

**Contributions to knowledge of Psammodiini from the Western Hemisphere 1.
Types of *Platytomus freudei* and *Platytomus gregalis*
(Coleoptera: Scarabaeidae: Aphodiinae)**

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Abstract. Types of the species *Platytomus freudei* (Balthasar, 1960) and *P. gregalis* (Cartwright, 1948) were studied. Redescriptions of the two species based on a *P. freudei* paratype and the *P. gregalis* holotype, respectively, are presented together with general as well as detailed photos of the type specimens. Combinations of characters important in terms of the differentiation from other *Platytomus* Mulsant, 1842 species occurring in the South-American Continent are emphasized. Some further specimens of the two species were studied and their locality data are also presented. *Platytomus freudei* is reported from Bolivia for the first time.

INTRODUCTION

Species of the genus *Platytomus* Mulsant, 1842 inhabiting American continents were revised by Cartwright (1948), but the revision considered American species, including the introduced Palaearctic species *Pleurophorus caesus* (Creutzer, 1796), within the framework of the genus *Pleurophorus* Mulsant, 1842. That time, there was a complicated situation in classing particular species into the genera *Pleurophorus* and *Diastictus* Mulsant, 1842. This problem was solved by Pittino and Mariani (1986), who restituted the third genus *Platytomus* within their revision of Old World species of the genus *Diastictus* and its allies; they also noted that New World species revised by Cartwright (1948) as members of the genus *Pleurophorus* (with exception of the introduced Palaearctic species *Pleurophorus caesus*) belong to *Platytomus*. The most recent, topically valid list of *Platytomus* species from the Western Hemisphere was provided by Skelley (2008). The list includes 12 species including the introduced Palaearctic species *Platytomus tibialis* (Fabricius, 1798).

The key by Cartwright (1948) is of principal importance, but some new species have been described since then and certain characters are insufficiently detailed there. Careful studies of types should be helpful in the interpretation of particular species. Two above mentioned species were studied here and the results are presented below as the first step in this direction.

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 the Helicon Focus programme.

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

- LMCT Ladislav Mencl, private collection, Týnec nad Labem, Czech Republic;
MRCD Miloslav Rakovič, private collection, Dobřichovice, Czech Republic;
PBCS Patrice Bordat, private collection, Saint-Cirq, France;
USNM Smithsonian National Museum of Natural History, Washington, USA (David G. Furth, Floyd W. Shockley);
ZSMC Zoologische Staatssammlung, München, Germany (Michael Balke).

Descriptions presented below include the characterization of the pronotal structure, particularly the presence of two pairs of lateral pronotal impressions. The impressions correspond to vestiges of transversal pronotal furrows 1 (the anterior pair of impressions) and 3 (the posterior pair of impressions), which are present in *Psammodiini* having the complete pronotal structure, i.e. five transversal ridges and five transversal furrows (for example in *Psammodius* Fallén, 1807); in each pair, the left and right impressions can be partially or completely connected by a row of punctures). The arrangement of relatively larger punctures can sometimes also indicate vestiges of other transversal furrows (furrows 2, 7 and/or 5). A posterior longitudinal pronotal furrow (extending forward from pronotal base) can also be present, which is only indicated by superficial, medium-sized punctures or fairly impressed and containing large and deep punctures.

TAXONOMY

Platytomus freudei (Balthasar, 1960)

(Figs. 1-17)

Diastictus freudei Balthasar, 1960: 7.

Platytomus freudei: Dellacasa, 1988: 421 (catalogue - world), Gordon & Pittino 1992: 268 (status of American *Psammodiini* genera and species), Skelley 2008 (list of New World species).

Type locality. Brazil, State of Santa Catarina, Nova Teutonia.

Type material studied. BRAZIL: Paratype, ♀ (ZSMC), "Brasilien / Nova Teutonia / Fritz Plaumann / iii. 1935 [white printed label] // *Diastictus / freudei* n. sp. / Balth. [pink handwritten/printed label] // 2180 / Dok. L. Mencl, 2017 [pale green printed label, related to the photo-documentation system of the third author]. See also Fig. 17.

Additional material studied: BOLIVIA: Santa Cruz Lea, La Chonta near Ascencion 226 m, 15°47'18''S 62°55'32''W, 8.-9. i. 2016, Lgt. Kremitovský, (4 specimens, LMCT).

Description of paratype. Small, body length of 2.6 mm. Oblong oval, moderately convex, subparallel, glabrous, only very slightly microreticulate and thus fairly shining, reddish brown, pronotum, scutellum, posterior 2/3 of elytral sutural interval, and apical and lateral



Figs. 1-3. *Platytomus freudei* (Balthasar, 1960), paratype, ♀, habitus: 1- dorsal view; 2- dorsolateral view; 3- ventral view. Scale line 1 mm. Photographs by L. Mencl.

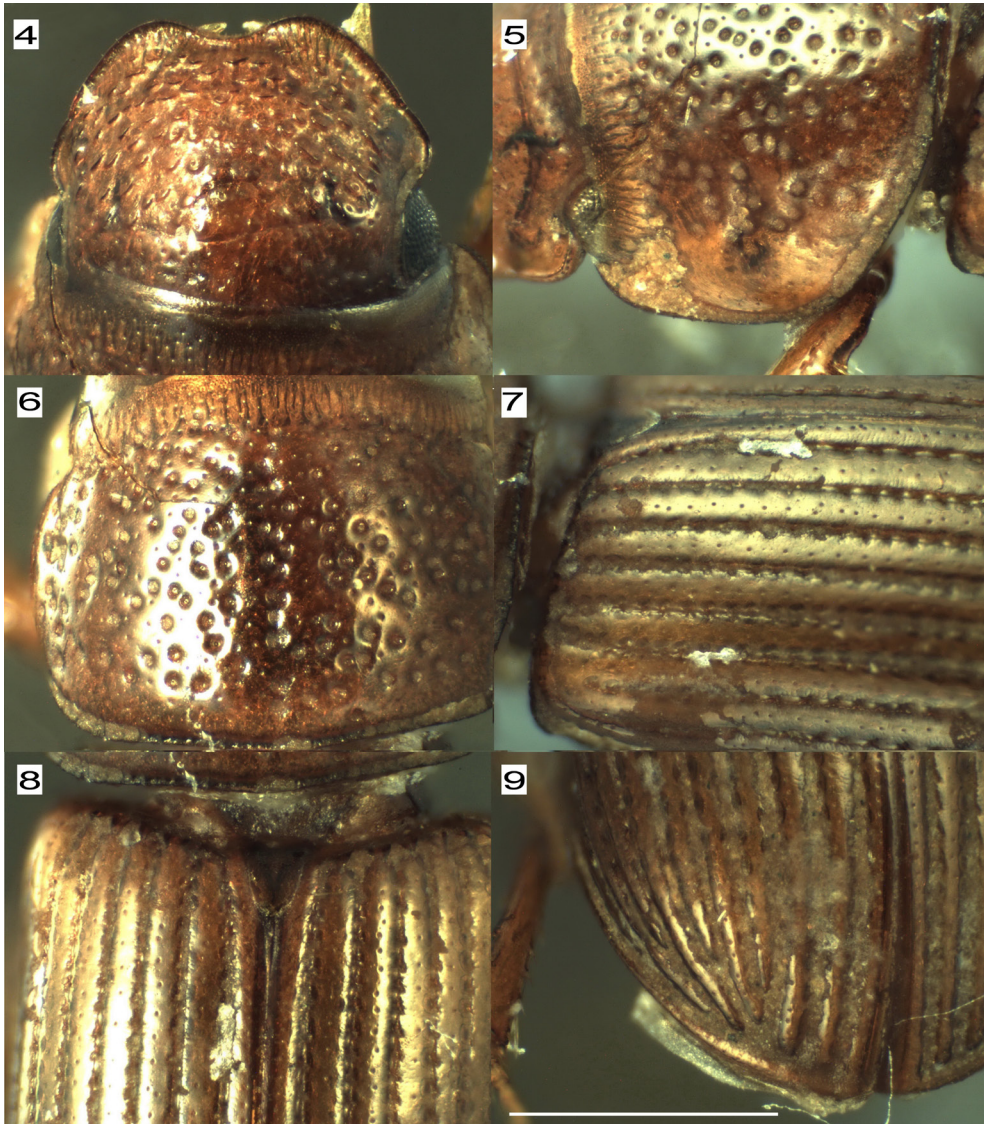
areas of elytra obsolete darker. Length-to-width ratio of 2.42, broadest at about 2/3 elytra length (Fig. 1).

Head (Fig. 4) convex, clypeus rounded each side of anteromedian emargination, with upturned anterior and lateral margins; its lateral sides slightly arcuate up to genae; genae bare, anteriorly nearly not differentiated from clypeus lateral margin, well rounded, not protruding beyond eyes. Granules (mostly transversal) situated throughout clypeus surface. Frontoclypeal suture quite distinct, head posteriorly (behind frontoclypeal suture) sparsely punctate (with fine and medium-sized punctures), otherwise smooth, glossy.

Pronotum (Figs. 5-6) transversal (length-to-width ratio of 0.737), with two pairs of lateral impressions (see Methods); impressions of anterior pair distinct, those of posterior pair less distinct in dorsal aspect, rather more distinct in oblique (dorsolateral view). Anterior angles moderately rounded, lateral margins arcuately merging in broadly rounded posterior angles. Pronotum lateral margins, posterior angles and base continuously bordered (furrowed). Pronotum surface finely punctate throughout; the fine punctures intermixed with coarse ones, which are, however, absent in zones along anterior, lateral and basal margins.

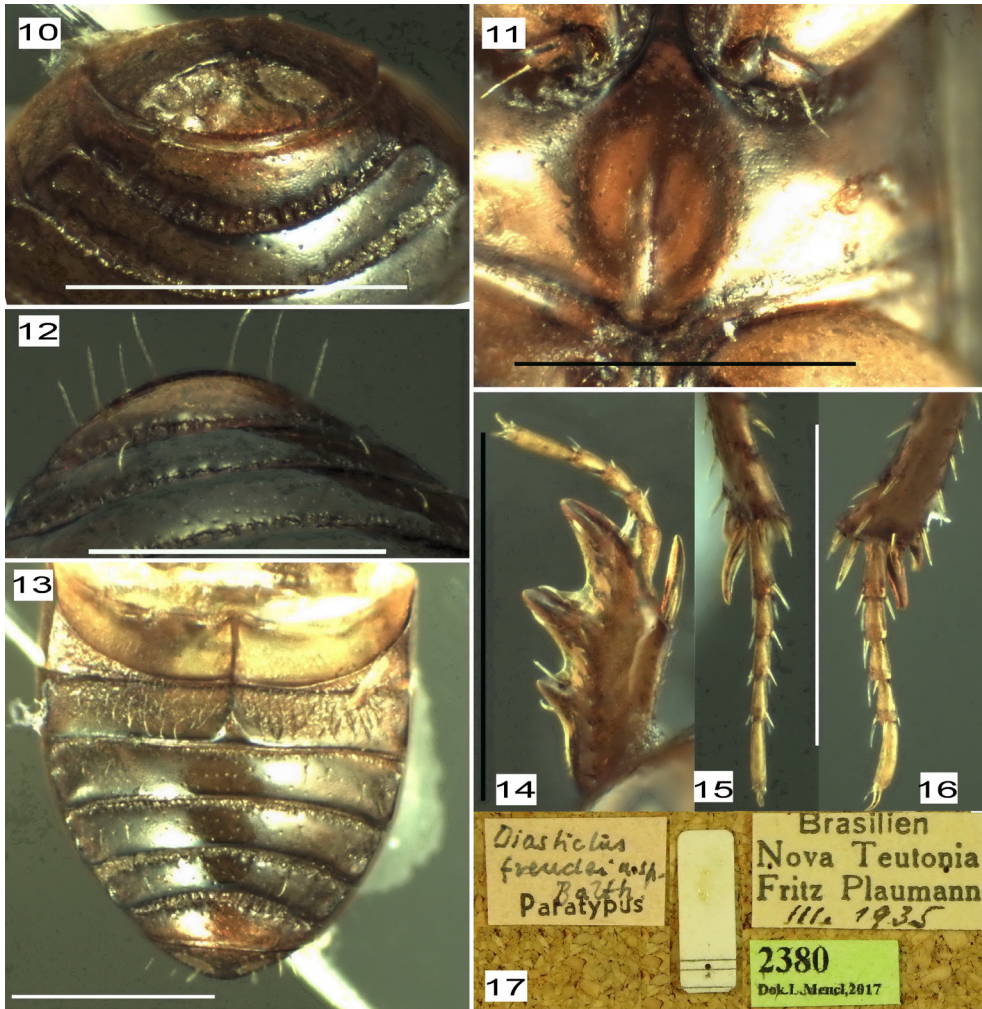
Scutellum small, triangular, smooth, with moderately arcuate sides and moderately rounded apex (Fig. 8).

Elytra elongate, only slightly broader behind, their length-to-width ratio of 1.44, slightly wider than pronotum (ratios pronotum width : maximum elytral width = 0.883, pronotum length : elytra length = 0.452); without humeral denticles; with ten striae and ten intervals; striae well distinct, with distinct punctures considerably crenating inside margins of intervals; intervals convex, quite distinctly finely punctate, punctures being arranged in rather irregular median longitudinal rows (Figs. 1-2 and 7-9).



Figs. 4-9. *Platytomus freudei* (Balthasar, 1960), paratype, ♀, details of head, pronotum and elytra: 4- head dorsal view; 5- pronotum, dorsolateral view; 6- pronotum, dorsal view; 7- anterior area of elytra, dorsolateral view; 8- anterior area of elytra, dorsal view; 9- elytral apex. Scale line 0.5 mm. Photographs by L. Mencl.

Legs (dorsal aspects). Protibia (Fig. 14) with three outer teeth in apical half, not denticulate in basal half; apical spur moderately bent outward, reaching to about apex of protarsomere 1, protibia dorsal face with a longitudinal row of setigerous punctures, otherwise smooth. Mesotibia (Fig. 15) slim, moderately widening toward apex; superior terminal spur rather longer than mesotarsomere 1, inferior terminal spur shorter than basal mesotarsomere.



Figs. 10-17. *Platytomus freudei* (Balthasar, 1960), paratype, ♀, details of pygidium, meso-metaventrum, abdomen, and legs and etiquettes: 10- abdominal sternites 5-6 and pygidium; 11- meso-metaventrum; 12- pygidial setae; 13- abdomen; 14- left protibia (upper face) with protarsus; 15- left mesotibia (outer face) with mesotarsus; 16- left metatibia (inner face) with metatarsus; 17- etiquettes. Scale lines 0.5 mm. Photographs by L. Mencl.

Metatibia (Fig. 16) moderately widening toward apex; basal metatarsomere widened apically (ratio of its length to its apical width of about 2.7), about 1.8 times longer than metatarsomere; superior spur of metatibia moderately longer than basal metatarsomere; inferior terminal spur about 1.6 times shorter.

Ventral surfaces (Figs. 3, 11, 13) yellowish brown to piceous (abdominal ventrites relatively darker than femora and meso-metaventrum). Femora smooth, glabrous. Meso-metataventral plate smooth, sparsely punctate, with longitudinal furrow narrow, complete posteriorly, widened in its middle part and then reduced anteriorly. Abdominal ventrite 2

richly macrosetaceous, ventrites 3-5 sparsely finely punctate, with few macrosetae, their anterior margins fluted. Pygidium with strongly uneven surface (Fig. 10); pygidial setae eight in number (Fig. 12).

Sexual dimorphism. Not available.

Variability. In the material studied (5 specimens - the paratype and 4 additional specimens) the body length varies from 2.2 to 2.7 mm. The colour of the dorsal surface is moderately variable. Darker (not distinctly delimited) areas on elytra can be found laterally, on disc or on apex, but can also be absent.

Collection circumstances. Unknown.

Differential diagnosis. Among *Platytomus* species, still known to occur in the South-American Continent, the species *P. freudei* is *inter alia* characterized by considerably upturned clypeus anterior and lateral margins. See also the section Discussion below.

Distribution. Brazil (Mato Grosso State), Bolivia (Santa Cruz District). New to Bolivia.

***Platytomus gregalis* (Cartwright, 1948)**
(Figs. 18-31)

Pleurophorus gregalis Cartwright, 1948: 145.

Platytomus gregalis: Dellacasa, 1988: 421 (catalogue - world), Gordon & Pittino 1992: 268 (status of American Psammodiini genera and species), Skelley 2008 (list of New World species).

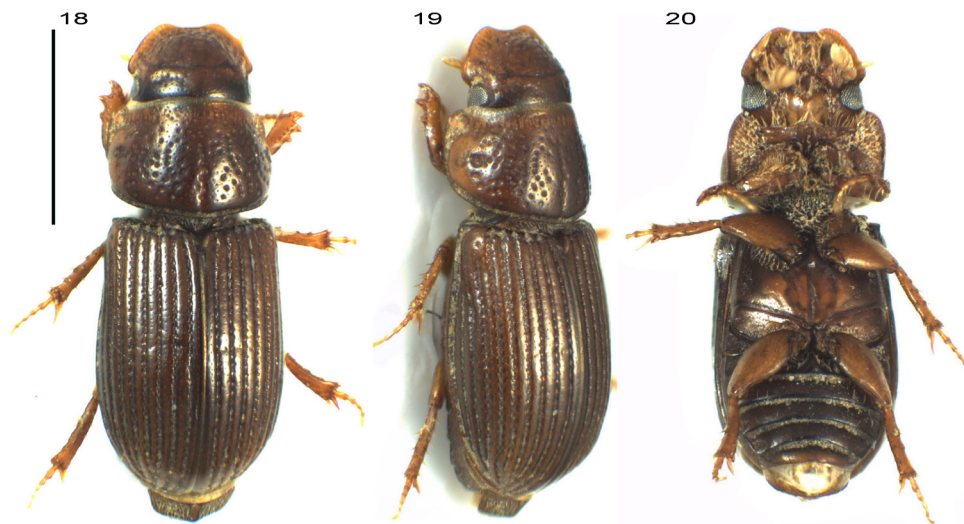
Type locality. "Colombia, Near Cali."

Type material studied. COLOMBIA: Holotype, ♂ (USNM), "Colombia / Val 2088 m / Mares above / 5. iii. 1942 [white printed label] // Chapin / No670 [white printed label] // HOLOTYPE / Pleurophorus / gregalis / Cartwright [red printed label] // Type No. / 58816 / U S N M [red printed label] // 2510 / Dok. L. Mencl, 2018 [pale green printed label, related to the photo-documentation system of the third author]. See also Fig. 31.

Additional material studied: ARGENTINA: Argentina NC, Gran Chaco, Salada Riv., S. of Macapilo (SE Salta), 20. i. 2009, Lgt. M. Snížek, (2 specimens, LMCT); FRENCH GUIANA: Matoury, Silvain leg., (2 specimens, PBCS); PARAGUAY: Prov. Canindeyu, 30. xi. 2010, 24°07' S 55°31' W, 200 m, Sv. Bílý leg., (2 specimens, LMCT); 60 km SW. of Concepcion, Presid. Haves Prov., 31. i. 2008, J. Halada leg., (9 specimens, MRCD).

Description of holotype. Small, body length of 2.6 mm. Oblong oval, moderately convex, subparallel, glabrous, shining, castaneous, clypeus margins and lateral areas of pronotum lighter. Length-to-width ratio of 2.52, broadest at about 0.56 elytra length (Fig. 18).

Head (Fig. 21) convex, clypeus rounded each side of anteromedian emargination, with moderately upturned anterior and lateral margins; its lateral sides moderately arcuate up to genae; genae bare, anteriorly slightly differentiated from clypeus lateral margin, well rounded, slightly protruding beyond eyes. Rather obsolete granules situated throughout clypeus



Figs. 18-20. *Platytomus gregalis* (Cartwright, 1948), holotype, ♂, habitus: 18- dorsal view; 19- dorsolateral view; 20- ventral view. Scale line 1 mm. Photographs by L. Mencl.

surface. Frontoclypeal suture considerably deep, head posteriorly (behind frontoclypeal suture) sparsely punctate (with fine and medium-sized punctures), otherwise smooth, glossy.

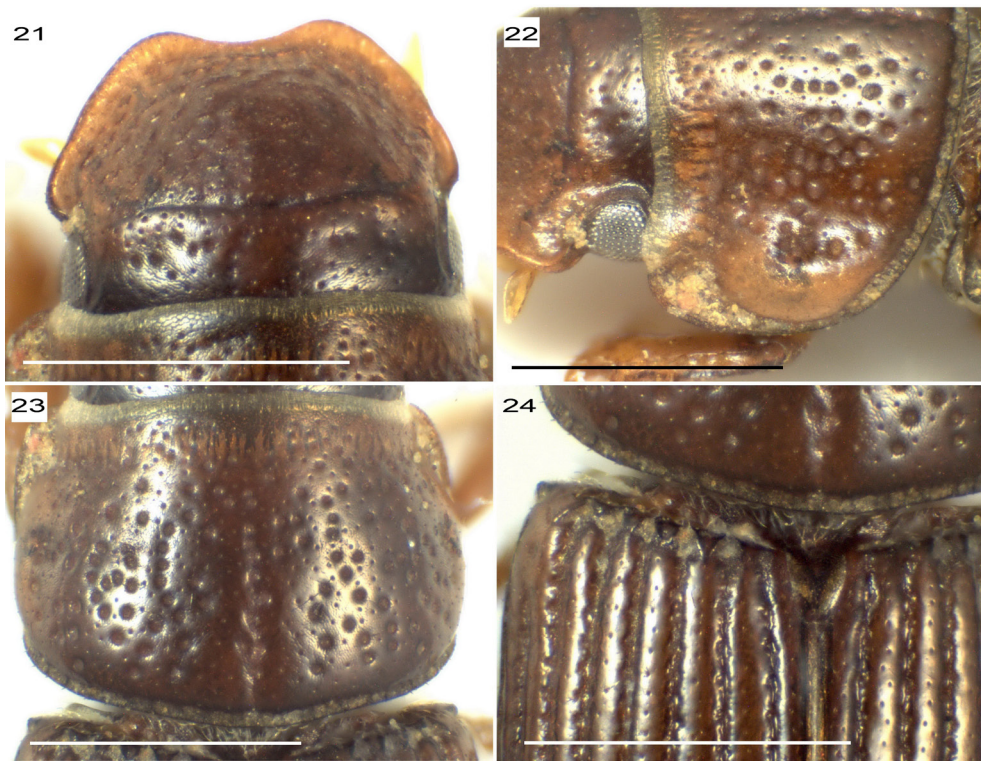
Pronotum (Figs. 22-23) transversal (length-to-width ratio of 0.756), with two pairs of lateral impressions (see Methods); impressions of anterior pair distinct, those of posterior pair less distinct in dorsal aspect, rather more distinct in oblique (dorsolateral view). Anterior angles moderately rounded, lateral margins arcuately merging in broadly rounded posterior angles. Pronotum lateral margins, posterior angles and base continuously bordered (furrowed). Pronotum surface finely punctate throughout; the fine punctures intermixed with coarse ones, which are, however, absent in zones along anterior, lateral and basal margins.

Scutellum small, triangular, smooth, with moderately arcuate sides and moderately rounded apex (Fig. 24).

Elytra (Figs. 18-19, 24-25, 27) elongate, moderately broader behind, their length-to-width ratio of 1.46, moderately wider than pronotum (ratios pronotum width : maximum elytral width = 0.872, pronotum length : elytra length = 0.452); humeral denticles small, but yet distinct; with ten striae and ten intervals; striae very deep, their punctures strongly crenate inside margins of intervals, and wide (stria width about 0.6 interval width on disc); intervals strongly convex, quite distinctly finely punctate, punctures being arranged in rather irregular longitudinal median rows.

Legs (dorsal aspects). Protibia with three outer teeth in apical half, not denticulate in basal half. Mesotibiae and metatibiae slim, moderately widening from knees toward apices; basal mesotarsomere as long as metatarsomeres 2 and 3 combined, its length to apical width ratio of 3.5:1.

Ventral surfaces (Figs. 20, 26) also castaneous, shining (abdominal ventrites relatively darker than femora and meso-metaventrum). Femora smooth, glabrous. Meso- and



Figs. 21-24. *Platytomus gregalis* (Cartwright, 1948), holotype, ♂, details of head, pronotum and elytra: 21- head, dorsal view; 22- pronotum, dorsolateral view; 23- pronotum, dorsal view; 24- pronotum base and anterior area of elytra with scutellum, dorsal view. Scale lines 0.5 mm. Photographs by L. Mencl.

metafemora in apical half narrowed and compressed along posterior margin, thus giving appearance of thick marginal line there. Meso-metataventral plate smooth, with longitudinal furrow distinct posteriorly, but suddenly vanishing anteriorly. Abdominal ventrites 3-5 with shortly fluted anterior margins. Pygidial setae eight in number (Fig. 28).

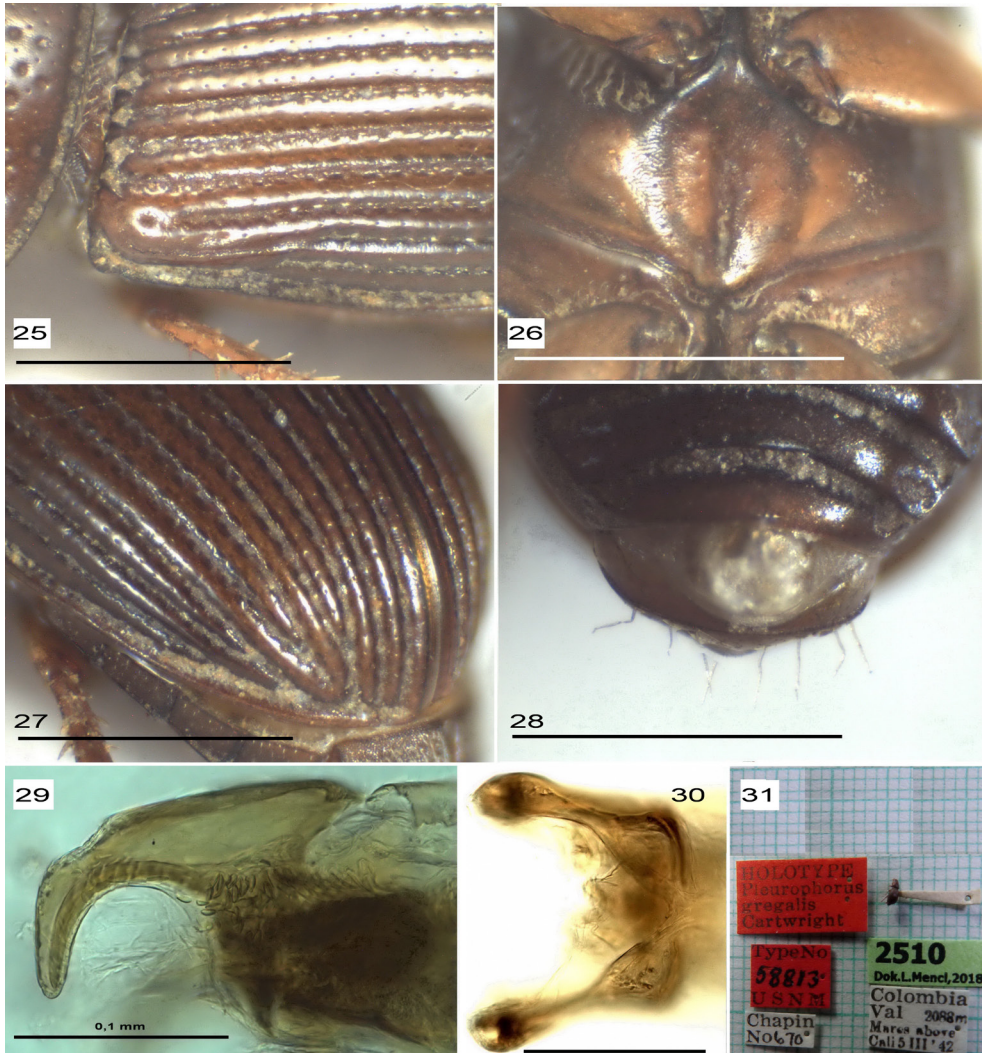
Aedeagus, shapes of parameres as in Figs. 29-30.

Sexual dimorphism. Not available.

Variability. According to the original description, in the type series (15 specimens – the holotype, allotype and 13 paratypes), the body length varies from 2.3 to 2.7 mm.

Collection circumstances. Unknown.

Differential diagnosis. Among *Platytomus* species, still known to occur in the South-American Continent, the species *P. gregalis* is *inter alia* characterized by considerably convex elytral intervals and wide elytral striae. See also the section Discussion below.



Figs. 25-31. *Platytomus gregalis* (Cartwright, 1948), holotype, ♂, details of elytra, meso-metaventral plate, pygidium, and aedeagus and etiquettes: 25- anterior area of elytra, dorsolateral view; 26- meso-metaventral plate; 27- elytral apex; 28- abdominal sternites 5-9 with pygidium and pygidial setae; 29- parameres, lateral view; 30- parameres, dorsal view; 31- etiquettes. Scale lines 0.5 mm for Figs. 25-28, 0.1 mm for Figs. 29-30. Photographs by L. Mencl.

Distribution. South America (based on the literature and specimens examined here still known from Argentina, Colombia, French Guiana and Paraguay).

DISCUSSION

The purpose of the work presented here was to study types of two *Platytomus* species and present more detailed data about their characters. Due to the reasons explained in the Introduction, the interpretation of *Platytomus* species from the Western Hemisphere is very difficult, but there are two works, which are of the top importance for future attempts: the revision by Cartwright (1848) and the list by Skelley (2008).

Table 1 is presented below, which could facilitate the considerations of species known to occur in the South-African Continent with taking into account the results of the present study.

Table 1. Comparison of some characters important for differentiating three species occurring in South-American Continent one from another

Species/body length/ distribution	Clypeus margins	Granules on head surface	Elytral intervals and striae	Colour (dorsum)	Metafemora
<i>Platytomus freudei</i> 2.2-2.7 mm Brazil, Bolivia	considerably upturned (Fig. 4)	transversal anteriorly and laterally, round on central area (Fig. 4)	intervals moderately convex, striae narrower, their punctures moderately crenating intervals (Fig. 8)	reddish brown	metafemur posterior margin not arranged as in <i>P. gregalis</i> (Fig. 3)
<i>Platytomus gregalis</i> 2.3-2.7 mm S. America (still known from Argentina, Colombia, French Guiana, Paraguay)	moderately upturned (Fig. 21)	rather obsolete (Fig. 21)	intervals strongly convex, striae very deep, their punctures strongly crenating intervals, and wide (stria width about 0.6 interval width on disc) (Fig. 24)	dark casta-neous	metafemur posteriorly narrowed and its margin is depressed in apical half (Fig. 20)
<i>Platytomus longulus</i> 1.9-2.4 mm From SE US to Bolivia and Argentina	moderately upturned	very fine (low and narrow)	intervals moderately convex, striae narrower, their punctures moderately crenating intervals	reddish brown, darker elytral margins	metafemur posterior margin not arranged as in <i>P. gregalis</i>

Types of the species *P. longulus* (Cartwright, 1948) are currently unavailable to us, but we have three reliably identified specimens from Florida (Hardy det.), which were also formerly compared with the holotype by the first author of the present work (M. R.).

It is, however, to remind that a further species has been described from this 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.

REFERENCES

- BALTHASAR V. 1960: Beiträge zur Kenntnis der Insektenfauna Boliviens. Teil XIII. Coleoptera XII. Neue Aphodiinae-Arten (100. Beitrag zur Kenntnis der Scarabaeidae). *Opuscula Zoologica* Nr. 48: 1-7.
- CARTWRIGHT O. L. 1948: The American species of *Pleurophorus* (Coleoptera: Scarabaeidae). *Transactions of the American Entomological Society* 74: 131-145.
- DELLACASA M. 1988: Contribution to a world-wide catalogue of Aegialiidae, Aphodiidae, Aulonocnemidae, Termitotrogidae (Coleoptera: Scarabaeoidea). *Memorie della Società Entomologica Italiana* 66 (1987): 1-455.
- GORDON R. D. & PITTINO R. 1992: Current status of the American genera and species of Psammodiini (Coleoptera: Scarabaeidae: Aphodiinae). *The Coleopterists Bulletin* 46: 260-273.
- MULSANT E. 1842: *Histoire naturelle des Coléoptères de France*. Paris: Maison Libraire; Lyon: Imprimerie de Dumoulin et Silouet, 626 pp.
- PAULIAN R. 1942: Coléoptères Scarabaeidae nouveaux. *Bulletin de la Société entomologique de France* 47: 59-61.
- PITTINO R. & MARIANI G. 1986: A revision of the Old World species of the genus *Diastictus* Muls. and its allies (*Platytomus* Muls., *Pleurophorus* Muls., *Afrodiastictus* n. gen., *Bordatius* n. gen.), (Coleoptera, Aphodiidae, Psammodiini). *Giornale Italiano di Entomologia* 3: 1-165.
- SKELLEY P. 2008: Generic Guide to New World Scarab Beetles. University of Nebraska State, Museum – Division of Entomology, Available at <http://www.museum.unl.edu/research/entomology/Guide/Scarabaeoidea/Scarabaeidae/Aphodiinae/AphodiinaeTribes/Psammodiini.html>.

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