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A taxonomic revision of *Bolbapium* Boucomont, 1910 (Coleoptera: Scarabaeoidea: Geotrupidae)

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ABSTRACT

The genus *Bolbapium* Boucomont 1910 comprises 22 species distributed throughout the Neotropical region. Here we present a taxonomic revision of *Bolbapium* with redescription of the following species: *B. baeri* (Boucomont, 1902), *B. borgmeieri* Martínez, 1976, *B. caesum* (Klug, 1843), *B. howdeni* Martínez, 1976, *B. lucidulum* (Klug, 1843), *B. minutum* (Luederwaldt, 1931), *B. modestum* (Castelnau, 1840), *B. paralucidulum* Ide and Martínez, 1993, *B. parcepunctatum* (Arrow, 1913), *B. quadrispinosum* (Luederwaldt, 1931), *B. quinques-triatum* (Boucomont, 1932), *B. striatopunctatum* (Castelnau, 1840), and *B. sulcifrons* Ide and Martínez, 1993. We also transferred *Bolboceras modestum* to *Bolbapium* and removed the name *Bolbapium sculpturatum* (Mannerheim 1829) from the genus; and we present nine new species: *B. boillyi* Carvalho and Vaz-de-Mello sp. nov., *B. dutraorum* Carvalho and Vaz-de-Mello sp. nov., *B. furta-doi* Carvalho and Vaz-de-Mello sp. nov., *B. limeirai* Carvalho and Vaz-de-Mello sp. nov., *B. luederwaldti* Carvalho and Vaz-de-Mello sp. nov., *B. matheusi* Carvalho and Vaz-de-Mello sp. nov., *B. sam-paioorum* Carvalho and Vaz-de-Mello sp. nov., *B. santanaorum* Carvalho and Vaz-de-Mello sp. nov. and *B. sergioidei* Carvalho and Vaz-de-Mello sp. nov. Illustrations, distribution maps and designation of type material are given. A new synonymy is here confirmed and proposed: *Bolbapium minutum* Luederwaldt, 1931 = *Bolbapium bigibbosum* syn. nov. Luederwaldt, 1931.

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region; new species

Introduction

Bolbapium Boucomont was formerly known as a South American genus. *Bolbapium* was originally described by Boucomont 1910 as a subgenus of *Bolboceras* Kirby, 1818, including four species from South America and two from Australia; Howden 1973 changed the status of *Bolbapium* to genus. Howden and Cooper (1977) transferred the Australian species of *Bolboceras* to *Bolbobaineus* Howden and Cooper, 1977 keeping only the South American species in *Bolbapium*.

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To date, 14 valid species are recognised as belonging to the genus *Bolbapium*: *Bolbapium baeri* (Boucomont, 1902), *Bolbapium borgmeieri* Martínez, 1976, *Bolbapium caesum* (Klug, 1843), *Bolbapium howdeni* Martínez, 1976, *Bolbapium lucidulum* (Klug, 1843), *Bolbapium minutum* (Luederwaldt, 1931), *Bolbapium modestum* (Castelnau, 1840), *Bolbapium paralucidulum* Ide and Martínez, 1993, *Bolbapium parcepunctatum* (Arrow, 1913), *Bolbapium quadrispinosum* (Luederwaldt, 1931), *Bolbapium quinquestriatum* (Boucomont, 1932), *Bolbapium sculpturatum* (Mannerheim, 1829) (see the discussion for more information about *Odontaeus sculpturatus* Mannerheim, 1829), *Bolbapium striatopunctatum* (Castelnau, 1840), and *Bolbapium sulcifrons* Ide and Martínez, 1993.

The only review involving species of *Bolbapium* was carried out by Luederwaldt (1931), and the last work published on the genus was the description of two new species by Ide and Martínez (1993). According to Ide and Martínez (1993), the main diagnostic characters to distinguish *Bolbapium* from other South America genera are: subtrapezoidal clypeus, frontoclypeal suture trituberculated and base of elytra with five striae between the elytral suture and humeral callus.

Several South American genera classified within Bolboceratini (*sensu* Martínez's key; 1976) are morphologically very similar to *Bolbapium*. These genera can be distinguished from *Bolbapium* by the following characteristics: *Bolbothyreus* Howden, 1973 presents a narrow and linear scutellum with subparallel edges while other genera present a broad and triangular scutellum; *Eucanthus* Westwood, 1848 presents subcontiguous middle femora while *Bolbapium* presents middle femora well separated; *Bolborhinum* Boucomont, 1910, *Halfterobolbus* Martínez, 1976, *Pereirabolbos* Martínez, 1976, and *Zefevazia* Martínez, 1976, have seven striae between the elytral suture and humeral callus, while *Bolbapium* has five striae only. Finally, *Parabolbapium* Ide and Martínez, 1994 is easily distinguished from other genera because it presents the clypeus divided into triangular areas.

Due the fact that the only review is old, plus the identification challenges of *Bolbapium* species, here we present a complete taxonomic revision of the genus *Bolbapium*, including (1) redescriptions of the genus and 12 species already described; (2) geographical distribution of all species; (3) descriptions of nine new species; (4) designation of lectotypes and neotypes; (5) proposal of a new synonymy; (6) transfer of *Bolboceras modestum* to *Bolbapium* and (7) removal of the name *Bolbapium sculpturatum* (Mannerheim, 1829) from the genus.

Material and methods

We examined 1397 dry pinned specimens of *Bolbapium* housed at the following collections (curators in parentheses):

- BMNH** – British Museum of Natural History, London, United Kingdom (Max Barclay);
- CEMT** – Department of Entomology of the Zoological Collection of the Federal University of Mato Grosso, Department of Biology and Zoology, Cuiabá, Mato Grosso, Brazil (Fernando Z. Vaz-de-Mello);
- CFPL-COL** – Luis Carlos Pardo-Locarno, private collection, Palmira, Valle del Cauca, Colombia (Luis Carlos Pardo-Locarno);
- COPL** – Olivier Boilly, private collection, Lille, France (Olivier Boilly);

- DZUP** – Museum of Entomology ‘Pe. Jesus Santiago Moure’, Federal University of Paraná, Paraná, Brazil (Lúcia Massutti de Almeida);
- MACN** – Museo Argentino de Ciencias Naturales ‘Bernadino Rivadavia’, Buenos Aires, Argentina (Pablo Mulieri);
- MLPA** – Museo de La Plata, Argentina (Adriana Malvardi);
- MNHN** – Museum National d’Histoire Naturelle, Paris, France (Olivier Montreuil);
- MZSP** – Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil (Sônia Casari and Carlos Campaner);
- LUOMUS** – Finnish Museum of Natural History, Helsinki, Finlândia (Sergei Tarasov and Michele Rossini);
- ZIN** – Zoological Institute St. Petersburg, Saint Petersburg, Rússia (Andrey Frolov).

Dissected specimens were placed in warm water before extraction of the aedeagus (see Cristovão and Vaz-de-Mello 2020 for details). The extracted aedeagus was preserved in glycerine inside a microtube pinned below its respective specimen. For holotype descriptions and morphological analyses, a Leica S8APO stereomicroscope was used. All photographs were taken using a Leica M205C stereomicroscope (7.8–160.0×) with a Leica MC190 HD image capture system. Pictures and plates were edited using the Inkscape software. Maps of geographical records were made with QGIS 3.14.1 software.

Treatment of type and non-type labels

Type of labels are transcribed verbatim. A slash (‘/’) is used to indicate a new line on the same label. Any additional or explanatory information is given between square brackets (‘[. . .]’). Information on non-type material is transcribed from each label and cited in alphabetic order; state, province or department is also given in alphabetic order (e.g. Rio de Janeiro; São Paulo); city and/or specific locality (when available); date and collector (when available); collection method (when available); number of examined specimens [males (♂), females (♀) and/or of unidentified gender] and collection (e.g. 2 ♂ 1 ♀ CEMT or 2 CEMT). Additional geographic coordinate information when not present on the labels is provided in square brackets (‘[. . .]’).

Type designation

Following the recommendations of the International Commission of Zoological Nomenclature (ICZN) and given the lack of primary types for some species, we proposed the designation of neotypes and paralectotypes for five species (each case is specified).

Taxonomy

***Bolbapium* Boucomont, 1910**

Bolboceras (*Bolbapium*) Boucomont 1910: 340–342 (review); 1912: 7 (catalogue); 1932: 266–268 (key). Blackwelder 1944: 220 (checklist)

Bolbapium: Howden, 1954: 142–143 (note); 1973: 1569; Martínez 1976: 532, 546, 547 (checklist); Howden and Cooper 1977: 2, 4–7, 18, 34, 36 (classification)

Genus diagnosis

Subtrapezoidal clypeus; suture clypeo-frontal trituberculated; elytra with five striae as dotted lines, between suture and humeral callus; scutellum slightly longer than wide and middle legs well separated, space between them almost as wide as long; globose species (Figure 1).

Type species *Bolboceras striatopunctatus* Castelnau, 1840.

Total length. 4.7–9.4 mm. **Colour:** uniformly dark brown or reddish brown, with elytral suture and posterior scutellar region darker. **Head:** Subtrapezoidal clypeus, with rugose sculpture in the upper region; clypeal carina trituberculated, variable width. Canthus partially divides the eyes, usually has an evident score. The frons may have a transverse carina and interocular tubercles, or not. Transverse labrum, with rounded edges and with thinner sides than the central region; surface rough and setae of ventral origin. Visible mandibles in the dorsal view; rounded, have setae at both dorsal and ventral regions; visible teeth. Maxillary palps three-segmented. Labial palps three-segmented. Antennae, in general, with the last three antennomeres flat and long (Figure 2(b)), in some species (placed separately) they are globular in shape (Figure 2(c)). **Pronotum:** Convex, twice as wide as long. Rounded posterior margin. Lateral margins with a row of ventral setae. Anterior, lateral and posterior margins outlined by equidistant points. Some species have ornamentation on

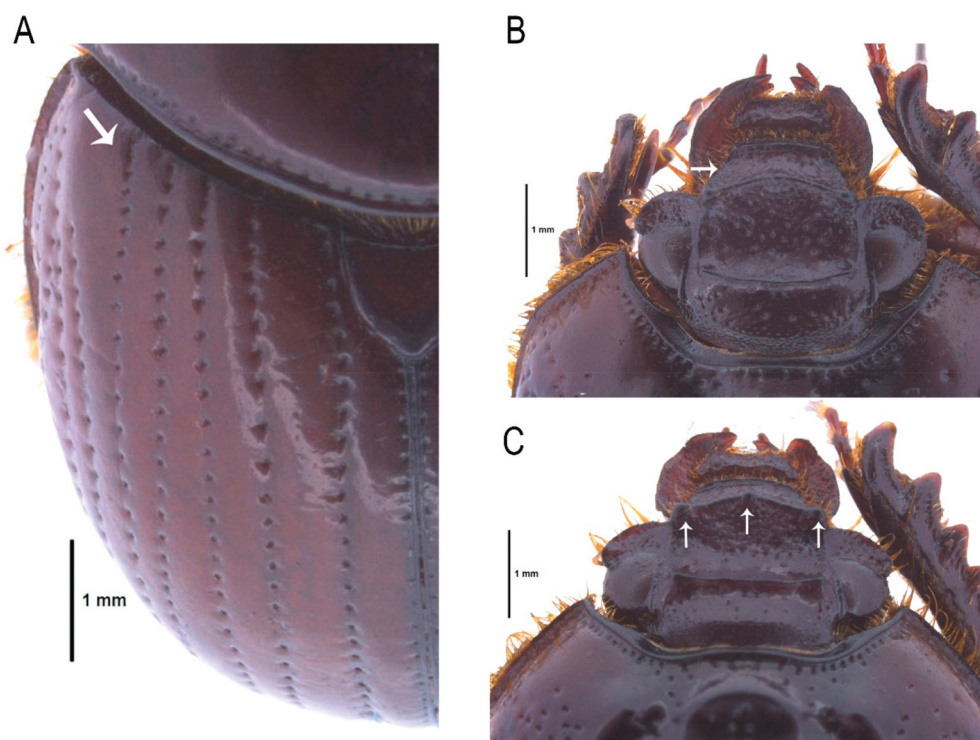


Figure 1. Diagnostic characters of *Bolbapium*. (a). Dorsal view, five striae between the suture and the humeral callus; (b). subtrapezoidal clypeus; (c). trituberculated clypeo-frontal suture.

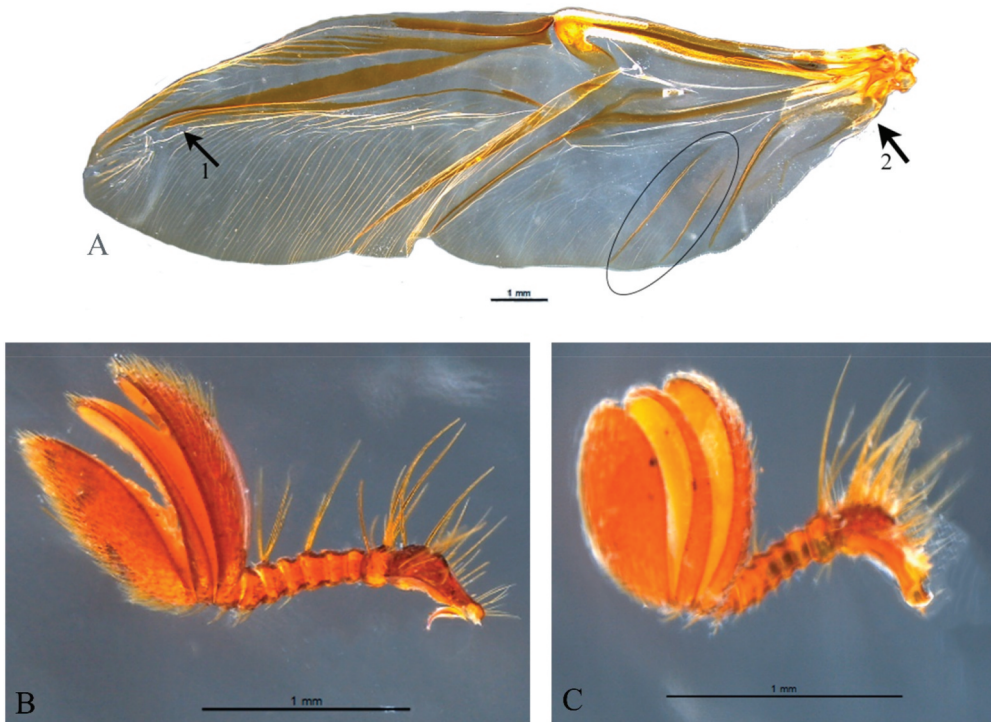


Figure 2. *Bolbapium* (a). Hind wings. Apex of the third branch of the radial vein directed towards the outer edge of the wing (black setae 1); between the cubital and the first anal vein articulated with the base of the wing there are two free veins (black circle); jugular wing area is not reduced (black setae 2). (b). Antenna with the last three antennomeres elongated. (c). Antenna with the last three antennomeres globose.

the anterior part of the disc; in this case, median groove of the pronotum with a line of points from the rear of the elevation to the slope of the disc close to the posterior margin, a region immediately lateral to the longitudinal central groove without evident points.

Scutellum: Surface with fine and irregularly arranged points on the surface. Usually sub-pentagonal, with parallel edges anteriorly and widely arched posteriorly. **Hypomeron:** Surface covered by setae, greater concentration on the outer edge. **Prosternum:** Extremely short compared with the mesoventrite. **Mesoventrite:** Wider than long; smooth central disc, other parts rough and with some setae arranged transversely. **Mesepimeron:** Rugged, whole surface covered by setae. **Metepisternum:** Elongated, gradually tapering, surface entirely covered by setae. **Metaventrte:** central discripen anterior area aligned with the mesocoxae and posterior area adjacent to the metacoxae; surface covered with setae, except for a small region close to the lower margin. **Elytra:** Elytral suture marked by points smaller and more distant than the points of the striae. Striae indicated with points in longitudinal rows, with five striae up to the humeral callus, ranging from the base of the elytra to the apex. The first three striae connect with the last three at the apex of the elytra, the first elytral stria connecting with the tenth striae; second connecting with the ninth and third connecting with the eighth. Fourth and fifth striae end before the elytra apex. Sixth stria begins below the humeral callus. Interstria have subtle punctation. **Epipleura:** Gradually narrowing towards the apex, surface with fine points and covered by setae.

Hind wings: Apex of the third branch of the radial vein directed towards the outer edge of the wing (Figure 2(a)); between the cubital and the first anal vein articulated with the base of the wing there are two free veins (Figure 2(a)); jugular wing area not reduced (Figure 2(a)). **Legs:** Dorsal region of the profemur with partially smooth surface; in ventral view covered by setae and points unevenly distributed. Protibiae with smooth inner edge; serrated outer edge, first large tooth, compared to the following teeth and the remaining teeth gradually smaller to the base of the tibiae; presence of a spinous spur. Meso and metafemur without evident punctuation, ventral region with some setae unevenly distributed; two carinae at the base with long bristles, equal in size of the first tarsomere. Mesotibia with expanded apex; short and slightly curved compared with pro and metatibiae. External face with two rows of teeth, the first tooth being larger than the others and the other teeth gradually smaller to the base of the tibiae; tibiae surface surrounded by bristles. Metatibiae larger than mesotibiae, characteristics of the external face are the same as the mesotibiae. Tarsomeres are coniform and have setae, the base being narrower than the apex. First and fifth tarsomeres larger than the others, with length equal to third and fourth together. Claws curved and symmetrical, the same size as the second tarsal segment. Second and third pair of legs with adjacent spurs. Both spiniform, the first being smaller than the first tarsomere and the second larger. **Abdomen:** Ventrite sides with setae; in dorsal view the first three ventrites are wider than the following ones, which gradually decrease; in ventral view, the last two ventrites have more setae than the others. **Pygidium:** Short and bristly. **Sexual dimorphism:** Males of some species present in the posterior region of the clypeus with fine and distinct punctuation, setae and carinae absent, while females have up to four setae in the same region and a rugose surface.

Remarks It is easily differentiated from the other South American genera of Bolboceratini, due to the separation of the middle coxae, the shape of the clypeus and scutellum, and the number of elytral striae between the suture and the humeral callus. See the introduction to this article for more information.

Distribution *Bolbapium* is reported from the Neotropical region, with occurrence in South America and Central America.

Notes about the natural history

Little is known about the natural history of Bolboceratinae, especially about those species in the Neotropical region. Some species of *Bolboceras* have been found associated with nests of *Acromyrmex* (Hymenoptera: Formicidae) (Luederwaldt 1931), or with underground fungi (Paulian 1941; Boilly 2011). Most Bolboceratinae species are readily attracted by light (Luederwaldt 1931; Howden and Cooper 1977; Krikken 2013). Personal observations and analyses of the information written on individual collection labels show that the majority of *Bolbapium* species are collected not only in light traps, but also with flight interception (FIT), malaise and even pitfall baited with human and bovine faeces.

Identification key to *Bolbapium* species

- 1 Frons with transverse carina between eyes 2
- 1' Frons without transverse carina between eyes; sulcus or a line of almost anastomosed punctures in occipital position and originating each side posterior to eyes is not considered this carina 10
- 2 No trace of medial tubercle adjacent to each eye; clypeal longitudinal lateral carina always lower posteriorly than anteriorly if there adjacent to eye; frontal transverse carina not elevated adjacent at each side of the eye 3
- 2' Frons with a single tubercle or horn adjacent to each eye; sometimes tubercle is only an angled elevation of the posterior tip of longitudinal lateral clypeal carina or of the frontal transverse carina 4
- 3 Frontal carina as wide as clypeo-frontal carina (Figure 3(a)), 6.86 to 8.95 mm. Midwest, South and Southeast Brazil; Argentina (Figure 12(a)) *Bolbapium striatopunctatum* (Castelnau, 1840)
- 3' Clypeo-frontal carina clearly much wider than frontal carina (Figure 3(b)), 5.97 to 6.17 mm. Midwest Brazil (Figure 14(a)) *Bolbapium dutraorum* Carvalho and Vaz-de-Mello, sp. nov.
- 4 Pronotum mesoanteriorly with a central double structure and a distinct lateral tubercle at each side of central structure 5
- 4' Pronotum mesoanteriorly with a single pair of central tubercles, or a double central structure, and at most a lateral indistinct rounded elevation at each side 6
- 5 Lower parts of clypeo-frontal carina much higher than anterior clypeal carina; mesoanterior pronotal structure bituberculated, well emarginated (Figure 3(c)). Argentina; Bolivia and Paraguay (Figure 16(b)) *Bolbapium sergioidei* Carvalho and Vaz-de-Mello, sp. nov.
- 5' Lower parts of clypeo-frontal carina about same level as frontal carina; mesoanterior pronotal structure concave, slightly emarginated (Figure 3(d)). North, Midwest, Northeast, South and Southeast Brazil; Argentina (Figure 13(b)) *Bolbapium luederwaldti* Carvalho and Vaz-de-Mello, sp. nov.
- 6 Clypeo-frontal carina with central tubercle very high and detached, usually at least as high, above carina, as lower parts of the carina itself (Figure 3(e)). Midwest, Northeast, South and Southeast Brazil; Argentina; Bolivia; Paraguay and Uruguay (Figure 16(a)) *Bolbapium minutum* (Luederwaldt, 1931)
- 6' Clypeo-frontal carina not elevated at each side, or central tubercle not detached and as high as carina 7
- 7 Pronotum mesoanteriorly with pair of longitudinal structures, not connected at base (Figure 3(f)). Peru (12A) *Bolbapium baeri* (Boucomont, 1902)

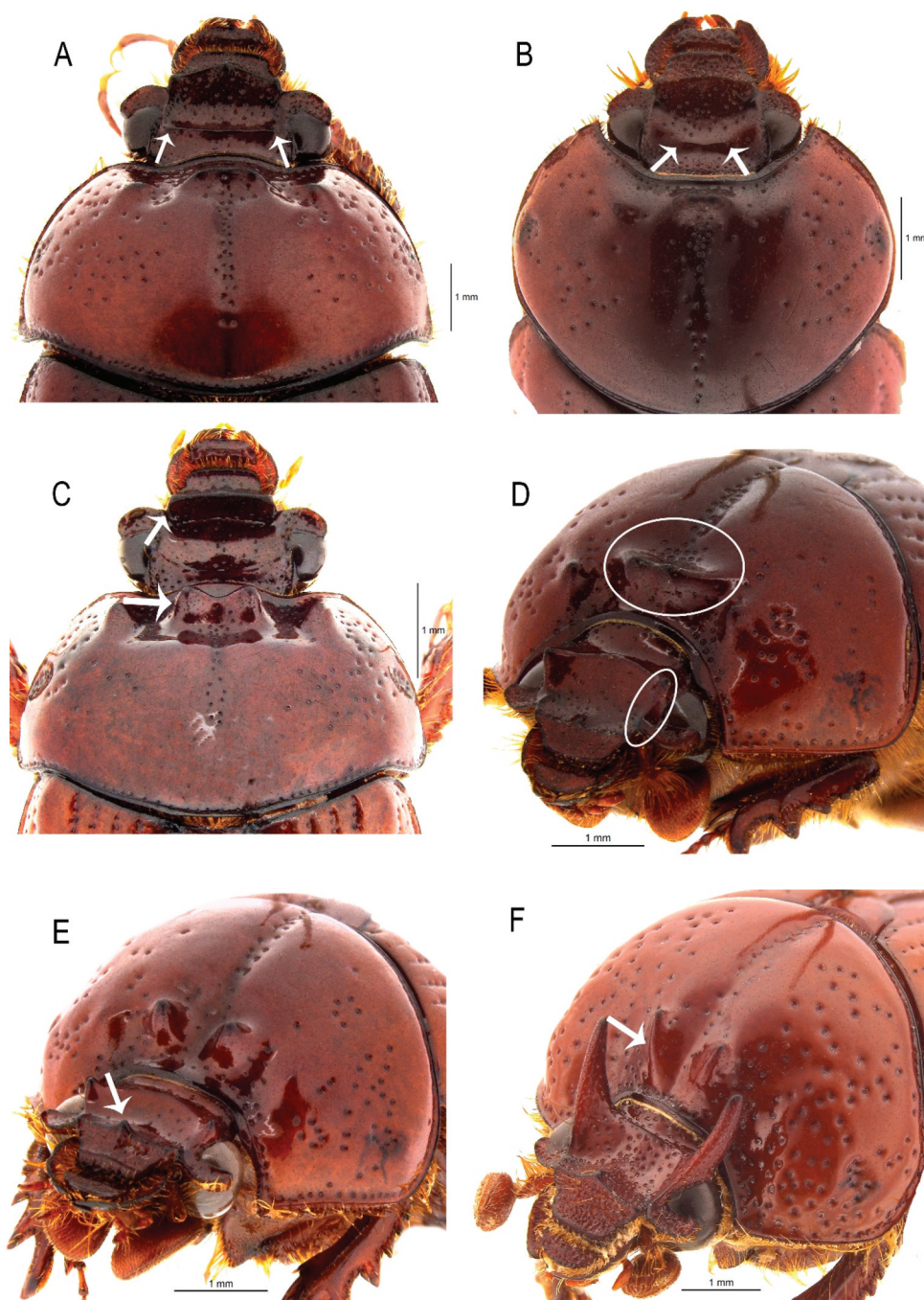


Figure 3. (a). Head with tranverse carina, *Bolbapium striatopunctatum* (Castelnau, 1840); (b). head with tranverse carina, *Bolbapium dutraorum* Carvalho and Vaz-de-Mello, sp. nov.; (c). clypeal-frontal carina high, pronotum with bituberculated structure, *Bolbapium sergioidae* Carvalho and Vaz-de-Mello, sp. nov.; (d). head with tubercles adjacent to each eye; pronotum with concave structure, *Bolbapium luederwaldti* Carvalho and Vaz-de-Mello, sp. nov.; (e). clypeal-frontal carina with very high and prominent central tubercle ♂, *Bolbapium minutum* (Luederwaldt, 1931); (f). pronotum mesoanteriorly with pair of longitudinal structure, *Bolbapium baeri* (Boucomont, 1902).

- 7' Pronotum mesoanteriorly with pared of structures connected at base, or single central structure 8
- 8 Pronotum mesoanteriorly with simple bituberculated stucture 9
- 8' Pronotum mesoanteriorly with robust pair of tubercles, connected at base and separate middle and apex region (Figure 4(a)). Midwest, Northeast and Southeast Brazil; Bolivia (Figure 12(b)) *Bolbapium quadrispinosum* (Luederwaldt, 1931)
- 9 Frons with angled elevation of the posterior tip of the frontal transverse carina (Figure 4(b)). Midwest and Northeast Brazil (Figure 15(a)) *Bolbapium limeirai* Carvalho and Vaz-de-Mello, sp. nov.
- 9' Frons with a marked tubercle adjacent to each eye (Figure 4(c)). Midwest and Southeast Brazil; Bolivia and Paraguay (Figure 14(b)) *Bolbapium furtadoi* Carvalho and Vaz-de-Mello, sp. nov.
- 10 Subpentagonal scutellum, with parallel edges anteriorly and widely arched posteriorly (Figure 5(a)) 11
- 10' Elongated scutellum, with parallel edges anteriorly and subtly rounded posteriorly (Figure 5(b)). Northeast and Southeast Brazil (Figure 13(a)) *Bolbapium sulcifrons* Ide and Martínez 1993
- 11 Pronotum with smooth lateral margins (Figure 5(c)) 12
- 11' Pronotum with serrated lateral margins (Figure 5(d)). Paraguay (Figure 14(a)) *Bolbapium quinquestriatum* (Boubomont, 1932)
- 12 Pronotum mesoanteriorly without stucture 13
- 12' Pronotum mesoanteriorly with some type of stucture 15
- 13 Frons without tubercle 14
- 13' Frons with tubercle adjacent to each eye, with base wider than apex (Figure 4(d)). Northern Brazil and French Guiana (Figure 12(b)) *Bolbapium boillyi* Carvalho and Vaz-de-Mello, sp. nov.
- 14 Clypeal carina extending to the mid-frontal region and meeting in the central region (Figure 4(e)). Southeast Brazil; Argentina and Paraguay ... *Bolbapium paralucidulum*
- 14' Clypeal carina short, not reaching the midline region of the frons (Figure 4(f)). Midwest, South and Southeast Brazil (Figure 16(b)) *Bolbapium lucidulum* Ide and Martínez 1993
- 15 Pronotum mesoanteriorly with stucture with width less than or equal to half the interocular width 16
- 15' Pronotum mesoanteriorly with stucture wider than half the interocular width ... 20
- 16 Pronotum mesoanteriorly with somewhat bituberculated stucture 17

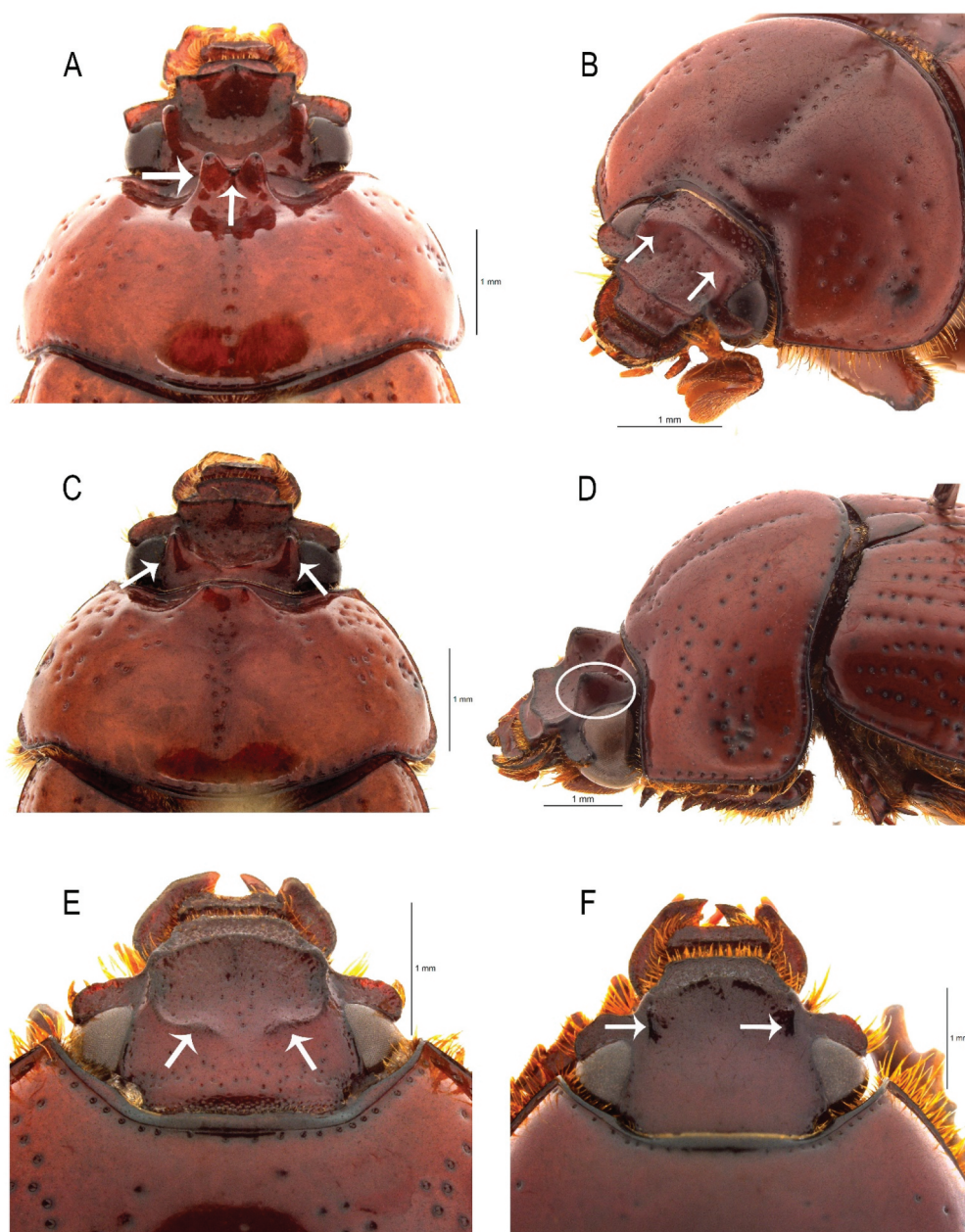


Figure 4. (a). Pronotum with robust bituberculated structure, connected at base and separated at the apex, *Bolbapium quadrispinosum* (Luederwaldt, 1931); (b). head with tranverse carina without tubercles, *Bolbapium limeirai* Carvalho and Vaz-de-Mello, sp. nov.; (c). head with tranverse carina with tubercles, *Bolbapium furtadoi* Carvalho and Vaz-de-Mello, sp. nov.; (d). head with tubercle adjacent to each eye, with base wider than apex, *Bolbapium boillyi* Carvalho and Vaz-de-Mello, sp. nov.; (e). clypeal carina extending to the mid-frontal region and meeting in the central region, *Bolbapium paralucidulum* Ide and Martínez, 1993; (f). clypeal carina short, not reaching the midline region of the frons, *Bolbapium lucidulum* (Klug, 1843).

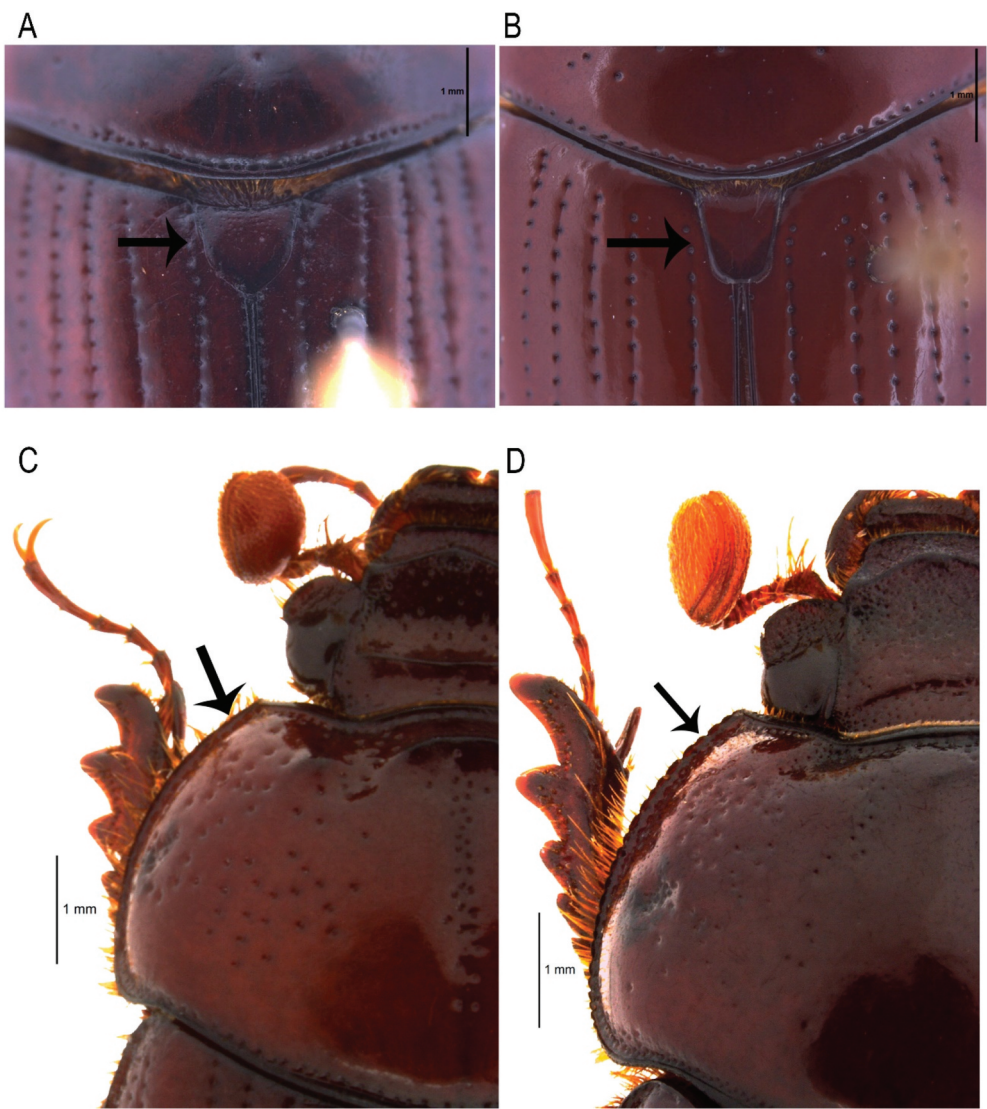


Figure 5. (a). Subpentagonal scutellum; (b). elongated scutellum, *Bolbapium sulcifrons* Ide and Martínez, 1993; (c). pronotum with smooth lateral margins; (d). pronotum with serrated lateral margins, *Bolbapium quinquestriatum* (Boucomont, 1932).

- 16' Pronotum mesoanteriorly with almost rectangular stucture in dorsal view (Figure 6 (a)). Colombia (Figure 15(b)) *Bolbapium modestum* (Castelnau, 1840)
- 17 Pronotum mesoanteriorly with bituberculated stucture with width equal to half the interocular width 18
- 17' Pronotum mesoanteriorly with bituberculated stucture with width less than half the interocular width 19

- 18 Parameres, in dorsal view, elongated and greatly separated (Figure 10(d)); in lateral view the parameres are concave and extend beyond the posterior margin (Figure 10(f)). Northeast Brazil (Figure 17) *Bolbapium parcepunctatum* (Arrow, 1913)
- 18' Parameres in dorsal view short and flat, posterior margin going beyond the apex of the parameres (Figure 10(g)); in lateral view posterior margin with curved projection forming an approximate angle of 45° towards the parameres (Figure 10(i)). Midwest, Northeast, South and Southeast Brazil (Figure 17)
..... *Bolbapium santanaorum* Carvalho and Vaz-de-Mello, sp. nov.
- 19 Frons with tubercle adjacent to each eye (Figure 6(b)); less than 5 mm. Midwest and Northeast Brazil (Figure 13(a)) *Bolbapium borgmeieri* Martínez 1976
- 19' Frons without tubercles, just clypeal carina extending to the mid-frontal forming slight angulation (Figure 6(c)); larger than 5 mm. Northeast Brazil (Figure 14(b))
..... *Bolbapium matheusi* Carvalho and Vaz-de-Mello, sp. nov.
- 20 Pronotum mesoanteriorly with the sides of structure well delimited 21
- 20' Pronotum mesoanteriorly with curved structure towards the head, without angulations on each side of structure (Figure 6(d)). Midwest Brazil; Bolivia (Figure 15(a))
..... *Bolbapium howdeni* Martínez, 1976
- 21 Pronotum mesoanteriorly with rectangular structure in dorsal view; frons with tubercle wider than long adjacent to each eye (Figure 6(e)). Midwest Brazil (Figure 15(b)) .
..... *Bolbapium sampaioorum* Carvalho and Vaz-de-Mello, sp. nov.
- 21' Pronotum mesoanteriorly with curved structure, with non-continuous lines and with small angulation on each side of structure; frons with tubercle narrow adjacent to each eye (Figure 6(f)). Northern Brazil; Colombia; French Guiana and Venezuela (Figure 13(b)) *Bolbapium caesum* (Klug, 1843)

***Bolbapium baeri* (Boucomont, 1902)**

(Figures 3(f), 12(a))

Bolboceras baeri Boucomont, 1902: 185; (review); Luederwaldt 1931: 430, 440, 441, 452, 454 (review; key); Blackwelder 1944: 220 (checklist)

Bolboceras (Eucanthus) baeri: Boucomont 1909: 117 (description)

Bolboceras (Bolbapium) baeri: Boucomont 1910: 340 (review); 1912: 7 (catalogue); 1932: 267 (key)

Bolbapium baeri: Howden 1973: 1569–1570; Martínez 1976: 546 (checklist)

Diagnosis

Clypeo-frontal carinae not elevated at each side. In fronto-lateral view, the apex of the tubercle exceeds half the projection of the pronotum. Anterior part of the pronotum with a pair of longitudinal structures, not connected at base (Figure 3(f)).

Type material. The type series are deposited at the MNHN which made photos available for analysis. As all the specimens correspond to the syntypes, we here designate a lectotype.

Lectotype. 'N. PÉROU/ PROV. TUMBEZ/ GRAU/ G A. BAER; *Bolboceras/ baeri* B. Type; Typus [red rectangular label]; MUSÉUM PARIS/ 1936/ COLL. A. BOUCOMONT; *B. Baeri/ Boucom.* SYNTYPE [red rectangular label]; SYNTYPE/ *Bolbapium/ baeri* (Boucomont 1902)' (MNHN/EC10574).

Paralectotypes. 'N. PÉROU/ PROV. TUMBEZ/ GRAU/ G A. BAER; MUSÉUM PARIS/ 1936/ COLL. A. BOUCOMONT; TYPUS [red rectangular label]; SYNTYPE [red rectangular label]; SYNTYPE/ *Bolbapium/ baeri* (Boucomont 1902)' (MNHN/EC10575).

'N. PÉROU/ PROV. TUMBEZ/ GRAU/ G A. BAER; MUSÉUM PARIS/ 1936/ COLL. A. BOUCOMONT; TYPUS [red rectangular label]; SYNTYPE [red rectangular label]; SYNTYPE/ *Bolbapium/ baeri* (Boucomont 1902)' (MNHN/EC10576).

'N. PÉROU/ PROV. TUMBEZ/ GRAU/ G A. BAER; MUSÉUM PARIS/ 1936/ COLL. A. BOUCOMONT; TYPUS [red rectangular label]; SYNTYPE [red rectangular label]; SYNTYPE/ *Bolbapium/ baeri* (Boucomont 1902)' (MNHN/EC10577).

Redescription

Body size: Length: 6.96 mm. Width: 5.55 mm. **Head:** Clypeus as wide as it is long; rugose surface and setae randomly distributed in the dorsal region, in addition to ventral setae; clypeal-frontal carina not elevated at each side. Frons presents interocular tubercles that are interconnected with the lateral carina of the clypeus; transversal carina between the tubercles; flat anterior region, pale and with some setae, except in the median area. **Pronotum:** pronotum mesoanteriorly with a pair of longitudinal structures not connected at base and lateral regions of the structures excavated. Disc sides with points, unevenly distributed. Points concentrated in the lateral region of the structures.

Type designation proposal. *Bolbapium baeri* was described based on a series type; the author did not mention how many specimens there were and did not designate the holotype. Currently the types are deposited at the MNHN and have been examined via photographs. We therefore propose the designation of the lectotype for the species to ensure the fixation of the specific name in the best available specimen, in terms of good condition and development of any diagnostic characters subject to allometry.

Differential diagnosis. *Bolbapium baeri* is morphologically similar to *B. furtadoi* sp. nov., *B. limeirai* sp. nov., *B. luederwaldti* sp. nov., *B. minutum* and *B. quadrispinosum* in presenting the forehead with a transverse carina interconnected by tubercles. However, it is easily differentiated from the other species because it has extremely long forehead tubercles, and by the type of structures in the anterior region of the pronotum, which are longitudinal projections.

Geographical distribution. Peru (Piura).



Figure 6. (a). Pronotum with almost rectangular structure, *Bolbapium modestum* (Castelnau, 1840); (b). head with tubercle adjacent to each eye, *Bolbapium borgmeieri* Martínez, 1976; (c). head without tubercles, *Bolbapium matheusi* Carvalho and Vaz-de-Mello, sp. nov.; (d). pronotum with curved structure towards the head, without angulations, *Bolbapium howdeni* Martínez, 1976; (e). head with tubercles wider than long; pronotum with rectangular structure, *Bolbapium sampaioorum* Carvalho and Vaz-de-Mello, sp. nov.; (f). head with tubercle narrow adjacent to each eye; pronotum with curved structure, *Bolbapium caesum* (Klug, 1843).

Non-type material. 1 specimen examined.

PERU: Piura, [5°10'41"S, 80°39'17"W], iii.1959, Martínez leg. (1 CEMT).

***Bolbapium boillyi* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 4(d), 9(d), (e), (f), 12(b))

Diagnosis

Clypeus with lateral carinae extending backwards, meeting the tubercles of the frons. Frons with tubercle adjacent to each eye, with base wider than apex. Pronotum mesoanteriorly without evident structure, central disc with slight sinuosity (Figure 4(d)).

Etymology. Named after Olivier Boilly, friend, great Geotrupidae specialist, and major contributor to the CEMT collection.

Type locality. Saul, Cayenne, French Guiana.

Holotype. 'GUYANE FR: Cayenne./Saul. 14.iii.2011. SEAG/leg' (CEMT 74247).

Paratypes. 93 specimens examined.

BRAZIL: Pará, Itaituba, Santarenzinho, Rio Tapajos, Diring leg. (1 MZSP); Roraima, Ilha de Maracá, [2°2'7"N, 50°27'5"W], ix.1996, Ribeiro & Vaz-de-Mello leg. (1 CEMT). COLOMBIA: Montería, Córdoba, v.1996, Rafael Muskus leg. (1 CFPL-COL); GUIANA FRANCESA: Cayenne, Saul, [3°51'37"N, 53°18'15"W], 14.iii.2011, SEAG leg. (5 CEMT); Same location, 17.i.2011, FIT, SEAG leg. (3 COPL); Same location, 11.i.2011, FIT, SEAG leg. (5 COPL); Same location, 09.ix.2011, FIT, SEAG leg. (4 COPL); Same location, 26.viii.2010, FIT, SEAG leg. (2 COPL); Same location, 07.vii.2011, FIT, SEAG leg. (1 COPL); Same location, 24.i.2011, FIT, SEAG leg. (2 COPL); Same location, 31.i.2011, FIT, SEAG leg. (4 COPL); Same location, 02.ix.2010, FIT, SEAG leg. (1 COPL); Same location, 17.ix.2010, FIT, SEAG leg. (2 COPL); Same location, 13.viii.2010, FIT, SEAG leg. (1 COPL); Same location, 23.ix.2010, FIT, SEAG leg. (1 COPL); Same location, 30.vi.2011, FIT, SEAG leg. (2 COPL); Same location, 24.viii.2011, FIT, SEAG leg. (1 COPL); Same location, 28.vii.2011, FIT, SEAG leg. (1 COPL); Same location, 08.vi.2011, FIT, SEAG leg. (2 COPL); Same location, 23.viii.2011, FIT, SEAG leg. (2 COPL); Same location, 22.iii.2011, FIT, SEAG leg. (1 COPL); Same location, 23.vi.2011, FIT, SEAG leg. (3 COPL); Same location, 30.iii.2011, FIT, SEAG leg. (2 COPL); Same location, 24.i.2011, FIT, SEAG leg. (7 COPL); Same location, 11.viii.2011, FIT, SEAG leg. (4 COPL); Same location, 21.vii.2011, FIT, SEAG leg. (3 COPL); Same location, 06.v.2011, FIT, SEAG leg. (2 COPL); Réserve des Nouragues, [4°05'36"N, 52°53'58"W], 02.ix.2010, FIT, SEAG leg. (1 COPL); Montagne des Chevaux, [4°43'23"N, 52°24'46"W], 01.iv.2012, FIT, SEAG leg. (2 COPL); Same location, 10.vi.2012, FIT, SEAG leg. (2 COPL); Same location, 4°44'56"N, 52°26'28"W, 11.ii.2013, FIT (V), SEAG leg. (1 CEMT). Same location, 11.viii.2012, FIT (V), SEAG leg. (1 CEMT). Monte Itoupé, [3°32'12"N, 53°34'24"W], 11.i.2016, FIT, SEAG leg. (1 COPL). St. Laurent du Maroni, Bélvédère de Saul, 3°37'22"N, 53°12'57"W, 15.vi.2011, SEAG leg. (1 CEMT); Same location, 27.v.2011, FIT 3, SEAG leg. (3 CEMT); Same location, 9.ix.2011, FIT – V2, SEAG leg. (2 CEMT); Same

location, 9.ix.2011, FIT – V1, SEAG leg. (1 CEMT); Same location, VPV5, 3°37'22"N, 53°12'57"W, 7.iv.2011, FIT, SEAG leg. (1 CEMT); Same location, 13.v.2011, FIT (V), SEAG leg. (1 CEMT); Same location, 20.v.2011, FIT (PIV), SEAG leg. (1 CEMT); Same location, 3°27'22"N, 53°13'57"W, 30.xi.2010, SEAG leg. (1 CEMT); Same location, 3°27'22"N, 53°13'57"W, 28.ii.2011, SEAG leg. (1 CEMT); Same location, 3°27'22"N, 53°13'57"W, 7.ii.2011, SEAG leg. (8 CEMT); Same location, 3°27'22"N, 53°13'57"W, 18.vii.2004, SEAG leg. (1 CEMT).

Description

Body size: Length: 5.93–6.80 mm. Width: 4.46–5.34 mm. **Head:** Surface of clypeus smooth; trituberculated clypeal carinae, the lateral ones being slightly higher than the median, subtly rounded edges; lateral carina of the clypeus extending backwards to meet the frons tubercles. Frons with tubercle adjacent to each eye, with base wider than apex. Interocular region with slope marked by points is defined, other regions of the front without evident punctuation. **Pronotum:** Without evident structures, central disc with slight sinuosity. **Male terminalia:** In dorsal view, elongated and asymmetric parameres when closed (Figure 9(d)); the right being larger and slightly more curved than the left, when open they are parallel and of the same size. In lateral view longitudinal parameres to the phallobase (Figure 9(f)). **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** The primary type is deposited at CEMT.

Differential diagnosis. *Bolbapium boillyi* sp. nov. is morphologically similar to *B. borgmeieri*, *B. caesum*, *B. howdeni*, *B. modestum*, *B. parcepunctatum*, *B. sampaioorum* sp. nov. and *B. santanaorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by the lack of structures on the pronotum.

Geographical distribution. Brazil (Amapa), Colombia (Monteria) and French Guiana (Cayenne; Saint Laurent du Maroni).

Bolbapium borgmeieri Martínez, 1976

(Figures 6(b), 10(j), (k), (l), 13(a))

Bolbapium borgmeieri Martínez, 1976: 539–543, 545–546 (original description; checklist).

Diagnosis

Pronotum mesoanteriorly with bituberculated structure with width less than half the interocular width. Frons with tubercles adjacent to each eye; less than 5 mm (Figure 6(b)).

Type material. The holotype is deposited at the MACN. It was possible to analyse the holotype through photographs.

Holotype. 'BRASIL/E° Goiaz/Rio Verde/Zelliboralez/Coll. Martínez//Dic: 945//; HOLOTYPUS [red rectangular label]; *Bolbapium/borgmeieri*/♂ /sp. nov./A Martínez – DET. 76; Fichado' (MACN-Em/924).

Redescription

Body size: Length: 4.22–4.66 mm. Width: 3.38–3.73 mm. **Head:** Clypeal carina trituberculated, tubercles do not differ in height. Surface of canthus with almost imperceptible points. Frons presents interocular tubercles, one on each side, region between the tubercles with slope and fine score. **Pronotum:** Pronotum mesoanteriorly with bituberculated structure with width less than half the interocular width. Disc sides with sparse points, distributed randomly. **Ventral region of the thorax:** Central region of the metaventrite with a few unevenly distributed setae. **Legs:** second and third pair of legs with adjacent spurs. The first is smaller than the first tarsomere and the second is larger. Metatibia with a spur and a flattened spur. **Male terminalia:** In dorsal view, large and short parameres; at the base they are connected and at the apex they are separated (Figure 10(j)). In lateral view only the apex of the parameres is visible (Figure 10(l)). **Sexual dimorphism:** Males have a thin, almost imperceptible punctuation and the setae are absent in the clypeus; well-developed frons tubercle. Females have up to four setae in the posterior region of the clypeus and a rough and carenated surface; underdeveloped frons tubercles. **Remarks:** Martínez (1976) described the species based on three individuals. The specimens were collected by H. Zellibor in Rio Verde, Goiás. The type series consists of the holotype (male), paratype (male) and allotype (female) and can be found at the Argentine Museum of Natural Sciences, Buenos Aires, Argentina.

Differential diagnosis. *Bolbapium borgmeieri* is morphologically similar to *B. boillyi* sp. nov., *B. caesum*, *B. howdeni*, *B. modestum*, *B. parcepunctatum*, *B. sampaioorum* sp. nov., and *B. santanaorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by being less than 5 mm and by the structure in the anterior region of the pronotum occupying less than half of the interocular space.

Geographical distribution. Brazil (Maranhão and Mato Grosso).

Non-type material. 13 specimens examined.

BRAZIL: Maranhão, Mirador, Parque Est. Mirador, posto avançado do Mel, 6°43'50"S, 44°58'59"W, 2 a 8.iv.2015, malaise trap, F. Limeira de Oliveira & D.W.A. Marques leg. (1 ♀ CEMT). Without location, Porto Baton, 5.viii.1983, J.I Lacerda leg. (1 DZUP). Without data, C2028, 5.i.1995, V. Lijo leg. (1 ♀ 1 ♂ CEMT). Mato Grosso, Chapada dos Parecis, 30 km N Uirapuru, 14°17'S, 59°15'W, 1–15.xii.2001, FIT, A. Foucart leg. (2 ♀ CEMT); Diamantino, Vale da Solidão, 14°21'52"S, 56°7'23"W, 23–26.xii–i.2008–2009, FIT, D.C.T. Oliveira leg. (1 ♀ CEMT); Same location, 14°22'23"S, 56°07'25"W, 31.i – 14.ii.2009, FIT, D.C.T. Oliveira leg. (1 COPL). Tangará da Serra, Campus UNEMAT/ experimental field, 14°38'58"S, 57°25'24"W, 14.xi.2017, Light trap, R. J. Silva leg. (2 ♀ 1 ♂ CEMT); Água Boa, Rancho Araguaia, 13°56'40"S, 52°6'10"W, 24.xii.2017, Mota & Schutz leg. (1 ♀ CEMT). São Paulo, Cerqueira César, [23°2'18"S, 49°9'57"W], xi.1996, J. Carlos leg. (1 ♀ CEMT).

Bolbapium caesum (Klug, 1843)

(Figure 6(f), 11(j), (k), (l), 13(b))

Bolboceras caesus Klug, 1843: 54–55 (original description; review); Lacordaire 1856: 143 (description)*Bolboceras caesum*: Gemminger and Harold 1869: 1077 (catalogue); Boucomont 1902: 4 (review); 1910: 340 (review); 1912: 8 (catalogue); Luederwaldt 1931: 429, 436, 450, 454 (review, key)*Bolboceras (Eucanthus) caesus*: Boucomont 1909: 117 (description)*Bolboceras (Bolbapium) caesum*: Boucomont 1910: 340 (review); 1912: 8 (catalogue)*Bolboceras caesa*: Blackwelder 1944: 220 (checklist)*Bolbapium caesum*: Martínez 1976: 546 (checklist)***Diagnosis***

Frons without transverse carina between the eyes and with poorly developed interocular tubercles. Pronotum mesoanteriorly with curved structure, with non-continuous lines and with small angulation on each side of structure; frons with tubercle narrow adjacent to each eye (Figure 6(f)).

Type material. Currently the holotype is in the MZUSP, which provided photos for analysis.

Holotype. ‘25,683; Type [red rectangular label]/ Zool. Mus./ Berlin; ♂; *caesus*; Klug*; Brit. Guyane. *Ichanb.*; Bolbapium/caesum/ (Klug 1843); S. Ide det. 1996’ (ZMHB).

Redescription

Body size: Length: 5.41–6.68 mm. Width: 4.12–4.95 mm. **Head:** Clypeus with ventral setae. Frons without transverse carina and presents developed interocular tubercles, flat frons with slight depression in the median region, this central region presents points, which are few and deep, other parts on the head without evident punctuation. **Pronotum:** Pronotum mesoanteriorly with curved structure, with non-continuous lines and with small angulation on each side of structure, and occupying more than half the interocular width; whole surface with strong and evident punctuation, sparse and unevenly distributed. **Ventral region of the thorax:** Central region of the metaventricle with a few unevenly distributed setae. **Male terminalia:** In dorsal view, parameres completely separated, from the base to the apex, and extended, apparently twisted; broken right paramere (Figure 11(j)). In lateral view, short and flat parameres (Figure 11(l)). **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** Klug (1843) described the species based on a specimen collected in French Guiana, belonging to the collection of R.H. Schomburgk; there is no indication of how many individuals were examined and whether they are male or female. The type series belongs to the ‘Museum für Naturkunde der Humboldt-Universität’, Berlin.

Differential diagnosis. *Bolbapium caesum* is morphologically similar to *B. boillyi* sp. nov., *B. borgmeieri*, *B. howdeni*, *B. modestum*, *B. parcepunctatum*, *B. sampaioorum* sp. nov. and *B. santanaorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by the fact that it presents a curved structure, with non-continuous lines in the pronotum.

Geographical distribution. Brazil (Roraima); French Guiana (Matiti, Régina and Mt. Itoupé); Colombia (Bolívar), Venezuela (Bolívar); Panama (Bocas del Toro).

Non-type material. 8 specimens examined.

BRAZIL: Roraima, Ilha de Maraca, Rio Uraricoera, [3°25'00"N, 61°40'00"W], 18 a 23.viii.1937, light trap, J.A Rafael, L.S. Aquino, J.F. Vidal & E. Binda leg. (1 CEMT). COLÔMBIA: Bolívar, Bosque Seco, [8°40'13"N, 74°01'48"W], x.1998, pitfall. (1 CEMT). GUYANA FRANCESA: Matiti, [3°07'18"N, 52°41'29"W], v.2010, FIT, J.L. Giuglaris leg. (2 COPL); Régina, [4°18'34"N, 52°08'03"W], vii.2017, FIT, J.L. Giuglaris leg. (1 COPL); Mt. Itoupé, [3°32'12"N, 53°34'24"W], 11.i.2016, FIT, SEAG leg. (1 COPL). PANAMA: Bocas del Toro, Route de Chiriqui-Chiriqui Grande, km55, 1075 m, [8°57'25"N, 82°8'38"W], viii.2003, G. Lecourt & T. Decaens leg (1 COPL). VENEZUELA: Bolivar, 15 km E. Caicara, [6°21'30"N, 63°34'50"W], 12–13.vi.1996, light trap, H & A Howden leg. (1 CEMT).

***Bolbapium dutraorum* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 3b, 14a)

Diagnosis

Clypeo-frontal carina clearly much wider than frontal carina; groove on the back of the frons, behind the carina. Pronotum mesoanteriorly with almost bituberculated tubercle (Figure 3b).

Etymology. Named after Luan Dutra and Isabela Dutra, beloved brother and sister of the first author.

Type locality. Cuiabá, Mato Grosso, Brazil.

Holotype. 'UNIVAG/5.iv.2004/ Cuiabá, MT/ Silva, F' (CEMT 74768).

Paratypes. 3 specimen examined.

BRAZIL: Mato Grosso, Porto Esperidião, [16°1'29"S, 59°0'44"W], xi.1984, Magno & Alvarenga leg. (1 CEMT); Rosario Oeste, Dirings leg. (2 MZUSP).

Description

Body size: Length: 5.97–6.17 mm. Width: 4.59–4.80 mm. **Head:** Clypeo-frontal carina clearly much wider than frontal carina. Canthus presents unevenly distributed spots and setae from the ventral region. Front presents arched carina, without formation of

tubercles on each side and a groove behind the carina; region between the carina and the clypeus with small depression; every surface with sparse and unevenly distributed points.

Pronotum: Anterior region of the disc with little-developed tubercles, almost bidentate, small depression in the region immediately lateral to the tuber. **Sexual dimorphism:** It was not possible to observe as all specimens are female. **Remarks:** The primary type is deposited at the CEMT.

Differential diagnosis. *Bolbapium dutraorum* sp. nov. is morphologically similar to *B. striatopunctatum* and *B. sergioidei* sp. nov. in presenting the forehead with a transverse carina without tubercle formation on each side. However, it is easily distinguished from the difference in structures in the anterior region of the pronotum, *B. dutraorum* sp. nov. presents a bituberculated structure in the pronotum and a groove in the posterior region of the forehead carina.

Geographical distribution. Brazil (Mato Grosso).

***Bolbapium furtadoi* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 4(c), 8(g), (h), (i), 14(b))

Diagnosis

Frons with a marked tubercle adjacent to each eye. Pronotum with simple bituberculated structure on the front and a small tubercle on each side of the central projection (Figure 4(c)).

Etymology. Named after Eurides Furtado, friend, pioneer of Entomology in the State of Mato Grosso, important lepidopterist, and major contributor to the CEMT collection.

Type locality. Sooretama, Espírito Santo, Brazil.

Holotype. 'BRASIL: Espírito Santo,/ Sooretama, Reserva/ Natural da Vale, xii.1998,/ JSSantos'. ♂ (CEMT 74675).

Paratypes. 182 specimens examined.

BOLIVIA: Santa Cruz, Ichilo, Cam. Vivora, [16°58'34"S, 64°10'1"W], 15–17.x.1998, M. Gutierrez, L. Targara & P. Coro leg. (1 CEMT). BRAZIL: Espírito Santo, Linhares, RFCVRD, 19° 8'39"S, 40°4'13"W, xii.1988, J.S. Santos leg. (1 CEMT); Same location, Flona de Goytacazes. Mata secundária, 19°25'56"S, 40°4'12"W, 9.xi.2010, light, D.S. Martins leg. (27 CEMT); Same location, Reserva Natural da Vale, [19°8'14"S, 40°3'49"W], xi.1988, J.S. Santos. (3 CEMT); Sooretama, Reserva Natural da Vale, [19°8'39"S, 40°4'2"W], xii.1988, J.S. Santos leg. (11 CEMT); Same location, 19°9'4"S, 40°4'14"W, xii.87, light, J.S. Santos leg. (95 CEMT); Same location, x.88, light, J.S. Santos leg. (11 CEMT); São Mateus, [18°42'0"S, 40°3'47"W], 4.xi.1995, M. Reis leg. (1 CEMT). Mato Grosso: Diamantino, 14°22'30"S, 56°7'30"W, 500 m, 26–31.x.2013, E. Furtado leg. (12 CEMT); Parque Nacional do Xingú, xii.1947. Sick leg. (1 MZSP). Mato Grosso do Sul, Campo Grande, CNPGC, [20°26"S, 54°43'7"W], 3.xii.1993, W.W. Koller leg. (1 CEMT). Minas Gerais, Águas Vermelhas, [15°44'36"S, 41°27'27"W], xii.1998, A. Bello & F. Vaz-

de-Mello leg. (4 CEMT); Três Marias, [18°12'21"S, 45°13'53"W], 17.xii.1991 (1 CEMT); Frei Gaspar, Sítio Recanto Paraíso, 18°2'6"S, 41°29'10"W, 3.i.2008, light trap, M.R. Santos leg. (1 CEMT); Same location, 30.xii.2007, light trap, M.R. Santos leg. (4 CEMT). Pará, Mocajuba, Vila Mangabeira, v.1953, Orlando Rego (1 MZSP); Rondônia, Porto Velho, Rio Tapirapé, 10–12. xii.1964, RT Lima (1 MZSP); São Paulo, Itú, ii.1959, U. Martins leg. (1 MZSP); Corumbataí, xii.1962, HA Britski (1 MZSP); Piracicaba, EECJV, [22°44'8"S, 47°38'52"W], 11.xi.1965, light trap (1 CEMT), Same location. (1 ZIN). PARAGUAY: Villarica, H. Richter. (2 MLPA).

Description

Body size: Length: 3.85–6.63 mm. Width: 3.01–5.02 mm. **Head:** Clypeal carina with three tubercles on an equal level. Canthus ventral setae, scarcely noticeable score. Frons with a marked tubercle adjacent to each eye, depression marked by points between the carina and the clypeus. **Pronotum:** Anterior region of the pronotum with bituberculated structure and a small tubercle on each side of the central projection. Disc with sparse points unevenly distributed, median groove of the pronotum with two lines of points, starting at the back of the central structure up to the slope of the disc close to the posterior margin. **Ventral region of the thorax:** Metaventrite with a few unevenly distributed setae. **Male terminalia:** In dorsal view, elongated parameres joined at the base and separated at the apex, posterior margin seen dorsally (**Figure 8(g)**). Parameres slightly curved in lateral view, forming an approximate angle of 45° in relation to the phallobase; posterior margin in lateral view with pointed and curved projection, almost reaching the parameres (**Figure 8(i)**). **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** The primary type is deposited at the CEMT.

Differential diagnosis. *Bolbapium furtadoi* sp. nov. is morphologically similar to *B. baeri*, *B. limeirai* sp. nov., *B. luederwaldti* sp. nov., *B. minutum* and *B. quadrispinosum* in presenting the forehead with a transverse carina interconnected by tubercles. However, it is easily distinguished from the other species because it presents a short bituberculated projection on the pronotum.

Geographical distribution. Brazil (Espírito Santo, Minas Gerais, Mato Grosso, Mato Grosso do Sul and São Paulo); Bolivia (Santa Cruz) and Paraguay (Villa Rica).

Bolbapium howdeni Martínez, 1976

(Figures 6(d), 11(d), (e), (f), 15(a))

Bolbapium howdeni Martínez, 1976: 542–546 (original description)

Diagnosis

Frons without transverse carina between the eyes, formation of interocular tubercles. Pronotum mesoanteriorly with curved structure towards the head, without angulations on each side of structure (**Figure 6(d)**).

Type material. The type series are deposited at the MACN. It was possible to analyse the holotype from photo.

Holotype. 'BOLIVIA/Dep. Sta. Cruz/Prov. Ichilo/Buenavista/Coll. Martínez//Oct: 949//; HOLOTYPUS [red rectangular label]; Bolbapium/howdeni/ ♂ /sp.nv./ A Martínez – DET – 76; Fichado' (MACN-Em/1136).

Redescription

Body size: Legth: 5.91–7.47 mm. Width: 4.48–5.99 mm. **Head:** Frons without transverse carina between the eye, and presents interocular tubercle, one on each side, the base being wider than the apex; slight slope between the tubercles, marked by unevenly distributed points. **Pronotum:** Pronotum mesoanteriorly with curved structure towards the head, without angulations on each side of structure, and occupying more than half the interocular width. Disc sides with unevenly distributed points. **Legs:** Second and third pair of legs with adjacent spurs; both spiniform. The first spur is smaller than the first tarsomere and the second is larger. **Male terminalia:** In dorsal view, short and flat parameres (Figure 11(d)). In lateral view posterior margin with rounded projection beyond the apex of the parameres (Figure 11(f)). **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** Martínez (1976) described the species based on two individuals from Bolivia. The type series consists of the holotype, collected by J.P.R. de Martínez and A. Martínez in the province of Ichilo, Buenavista, and the paratype, collected by A. Martínez in the province of Sara, Santa Rosa. Both are in the Argentine Museum of Natural Sciences, Buenos Aires, Argentina.

Differential diagnosis. *Bolbapium howdeni* is morphologically similar to *B. boillyi* sp. nov., *B. borgmeieri*; *B. caesum*, *B. modestum*, *B. parcepunctatum*, *B. sampaioorum* sp. nov., and *B. santanaorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by presenting at the pronotum a curved structure towards the head, without angulations.

Geographical distribution. Brazil (Acre, Amazonas, Mato Grosso and Pará) and Bolivia (Santa Cruz).

Non-type material. 20 specimens.

BOLIVIA: Santa Cruz, Est. Experimental Gral. Saavedra, [17°13'43"S, 63°13'2"W], i.1974, L. Stange & C. Porter leg. (1 CEMT); Same location, iii.1973, L. Stange & C. Porter leg. (1 CEMT); Ichilo, Cam. Vibora, [16°58'34"S, 64°10'1"W], 15–17.x.1998, M. Gutierrez, L. Tangara & P. Coro leg. (1 CEMT). BRAZIL: Acre, Rio Branco, Faz. Catuaba, [10°3'32"S, 67°35'49"W], ii.1997, F.Z. Vaz-de-Mello leg. (1 CEMT); Mâncio Lima, ParNa Serra do Divisor, 7°27'4"S, 73°38'57"W, 06–10.xii.2019, PlotB FIT 1–2, R.A. Azevedo leg. (1 CEMT); Same location, 7°24'59"S, 73°37'56"W, 10–14.xii.2019 PlotC FIT 4–3, R.A. Azevedo leg. (1 CEMT). Amazonas, IPIXUNA, Rio Gregório, Com. Lago grande, 7°10'11"S, 70°49'10"W, 18–23.v.2011, malaise, J.A. Rafael, J.T. Câmara, R.F. Silva, A. Somavilla & C. Gonçalves leg. (1 CEMT). Pará, Novo Progresso, Faz. Florentino. Amazon Forest., 7°8'11"S, 55°23'42"W, x–xi.2010, ligh, D. Krinski leg. (1 CEMT) (1 COPL). Mato Grosso, Chapada dos Guimarães, [15°27'53"S, 55°45'1"W], 17–24.x.2009, luz, S.P. Rosa, F. Fernandes, B. Medeiros & L. Prado leg. (1 CEMT); Cáceres, [16°4'1"S, 57°40'57"W], 1.xi.2009, R.G. Moura leg. (1 CEMT); Chapada dos Parecis, 30 km N Uirapuru, 14°17'00"S, 59°15'00"W, 1–15. xii.2001, FIT, A. Foucart leg. (2 CEMT); Poconé, Sesc Pantanal, [16°23'34"S, 56°30'0"W], 21. xi.2002, malaise (1 CEMT); Cuiabá, Dist. Guia Faz. Santhidi, 15°28'47"S, 56°7'33"W, 3.xi.2010, ligh, L.R. Silva leg. (1 CEMT); Tangará da Serra, [14°37'11"S, 57°29'15"W], 7–11.ii.2011, C. Alves

leg. (1 CEMT); Same location, Campus UNEMAT/ experimental field, 14°38'58"S, 57°25'24"W, 14.xi.2017, light trap, R. J. Silva leg. (1 CEMT); Vila Bela da Santíssima Trindade, Trilha do Jatobá, 16°5'55"S, 58°26'18"W, 14.xi.2015, A. Chagas Jr & A. Kury leg. (2 CEMT).

***Bolbapium limeirai* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 4(b), 8(d), (e), (f), 15(a))

Diagnosis

Frons with angled elevation of the posterior tip of the frontal transverse carina. Pronotum mesoanteriorly with bituberculated structure, which may be little or very developed, occupying less than half of the interocular space (Figure 4(b)).

Etymology. Named after Prof. Dr Francisco Limeira-de-Oliveira, friend, great dipterist, and an eminent Entomologist in Maranhão State.

Type locality. Caxias, Maranhão, Brazil.

Holotype. 'Brasil: (MA), Caxias/ Res. Ecol. Inhamum/ Armadilha luminosa; 03–05.vii.2005/ F. Limeira de Oliveira/ et al. cols. ♂' (CEMT 74776).

Paratypes. 24 specimens examined.

BRAZIL: Distrito Federal, Brasília, [15°49'36"S, 47°55'18"W], xii.2000, N. Degallier leg. (2 ♂ 1 ♀ CEMT). Goiás, Araçu, 14kmN, [16°21'24"S, 49°40'51"W], 08.ii.1997, light, Schoolmeester, George Hangay leg. (1 COPL). Maranhão, Mirador, Parque Est. Mirador, posto avançado do Mel, 6°45'50"S, 44°58'59"W, 30–31.v.2011, light trap, A.A. Santos & T.T. A. Silva leg. (1 ♀ CEMT); Same location, 02–08.v.2011, light trap, G.A. Reis & M. S. Oliveira (1 ♂ CEMT); Same location, Base do Mosquito, [6°24'38"S, 44°28'42"W], 04–08.ii.2011, malaise trap, F. Limeira de Oliveira leg. (1 ♂ 2 ♀ CEMT); Same location, Base da Geraldina, 20–24.xii.2011, light trap, F. Limeira de Oliveira leg. (1 ♀ CEMT); Same location, [6°37'25"S, 45°52'8"W], 11–16.i.2013, malaise trap, J.T. Câmara, L.L.M. Santos & L.S. Santos leg. (1 ♀ CEMT); Same location, Base dos Cágados, 6°46'37"S, 45°6'34"W, 27–03.xi–xii.2011, light trap (UV), A.A. Santos, T.M.A. Lima & F. Limeira de Oliveira leg. (1 ♀ CEMT); Caxias, Res. Esol. Inhamum, 4°53'29"S, 43°24'49"W, 17.vi.2009, M.M.L. Silva leg. (1 ♀ CEMT); Coelho Neto, Bairro Santana – Zona urbana, 4°14'56"S, 43°0'28"W, 30.vi.2010, L.M. Oliveira leg. (1 ♀ CEMT). Mato Grosso, Diamantino, Vale da Solidão, 14°22'30"S, 56°7'30"W, 26–31.x.2013, E. Furtado leg. (2 ♀ CEMT); Santa Carmem, Fazenda São Vicente, pasture, 11° 58'12"S, 55°16'39"W, 4.v.2014, K. Peña leg. (1 ♀ CEMT); Santo Antônio do Leveger, i.2018, H. Marota leg. (1 ♂ CEMT). Minas Gerais, Uberlândia, Campus UFU, [18°56'39"S, 48° 12'51"W], 27.ii.2006, J. Mendes leg. (1 ♀ CEMT); Itumirim, Serra do Janela, i–iv.2018, J. Louzada & L. Vieira leg. (1 ♀ CEMT). Piauí, Santa Filomena, Riozinho, 8°33'S, 44°57'W, iv.2005, MV light trap, C.D. Gilett leg. (1 COPL). Tocantins, Araguaina, [7°11'33"S, 48° 12'17"W], xii.2015, Y.E Sandoval leg. (1 ♀ CEMT); Palmas, [10°14'56"S, 48°19'27"W], 13. xi.2001, Equipe de Resgate U.H.E Lajeado leg. (1 ♀ CEMT); Palmas, Rio Tocantins, [10° 14'56"S, 48°19'27"W], xii.1994, J. Nilson leg. (1 COPL).

Description

Body size: Length: 4.48–6.04 mm. Width: 3.20–4.71 mm. **Head:** Clypeal carina with three tubercles on the same level, lateral carinae end beyond the beginning of the canthus. Frons with angled elevation of the posterior tip of the frontal transverse carina; region between the carina and the clypeus almost flat and with few points. **Pronotum:** Anterior region of the pronotum with bituberculated structure, which may be little or very developed, projection occupies less than half of the interocular space. Disc with sparse points, unevenly distributed. **Ventral region of the thorax:** Central region of the metaventre with a few unevenly distributed setae. **Male terminalia:** In dorsal view, parallel parameres, meeting at the apex; projection of the posterior margin seen dorsally (Figure 8(d)). Parameres slightly curved in lateral view, forming an approximate angle of 45° in relation to the phallobase; posterior margin in lateral view with pointed and curved projection, almost reaching the parameres (Figure 8(f)). **Sexual dimorphism:** Males have almost imperceptible punctuation on the clypeus, while females have a rough and multicrenate crenated clypeus surface. **Remarks:** The primary type is deposited at the CEMT.

Differential diagnosis. *Bolbapium limeirai* sp. nov. is morphologically similar to *B. baeri*, *B. furtadoi* sp. nov., *B. limeirai* sp. nov., *B. luederwaldti* sp. nov., *B. minutum* and *B. quadrispinosum* in presenting the forehead with a transverse carina interconnected by tubercles. However, it is easily distinguished from the other species because it has a short biterculated projection on the pronotum.

Geographic distribution. Brazil (Distrito Federal, Goiás, Maranhão, Mato Grosso, Minas Gerais, Piauí and Tocantins).

Bolbapium lucidulum (Klug, 1843)

(Figures 4(f), 9(j), (k), (l), 15(b))

Bolboceras lucidulus Klug, 1843: 54 (original description); Lacordaire 1856: 143 (description)

Bolboceras lucidulum: Gemminger and Harold 1869: 1079 (catalogue); Boucomont 1902: 5 (review); Luederwaldt 1931: 432–434, 436, 449, 454 (review, key)

Bolboceras (Eucanthus) lucidulus: Boucomont 1909: 117 (review)

Bolboceras (Bolbapium) lucidulum: Boucomont 1910: 336 (review); 1912: 11 (catalogue); 1932: 267 (key)

Bolboceras lucidula: Blackwelder 1944: 220 (checklist)

Bolbapium lucidulum: Martínez 1976: 542, 546 (checklist)

Diagnosis

Frons without formation of interocular tubercles. Clypeus with short lateral carina, not reaching the middle region of the frons. Pronotum mesoanteriorly without evident structures and without median groove (Figure 4(f)).

Type material. Currently the holotype is in the MZUSP, which provided photos for analysis.

Holotype. '25,679; Type [red rectangular label]; ♂; *lucidulus*; Klug*/ Salto grande. Sello/ Brasil. Vir; Bolbapium/lucidulum/ (Klug 1843); S. Ide det. 1996' (ZMHB).

Redescription

Body size: Length: 6.18–8.60 mm. Width: 4.41–6.02 mm. **Head:** Clypeal carina trituberculated, the central tubercle being more forward than the lateral ones; short lateral carinae and a short median groove. Frons flat and without structures; it has weak and almost imperceptible points on its surface. **Pronotum:** Without evident structures, central disc with little evident punctuation, without median groove. **Ventral region of the thorax:** Prosternum has a median longitudinal projection to the posterior margin. Mesoventrite completely smooth surface, without setae and without evident punctuation. **Legs:** Third pair of legs with two adjacent spurs of the same size. **Male terminalia:** In dorsal view, non-differentiated parameres of the phallobase (Figure 9(j)). In lateral view, apex of the terminalia completely rounded (Figure 9(l)). Phallobase with two pointed projections, one on each side, morphologically resembling the genitalia of *Bolbapium sulcifrons* and *Bolbapium paralucidulum* differing from other species that have a single central projection. **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** Klug (1843) described the species based on some specimens, without mentioning the number and sex of the examined specimens. The specimens were collected by F. Sellow in Salto Grande, Brazil. The standard series belongs to the 'Museum für Naturkunde der Humboldt-Universität', Berlin.

Differential diagnosis. *Bolbapium lucidulum* is morphologically similar to *B. matheusi* sp. nov., *B. paralucidulum*, *B. quinquestriatum* and *B. sulcifrons* in not presenting the forehead with tubercles and interocular carinae. However, it is easily differentiated by the clypeus with short lateral carinae extended backwards.

Geographical distribution. Brazil (Distrito Federal, Espírito Santo, Goiás, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul and São Paulo).

Non-type material. 107 specimens.

BRAZIL: Distrito Federal, Planaltina, [15°37'17"S, 47°39'7"W], 2.x.1998, F.O.V. Costa leg. (1 CEMT); Same location, 15°36'24"S, 47°44'42"W, 8.iv.2016, light trap., A. Specht leg. (1 CEMT); Same location, Embrapa Cerrados. Pasto, 15°35'47"S, 47°42'20"W, 15.xii.2017, pitfall cow faeces, Y. Ferreira leg. (1 CEMT); Sobradinho, 15°34'53"S, 47°59'0"W, 14.ii.2018, M.E. Maldaner leg. (1 CEMT); Brasília. (1 MLPA); Same location, PNB Mata de Galeria, 15°44'49"S, 48°0'32"W, 27.xi.2015, FIT, N.H.D. Silva leg. (1 CEMT); Same location, 11.xi.2015, FIT, N.H.D. Silva leg. (2 CEMT). Espírito Santo, P.E. Pedra Azul, [20°23'30"S, 41°1'18"W], i.2000, Lopes-Andrade & Vaz-de-Mello leg. (2 CEMT). Goiás, Joanópolis, Chácara São José, 16°16'43"S, 48°50'57"W, x–xii.2020, Manual, J. Ribeiro & E. Carvalho leg. (2 CEMT). Minas Gerais, Cordisburgo, Faz. Pontinha, [19°45'57"S, 43°2'7"W], xii.1997, Vaz-de-Mello leg. (1 CEMT); Same location, [19°7'31"S, 44°19'13"W], i.1999, F.Z. Vaz-de-Mello leg. (1 CEMT); Conceição dos Ouros, Chacarã das flores. Rio Sapucaí Mirim, [22°24'45"S, 45°47'51"W] (1 CEMT); Ingaí, Boqueirão Res. UNILAVRAS, gallery forest, [21°24'6"S, 44°55'7"W], 2.xi.2002, FIT, Silva & Frieiro-Costa leg. (1 CEMT); Same location, 13.xi.2002, FIT, Silva & Frieiro-Costa leg. (1 CEMT); Same location, 20.xi.2002, FIT, Silva & Frieiro-Costa leg. (1 CEMT); Same location, Mata Boqueirão, prox Poço Bonito, [21°24'6"S, 44°55'7"W], 29.

iv.2003, R.J. Silva leg. (2 CEMT); Itabirito, [20°14'50"S, 43°48'9"W], 1400 m, xii.1998, F.Z. Vaz-de-Mello leg. (1 CEMT); Lavras, forest fragmente, 14.i.2003, FIT, Souza et al leg. (1 CEMT); Same location, [21°14'54"S, 45°0'4"W], 16.vi.2003, Renato Jório leg. (1 CEMT); Nova Era, [19°45'57"S, 43°2'7"W], 22.x.1992 (1 CEMT); Same location, xi.1991 (1 CEMT); Teixeira, [20°39'23"S, 42°51'24"W], 780 m, 7-14.xi.1996, M. Hardy leg. (1 CEMT); Viçosa, [20°44'50"S, 42°52'59"W], xi.1998, FIT, Vaz-de-Mello leg. (1 CEMT); Same location, xi.1999, FIT, Andrade & Vaz-de-Mello leg. (1 CEMT); Same location, ii.1999, FIT, Vaz-de-Mello leg. (1 CEMT); Same location, 30.i.1996, J.N.C. Louzada leg. (1 CEMT); Same location, v.1998, FIT, Vaz-de-Mello leg. (1 CEMT); Same location (1 CEMT); Same location, Mata do Paraíso, [20°48'5"S, 42°51'58"W], 13.ii.2015, FIT, S.Aloquio, A.Orsetti, C. Lopes-Andrade & M.Bento leg. (1 CEMT); Itumirim, Serra do Janela, 2019, J. Louzada & L. Vieira (1 CEMT); Same location, i-iv.2018, J. Louzada & L. Vieira (3 CEMT). Paraná, Londrina, P.E Mata dos Godoy. Trilha dos catetos, 23°26'32"S, 51°15'10"W, 31.x.2018, malaise, R.C. Barros leg. (5 CEMT); Same location, 21.ii.2018, malaise, R.C. Barros leg. (1 CEMT); Same location, 16.iii.2018, malaise, R.C. Barros leg. (1 CEMT); Campina Grande do Sul, Estrada da Mandassaia, [25°18'16"S, 49°2'12"W], 8.v.2014, FIT, F.W.T. Leivas leg. (1 CEMT); Same location, 7-10.iv.2014, FIT, F.W.T. Leivas leg. (2 CEMT); Same location, 2.iv.2014, FIT, F.W.T. Leivas leg. (1 CEMT); Same location, 2009, FIT, F.W.T. Leivas leg. (1 CEMT); Curitiba, [25°25'44"S, 49°16'1"W], iii.1968, R. Langer leg. (2 DZUP); Same location, Campina Grande do Sul, 25°17'46"S, 49°2'14"W, FIT, F.W.T. Leivas leg. (1 CEMT); Londrina, UEL, [23°19'27"S, 51°12'1"W] (1 CEMT); Morretes, [25°28'57"S, 48°49'44"W], 22-10.xi-xii.2001, Scuheii leg. (2 DZUP); Piraquara, 25°29'33"S, 48°58'41"W, 1038 m, 9.xii.2011, FIT, F.W.T. Leivas & K. Mise leg. (2 CEMT); Same location, 13.iii.2012, FIT, F. Leivas & P. Grossi leg. (3 CEMT); Ponta Grossa, V. Velha – IAPAR c004 690, [25°5'57"S, 50°9'29"W], 17.i.2000, malaise, Ganho & Marinone leg. (1 DZUP); Tijucas do Sul, Vivat Flor. Sist. Ecol., [25°55'32"S, 49°10'43"W], 10.xii.2004, malaise, N. G. Ganho leg. (1 DZUP); Same location, 19.xi.2004, malaise, N. G. Ganho leg. (1 DZUP); Same location, 5.xi.2004, malaise, N. G. Ganho leg. (1 DZUP). Rio de Janeiro, without data (1 COPL); Represa Rio Grande, [22°54'24"S, 43°10'22"W], iii.1972, F.M. Oliveira leg. (1 CEMT) (2 DZUP); Nova Friburgo, [22°17'19"S, 42°32'2"W], i.1995, F.Z. Vaz-de-Mello leg. (1 CEMT); Same location, xi.1988, P. & E. Grossi leg. (1 CEMT); Same location, i.2009, light, P. Grossi leg. (2 COPL); Same location, 2.xi.2009, N. Degallier leg. (2 COPL); Same location, Macaé de Cima, [22°23'43"S, 42°27'57"W], iii.2000, Vaz-de-Mello leg. (1 CEMT); Same location, i.1999, P. Grossi leg. (2 CEMT) (1 COPL); Same location, x.2000, P. Grossi (1 CEMT); Same location, ii.2006, E.J. Grossi leg. (2 CEMT); Galeão, [22°49'1"S, 43°13'40"W], ii.1954, M. Alvarenga leg. (1 DZUP). Rio Grande do Sul, Triunfo, Parque COPEL, [29°55'16"S, 51°32'9"W], 26-23.ix-x.2001, Pitfall, R. Ott leg. (1 CEMT); São Francisco de Paula, Pro-mata. Mata secundaria, 29°29'16"S, 50°10'60"W, 20-21.i-ii.2001, Pitfall, R. Ott leg. (2 CEMT). Without data (1 CEMT) (3 ZIN). São Paulo, 7076, [23°32'35"S, 43°37'45"W], 16.xi.1955, K. Lenko leg. (1 DZUP); Same location, 7975, 15.xii.1955, K. Lenko leg. (1 DZUP); Same location, 7347, 15.xi.1955, K. Lenko leg. (1 DZUP); Same location, 8003, 15.xii.1955, K. Lenko leg. (1 DZUP); Same location, 7601, 6.xii.1955, K. Lenko leg. (1 DZUP); São Luis do Paratinga, Pq. Est. Serra do Mar, Núcleo St Virginia, [23°37'17"S, 45°39'29"W], xi.2004, M. Uehara leg. (1 CEMT); Same location, ii.2005, M. Uehara leg. (2 CEMT); Barueri, [23°30'40"S, 46°52'22"W], 20.xii.1954, K. Lenko leg. (1 DZUP); Same location, iv.1955, K. Lenko leg. (1 DZUP); Same location, 7.iv.1955, K. Lenko leg. (1 DZUP); Same location, 21.iv.1955, K. Lenko leg. (1 DZUP); Same location, 8.xii.1954,

K. Lenko leg. (1 DZUP); Same location, 29.ii.1956, K. Lenko leg. (1 DZUP); Same location, 18. xii.1954, K. Lenko leg. (2 DZUP); Same location, 26.xii.1954, K. Lenko leg. (1 DZUP); Same location, 12.xii.1954, K. Lenko leg. (1 DZUP).

***Bolbapium luederwaldti* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 3(d), 7(g), (h), (i), 13(b))

Bolboceras sculpturatus: Castelnau, 1840: 106 (genus transfer); Klug 1843: 53 (diagnosis); Lacordaire 1856: 143 (mention). Auct. (not Mannerheim 1829)

Bolboceras sculpturatum: Gemminger and Harold 1869: 1080 (catalogue); Boucomont 1902: 6 (mention); Luederwaldt 1931: 431, 443, 444, 452–454 (key, description, distribution). Auct. (not Mannerheim 1829)

Bolboceras (Eucanthus) sculpturatum: Boucomont 1909: 117 (subgeneric ubication, mention). Auct. (not Mannerheim 1829)

Bolboceras (Eucanthus) sculpturatus: Bruch, 1911: 192 (catalogue). Auct. (not Mannerheim 1829)

Bolboceras (Bolbapium) sculpturatum: Boucomont 1910: 334, 336, 340 (subgeneric publication, mention); 1912: 13 (catalogue); 1932: 267 (key). Auct. (not Mannerheim 1829)

Bolboceras (Bolbapium) sculpturata [sic]: Blackwelder 1944: 220 (checklist). Auct. (not Mannerheim 1829)

Bolbapium sculpturatum: Martínez 1976: 547 (generic transfer). Auct. (not Mannerheim 1829)

Diagnosis

Frons with transversal carina with tubercle formation on each side. Lower parts of clypeo-frontal carina much higher than anterior clypeal carina. Pronotum mesoanteriorly with a central bituberculated struture and a distinct lateral tubercle at each side of central struture. Depression marked by points behind the central projection (Figure 3(d)).

Etymology. The new name is proposed after Hermann (also Germano) Lüderwaldt (also Luederwaldt), a Pomeranian entomologist established in Brazil in the beginning of the twentieth century, who among many other important works reviewed the Brazilian bolboceratines and described several species.

Type locality. Tangará da Serra, Mato Grosso, Brazil.

Holotype. 'BRASIL: Mato Grosso. Tangará/da Serra. Campus UNEMAT. 14°/38'58"S, 57° 25'24"W; 439 m./Campo experimental. Light/trap. 14.xi.2017. RJ Silva" (CEMT 74440)

Paratypes. 91 specimens examined.

ARGENTINA: Bueno Aires, H. Richter. (1 ♀ MLPA). BRAZIL: Alagoas, Ibateguara, Coimbra, [8°58'24"S, 35°55'51"W], 10.xi.2007, faeces, B.K.C. Figueiras leg. (1 ♀ CEMT); Maceió, Campus UFAL, [9°33'19"S, 35°46'40"W], 15.v.2018, Manual, H. Rodrigues leg. (1 ♂ 2 ♀ CEMT). Distrito Federal, Sobradinho, 15°34'53"S, 47°59'0"W, 14.ii.2018, M.E.

Maldaner leg. (1 ♀ CEMT); Planaltina, 15°36'24"S, 47°44'42"W, 1.ii.2016, light trap, A. Specht leg. (1 ♂ CEMT); Brasília, Campus UNB, [15°45'47"S, 47°52'14"W], 10.xi.1970, Kunze leg. (1 ♂ CEMT). Espírito Santo, Montanha, [18°7'32"S, 40°21'58"W], 13.ix.1995, A.E.G. Leochi leg. (1 ♂ CEMT); Linhares, Flona de Goytacazes. Mata secundária, 19°25'56"S, 40°4'12"W, 9.xi.2010, light, D.S. Martins leg. (1 ♀ CEMT). Maranhão, Caxias, Campus UEMA, morro do alecrim, [4°51'56"S, 43°21'21"W], 28.v.2009, rede entomológica, A.N. Pinho & J.M. Nascimento leg. (1 ♂ CEMT); Mirador, Parque Est. Mirador, base da Geraldina, 6°37'25"S, 45°52'8"W, 11 a 16.i.2013, malaise trap, J.T. Câmara, L.L.M. Santos, L.S Santos leg. (1 CEMT); Same location, 6°46'37"S, 45°6'34"W, 8.xii.2006, malaise trap, F. Limeira de Oliveira leg. (1 CEMT). Mato Grosso, Chapada dos Guimarães, Exc. Dep. Zool-UFPR (polonoroeste), 19.xi.1983. (1 ♀ DZUP), Same location, Chapada aventura, [15°27'50"S, 55°45'34"W], 21.iv.2016, manual, B. Bordin leg. (1 ♀ CEMT); Chapada dos Parecis, Faz. Sta Teresinha, 14.xi.2017, D.J. Arruda (1 ♀ CEMT); Same location, 30 km N Uirapuru, 14°9'43"S, 57°56'28"W, 1 a 15.xii.2001, FIT, A. Foucart leg. (1 ♀ CEMT), Same location, 14°17'""S, 59°15'""W, 1 a 15.xii.2001, FIT, A. Foucart leg. (1 ♀ CEMT), Same location, 10.xii.2001, FIT, A. Foucart leg. (1 COPL); Colider, UHE, [10°58'48"S, 55°45'59"W], x.2011, light e manual, Equipe resgate de fauna leg. (1 ♂ CEMT); Cuiabá, Gustavo Dutra, [15°42'39"S, 55°45'53"W], 26.x.1953, C. R. Gonçalves leg. (2 DZUP); Diamantino, [14°24'24"S, 56°26'13"W], x.2001, E. Furtado leg. (1 ♂ CEMT); Same location, Alto Rio Arinos, [12°24'1"S, 56°58'6"W], .iii.2001, E. Furtado leg. (1 ♂ CEMT); Same location, 26.ii.2004, E. Furtado leg. (1 ♂ 1 ♀ CEMT); Same location, Vale da Solidão, 14°22'30"S, 56°7'30"W, 500 m, 26-31.x.2013, E. Furtado leg. (9 ♂ 5 ♀ CEMT); Same location, 12°22'30S, 56°7'30"W, 500 m, 26-31.x.2013, E. Furtado (1 ♂ CEMT); Same location, 23-26.xii-i.2008-2009, FIT, D.C.T. Oliveira leg. (1 ♀ CEMT); Same location, xi.1998, E. Furtado leg. (1 ♀ 1 ♂ CEMT); Same location, xi.2008, light, E. Furtado leg. (2 ♂ CEMT); Paranatinga, Aldeia Paikum, [13°50'26"S, 54°22'27"W], 12.xi.2011, manual, O. Neto leg. (1 ♀ CEMT); Poconé, Pantanal, [16°23'34"S, 56°30'0"W], 16.vi.2011, light trap, D. Gonzalez leg. (1 ♀ CEMT); Porto Esperidião, [16°1'29"S, 59°0'44"W], xi.1984, Magno & Alvarenga leg. (1 ♂ CEMT); Tangará da Serra, Faz. Aparecida da Serra. Cerrado campo sujo, 14°19'56"S, 57°43'30"W, 22-24.xi.2017, coleta direta, U.F. Santos leg. (1 ♀ CEMT); Santo Antônio do Leverger, i.2019, H. Marota (1 ♀ CEMT). Mato Grosso do Sul, [20°46'20"S, 54°47'6"W], xi.1951, S. Alvarenga leg. (1 DZUP); Chapadão do Sul, 18°46'30"S, 52°31'4"W, 13.xii.2015, light trap, A. Specht leg. (1 ♂ CEMT); Inocência, Faz. Moinho, 19°13'12"S, 52°9'33"W, 28.x.2018, light, H.L. Rainho leg. (1 ♂ CEMT); Três Lagoas, Horto Barra da Moeda, Três Lagoas, Agroflorestal, [20°59'48"S, 51°47'48"W], 9.x.1993, black light trap, *Eucalyptus grandis stand*, C.A.H. Flechtamnn leg. (1 ♀ CEMT); Campo Grande, atraídos ao WC lab. Samid. Animal, [20°28'10"S, 54°37'12"W], 10.xii.2003, W.W. Koller leg. (1 ♀ CEMT); Same location, WC lab. Samid. Animal Embrapa, [20°26'""S, 54°43'7"W], 21. iv.2004, light trap, W.W. Koller leg. (1 ♀ CEMT). Goiás, São João da Aliança, [14°42'28"S, 47°31'18"W], 28.x.2010, R. Koike leg. (2 ♀ 2 ♂ CEMT), Same location, 20.x.2010, R. Koire leg. (2 COPL); P.N. Emas, [18°7'20"S, 52°54'30"W], xii.1999, F. Rodrigues leg. (1 ♀ CEMT); Campinas, Borgmeier et S. Lopez, [16°39'39"S, 49°17'33"W], xii.935, A. Martínez det. 1955 leg. (1 COPL). Minas Gerais, Cordisburgo, Faz. Pontinha, [19°7'31"S, 44°19'13"W], xii.1997, Vaz-de-Mello leg. (1 CEMT); Buritis, Farm Querência, [15°9'38"S, 46°33'55"W], 3.xii.2012, ligth, C.M. Oliveira leg. (2 ♀ CEMT); São Gonçalo do Sapucaí, [21°53'34"S, 45°35'38"W], 28.i.2017, L.F. Maia leg. (1 ♀ CEMT); Itumirim, Serra do Janela, i-iv.2018, J. Louzada & L.

Vieira (3 ♀ 4 ♂ CEMT). Paraná, [25°15'7"S, 52°1'17"W], 7.i.1940, J. Leprevost leg. (1 DZUP); Tamarana, [23°43'32"S, 51°5'44"W], 5.i.2001, light trap, J. Lopes leg. (1 ♀ CEMT); Same location, 4.xii.2000, light trap, J. Lopes leg. (1 ♀ CEMT); Campina Grande do Sul, 25° 18'17"S, 49°3'14"W, 21.xi.2014, luz, F.W.T. Leivas leg. (1 ♂ CEMT); Ponta Grossa, Reserva IAPARBr 376. Lev. Ent. PROFAUPAR, [25°5'57"S, 50°9'29"W], 2.i.1987, light bulb, leg. (1 DZUP); Same location, V. Velha – IAPAR c004 689, [25°5'57"S, 50°9'29"W], 24.i.2000, malaise, Ganho & Marinone leg. (1 DZUP). Rondônia, São Miguel do Guaporé, [11° 40'13"S, 62°43'56"W], 23.iv.2006, light trap, J.A. Rafael & F.F. Xavier leg. (1 ♂ CEMT); Chupinguaia, 12°13'30S, 60°43'22"W, 2016, T. Semedo & Ribeiro (1 ♀ CEMT) Santa Catarina, 89, [27°14'32"S, 50°13'7"W], xi.1959, (1 DZUP). Without data, PADF, 23. iii.1996, Cunha leg. (1 ♀ CEMT); Without data, PADF, 23.iii.1996, Serrano leg. (1 ♀ CEMT); Without data, 15.xi.1993 (1 ♀ CEMT). São Paulo, Cerqueira César, [23°2'18"S, 49°9'57"W], xi.1996, J. Carlos leg. (1 ♀ CEMT); Same location, xii.1994, J. Carlos leg. (1 ♂ CEMT); Cruzeiro, [22°34'38"S, 44°57'30"W], 3.xi.1979, Aluno Ciman leg. (1 ♂ CEMT).

Description

Body size: Length: 5.40–7.59 mm. Width: 4.06–6.05 mm. **Head:** Lower parts of clypeo-frontal carina much higher than anterior clypeal carina. Frons presents a slightly curved transversal carina with tubercle formation on each side, which is not very apparent; region between the clypeus and the carina with fine points. **Pronotum:** Pronotum mesoanteriorly with a central bituberculated struture and a distinct lateral tubercle at each side of central struture. Depression marked by points behind the central projection. Disc sides with sparse distributed points, unevenly distributed. **Ventral region of the thorax:** Central region of the metaventricle with a few setae that are more concentrated in the posterior part, near the lower margin without setae. **Elytron:** There are setae in the apical region of the external dorsal margin of the elytron (quantity varies among individuals). **Male terminalia:** In dorsal view, parallel parameres, meeting at the apex (Figure 7(g)). Parameres slightly curved in lateral view, forming an approximate angle of 45° in relation to the phallobase; posterior margin in lateral view with pointed and curved projection, almost reaching the parameres (Figure 7(ii)). **Sexual dimorphism** Males present the posterior region of the clypeus with fine and distinct punctuation, setae and carinae absent, while females have a rough and carenaded clypeus surface, with four setae in the posterior region. **Remarks:** This is the species usually named '*Bolbapium sculpturatum*' in most collections. As we had no evidence that *Odontaeus sculpturatus* Mannerheim, 1829 is truly a species of *Bolbapium*, we here provide a new name for this species. So, the name *Odontaeus sculpturatus* Mannerheim, 1829 is considered a *species inquirenda*.

Differential diagnosis. *Bolbapium luederwaldti* sp. nov. is morphologically similar to *B. baeri*, *B. furtadoi* sp. nov., *B. limeirai* sp. nov., *B. minutum* and *B. quadrispinosum* in presenting the forehead with a transverse carina interconnected by tubercles. However, it is easily distinguished by presenting a bituberculated projection with a flat surface and lateral tubercles on the pronotum.

Geographical distribution. Brazil (Alagoas, Distrito Federal, Espírito Santo, Goiás, Maranhão, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Rondônia, Santa Catarina and São Paulo) and Argentina (Buenos Aires).

***Bolbapium matheusi* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 6(c), 11(a), (b), (c), 14(b))

Diagnosis

Frons without tubercles, clypeal carina extending to the mid-frontal forming slight angulation; larger than 5 mm; pronotum mesoanteriorly with little-elevated tubercle, almost bidentate (Figure 6(c)).

Etymology. Named in memory of Matheus José, dear cousin of the first author who left his family too soon.

Type locality. Santa Teresinha, Paraíba, Brazil.

Holotype. 'Brasil, PB, S. Teresinha/ Faz. Tamanduá Arm. B3/ 9.v.2011 Reserva/ Lima A.D.A' ♂ (CEMT 74395).

Paratypes. 15 specimens examined.

BRAZIL, Bahia, Mata de São João, [12°31'32"S, 38°18'40"W], 4.viii.2014, Light, M.E. Maldaner leg. (2 ♀ CEMT); Feira de Santana, 12.vi.2002, F. Bravo leg. (1 ♂ CEMT) Same location, UEFS, [12°12'1"S, 38°58'18"W], 12.v.2002, Freddy Bravo leg. (1 ♀ CEMT). Without data (1 ♀ CEMT). Paraíba, João Pessoa, Campus universitário Mata atlântica primaria, [7° 8'21"S, 34°51'31"W], 29.iii.1982, light, R. da Paz leg. (1 ♂ CEMT); São José dos Cordeiros, Faz. Almas, [7°28"S, 36°53"W], 8 e 9.iii.2003, R. Rothea leg. (1 ♂ CEMT), Same location, light trap, Rothéa & Creão leg. (1 ♂ CEMT); Santa Teresinha, Faz. Tamanduá trap B3, [7° 1'31"S, 37°23'31"W], 9.v.2011, A.D.A. Lima leg. (1 ♀ 1 ♂ CEMT). Pernambuco, Camaragibe, aldeia, 7°58'1"S, 35°0'15"W, 1–31.vii.2016, L.V.P.C. Grossi leg. (1 ♂ CEMT); Serra Talhada, [7° 58'55"S, 38°17'21"W], 16.iv.1971, A. Lima leg. (1 ♀ CEMT); Brejo de Madre de Deus, [8° 08'25"S, 36°22'17"W], i–iii.2004, coll. E & R. Stronkhorst. (1 COPL); Gravatá, 08.vi.2015, L.S. Albuquerque leg. (1 ♀ CEMT). Rio Grande do Norte, Baía Formosa, RPPN Mata Estrela, 6° 23'3"S, 35°1'54"W, 25.vi.2014, A.P.M. Santos leg. (1 ♂ CEMT).

Description

Body size: Length: 5.68–6.55 mm. Width: 4.19–4.98 mm. **Head:** clypeal carina extending to the mid-frontal forming slight angulation; frons without structures; every surface with sparse points, unevenly distributed. **Pronotum:** anterior region of the disc with little developed tubercle, almost bidentate. The entire pronotum surface with sparse points, greater concentration on the sides of the disc and unevenly distributed. **Ventral region of the thorax:** Central region of the metaventricle with a few unevenly distributed setae. **Male terminalia:** In dorsal view, apparently short parameres with the approximate base and the apex greatly separated (Figure 11(a)). In lateral view, elongated parameres and posterior margin as long as the parameres (Figure 11(c)). **Sexual dimorphism:** Males have a smooth surface and setae are absent, while females have up to four setae in the posterior region of the clypeus and a carenated clypeus surface. **Remarks:** The primary type is deposited at the CEMT.

Differential diagnosis. *Bolbapium matheusi* sp. nov. is morphologically similar to *B. lucidulum*, *B. paralucidulum*, *B. quinquestriatum* and *B. sulcifrons* in not presenting the forehead with tubercles and interocular carinae. However, it is easily differentiated by presenting a slight sinuosity in the anterior region of the pronotum.

Geographical distribution. Brazil (Rio Grande do Norte, Paraíba, Bahia and Pernambuco).

***Bolbapium minutum* (Luederwaldt, 1931)**

(Figures 3(e), 7(j), (k), (l), 16(a))

Bolboceras minutum Luederwaldt, 1931 (original description; key)

Bolboceras bigibbosum Luederwaldt, 1931 (original description; key)

Bolboceras (Bolbapium) minutum: Boucomont 1932: 267 (key)

Bolboceras (Bolbapium) bigibbosum: Boucomont 1932: 267 (key)

Bolboceras minuta: Blackwelder 1944: 220 (checklist)

Bolboceras bigibbosa: Blackwelder 1944: 220 (checklist)

Bolbapium minutum: Martínez 1976: 546 (checklist)

Bolbapium bigibbosum: Martínez 1976: 546 (checklist)

Diagnosis

Clypeo-frontal carina with central tubercle very high and detached, usually at least as high, above carina, as lower parts of the carina itself. Pronotum mesoanteriorly with prismatic structures in females and mammiliform structures in males; at most a lateral indistinct rounded elevation at each side (Figure 3(e)).

Neotype: 'BRASIL: MS, Corumbá/ Passo do Lontra, FIT/ ii.1999, V. Lopes leg'. ♂ (CEMT 74144).

Redescription

Body size: Length: 3.98–7.52 mm. Width: 3.07–5.60 mm. **Head:** Clypeo-frontal carina with central tubercle very high and detached, usually at least as high, above carina, as lower parts of the carina itself. Canthus presents different types of punctuation, some strong and some weak. The frons presents a slightly arched transversal carina with tubercle formation on each side; the region between the clypeus and the frons with slope and points randomly distributed; region behind the frontal carina marked by circular and oval points. The last three antennomeres of the antenna, which form the antennal club, have a globular shape, compared to the other species (Figure 2(c)). **Pronotum:** Prismatic or mammiliform structures in the anterior part of the disc. Disc sides with sparsely distributed points, unevenly distributed. **Ventral region of the thorax:** Central region of the metaventre with a few unevenly distributed setae. **Elytron:** There are setae in the apical region of the external dorsal margin of the elytra (quantity varies among individuals). **Male terminalia:** Parameres not seen dorsally (Figure 7(j)); in lateral view completely curved, at an angle of approximately 90° in relation to the phallobase (Figure 11(l)). **Sexual dimorphism:** Females have a prismatic structure in the anterior region of the pronotum, while males have this mammiliform structure, which can be very or little

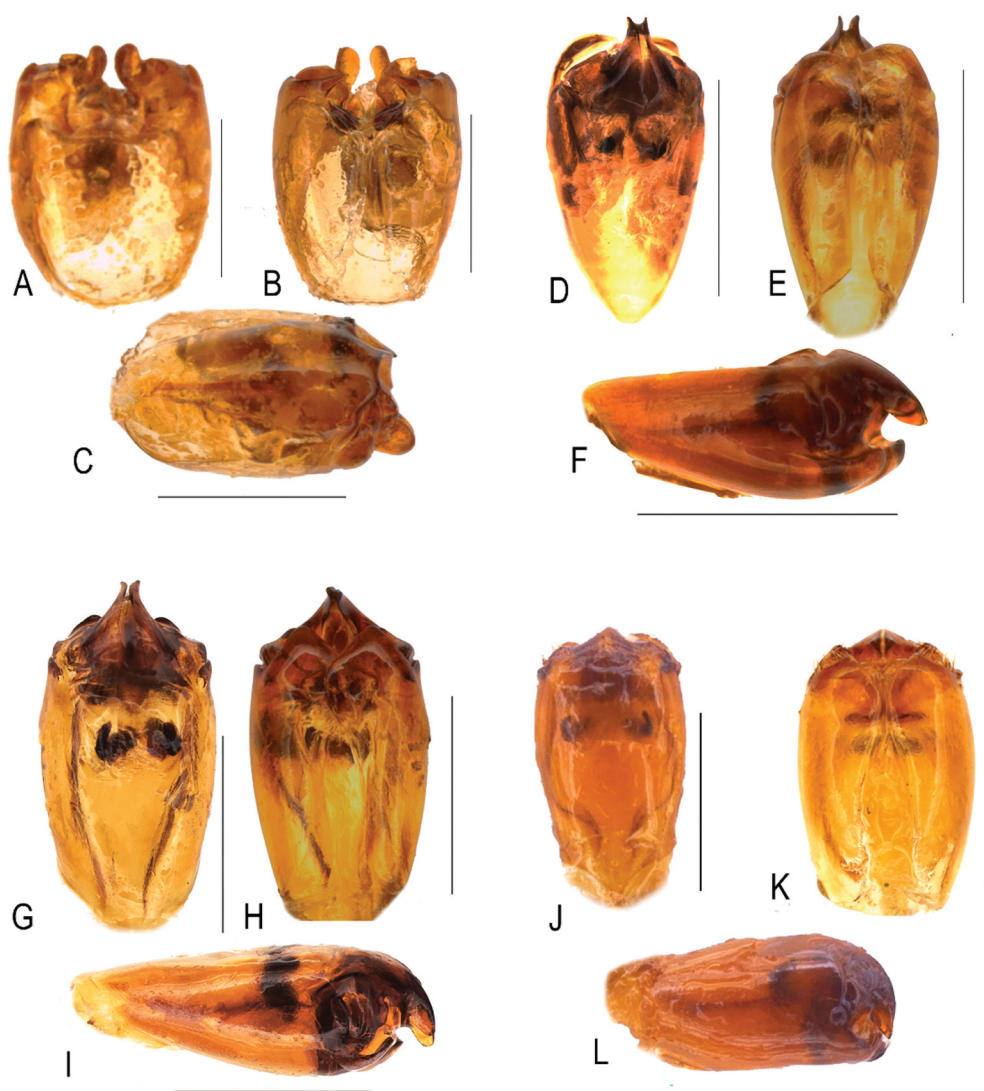


Figure 7. Aedeagus. *Bolbapium striatopunctatum* (Castelnau, 1840) (a). dorsal view; (b). ventral view; (c). lateral view. *Bolbapium sergioidae* Carvalho and Vaz-de-Mello, sp. nov. (d). dorsal view; (e). ventral view; (f). lateral view. *Bolbapium luederwaldti* Carvalho and Vaz-de-Mello, sp. nov.; (g). dorsal view; (h). ventral view; (i). lateral view. *Bolbapium minutum* (Luederwaldt, 1931) (j). dorsal view; (k). ventral view; (l). lateral view.

developed in both. **Remarks:** Luederwaldt (1931) described *Bolbapium minutum* and designated as type a specimen collected by W. Melzer in Porto Murinho, Mato Grosso do Sul. In the same work he described *Bolbapium bigibbosum* based on two specimens, also collected by Melzer in Porto Murinho, Mato Grosso do Sul. The suspicion of synonymy between the two species was raised by Sergio Ide in his master's dissertation. From an examination of the genitalia of both species, Ide confirmed that all specimens of *B.*

minutum are females and *B. bigibbosum* males, in addition to the coincidence of geographical distribution; however, the work has not been published. More specimens were dissected and analysed to support this previously proposed hypothesis. This leads us to conclude that the two names are synonymous. As both names have been proposed in the same work, the name *Bolboceras minutum* is here chosen as senior synonym because it represents the size of the specimens, both male and female, while the name *B. bigibbosum* refers to a character that is found only in males. Besides, Ide (1992) had already suggested (while not validly published) the use of *minutum* instead of *bigibbosum* and, in consequence, most Brazilian collections already bear this name as the valid name for this species.

Designation of type material. It was confirmed that the type of *Bolbapium minutum* was lost in the fire that occurred at the National Museum, Rio de Janeiro, in 2018. According to Ide the type of *Bolbapium bigibbosum* is in the MZSP; however it was not found. Therefore, for confirmation of the taxon and so there are no further problems of identification, we propose the designation of a neotype for species. The specimen being proposed as a neotype originally belonged to the CEMT, and comes from the location closest to the type locality of the species. It will be deposited at the National Museum, Rio de Janeiro.

Differential diagnosis. *Bolbapium minutum* is morphologically similar to *B. baeri*, *B. furtadoi* sp. nov., *B. limeiraisp.* nov., *B. luederwaldti* sp. nov. and *B. quadrispinosum* in presenting the forehead with a transverse carina interconnected by tubercles. However, it is easily distinguished from the other species by presenting the mammiliform or prismatic projections.

Geographical distribution. Brazil (Bahia, Espírito Santo, Goiás, Maranhão, Mato Grosso do Sul, Mato Grosso, Paraná, Santa Catarina and São Paulo); Argentina (Catamarca and Chaco); Bolivia (Santa Cruz); Paraguay (Amambay, Caazapá, Canindeyú, Concepción and Villarica) and Uruguay.

Non-type material. 180 specimens.

ARGENTINA: Catamarca, E. Brunch. (1 ♀ MLPA). Chaco, Gancedo, 8.xii.1939, Biraben-Bezzi. (2 ♂ MLPA); Without data. (2 ♂ 1 ♀ ZIN). BOLIVIA, Santa Cruz, [17°48'52"S, 63°9'21"W], 500m, 6.xi.1955, Zischka leg. (1 CEMT). Without data. (1 ♀ ZIN); Without data (1 ♀ CEMT). BRAZIL: Bahia, Encruzilhada, 15°31'50"S, 40°54'46"W, 980m, xi.1972, M. Alvarenga leg. (1 ♀ CEMT). Goiás, Bom Jardim de Goiás, [16°12'17"S, 52°10'25"W], ii.1998, Vaz-de-Mello leg. (1 ♀ CEMT); Luziânia, [16°31'25"S, 48°0'3"W], 24.ii.1974, Bello leg. (1 ♀ CEMT). Maranhão, Estreito, Rio Tocantins, 6°11'20"S, 47°24'28"W, xii.2009, manual, R.V. Nunes leg. (1 ♂ CEMT). Mato Grosso, Água Boa, Rancho Araguaia, 13°56'40"S, 52°6'10"W, 24.xii.2017, Mota & Schutz leg. (1 ♀ 1 ♂ CEMT); Chapada dos Guimarães, Fazenda Jardim, 15°27'24"S, 55°44'24"W, 2.iii.2013, V.C. Jorge leg. (1 ♀ CEMT); Campo Novo do Parecis, Balneário Pilger, [13°21'54"S, 57°37'15"W], 2.i.2019, F. Kaspary leg. (1 ♀ CEMT); Cuiabá, Boa Esperança, [15°36'29"S, 56°3'22"W], .xi.2011, F.Z. Vaz-de-Mello leg. (1 ♂ CEMT); Same location, Recanto da Seriema, x–xii.2017, light trap, L.G.O.A Nunes (1 ♂ CEMT); Dist. Guia Faz. Santhidi, 15°28'47"S, 56°7'33"W, 11.xii.2009, Ligth, L.R. Silva leg. (2 ♀ CEMT); Fazenda Santidi, 15°23'6"S, 56°6'42"W, 22–1.viii–ix.2008, FIT, L.R. Silva leg. (1 ♀ CEMT); Same location,

28-4.iii-iv.2009, FIT, L.R. Silva leg. (1 ♀ CEMT); Rec. Das siriemas, 15°35'33"S, 56°1'38"W, 10. iii.2013, Manual, L.G.O.A. Nunes leg. (1 ♀ CEMT); Recanto das siriemas, 15°35'33"S, 56° 1'37"W, xii.2015, manual, L.G. Nunes leg. (1 ♂ CEMT); Same location, 3.iii.2016, manual, L. G. Nunes leg. (1 ♀ CEMT); Curvelânida, [15°36'34"S, 57°55'9"W], ii.2011, L.R. Silva leg. (1 ♂ CEMT); Diamantino, Alto Rio Arinos, [12°24'1"S, 56°58'6"W], iii.2001, E. Furtado leg. (1 ♀ CEMT); Same location, x.1999, E. Furtado leg. (1 ♂ CEMT); Vale da Solidão, 14°21'52"S, 56° 7'23"W, 23-26.xii-i.2008-2009, FIT, D.C.T. Oliveira leg. (2 ♀ 2 CEMT); Same location, 14° 22'30"S, 56°7'30"W, 500m, 26-31.x.2013, E. Furtado leg. (4 ♀ 6 ♂ CEMT); Same location, 14° 22'23"S, 56°7'25"W, 31-14.i-ii.2009, FIT, D.C.T. Oliveira leg. (1 ♂ CEMT); Same location, [14° 22'30"S, 56°7'30"W], ix.2001, E. Furtado leg. (2 ♀ CEMT); Same location, 14°22'"S, 56°7'"W, x.2008, luz, E. Furtado leg. (2 ♀ 4 ♂ CEMT); Same location, 450 m, xi.2012, E. Furtado leg. (1 ♀ 2 ♂ CEMT); Same location, [14°22'30"S, 56°7'30"W], xi.1998, E. Furtado leg. (1 ♀ CEMT); Nobres, Bom Jardim, Pousada Reino Encantado, [14°38'13"S, 56°6'15"W], 15.xi.2010, F.R. Tortato leg. (1 ♀ CEMT); Poconé, [16°15'59"S, 56°37'35"W], 28.i.1998, light trap, Mata leg. (1 ♀ CEMT); Same location, 13.xii.1990, Inês Castrillon leg. (1 ♀ CEMT); Same location, Faz. Alvorada, 15.xii.1990, Noraney Almeida leg. (1 ♂ CEMT); Tangará da Serra, 14°35'49"S, 57° 29'27"W, 326mols, xi.2014, R.J. Silva leg. (1 ♀ CEMT); Same location, UNEMAT, [14°39'7"S, 57°26'2"W], xi.2011, lighth, G.A.P.C. Neves leg. (1 ♂ CEMT); Same location, Campus UNEMAT/ experimental field, 14°38'58"S, 57°25'24"W, 439m, 14.xi.2017, light trap, R.J. Silva leg. (12 ♂ 18 ♀ CEMT); Várzea Grande, Empaer, [15°37'30"S, 56°6'48"W], 25.x.2017, manual, G.A.P.C. Neves leg. (1 ♀ CEMT). Mato Grosso do Sul, Aquidauana, Fazenda UEMS, 20°28'"S, 55°48"W, 19.ix.2006, light trap, S.R. Rodrigues leg. (2 ♀ 3 ♂ CEMT); Same location, 18.ix.2006, light trap, S.R. Rodrigues leg. (1 ♂ CEMT); Campo Grande, [20°28'10"S, 54°37'12"W], i.1998, E. Lima leg. (5 ♀ CEMT); Corumbá, Passo do Lontra, [19°36'34"S, 56°56'24"W], xi.2000, J. Raizer leg. (1 ♀ CEMT); Same location, ii.1999, FIT, V. Lopes leg. (2 ♂ CEMT); Inocência, Faz. Moinho, 19°13'12"S, 52°9'33"W, 28.x.2018, light, H.L. Rainho leg. (10 ♀ ♂ 4 CEMT); Nova Andradina, Usina Santa Helena, 21°59'32"S, 53°26'28"W, 18.x.2012, G. Coutinho leg. (2 ♂ 4 ♀ CEMT); Same location, 29.ix.2017, E.S. Gomes (1 ♀ CEMT); São Gabriel do Oeste, 16° 23'16"S, 54°35'47"W, 620m, xi.2020, I.E.C. Okawada (1 ♂ 1 ♀ CEMT); Deodápolis, Agro Terenas, cana, 26.x.2017, E.S. Gomes (1 ♀ CEMT); Porto Murtinho, i.1930, Roberto Spirtz leg. (1 ♀ MZSP). Paraná, Icaraíma, 23°23'46"S, 53°37'W, 357m, 2019, Felipe & Rodrigues (2 ♂ CEMT); Same location, Estância Felipe, 23°20'32"S, 53°39'9"W, 300m, 2019, Felipe & Rodrigues (2 ♀ 3 ♂ CEMT). Santa Catarina, 272, [27°14'32"S, 50°13'7"W], i.1966, leg. (1 DZUP). Without data. (1 ZIN) (1 ♂ MLPA). São Paulo, Barra Bonita, [22°28'22"S, 48° 33'49"W], 1976, P.S.M. Botelho leg. (4 ♀ CEMT); Cerqueira César, [23°2'18"S, 49°9'57"W], xii.1997, J. Carlos leg. (1 ♀ CEMT); Luiz Antonio, E. E. de Jataí, [21°33'13"S, 47°42'10"W], 20-23.xi.2008, S.P. Rosa & M. Ladenthin leg. (1 ♀ 1 ♂ CEMT); Rio Claro, Chácara paraíso, [22° 28'49"S, 47°20'15"W], 19.i.1938, Claretiano leg. (1 DZUP); Pirassununga, xi.1943 (1 ♀ MZSP). PARAGUAY: Amambay, Estancia Oliva, [22°10'55"S, 56°26'30"W], 22-25.i.2013, U. Drechsel leg. (1 COPL). Caazapá, Estero Cristal, [26°10'57"S, 56°22'16"W], 20.xi.1998, leg. (3 ♂ 2 ♀ CEMT); Estancia la Lejana, 20.xi.2008, U. Drechsel leg. (3 COPL); Canindeyú, Ygatimí, Guyrakeha, [24°1'55"S, 55°34'48"W], 20.xi.2009, leg. (1 ♀ CEMT); Guyra Keha, [24°14'37"S, 55°17'21"W], 15.x.2009, J. Rivas leg. (4 COPL). Villarica, H. Richter. (1 ♀ MLPA). Concepción, Zanja Moroti, [23°19'17"S, 56°21'10"W], 25.x.2012, J. Rivas leg. (7 COPL); Same location, 20.

v.2007, J. Rivas leg. (3 COPL); Estancia Recife, [22°17'00"S, 57°27'00"W], 16.ii.2014, U. Drechsel leg. (1 COPL); Caaguazú, [23°24'22"S, 57°25'14"W], x.2010, J. Rivas leg. (1 COPL). Without data. (1 ♀ ZIN). URUGUAY: Without data. (1 ♀ ZIN).

***Bolbapium modestum* (Castelnau, 1840)**

(Figures 6(a), 10(a), (b), (c), 15(b))

Bolboceras modestus Castelnau, 1840: 105 (original description)

Bolboceras modestum: Gemminger and Harold 1869: 1079 (catalogue); Luederwaldt 1931: 430, 436, 437 (review, key), Martínez 1976 (checklist, *incertae sedis*)

Bolboceras modesta: Blackwelder 1944: 220 (checklist)

Diagnosis

Frons with interocular tubercles between eyes and depression in the central region between the tubercles and the clypeus. Pronotum mesoanteriorly with almost rectangular structure in dorsal view; the structure measures less than or equal to half the interocular width (Figure 6(a)).

Redescription

Body size: Length: 5.52–5.64 mm. Width: 4.35–4.57 mm. **Head:** Frons with interocular tubercles between eyes, not connected by transverse carina; region between the tubercles depressed and punctured. **Pronotum:** Pronotum mesoanteriorly with almost rectangular structure in dorsal view, the structure measures less than or equal to half the interocular width. Disc with sparse points, unevenly distributed. **Male terminalia:** In dorsal view, greatly separated parameres and posterior margin with projection beyond the apex of the parameres (broken right paramere) (Figure 10(a)); In lateral view, parameres presenting curvature close to 45°, with the base released and the apex thin (Figure 10(c)). Genital capsule with rounded lateral margins, with setae in both the lateral and central lobes.

Sexual dimorphism: This species does not feature sexual dimorphism. **Remarks:** Castelnau (1840) described the species apparently based on a single specimen collected in Colombia; the original description is simple and does not mention the number of specimens examined. The author mentions that the specimen belongs to the collection of M. Gory; however, the type was never found. It is possible the type is among the miscellany in MNHN; however, no one has been able to analyse it. After the review by Martínez 1976, the species was considered *incertae sedis* and later works do not mention it. Earlier, however, Luederwaldt 1931 mentioned the species among those that currently belong to the genus *Bolbapium*. Considering this, and carefully analysing the original description and species distribution, the transfer of the species to the genus *Bolbapium* is here proposed. Thus, *Bolboceras modestum* is now considered *Bolbapium modestum* comb. nov.

Differential diagnosis. *Bolbapium modestum* is morphologically similar to *B. borgmeieri*, *B. boillyi* sp. nov., *B. caesum*, *B. howdeni*, *B. parcepunctatum*, *B. sampaioorum* sp. nov. and *B. santanaorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by the almost rectangular structure in dorsal view.

Geographical distribution. Colômbia (Tolima).

Non-type material. 2 specimens.

COLOMBIA, Chaparral, viii.1998, J. Noriega leg. (1 CEMT). Tolima, Meuse, BLT – 300m, [4° 5'33"N, 75°9'16"W], xi.1995, EE leg. (1 CEMT).

***Bolbapium paralucidulum* Ide and Martínez, 1993**

(Figures 4(e), 9(g), (h), (i), 16(b))

Bolbapium paralucidulum Ide and Martínez, 1993: 370–371 (original description)

Diagnosis

Frons without formation of interocular tubercles. Clypeal carina extending to the mid-frontal region and meeting in the central region. Pronotum mesoanteriorly without evident structures and without median groove (Figure 4(e)).

Type material. The paratype is deposited at the MZSP, which provided a photo for analysis.

Paratype. 'Ribeirão Preto/ (Fac. Medicina)/ xi.1954/ Barreto col.; Coleão/ M.P: Barreto/ 1969' (MZUSP).

Redescription

Body size: Length: 5.27–7.88 mm. Width: 4.08–6.24 mm. **Head:** Clypeal carina extending to the mid-frontal region and meeting in the central region. Frons flat without tubercles; region between the lateral carinae of the clypeus with strong and evident punctuation, other parts with weak punctuation, almost imperceptible. **Pronotum:** Without evident structures and without median groove; surface with sparse points, unevenly distributed. **Ventral region of the thorax:** Prosternum presents a median longitudinal projection to the posterior margin. **Male terminalia:** In dorsal view, non-differentiated parameres of the phallobase (Figure 9(g)); phallobase with two pointed projections, one on each side, morphologically resembling the genitalia of *Bolbapium sulcifrons* and *Bolbapium lucidulum*, differing from other species that have a single central projection. **Sexual dimorphism:** This species does not feature sexual dimorphism.

Differential diagnosis. *Bolbapium paralucidulum* is morphologically similar to *B. lucidulum*, *B. matheusi* sp. nov., *B. quinquestriatum* and *B. sulcifrons* in not presenting the forehead with tubercles and interocular carinae. However, it is easily differentiated by presenting the curved carinae in the median region of the forehead.

Geographical distribution. Brazil (Distrito Federal, Mato Grosso do Sul, Paraná, Minas Gerais, Rio Grande do Sul, Santa Catarina and São Paulo), Argentina (Buenos Aires and Misiones) and Paraguay (Caazapa).

Non-type material. 25 specimens.

ARGENTINA: Buenos Aires, H. Richter. (1 MLPA); Misiones, x.1935. (1 MLPA). BRAZIL: Distrito Federal, Res. IBGE, [15°52'27"S, 47°53'36"W], xii.1986, I. Diniz leg. (1 CEMT). Mato Grosso do Sul, Bonito, Faz. Pitangueiras, [21°7'35"S, 56°29'2"W], 3.xi.2009, light, Grossi & Parizotto leg. (2 CEMT). Paraná, Piraquara, 25°29'33"S, 48°58'41"W, 9.xii.2011, FIT, F.W.T. Leivas & K. Mise leg. (1 CEMT); Campina Grande do Sul, Estrada da Mandassaia, [25°18'16"S, 49°2'12"W], 2009, FIT, F.W.T. Leivas leg. (1 CEMT); Curitiba, Campina Grande do Sul, 25°17'46"S, 49°2'14"W, FIT, F.W.T. Leivas leg. (1 CEMT); Colombo, EMBRAPA Br 476 km 20. Lev. Ent. PROFAUPAR, [25°20'13"S, 49°10'9"W], 1.xii.1986, malaise, leg. (1 DZUP). Rio Grande do Sul, Santa Cruz do Sul, Cerro Alegre, 43nual crop, (P), 29°48'11"S, 52°19'51"W, 18.ii.2012, pitfall bovine faeces, R. Bohn leg. (1 CEMT); Eldorado do Sul, EEA-UFRGS, [30°1'59"S, 51°13'14"W], 17.i.1997, light trap, Carvalho & Silva leg. (1 CEMT); Montenegro, [29°40'54"S, 51°28'4"W], 16.x.2009, impact trap, Y.E.A. Gadelha leg. (1 CEMT); Bagé, forest, 232m, 31°21'5"S, 54°1'13"W, 2.ii.2017, R.N. Sisti; J.U.P Corrêa; M.A. P. da Silva & H. Ebert leg. (1 CEMT) Santa Catarina, Florianópolis, Praia Pântano do Sul, 27°47"S, 48°31"W, x.2009, pitfall, M.I.M. Hernadez, M. Heusi-Silveira & A.G. Martins leg. (1 CEMT). São Paulo, Assis, [22°39'37"S, 50°25'7"W], 1976, P.S.M. Botelho leg. (1 CEMT); Descalvado, Faz. Itaúnas, citrus, [21°54'57"S, 47°37'13"W], 1.xii.2005, pitfall, N. Periotto leg. (1 CEMT); Same location, mata cerrado, [21°54'57"S, 47°37'13"W], 27.i.2005, pitfall, N. Periotto leg. (1 CEMT). PARAGUAY: Caazapa, Estancia la Lejana, 26°20'S, 55°59'W, 20.xi.2008, U. Drechsel leg. (2 COPL); Tavai, est. Olmedo, 26°13'S, 55°36'W, 01.x.2008, U. Drechsel leg. (6 COPL).

***Bolbapium parcepunctatum* (Arrow, 1913)**

(Figures 10(d), (e), (f), 17)

Bolboceras parcepunctatum Arrow, 1913: 462–463 (original description); Luederwaldt 1931: 445–447, 453–454 (review, key); Bacchus 1978: 114 (catalogue)
Bolboceras (Bolbapium) parcepunctatum: Boucomont 1932: 266–267 (key)
Bolboceras parcepunctata: Blackwelder 1944: 220 (checklist)
Bolbapium parcepunctatum: Martínez 1976: 539, 542, 547 (checklist)

Diagnosis

Frons with formation of poorly developed interocular tubercles between eyes. Pronotum mesoanteriorly with bituberculated structure, almost bidentate, with width equal to half the interocular width. Aedeagus in dorsal view, parameres elongated and with twisted base, greatly separated; in side view, the parameres are concave and extend beyond the posterior margin (Figure 10(d), (e), (f)).

Type material. The type series is deposited at BMNH. It was possible to analyse the material during the curator's stay at the BMNH in Cuiabá; photos of the specimens were taken during this period.

Holotype. '*Bolboceras* ♂ / *parcepunctatum* Arr/ M.E. Bacchus det 1975/ HOLOTYPE; *Bolbapium*/ *parcepuntatum*/ det. J. Krikken 1971; *Bolboceras*/ *parcepunctatum*/ type Arrow; Fry Coll/ 1905–100; Bahia/ ♂ ; Holo/type [white circular label with red edges]' (BMNH).

Paratypes. '*Bolboceras* ♀ / *parcepunctatum* Arr/ M.E. Bacchus det 1975/ PARATYPE; Brazil/ Stanford Exped./ 1913–56.; Ceara-Mirim, Rio/ Grande do Norte/ Brazil. W.M. Mann; Para/type [white circular label with yellow edges]' (BMNH).

'*Bolboceras* ♀ / *parcepunctatum* Arr/ M.E. Bacchus det 1975/ PARATYPE; *Bolbapium*/ *parcepunctatum*/ det. J. Krikken 1971 Arr/ Bahia/ Fry Coll./ 1905–100./ Para/type [white circular label with yellow edges]' (BMNH).

'*Bolboceras* ♂ / *parcepunctatum* Arr/ M.E. Bacchus det 1975/ PARATYPE; Fry Coll./ 1905–100.; Bahia; Para/type [white circular label with yellow edges]' (BMNH).

Redescription

Body size: Length: 5.74–8.45 mm. Width: 4.44–6.10 mm. **Head:** Frons with interocular tubercles between eyes, not connected by transverse carina; region between the tubercles almost flat and with deep points. **Pronotum:** Pronotum mesoanteriorly with little elevated tubercle, almost bidentate, which can be more or less developed; depression marked by points behind the tubercle. Disc with sparse points, unevenly distributed. **Male terminalia:** In dorsal view, parameres elongated and with twisted base, greatly separated (Figure 10(d)); In lateral view, the parameres are concave and extend beyond the posterior margin (Figure 10(f)). **Sexual dimorphism:** Males have weak, almost imperceptible punctuation and the setae are absent in the clypeus; well developed frons tubercle, while females have up to four setae in the posterior region of the clypeus and the rough and carenated surface; underdeveloped frons tubercles. **Remarks:** Arrow (1913) described the species based on a series collected in Bahia, by Alexander Fry in 1860; a male specimen of the series was designated as a type. Bacchus (1978) provided the following information about the type series: Holotype (male) Brazil: Bahia. Paratypes, Brazil: (1 male, 4 females) same data as the holotype; 1 female Ceara-Mirim, Rio Grande do Norte (W. M. Mann); 1 female, Independência, Parahyba (Mann and Heath). The type series is deposited at BMNH.

Differential diagnosis. *Bolbapium parcepunctatum* is morphologically similar to *B. borgmeieri*, *B. boillyi* sp. nov., *B. caesum*, *B. howdeni*, *B. modestum*, *B. sampaiorum* sp. nov. and *B. santanaorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by presenting a bituberculated projection. In addition, it is only possible to distinguish the species from *Bolbapium santanaorum* sp. nov. by male terminalia and geographic distribution, with *B. parcepunctatum* occurring exclusively in the northeast of the country while *B. santanaorum* sp. nov. occurs in the Central-West region, in the north of the southern part of the country and part of the northeast.

Geographical distribution. Brazil (Bahia, Ceará, Paraíba, Pernambuco and Rio Grande do Norte).

Non-type material. 14 specimens.

BRAZIL: Bahia, without data (1 ♀ CEMT); Ubaíra, parc 32, 13°7'6"S, 39°41'24"W, 416mols, xi.2011, pitfall, C.M.P. Leite leg. (1 ♂ CEMT). Ceará, Ubajara, PN Ubajara, Trilha da Samambaia, 3°50'20"S, 40°53'55"W, 850m, 17.ii.2013, light, Vaz-de-Mello & Grossi leg. (1 ♂ CEMT). Paraíba, Santa Teresinha, Faz. Tamandua, trap B1, [7°1'31"S, 37°23'31"W], 2. v.2011, A.D.A. Lima leg. (1 ♂ CEMT); Same location, trap B1, 23.v.2011, A.D.A. Lima leg. (1 ♀ CEMT); Same location, 21.ii.2011, A.D.A. Lima leg. (1 ♀ CEMT). Pernambuco, Caruaru, [8° 16'33"S, 35°58'54"W], 900 m, v.1972, J. Lima leg. (1 ♂ CEMT); Igarassu, RECD, [7°49'42"S, 34°52'26"W], 11.v.2007, Cavalcanti et al. leg. (3 ♀ CEMT); Same location, 25.v.2007, Cavalcanti et al. leg. (2 ♀ CEMT); Rio Grande do Norte, Natal, Parnamirim, [5°54'41"S, 35° 16'16"W], iv.1950, M. Alvarenga leg. (1 DZUP); Same location, xi.1949, M. Alvarenga leg. (1 DZUP).

Bolbapium quadrispinosum (Luederwaldt, 1931)

(Figures 4(a), 8(a), (b), (c), 12(b))

Bolboceras quadrispinosum Luederwaldt, 1931 (original description, key)

Bolboceras (Bolbapium) quadrispinosum: Boucomont 1932: 267 (key)

Bolboceras quadrispinosa: Blackwelder 1944: 220 (checklist)

Bolbapium quadrispinosum: Martínez 1976: 547 (checklist)

Diagnosis

Frons with tubercles connected by transversal carina between the eyes. Pronotum mesoanteriorly with robust pair of tubercles, connected at base and separate middle and apex region, behind the structure there is a depression in which the median groove begins (Figure 4(a)).

Neotype. 'BRASIL: São Paulo./ Jaboticabal. Campus/ FCAV-UNESP, 21°14'25'S/ 48° 17'22"O, 605 m./ outubro de 2013. Atraído/ por luz. Noite. HL Rainho. ♂ " (CEMT 74829).

Redescription

Body size: Length: 4.32–6.16 mm. Width: 3.33–4.84 mm. **Head:** Frons with interocular tubercles connected by transversal carina; region between the frons and the clypeus with slope and weak points. **Pronotum:** Bituberculated structure split in half at the anterior part of the disc; region immediately lateral to the concave projection; behind the projection there is a depression in which the median groove begins. Disc sides with a few points unevenly distributed. **Ventral region of the thorax:** Metaventricle with a few unevenly distributed setae. **Elytron:** There are setae in the apical region of the external dorsal margin of the elytra (quantity varies among individuals). **Male terminalia:** In dorsal view, parallel and separate parameres (Figure 8(a)). Parameres slightly curved in lateral view, forming an approximate angle of 45° in relation to the phallobase; posterior margin in lateral view with pointed and curved projection (Figure 8(c)). **Sexual dimorphism:** Males have the anterior margin of the clypeus projected forward, the width is smaller, the setae are absent and the tubercles and central structure are more robust, while the females have the clypeus as wide as long and in the posterior region of the clypeus up to four setae, rough and carenated clypeus surface, and the projection of the pronotum is lower compared to males.

Designation of type material. It was confirmed that the type of *Bolbapium quadrispinosum* was lost in the fire that occurred at the National Museum, Rio de Janeiro, in 2018, therefore, for confirmation of the taxon and so there are no further problems of identification, we propose to designate a neotype for the species. The specimen being proposed as a neotype originally belongs to the CEMT, and comes from the location closest to the type locality of the species. It will be deposited at the National Museum, Rio de Janeiro.

Differential diagnosis. *Bolbapium quadrispinosum* is morphologically similar to *B. baeri*, *B. furtadoi* sp. nov., *B. limeirai* sp. nov., *B. luederwaldti* sp. nov. and *B. minutum* in presenting the forehead with a transverse carina interconnected by tubercles. However, it is easily distinguished from the other species because presents the structure of the pronotum split in the middle.

Geographical distribution. Brazil (Alagoas, Bahia, Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais and São Paulo) and Bolivia (Santa Cruz).

Non-type material. 413 specimens.

BOLIVIA, Santa Cruz, Ichilo, Cam. Vivora, [16°58'34"S, 64°10'1"W], 15–17.x.1998, M. Gutierrez, L. Targara & P. Coro leg. (1 ♂ CEMT); Same location, Buenavista, x.1949, coll A. Martínez. (2 COPL); Santa Cruz, 500 m, xii.1955, A. Reichenbach det. 2010, Zischka leg. (2 COPL). BRAZIL: Alagoas, Ibateguara, Serra Grande, [8°58'90"S, 36°3'53"W], 2. ii.2011, UFPE students leg. (1 ♂ 1 ♀ CEMT); Same location, Usina Serra Grande – NI-5 TR 11–200, [8°58'23"S, 36°3'58"W/] 1.v.2011, B.K.C. Filgueiras leg. (1 ♀ CEMT). Bahia, Mucuri, [18°5'0"S, 39°32'59"W], 24.x.1997, Anjos & Silveira leg. (2 ♂ CEMT); Caravelas, [17°44'0"S, 39°15'54"W], iii.1997, R.D. Silveira leg. (1 ♂ CEMT); Itamarajú, Parc 9, 17° 1'8"S, 39°27'33"W, 5.iv.2011, pitfall, C.M.P. Leite leg. (1 ♀ CEMT); Una, Eat. Exper. Lemos Maia, 15°17'11"S, 39°5'26"W, 18.x.1983, J. Beackey leg. (1 ♂ CEMT); Poções, [14°31'30"S, 40°21'53"W], xi.1973, H. Alvarenga, Pereira det 1976. (1 COPL); Encruzilhada, [15°31'50"S, 40°54'46"W], xii.2007, P. Grossi leg. (4 COPL). Espírito Santo, Linhares, Flona de Goytacazes. Mata primária, 19°26'10"S, 40°4'24"W, 19. xi.2010, light, D.S. Martins leg. (1 ♂ CEMT); Same location, 10.xi.2010, light, D.S. Martins leg. (2 ♂ CEMT); Same location, 09.xi.2010, light, D.S. Martins leg. (1 ♂ CEMT); Same location, 11.xi. 2010, light, D.S. Martins leg. (1 ♂ CEMT); Same location, Flona de Goytacazes. Mata secundária, 19°25'56"S, 40°4'12"W, 9.xi.2010, light, D.S. Martins leg. (36 ♂ 42 ♀ CEMT); Same location, Reserva Natural da Vale, [19°8'14"S, 40° 3'49"W], xi.1988, J.S. Santos leg. (15 ♂ 31 ♀ CEMT); Same location, 19°9'4"S, 40° 4'14"W, x.88, light, J.R. Santos (4 ♀ 12 ♂ CEMT); Same location, xii.87, light, J.R. Santos (47 ♀ 127 ♂ CEMT); Same location, RFCVRD, 19°8'39"S, 40°4'13"W, xii.1988, J. S. Santos leg. (1 ♂ CEMT); Sooretama, Reserva Natural da Vale, [19°8'39"S, 40°4'2"W], xii.1988, J.S. Santos leg. (23 ♂ 23 ♀ CEMT). Goiás, Niquelândia, [14°28'1"S, 48° 27'16"W], x.1993 (1 ♀ CEMT); Luziânia, [16°31'25"S, 48°0'3"W], 12.i.1992, Bello leg. (1 ♀ CEMT). Mato Grosso, Tangará da Serra, [14°37'11"S, 57°29'15"W], 27.vi.2018, M.V. S. Silva leg. (1 ♂ CEMT); Same location, UNEMAT, [14°39'7"S, 57°26'2"W], 11.xi.2011, light, G.A.P. Neves leg. (1 ♂ CEMT); Água Boa, Rancho Araguaia, 13°56'40"S, 52° 6'10"W, 24.xii.2017, Mota & Schutz leg. (1 ♂ CEMT); Diamantino, Vale da Solidão, 12°22'"S, 56°7'"W, 450 m, ii.2012, E. Furtado leg. (2 ♂ CEMT); Same location, 14°

22°30'S, 56°7'30"W, 500 m, 26 a 31.x.2013, E. Furtado leg. (7 ♂ 3 ♀ CEMT). Mato Grosso do Sul, Dourados, [22°13'24"S, 54°48'55"W], 15.xi.2007, L. Landefeldt leg. (1 ♂ CEMT); Campo Grande, WC lab. Samid. Animal Embrapa, [20°26'S, 54°43'7"W], 12.ii.2004, luz, W.W. Koller leg. (1 ♂ CEMT). Minas Gerais, Sete Lagoas, Embrapa, 19°26'49"S, 44°10'19"W, 25.xi.2011, light trap, S.M. Mendes leg. (1 ♀ CEMT); Frei Gaspar, Sítio Recanto Paraíso, 18°2'6"S, 41°29'10"W, 3.i.2008, light trap, M.R. Santos leg. (1 ♂ CEMT); Same location, 571 m, 30.xii.2007, light trap, M.R. Santos (3 ♂ CEMT); Same location, 28.xii.2007, light trap, M.R. Santos (2 ♂ CEMT). São Paulo, Cerqueira César, [23°2'18"S, 49°9'57"W], xii.1995, J. Carlos leg. (1 ♂ CEMT); Batatais, [20°53'10"S, 47°35'07"W], xi.1948, coll A. Martínez, P. Peeira leg. (1 COPL).

***Bolbapium quinquestriatum* (Boucomont, 1932)**

(Figures 5(d), 9(a), (b), (c), 14(a))

Bolboceras (*Bolbapium*) *quinquestriatum* Boucomont, 1932: 265, 266, 268 (original description)

Bolboceras quinquestriata: Blackwelder 1944: 220 (checklist)

Bolbapium quinquestriatum: Martínez 1976: 542, 547 (checklist)

Diagnosis

Frons without interocular tubercles between eyes. Clypeus with lateral carinae extending backwards; posterior border of the frons with transverse groove. Pronotum mesoanteriorly without evident structures and pronotum with serrated lateral margins (Figure 5(d)).

Type material. It was possible to analyse one of the types during the curator's stay at the BMNH in Cuiabá; photos of the specimen were taken during this period. The other types are deposited at the MNHN, which provided photos of the material. Therefore, we here designate a lectotype.

Lectotype. 'Para-/guay; MUSÉUM PARIS/ 1938/ COLL. A. BOUCOMONT; SYNTYPE [red rectangular label]; SYNTYPE/ *Bolbapium/ quinquestriatum/* (Boucomont 1932)' (MNHN/EC10573).

Paralectotypes. 'Boucomont det. 1931/ *Bolboceras/ quinquestriatum/* Paraguay./ Sapucay./ W. Foster./ 3.xi.1901./ 1905–188.; *Bolboceras/ quinsquestriatum/ Boucomont 1931/ des. E. Carvalho/* PARALECTOTYPE. [yellow rectangular label]' (BMNH).

'Para-/guay; *Bolboceras/ 5 – itriatus/ N. ih./* Typus [red rectangular label]; *B. quinquestriatus/ Bouc./* MUSÉUM PARIS/ 1938/ COLL. A. BOUCOMONT; SYNTYPE [red rectangular label]; SYNTYPE/ *Bolbapium/ quinquestriatum/* (Boucomont 1932)' (MNHN/EC10572).

Redescription

Body size: Length: 8.11–9.47 mm. Width: 6.28–7.43 mm. **Head:** Clypeus opaque, with distinct punctuation; sides wider than the central part; clypeal carina with three tubercles, the lateral ones being slightly higher than the middle one; lateral carinae

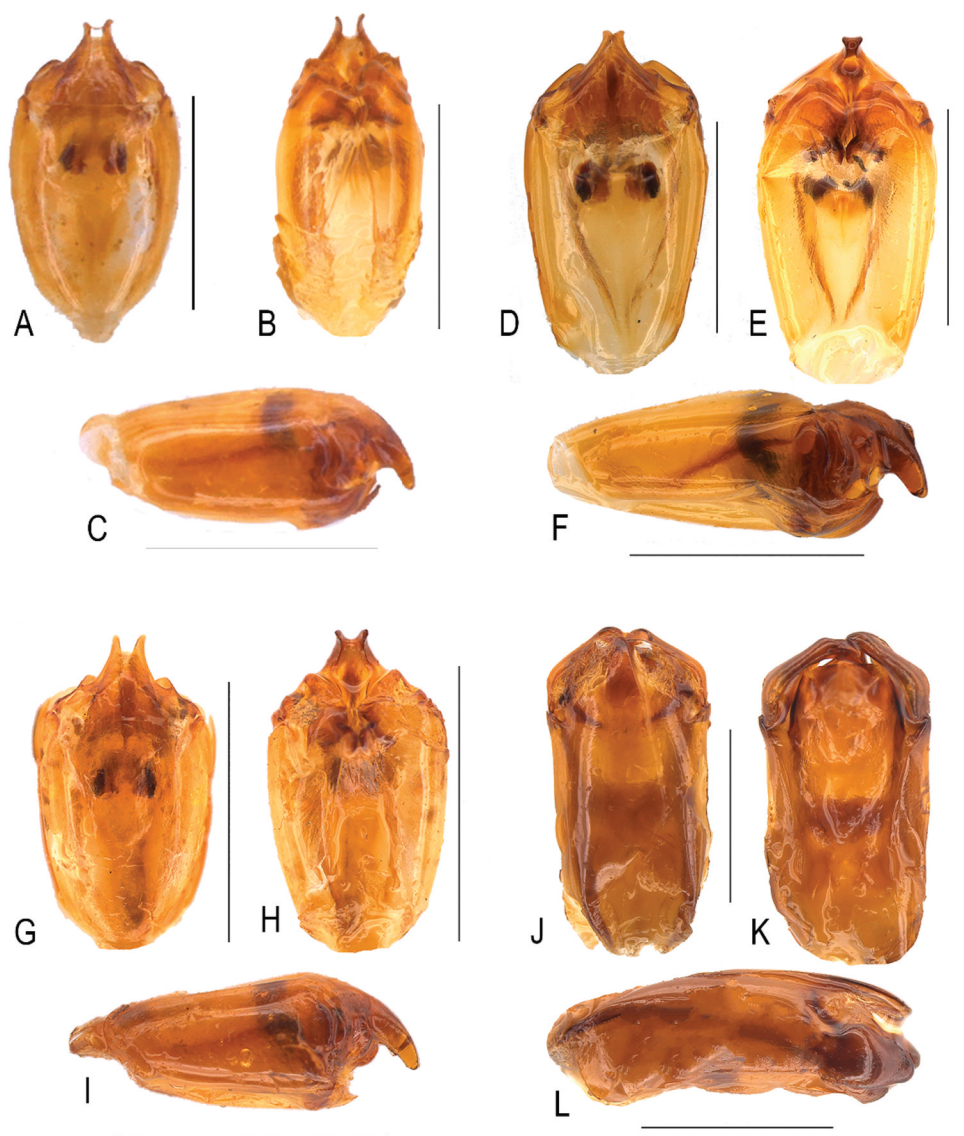


Figure 8. Aedeagus. *Bolbapium quadrispinosum* (Luederwaldt, 1931) **(a)**. dorsal view; **(b)**. ventral view; **(c)**. lateral view. *Bolbapium limeirai* Carvalho and Vaz-de-Mello, sp. nov. **(d)**. dorsal view; **(e)**. ventral view; **(f)**. lateral view. *Bolbapium furtadoi* Carvalho and Vaz-de-Mello, sp. nov. **(g)**. dorsal view; **(h)**. ventral view; **(i)**. lateral view. *Bolbapium sulcifrons* Ide and Martínez, 1993 **(j)**. dorsal view; **(k)**. ventral view; **(l)**. lateral view.

extending backwards ending at the edge of the canthus. Canthus wide compared to other species of the genus, with strong and evident punctuation. Frons flat and without projections, punctuation more concentrated in the anterior region, between the clypeal carinae; other parts with sparse points, distributed unevenly; posterior region of the frons with transverse groove. The last three antennomeres of the antenna, which form the antennal club, have a globular shape, compared to the other species (Figure 2(c)).



Figure 9. Aedeagus. *Bolbapium quinquestriatum* (Boucomont, 1932) (a). dorsal view; (b). ventral view; (c). lateral view. *Bolbapium boillyi* Carvalho and Vaz-de-Mello, sp. nov. (d). dorsal view; (e). ventral view; (f). lateral view. *Bolbapium paralucidulum* Ide and Martínez, 1993 (g). dorsal view; (h). ventral view; (i). lateral view. *Bolbapium lucidulum* (Klug, 1843) (j). dorsal view; (k). ventral view; (l). lateral view.

Pronotum: Serrated side margin and with a row of ventral setae. Without evident structures. **Ventral region of the thorax:** Metaventricle convex in the central region and with a median groove that follows from the apex the base of the metaventricle, the base being wider than the apex; region where the median groove starts higher than

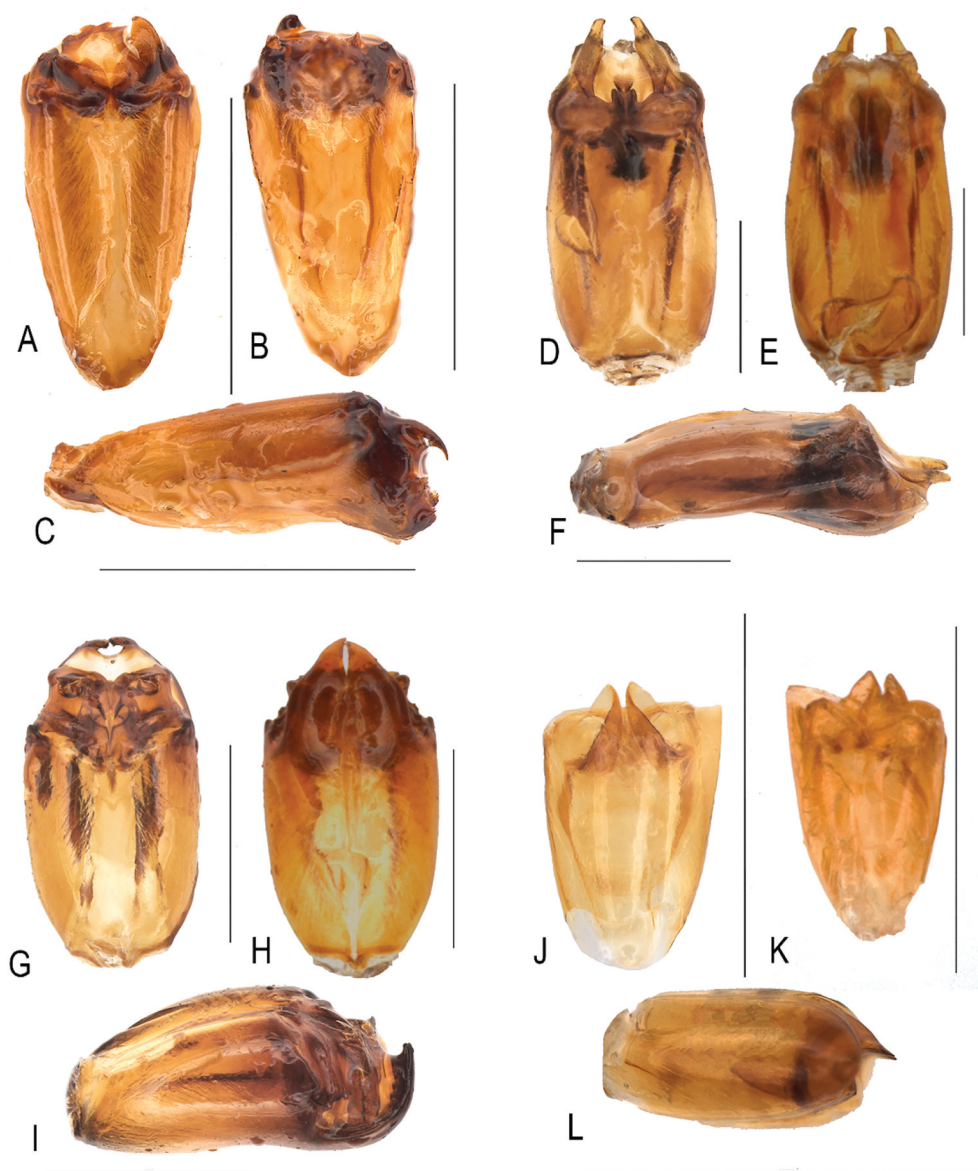


Figure 10. Aedeagus. *Bolbapium modestum* (Castelnau, 1840) (a). dorsal view; (b). ventral view; (c). lateral view. *Bolbapium parcepunctatum* (Arrow, 1913) (d). dorsal view; (e). ventral view; (f). lateral view. *Bolbapium santanaorum* Carvalho and Vaz-de-Mello, sp. nov. (g). dorsal view; (h). ventral view; (i). lateral view. *Bolbapium borgmeieri* Martínez, 1976 (j). dorsal view; (k). ventral view; (l). lateral view.

the others, projected upwards; metaventrite surface with setae, except for a small region near the lower margin. **Male terminalia:** Elongated, parallel and symmetrical dorsal view (Figure 9(a)); in lateral view, longitudinal parameres to the phallobase (Figure 9(c)). **Sexual dimorphism:** This species does not feature sexual dimorphism.

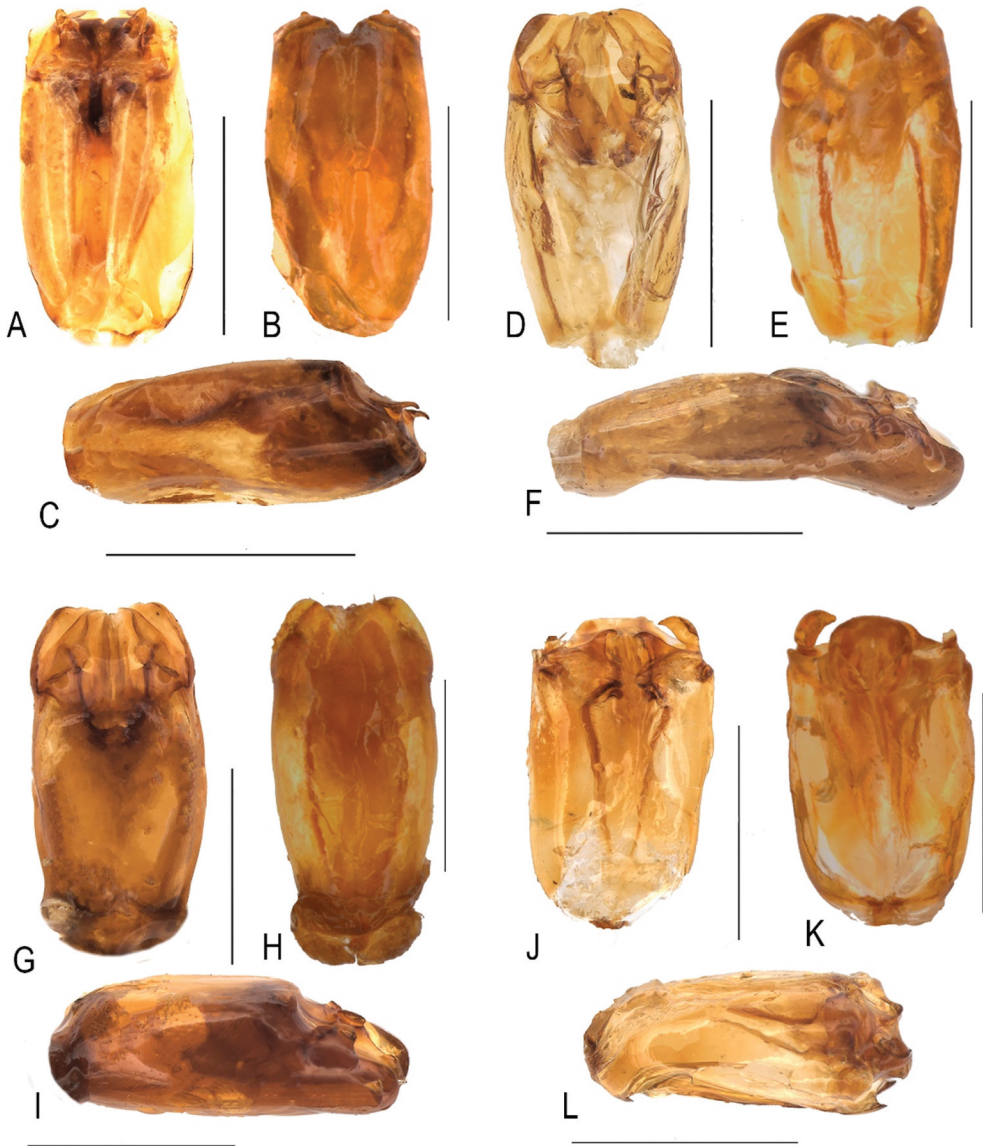


Figure 11. Aedeagus. *Bolbapium matheusi* Carvalho and Vaz-de-Mello, sp. nov. (a). dorsal view; (b). ventral view; (c). lateral view. *Bolbapium howdeni* Martínez, 1976 (d). dorsal view; (e). ventral view; (f). lateral view. *Bolbapium sampaioorum* Carvalho and Vaz-de-Mello, sp. nov. (g). dorsal view; (h). ventral view; (i). lateral view. *Bolbapium caesum* (Klug, 1843) (j). dorsal view; (k). ventral view; (l). lateral view.

Designation of type material. *Bolbapium quinquestriatum* was described based on a series type; the author did not mention how many specimens were studied and did not designate the holotype. Currently the types are deposited at the MNHN and BMNH and have been examined, respectively, by photos and in person. We propose to designate the

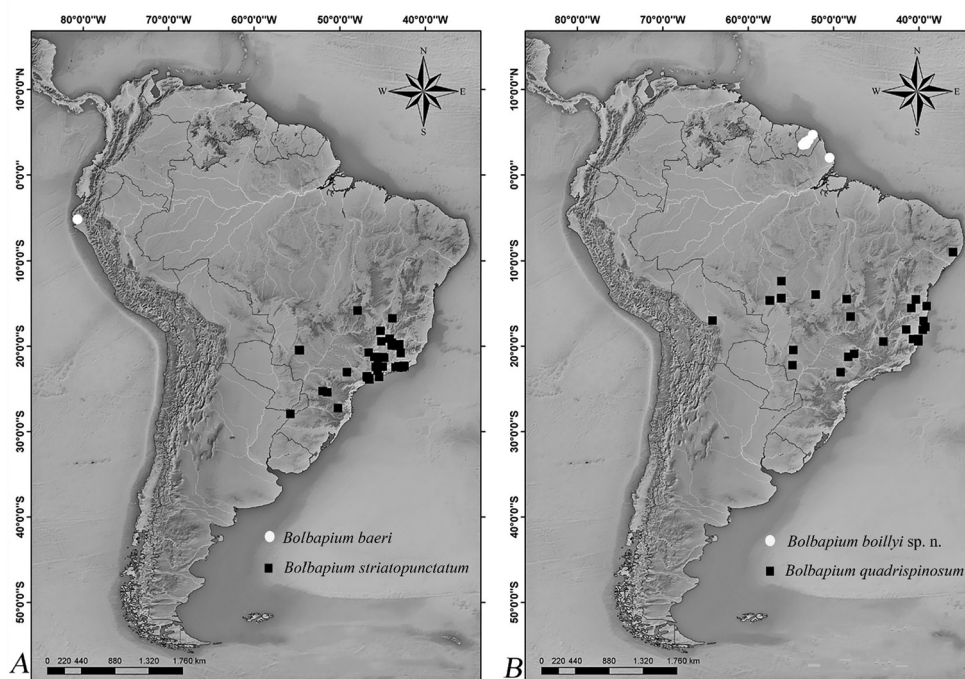


Figure 12. Geographical distribution. **(a).** *Bolbapium baeri* (Boucomont, 1902) (white circle) and *Bolbapium striatopunctatum* (Castelnau, 1840) (black squares); **(b).** *Bolbapium boillyi* sp. nov. (white circles) and *Bolbapium quadrispinosum* (Luederwaldt, 1931) (black squares).

lectotype for the species to ensure the fixation of the specific name in the best available specimen, in terms of good condition and development of any diagnostic characters subject to allometry.

Differential diagnosis. *Bolbapium quinquestriatum* is morphologically similar to *B. lucidulum*, *B. matheusi* sp. nov., *B. paralucidulum*, *B. quinquestriatum* and *B. sulcifrons* in not presenting the forehead with tubercles and interocular carinae. However, it is easily differentiated by presenting a serrated pronotum edge.

Geographical distribution. Paraguay (Caazapa, Concepción and Guairá.).

Non-type material. 5 specimens.

PARAGUAY: Caazapa, Estancia la Lejana, 26°20'S, 55°59'W, 20.xi.2008, U. Drechsel leg. (2 COPL); Concepción, NP Serranía San Luis, [22°34'0"S, 57°28'0"W], 21–23.i.2001, Mráček leg. (2 CEMT). Guairá, Villarrica, [25°46'33"S, 56°26'58"W], xi.1928, F. Schada leg. (1 CEMT).

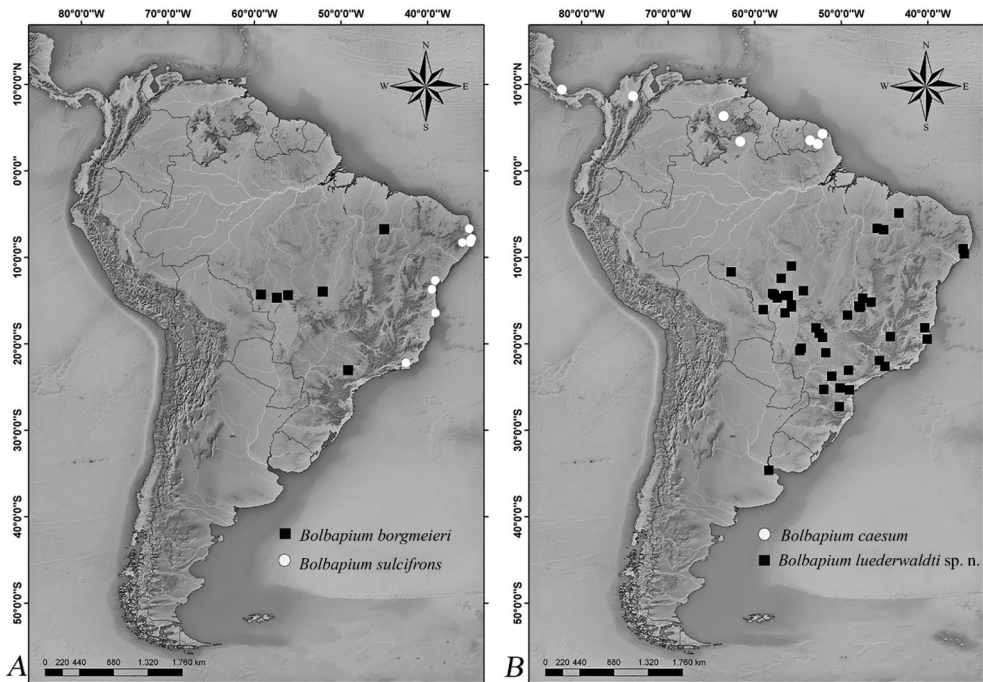


Figure 13. Geographical distribution. **(a).** *Bolbapium borgmeieri* Martínez, 1976 (black squares) and *Bolbapium sulcifrons* Ide and Martínez, 1993 (white circles); **(b).** *Bolbapium caesum* (Klug, 1843) (white circles) and *Bolbapium luederwaldti* Carvalho and Vaz-de-Mello, sp. nov. (black squares).

***Bolbapium sampaioorum* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 6(e), 11(g), (h), (i), 15(b))

Diagnosis

Frons with tubercle wider than long adjacent to each eye. Pronotum mesoanteriorly with almost rectangular structure in dorsal view (Figure 6(e)).

Etymology. Named after Isadora Sampaio and Henrique Sampaio, beloved sister and brother of the first author.

Type locality. Tangará da Serra, Mato Grosso, Brazil.

Holotype. ‘Brasil: Mato Grosso. Tangará/ da Serra. Campus UNEMAT. 14°/38’58’S, 57° 25’24”W, 439 m./ Campo experimental, light/ trap. 14.xi.2017 R.J. Silva.” ♂ (CEMT 74758).

Paratypes. 4 specimens examined.

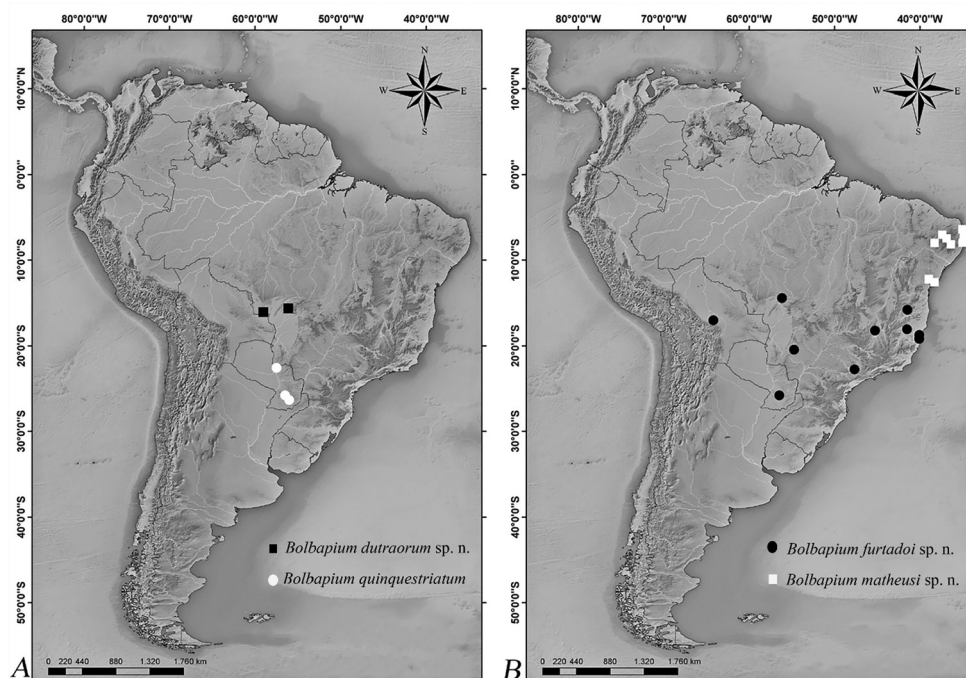


Figure 14. Geographical distribution. **(a).** *Bolbapium dutraorum* Carvalho and Vaz-de-Mello, sp. nov. (black squares) and *Bolbapium quinquestriatum* (Boubomont, 1932) (white circles); **(b).** *Bolbapium furtadoi* Carvalho and Vaz-de-Mello, sp. nov. (black circles) and *Bolbapium matheusi* Carvalho and Vaz-de-Mello, sp. nov. (white squares).

BRAZIL: Acre, Rio Branco, [9°58'31"S, 67°49'29"W], 1.x.1988, Faria leg. (1CEMT). Goiás, Niquelândia, Codemin, [14°18'21"S, 48°23'44"W], 8.xii.1991, leg. (1 CEMT). Mato Grosso, Cuiabá, Flor do Cerrado, 15°29'38"S, 56°4'36"W, 8–12.x.2016, FIT, A. Frolov leg. (1 CEMT). Rondônia, Vilhena, [12°44'29"S, 60°7'49"W], 25.iv.2006, light trap, J.A. Rafael & F.F. Xavier leg. (1 CEMT).

Description

Body size: Length: 4.98–6.71 mm. Width: 3.56–5.45 mm. **Head:** Clypeal carina with three tubercles, being poorly defined and on an equal level. Frons presents interocular tubercles that are wider than long adjacent to each eye; concave region between the tubercles and with sparse punctuation, with points unevenly distributed. **Pronotum:** Anterior region of the disc with almost rectangular tubercle, wider than half the interocular space. The entire pronotum surface with sparse points, greater concentration on the sides of the disc and unevenly distributed. **Male terminalia:** In dorsal view, apparently short and twisted parameres (Figure 11(g)). In lateral view, parameres not visible and posterior margin beyond the apex of the parameres and rounded (Figure 11(i)). **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** The primary type is deposited at the CEMT.

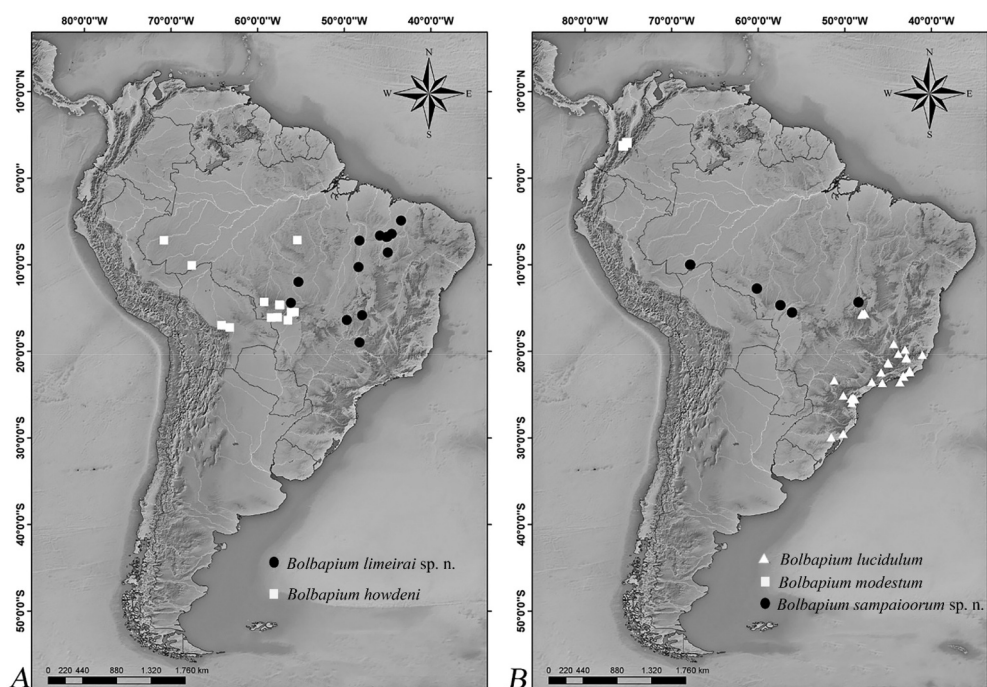


Figure 15. Geographical distribution. **(a).** *Bolbapium limeirai* Carvalho and Vaz-de-Mello, sp. nov. (black circles) and *Bolbapium howdeni* Martínez, 1976 (white squares); **(b).** *Bolbapium lucidulum* (Klug, 1843) (white triangles), *Bolbapium modestum* (Castelnau, 1840) (white squares) and *Bolbapium sampaioorum* Carvalho and Vaz-de-Mello, sp. nov. (black circles).

Differential diagnosis. *Bolbapium sampaioorum* sp. nov. is morphologically similar to *B. borgmeieri*, *B. boillyi* sp. nov., *B. caesum*, *B. howdeni*, *B. modestum*, *B. parcepunctatum* and *B. santanaorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by presenting on the pronotum almost rectangular structure occupying more than half of the interocular space.

Geographical distribution. Brazil (Acre, Goias, Mato Grosso and Rondonia).

Bolbapium santanaorum Carvalho and Vaz-de-Mello, sp. nov.

(Figures 10(g), (h), (i), 17)

Diagnosis

Frons with formation of poorly developed interocular tubercles and the anterior part of the pronotum with little elevated, almost bidentate tubercle. Aedeagus in dorsal view, extremely short and flat parameres, posterior margin going beyond the apex of the parameres. In posterior lateral margin view with curved projection forming an approximate 45° angle towards the parameres (Figure 10(g), (h), (i)).

Etymology. Named for Evelyn Santana, Vinicius Santana and Murillo Santana, beloved sister and brothers of the first author.

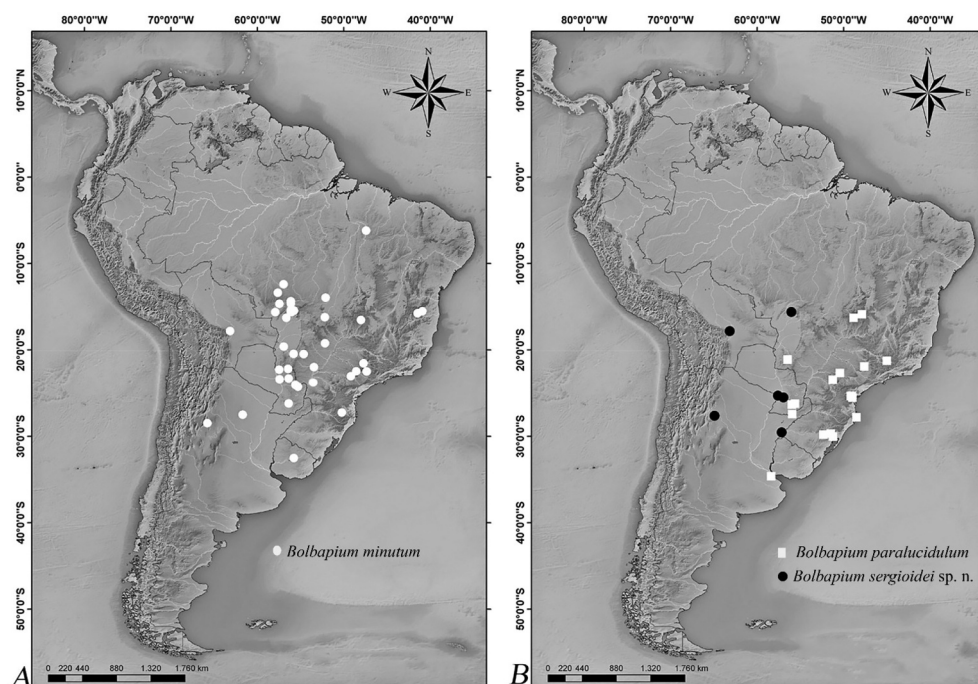


Figure 16. Geographical distribution. **(a).** *Bolbapium minutum* (Luederwaldt, 1931) (white circles); **(b).** *Bolbapium paralucidulum* Ide and Martínez, 1993 (white squares) and *Bolbapium sergioides* Carvalho and Vaz-de-Mello, sp. nov. (black circles).

Type locality. Mirador, Maranhão, Brazil.

Holotype. 'Brasil (MA), Mirador/ Parque Est. Mirador/ Base da Geraldina/ 06°37'25"S|4°52'08"W; Armadilha de Malaise/ 11–16.i.2013, J. T./ Câmara, L. M. Santos/ L. S. Santos, cols.// CZMA//." ♂ (CEMT 74810).

Paratypes. 28 specimens examined.

BRAZIL: Distrito Federal, Sobradinho, Contagem, 15°39'51"S, 47°50'2"W, 31.i.2009, manual, C.M. Oliveira leg. (1 CEMT); Ceilândia, 15°45'31"S, 48°15'6"W, 13.xi.2012, pitfall, F. Schmidt leg. (1 CEMT); Planaltina, 15°36'24"S, 47°44'42"W, 4.xii.2015, light trap., A. Specht leg. (1 CEMT); Same location, Embrapa CPAC, 15°36'24"S, 47°42'45"W, 28.xi.2013, FIT, C.M. Oliveira leg. (1 CEMT); Same location, 27.ii.2014, FIT, C.M. Oliveira leg. (1 CEMT). Goiás, Niquelândia, [14°28'1"S, 48°27'16"W], i.1995 (1 CEMT); Jataí, [17°53'3"S, 51°43'39"W], x.1972, F.M. Oliveira leg. (1 CEMT). Maranhão, Caxias, Povoado Descanso Posto Policial, Farol, [4°51'40"S, 43°12'49"W], 16.viii.2009, A.T. Sousa, A.L. Costa, P.A.M. Moraes leg. (1 CEMT); Mirador, Parque Est. Mirador, posto avançado do Mel, 6°43'48"S, 45°0'22"W, 18–25.iii.2012, malaise trap, F. Limeira de Oliveira & D.W.A. Marques leg. (1 CEMT); Same location, Base da Geraldina, 6°37'25"S, 45°52'8"W, 11–16. i.2013, malaise trap, J.T. Câmara, L.L.M. Santos, L.S. Santos leg. (4 CEMT); Same location, 07–14. v.2010, malaise trap, J.C. Silva & M.M. Abreu leg. (1 CEMT). Mato Grosso, Chapada dos Guimarães, [15°27'53"S, 55°45'1"W], 03–13.xi.2008, malaise 1, S.P. Rosa, F. Fernandes, R. Kawada, J. Almeida leg. (1 CEMT); Diamantino, Vale da Solidão, 14°22'30"S, 56°7'30"W, 26–

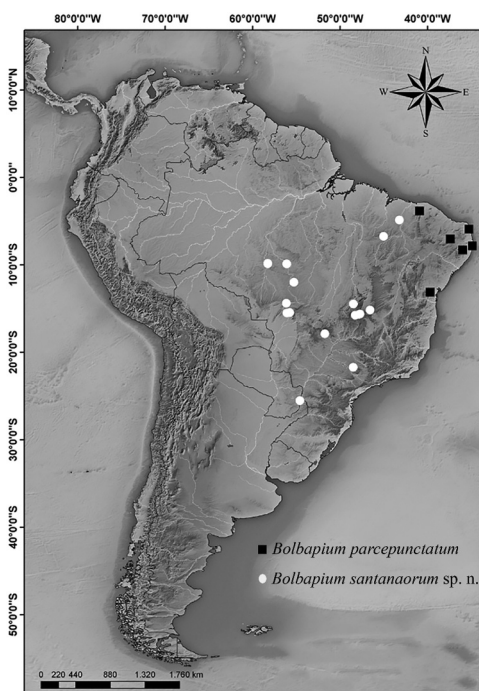


Figure 17. Geographical distribution. *Bolbapium parcepunctatum* (Arrow, 1913) (black squares) and *Bolbapium santanaorum* Carvalho and Vaz-de-Mello, sp. nov. (white circles).

31.x.2013, E. Furtado leg. (1 CEMT); Cuiabá, Flor do Cerrado, 15°29'38"S, 56°4'36"W, 12–17. xi.2015, FIT, A. Frolov leg. (1 CEMT); Alta Floresta, CEPLAC, [9°53'11"S, 56°5'3"W], 1.iv.2010, FIT, V. Golçlves leg. (2CEMT); Santa Carmem, [11°58'31"S, 55°16'43"W], 1.v.2014, K. Peña leg. (1 CEMT); Cotriguaçu, Faz. São Nicolau, [9°51'21"S, 58°14'52"W], iv.2005, O. Peres leg. (2 CEMT); Same location, Faz. São Nicolau – PPBio P1, 9°48'35"S, 58°15'51"W, 23.x.2012, FIT, F.Z. Vaz-de-Mello leg. (1 CEMT). Minas Gerais, Buritis, Farm. Querência, [15°9'38"S, 46°33'55"W], 3.xii.2012, light, C. M. Oliveira leg. (1 CEMT). Paraná, Foz do Iguaçu, [25°30'58"S, 54°35'7"W], 3.xi.1983, O.J. Celso leg. (1 CEMT). São Paulo, Matão, 21°42'12"S, 48°28'42"W, xii.2013 (1 CEMT). Without data (2 CEMT).

Description

Body size: Length: 6.20–7.14 mm. Width: 4.84–5.59 mm. **Head:** Clypeal carina with three tubercles on an equal level. Frons with poorly developed interocular tubercles, not connected by carina; region between the tubercles almost flat and with few points. **Pronotum:** Anterior region of the pronotum with little elevated tuber, almost bidentate, which can be more or less developed; depression marked by points behind the tubercle. **Male terminalia:** In dorsal view, extremely short and flat parameres, posterior margin going beyond the apex of the parameres (Figure 10(g)). In posterior lateral margin view with curved projection forming an approximate 45° angle towards the parameres (Figure 10(i)). **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** The primary type is deposited at the CEMT.

Differential diagnosis. *Bolbapium santanaorum* sp. nov. is morphologically similar to *B. borgmeieri*, *B. boillyi* sp. nov., *B. caesum*, *B. howdeni*, *B. modestum*, *B. parcepunctatum* and *B. sampaioorum* sp. nov. in not presenting the transverse carina forehead interconnecting the interocular tubercles. However, it is easily differentiated by presenting a bituberculated projection. In addition, it is only possible to separate the species of *Bolbapium parcepunctatum* for male aedeagus and geographic distribution; see the Remarks on *B. parcepunctatum* for more information.

Geographic distribution. Brazil (Maranhão, Minas Gerais, Distrito Federal, Goiás, Mato Grosso, Paraná and São Paulo).

***Bolbapium sergioidae* Carvalho and Vaz-de-Mello, sp. nov.**

(Figures 3(c), 7(d), (e), (f), 16(b))

Diagnosis

Lower parts of clypeo-frontal carina much higher than anterior clypeal carina; mesoanterior pronotal structure bituberculated, well emarginated, tubercle on each side of the central structure (Figure 3(c)).

Etymology. Named for Dr Sergio Ide, Brazilian scarabaeoidologist, who reviewed the genus *Bolbapium* in his MSc thesis back in 1992.

Type locality. Recanto das Siriemas, Cuiabá, Mato Grosso, Brazil.

Holotype. 'Brasil: Mato Grosso,/ Cuiabá, Recanto das/ Siriemas, 15°35'33"S, 56°/1'37"W, x.2015/LGOA Nunes." ♂ (CEMT 74746).

Paratypes. 7 specimens examined.

ARGENTINA: Corrientes, Rta 14, 45 km N Paso de Los Libres, 29°31'21"S, 57°7'58"W, 24.xi.2006, Berger-Dostal leg. (1 CEMT); Santiago del Estero, Rio Hondo, [27°35'34"S, 64°54'46"W], 25.xi.1953, coll. Martínez, A. Ogloblin leg. (1 COPL). BOLIVIA: Santa Cruz, [17°48'52"S, 63°9'21"W], 30.x.1955, Zischka leg. (1 CEMT). BRAZIL: Mato Grosso, Várzea Grande, EMPAER, 08.xi.2021 G. Pessoa leg. (2 CEMT). PARAGUAY: Assunção, [25°15'49"S, 57°34'33"W], 14.iv.1948, coll. Martínez, Podtinguin leg. (1 COPL); Cordillera, Pirareta, 25°29'S, 56°56'W, 03.xi.2012, U. Drechsel leg. (1 COPL).

Description

Body size: Length: 5.70–6.01 mm. Width: 4.41–4.69 mm. **Head:** Lower parts of clypeo-frontal carina much higher than anterior clypeal carina. Frons presents an arc-shaped carina that connects with clypeo-frontal carina; region between the carina and the clypeus with a weak and not very evident score. Antenna with the last three antennomeres with globular shape compared with the other species (Figure 2(c)). **Pronotum:** Bituberculated structure, well emarginated, and a tubercle on each side of the central structure. **Ventral region of the thorax:** Central region of the metaventrite with a few unevenly distributed setae. **Elytron:** There are setae in the apical region of the external dorsal margin of the elytron

(quantity varies among individuals). **Male terminalia:** In dorsal view, parameres are found together, separating slightly at the apex (Figure 7(d)); in lateral view, curved parameres forming an angle of almost 45°; posterior margin with slightly curved projection and rounded apex (Figure 7(f)). **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** The primary type is deposited at the CEMT.

Differential diagnosis. *Bolbapium sergioidei* sp. nov. is morphologically similar to *B. dutraorum* sp. nov. and *B. striatopunctatum* in presenting the forehead with a transverse carina without tubercle formation on each side. However, it is easily distinguished by the difference in structures in the anterior region of the pronotum: *B. sergioidei* sp. nov. has a strongly bituberculated structure, in addition to the upward-projected clypeus.

Geographical distribution. Brazil (Mato Grosso); Bolivia (Santa Cruz); Argentina (Corrientes and Santiago del Estero), Paraguay (Asunción and Cordillera).

***Bolbapium striatopunctatum* (Castelnau, 1840)**

Type species

(Figures 3(a), 7(a), (b), (c), 12(a))

Bolboceras striatopunctatus Castelnau, 1840: 105 (original description); Klug 1843: 52–53 (review); Lacordaire 1856: 143 (description); Gemminger and Harold 1869: 1080 (catalogue); Boucomont 1902: 587 (checklist); Boucomont 1902: 6 (review)

Bolboceras (Eucanthus) striatopunctatus: Boucomont 1909: 117 (notes)

Bolboceras (Bolbapium) striatopunctatum: Boucomont 1910: 336, 340 (review); 1912: 14 (catalogue); 1932: 226 (key). Luederwaldt 1931: 428, 429, 431, 435, 442 (biol.); Paulian 1941: 3 (review)

Bolboceras striatopunctata: Blackwelder 1944: 220 (checklist)

Bolbapium striatopunctatum: Howden 1973: 1569–1570 (notas); Martínez 1976: 543 (checklist)

Diagnosis

No trace of medial tubercle adjacent to each eye. Frontal carina as wide as clypeo-frontal carina. Pronotum mesoanteriorly with trapezoidal structure and a lateral tubercle on each side of the central structure. Small depression marked by points on each side, between the tubercle and the central structure (Figure 3(a)).

Neotype. ‘Brasília/ DF – BRASIL/ xii-1987/ leg: V-de-M (CEMT 00074109)’.

Redescription

Body size: Length: 6.86–8.95 mm. Width: 5.12–6.89 mm. **Head:** No trace of medial tubercle adjacent to each eye. Frontal carina as wide as clypeo-frontal carina, frons presents a transverse carina that meets the lateral carinae that extend from the clypeus; region between the clypeus and the frons carina is concave. Punctuation more concentrated in the anterior region of the head, with a cluster of deep and well-defined points. **Pronotum:** Trapezoidal structure in the anterior part of the disc and tubercles (smaller

than the transverse elevation), one on each side of the structure, the structures may vary according to the individual's size; region between the transverse structure and the tubercles marked by points. **Elytron:** There are setae in the apical region of the external dorsal margin of the elytra (quantity varies among individuals). **Male terminalia:** In dorsal view, rounded parameres, in the form of capsules, base twisted to fit the phallobase that is larger than the parameres and phallobase with two horizontal spines at the apex (Figure 7 (a)). **Sexual dimorphism:** Males have weak and distinct punctuation in the posterior region of the clypeus and absent setae, while females have up to four setae in the posterior region of the clypeus and the rough and crenated surface.

Designation of type material. According to the literature, the Castelnau collection was lost in a fire, but there is a possibility that the type may be in the MNHN miscellany. Unfortunately it was not possible to carry out a search; however, because it is the type species of the genus, for the confirmation of the taxa and so there are no further problems of identification, we propose to designate a neotype for the species. The specimen being proposed as a neotype originally belonged to the CEMT, and comes from the location closest to the type locality of the species. It is deposited at CEMT.

Differential diagnosis. *Bolbapium striatopunctatum* is morphologically similar to *B. dutraorum* sp. nov. and *B. sergioidei* sp. nov. in presenting the forehead with a transverse carina without tubercles formation on each side. However, it is easily distinguished by the difference in structures in the anterior region of the pronotum, that in *B. striatopunctatum* is a trapezoidal carina.

Geographical distribution. Brazil (Distrito Federal, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Santa Catarina and São Paulo) and Argentina (Misiones).

Non-type material. 101 specimens.

ARGENTINA, Misiones, Apostoles San José, [27°54'50"S, 55°45'17"W], 4 a 27.ii.1981, R. Golbach leg. (1 ♀ CEMT). Without data (1 ♀ CEMT); Without data, Embrapa, 6.xi.2003, M. Pereira. (1 ♂ CEMT). Without data. (1 ♂ ZIN). BRAZIL, Distrito Federal, Brasília (1 ♂ ZIN); Same location, xii.1987, Vaz-de-Mello leg. (1 ♂ CEMT); SMPW, [15°49'36"S, 47°55'18"W], 10.ii.1999, P. A. Dias leg. (1 ♂ CEMT). Mato Grosso do Sul, Campo Grande, CNPGC, [20°26"S, 54°43'7"W], 26. xii.1984, W.W. Koller leg. (1 ♂ CEMT); Same location, [20°28'10"S, 54°37'12"W], xii.1995, W.W. Koller leg. (1 ♀ CEMT); Same location, WC lab. Samid. Animal Embrapa, [20°26"S, 54°43'7"W], 25.iii.2004, Luz, W.W. Koller leg. (1 ♀ CEMT). Minas Gerais, [18°30'43"S, 44°33'18"W], 10.xi.2001, E.A. Pereira leg. (1 ♂ CEMT); Belo Horizonte, [19°55'0"S, 43°56'4"W], xi.1990 (1 ♂ CEMT); Conceição dos Ouros, [22°24'50"S, 45°47'53"W], 15.ix.2012, G.P. Almeida Neto leg. (1 ♂ CEMT); Same location, 5.xi.2008, G.P. Almeida Neto leg. (1 ♂ CEMT); Same location, Rio Sapucaí, [21°49'49"S, 45°34'12"W], xi.2005, G.P. Almeida Neto leg. (1 ♂ 1 ♀ CEMT); Cordisburgo, Faz. Pontinha, [19°7'5"S, 44°10'0"W], xii.1997, Vaz-de-Mello leg. (1 ♂ CEMT); Ibitira, [19°25'7"S, 45°9'8"W], xi.1988, Luz, leg. (1 ♀ CEMT); Itumirim, 21°20'24"S, 44°48'6", 19. x.2016, Light, L. Vieira, F.Z. Vaz-de-Mello & J. Louzada leg. (2 ♀ 6 ♂ CEMT); Same location, Serra do Janela, 2019, J. Louzada & L. Vieira (1 ♀ CEMT) Montes Claros, [16°43'43"S, 43°51'29"W], i.2002, G.L.D. Leite leg. (1 ♀ CEMT); Lagoa Santa, [19°34'49"S, 43°53'53"W], i.1954, B. J. Sousa leg. (1 DZUP); Lavras, [21°14'54"S, 45°0'4"W], x.1998, J.N.C Louzada leg. (1 ♂ CEMT); Same

location, 21.iv.2001, Ana Brigagão leg. (1 ♀ CEMT); Same location, 18.i.1999, R.R. Guedes leg. (1 ♂ CEMT); Same location, Campus UFLA, 21°13'37"S, 45°58'49", ii.2008, F.Z. Vaz-de-Mello leg. (1 ♂ 1 ♀ CEMT); Same location, x.2007, F.Z. Vaz-de-Mello leg. (1 ♂ CEMT); Nova Era, [19°45'57"S, 43°2'7"W], vii.1987 (1 ♀ CEMT); Santa Barbara, Fazenda Bocaina, [19°57'48"S, 43°24'44"W], 1.xi.1997, M.F. Vasconcelos leg. (1 ♀ CEMT); Passa Quatro, prox FLONA, [22°23'26"S, 44°57'58"W], 3.xi.2007, F. Frieiro-Costa leg. (1 ♀ CEMT); Passos, [20°43'19"S, 46°36'48"W], 28-7.xi-xii.1962, Claudionor leg. (1 DZUP); Três Marias, [18°12'21"S, 45°13'53"W], 27.iv.1993, André C. Zanuncio leg. (1 ♀ CEMT); São Gonçalo do Rio Abaixo, [19°49'28"S, 43°21'31"W], 11.x.2010, F.M. França leg. (1 ♀ CEMT); Viçosa, [20°45'17"S, 42°52'42"W], 11.iv.1997, H.H. Souza leg. (1 ♂ CEMT); Same location, xi.1997, (1 ♀ CEMT); Same location, vii.1997, Vaz-de-Mello leg. (1 ♀ CEMT); Same location, 13.iv.1997, C. Castro leg. (1 ♂ CEMT); Same location, xi.1995, Vaz-de-Mello leg. (1 ♂ CEMT); Same location, 25.iii.1998, T. Zanuncio leg. (1 ♂ CEMT); Same location, 13.iii.1998, T. Zanuncio leg. (1 ♂ CEMT); Same location, iii.2000 (2 ♀ CEMT); Same location, Campus UFV, [20°45'49"S, 42°52'12"W], xi.1997, F. Vaz-de-Mello leg. (1 ♀ CEMT); Same location, Córrego do Paraíso. Mata da prefeitura, [20°48'5"S, 42°51'58"W], xi.1982, UV trap, P.S. Fiuza F leg. (1 ♀ CEMT); Same location, UFV, [20°45'49"S, 42°52'12"W], xii.1999, Lopes-Andrade & Vaz-de-Mello leg. (1 ♂ CEMT); Frei Gaspar, Sítio Recanto Paraíso, 571 m, 18°2'6"S, 41°29'10"W, 28.xii.2007, light trap, M.R. Santos (1 ♀ CEMT); Same location, 3.i.2008, light trap, M.R. Santos (1 ♀ CEMT). Paraná, [25°15'7"S, 52°1'17"W], 10.xii.1963, R. Langer leg. (1 DZUP); Guarapuava, [25°23'26"S, 51°27'46"W], i.1950, H. Schneider leg. (1 DZUP); Banhado, [25°15'7"S, 52°1'17"W], ii.1972, P. J. Richs leg. (1 DZUP); Same location, i.1972, P. J. Richs leg. (1 DZUP). Rio de Janeiro, Nova Friburgo, [22°17'19"S, 42°32'2"W], i.1999, P. Grossi leg. (1 ♀ CEMT); Same location, i.2009, P. Grossi leg. (2 COPL); Macaé de Cima, [22°21'0"S, 42°25'46"W], i.1999, P. G. Grossi leg. (1 ♂ CEMT) (1 COPL); Pedro do Rio, [22°20'14"S, 43°8'21"W], xi.1991, A. Bello leg. (1 ♀ CEMT); Same location, ii.2001, A. Bello leg. (1 ♂ CEMT); Cachoeiras de Macacu, [22°27'45"S, 42°39'10"W], x.1994, Rogerio leg. (1 ♀ CEMT); Miguel Pereira, [22°27'27"S, 43°28'50"W], xii.2000, J. Carlos leg. (1 ♀ CEMT); Same location, iii.2001, J. Carlos leg. (1 ♀ CEMT); Same location, iii.1998, J. Carlos leg. (1 ♂ CEMT); Same location, i.1998, J. Carlos leg. (2 ♂ CEMT). Santa Catarina, 80, [27°14'32"S, 50°13'7"W], iii.1959, leg. (1 DZUP). Brasil, Minas Gerais, 18°30'43"S, 44°33'18"W, 10.xi.2001, E.A. Pereira leg. (CEMT)Brasil, Minas Gerais, 18°30'43"S, 44°33'18"W, 10.xi.2001, E.A. Pereira leg. (CEMT)São Paulo, Cerqueira César, [23°2'18"S, 49°9'57"W], xii.1994, J. Carlos leg. (1 ♂ CEMT); Caraguatatuba, Est. FABESP, 23°35'29"S, 45°23'39", 19.ix.2012, pitfall human faeces, A. Díaz-Rojas leg. (1 ♀ CEMT); Barueri, [23°30'40"S, 46°52'22"W], 2.xi.1954, K. Lenko leg. (1 DZUP); Same location, 8007, 15.xii.1955, K. Lenko leg. (1 DZUP); Same location, 7955, 15.xii.1955, K. Lenko leg. (1 DZUP); Same location, 8278, 13.i.1956, K. Lenko leg. (1 DZUP); Same location, 10.xi.1954, K. Lenko leg. (1 DZUP); Same location, 14.xii.1954, K. Lenko leg. (1 DZUP); Brasil, São Paulo, Barueri, 23°30'40"S, 46°52'22"W, 10.xi.1954, K. Lenko leg. (DZUP)Brasil, São Paulo, Barueri, 23°30'40"S, 46°52'22"W, 10.xi.1954, K. Lenko leg. (DZUP); Same location, 18.xii.1954, K. Lenko leg. (4 DZUP); Same location, 18.i.1955, K. Lenko leg. (1 DZUP); Same location, 20.xii.1954, K. Lenko leg. (4 DZUP); Same location, 30.xii.1954, K. Lenko leg. (1 DZUP); Same location, 21.iv.1955, K. Lenko leg. (1 DZUP); Atibaia, [23°07'03"S, 46°33'24"W], 08.i.1969, De Barros leg. (1 COPL); Campos de Jordão, 1300 m, [22°44'34"S, 45°34'32"W], xii.1962, A. Martínez coll. (1 COPL); Cipo-Guaçu, [23°52'42"S, 46°47'37"W], 16.i.1973, V.N. Alin leg. (2 COPL); Osasco, [23°32'13"S, 46°47'46"W], xi.1956, Keller, Vulcano leg. A. Martínez coll. (2 COPL); São Paulo, Carvalho Araujo, [23°39'18"S, 46°32'50"W], J. Guérin leg. A. Martínez coll. (1 COPL). Without data (1 ♂ ZIN).

***Bolbapium sulcifrons* Ide and Martínez, 1993**

(Figures 5(b), 8(j), (k), (l), 13(a))

Bolbapium sulcifrons Ide and Martínez, 1993: 376–377 (original description)**Diagnosis**

Frons without transverse carina. Clypeus with lateral carinae extending backwards and posterior border of the frons with a groove in the shape of an arch marked by points. Pronotum mesoanteriorly without evident structure. Elongated scutellum, with parallel edges anteriorly and subtly rounded posteriorly (Figure 5(b)).

Type material. The holotype is deposited at the MZSP, which provided a photo for analysis.

Holotype. '135;/W. Zikán// ITATIAYA 700 m./ Est. Do Rio/ 2-vi-934; *Bolbapium spn2/ HOLÓTIPO* ♂ / S. Ide det. 19 (red label); *Bolboceras/ lucidulum/ Kl./ P. Pereira det'* (MZUSP).

Redescription

Body size: Length: 5.34–8.27 mm. Width: 4.23–6.24 mm. **Head:** Lateral carinae of clypeus extending backwards ending at the edge of the canthus. Frons flat without projection; median region, between the lateral carinae of the clypeus marked by points that form an arch; posterior region is an arc-shaped groove marked by well-defined points. **Pronotum:** Without evident ornamentation. **Scutellum:** Elongated, almost rectangular, parallel edges anteriorly and subtly rounded posteriorly, with no evident punctuation. **Male terminalia:** In dorsal view, parameres completely separated, from the base to the apex, and laterally extended (Figure 8(j)). In lateral view, parameres are practically not visible (Figure 8(l)). Phallobase with two pointed projections, one on each side, morphologically resembling the genitalia of *Bolbapium lucidulum* and *Bolbapium paralucidulum* differing from the other species that have a single central projection. **Sexual dimorphism:** This species does not feature sexual dimorphism. **Remarks:** Ide and Martínez (1993) described the species based on three specimens collected in Rio de Janeiro: the male holotype, from Itatiaia, collected by W. Zikán; and two paratypes (females), one from Represa Rio Grande, collected by F.M. Oliveira, and the other from Galeão, collected by M. Alvarenga. The holotype and paratype collected in Galeão are deposited at the MZSP, and the paratype collected at the Represa Rio Grande is deposited at the DZUP.

Differential diagnosis. *Bolbapium sulcifrons* is morphologically similar to *B. lucidulum*, *B. matheusi* sp. nov., *B. paralucidulum* and *B. quinquestriatum* in not presenting the forehead with tubers and interocular carinae. However, it is easily differentiated by presenting an elongated scutellum.

Geographical distribution. Brazil (Bahia, Paraíba, Pernambuco and Rio de Janeiro).

Non-type material. 32 specimens.

BRAZIL: Bahia, Cruz das Almas, [12°40'24"S, 39°6'6"W], 3.i.2005, Ribeiro Junior leg. (1 CEMT); Porto Seguro, [16°26'39"S, 39°3'55"W], 2.xi.1998,, C.S.F. Mariano leg. (1 CEMT); Wenceslau Guimarães, [13°41'28"S, 39°28'35"W], 6.i.2011, Pitfall, C.M.P. Leite leg. (1 CEMT). Paraíba, Mamanguape, Rebio Guaribas, 6°41'33"S, 35°10'00"W, 2002, FIT, M.I.M. Hernandez leg. (1 CEMT); Pernambuco, Caruaru, [8°16'33"S, 35°58'54"W], v.1972, Joaquim Lima leg. (2 CEMT) (4 DZUP); Igarassu, RECD, [7°49'42"S, 34°52'26"W], 25.v.2007, Cavalcanti et al. leg. (1 CEMT); Same location, 11.v.2007, Cavalcanti et al. leg. (1 CEMT); Cabo de Santo Agostinho, Res. Ecol. Gurjaú, [8°16'45"S, 35°1'49"W], 15.vi.2003, Malaise, S. Santos leg. (1 CEMT); Same location, 29.vi.2003, malaise, S. Santos leg. (1 CEMT); Camaragibe, aldeia, [7°58'1"S, 35°0'15"W], 1-31.vii.2016, L.V.P.C. Grossi leg. (2 CEMT). Rio de Janeiro, Represa Rio Grande, [22°10'60"S, 42°30'00"W], iii.1972, F.M. Oliveira leg. (4 CEMT) (7 DZUP) (1 COPL); Same location, xi.1967, F.M. Oliveira leg. (2 DZUP); Same locattion, viii.1966, F.M. Oliveira leg. (2 DZUP).

Discussion and conclusion

Our data support the recognition of 22 species of the genus *Bolbapium*. Until now considered a South American genus, here, we present its first record in Central America, and it is now considered a Neotropical genus.

The synonymy of *Bolbapium bigibbosum* Luerderwaldt, 1931 with *Bolbapium minutum* Luerderwaldt, 1931, previously proposed by Sergio Ide (1992), has been confirmed and validated.

Through an analysis of the original description of *Bolboceras modestum* hitherto considered *incertae sedis* by Martínez (1976), we confirm that this species belongs to the genus *Bolbapium*; therefore, *Bolbapium modestum* comb. nov. is now proposed.

We consider *Odonteus sculpturatus* Mannerheim, 1829, *species inquirenda*.

Mannerheim (1829) mentions in a footnote that 'The individual described seems to me to be the female of my new species, of which I do not yet know the other sex'. It is also mentioned that the specimen (then a holotype) belongs to 'Acad. Imp. Scient. Petrop.', whose collection forms the basis of the collection of the Zoological Institute in St. Petersburg (pag 44; has been translated from French).

In this collection there are two specimens of *Bolbapium* old enough that they could include the type (both with poorly readable code tags and related to a record book the whereabouts of which are unknown to the curator). These specimens were meticulously analysed and compared with the original description of the species, but none of them corresponds to the original description, which says that the species has a projection with 'three teeth' in the anterior region of the pronotum, one central and two lateral. None of the specimens analysed correspond to the species named by Mannerheim (and so considered by Luederwaldt 1929, for instance); such specimens can be attributed to the species treated here as *B. striatopunctatum* and *B. minutum*.

Another possible type belonging to the Finnish Museum of Natural History (LUOMUS) (and labelled as collected by Ménériés, who was the collector of Langsdorff's specimens sent to Mannerheim) was analysed, but the specimen corresponds to our *Bolbapium quadrispinosum*.

Castelnau 1840 transferred '*Odontaeus sculpturatus*' to *Bolboceras*; however, he does not cite the examination of the holotype, nor do any of the works that follow nor do any of the works that place it in *Bolboceras* (*Eucanthus*), *Bolboceras* (*Bolbapium*), or transferring it to *Bolbapium* Boucomont, 1910.

Therefore, and considering the analysis of the material and specimens, it is not certain that any of those three, representing three different species, can be considered the holotype of '*Odontaeus sculpturatus*', and none of them corresponds to the original description.

This described character is not found in any presently known species of *Bolbapium* and is the reason for us removing this species name from the genus treated here. It is, then, preferable to consider the name '*Odontaeus sculpturatus*' as *species inquirenda*.

Since the separation of Bolboceratinae tribes proposed by Nikolajev (1996, 2003), partially based on hind wing characters, the placement of *Bolbapium* has remained uncertain. According to Nikolajev's identification key (2003), *Bolbapium* fits within Stenaspidiini Nikolajev 2003. However, each tribe and its respective genera are mentioned in the same work (Nikolajev 2003); the author made it clear that Stenaspidiini is limited to Australian genera and suggests that South American genera of Bolboceratinae belong to Eubolbiini Nikolajev 1970, including *Bolbapium*. Our suggestion here is to leave this question open until a future study addresses again the classification of all genera involved.

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