Contributions to knowledge of Psammodiini from the Western Hemisphere. 2. Two new species of *Platytomus* from the South-American Continent (Coleoptera: Scarabaeidae: Aphodiinae)

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Abstract. Two new species of the genus *Platytomus* Mulsant, 1842 are described, illustrated and keyed within the framework of a key to species known to occur in the South-American Continent as follows: *Platytomus bordati* sp. nov. from Brazil (Brasilia – District Federal), and *Platytomus brasiliensis* sp. nov. from Brazil (Mato Grosso) and Argentina (Gran Chaco).

INTRODUCTION

The work presented here was stimulated thanks to a shipment of specimens from Brazil, sent to the first author (M. R.) by Patrice Bordat (Saint-Cirq, France). They appeared to belong to a new species of the genus *Platytomus* Mulsant, 1842. A further (similar) new species of the genus was found in the collection of the second author (L. M.).

The preceding communication (Rakovič et al. 2020) was focused on studying types of two *Platytomus* species. It also comprised an explanation of problems concerning the genus *Platytomus* and related genera.

MATERIAL AND METHODS

The specimens were observed by using the MBS-10 and SZP 1120-T stereoscopic microscopes. The photos published here were taken by the use of the Meopta laboratory microscope, CMEX 5 digital camera and Helicon Focus programme.

The following acronyms stand for collections, in which the specimens studied here are kept (curator in parentheses):

CEMT Seção de Entomologia da Coleção Zoológica da Universidade Federal de Mato Grosso, Cuiabá, Brazil
(Fernando Z. Vaz-de-Mello);
LMCT Ladislav Mencl private collection, Týnec nad Labem, Czech Republic;
MRCD Miloslav Rakovič private collection, Dobřichovice, Czech Republic;
NMPC National Museum, Praha, Czech Republic (Jiří Hájek);
PBCS Patrice Bordat private collection, Saint-Cirq, France.

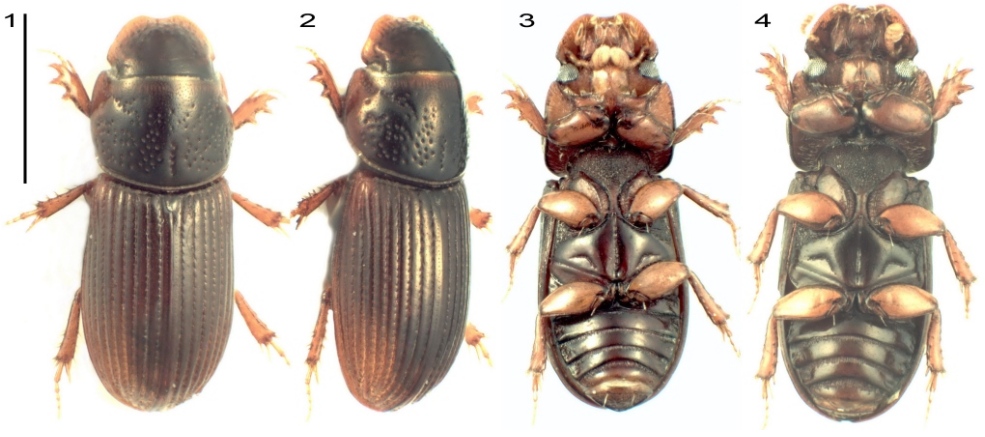
Label data are specified below in paragraphs Type material. Our remarks and addenda are found in brackets, separate label lines are indicated by a slash (/), separate labels by a double slash (//).

TAXONOMY

Platytomus bordati sp. nov.
(Figs. 1-25)

Type locality. Brazil, District Federal, Brasilia.

Type material. BRAZIL: Holotype, ♂ (PBCS), "I-1999, Brasilia / (DF [= District Federal) 1100 m Brésil / N. Dégallier leg [white printed label] // Piège lumière [white printed label] // 2670 / Dok. L. Mencl, 2020 [pale green printed label, related to the photo-documentation system of the second author] // HOLOTYPE / *Platytomus bordati* sp. nov. / M. Rakovič, L. Mencl & / D. Král det. 2020 [red printed label]. Allotype, ♀ (PBCS), same data as with holotype except for 2639 instead of 2670 on pale green label and word ALLOTYPE instead of HOLOTYPE on red label. 28 paratypes (2 LMCT, 2 MRCD, 2 NMPC, 22 PBCS), same data as with holotype on red labels except for word PARATYPE instead of HOLOTYPE; information on location and on collector (on white labels) same as with holotype, but information on month and year of collecting different as follows: December 1998 in 2 paratypes, January 1999 in 1 paratype, October 1999 in 1 paratype, January 2000 in 1 paratype, February 2000 in 3 paratypes, May 2000 in 5 paratypes, October 2002 in 4 paratypes, November 2002 in 1 paratype, January 2003 in 1 paratype, February 2003 in 3 paratypes, and April 2003 in 5 paratypes.
See also Figs. 23-25 for etiquettes.

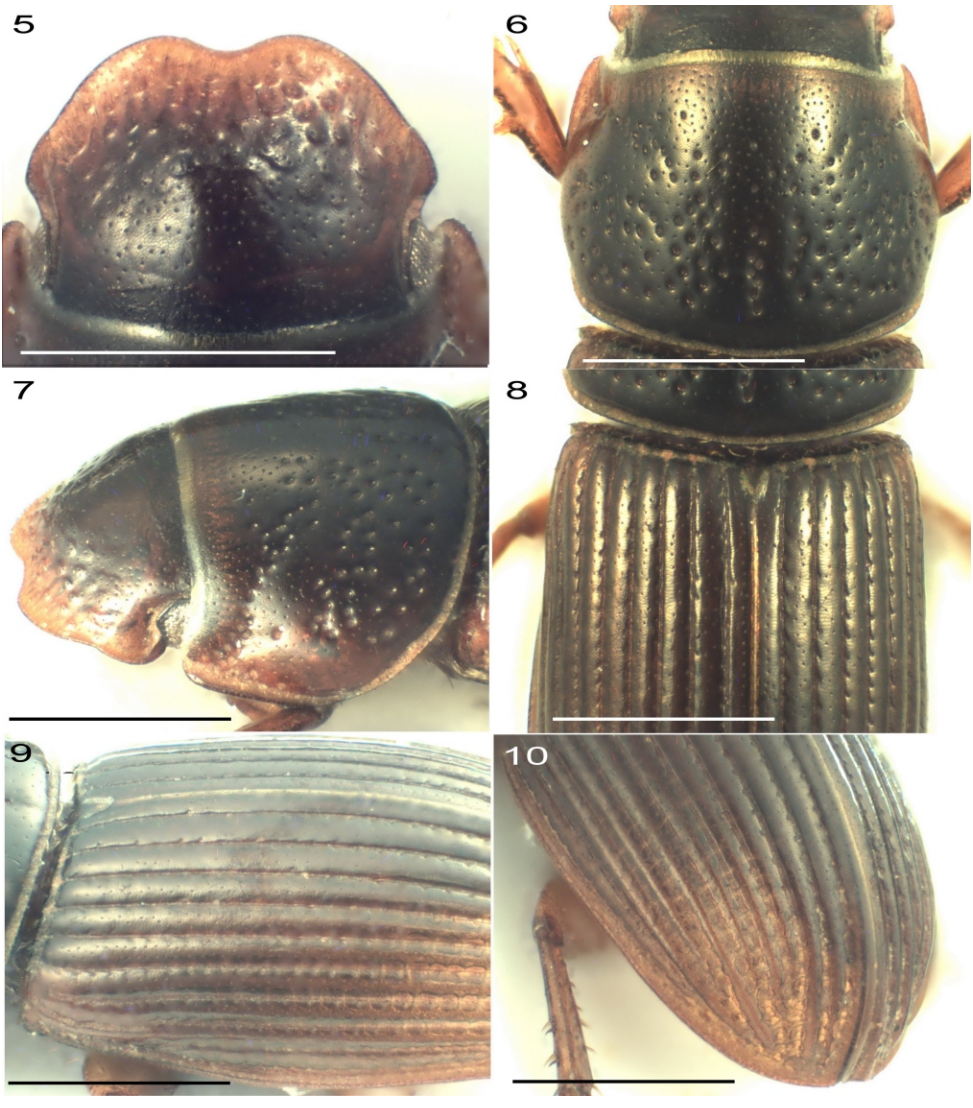


Figs. 1-4. *Platytomus bordati* sp. nov., habitus: 1- holotype, ♂, dorsal view; 2- holotype, ♂, dorsolateral view; 3- paratype, ♂, ventral view; 4- paratype, ♀, ventral view. Scale line 1 mm. Photographs by L. Mencl.

Description of holotype (♂). Oblong oval, moderately convex, subparallel, glabrous, shining, dark brown, legs, clypeus margins, pronotum anterior margins and anterior angles considerably paler). Length-to-width ratio of 2.56, broadest at about 2/3 elytra length (Figs. 1-2). Body length of 2.32 mm.

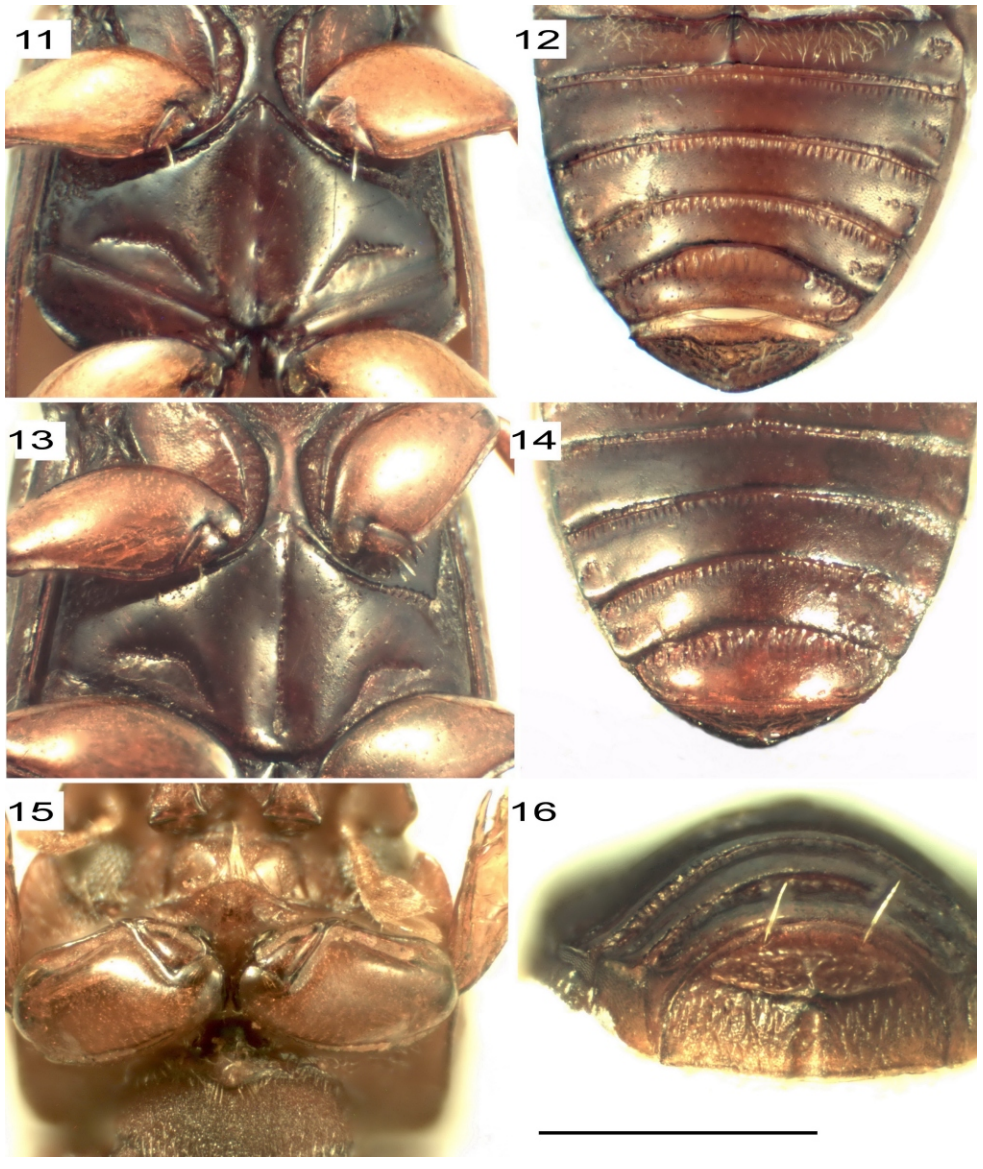
Head (Fig. 5) convex, clypeus rounded each side of deep anteromedian emargination, its lateral sides moderately arcuate; genae bare, their anterior margins not differentiated from clypeus lateral margins, obtusely angulate posteriorly, protruding beyond eyes. Frontoclypeal suture fine (in shape of shallow and narrow line), distinct under high magnification only. Moderately transversal and not very high granules rather sparsely situated between epistomal gibbosity and clypeus anterior and lateral margins, remaining area of clypeus surface being non-granulate (at most narrow zone of epistomal gibbosity adjacent to clypeus margins with transversal granules). Frons (area behind frontoclypeal suture) finely punctate and otherwise smooth, glossy, similarly as prevalent surface area of epistomal gibbosity.

Pronotum (Figs. 6-7) transversal (length-to-width ratio of 0.810), with two pairs of lateral impressions; impressions of anterior pair distinct, those of posterior pair also distinct, but small.



Figs. 5-10. *Platytomus bordati* sp. nov., holotype, ♂, details of head, pronotum and elytra: 5- head, dorsal view; 6- pronotum, dorsal view; 7- head and pronotum, dorsolateral view; 8- anterior part of elytra with scutellum and pronotum base, dorsal view; 9- elytra, dorsolateral view; 10- elytral apex. Scale lines 0.5 mm. Photographs by L. Mencl.

Anterior angles moderately rounded, lateral margins anteriorly first straight, the straight segment (between anterior and posterior angles) being, however, relatively short; lateral margins then arcuately merge in broadly rounded posterior angles. Pronotum lateral margins, posterior angles and base continuously margined (furrowed). Pronotum surface finely punctate throughout; the fine punctures intermixed with relatively coarse ones, which are, however, absent in zones along anterior and lateral margins and, on the other hand, more concentrated in short and finely impressed posterior longitudinal furrow.

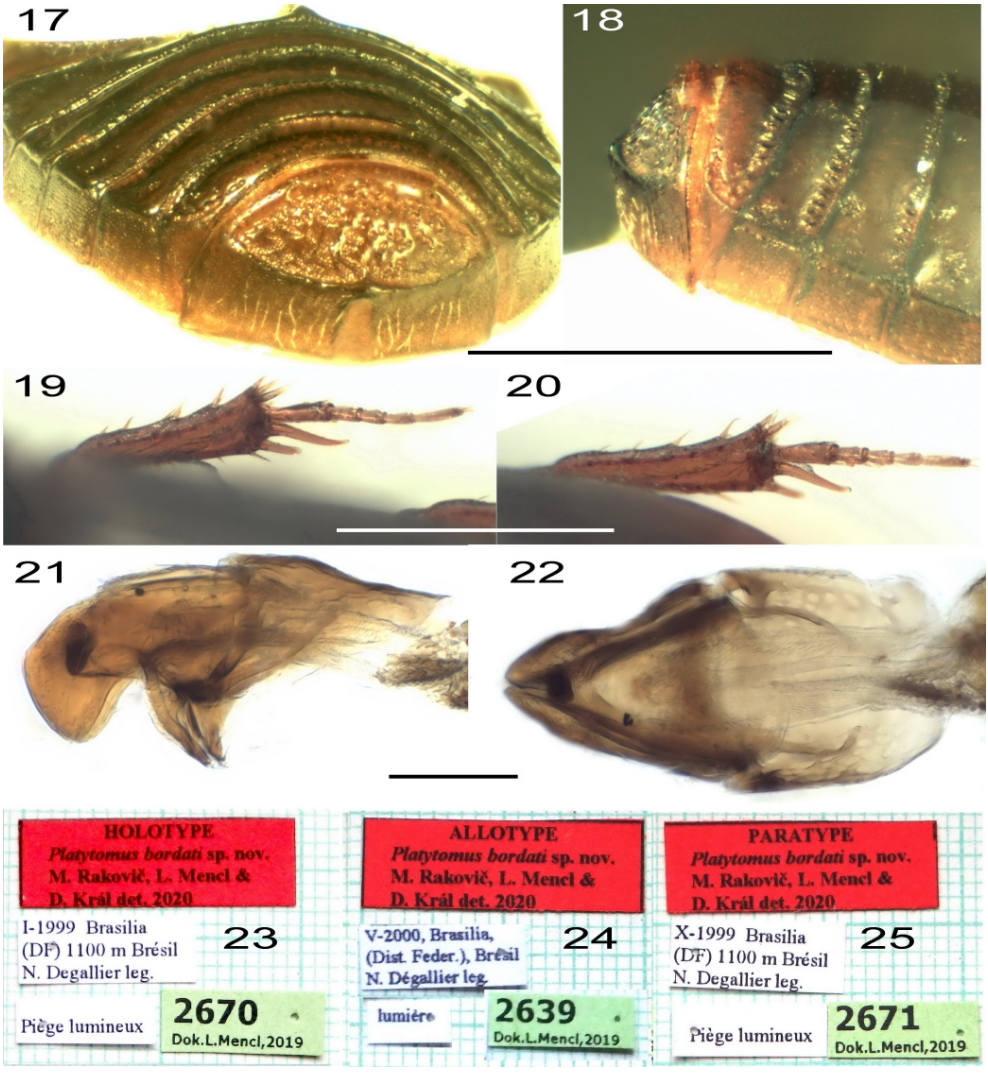


Figs. 11-16. *Platytomus bordati* sp. nov., details (ventral side): 11- holotype, ♂, meso-metaventrum; 12- holotype, ♂, abdomen; 13- paratype, ♀, meso-metaventrum; 14- allotype, ♀, abdomen; 15- allotype, ♀, profemora; 16- allotype, ♀, pygidium with two setae. Scale lines 0.5 mm. Photographs by L. Mencl.

Scutellum triangular, smooth, with distinctly rounded apex, darker in anterior triangular area, paler in lateral and apical areas (Fig. 8).

Elytra (1-2 and 8-20) elongate, only slightly broader behind, their length-to-width ratio of 1.56, slightly wider than pronotum (ratios pronotum width : maximum elytral width = 0.927, pronotum length : elytra length = 0.465); with poorly distinct or absent humeral denticles; with ten striae and

ten intervals, striae well distinct, narrow, with punctures crenating inside margins of intervals, intervals wide, convex, very finely and sparsely punctate.



Figs. 17-25. *Platytomus bordati* sp. nov., details and etiquettes: 17- paratype, ♂, abdomen, caudal view; 18- paratype, ♂, posterior part of abdomen, lateroventral view; 19- allotype, ♀, right mesotibia and mesotarsus, dorsal view; 20- allotype, ♀, right metatibia and metatarsus, dorsal view; 21- holotype, ♂, aedeagus, lateral view; 22- holotype, ♂, aedeagus, ventral view; 23- etiquettes under holotype; 24- etiquettes under allotype; 25- etiquettes under paratype. Scale lines 0.5 mm for Figs. 17-20, 0.1 mm for Figs. 21-22. Photographs by L. Mencl.

Legs (tibiae and tarsi, dorsal view). Right metatibia with metatarsus shown in Fig. 20; basal metatarsomere only moderately widened apically, about as long as metatarsomeres 2 and 3 combined, superior terminal spur of metatibia slim, rather S-shaped, reaching about middle of metatarsomere 2, inferior terminal spur straight, shorter. In mesotibia and mesotarsus (Fig. 19),

the shapes and lengths ratios are very similar to those of respective elements in metatibia and metatarsus.

Ventral surfaces (Figs. 3-4 and 11-15) also dark brown (femora paler than abdominal ventrites and meta-mesoventrum), prevalently glabrous and smooth. Meso-metataventral plate (Fig. 13) smooth, with narrow midline furrow and with pair of impressions for insertion of metafemora; anterior margin of each impression in shape of two nearly straight line segments forming obtusely rounded angle. Abdominal ventrites 3-6 smooth, impunctate, with fluted anterior margins.

Pygidium as in Figs. 16-18, bearing two pygidial setae.

Aedeagus as in Figs. 21-22.

Sexual dimorphism. There are only slight differences between males and females in shapes of the propygidium (see Figs. 12 and 14).

Variability. In the type series studied (28 specimens), the body length varies from 2.1 to 2.4 mm. There are actually no important inter-individual differences in the structures and sculptures of the head, pronotum or elytra.

Differential diagnosis. The two new species described here (*P. bordati* sp. nov. and *P. brasiliensis* sp. nov.) have a very weak frontoclypeal suture, which is in the shape of a very fine (not impressed) line, non-observable under low magnification or even missing. At least an area of about the posterior half of the epistomal gibbosity non-granulate (Figs. 5 and 30. The remaining species of the genus known from the South-American Continent have a very distinct (impressed) frontoclypeal suture and granules present throughout the area between the clypeus anterior margin and frontoclypeal suture (including the whole epistomal gibbosity). The differences between the two new species are summarized in the KEY below, in couples 7(8) and 8(7).

Collecting circumstances. Collected at light.

Distribution. Brazil, District Federal.

Name derivation. Patronymic, in honour of our friend Patrice Bordat (Saint-Cirq, France), a top specialist in Afrotropical Aphodiinae, who submitted the type material to us for study.

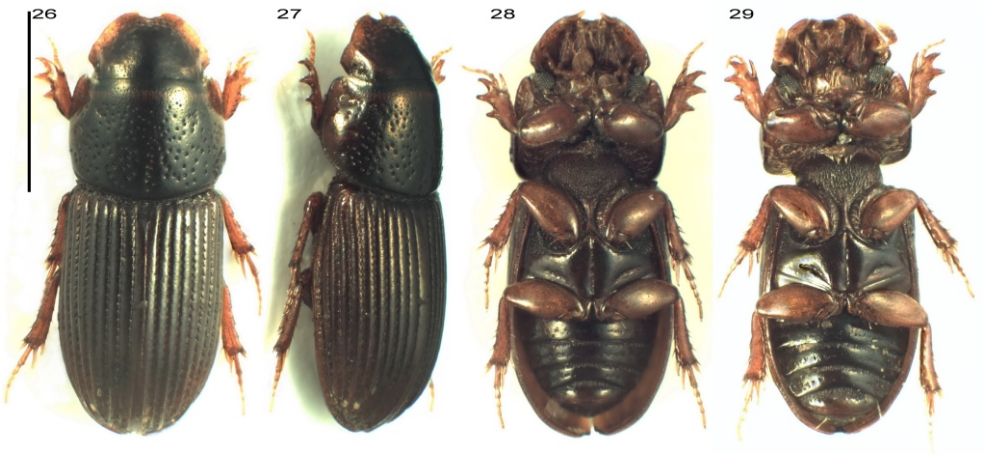
***Platytomus brasiliensis* sp. nov.**

(Figs. 26-49)

Type locality. Brazil, Mato Grosso, Juína env.

Type material. BRAZIL: Holotype, ♂, (LMCT) "Brazil-Mato Grosso / Juína env. / 28. xi – 3. xii. 2012 F. Vaz-de-Mello lgt. [white printed label] // 2660 / Dok. L. Mencl, 2020 [pale green printed label, related to the photo-documentation system of the second author] // HOLOTYPE / *Platytomus brasiliensis* / sp. nov. / M. Rakovič, L. Mencl & / D. Král det. 2020 [red printed label]. Allotype, ♀ (LMCT), same data as with holotype except for 2637 instead of 2660 on pale green label and word ALLOTYPE instead of HOLOTYPE on red label.

35 paratypes (6 CEMT, 11 LMCT, 6 MRCD, 6 NMPC, 6 PBCS,) from among them 34 paratypes bear same data as with holotype on white and red labels except for word PARATYPE instead of HOLOTYPE on red labels, but 1 paratype shows different locality data on white label - "Brazil-Mato Grosso / Diamantino, Vale da Solidão / 10.-14. xii. / 2012 / F. Vaz-de-Mello lgt.". ARGENTINA: 1 paratype (LMCT) "ARGENTINA NC / Gran Chaco, Salada riv. / S of Macapilo (SE Salta) / Lgt. M. Snížek, 20. i. 2009", same data as with paratypes from Brazil on red labels. The total number of paratypes from Brazil and Argentina is of 36. See also Figs. 47-49 for etiquettes.



Figs. 26-29. *Platytomus brasiliensis* sp. nov., habitus: 26- holotype, ♂, dorsal view; 27- holotype, ♂, dorsolateral view; 28- paratype, ♂, ventral view; 29- paratype, ♀, ventral view. Scale line 1 mm. Photographs by L. Mencl.

Description of holotype (♂). Oblong oval, moderately convex, subparallel, glabrous, shining, dark brown, legs, clypeus margins, pronotum anterior margins and anterior angles considerably paler). Length-to-width ratio of 2.60, broadest at about 2/3 elytra length (Figs. 26-27). Body length of 2.38 mm.

Head (Fig. 30) convex, clypeus rounded each side of deep anteromedian emargination, its lateral sides arcuate. Genae bare, their anterior margins moderately differentiated from clypeus lateral margins, fairly rounded and moderately protruding beyond eyes. Frontoclypeal suture quite indistinct (absent) even under high magnification. Rather round than transversal granules sparsely situated between epistomal gibbosity and clypeus anterior and lateral margins, anterior 1/3 of epistomal gibbosity with obsolete round to oval granules. Posterior 2/3 of epistomal gibbosity and frons finely punctate and moderately shagreened, but otherwise smooth (free of any granules).

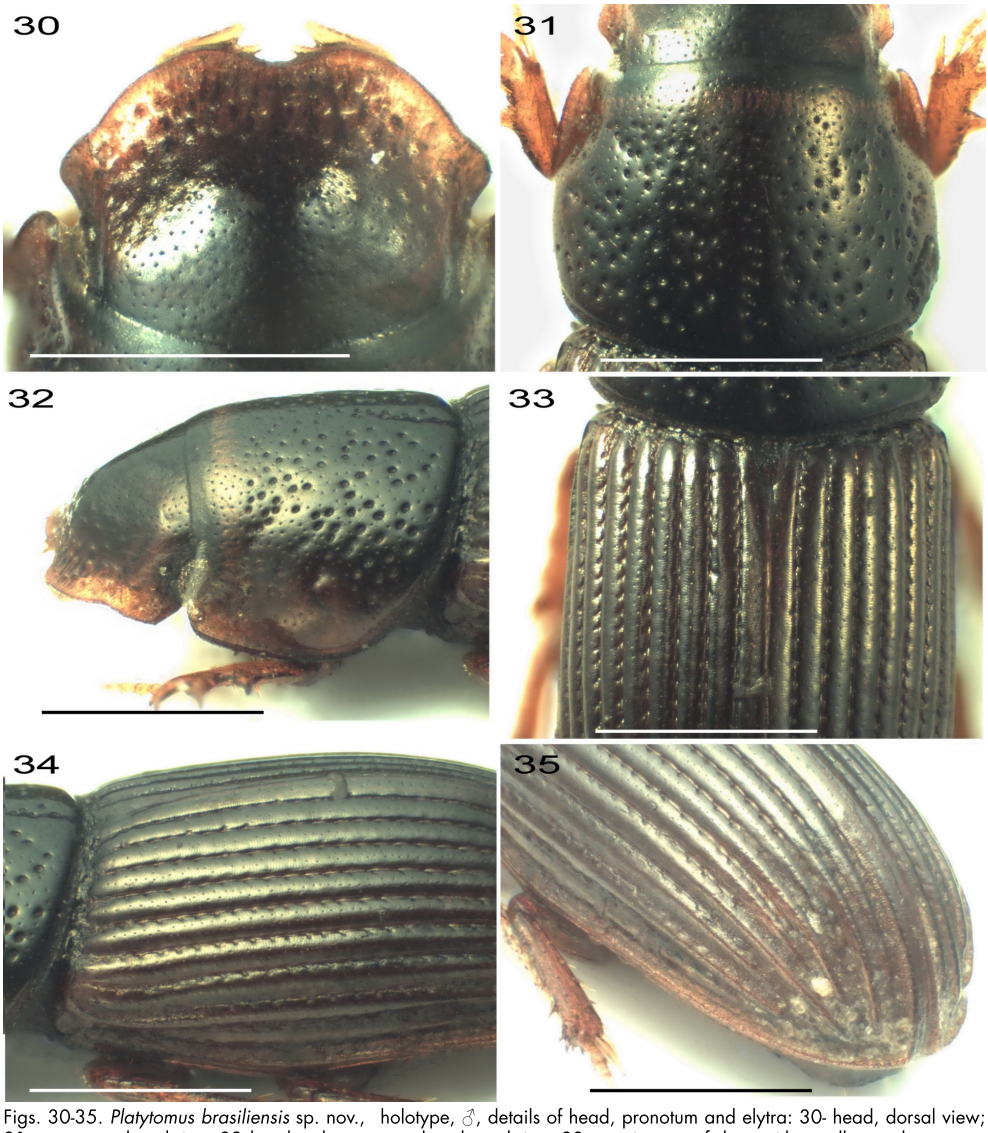
Pronotum (Figs. 31-32) transversal (length-to-width ratio of 0.814), with two pairs of lateral impressions; impressions of anterior pair distinct, those of posterior pair also distinct, but small. Anterior angles moderately rounded, lateral margins anteriorly first straight, the straight segment (between anterior and posterior angles) being, however, relatively short; lateral margins then arcuately merge in broadly rounded posterior angles. Pronotum lateral margins, posterior angles and base continuously margined (furrowed). Pronotum surface finely punctate throughout; the fine punctures intermixed with relatively coarse ones, which are, however, absent in zones along anterior and lateral margins and, on the other hand, more concentrated in short and finely impressed posterior longitudinal furrow. Pronotum shape as well as sculpture very similar to those of the preceding species.

Scutellum narrowly triangular, smooth, with moderately rounded apex, dark anteriorly as well as posteriorly (Fig. 33).

Elytra (Figs. 26-27 and 34-35) elongate, only slightly broader behind, their length-to-width ratio of 1.52, slightly wider than pronotum (ratios pronotum width : maximum elytral width = 0.979, pronotum length : elytra length = 0.479); with poorly distinct or absent humeral denticles; with ten striae and ten intervals, striae well distinct, narrow, with punctures crenating inside margins of intervals, intervals wide, convex, very finely and sparsely punctate.

Legs (tibiae and tarsi, dorsal view) as in Figs. 45-46. Metatibia and metatarsus similar to those

in preceding species, but superior terminal spur of metatibia rather straight (or only very slightly S-shaped).



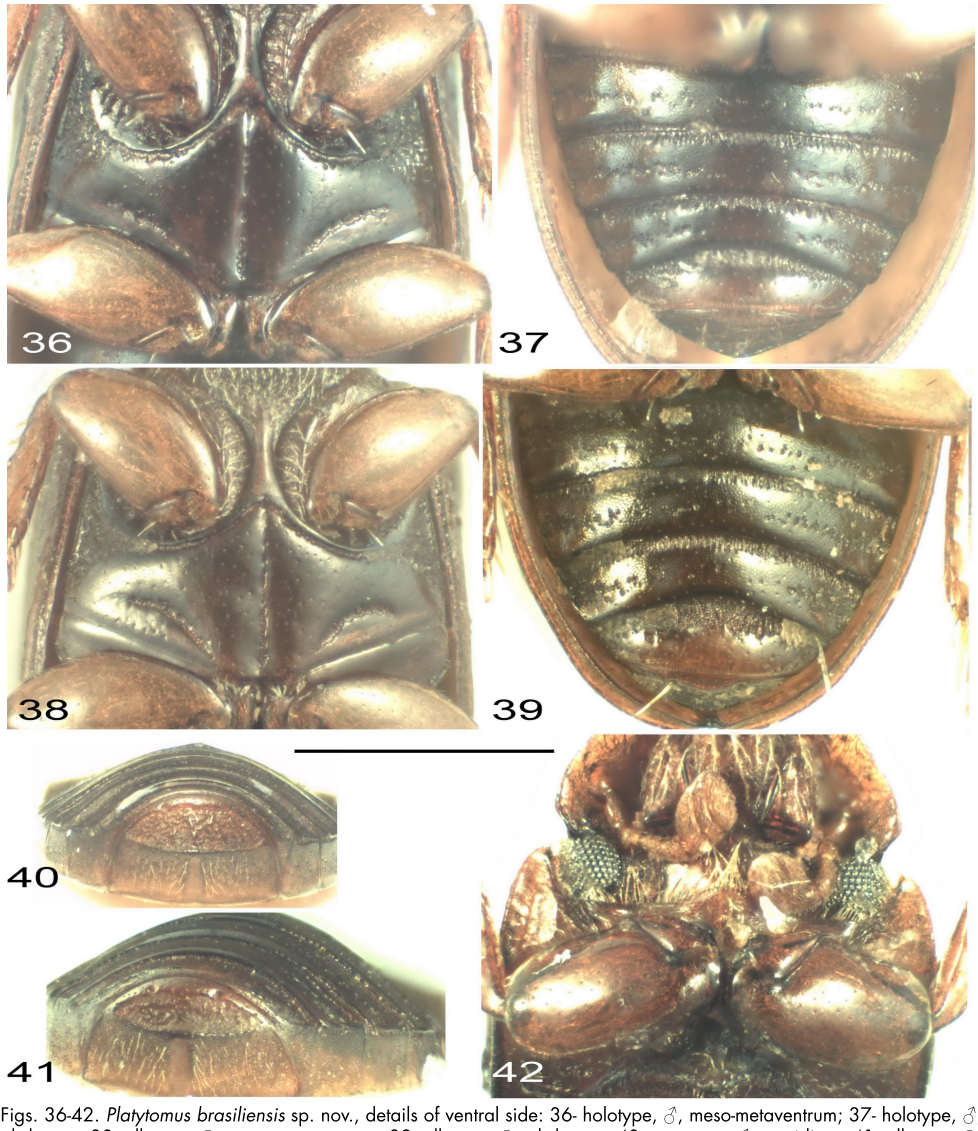
Figs. 30-35. *Platytomus brasiliensis* sp. nov., holotype, ♂, details of head, pronotum and elytra: 30- head, dorsal view; 31- pronotum, dorsal view; 32- head and pronotum, dorsolateral view; 33- anterior part of elytra with scutellum and pronotum base, dorsal viev; 34- elytra, dorsolateral view; 35- elytral apex. Scale lines 0.5 mm. Photographs by L. Mencl.

Ventral surfaces (Figs. 28-29, 36-39 and 42) also dark brown (femora paler than abdominal ventrites and meta-mesoventrum), prevalently glabrous and smooth. Meso-metataventral plate (Fig. 38) smooth, with narrow midline furrow and with pair of arc-shaped impressions for insertion of metafemora. Abdominal ventrites 3-6 with fluted anterior margins, surfaces of abdominal

ventrites 3-5 smooth with exception of transverse row of rather distinct punctures arranged in serrate line ("zig-zag line") on each of them.

Pygidium as in Figs. 40-41, bearing two pygidial setae.

Aedeagus as in Figs. 43 and 44.



Figs. 36-42. *Platytomus brasiliensis* sp. nov., details of ventral side: 36- holotype, ♂, meso-metaventrum; 37- holotype, ♂, abdomen; 38- allotype, ♀, meso-metaventrum; 39- allotype, ♀, abdomen; 40- paratype, ♂, pygidium; 41- allotype, ♀, pygidium; 42- holotype, ♂, profemora. Scale lines 0.5 mm. Photographs by L. Mencl.

Sexual dimorphism. There are moderate differences between males and females in shapes of the propygidium (see Figs. 37 and 39).

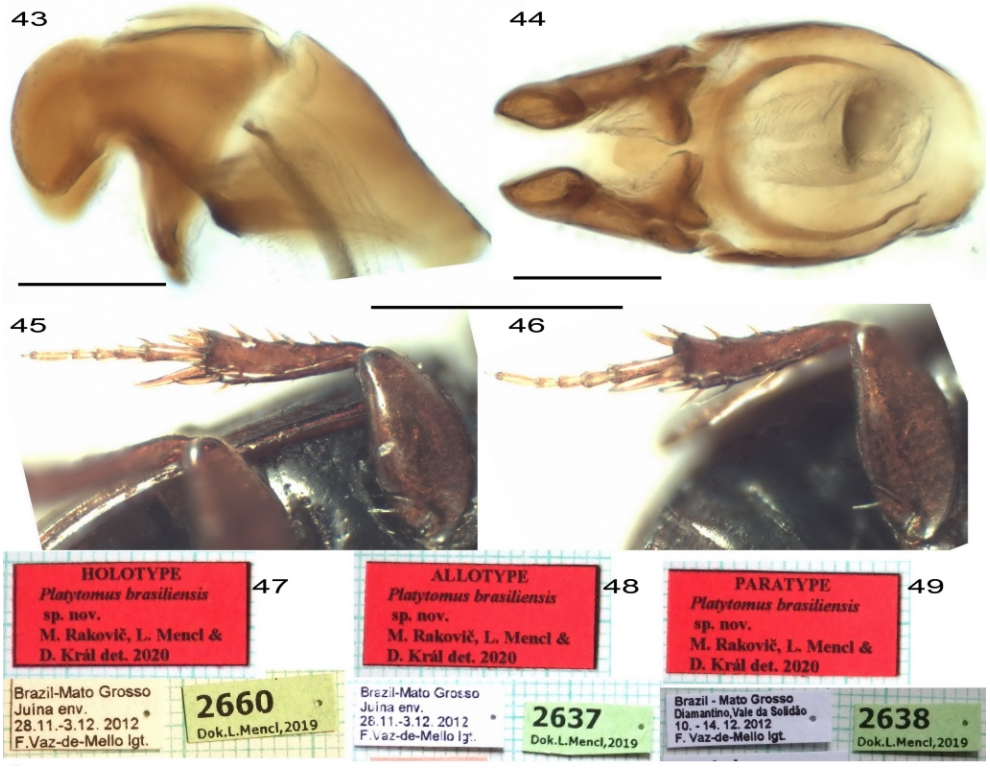
Variability. In the series studied (39 specimens), the body length varies from 2.28 to 2.34 mm. There are no important differences in the structures and sculptures of the head, pronotum or elytra.

Differential diagnosis. See the paragraph Differential diagnosis in the preceding species *P. bordati* sp. nov.

Collecting circumstances. Unknown.

Distribution. Brazil (Mato Grosso), Argentina (Gran Chaco).

Name derivation. Toponymic, based on the name of the country, where the holotype was collected.



Figs. 43-49. *Platytomus brasiliensis* sp. nov., aedeagus, mesotibia with mesotarsus, metatibia with metatarsus, etiquettes: 43- holotype, ♂, aedeagus, lateral view; 44- holotype, ♂, aedeagus, ventral view; 45- paratype, ♀; 46- paratype, ♀; 47- etiquettes under holotype; 48- etiquettes under allotype; 49- etiquettes under paratype. Scale lines 0.5 mm for Figs. 45-46, 0.1 mm for Figs. 23-44. Photographs by L. Mencl.

KEY TO *PLATYTOMUS* SPECIES STILL REPORTED FROM THE SOUTH-AMERICAN CONTINENT*

1(6) Species with very distinct (impressed) frontoclypeal suture. Granules present throughout area between clypeus anterior margin and frontoclypeal suture (including whole epistomal gibbosity). Frons with few relatively large punctures intermixed with more numerous fine punctures. Pygidial setae 8 in number.

2(3) Clypeus margins considerably upturned. Granules on head transversal anteriorly and laterally, round on epistomal gibbosity. Reddish brown, 2.2-2.7 mm. Brazil, Bolivia. ..... *P. freudei* (Balthasar, 1960)

3(2) Clypeus margins moderately upturned. Granules on head rather obsolete or relatively low and narrow.

4(5) Elytral intervals strongly convex. Elytral striae very deep and wide (stria width of about 0.6 interval width on elytral disc), their punctures strongly crenate inside margins of intervals. Granules on head rather obsolete. Dark castaneous, 2.3-2.7 mm. S. America (still reported from Argentina, Colombia, French Guiana and Paraguay). ..... *P. gregalis* (Cartwright, 1948)

5(4) Elytral intervals moderately convex. Elytral striae narrow, their punctures moderately crenate inside margins of intervals. Granules on head fine (low and narrow). Reddish brown with darker elytral margins. 1.9-2.4 mm). From SE USA to Bolivia and Argentina. ..... *P. longulus* (Cartwright, 1948)

6(1) Species with very weak frontoclypeal suture, which is in shape of very fine (not impressed) line, non-observable under low magnification or even missing. At least area of about posterior half of epistomal gibbosity non-granulate (Figs. 5 and 30). Frons with very fine punctures only. Pygidial setae 2 in number.

7(8) Granules on head mostly transversal, present only on clypeus anterior and lateral margins, at most with few granules on narrow anterior zone of epistomal gibbosity (Fig. 5). Lateral impressions of meta-mesoventrum for inserting anterior margins of metafemora angular (Fig. 13). Abdominal ventrites 3-5 impunctate or at most with few very fine indistinct punctures (Fig. 12). Dark brown 2.1-2.4 mm. Brazil (Brasilia - District Federal). ..... *P. bordati* sp. nov.

8(7) Granules on head rather obsolete, mostly round or oval, present also on about anterior 1/3 of epistomal gibbosity (Fig. 30). Lateral impressions of meta-mesoventrum for inserting anterior margins of metafemora in shape of flat arcs (Fig. 36). Abdominal ventrites 3-5 with quite distinct punctures arranged in serrate lines (referred to as "zig-zag lines" in many works dealing with Psammodiini) (Fig. 39). Dark brown 2.2-2.4 mm. Brazil (Mato Grosso), Argentina (Gran Chaco). .... *P. brasiliensis* sp. nov.

*The key does not include a further species described from the continent: *Platytomus grisoli* (Paulian, 1942) from Venezuela. According to the original description, it is very small (body length of 1.5 to 2 mm), blackish brown with reddish brown elytra. The description of particular characters is very brief and currently insufficient. Future examination of types deposited in the Paris museum will be necessary; synonymy with a species known from the West Indies can also come in question.

DISCUSSION

The key to species presented above includes only those taxa, which have still been actually reported from the South-American Continent (for example it does not comprise species still known from West Indies only).

The interpretation of characters quoted in couples 6(1), 7(8) and 8(7), leading to the two new species, *P. bordati* sp. nov. and *P. brasiliensis*, sp. nov. can be facilitated by using respective figures displayed in the present work. Photographs presented in our preceding work (Rakovič et al. 2020) should be helpful in the interpretation of characters mentioned in couples 2(3), 3(2) and 4(5). i.e. in the identification of *P. freudei* and *P. gregalis*.

American species were revised by Cartwright (1948). The work is very exact as usual with any work by this author dealing with Psammodiini or Eupariini. However, some new species have been described since then. Some characters are thus described in a rather general manner there. For example the thesis "clypeus verrucose" cannot characterize differences between species as to the granulate sculpture of the head. The shape and distribution of granules should be taken into account and appropriate photographs should be employed for this purpose.

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