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Taxonomy and Systematics

New species of *Bolbapium* Boucomont, 1910 (Coleoptera: Geotrupidae) from Brazil

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Abstract. *Bolbapium* Boucomont, 1910 is a Neotropical genus of Geotrupidae with 22 known species. In this paper, we describe *Bolbapium vazdemelloi* **sp. nov.** in Southwestern Bahia, Brazil. This new species is distinguished from congeneric species by its unique combination of morphological characters: cephalic tubercle adjacent to each eye; pronotum with little expanded bidentate tubercle; parameres symmetric, with acute and divergent apex. The new species was incorporated into a previously published identification key for *Bolbapium*.

Keywords: Bahia state; Semi-arid region; Scarabaeoidea; Bolboceratinae; Athyreini.

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Bolbapium Boucomont, 1910 (Scarabaeoidea: Geotrupidae: Bolboceratinae: Athyreini) is a Neotropical genus with 22 known species, distributed mainly in South America (Argentina, Bolivia, Brazil, Colombia, French Guiana, Guyana, Paraguay, Uruguay, and Venezuela) and Panama (Carvalho & Vaz-de-Mello 2022). Nineteen species are recorded from Brazil, but there are no records in two Brazilian states, Amapá in the north and Sergipe in the northeastern (Vaz-de-Mello 2023). In Northeastern Brazil, nine species are recorded, five of which are from Bahia state (Carvalho & Vaz-de-Mello 2022).

Here, we describe *Bolbapium vazdemelloi* **sp. nov.** in Southwestern Bahia, Brazil. The new species is illustrated and incorporated into a previously published identification key for the genus proposed by Carvalho & Vaz-de-Mello (2022).

MATERIAL AND METHODS

Were studied 16 specimens of *Bolbapium* Boucomont, 1910 (Coleoptera: Geotrupidae), all males, deposited at Coleção Entomológica Prof. Johann Becker of the Museu de Zoologia of Universidade Estadual de Feira de Santana, Bahia, Brazil (MZFS). Some paratypes were deposited at Coleção Entomológica de Mato Grosso Eurides Furtado, Instituto de Biociências, Universidade Federal de Mato Grosso, Cuiabá, Mato Grosso, Brazil (CEMT).

Photographs were captured using a self-assembled stereomicroscope (model Leica M205 C with FusionOptics™) equipped with a digital camera (model Leica DFC295) and the Leica Application Suite LAS EZ Version 3.8.0 software. The lighting system used was developed by Ferreira *et al.* (2021). The aedeagus preparation followed the protocol of Cristovão & Vaz-de-Mello (2020), while the morphological terminology used was based on Beutel & Lawrence (2005) and Lawrence *et al.* (2010).

The geographical record was plotted on the map using QGIS version 2.10.1 (Q GIS Development Team 2017). The final image editions and editing of the geographical record map were made with GIMP version 2.10.22 (The GIMP Development Team 2020). The final adjustments and editing of the geographical record map, as well as image editions, were performed using GIMP.

RESULTS

Bolbapium vazdemelloi sp. nov. (Figures 1A–I)

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Type material. Holotype male: BRAZIL, Bahia, [Aracatu], Fazenda Lagoa do Tamburí [-14.60000000, -40.43333333, 750 m], km 400, toward Vitória da Conquista/Brumado, 12.iv.2013, (MZFS). Paratypes: 10 males, same data as holotype (MZFS); 5 males, same data as holotype (CEMT).

Diagnosis: Head with tubercle adjacent to each eye (Figures 1A, D–E). Pronotum with little expanded tubercle, practically bidentate (Figures 1A, D–E); all the surface with scattered points (Figures 1C–D, F). Parameres symmetrical, with acute and divergent apex in dorsal view (Figures 1G, I).

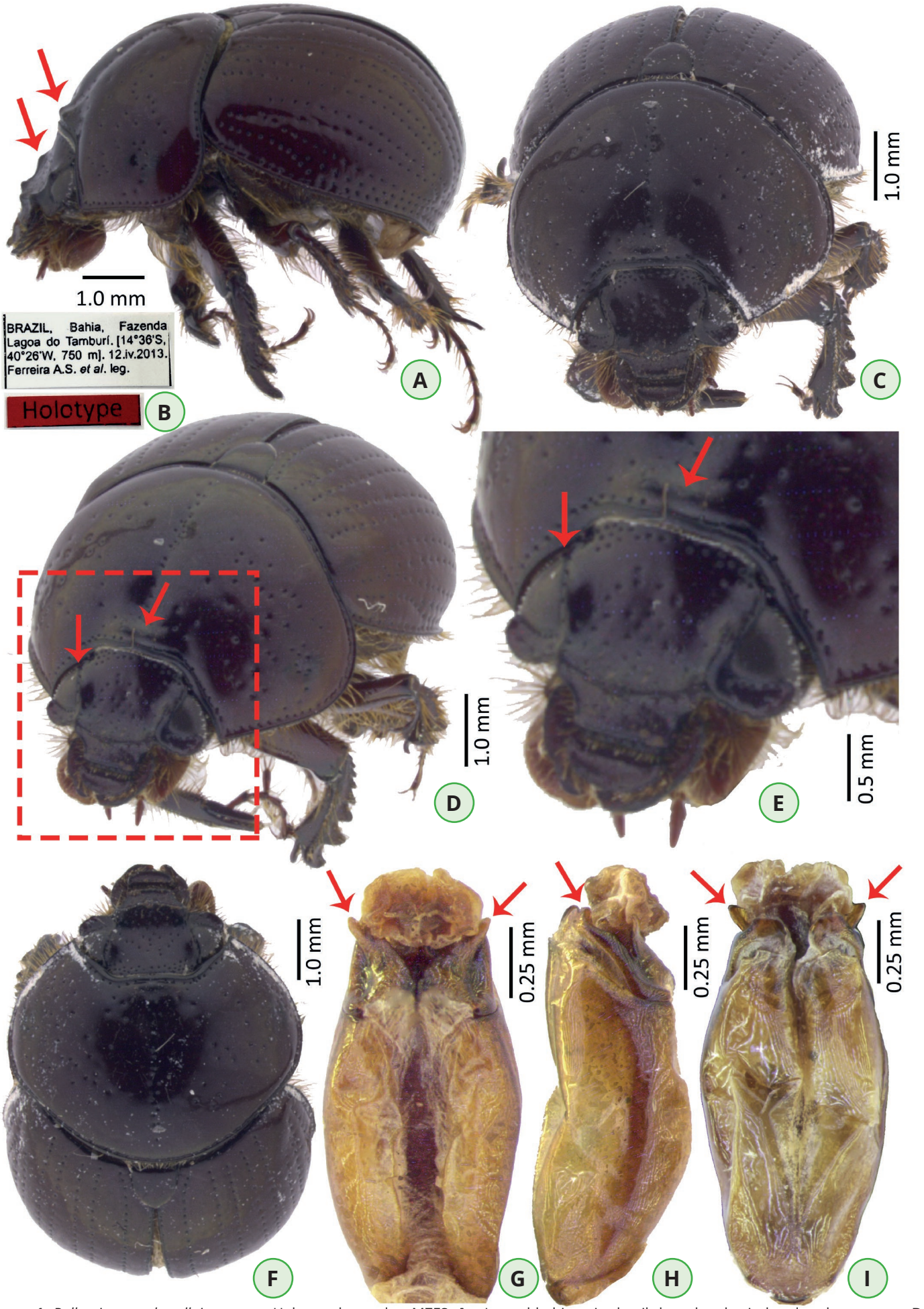

Figure 1. *Bolbapium vazdemelloi* **sp. nov.,** Holotype housed at MZFS. **A –** Lateral habitus, in detail the tubercles in head and pronotum; **B –** labels attached to the holotype; **C –** Head and pronotum (dorsal view); **D** Head and pronotum (latero-dorsal view); **E –** Head and anterior portion of pronotum in detail (latero-dorsal view); **F –** Head and pronotum (dorso-frontal view); **G–I** Aedeagus (dorsal, lateral and ventral view respectively).

Description (holotype, male): (Figures 1A, C–F). **Body size:** Total length: 7.11 mm, width: 5.02 mm. **Colour:** uniformly dark brown. **Head:** clypeal carina expanding to the mid-frontal area generating a little angulation; frons without tubercles; surface completely with scattered points, heterogeneous (Figures 1D–E). **Pronotum:** anterior region of disc with little expanded tubercle, practically bidentate. Points spread over the complete surface of the pronotum, with greater evidence on the sides of the disc and with a non-standard distribution. **Ventral region of the thorax:** central region of the metaventrite with a few scattered in a non-standard way setae. **Male terminalia (Figures 1G–I):** parameres, symmetrical, with the approximate base and truncated and divergent apex, widely separated in dorsal view (Figure 1G); completely visible in lateral view (Figure 1H); only the apex visible in ventral view (Figure 1I).

Sexual dimorphism: female unknown.

Remarks: *Bolbapium vazdemelloi* **sp. nov.** has a head with tubercle adjacent to each eye, similar to *Bolbapium luederwaldti* Carvalho & Vaz-de-Mello, 2022, *Bolbapium boillyi* Carvalho & Vaz-de-Mello, 2022, *Bolbapium borgmeieri* Martínez, 1976, *Bolbapium caesum* (Klug, 1843), and *Bolbapium furtadoi* Carvalho & Vaz-de-Mello, 2022. However, *B. vazdemelloi* **sp. nov.** has the anterior region of pronotum with a small, expanded tubercle, practically bidentate (Figures 1A, C–F), a characteristic that is absent or morphologically different in the other previously mentioned species. In *B. luederwaldti,* the pronotum is a concave structure (see Figure 3D in Carvalho & Vaz-de-Mello 2022); in *B. borgmeieri,* the pronotum, mesoanteriorly, is a curved structure with width less than half the interocular width (see Figure 6B in Carvalho & Vaz-de-Mello 2022); in *B. caesum,* the pronotum, mesoanteriorly, is a curved structure, with non-continuous lines and with small angulation on each side of the structure (see Figure 6F in Carvalho & Vaz-de-Mello 2022); in *B. furtadoi,* the pronotum is a simple bi-tuberculated structure at the front and with small tubercle on each side of the central projection (see Figure 4C in Carvalho & Vaz-de-Mello 2022), and in *B. boillyi,* the pronotum, mesoanteriorly do not have an evident structure, the central disc has a slight sinuosity (see Figure 4D in Carvalho & Vaz-de-Mello 2022). *Bolbapium vazdemelloi* **sp. nov.** (Figures 1D–E) is morphologically similar to *B. matheusi* (see Figure 6C in Carvalho & Vaz-de-Mello 2022), both species have the anterior region of pronotum with little expanded tubercle, practically bidentate; however, *B. matheusi* does not have the head with tubercle adjacent to each eye (see Figure 6C in Carvalho & Vaz-de-Mello 2022) that is present in the new species.

Geographical distribution: *Bolbapium vazdemelloi* **sp. nov.** is known only from the type locality (Figure 2).

Identification key

Bolbapium vazdemelloi **sp. nov.** was included in couplet 19 of the identification key for the species *Bolbapium* (Carvalho & Vaz-de-Mello 2022).

19. Frons with tubercle adjacent to each eye; less than 5 mm. Midwest and Northeast Brazil ..... A

19'. Frons without tubercles, just clypeal carina extending to the mid-frontal forming slight angulation; larger than 5 mm (see Figure 6C in Carvalho & Vaz-de-Mello 2022). Northeast Brazil .....*Bolbapium matheusi* Carvalho & Vaz-de-Mello, 2022

A. Parameres symmetrical, with acute and parallels apex in dorsal view; connected at the base and separated at the apex (see Figure 10J in Carvalho & Vaz-de-Mello 2022); only the apex is visible in lateral view (see Figure 10L in Carvalho & Vaz-de-Mello 2022) .....*Bolbapium borgmeieri* Martínez, 1976

A'. Parameres symmetrical, with the approximate base and acute and divergent apex, widely separated in dorsal view (Figure 1G); completely visible in lateral view (Figure 1H) ....*Bolbapium vazdemelloi* **sp. nov.**

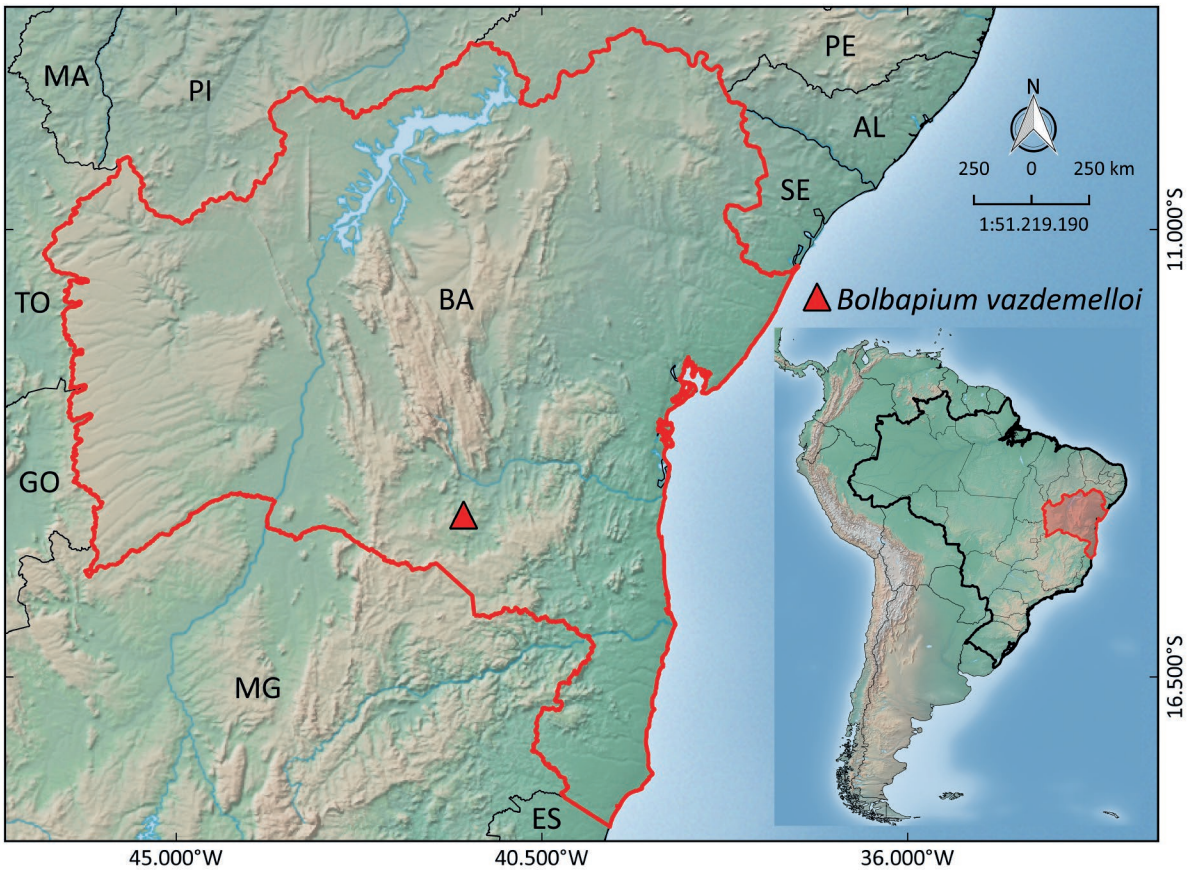

Figure 2. *Bolbapium vazdemelloi* **sp. nov.** distribution. Acronyms for Brazilian states: AL (Alagoas), BA (Bahia), ES (Espírito Santo), GO (Goiás), MA (Maranhão), MG (Minas Gerais), PE (Pernambuco), PI (Piauí), SE (Sergipe), TO (Tocantins).

TAXONOMIC AUTHORITIES

Bolbapium luederwaldti Carvalho & Vaz-de-Mello, 2022, *Bolbapium boillyi* Carvalho & Vaz-de-Mello, 2022, and *Bolbapium furtadoi* Carvalho & Vaz-de-Mello, 2022: in Carvalho & Vaz-de-Mello (2022); *Bolbapium borgmeieri* Martínez, 1976 in Martínez (1976); *Bolbapium caesum* (Klug, 1843) in Klug (1843).

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AUTHORS CONTRIBUTION

All authors contributed to the study conception and design. CDV: The analysis of metadata, first draft and final writing of the article, ASF: The analysis of metadata, Revision and final writing of the article, FB: The analysis of metadata, revision and Supervision. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare no competing interests.

REFERENCES

Beutel, RG & Lawrence, JF (2005). Coleoptera, beetles: morphology and systematics, pp. 23–27. In: Beutel, RG & Leschen, RAB (Eds.). *Handbook of Zoology*. Vol. I. Walter de Gruyter. https://doi.org/10.1515/9783110904550

Carvalho, EC & Vaz-de-Mello, FZ (2022). A taxonomic revision of *Bolbapium* Boucomont, 1910 (Coleoptera: Scarabaeoidea: Geotrupidae), *Journal of Natural History*, 56(13-16): 769-828. https://doi.org/10.1080/00222933.2022.2092429

Cristovão, JP & Vaz-de-Mello, FZ (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*, 191(4): 1001–1043. https://doi.org/10.1093/zoolinnean/zlaa079

Ferreira, AS; Bravo, F & Castro, I (2021). Low-cost circular LED dome lighting system for Insecta (Hexapoda) image capture in self-assembly stereomicroscope. *EntomoBrasilis*, 14: e957. DOI: https://doi.org/10.12741/ebrasilis.v14.e957

Klug, JCF (1843). Die Coleopteren-Gattungen: Athyreus und Bolboceras. Dargestellt nach den in der Sammlung der hiesiger. Königlich Universität davon vorhandenen Arten. Abhandlungen der Koniglich-Preussischen Akademie der Wissenschaften; Berlin.

Lawrence, JF; Beutel, RG & Leschen, RAB (2010). 2. Glossary of morphological terms, pp. 9-20. In: Leschen, RAB; Beutel, RG & Lawrence, JF (Eds.) *Handbook of Zoology*. Vol. 2. Walter de Gruyter. https://doi.org/10.1515/9783110911213.9

Martínez, A (1976). Contribution al conocimento de los Bolboceratini sudamericanos (Coleoptera, Scarabaeidae, Geotrupinae, Bolboceratini). *Studia Entomológica*, 19 (1/4): 531–551.

QGIS Development Team (2017). *QGIS Geographic Information System*. Open Source Geospatial Foundation Project. Version 2.10.1. URL: <https://download.qgis.org/downloads/>

The GIMP Development Team (2020). *GNU Image Manipulation Program (GIMP)*. Version 2.10.22. URL: <https://www.gimp.org/downloads>

Vaz-de-Mello, FZ (2023). Geotrupidae in Catálogo Taxonômico da Fauna do Brasil. PNUD. URL: <http://fauna.jbrj.gov.br/fauna/faunadobrasil/122831>. Access: 30.iii.2023.