀♀; Mantagelapa, Dpt., Selva Negra; 13 Jun. 2002; F.W. Skillman Jr. leg.; CEMT.

PANAMA • 1 ♂; Chiriquí Province, S Bosque; alt. 1400 m; 24 Jul. 1998; M. Hardy leg.; CEMT • 1 ♀; same collection data as for preceding • 1 ♂; Chiriquí Province, Santa Clara vill. Env., Finca Hartmann, ojo de Agua; 8°51.7' N, 82°44.6' W; alt. 1430 m; 8–11 Sep. 2017; Fikáček, Hajek, Seidel and Sekerka leg.; pitfall traps (rotten squid) in a lower tropical mountain forest; CEMT • 3 ♀♀; same collection data as for preceding • 1 ♂; Chiriquí Province; 4–7 Jul. 1997; Morris and Wappes leg.; Hartmann's Finca; CEMT • 1

♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; CERPE • 1 ♀; same collection data as for preceding • 3 ♂♂; Colón, San Lorenzo Forest; 9°17' N, 79°58' W; May 2004; A. Tishechkin leg.; FIT; CEMT • 2 ♀♀; same collection data as for preceding • 2 ♀♀; same collection data as for preceding; 20 May 2004; A.K. Tishechkin leg.; *Eciton burchelli* colony • 1 ♂; Cerro Campana; alt. 700 m; May 2007; D. Curoe leg.; CEMT • 3 ♂♂; Panamá Province, Altos de Campana, Cerro Campana; 8°41.1' N, 79°56.0' W; alt. 800–900 m; 1–13 Sep. 2017; Fikáček, Seidel and Sekerka leg.; FIT on ridge in a lower tropical mountain forest; CEMT • 1 ♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; 21–24 Jul. 2017 • 1 ♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; 17–21 Jul. 2017 • 1 ♂; same collection data as for preceding; DZUP • 2 ♀♀; Panamá Province; Pipeline Rd. K 1–12; 30 Jun. 1997; Morris and Wappes leg.; CEMT • 2 ♂♂; Canal zone, Skunk Hollow, 6 mi NW of Gatun Locks; 17–31 May 1980; B.C. Ratcliffe leg.; DZUP • 1 ♀; same collection data as for preceding • 2 ♀♀; Canal zone, Barro Colorado Is.; 19 Jul. 1978; A. Forsyth leg.; dung trap.; CEMT.

Type locality

Coilodes castaneus: Colombia.

Coilodes nigripennis: Saint Vincent and the Grenadines (Saint Vincent: Leeward side).

Gnombolbus orosi: Costa Rica (Orosi).

Redescription

Male

MEASUREMENTS. Length 5.6–6.9 mm. Width 3.4–4.0 mm. Body (Fig. 2A–B) convex, oval and shiny.

COLOUR. Head and scutellar shield dark brown with black stains; pronotum, legs and venter yellowish brown; elytra from dark brown to yellowish brown with its elytra base black; some specimens with body uniformly yellowish brown and elytra base black or dark brown.

HEAD (Fig. 2C–D). Surface strigulate. Frons, in dorsal view, subrectangular; two small tubercles in the middle or one long tubercle formed by the fusion of the small ones; proximal border rounded; posterior margin narrower than the anterior; lateral margin straight or weakly arched; sparse punctures. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders rounded; apex usually straight; setae thin and sparse, throughout the anterior margin dorsally; sparse punctures. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subtrapezoidal; inferior margin arched, wider than anterior margin; lateral margins slightly rounded and superior strongly curved in the middle; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 2E). Convex; excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae absent; punctures thin and sparse.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal punctures, sutural stria complete, formed by thicker punctures.

VENTER (Fig. 2B). Hypomeral surface strigulate, setose; prosternum (Fig. 2B, D) elevated at midlength, transversally grooved; anterior margin rounded and flat, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface strigulate. Protochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibial inner margin convex; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 2F–K). Lobe of tegmen absent; sclerotized region next to the base of the right paramere; parameres asymmetrical; right paramere subrectangular, rounded vertices; left paramere with wide base and apex strongly curved outward.

Female

Length 5.2–6.4 mm. Width 3.0–4.0 mm.

Geographical distribution

Nicaragua (Metagalpa); Costa Rica (Guanacaste, Alajuela, Heredia, Limón, Putarenas, San José, Cartago); Panama (Chiriquí, Colón, Coclé, Panamá); Saint Vincent and the Grenadines (Saint Vincent: Leeward side); Colombia (La Guajira, Magdalena, north Santander, Chocó, Tolima); Ecuador (Napo, Tungurahua) (Fig. 14A) (Westwood 1846; Bates 1887; Arrow 1903; Cornaby 1974; Ratcliffe 2002; Wehncke & Dalling 2005; Perk 2010; Otavo *et al.* 2013; Prokofiev 2013a; label data).

Biological data

Species collected in: carcasses of vertebrates (sloth, hedgehog, rat, lizard, frog, and fish), and invertebrates (shrimp, squid, and earthworm); human faeces, dung of monkeys, coatids, and tapirs; rotten fruit; and fungi (Cornaby 1974; Young 1983; Wehncke & Dalling 2005; label data). It was also observed in association with colonies of *Eciton burchelli* (Westwood, 1842) (Hymenoptera: Formicidae), and there are records of captures with flight trap (label data).

Coilodes edeiltae Basílio & Vaz-de-Mello sp. nov.

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Figs 3, 14A

Diagnosis

Similar to *Coilodes punctipennis* and some *C. parvulus* specimens, it is distinguished from both by the presence of a dorsal lobe on the tegmen. It is also distinguished from *C. parvulus* by the presence of strong punctures on the elytra.

Etymology

Noun in the genitive singular. *Coilodes edeiltae* Basílio & Vaz-de-Mello sp. nov. is named after Edeilta Silva Basílio, mother and the main supporter of the first author.

Type material

Holotype

BRAZIL • ♂; Paraná, Rancho Alegre, Fazenda Congonhas; 22°47'45" S, 51°00'12" W; alt. 580 m.; 27 Sep. 2012; P.M. Félix leg.; pitfall fish; CEMT.

Paratypes (47 ♂♂ and 23 ♀♀)

BRAZIL – Minas Gerais • 1 ♂; Lavras, [next to] Poço Bonito; Dec. 2001; Vaz-de-Mello leg.; CERPE • 1 ♀; same collection data as for preceding; Oct. 2001; P. Grossi and F.Z. Vaz-de-Mello leg.; CERPE • 2 ♂♂; Lavras; Nov. 1997; Vaz-de-Mello and Louzada leg.; CEMT • 2 ♀♀; same collection data as for preceding • 1 ♂; Lavras; 24 Oct. 2003; V.S. Alves leg.; CEMT. – **Rio de Janeiro** • 9 ♂♂; Nova Friburgo; Mar. 1998; P. Grossi and E. Grossi leg.; FIT; CEMT • 11 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; Nov. 1998; P. Grossi leg • 2 ♂♂; same collection data as for preceding; Nov. 1996; F.Z. Vaz-de-Mello leg. • 1 ♂; Itatiaia, ParNa, Mata Atlântica; 22°27'11" S, 44°36'28" W; alt. 850 m; 20 Jan. 2012; C. Araujo leg.; pitfall, [human faeces]; CEMT • 1 ♂; Campo dos Goytacazes, Mata do merguão; 31 Dec. 2003–14 Jan. 2004; C.C.L. Teixeira leg.; [soil trap]; CEMT; • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding. – **São Paulo** • 1 ♂; Campinas, B. da Paz; Oct. 1997; M.R. Mattos leg.; [carcass]; CEMT • 3 ♀♀; same collection data as for preceding. – **Paraná** • 19 ♂♂; Rancho Alegre, Fazenda Congonhas; 22°47'45" S, 51°00'12" W; alt. 580 m; 27 Sept. 2012; P.M. Félix leg.; pitfall fish; CEMT • 1 ♀; same collection data as for preceding • 4 ♂♂; same collection data as for preceding; DZUP • 1 ♂; same collection data as for preceding; CERPE • 1 ♂; Cornélio Procópio, Parque Estadual, Mata São Francisco; 23°09'28" S, 50°34'18" W; 19 Dec. 2009; N. Cipola; leg.; Trap attractive; CEMT • 1 ♀; same collection data as for preceding; 14 Aug.–19 Oct. 2009; DZUP • 2 ♂♂; same collection data as for preceding; 23°09'33" S, 50°34'13" W; CEMT • 1 ♀; same collection data as for preceding • 1 ♀; Londrina; Nov.–Dec. 1998; I.M. Medri leg.; CEMT • 1 ♀; same collection data as for preceding; CERPE.

Description

Male (holotype)

MEASUREMENTS. Length 4.9 mm. Width 3.0 mm. Body (Fig. 3A–B) convex, oval and shiny.

COLOUR. Body yellowish brown.

HEAD (Fig. 3C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; one long tubercle in the middle; proximal border rounded; posterior margin as wide as the anterior one; lateral margin slightly arched and darker; sparse and slightly defined punctures. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders rounded; apex straight; setae thin and sparse, throughout the anterior margin dorsally; punctures sparse and weakly defined. Labrum semicircular; inconspicuous medial projection; setae sparse, along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior margin arched; lateral and superior margins slightly rounded; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout its surface; maxillary palp with four palpomeres; basal palpomere curved; second and third palpomeres longer than their width; distal palpomere barrel-shaped, length equivalent to the sum of the previous three. Antenna with 10 antennomeres; antennal club with three antennomeres, basal antennomere cupuliform.

PRONOTUM (Fig. 3E). Convex; slightly excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae absent; punctures thin and sparse.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal and thick punctures, sutural stria complete, formed by thicker punctures.

VENTER (Fig. 3B). Hypomerai surface strigulate, setose; prosternum (Fig. 3B, D) elevated at midlength, transversally grooved; anterior margin rounded and jagged, slight invagination in the middle; mesoventrite and metaventrite weakly strigulate.

LEGS. Procoxa conical; surface strigulate. Protochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

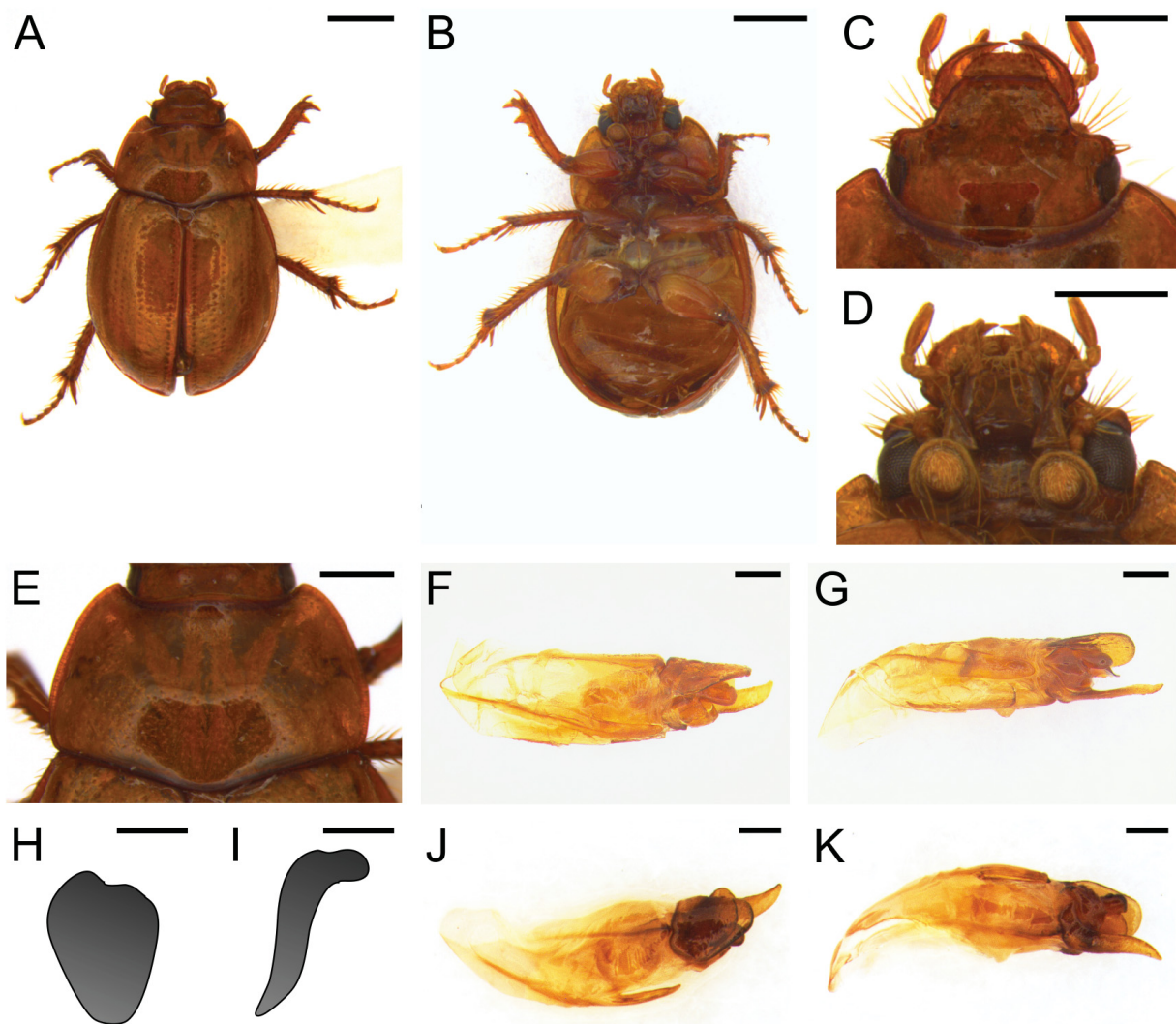


Fig. 3. *Coilodes edeiltae* Basílio & Vaz-de-Mello sp. nov., holotype ♂ (A–G, J–K) and graphical representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

GENITALIA (Fig. 3F–K). Lobe of tegmen reaching the paramere base, slightly dislocated to left side; parameres asymmetrical; right paramere with rounded edges, base wider than apex; left paramere with wide base and sickle shaped apex.

Female

Length 5.2 mm. Width 3.0 mm.

Variation

Length ranging from 4.4 to 5.5 mm. Width ranging from 2.7 to 3.1 mm. Colour ranging from yellowish brown to dark brown. Pronotum in males can sometimes be smooth and may have a stronger excavation.

Geographical distribution

Brazil (Minas Gerais, Rio de Janeiro, São Paulo, Paraná) (Fig. 14A).

Biological data

Species collected in human faeces, carcasses of fish, and with flight interception trap (label data).

Coilodes fumipennis Arrow, 1909

Figs 4, 14B

Coelodes fumipennis Arrow, 1909: 491 (original description).

Coelodes fumipennis – Arrow 1912: 37 (catalogue).

Coilodes fumipennis – Blackwelder 1944: 217 (checklist). — Allsopp 1984: 107 (checklist). — Ocampo & Ballerio 2006: 191 (checklist).

Diagnosis

Coilodes fumipennis is different from *C. castaneus* by having the inferior margin of mentum strongly arched, and by the presence of a small sharp projection in tegmen next to the right paramere base.

Type material

Lectotype

BRAZIL • ♂; NHMUK.

Additional material examined (55 ♂♂ and 83 ♀♀)

BRAZIL – **Pará** • 1 ♂; Redenção, Pinkiaiti, Aik; 07°46' S, 51°58' W; 31 Oct. 1988; P.Y. Scheffler leg.; CEMT • 1 ♀; São Félix do Xingu, Área Indígena Kayapó Pinkiaiti, Research Station; 7°45' S; 51°57' W; 21–23 Oct. 1999; P.Y. Scheffler leg.; intact forest, carrion baited; CEMT • 1 ♀; Óbidos; Jan. 1962; F.M. Oliveira leg.; CEMT. – **Acre** • 1 ♂; Rio Branco, Faz. Catuaba; Feb. 1997; F.Z. Vaz-de-Mello leg.; CEMT • 2 ♀♀; same collection data as for preceding. – **Rondônia** • 8 ♂♂; Parq. Estadual Guajará-Mirim; 10°19.194' S, 64°33.456' W; 25 Nov. 2016; M.A.P.A. Silveira leg; pitfall, human dung; CEMT • 13 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 10°19.208' S, 64°33.477' W • 2 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; CERPE • 1 ♀; same collection data as for preceding; CERPE • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding; DZUP • 1 ♂; same collection data as for preceding; 10°18.807' S, 64°32.630' W; 23 Nov. 2016 • 7 ♀♀; same collection data as for preceding; 10°18.783' S, 64°32.431' W; 23 Nov. 2017 • 1 ♀; same collection data as for preceding; 10°19.175' S, 64°33.431' W; 22 Nov. 2017 • 4 ♂♂; Fzda. Rancho Grande, “62 \ km SW Ariquemes”; 3–15 Dec. 1996; J.E. Eger leg.; fish carrion pitfall; CEMT. – **Mato Grosso** • 4 ♂♂; Alta Floresta; 5 Mar. 2010; V. Gonçalves leg;

[human faeces]; CEMT • 1 ♂; same collection data as for preceding; CERPE • 2 ♂♂; Santo Antônio do Leverger, São Vicente da Serra, “Campus IFMT”; 15°49'42" S, 55°25'11" W; 3–5 Dec. 2011; A.S. Tissiani and F. Vaz-de-Mello leg.; bov dung, forest; CEMT • 2 ♂♂; Cotriguaçu, Faz São Nicolau, “Matinha”; 9°50'19" S, 58°15'03" W; 8 Oct. 2009; Vaz-de-Mello leg.; pitfall, human faeces; CEMT • 3 ♀♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; 9°48'49" S; 58°18'24" W; 16 Dec. 2010; A.F. Oliveira and J.P. Silva leg. • 2 ♂♂; same collection data as for preceding; 9°50'24" S, 58°19'10" W; 5 Oct. 2009; alt. 250m; Vaz-de-Mello leg.; “flor.prim” • 3 ♀♀; same collection data as for preceding • 1 ♂; Cotriguaçu, Faz São Nicolau, “Prainha”; 9°51'36" S, 58°12'53" W; Oct. 2009; F.Z. Vaz-de-Mello leg.; pitfall; CEMT • 1 ♀; Cotriguaçu, Faz. São Nicolau; 9°49'09" S, 58°15'30" W; 24–31 Oct. 2014; M. Karam-Gemael leg.; pitfall; CEMT • 1 ♂; Cotriguaçu, Faz. São Nicolau, “Matinha”; 9°50'19" S, 58°15'15" W; 30 Oct. 2017; Vaz-de-Mello et al. leg.; FIT; CEMT • 2 ♀♀; same collection data as for preceding • 6 ♂♂; same collection data as for preceding; “Matinha do Fernando”; 9°50'19" S, 58°15'15" W; 3 Nov. 2017 • 4 ♀♀; same collection data as for preceding • 7 ♂♂; same collection data as for preceding; “PPBio1”; 9°49'17" S, 58°15'32" W; 1–3 Nov. 2017 • 10 ♀♀; same collection data as for preceding • 3 ♀♀; Novo Mundo, PE Cristalino; 9°27'59" S, 55°50'02" W; Nov. 2012; V. Magalhães leg.; pitfall; CEMT.

COLOMBIA • 1 ♀; Dept. Magdalena, Hacienda Cincinnati; alt. 3500 ft.; 11 Jun. 1920; F.M. Galge leg.; CEMT • 1 ♂; Boyacá, Cusiana Cojoque; 5°26'05" N, 72°41'30" W; alt. 2100 m; Jun. 1997; Potrero Ex H F. Escobar leg.; CEMT • 1 ♀; same collection data as for preceding.

FRENCH GUIANA – **Saint Laurent du Maroni** • 4 ♀♀; Belvédère de Saül, 3°37'22" N, 53°12'57" W; alt. 326 m; 13 May 2011; Seag leg.; CEMT • 1 ♀; same collection data as for preceding; CERPE • 1 ♂; same collection data as for preceding; 20 May 2011; CEMT • 1 ♀; same collection data as for preceding; 30 Jun. 2011 • 1 ♀; same collection data as for preceding; 15 Oct. 2011 • 5 ♀♀; same collection data as for preceding; 14 Mar. 2011 • 1 ♀; same collection data as for preceding; 22 Mar. 2011; FIT • 1 ♂; same collection data as for preceding; 30 Mar. 2011 • 3 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 1 May 2011 • 1 ♂; same collection data as for preceding; 6 May 2011 • 1 ♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; 27 May 2011 • 1 ♂; Belvédère de Saül; 7 Feb. 2011; Stéphane Brûlé leg.; DZUP • 2 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 13 May 2011 • 1 ♀; same collection data as for preceding; 6 May 2011 • 1 ♀; same collection data as for preceding; 7 Apr. 2011; CEMT. – **Cayenne** • 1 ♂; Nouragues, inselberg; 4°05' N, 52°41' W; alt. 411 m; 9 Oct. 2010; Seag leg.; FIT; CEMT • 2 ♀♀; Nouragues; Dec. 1995; F. Feer leg.; “Forêt primaire”; CEMT • 1 ♂; Cayenne-Kourou; 2 Aug. 2011; J. Touroult leg.; savane; FIT; CEMT • 2 ♀♀; same collection data as for preceding.

Type locality

Brazil (Pará, Ega - currently known as the city of Tefé; belongs to the state of Amazonas).

Redescription

Male

MEASUREMENTS. Length 5.3–6.4 mm. Width 3.2–3.9 mm. Body (Fig. 4A–B) convex, oval and shiny.

COLOUR. Head ranging from yellowish brown to dark brown; pronotum, scutellar shield, legs and venter yellowish brown; elytra dark brown with smoky region at base and external margins.

HEAD (Fig. 4C–D). Surface strigulate. Frons, in dorsal view, subrectangular; two small tubercles in the middle; proximal border rounded; posterior margin as wide as the anterior one; lateral margin with slightly and darker arched entrance; punctures sparse, weakly defined, or absent. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins

weakly rounded; anterior borders angulate; apex straight; setae thin and sparse, throughout the anterior margin dorsally; punctures sparse and slightly defined, or absent. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior margin arched; lateral margins slightly rounded and superior curved in the middle; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

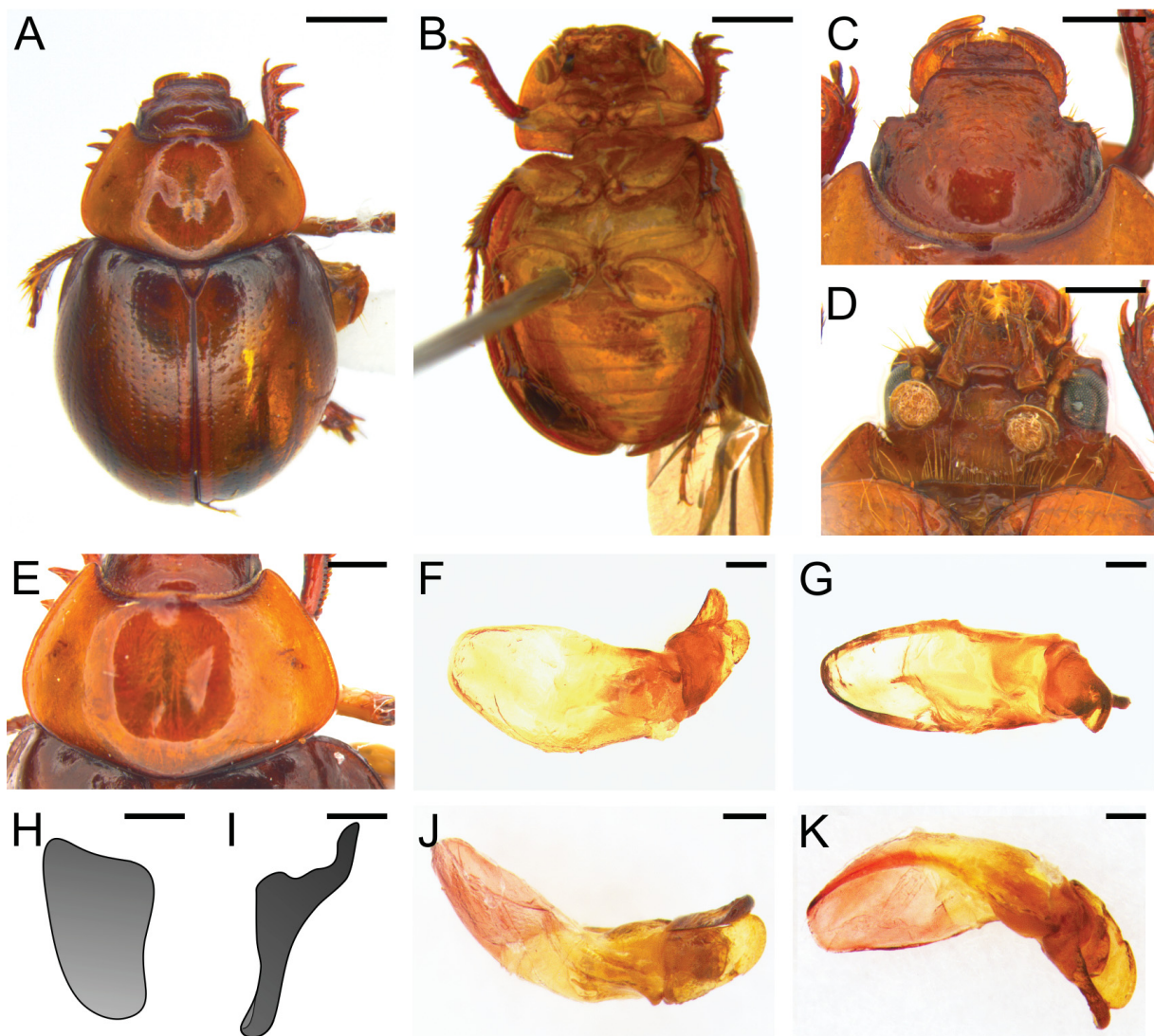


Fig. 4. *Coilodes fumipennis* Arrow, 1909, ♂ at CEMT from Alta Floresta, Mato Grosso, Brazil (A, C, E), ♂ at CERPE from Rondônia, Brazil (B), ♂ at CERPE from Alta Floresta, Mato Grosso, Brazil (D); ♂ at CEMT from Rondônia, Brazil (F–G), graphical representation (H–I), and another ♂ at CEMT from Alta Floresta, Mato Grosso, Brazil (J–K). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

PRONOTUM (Fig. 4E). Convex; strongly or weakly excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae absent; punctures thin and sparse or absent.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of strong longitudinal punctures, sutural stria complete formed by strong punctures.

VENTER (Fig. 4B). Hypomerall surface strigulate, setose; prosternum (Fig. 4B, D) elevated at midlength, transversally grooved; anterior margin straight and flat, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface strigulate. Protrochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular, with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 4F–K). Lobe of tegmen absent; sclerotized sharp projection next to right paramere base; parameres asymmetrical; right paramere longer than it is wide, with rounded apex; left paramere dislocated to ventral region, wide base and apex spoon-shaped.

Female

Length 5.4–7.1 mm. Width 3.2–4.4 mm.

Geographical distribution

Colombia (Magdalena, Boyacá); French Guiana (Saint-Laurent-du-Maroni, Régina); Brazil (Amazonas, Pará, Acre, Rondônia, Mato Grosso) (Fig. 14 B) (Arrow 1909, label data).

Biological data

Attracted to fish, human faeces, and collected by flight interception trap (label data).

Coilodes humeralis (Mannerheim, 1829)

Figs 5, 14B

Hybosorus humeralis Mannerheim, 1829: 45 (original description).

Hybosorus gibbus Perty, 1830: 43. **Syn. nov.**

Hybosorus brasiliensis Castelnau, 1840: 108.

Coilodes chilensis Westwood, 1846: 164. **Syn. nov.**

Coelodes gibbus var. *testaceus* Pic, 1928: 5.

Hybosorus gibbus – Perty 1830:43 (original description).

Hybosorus geminatus – Dejean 1833: 149 (catalogue); 1837: 165 (catalogue). — Westwood 1846: 164 (taxonomy).

Hybosorus brasiliensis – Westwood 1846: 164 (synonymy).

Coilodes gibbus – Westwood 1846: 164 (checklist). — Allsopp 1984: 107 (checklist). — Ocampo & Ballerio 2006: 191 (checklist). — Ocampo 2006:17 (phylogeny). — Santos *et al.* 2017: 43 (biology).

Coilodes chilensis – Westwood 1846: 164 (original description). — Blackwelder 1944: 217 (checklist). — Allsopp 1984: 107 (checklist). — Ocampo & Ballerio 2006: 191 (checklist).
Coelodes humeralis – Gemminger & Harold 1869: 1075 (incorrect subsequent spelling: catalogue). — Arrow 1912: 37 (catalogue). — Basílio *et al.* 2023: 5 (phylogeny).
Coelodes gibbus – Gemminger & Harold 1869: 1075 (incorrect subsequent spelling: catalogue). — Arrow 1912: 37 (catalogue).
Coelodes chilensis – Gemminger & Harold 1869: 1075 (incorrect subsequent spelling: catalogue). — Arrow 1912: 37 (catalogue).
Coilodes humeralis – Blackwelder 1944: 217 (checklist). — Allsopp 1984: 107 (checklist). — Ocampo & Ballerio 2006: 191 (checklist). — Rodrigues *et al.* 2013: 213 (ecology). — Uchoa & Rodrigues 2019: 21 (ecology). — Basílio *et al.* 2023: 5 (phylogeny).
Coilodes gibba – Blackwelder 1944: 217 (incorrect subsequent spelling: checklist).
Coilodes gibba var. *testacea* – Blackwelder 1944: 217 (incorrect subsequent spelling: checklist).
Coilodes testaceus – Ocampo & Ballerio 2006: 191 (checklist).

Diagnosis

Coilodes humeralis is similar to *C. lunae* sp. nov., *C. mayae* sp. nov., and *C. niger* stat. rev. It differs from them by presenting a subtrapezoidal clypeus with angulate anterior margin, pronotum with rounded lateral margins, and base as wide as apex, besides the presence of a lobe of the tegmen reaching the paramere base.

Type material

Lectotype of *C. humeralis* (here designated)

BRAZIL • ♂; “5163 1”; ZIN.

Holotype of *H. gibbus*

BRAZIL • ♀; ZSM.

Holotype of *C. chilensis*

CHILE • ♀; “67.45”; NHMUK.

Additional material examined (375 ♂♂ and 376 ♀♀)

ARGENTINA – **Misiones** • 1 ♂; Leandro Alem.; Oct. 1950; “Saitopel”; UCCC • 1 ♂; Dos de Mayo; Nov. 2007; E. Ahadie leg.; CEMT.

BRAZIL • 2 ♀♀; CEMT • 1 ♂; “Rep Rio Grande”; 5 Oct. 1960; F.M. Oliveira leg.; CEMT • 1 ♀; same collection data as for preceding. – **Distrito Federal** • 1 ♂; Brasília, PNB, Mata de galeria; 15°44'49.5" S, 48°00'32.3" W; 8 Dec. 2016; J. Evangelista and M.V.C. Rocha leg.; FIT; CEMT • 1 ♀; same collection data as for preceding. – **Minas Gerais** • 83 ♂♂; Viçosa; 21 Nov. 1991; Lopes and Louzada leg.; CEMT • 95 ♀♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; CERPE • 2 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 11 Jan. 1992; CEMT • 2 ♀♀; same collection data as for preceding; 18 Dec. 1990 • 1 ♀; Viçosa; 30 Jan. 1995; J.N.C. Louzada leg.; CEMT • 1 ♂; Viçosa; Nov. 1996; Vaz-de-Mello, Hardy and Harrison leg.; “fungos brancos”; CEMT • 4 ♀♀; same collection data as for preceding • 1 ♀; Viçosa; 20°45' S, 42°53' W; Oct. 2000; F.Z. Vaz-de-Mello leg.; Flight Intercept trap; CEMT • 1 ♂; Viçosa, Mata Paraíso; Jan. 1996; Vaz-de-Mello leg.; CEMT • 40 ♂♂; same collection data as for preceding; 20°47' S, 42°51' W; Dec. 1998 • 29 ♀♀; same collection data as for preceding • 4 ♂♂; same collection data as for preceding; 20°48'20.5" S, 42°51'12.4" W; alt. 781 m; 28 Jan. 2014; T. Vargas and L.S. Lopes leg.; pitfall • 5 ♀♀; same collection data as for preceding • 1 ♂; Viçosa, Mata do Paraíso; 13 Feb. 2015; S. Aloquio, A. Orsetti, C. Lopes-Andrade and M. Bento leg.; FIT; CEMT • 3 ♀♀ same collection data as for preceding • 10 ♂♂; same

collection data as for preceding; 19 Fev. 2015 • 24 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 21 Fev. 2015 • 3 ♀♀; same collection data as for preceding • 1 ♂; Viçosa, Mata da Biologia; 14 Fev. 2015; S. Aloquio and M. Bento leg.; pitfall; CEMT • 3 ♀♀; Viçosa, Mata da Prefeitura; Nov. 2000; F.Z. Vaz-de-Mello leg.; CEMT • 1 ♀; Viçosa, Campus UFV; Jan. 1995; J. Louzada leg.; CEMT • 1 ♀; same collection data as for preceding; Oct. 2000; M.G.F. da Mata leg.; pitfall • 1 ♀; Paula Cândido; 20°40'53" S, 44°55'57" W; Jan. 1995; J. Louzada, P. Lopes and C.F. Sperber leg.; pitfall; CEMT • 1 ♂; Parq. Rio Doce; Aug. 1992; J. Louzada leg.; CEMT • 2 ♀♀; same collection data as for preceding • 5 ♂♂; same collection data as for preceding; Oct. 1992 • 1 ♀; same collection data as for preceding • 2 ♂♂; Araponga, Pico do Boné; 17 Dec. 2000; E. Stehling leg.; CEMT • 1 ♂; Nova Lima PE Serra Rola Moça; 2005; G. Schiffler leg.; CEMT • 1 ♀; Rio \ Novo, "Mata"; 7 Jan. 2013; HML Advincola leg.; CEMT • 4 ♂♂; Lavras, Mata do Capivari; 21°16'25" S, 44°16'57" W; Dec. 2001; G. Schiffler leg.; CEMT • 1 ♀; same collection data as for preceding • 2 ♂♂; Lapinha; Nov. 1981; Celso Jr leg.; CEMT • 2 ♀♀; same collection data as for preceding • 1 ♀; Belo Horizonte, Estação Ecológica da UFMG; 11 Nov. 1994; M.F. Vasconcelos leg.; "Mata Estacional Semidecidual", "Necrófilo em carcaça de rato"; CEMT • 2 ♂♂; Paracatu; Dec. 1997; S. Lourenço Jr. leg.; CEMT • 1 ♂; Montes Claros; Jan. 2000; Louzada leg.; CEMT • 5 ♂♂; Campos Altos, Parque Estadual de Campos Altos; 19°43'45" S, 46°07'32" W; 16 Jan. 2014; L.D.L. Cardoso leg.; CEMT • 4 ♀♀; same collection data as for preceding. – **Espírito Santo** • 3 ♂♂; Domingos Martins, Pq. E. Pedra Azul; alt. 1500 m; Jan. 2000; Lopes-Andrade and Vaz-de-Melo leg.; CEMT • 3 ♀♀; same collection data as for preceding • 3 ♂♂; Baixo Gandu; 23–30 Sept. 1970; C. Elias and C.T. Elias leg.; DZUP • 1 ♀; same collection data as for preceding • 7 ♂♂; Baixo Gandu; 15–21 Oct. 1970; Tadeu and C. Elias leg.; DZUP • 9 ♀♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; C. Elias leg. • 2 ♀♀; same collection data as for preceding. – **Mato Grosso do Sul** • 4 ♀♀; Bonito Faz. Remanso; 20°47.309' S, 56°43.737' W; Nov. 2009; FO Roque; CEMT • 5 ♀♀; same collection data as for preceding; 21°06.274' S, 56°38.148' W • 1 ♀; Dourados; [Students] leg.; CEMT • 1 ♂; Dourados; 12 Nov. 2005; M. Milo ca leg.; CEMT • 1 ♂; same collection data as for preceding; 19 Nov. 2005 • 1 ♀; same collection data as for preceding • 2 ♂♂; Dourados M Coqueiro; 22°12'38" S, 54°55'06" W; Dec. 2011; L.O. Bavutti leg.; human faeces; CEMT • 1 ♀; same collection data as for preceding. – **Rio de Janeiro** • 2 ♂♂; Visconde de Mauá; Nov. 1987; C. Godinho leg.; CEMT • 3 ♀♀; same collection data as for preceding • 1 ♀; Guanabara; 5 Mar. 1966; F.M. Oliveira leg.; DZUP • 1 ♀; Guanabara, Represa Rio Grande; Oct. 1967; F.M. Oliveira leg.; DZUP • 1 ♂; Aniai; Jan. 1945; Dr. Nick; UCCC • 1 ♂; P. N. Itatiaia; Mar. 1993; E. Grossi and P. Grossi leg.; DZUP. – **São Paulo** • 1 ♀; São Paulo, P. E. Serra do mar, Nucleo SantaVirgínea, Sede Vargem Grande; 23°23'20" S, 45°14'16" W; 17 Jan. 2012; E. Bovy leg.; human faeces; CEMT • 1 ♀; Mogi das Cruzes, Parque das Neblinas; 23°45'49" S, 46°12'05" W; alt. 1035 m; Sep. 2015; RV Nunes leg.; pitfall, [human faeces]; CEMT. – **Paraná** • 1 ♀; Palotina, UFPR, "Mata anexa ao campus"; 18 Dec. 2011; R. J. Simioni, S. B. Silva and E. Caron leg.; "Manual"; DZUP • 1 ♀; same collection data as for preceding; 22 Dec. 2011 • 1 ♂; same collection data as for preceding; 1 Jan. 2012 • 1 ♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; 3 Jan. 2012 • 2 ♀♀; same collection data as for preceding; 24 Dec. 2011; pitfall • 1 ♀; same collection data as for preceding; 5 Jan. 2012 • 1 ♂; same collection data as for preceding; 9 Jan. 2012 • 1 ♂; same collection data as for preceding; 21 Jan. 2012 • 7 ♀♀; same collection data as for preceding; 17 Jan. 2012 • 1 ♀; same collection data as for preceding; 20 Dec. 2011 • 1 ♀; same collection data as for preceding; 20 Nov. 2012 • 1 ♂; same collection data as for preceding; 1 Feb. 2011; pitfall, [pig carcass]; CEMT • 1 ♂; same collection data as for preceding; 16 Oct. 2011; DZUP • 1 ♀; Curitiba; Nov. 1958; Moure, Langec and Michener leg.; DZUP • 1 ♂; Curitiba; 25°26'44" S, 49°13'56" W; 9 Sept. 2015; D.S. Basílio leg.; [Chicken bait]; DZUP • 1 ♂; same collection data as for preceding; CERPE • 3 ♂♂; same collection data as for preceding; 15 Oct. 2015; DZUP • 1 ♀; same collection data as for preceding • 12 ♂♂; same collection data as for preceding; 16 Oct. 2015 • 2 ♀♀; same collection data as for preceding • 13 ♂♂; same collection data as for preceding; 23 Oct. 2015 • 2 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; CERPE • 1 ♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; 27 Oct. 2015; DZUP

• 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 30 Oct. 2015
 • 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 12 Nov. 2015 •
 2 ♂♂; same collection data as for preceding; 13 Nov. 2015 • 3 ♀♀; same collection data as for preceding
 • 1 ♂; same collection data as for preceding; CERPE • 1 ♀; same collection data as for preceding • 2 ♂♂;
 same collection data as for preceding; 20 Dec. 2015; DZUP • 2 ♀♀; same collection data as for preceding
 • 3 ♂♂; same collection data as for preceding; 28 Jan. 2016 • 1 ♀; same collection data as for preceding
 • 1 ♀; same collection data as for preceding; 20 Oct. 2016 • 1 ♂; same collection data as for preceding;
 20 Nov. 2016 • 1 ♀; same collection data as for preceding; 23 Nov. 2016 • 5 ♂♂; same collection data
 as for preceding; 20 Dec. 2016 • 5 ♂♂; same collection data as for preceding; 20 Oct. 2016; [fish bait] •
 2 ♀♀; same collection data as for preceding • 1 ♀; Curitiba, Centro Politécnico; 6 Nov. 2005; K.M. Mise
 leg.; [Manual]; DZUP • 1 ♀; same collection data as for preceding; 18 Nov. 2005 • 2 ♀♀; same collection
 data as for preceding; 22 Nov. 2005 • 1 ♀; same collection data as for preceding; 23 Nov. 2005 • 1 ♂;
 same collection data as for preceding; 25 Dec. 2005 • 1 ♂; same collection data as for preceding; 1 Jan.
 2006 • 1 ♂; same collection data as for preceding; 25°26'45" S, 49°13'58" W; alt. 919 m; 22 Nov. 2007;
 “gamba” • 2 ♀♀; same collection data as for preceding • 4 ♂♂; Curitiba, Centro Politécnico; 25°26' S,
 49°14' W; alt. 919 m; 2012; R.C. Correa leg.; DZUP • 1 ♀; same collection data as for preceding • 12
 ♂♂; Adrianópolis, 7–11 Dec. 2017; Souza and Inista leg.; pitfall; DZUP • 7 ♀♀; same collection data as
 for preceding • 1 ♀; Londrina, Mata Godoy; 13 Dec. 1984; J. Lopes leg.; CEMT • 1 ♂; same collection
 data as for preceding; 19 Dec. 1984 • 1 ♂; Londrina, P. M. Arthur Thomas; 31 Jan. 2006; J. Lopes et al.
 leg.; [pitfall with meat]; CEMT • 1 ♂; Londrina; Nov.–Dec. 1998; I.M. Medri leg.; CEMT • 2 ♀♀; same
 collection data as for preceding • 1 ♂; Rolândia; 25 Oct. 1943; Roosen. Ruge leg.; “Dr. Nick”; UCCC •
 2 ♂♂; same collection data as for preceding; Sept. 1946 • 1 ♂; Guarauna; Dec. 1940; DZUP • 27 ♂♂;
 Rancho Alegre, Fazenda Congonhas; 22°47'45" S, 51°00'12" W; alt. 580 m; 27 Sept. 2012; P.M. Félix
 leg.; pitfall fish; CEMT • 26 ♀♀; same collection data as for preceding • 8 ♂♂; Cornélio Procópio, Parque
 Estadual Mata São Francisco; 23°09'20.6" S, 50°34'20.04" W; 13 Nov.–14 Dec. 2009; N.G. Cipola leg.;
 pitfall; CEMT • 10 ♀♀; same collection data as for preceding • 2 ♂♂; same collection data as for
 preceding; 23°10'11" S, 50°33'51" W; 14 Dec. 2009; trap attractive • 1 ♀; same collection data as for
 preceding • 31 ♂♂; Balsa Nova, São Luiz do Purunã, Faz Manjolo; 49.70°W, 25.45°S; alt. 1116 m; Jan.
 2007; P. Lowenberg Neto leg.; pitfall; CEMT • 38 ♀♀; same collection data as for preceding • 1 ♂; Foz
 do Iguaçu; 7 Dec. 1996; DZUP • 1 ♀; same collection data as for preceding; 12 Dec. 1996 • 1 ♂; Campina
 Grande do Sul, Estrada da Mandaçaia; 9–10 Dec. 2011; F.W.T. Leivas leg.; CEMT • 1 ♀; same collection
 data as for preceding • 1 ♀; same collection data as for preceding; 7–10 Apr. 2014; FIT • 2 ♂♂; same
 collection data as for preceding; 25°17'47" S, 49°02'13" W; 14 Jan. 2014. – **Santa Catarina** • 1 ♂; Oct.
 1961; DZUP • 1 ♀; Oct. 1961; DZUP • 1 ♂; Oct. 1965; DZUP • 3 ♂♂; Nova Teutônia; 7 Dec. 1983;
 DZUP • 1 ♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; Dec.
 1980; F. Plaumann leg. • 1 ♀; Corupá; Nov. 1953; A. Maller leg.; DZUP • 2 ♂♂; Campos Novos; 27°23' S,
 51°12' W; Feb. 2011; R.C. Campos leg.; [pitfall trap with bait]; CEMT • 1 ♀; Rancho Queimado;
 27°41'22.60" S, 49°00'52.90" W; alt. 800m; 16 Dec. 2015; P.G. da Silva leg.; pitfall [(meat)]; CEMT •
 1 ♀; same collection data as for preceding; pitfall [(faeces)] • 1 ♀; Urubici, “Pamas S.JQ”; 28°07'02.000" S,
 49°30'02.730" W; alt. 1736 m; 14 Jan. 2016; P.G. da Silva leg.; [meat]; CEMT. – **Rio Grande do Sul** •
 1 ♀; Porto Alegre; Martinez leg.; “Röhmer. log.”, “JUL: 934”; CEMT • 1 ♂; “LAMI, Ponta do Cego”;
 21 Oct.–Nov. 2005; R. Moraes leg.; CEMT • 1 ♂; Derrubadas, Pq. Est Turvo; 31 Oct. 2003; pitfall trap;
 CEMT • 1 ♀; same collection data as for preceding • 2 ♂♂; Capão do Leão, Horto Botânico, Mata de
 Restinga; 31°48'58" S, 52°25'55" W; 20 Dec. 2011; L. Garcia leg.; CEMT • 1 ♀; same collection data
 as for preceding • 1 ♂; Riozinho, rip.for; 29°28'59" S, 56°09'16" W; 20–23 Oct. 2010; G. Viegas leg.;
 human faeces; CEMT • 1 ♀; São José do Ouro; E.B. Santos leg.; Ovitampa; CEMT • 2 ♂♂; Passo Fundo,
 Mato Castelhano, FloNa; 10–17 Dec. 2008; R.M. Moraes leg.; pitfall, “Mata Primária”; CEMT • 3 ♀♀;
 same collection data as for preceding.

PARAGUAY – **Amambay** • 3 ♂♂; Pedro Juan Caballero; Nov. 1988; M.A. Ruiz Diaz leg.; CEMT • 1 ♀; same collection data as for preceding. – **Caazapa** • 2 ♂♂; San Jose Cristal; 1 Dec. 1991; CEMT • 1 ♀; San Juan Nopomuseno; Dec. 1998; A. Ugarte-Peña leg.; CEMT • 1 ♀; same collection data as for preceding; U. Peña leg. • 2 ♂♂; Euramadita Prechsell; Dec. 1991; CEMT • 1 ♀; same collection data as for preceding. – **Misiones** • 1 ♂; Villa Florida; 21 Dec. 1949; UCCC • 1 ♀; same collection data as for preceding.

Type locality

Coilodes humeralis: Brazil.

Coilodes chilensis: Chile.

Coilodes testaceus: Brazil.

Hybosorus gibbus: Brazil.

Hybosorus brasiliensis: Brazil.

Redescription

Male

MEASUREMENTS. Length 5.5–8.7 mm. Width 3.0–5.1 mm. Body (Fig. 5A–B) convex, oval and shiny.

COLOUR. Body ranging from black to dark brown; elytral disc might have yellowish brown spots throughout surface or just on humerus.

HEAD (Fig. 5C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; two small tubercles in the middle or one long tubercle formed by the fusion of the small ones; proximal border rounded; posterior margin narrower than the anterior; lateral margin straight; sparse punctures. Eye visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders angulated; apex straight; setae thin and sparse, throughout the anterior margin dorsally; sparse and slightly defined punctures. Labrum semicircular; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; superior and inferior margin straight; lateral margins slightly rounded; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 5E). Convex; excavated medially; posterior margin as wide as anterior margin; lateral margins strongly convex; midlength usually longer than the anterior and posterior margins; anterior margin strongly arched, angles subacute; posterior margin rounded and weakly produced medially; setae absent; punctures thin and sparse.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal punctures, sutural stria complete, formed by thicker punctures.

VENTER (Fig. 5B). Hypomerall surface strigulate, setose; prosternum (Fig. 5B, D) elevated at midlength, transversally grooved; anterior margin rounded and jagged, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface strigulate. Protrochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular, with bifurcated apex. Mesofemur and

metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 5F–K). Lobe of tegmen reaching the paramere base, slightly curved to left side; parameres asymmetrical; right paramere base as wide as apex, edge rounded; left paramere with wide base and apex sickle-shaped.

Female

Length 5.7–8.3 mm. Width 3.2–4.6 mm.

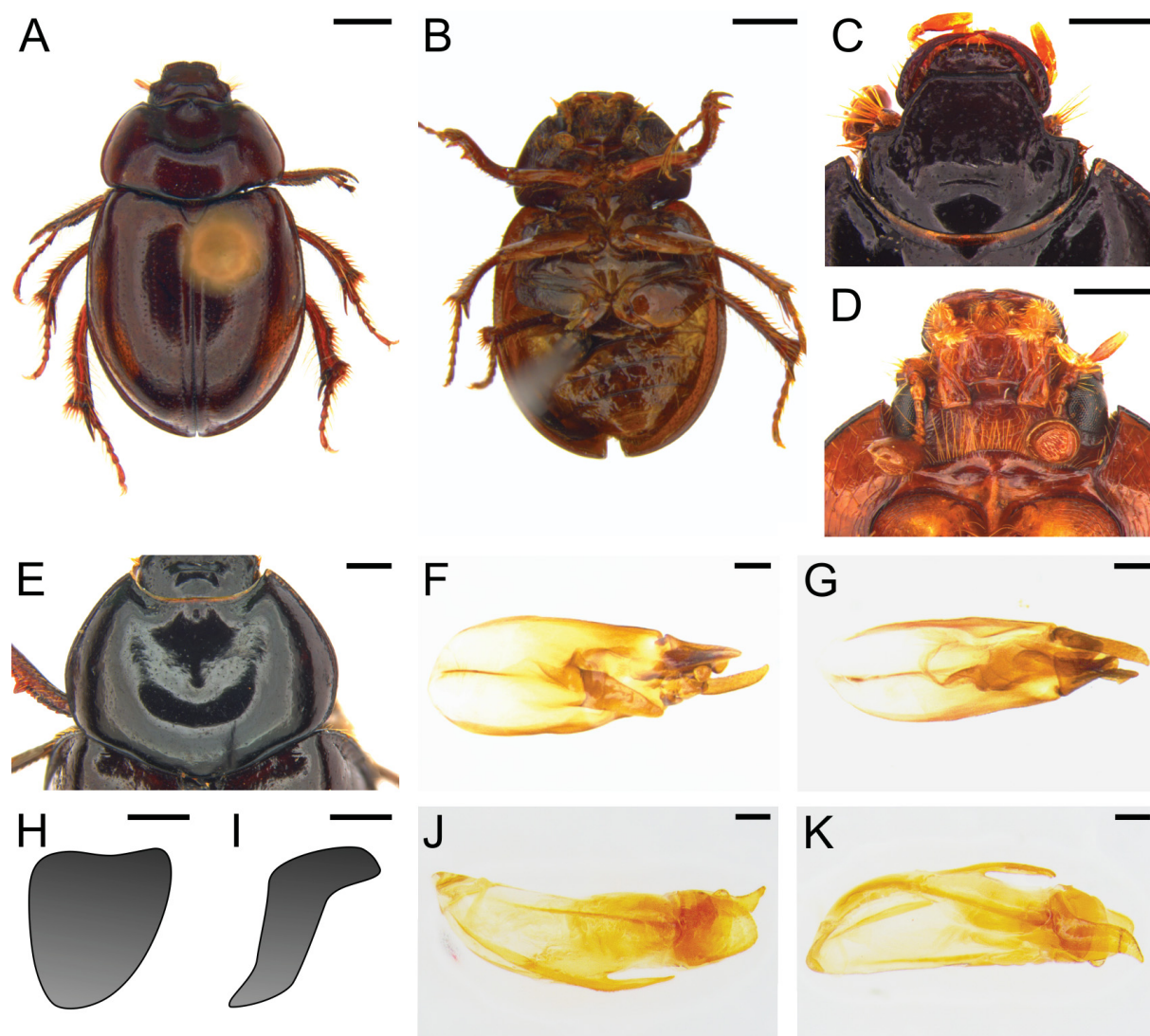


Fig. 5. *Coilodes humeralis* (Mannerheim, 1829), ♂ at DZUP from Baixo Gandu, Espírito Santo, Brazil (A, D), four different ♂♂ at DZUP from Curitiba, Brazil (B–C, E–G); graphical representation (H–I), and another ♂ at DZUP from Baixo Gandu, Espírito Santo, Brazil (J–K). A. Body, dorsal view. B. Body, ventral view. C. Head, dorsal view. D. Head, ventral view. E. Pronotum, dorsal view. F–K. Male genitalia. F. Dorsal view. G. Ventral view. H. Right paramere. I. Left paramere. J. Right side. K. Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

Geographical distribution

Brazil (Distrito Federal, Minas Gerais, Espírito Santo, Mato Grosso do Sul, São Paulo, Rio de Janeiro, Paraná, Santa Catarina, Rio Grande do Sul); Chile? [questionable distribution]; Paraguay (Amambay, Caazapá, Misiones); Argentina (Misiones) (Fig. 14 B) (Mannerheim 1829; Perty 1830; Westwood 1846; Ocampo & Ballerio 2006; Rodrigues *et al.* 2013; Santos *et al.* 2017; Uchoa & Rodrigues 2019; label data).

Biological data

Species collected in: human and bovine faeces; and direct association with decomposing meat of pig, chicken, and fish (Rodrigues *et al.* 2013; label data). Collected during the day. Many specimens were collected in suspended traps using fish as bait, FIT; and with ovitrap for mosquitoes. This demonstrates that *C. humeralis* has a good flight ability (Santos *et al.* 2017; label data; first author's personal observation). In addition, the species seems to have stridulating behaviour and the ability to bury itself (probably as a defense mechanism) (first author, personal observation).

Remarks

Hybosorus gibbus Perty, 1830 is the type species as designated by Westwood (1846), although it is a junior synonym of *C. humeralis* (Mannerheim, 1829).

Coilodes chilensis Westwood, 1846 was described from a single specimen with distribution attributed to Chile. After this, no other *Coilodes* was collected at this locality. Due to the absence of non-type material from this country, and to the Chilean ecological particularities, different from the rest of the Neotropical Region, this distribution is considered suspicious. There is a possibility that the specimen was collected in another South American country during an expedition, and it was mislabelled.

Coilodes testaceus Pic, 1928 was cited as a variation of *C. gibbus* (see Art. 45.6.4. of the ICZN Code, ICZN 1999) and Ocampo & Ballerio (2006) synonymized it with *Coilodes gibbus*.

A lectotype of *C. humeralis* is here designated because the original description (Mannerheim 1829) did not designate a holotype or specify how many specimens were examined.

***Coilodes lunae* Basílio & Vaz-de-Mello sp. nov.**

urn:lsid:zoobank.org:act:8152C1A8-E803-4ABA-97C1-DC36207F4392

Figs 6, 14B

Diagnosis

Similar to *Coilodes humeralis*, *C. mayae* sp. nov., and *C. parvulus*, it is distinguished from *C. humeralis* and *C. parvulus* in the subrectangular shape of the clypeus, four times wider than long with strongly rounded anterior margin. As in *C. parvulus* and *C. mayae* sp. nov., its male genitalia lack a dorsal lobe of the tegmen. However, it is characterized by the presence of a transparent region on the distal half of the right paramere.

Etymology

Noun in the genitive singular. *Coilodes lunae* Basílio & Vaz-de-Mello sp. nov. is named after Luna Basílio Dantas, niece of the first author.

Type material

Holotype

BRAZIL • ♂; Rio de Janeiro, Itatiaia, “PARNA”; 22°25'46.1" S, 44°37'03" W; alt. 1100 m; 23–26 Dec. 2011; C. Araujo and R. Andrade leg.; pitfall; CEMT.

Paratypes (4 ♂♂ and 5 ♀♀)

BRAZIL – **Bahia** • 1 ♂; Itabuna, “CEPLAC, Cabruca”; 7 Jan. 2003; M. Santos leg.; CERPE • 1 ♂; Bahia, Ituberá, Pancada Grande, Mata Madura; 9 Dec. 2009; P. Lopes, M. Campos and L. Oliveira leg.; DZUP • 1 ♀; same collection data as for preceding; CERPE. – **Rio de Janeiro** • 3 ♀♀; Itatiaia, “PARNA”; 22°25'46.1" S, 44°37'03" W; alt. 1100 m; 23–26 Dec. 2011; C. Araujo and R. Andrade leg.; pitfall; CEMT • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding • 1 ♂; Itatiaia, P.N. Itatiaia; Mar. 1993; E. Grossi and P. Grossi leg.; CEMT.

Description

Male (holotype)

MEASUREMENTS. Length 6.3 mm. Width 3.5 mm. Body (Fig. 6A–B) convex, oval and shiny.

COLOUR. Head and pronotum black; scutellar shield and elytra dark brown with lighter stains; legs and venter fully dark brown.

HEAD (Fig. 6C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; two tubercles in the middle; proximal border rounded; posterior margin as wide as the anterior one; lateral margin with slightly rectangular entrance; sparse punctures. Eye visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subrectangular, four times as wide as long; lateral margins rounded; anterior borders rounded; apex straight; setae thin and sparse, throughout the anterior margin dorsally; sparse punctures. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior margin arched; lateral margins slightly rounded and superior margin straight; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 6E). Convex; excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae absent; punctures thin and sparse.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of thick longitudinal punctures, sutural stria complete, formed by thick punctures.

VENTER (Fig. 6B). Hypomeral surface strigulate, setose; prosternum (Fig. 6B, D) elevated at midlength, transversally grooved; anterior margin rounded and jagged, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface smooth. Protrochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 6F–K). Lobe of tegmen absent; sclerotized region next to right paramere base; parameres asymmetrical; right paramere subrectangular, longer than wide, apex as wide as the base and middle region narrower than the apex and the base, transparent area inside the superior half of right paramere; left paramere with wide base and pointed, narrow apex, strongly curved outward.

Female

Length 6.0 mm. Width 3.5 mm.

Variation

Length ranging from 5.6 to 6.3 mm. Width ranging from 3.3 to 3.6 mm. Colour ranging from dark brown to black.

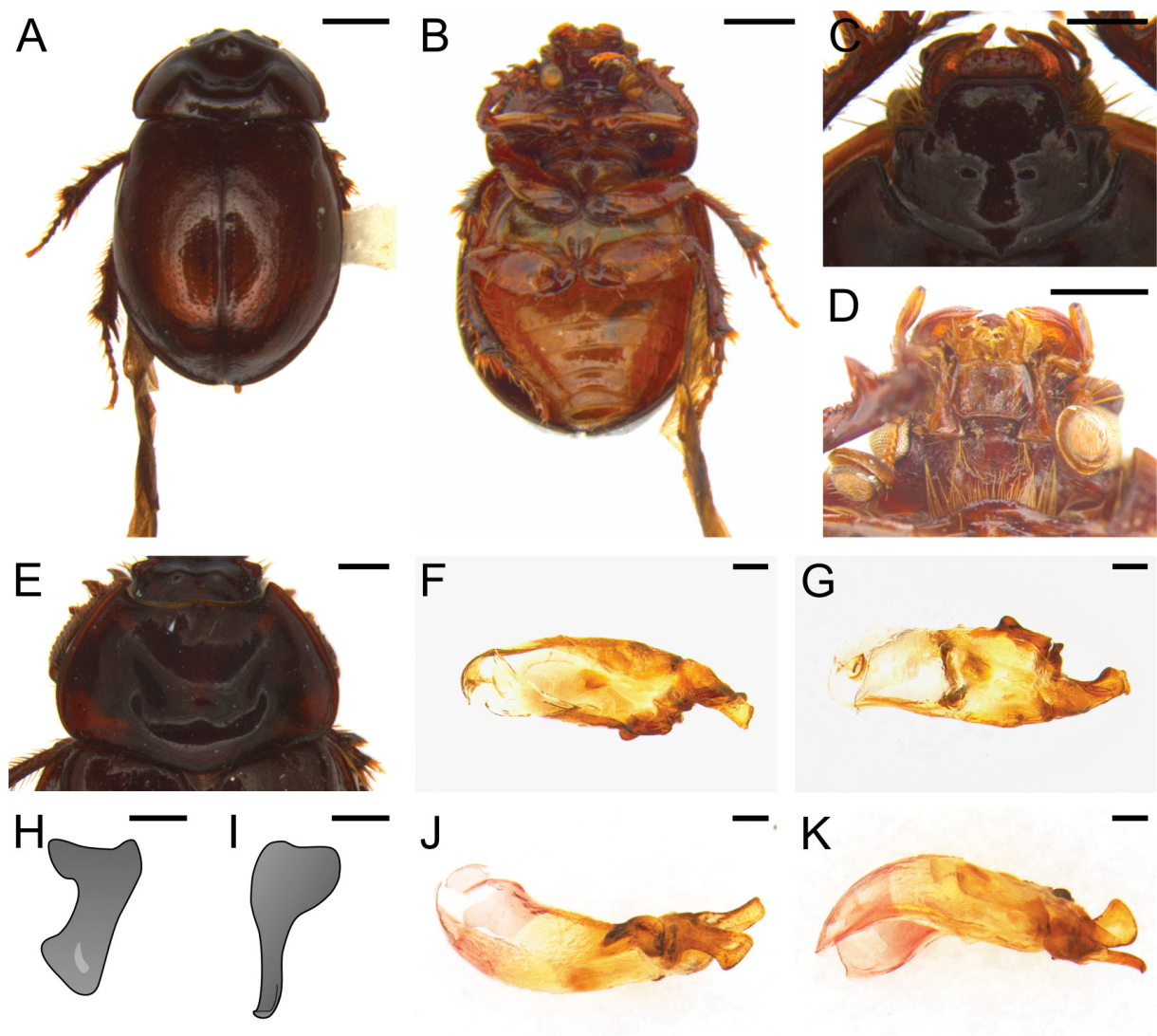


Fig. 6. *Coilodes lunae* Basílio & Vaz-de-Mello sp. nov., holotype ♂ (A–C, E–G, J–K), paratype ♀ at DZUP from Itatiaia, Rio de Janeiro (D), and graphical representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

Geographical distribution

Brazil (Bahia, Rio de Janeiro) (Fig. 14B).

Biological data

There is no data on the behaviour of this species.

Coilodes mayae Basílio & Vaz-de-Mello sp. nov.

urn:lsid:zoobank.org:act:17AF5EC7-E92A-4FA2-B3C1-4547FD648292

Figs 7, 14C

Diagnosis

Similar to *Coilodes humeralis* and to *C. lunae* sp. nov. Distinguished from both by the presence of a perpendicular laminar structure on the internal region of the tegmen. It is distinguished from *C. humeralis* by the absence of a dorsal lobe on the tegmen, and from *C. lunae* sp. nov. by the sharp constriction next to the base of the right paramere and by the absence of a transparent region on the superior half of the right paramere.

Etymology

Noun in the genitive singular. *Coilodes mayae* Basílio & Vaz-de-Mello sp. nov. is named after Maya Basílio Dantas, younger niece of the first author.

Type material

Holotype

BRAZIL • ♂; Espírito Santo, Castelo; Dec. 1996; JNC Louzada leg.; CEMT.

Paratypes (11 ♂♂ and 6 ♀♀)

BRAZIL – Espírito Santo • 5 ♂♂; same collection data as for holotype • 1 ♀♀; same collection data as for holotype • 1 ♂; same collection data as for holotype; DZUP • 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for holotype; CERPE • 1 ♀; same collection data as for preceding • 1 ♂; Venda Nova do Imigrante; Dec. 2000; F.Z. Vaz-de-Mello leg.; CEMT • 2 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; CERPE • 1 ♂; same collection data as for preceding; Oct. 1998; Falqueto and Vaz-de Mello leg.; CEMT.

Description

Male (holotype)

MEASUREMENTS. Length 5.6 mm. Width 3.6 mm. Body (Fig. 7A–B) convex, oval and shiny.

COLOUR. Head and pronotum dark brown; scutellar shield, venter and legs yellowish brown; elytra yellowish brown, margins dark brown.

HEAD (Fig. 7C–D). Surface strigulate. Frons, in dorsal view, subrectangular; one small tubercle in the middle; proximal border rounded; posterior margin as wide as the anterior one; lateral margin slightly arched; sparse punctures, restricted to region next to clypeus. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subquadrate; lateral margins weakly rounded; anterior borders rounded; apex straight; setae thin and sparse, throughout the anterior margin dorsally; sparse punctures. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate;

inferior margin arched; lateral margins slightly rounded and superior margin curved in the middle; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 7E). Convex; strongly excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, weakly produced medially, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae and punctures absent.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal punctures, sutural stria complete, formed by punctures.

VENTER (Fig. 7B). Hypomerall surface strigulate, setose; prosternum (Fig. 7B, D) elevated at midlength, transversally grooved; anterior margin rounded and slightly jagged, mesoventrite and metaventrite smooth.

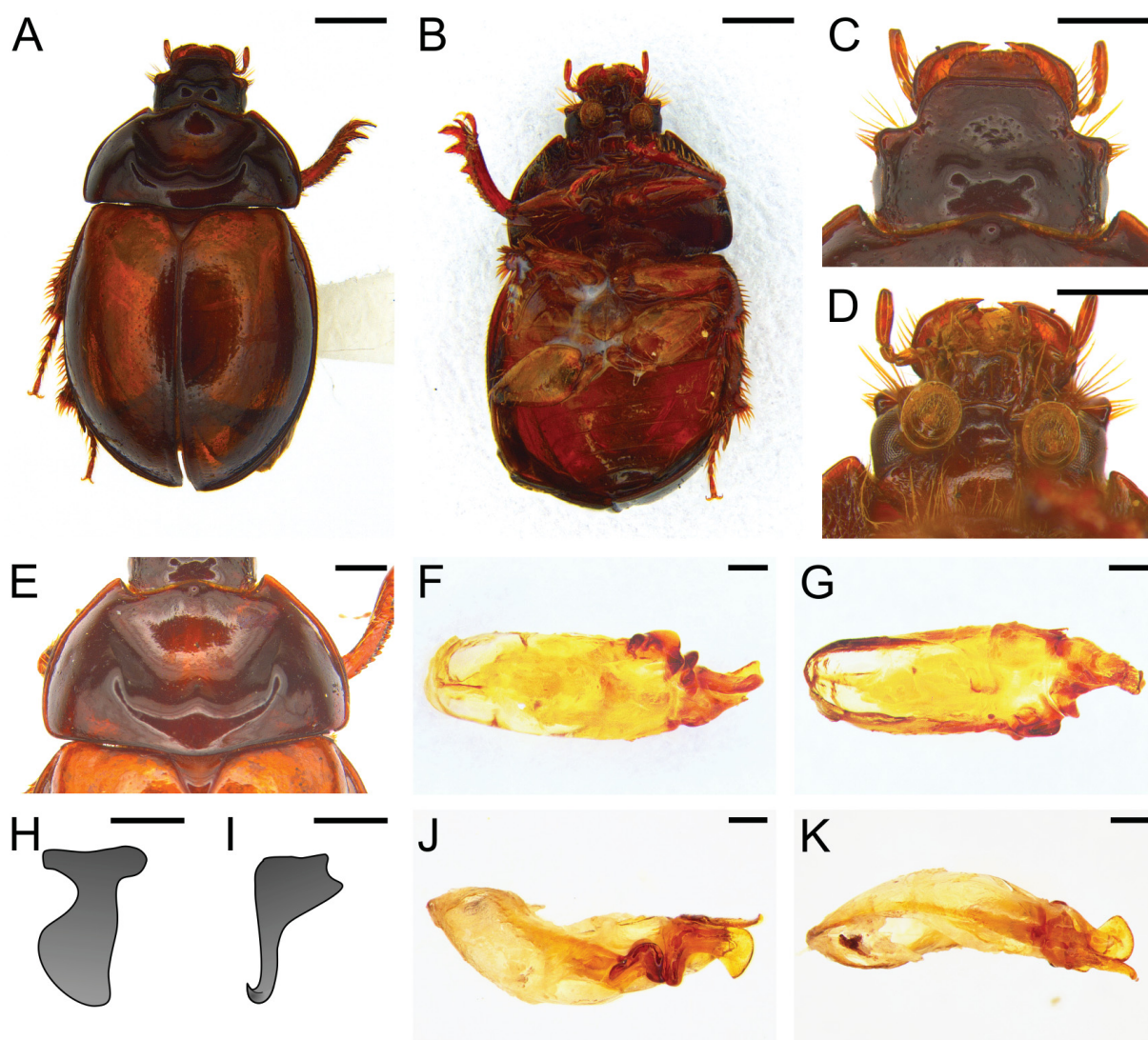


Fig. 7. *Coilodes mayae* Basílio & Vaz-de-Mello sp. nov., holotype ♂ (A–G, J–K) and graphic representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

LEGS. Procoxa conical; surface strigulate. Protrochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 7F–K). Lobe of tegmen absent; region with strongly sclerotized projection next to right paramere base, sclerotized laminar structure on inferior ventral region of tegmen, parallel to the sides of tegmen; parameres asymmetrical; right paramere longer than it is wide, base as wide as apex, strong constriction next to paramere base, gradually increasing towards the apex, rounded vertices; left paramere, wide base and apex strongly curved outward.

Female

Length 5.5–6.0 mm. Width 3.1–3.5 mm.

Variation

Length ranging from 5.3 to 6.2 mm. Width ranging from 3.1 to 3.6 mm. Elytra with dark brown region restricted to the margins or extended to the entire distal half of elytra.

Geographical distribution

Brazil (Espírito Santo) (Fig. 14C).

Biological data

Species collected in: pitfall trap with human faeces bait and flight interception trap.

Coilodes niger (Mannerheim, 1829) stat. rev.

Figs 8, 14C

Hybosorus niger Mannerheim, 1829: 46 (original description).

Coilodes niger – Blackwelder 1944: 217 (checklist). — Allsopp 1984: 107 (checklist). — Ocampo & Ballerio 2006: 191 (catalogue: synonym with *Coilodes humeralis*). — Basílio *et al.* 2023: 5 (phylogeny).

Hybosorus auger – Westwood 1846: 165 (incorrect subsequent spelling: taxonomy). — Ocampo & Ballerio 2006: 191 (synonym with *C. humeralis*).

Coelodes niger – Gemminger & Harold 1869: 1075 (incorrect subsequent spelling: catalogue). — Arrow 1912: 37 (catalogue).

Diagnosis

Similar to *Coilodes humeralis*, it is distinguished by the subtrapezoidal shape of the pronotum, the rounded anterior margin of the clypeus and male genitalia with a short dorsal lobe on the tegmen, smaller than half the distance between the lobe of the tegmen base and the paramere base.

Type material

Lectotype (here designated)

BRAZIL • ♀; ZIN.

Additional material examined (40 ♂♂ and 36 ♀♀)

BRAZIL – **Rio de Janeiro** • 1 ♂; Nova Friburgo; Nov. 1998; P. Grossi and E. Grossi leg.; CEMT • 1 ♀; same collection data as for preceding • 16 ♂♂; same collection data as for preceding; Mar. 1998; FIT; CEMT • 14 ♀♀; same collection data as for preceding • 1 ♂; Nova Friburgo; Oct. 1998; P. Grossi leg.; CEMT • 1 ♂; same collection data as for preceding; DZUP • 2 ♂♂; Nova Friburgo, Macaé de Cima; Jan. 2006; B. Miller leg.; CEMT • 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; CERPE • 11 ♂♂; same collection data as for preceding; Feb. 2006; E.J. Grossi leg.; CEMT • 12 ♀♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; CERPE • 1 ♂; same collection data as for preceding; Jan. 2000; E. Grossi and P. Grossi leg.; FIT; CEMT • 1 ♀; same collection data as for preceding • 1 ♀; Teresópolis; Dec. 1973; A. Bello leg.; CEMT • 1 ♂; same collection data as for preceding; Nov. 1990 • 1 ♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; Oct. 1991 • 2 ♂♂; Teresópolis, Pq. Nac. Serra dos Órgãos; Jan. 2014; R. Monteiro leg.; CEMT • 3 ♀♀; same collection data as for preceding.

Type locality

Brazil.

Redescription

Male

MEASUREMENTS. Length 5.9–7.6 mm. Width 3.7–4.7 mm. Body (Fig. 8A–B) convex, oval and shiny.

COLOUR. Head and elytra black; pronotum and scutellar shield ranging from black to red; venter and legs dark brown.

HEAD (Fig. 8C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; one long tubercle in the middle; proximal border rounded; posterior margin as wide as the anterior one; lateral margin arched; punctures small and sparse or absent. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus semicircular; lateral and anterior margins rounded; setae thin and sparse, throughout clypeal margin dorsally; punctures small and sparse or absent. Labrum semicircular; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subrectangular; lateral margins slightly rounded, inferior margin arched and superior margin straight; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 8E). Convex; slightly or stronger excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex; setae and punctures absent.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal punctures, sutural stria complete, formed by thicker punctures.

VENTER (Fig. 8B). Hypomeral surface strigulate, setose; prosternum (Fig. 8B, D) elevated at midlength, transversally grooved; anterior margin subtrapezoidal, apex straight and jagged, mesoventrite and metaventricle smooth.

LEGS. Procoxa conical; surface strigulate. Protrochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

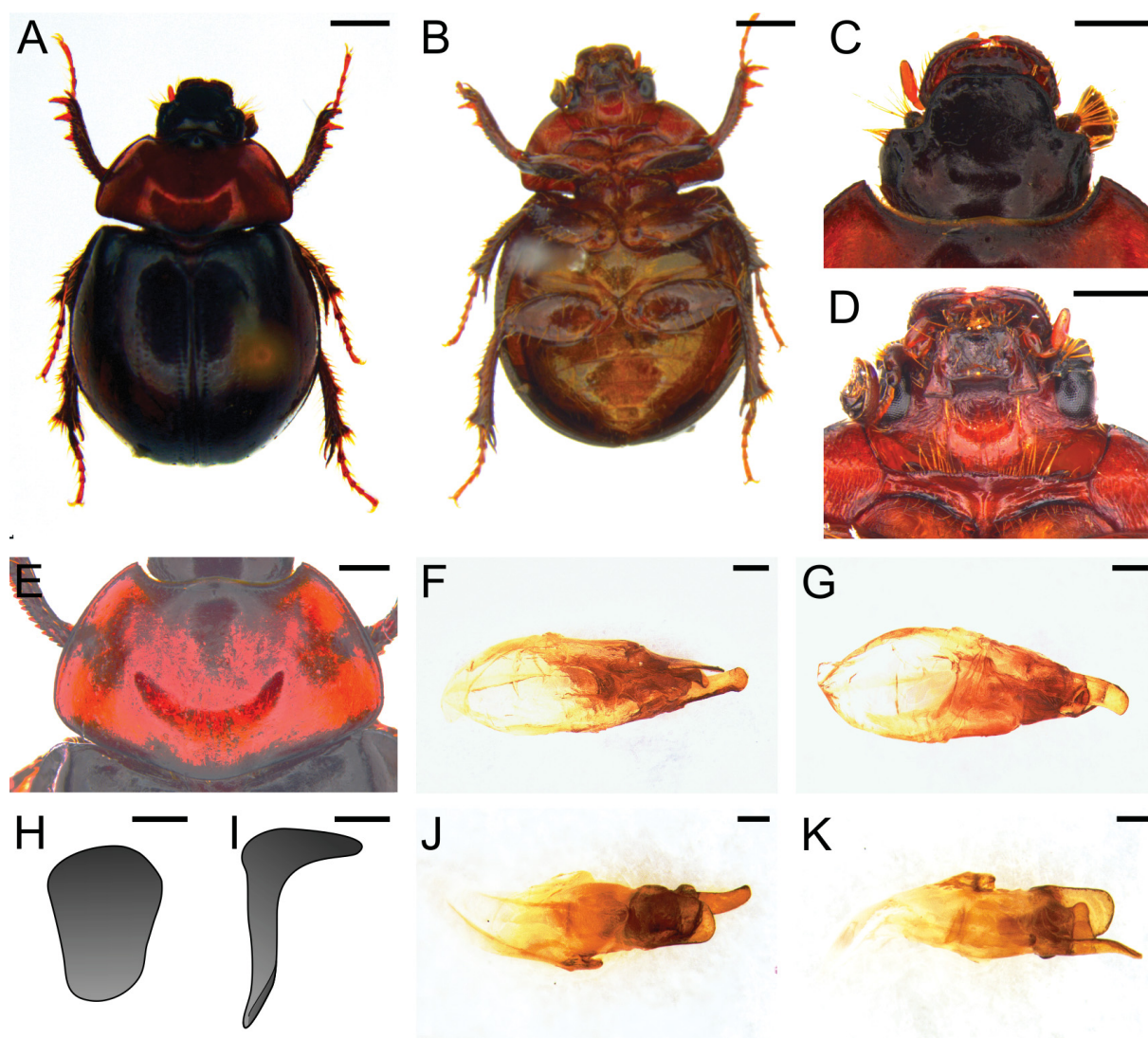


Fig. 8. *Coilodes niger* (Mannerheim, 1829) stat. rev., two ♂♂ from Macaé de Cima, Nova Friburgo, Rio de Janeiro, Brazil, at CERPE (A–E) and at CEMT (F–G); another ♂ at CEMT from Nova Friburgo, Rio de Janeiro, Brazil (J–K); and graphical representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

GENITALIA (Fig. 8F–K). Lobe of tegmen short; less than half the distance between the lobe of tegmen base and paramere base; parameres asymmetrical; right paramere base as wide as apex, with rounded edges; left paramere with wide base, large, narrow, and rounded apex slightly curved.

Female

Length 7.0 mm. Width 4.3 mm.

Geographical distribution

Brazil (Rio de Janeiro) (Fig. 14C) (Mannerheim 1829; label data).

Biological data

Coilodes niger was collected by flight interception trap.

Remarks

Coilodes niger was synonymized with *C. humeralis* by Ocampo & Ballerio (2006). It is here revalidated after comparison between the type material of both species and the additional material.

Coilodes auger Westwood, 1846 is *C. niger* misspelled. As it is not an available name, it is not considered a synonym.

A lectotype is here designated for *Coilodes niger* because the original description (Mannerheim 1829) neither specified how many specimens were examined nor designated a holotype.

***Coilodes ovalis* Robinson, 1948**

Figs 9, 14C

Coelodes ovalis Robinson, 1948: 32 (original description).

Coilodes ovalis – Allsopp 1984: 107 (checklist). — Perk *et al.* 2002: 14 (checklist). — Ocampo & Ballerio 2006: 191 (checklist).

Diagnosis

Similar to *Coilodes castaneus*, it is distinguished by the presence of bigger parameres, longer than half the tegmen size, and by the left paramere apex being not curved.

Type material

Holotype

VENEZUELA • ♀; El valle, D. F.; G. Vivas-Berthier leg.; CUIC.

Additional material examined (36 ♂♂ and 68 ♀♀)

COLOMBIA – **Bolivar** • 5 ♂; Serrania de San Lucas; 8°02'15" N, 74°12'09" W; Mar. 2019; Jorge A. Noriega leg. [pitfall trap, human faeces]; DZUP • 2 ♀; same collection data as for preceding.

VENEZUELA – **Distrito Capital** • 1 ♀; Caracas; Marcuzzi leg.; “S. 1550”; UCCC. – **Yaracuy** • 3 ♂♂; Bolivar, Aroa; 10°00'00" N, 68°00'00" W; alt. 459 m; 19 Jul. 2009; M. Asmussen, P. Colmenares and H. Martinez leg.; [human faeces]; CEMT • 12 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; alt. 710 m; [human faeces bait]; CEMT • 1 ♀; same collection data as for preceding; 10°23'11.9" N, 68°50'00" W • 1 ♀; same collection data as for preceding; 10°20'21.98" N,

68°50'6.03" W; alt. 1362 m; [human faeces] • 1 ♂; same collection data as for preceding; 10°23'06.1" N, 68°50'45.45" W; alt. 1415 m • 1 ♂; same collection data as for preceding; 10.3867°N, 68.6471°W; alt. 1380 m; Jul. 2009; Asmussen, Colmenares and Martínez leg. • 7 ♀♀; same collection data as for preceding. – **Vargas** • 1 ♀; Vargas La Sabana; 10°35'47.90" N, 66°16'49.94" W; alt. 30 m; 20 Jul. 2009; H. Martinez, P. Cely, M. Córdova and M. Nuñez leg.; [human faeces bait]; CEMT. – **Merida** • 5 ♂♂; Sucre, Jaji; 8°33'29.87" N, 71°22'05.59" W; alt. 1876 m; 8 Jul. 2009; D. Mora, P. Colmenares, M. Cordova and M. Nuñez leg.; [Chicken bait]; CEMT • 5 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; CERPE • 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 8°35'18.31" N, 71°20'47.18" W; alt. 2037 m; CEMT • 6 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; CERPE • 1 ♀; same collection data as for preceding • 1 ♀; same collection data as for preceding; 8°35'11.65" N, 71°20'48.3" W; alt. 2041 m; CEMT • 1 ♀; Hacienda El Alto, Manzano Alto; alt. 1600 m; 4 Jul. 1991; C. Porter and L. Stange leg.; cloud forest; CEMT • 17 ♂♂; Libertador, meseta de zumba, Hacienda Los Arcos; 8°33'14" N, 71°13'20" W; alt. 1181 m; 6 May 2016; R. Accohacesncia and J. Gámez leg.; pitfall human feces; CEMT • 26 ♀♀; same collection data as for preceding.

Type locality

Venezuela (El Valle).

Redescription

Male

MEASUREMENTS. Length 5.5–6.7 mm. Width 2.9–3.8 mm. Body (Fig. 9A–B) convex, oval and shiny.

COLOUR. Body ranging from yellowish brown to dark brown; might have darker spots.

HEAD (Fig. 9C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; one long tubercle in the middle; proximal border rounded; posterior margin narrower than the anterior; lateral margin with slightly rectangular entrance; disc strigulate. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders rounded; apex straight; setae thin and sparse, throughout the anterior margin dorsally; disc strigulate. Labrum semicircular; curved medially; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior margin arched; lateral margins slightly rounded and superior margin curved in the middle; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres, antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 9E). Convex; excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight or arched, angles subacute; posterior margin rounded and weakly produced medially; lateral margin strongly convex, setae absent; punctures thin and sparse.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal thick punctures, sutural stria complete, formed by thick punctures.

VENTER (Fig. 9B). Hypomeral surface strigulate, setose; prosternum (Fig. 9B, D) elevated at midlength, transversally grooved; anterior margin rounded and jagged, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface strigulate. Protrochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly

curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 9F–K). Lobe of tegmen absent; sclerotized region next to right paramere base; parameres asymmetrical, dislocated to ventral region; right paramere with rounded edges, base wider than the apex; left paramere wider than the right one, wide base and curved apex.

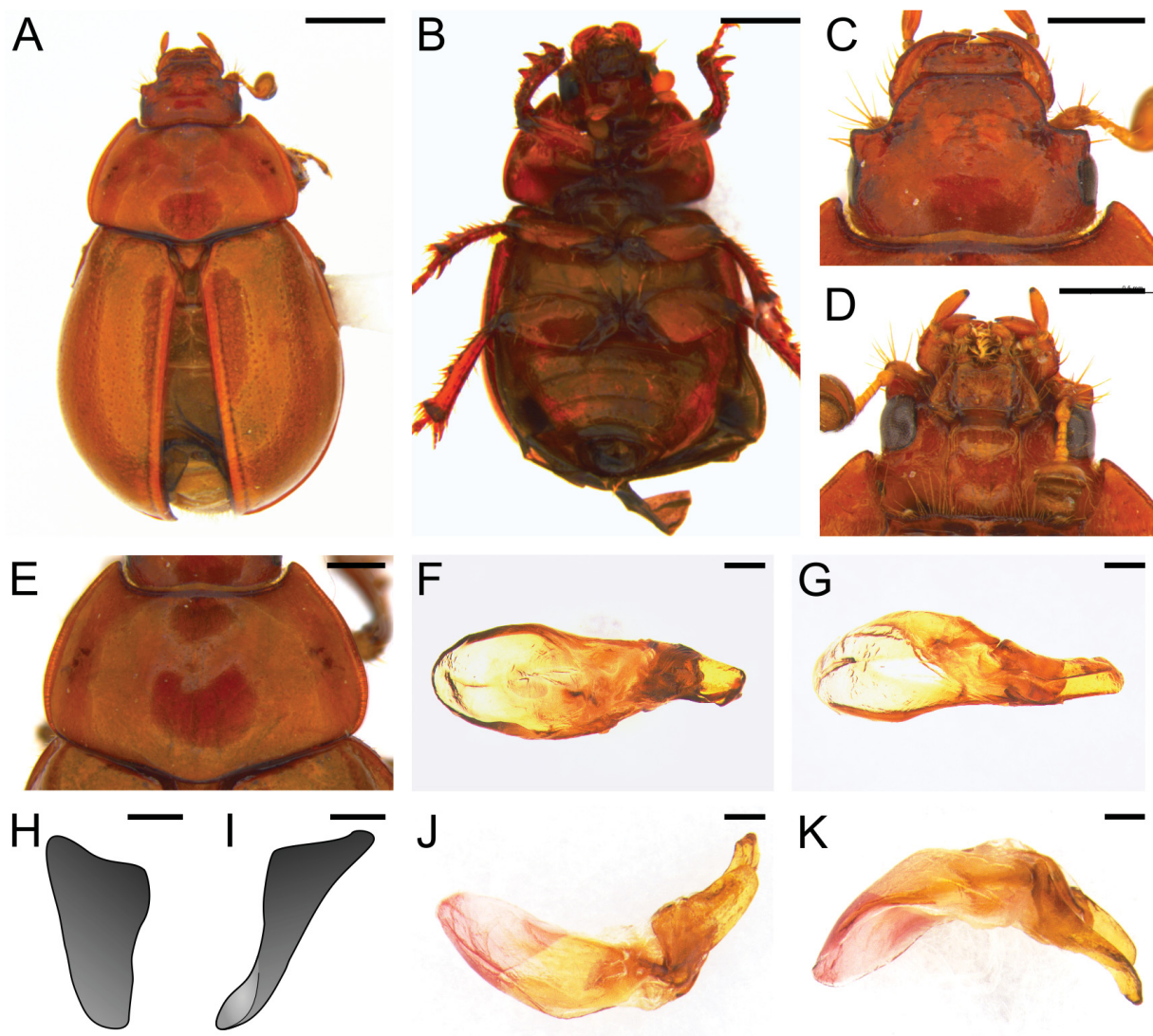


Fig. 9. *Coilodes ovalis* Robinson, 1948, three ♂♂ from Jaji, Sucre, Venezuela, two at CEMT (first A, C–D; and second B, E), and one at DZUP (F–G, J–K); and graphical representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

Female

Length 5.2–7.1 mm. Width 3.0–4.0 mm.

Geographical distribution

Colombia (Bolívar); Trinidad and Tobago; Venezuela (Yaracuy, Vargas, Distrito Capital, Miranda and Mérida) (Fig. 14 C) (Robinson 1948; Perk *et al.* 2002; label data).

Biological data

Species collected in: human and bovine faeces; and in chicken meat (label data).

Coilodes parvulus Westwood, 1846

Figs 10, 14C

Coilodes parvulus Westwood, 1846: 165 (original description).

Coilodes parvulus – Allsopp 1984: 107 (checklist). — Ocampo & Ballerio 2006: 191 (checklist).

Coelodes parvulus – Gemminger & Harold 1869: 1075 (incorrect subsequent spelling: catalogue). — Arrow 1912: 37 (catalogue).

Coilodes parvula – Blackwelder 1944: 217 (incorrect subsequent spelling: checklist).

Diagnosis

Some yellowish brown specimens are similar to *Coilodes edeiltae* sp. nov. They are distinguished by the presence of fine punctures, elytra with black margins, and in having the male genitalia without a lobe on the tegmen. Dark brown specimens are similar to *C. lunae* sp. nov. They are distinguished by the presence of a subtrapezoidal clypeus and by the absence of a transparent region on the distal half of the right paramere.

Type material

The holotype (♀) is probably in the OUMNH collection, where *C. castaneus* is deposited. However, the collection was consulted and the holotype of *C. parvulus* was not found.

Additional material examined (22 ♂♂ and 25 ♀♀)

BRAZIL – **Ceará** • 4 ♂♂; Ubajara, PN Ubajara, Gruta Ubajara; 3°49'55" S, 40°54'5" W; alt. 480 m; 16 Feb. 2013; Vaz-de-Melo and Grossi leg.; pitfall human dung; CEMT • 8 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; DZUP • 1 ♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; 17 Feb. 2013; light; CEMT • 1 ♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; 3°49'59" S, 40°54'10" W; alt. 520 m; 19 Feb. 2013 • 3 ♀♀; same collection data as for preceding. – **Bahia** • 1 ♀; Ubaíra; 13°07'06" S, 39°41'24" W; Nov. 2011; C.M.P. Leite leg.; pitfall, “416mosl. Parc. 32”; CEMT • 2 ♀♀ Ituberá, Panca de Grande, Mata Maduras; 9 Dec. 2009; P. Lopes, M. Campos and L. Oliveira leg.; CEMT • 3 ♂♂; Igrapiuna, “Vila 5”; 13°48'08" S, 39°10'03" W; 12 Apr. 2010; R. Carvalho leg.; CEMT • 1 ♂; Itapetinga; 15°16'27" S, 39°54'50" W; Dec. 2011; C.M.P. Leite leg.; pitfall; CEMT • 3 ♂♂; Aracatu, Faz. Lagoa do tamburi, BA262, Km400, NW, estr. Umbuzeiro da Terra; 10 Oct. 2017–8 Jan. 2018; A.S. Ferreira leg.; CEMT • 3 ♀♀; same collection data as for preceding • 2 ♂♂; same collection data as for preceding; CERPE • 2 ♀♀; same collection data as for preceding. – **Minas Gerais** • 1 ♂; Cordisburgo; Jan. 1998; Vaz-de-Mello leg.; CEMT • 3 ♀♀; same collection data as for preceding • 4 ♂♂; same collection data as for preceding; Cordisburgo, Faz Pontinha; Dec. 1997 • 1 ♀; same collection data as for preceding.

Type locality

Brazil.

Redescription

Male

MEASUREMENTS. Length 4.7–5.8 mm. Width 2.6–3.3 mm. Body (Fig. 10A–B) convex, oval and shiny.

COLOUR. Body ranging from yellowish brown to dark brown; elytral inner and elytral outer margins black.

HEAD (Fig. 10C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; two small tubercles in the middle or one long tubercle formed by the fusion of the small ones; proximal border rounded;

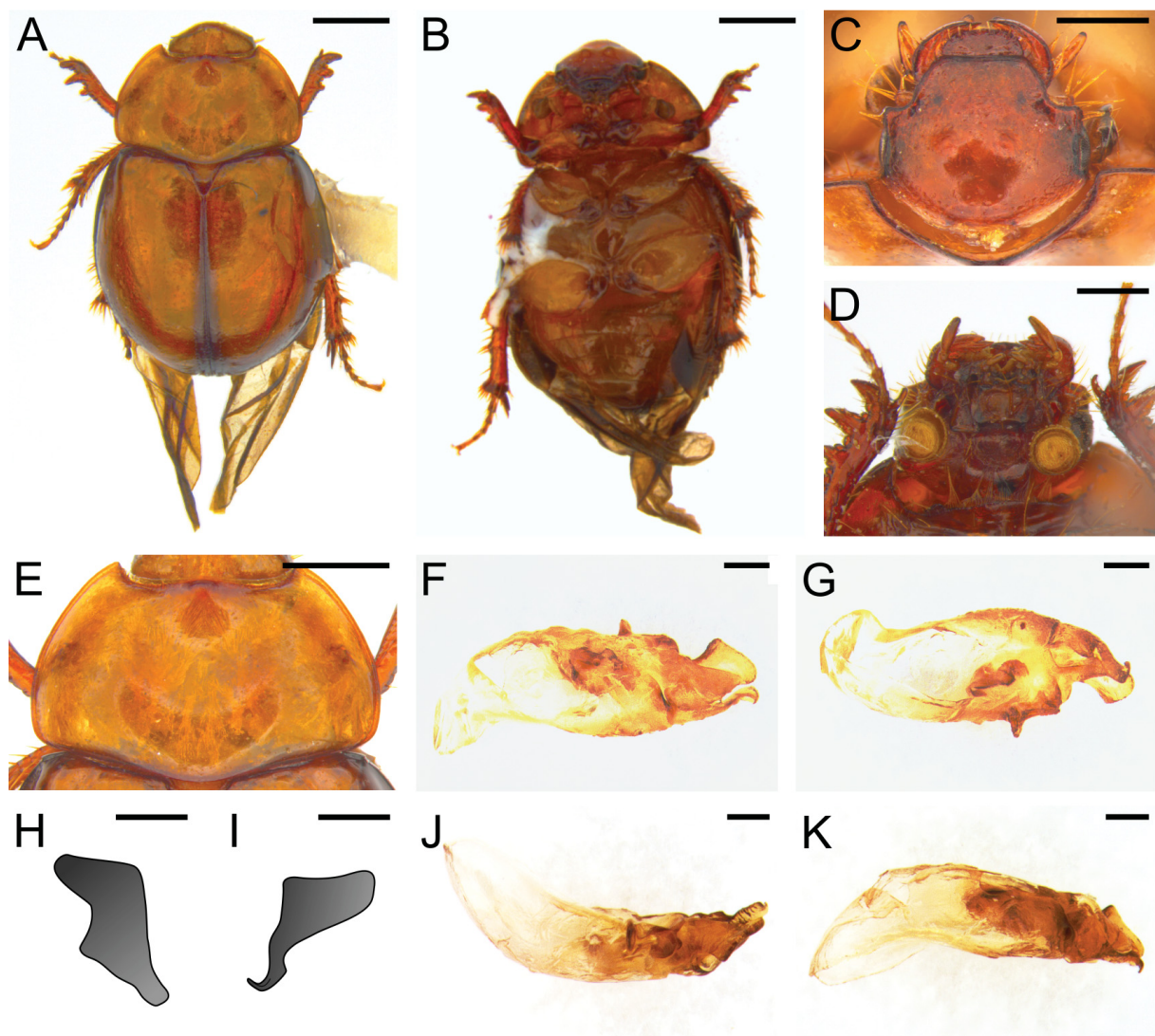


Fig. 10. *Coilodes parvulus* Westwood, 1846, Three ♂♂ at CEMT, two from Ubajara, Ceará, Brazil (A–B, E) and (C), and one from Igrapiuna, Bahia, Brazil (D, F–G, J–K); graphical representation (H–I). A. Body, dorsal view. B. Body, ventral view. C. Head, dorsal view. D. Head, ventral view. E. Pronotum, dorsal view. F–K. Male genitalia. F. Dorsal view. G. Ventral view. H. Right paramere. I. Left paramere. J. Right side. K. Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

posterior margin as wide as the anterior; lateral margin straight and darker; sparse punctures, restricted to the region next to clypeus. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders angulated; apex straight; setae thin and sparse, throughout the anterior margin dorsally; sparse punctures. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior margin arched; lateral margins slightly rounded and superior margin slightly curved; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 10E). Convex; slightly excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae absent; punctures thin and sparse or absent.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal punctures, sutural stria complete, formed by thicker punctures.

VENTER (Fig. 10B). Hypomeral surface strigulate, setose; prosternum (Fig. 10B, D) elevated at midlength, transversally grooved; anterior margin straight and flat, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface strigulate. Protrochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur with sharp apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 10F–K). Lobe of tegmen absent; parameres asymmetrical; right paramere subtrapezoidal, longer than it is wide, apex wider than base; left paramere with wide base and narrow, slightly sharp apex, strongly curved outward.

Female

Length 5.3–6.9 mm. Width 3.0–3.9 mm.

Geographical distribution

Brazil (Ceará, Bahia, Minas Gerais) (Fig. 14C) (Westwood 1846, label data).

Biological data

Species collected in: human faeces and in light traps (label data).

Remarks

According to original description, *Coilodes parvulus* was registered in Brazil and has a yellowish brown body, elytra with twin longitudinal lines composed of punctures, and is of smaller size than the other species of *Coilodes* examined by Westwood (1846) (approximately 5.4 mm length). Although the holotype of *C. parvulus* was not found, all specimens examined have the same characters cited by Westwood

(1846), including the very small size (length ranging from 4.8 to 6.9 mm), very distinctive of this species when compared to the other species of *Coilodes*.

The measurements given in the original description were converted to the metric system. The measurement technique used by Westwood was probably different from that used in this research study, but comparative analyses of sizes of *Coilodes* species, especially those that occur in Brazil, give us confidence to assume that our concept of *Coilodes parvulus* is correct.

***Coilodes punctipennis* Arrow, 1909**

Figs 11, 14D

Coelodes punctipennis Arrow, 1909: 491 (original description).

Coelodes punctipennis – Arrow 1912: 37 (catalogue).

Coilodes punctipennis – Blackwelder 1944: 217 (checklist). — Allsopp 1984: 107 (checklist). — Ocampo & Ballerio 2006: 191 (catalogue).

Diagnosis

Similar to *Coilodes edeiltae* sp. nov., it is distinguished by the male genitalia not having a dorsal lobe on the tegmen.

Type material

Lectotype

EQUADOR • ♂; Mirador; “Fry Coll.”; “1905-100”; NHMUK.

Additional material examined (11 ♂♂ and 12 ♀♀)

BOLIVIA • 1 ♂; Tropica Region Chapare, “400 ms lischka”; 25 Jul. 1949; UCCC.

ECUADOR – **Napo** • 1 ♂; Cotococha; alt. 860 m; 15 Apr. 1995; X Cisneros leg.; CEMT • 3 ♀♀; same collection data as for preceding • 1 ♂; Tena, Puerto Izahualli; 17–22 Mar. 2004; J. Jensen leg.; CEMT • 5 ♀♀; same collection data as for preceding • 1 ♂; Puerto Misahuali; 1°02'4.2" S, 77°39'49.2" W; alt. 1650–1900; 6–19 Sep. 1998; J.E. Eger leg.; pitfall trap, fish carron baited; FIT; CEMT. – **Tugurahua** • 1 ♂; Baños; 26 Dec. 1996; N. Vieira leg.; CEMT • 1 ♂; Baños, “El Topo”; 1°23'41" N, 78°22'52" W; alt. 1590 m; 23 Jan. 2011; G. Maldonado leg.; human faeces; CEMT • 2 ♀♀; same collection data as for preceding • 1 ♂; same collection data as for preceding; CERPE • 1 ♂; same collection data as for preceding; DZUP • 1 ♂; same collection data as for preceding; 2°34'59" S, 79°49'59" W; alt. 1390 m; pitfall “Carroña”; CEMT. – **Pastaza** • 1 ♀; Villano; 3 Jul. 1996; J. Naranjo leg.; CERPE • 1 ♀; same collection data as for preceding; DZUP • 1 ♂; same collection data as for preceding; 9 Jul. 1996; CEMT • 1 ♂; same collection data as for preceding; 10 Jul. 1996.

Type locality

Ecuador (Canelos, Mirador) and Peru (Nauta).

Redescription

Male

MEASUREMENTS. Length 5.8–6.9 mm. Width 3.7–4.0 mm. Body (Fig. 11A–B) convex, oval and shiny.

COLOUR. Body yellowish brown; elytra might have dark brown spots.

HEAD (Fig. 11C–D). Surface strigulate. Frons, in dorsal view, subrectangular; two small tubercles in the middle; proximal border rounded; posterior margin as wide as the anterior; slightly arched and darker entrance on lateral margin; sparse punctures. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders rounded; apex straight; setae thin and sparse, throughout the anterior margin dorsally. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum; invagination in the upper area of tooth base. Labium with mentum subrectangular; inferior margin slightly arched, lateral and superior margins straight; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

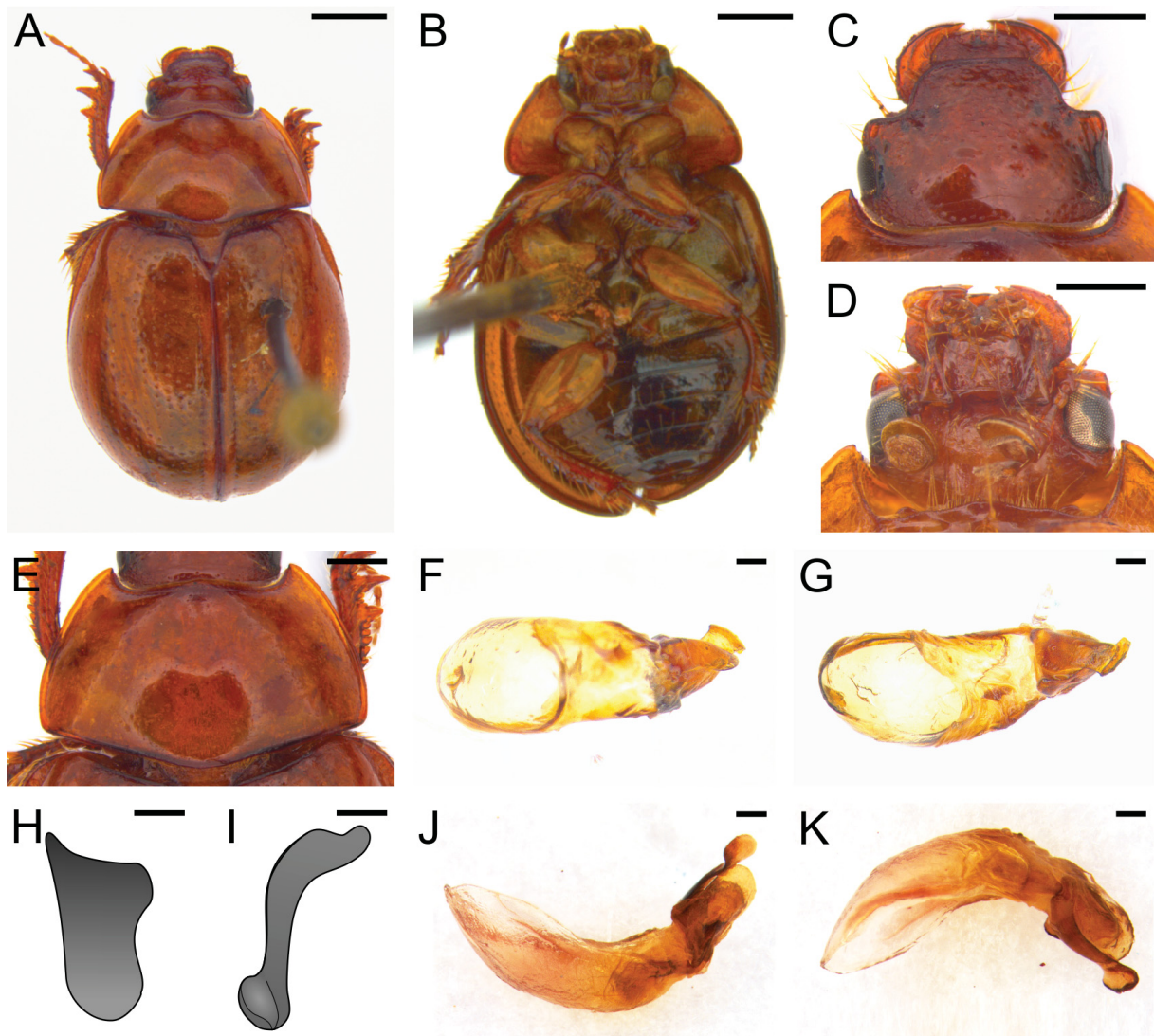


Fig. 11. *Coilodes punctipennis* Arrow, 1909, ♂ at UCCC from Tropica Region Chapare, Bolivia (A, C–E), ♂ at CEMT from Cotococha, Napo, Ecuador (B), ♂ at DZUP from Tugurahua, Ecuador (F–G, J–K), and graphical representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

PRONOTUM (Fig. 11E). Convex; slightly excavated medially; subtrapezoidal, posterior margin wider than anterior margin; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae and punctures absent.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal thick punctures, sutural stria complete, formed by thick punctures.

VENTER (Fig. 11B). Hypomeral surface strigulate, setose; prosternum (Fig. 11B, D) elevated at midlength, transversally grooved; anterior margin rounded and flat, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface strigulate. Protochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 11F–K). Lobe of tegmen absent; sclerotized region next to right paramere base; parameres asymmetrical; right paramere longer than wide, rounded apex; left paramere dislocated to ventral region, wide base and apex spoon-shaped, strongly curved outward.

Female

Length 6.6–7.0 mm. Width 3.8–4.0 mm.

Geographical distribution

Ecuador (Napo, Tungurahua, Pastaza); Peru (Loreto); Bolivia (Chapare) (Fig. 14D) (Arrow 1909; label data).

Biological data

Species collected in human faeces (label data).

Coilodes ravii Basílio & Vaz-de-Mello sp. nov.

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Figs 12, 14D

Diagnosis

Similar to *Coilodes punctipennis*, it is distinguished by the presence of finer punctures on elytra and by the presence of a sharp lobe on the right side of the tegmen, reaching the base of parameres.

Etymology

Noun in the genitive singular. *Coilodes ravii* Basílio & Vaz-de-Mello sp. nov. is named after Ravi Basílio Dantas, nephew of the first author.

Type material

Holotype

ECUADOR • ♂; Prov. Napo, vic. Puerto Misahuali; 1°02'04.2" S, 77°39'49.2" W; alt. 1650–1900 ft; 6–19 Sep. 1998; J.E. Eger leg.; fish carrion baited, pitfall trap; CEMT.

Paratypes (2 ♂♂ and 4 ♀♀)

ECUADOR – Napo • 1 ♂; same collection data as for holotype; CEMT • 1 ♀; same collection data as for holotype; CEMT • 1 ♂; same collection data as for holotype; DZUP • 1 ♀; same collection data as for holotype; DZUP • 1 ♀; Yutari; Mar. 1990; S. Sandoval leg.; CEMT • 1 ♀; Pichira; 8 Mar. 1990; S. Sandoval leg.; [trap], “carne baja”; CEMT.

Description

Male (holotype)

MEASUREMENTS. Length 6.4 mm. Width 3.7 mm. Body (Fig. 12A–B) convex, oval and shiny.

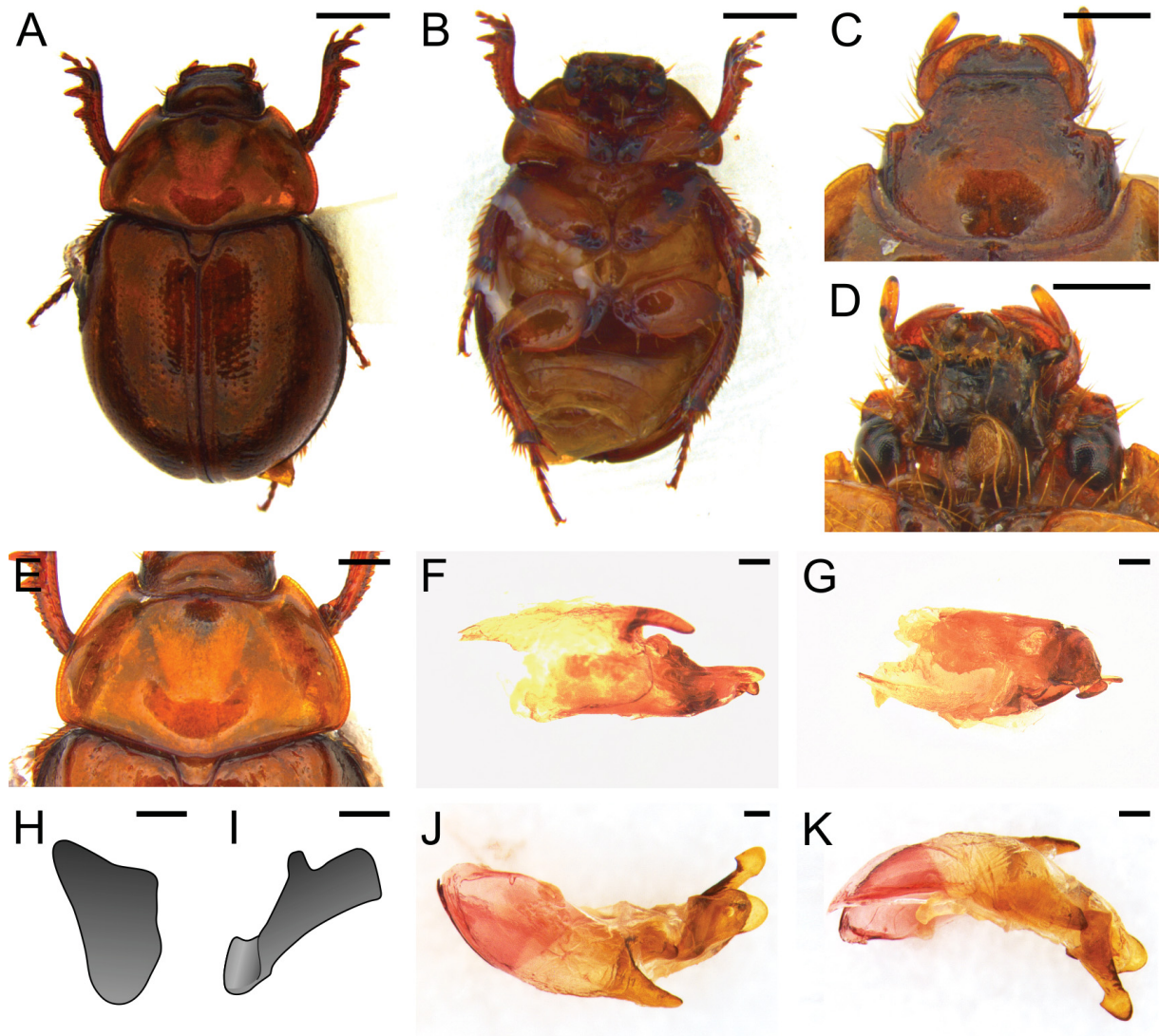


Fig. 12. *Coilodes ravii* Basílio & Vaz-de-Mello sp. nov., holotype ♂ (A–G, J–K) and graphical representation (H–I). **A.** Body, dorsal view. **B.** Body, ventral view. **C.** Head, dorsal view. **D.** Head, ventral view. **E.** Pronotum, dorsal view. **F–K.** Male genitalia. **F.** Dorsal view. **G.** Ventral view. **H.** Right paramere. **I.** Left paramere. **J.** Right side. **K.** Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

COLOUR. Body, yellowish brown; elytra with outer margins black.

HEAD (Fig. 12C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; two small tubercles merged, in the middle; proximal border rounded; posterior margin as wide as the anterior one; lateral margin, straight and darker; surface without punctures. Eye barely visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subrectangular; lateral margins weakly rounded; anterior borders rounded; apex straight; setae thin and sparse, throughout the anterior margin dorsally; surface without punctures. Labrum semicircular; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior and lateral margins straight and superior margin slightly curved in the middle; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 12E). Convex; strongly excavated medially; subtrapezoidal, posterior margin wider than anterior one; anterior margin straight, angles subacute; posterior margin rounded and weakly produced medially; lateral margin convex, setae and punctures absent.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of longitudinal punctures, sutural stria complete, formed by thicker punctures.

VENTER (Fig. 12B). Hypomeral surface strigulate, setose; prosternum (Fig. 12B, D) elevated at midlength, transversally grooved; anterior margin straight and flat, mesoventrite and metaventrite smooth.

LEGS. Procoxa conical; surface strigulate. Protochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibia with inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the protibial second tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 12F–K). Lobe of tegmen triangular on right side, reaching the paramere bases; sclerotized region next to paramere bases; parameres asymmetrical; right paramere longer than wide, straight base and apex rounded; left paramere dislocated to ventral region, straight apex strongly curved outward.

Female

Length 5.8 mm. Width 3.6 mm.

Variation

Length ranging from 5.8 to 6.4 mm. Width ranging from 3.5 to 3.7 mm. Head and pronotum colour ranging from yellowish brown to dark brown. Pronotum in males sometimes with a slight excavation.

Geographical distribution

Ecuador (Napo) (Fig. 14D).

Biological data

Species collected in carcasses of fish (label data).

Coilodes skelleyi Basílio & Vaz-de-Mello sp. nov.

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Figs 13, 14D

Diagnosis

Similar to *Coilodes castaneus*, it is distinguished by the presence of a compact lobe on the right side of the tegmen and by having the right paramere with a sinuous apex.

Etymology

Noun in the genitive singular. *Coilodes skelleyi* Basílio & Vaz-de-Mello sp. nov. is named after Paul E. Skelley, the aphodiine and erotylid specialist, and collector of most specimens known thus far.

Type material

Holotype

PERU • ♂; Loreto, 80 km, NE Iquitos, Explorama Lodge, Rio Ynamono, 1 km from Amazon R.; 1–5 Sept. 1992; P.E. Skelley leg.; human dung; FSCA.

Paratypes (4 ♂♂ and 16 ♀♀)

BRAZIL – **Amazonas** • 2 ♀♀; Benjamin Constant, “Guanabara II”; 10 Mar. 2004; Silva, P. H. leg.; CEMT • 1 ♂; same collection data as for preceding; DZUP • 3 ♀♀; same collection data as for preceding • 2 ♀♀; same collection data as for preceding; CEMT • 1 ♂; Pico da Neblina; 0°40' N, 66°00' W; 5–12 Nov. 1977; Robin Best leg.; CEMT.

PERU – **Loreto** • 1 ♂; same collection data as for holotype • 5 ♀♀; same collection data as for holotype • 1 ♂; same collection data as for holotype; CEMT • 2 ♀♀; same collection data as for holotype • 2 ♀♀; same collection data as for holotype; DZUP.

Description

Male (holotype)

MEASUREMENTS. Length 5.6 mm. Width 3.2 mm. Body (Fig. 13A–B) convex, oval and shiny.

COLOUR. Head, scutellar shield, elytra and legs dark brown; pronotum and venter yellowish brown.

HEAD (Fig. 13C–D). Surface slightly strigulate. Frons, in dorsal view, subrectangular; one long tubercle in the middle; proximal border rounded; posterior margin narrower than the anterior; lateral margin slightly arched; disc slightly strigulate. Eye visible dorsally. Canthus strong; distinct area expanded downwards. Clypeus subtrapezoidal; lateral margins weakly rounded; anterior borders rounded; apex straight; setae thin and sparse, throughout the anterior margin dorsally; disc strigulate. Labrum semicircular; slight medial projection; setae sparse, spreading along the entire dorsal border. Mandibles dorsally excavated, protruding beyond the apex of labrum. Labium with mentum subquadrate; inferior margin arched; lateral margins straight and superior margin slightly curved in the middle; disc strigulate, long setae on the margins. Maxilla subtriangular; long setae throughout surface. Antenna with 10 antennomeres; antennal club with three antennomeres; club with basal antennomere cupuliform.

PRONOTUM (Fig. 13E). Convex; slightly excavated medially; posterior margin as wide as the anterior one; anterior margin arched, angles subacute; posterior margin rounded and produced medially; lateral margin convex, setae absent; punctures thin and sparse.

SCUTELLAR SHIELD. Subtriangular; setae and punctures absent; apex punctate.

ELYTRA. Double row of thick longitudinal punctures, sutural stria complete, formed by thick punctures.

VENTER (Fig. 13B). Hypomer surface strigulate, setose; prosternum (Fig. 13B, D) elevated at midlength, transversally grooved; anterior margin subtrapezoidal and flat, projected outward; mesoventrite and metaventricle smooth.

LEGS. Procoxa conical; surface smooth. Protochanter joint with the procoxa rounded, distally angulate. Profemur with posterior margin carinate. Protibial inner margin convex; carinate; single spur, slightly curved at the apex; external margin with three larger teeth and series of smaller denticles along the entire margin. Protarsi with tarsal insertion beneath the second protibial tooth. Mesothoracic and metathoracic legs smooth. Mesotrochanter and metatrochanter subtriangular with bifurcated apex. Mesofemur and

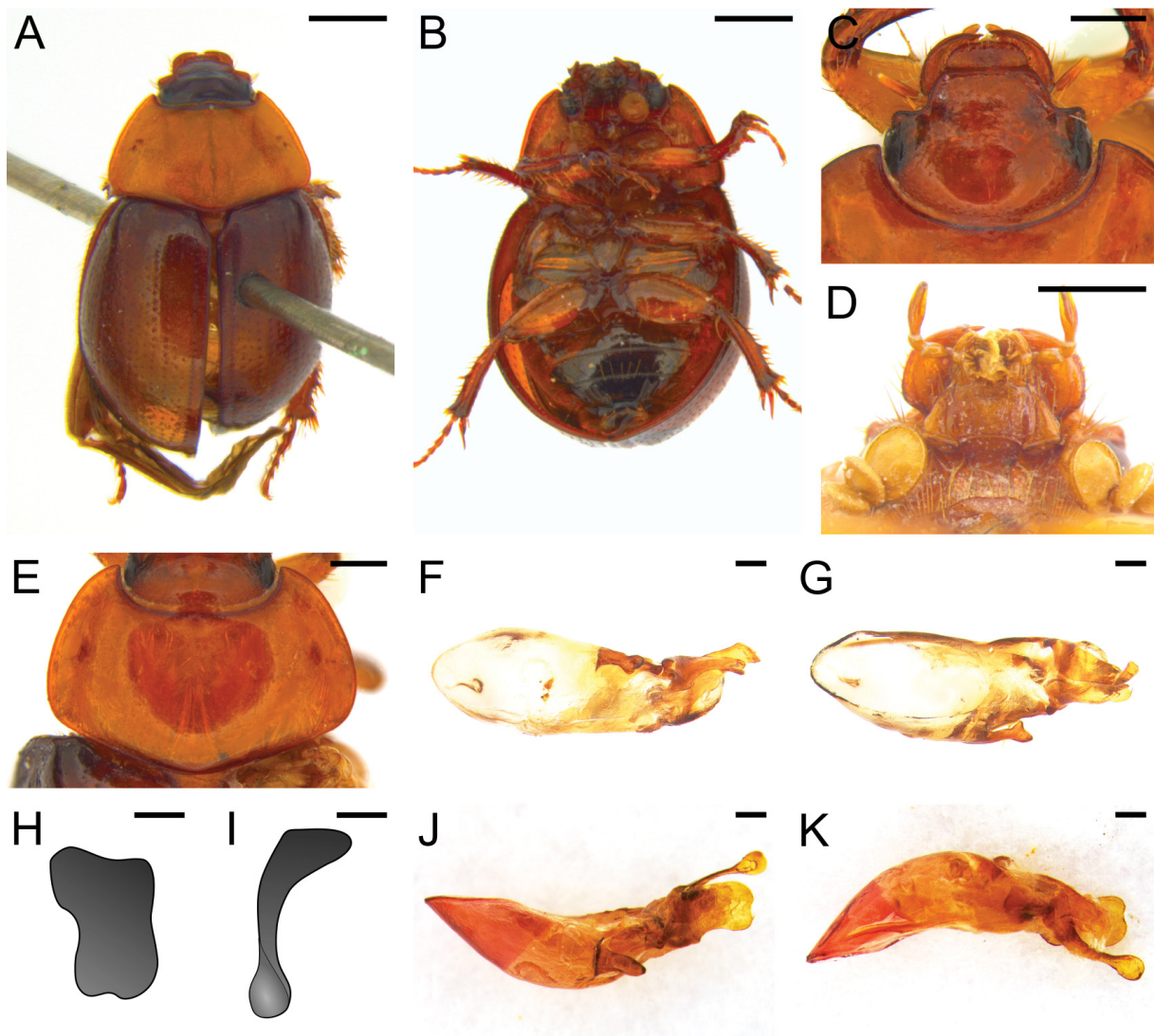


Fig. 13. *Coilodes skelleyi* Basílio & Vaz-de-Mello sp. nov., paratype ♂ at CEMT from Pico da Neblina, Amazonas, Brazil (A, F–G), paratype ♀ at DZUP from Loreto, Peru (B), paratype ♂ at DZUP from Benjamin Constant, Amazonas, Brazil (C, E), holotype ♂ (D, J–K), and graphical representation (H–I). A. Body, dorsal view. B. Body, ventral view. C. Head, dorsal view. D. Head, ventral view. E. Pronotum, dorsal view. F–K. Male genitalia. F. Dorsal view. G. Ventral view. H. Right paramere. I. Left paramere. J. Right side. K. Left side. Scale bars: A–B = 1 mm; C–E = 0.5 mm; F–K = 0.2 mm.

metafemur carinate on posterior margin. Mesotibia and metatibia with erect setae; apex weakly expanded; pair of spurs with sharp apex. Tarsi with five tarsomeres; tarsal claws toothed medially.

ABDOMEN. Six ventrites with recumbent setae.

GENITALIA (Fig. 13F–K). Lobe of tegmen on the right side, with rounded apex, measuring $\frac{2}{3}$ of the distance between the lobe base and the paramere base; sclerotized region next to right paramere base; parameres asymmetrical; right paramere subrectangular, longer than wide, with curved apex; left paramere, spoon-shaped, dislocated to dorsal region.

Female

Length 5.2–6.7 mm. Width 3.1–4.2 mm.

Variation

Length ranging from 5.2 to 6.7 mm. Width ranging from 3.1 to 4.2 mm. Body colour in dorsal view sometimes uniform, ranging from yellowish brown to dark brown. Frons lateral margins may have a strong rectangular entrance.

Geographical distribution

Peru (Loreto); Brazil (Amazonas) (Fig. 14D).

Biological data

Species collected in human faeces (label data).

Discussion

Due to the morphological homogeneity of *Coilodes*, the identification of its species is very difficult, reflected in studies with mistakes or unprecise identifications, commonly limited to generic level. Problematic species delimitation is also known in the genus *Phaeochrous*, the most diverse Hybosorinae genus (Kuijten 1978).

Coilodes was composed of nine species and five synonyms, totalizing 14 names (Ocampo & Ballerio 2006; Prokofiev 2013b). This genus is now composed of 13 species, of which seven were redescribed (*C. castaneus*, *C. fumipennis*, *C. humeralis*, *C. niger*, *C. ovalis*, *C. punctipennis*, and *C. parvulus*). Among these species, *C. niger* had its status revalidated and, with *C. humeralis*, both had lectotypes designated.

Six new species were described (*C. bezerrai*, *C. edeiltae*, *C. lunae*, *C. mayae*, *C. ravii* and *C. skellei*), and, as the other species of the genus, they were distinguished mainly by paramere shape and by the presence and shape of the lobe on the tegmen.

Three new synonyms were also proposed: *Coilodes nigripennis* as a junior synonym of *C. castaneus*; and *Hybosorus gibbus* and *C. chilensis* as junior synonyms of *C. humeralis*. Thus, *Hybosorus brasiliensis* and *C. testaceus* are now junior synonyms of *C. humeralis*. Both were previously synonymized with *C. gibbus*, *H. brasiliensis* by Westwood (1846) and *Coilodes testaceus* by Ocampo & Ballerio (2006).

Gnombolbus orosi remains a synonym of *C. castaneus*, and we found that the name *Coilodes auger* is a nomen nudum. *Coilodes auger* is an incorrect spelling of *C. niger*.

The known geographical distribution for five species was expanded (*C. castaneus*, *C. fumipennis*, *C. humeralis*, *C. ovalis*, *C. punctipennis*), and new biological data are presented, mainly in relation to their feeding habits.

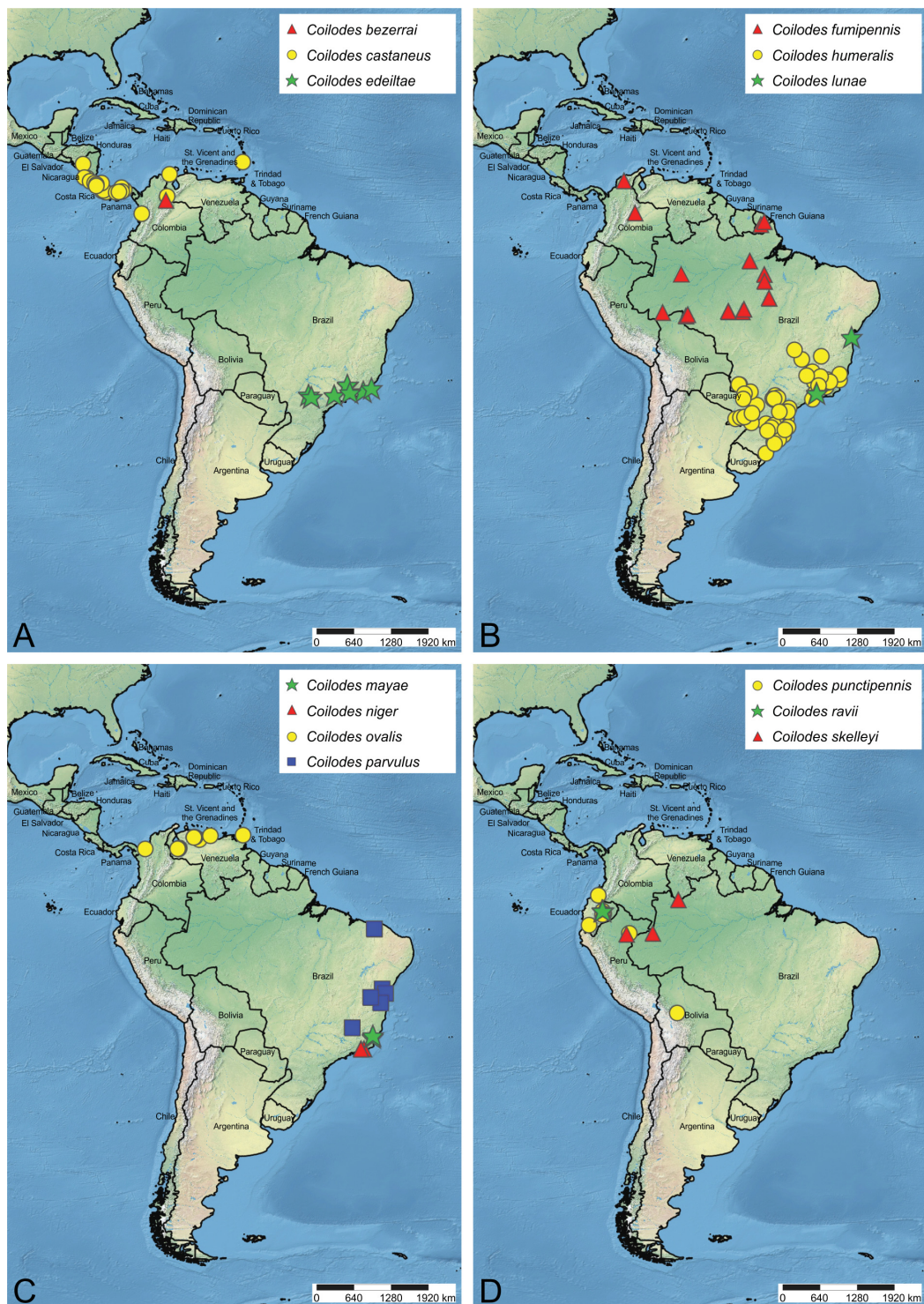


Fig. 14. Distribution map of species of *Coilodes* Westwood, 1846. **A.** *Coilodes bezerrai* Basílio & Vaz-de-Mello sp. nov.; *Coilodes castaneus* Westwood, 1846; and *Coilodes edeiltae* Basílio & Vaz-de-Mello sp. nov. **B.** *Coilodes fumipennis* Arrow, 1909; *Coilodes humeralis* (Mannerheim, 1829); and *Coilodes lunae* Basílio & Vaz-de-Mello sp. nov. **C.** *Coilodes mayae* Basílio & Vaz-de-Mello sp. nov.; *Coilodes niger* (Mannerheim, 1829) stat. rev.; *Coilodes ovalis* Robinson, 1948; and *Coilodes parvulus* Westwood 1846. **D.** *Coilodes punctipennis* Arrow, 1909; *Coilodes ravii* Basílio & Vaz-de-Mello sp. nov.; and *Coilodes skellei* Basílio & Vaz-de-Mello sp. nov.

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References

- Allsopp P.G. 1984. Checklist of the Hybosoridae (Coleoptera: Scarabaeidae). *The Coleopterists Bulletin* 38 (2): 105–117. Available from <https://www.jstor.org/stable/4008153> [accessed 23 Nov. 2023].
- Arrow G.J. 1903. On the laparostict lamellicorne Coleoptera of Granada and St. Vincent (W. Indies). *Transactions of the Entomological Society of London* 2: 509–520. <https://doi.org/10.1111/j.1365-2311.1903.tb01144.x>
- Arrow G.J. 1909. On the characters and relationships of the less know groups of lamellicorn Coleoptera, with description of a new species of Hybosorinae, etc. *Transactions of the Entomological Society of London* 2: 479–507.
- Arrow G.J. 1912. Scarabaeidae: Pachypodinae, Pleocominae, Aclopinae, Glaphyrinae, Ochodaeinae, Orphninae, Idiostominae, Hybosorinae, Dynamopinae, Acanthocerinae, Troginae. *Coleopterorum Catalogus* 43: 1–65.
- Bai M., Zhang W., Ren D., Shih C. & Yang X. 2015. *Hybosorus ocampoi*: the first hybosorid from the Cretaceous Myanmar amber (Coleoptera: Scarabaeoidea). *Organisms Diversity & Evolution* 16 (1): 233–240. <https://doi.org/10.1007/s13127-015-0245-3>
- Ballerio A. & Grebennikov V.V. 2016. Rolling into a ball: phylogeny of the Ceratocanthinae (Coleoptera: Hybosoridae) inferred from adult morphology and origin of a unique body enrollment coaptation in terrestrial arthropods. *Arthropod Systematics & Phylogeny* 74 (1): 23–52.
- Basilio D.S., Cherman M.A., Vaz-de-Mello F.Z. & Almeida L.M. 2023. Phylogenetic relationships in Hybosoridae (Coleoptera: Scarabaeoidea). *Zoological Journal of the Linnean Society* 198 (4): 1156–1170. <https://doi.org/10.1093/zoolinnean/zlac095>
- Bates H.W. 1887. *Biologia Centrali Americana: Insecta. Coleoptera*. Vol. II. Part 2. *Pectinicornia and Lamellicornia*. R.H. Porter, London. Available from <https://www.biodiversitylibrary.org/page/42603494> [accessed 12 Nov. 2023].
- Blackwelder R.E. 1944. *Checklist of the Coleopterous Insects of Mexico, Central America, the West Indies, and South America*. Parts 1 and 2. Bulletin 185, United States National Museum. United States Government Printing Office, Washington DC.
- Castelnau [Laporte F.D.] 1840. *Histoire naturelle des Animaux articulés*. Volume 2. Dumenil, Paris.
- Cornaby B.W. 1974. Carrion reduction by animals in contrasting tropical habitats. *Biotropica* 6 (1): 51–63. <https://doi.org/10.2307/2989697>

- Cristóvão J.P. & Vaz-de-Mello F.Z. 2020. The terminalia of the superfamily Scarabaeoidea (Coleoptera): specific glossary, dissecting methodology, techniques and previously unrecorded sexual dimorphism in some difficult groups. *Zoological Journal of the Linnean Society* 20: 1–43.
<https://doi.org/10.1093/zoolinnean/zlaa079>
- Dejean P.F. 1833. *Catalogue des Coléoptères de la Collection de M. le Comte Dejean*. Méquignon-Marvis père et fils, Paris. <https://doi.org/10.5962/bhl.title.8771>
- Dejean P.F. 1837. *Catalogue des Coléoptères de la Collection de M. le Comte Dejean*. Third edition. Méquignon-Marvis père et fils, Paris.
- Erichson W.F. 1847. Conspectus insectorum coleopterorum quae in Republica Peruana observata sunt. *Archiv für Naturgeschichte* 13: 67–185.
- Escobar F. 1997. Estudios de la comunidad de coleópteros coprófagos (Scarabaeidae) en un remanente de bosque seco al norte del Tolima, Colombia. *Caldasia* 19 (3): 419–430.
- Feer F. 2000. Les coléoptères coprophages et nécrophages (Scarabaeidae s. str. et Aphodiidae) de la forêt de Guyane française: composition spécifique et structure des peuplements. *Annales de la Société entomologique de France* 36: 29–43.
- Gemminger M. & Harold E. 1869. *Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus, Tom. IV: Scarabaeidae*. E.H. Gumm, Munich.
- Grebennikov V.V., Ballerio A., Ocampo F.C. & Scholtz C.H. 2004. Larvae of Ceratocanthidae and Hybosoridae (Coleoptera: Scarabaeoidea): study of morphology, phylogenetic analysis and evidence of paraphyly of Hybosoridae. *Systematic Entomology* 29 (4): 524–543.
<https://doi.org/10.1111/j.0307-6970.2004.00257.x>
- Harold E.F. 1874. Zur Kenntnis der kugelförmigen Trogiden. *Coleopterologischen Hefte* 12: 26–51.
- Harold E.F. 1880. Verzeichniss der von Steinheil in Neu-Granada gesammelten coprophagen lamellicornien. *Stettiner Entomologische Zeitung* 41: 13–46.
- Howden H.F. & Gill B.D. 1987. New species and new records of Panamanian and Costa Rican Scarabaeinae (Coleoptera: Scarabaeidae). *The Coleopterists Bulletin* 41 (3): 201–224.
Available from <https://www.jstor.org/stable/4008409> [accessed 23 Nov. 2023].
- ICZN 1999. *International Code of Zoological Nomenclature*. Fourth edition adopted by the International Union of Biological Sciences. International Trust for Zoological Nomenclature, London.
- Kuijten P.J. 1978. Revision of the Indo-Australian species of the genus *Phaeochrous* with notes on the African species. *Zoologische Verhandelingen* 165: 3–40.
- Lacordaire J.T. 1856. *Histoire naturelle des Insectes: Genera des Coléoptères ou Exposé méthodique et critique de tous les Genres proposés jusqu'ici dans cet Ordre d'Insectes. Tome 3. Contenant les Familles des Pectinicornes et Lamellicornes*. Librairie encyclopédique de Roret, Paris.
- Lucas R. 1920. *Catalogus Alphabeticus Generum et Subgenerum Coleopterorum Orbis Terrarum Totius (Famil., Trib., Subtr., Sect. Incl.)*. Pars I. R. Stricker, Berlin.
- MacLeay W.J. 1864. Descriptions of new genera and species of Coleoptera from Port Denison. *The Transactions of the Entomological Society of New South Wales* 1: 106–130.
- Mannerheim K.G. 1829. Description de quarante nouvelles espèces de scarabéides du Brésil: avec figures. *Mémoires de la Société impériale des Naturalistes de Moscou* 7: 29–80.

- Ocampo F.C. 2002. Hybosorids of the United States and expanding distribution of the introduced species *Hybosorus illigeri* (Coleoptera: Scarabaeoidea: Hybosoridae). *Annals of the Entomological Society of America* 95 (3): 316–322. [https://doi.org/10.1603/0013-8746\(2002\)095\[0316:HOTUSA\]2.0.CO;2](https://doi.org/10.1603/0013-8746(2002)095[0316:HOTUSA]2.0.CO;2)
- Ocampo F.C. 2006. Phylogenetic analysis of the scarab family Hybosoridae and monographic revision of the New World subfamily Anaidinae 3. Phylogenetic analysis of the subfamily Anaidinae. *Bulletin of the University of Nebraska State Museum* 19: 13–177.
- Ocampo F.C. 2010. A new species of the South American genus *Metachaetodus* (Coleoptera: Scarabaeoidea: Hybosoridae: Hybosorinae). *Revista de la Sociedad entomológica Argentina* 69: 201–207.
- Ocampo F.C. & Ballerio A. 2006. Phylogenetic analysis of the scarab family Hybosoridae and monographic revision of the New World subfamily Anaidinae (Coleoptera: Scarabaeoidea). 4. Catalog of the subfamilies Anaidinae, Ceratocanthinae, Hybosorinae, Liparochrinae, and Pachyplectrinae (Hybosoridae). *Bulletin of the University of Nebraska State Museum* 19: 178–209.
- Ocampo F.C. & Hawks D.C. 2006. Phylogenetic analysis of the scarab family Hybosoridae and monographic revision of the New World subfamily Anaidinae 2. Molecular phylogenetics and systematic placement of the Hybosoridae. *Bulletin of the University of Nebraska State Museum* 19: 7–12.
- Orozco M. & Pérez A. 2008. Escarabajos coprófagos (Coleoptera, Scarabaeoidea) del Parque Nacional Los Estoraques (Norte de Santander, Colombia). *Revista brasileira de Entomologia* 52 (1): 36–40. <https://doi.org/10.1590/S0085-56262008000100007>
- Otavo S.F., Parrado-Rosselli A. & Noriega J.A. 2013. Superfamilia Scarabaeoidea (Insecta: Coleoptera) como elemento bioindicador de perturbación antropogénica en un parque nacional amazónico. *Revista de Biología tropical* 61 (2): 735–752.
- Paulian R. 1938. Contribution a l'étude des canthonides américains. *Annales de la Société entomologique de France* 107: 213–296.
- Perk S.B. 2010. The beetles of the island of St. Vincent, Lesser Antilles (Insecta: Coleoptera); diversity and distributions. *Insecta Mundi* 144: 1–77.
- Perk S.B., Cook J. & Hardy Jr J.D. 2002. Beetle fauna of the island of Tobago, Trinidad and Tobago, West Indies. *Insecta Mundi* 16: 9–23.
- Perty J.A.M. 1830. *Delectus Animalium Articulatorum quae in Itinere per Brasiliam Annis MDCCCXVII-MDCCCXX Jussu et Auspiciis Maximiliani Josephi I Bavariae Regis Augustissimi Peracto*. Munich. <https://doi.org/10.5962/bhl.title.158694>
- Pic M. 1928. *Melanges exotico-entomologiques. Notes et Descriptions*. Vol. 51. Les Imprimeries Réunies, Moulins.
- Preudhomme de Borre A. 1886. Liste des lamellicornes laparostictiques recueillis par Feu Camille van Volxem pendant son voyage au Brésil et à la Plata en 1872, suivie de la description de dix huit espèces nouvelles et un genre nouveau. *Annales de la Société entomologique de Belgique* 30: 103–120.
- Prokofiev A.M. 2013a. A new bolboceratine beetle from Mesoamerica (Coleoptera: Geotrupidae: Bolboceratinae). *Calodema* 244: 1–2.
- Prokofiev A.M. 2013b. *Gnombolbus*, a synonym of *Coilodes* (Coleoptera: Scarabaeoidea: Hybosoridae). *Calodema* 252: 1.
- Ratcliffe B.C. 2002. A checklist of the Scarabaeoidea (Coleoptera) of Panama. *Zootaxa* 32 (1): 1–48. <https://doi.org/10.11646/zootaxa.32.1.1>

- Ratcliffe B.C. & Ocampo F.C. 2001. *Tyrannosorus rex* Ratcliffe and Ocampo, a new genus and species of Miocene hybosorid in amber from the Dominican Republic (Coleoptera: Scarabaeoidea: Hybosoridae). *The Coleopterists Bulletin* 55 (3): 351–355.
[https://doi.org/10.1649/0010-065X\(2001\)055\[0351:TRRAOA\]2.0.CO;2](https://doi.org/10.1649/0010-065X(2001)055[0351:TRRAOA]2.0.CO;2)
- Robinson M. 1948. Studies in the Scarabaeidae IV (Coleoptera). *Transactions of the American Entomological Society* 74 (1): 29–36. Available from <https://www.jstor.org/stable/25077572> [accessed 23 Nov. 2023].
- Rodrigues M.M., Uchoa M.A. & Ide S. 2013. Dung beetles (Coleoptera: Scarabaeoidea) in three landscapes in Mato Grosso do Sul, Brazil. *Brazilian Journal of Biology* 73 (1): 211–220.
<https://doi.org/10.1590/S1519-69842013000100023>
- Santos E.B., Da Silva P.G., Favretto M.A. & Müller G.A. 2017. Occurrence of beetles (Insecta: Coleoptera) in mosquito ovitraps (Diptera: Culicidae, Culicinae) in an Atlantic Forest fragment. *Revista brasileira de Zoologia* 18 (1): 41–46. <https://doi.org/10.34019/2596-3325.2017.v18.24576>
- Scudder S.H. 1882. *Nomenclator Zoologicus: an Alphabetical List of All Generic Names that have been Employed by Naturalists for Recent and Fossil Animals from the Earliest Times to the Close of the Year 1879*. n. 19. Government Printing Office, Washington DC. <https://doi.org/10.5962/bhl.title.1143>
- Shorthouse D.P. 2010. SimpleMappr, an online tool to produce publication-quality point maps. Available from <https://www.simplemappr.net/> [accessed 18 Apr. 2021].
- Uchoa M.A. & Rodrigues M.M. 2019. Dung beetles (Coleoptera: Scarabaeoidea) population patterns in three environments in the Midwest of Brazil. *EntomoBrasilis* 12 (1): 19–26.
<https://doi.org/10.12741/ebrazilis.v12i1.825>
- Wehncke E.V. & Dalling J.W. 2005. Post-dispersal seed removal and germination selected tree species dispersed by *Cebus capucinus* on Barro Colorado Island, Panama. *Biotropica* 37 (1): 73–80.
<https://doi.org/10.1111/j.1744-7429.2005.03037.x>
- Westwood J.O. 1846. XXVI. On the lamellicorn beetles which possess exerted mandibles and labrum, and 10-jointed antennae. *Transactions of the Entomological Society of London* 4 (3): 155–180.
<https://doi.org/10.1111/j.1365-2311.1846.tb01350.x>
- Young O.P. 1983. The distribution and ecology of *Coilodes castanea* (Coleoptera: Scarabaeidae: Hybosorinae). *The Coleopterists Bulletin* 37 (3): 247–253.
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Supp. file 1. Labels of the examined material. <https://doi.org/10.5852/ejt.2023.914.2377.10435>

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