

Two new species of Ptomaphagini from Bolivia (Coleoptera, Leiodidae, Cholevinae)

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Abstract. – Two new species of forest litter beetles, *Adelopsis singularis* n. sp. and *Ptomaphagus (Tupania) boliviensis* n. sp. are described, with the first record of the subgenus *Tupania* Szymczakowski, 1961, from Bolivia. Illustrations are given and comparative differences with the nearest taxa are discussed. The female of *Ptomaphagus (Tupania) flabellatus* Szymczakowski, 1961, is described and the spermatheca is illustrated for the first time.

Résumé. – Deux nouvelles espèces de Ptomaphagini de Bolivie (Coleoptera, Leiodidae, Cholevinae). Deux nouvelles espèces de Coléoptères forestiers de la litière, *Adelopsis singularis* n. sp. et *Ptomaphagus (Tupania) boliviensis* n. sp., sont décrites et illustrées, avec le premier signalement d’une espèce du sous-genre *Tupania* Szymczakowski, 1961, en Bolivie. Les caractères distinctifs avec les taxons apparentés sont discutés. La femelle de *Ptomaphagus (Tupania) flabellatus* Szymczakowski, 1961, est décrite et la spermatheque est illustrée pour la première fois.

Resumen. – Dos especies nuevas de Ptomaphagini de Bolivia (Coleoptera, Leiodidae, Cholevinae). Se describen dos especies nuevas de coleópteros del humus del bosque, *Adelopsis singularis* n. sp. y *Ptomaphagus (Tupania) boliviensis* n. sp., con el primer dato de una especie del subgénero *Tupania* Szymczakowski, 1961, de Bolivia. Se realizan gráficos de ambas especies para una más segura determinación y se discuten las diferencias con los taxones más próximos. La hembra de *Ptomaphagus (Tupania) flabellatus* Szymczakowski, 1961, es descrita y la espermateca es dibujada por vez primera.

Keywords. – Taxonomy, *Adelopsis*, *Tupania*, new species, new record.

The genus *Adelopsis* Portevin, 1907, which includes 77 species — without the species described in this paper — is typically found in the Neotropical region (PECK *et al.*, 1998; PERREAU, 2000). Of all these species, only two are known from Bolivia: *Adelopsis heterocera* Portevin, 1907, and *A. ruficollis* (Portevin, 1903). In this work, a third species, which is new to science, is added. As in the case of the previous two species, the specimens were collected in the Cochabamba Department (Bolivia).

In *Ptomaphagus* Illiger, 1798, the subgenus *Tupania* Szymczakowski, 1961, comprises seven species (MATTHEWS, 1888; SZYMCHAKOWSKI, 1961; PECK, 1977, 2003; PECK *et al.*, 1998) characterised by the more or less flabellate club segments and the shape of the aedeagus and spermatheca. Five of these seven species occur in south Mexico, one in Costa Rica and Panama, and another one in north east Brazil. An eighth species, described in this study, is now added. This is the first record of the subgenus *Tupania* in Bolivia and the second record for South America, thus extending the known distribution area of this subgenus.

MATERIAL AND METHODS

The studied specimens belong to Oxford University, Museum of Natural History, except for the two specimens of *Ptomaphagus (Tupania) flabellatus* Szymczakowski, 1961, provided as comparative material by the Museum of the Polish Academy of Sciences, Kraków (Poland).

The same methodology has been used to study these species as in previous publications by SALGADO (2002, 2005).

Abbreviations used. – The collections will be referred to as: **OUMNH**, Oxford University, Museum of Natural History (Oxford, United Kingdom); **CZULE**, Zoological Collection of León University (León, Spain).

***Adelopsis singularis* n. sp.** (fig. 1-8)

HOLOTYPE: ♂, Bolivia, Department of Cochabamba, Carmen Pampa, 16°37'06"S - 66°28'50"W, 1820 m, 26.VIII.2001, baited pitfall, humid montane forest, *A. C. Hamel & A. Pascall leg.* (OUMNH).

PARATYPES: 5 ♀, *idem* holotype (4 in OUMNH, 1 in CZULE).

Diagnosis. – Length between 2.26-2.82 mm; antennal segment 2 longer than 3; segments 8 to 10 transverse; uroventrite 4 tuberculate; male genital segment with gastral spine strongly wide and robust; aedeagus with very characteristic apical lamina of right lobe and microsetae on ventral face of lamina; left lobe atrophied; parameres with two fine apical setae; stylet long, robust and contoured; spermatheca long, with anterior region in “S” and apical lobe longer than wide.

Description of male holotype. – Length 2.80 mm; width 1.18 mm (fig. 1). Elongate oval-shaped. Shiny reddish colouration, head somewhat darker, antennae brown, though first two segments and last segment slightly lighter. Pubescence golden, short, fine and recumbent. Transverse striae on head poorly defined, eyes fully developed and pigmented.

Antennae with carinae weakly discernible on last seven segments, slightly longer than length of pronotum (1.02 mm); only segment 8 clearly transverse, segments 9 and 10 very slightly wider than long, also, segment 2 somewhat longer than 3, and 5 almost equal in length to 4 (fig. 2) (table I).

Pronotum 1.58 times wider than long, narrower than maximum width of elytra; sides weakly rounded, almost rectilinear in posterior half; posterior vertices pointed and protruding backwards; transverse striae more widely spaced and deeper than those on the head but less so than those on the elytra.

Elytra quite convex, 2.57 times longer than pronotum and 1.60 times longer than wide; sides weakly but uniformly arcuate; apical area in broad arch, almost subtruncate; transverse striae clearly defined, close together and perpendicular to suture. Metathoracic wings fully developed.

Legs. Intermediate tibiae weakly arcuate, posterior tibiae straight, both robust.

Abdomen. Middle region of posterior margin of ventrite 4 with two robust prominences and a half-moon shaped area between them covered in short quite stout setae; ventrite 6 with broad arch and tips of lateral edges pointed (fig. 3). Genital segment wider than long; gastral spine robust and strongly wide, particularly in the basal area and slightly sinuate in mid apical area (fig. 4).

Aedeagus quite long (0.48 mm), robust and wide (0.22 mm). In dorsal view (fig. 5), widest at base; apical area of right lobe forming a lamina of irregular lobes protruding slightly towards sides, one with a weakly serrate margin and three fairly long robust setae at the base; left lobe atrophied, only one small prominence with three short quite robust setae inserted. In right and left lateral view (fig. 6-7), aedeagus strong and uniformly arcuate, margins of ventral side of right lobe bearing fine microsetae; parameres very close to lateral sides of aedeagus, not easily discernible, with two long fine setae inserted in tip; internal sac with long, robust contoured stylet resting on clearly differentiated plate, weakly sclerotised irregularly shaped piece below stylet (fig. 5-6).

Note. – No reference has been made to the protarsi as the studied specimen lacks front legs.

Description of the female paratypes. – Length between 2.26-2.82 mm; width 1.18-1.24 mm. Shape and colouration similar to the male. Differences can be seen in the apical area of the elytra, slightly more rounded in the females, and in the antennae which are shorter; segments 4 and 5 very similar; club segments proportionally more transverse and no carinae visible.

The most striking difference with other species of the genus is undoubtedly seen in the spermatheca (fig. 8). In this species it is characteristic, with a very long “S” shaped apical region, and elongate apical lobe, twice as long as wide; the basal region with short spires, the first two clearly defined, and this region ending in a very fine long narrow duct.

Table I. – Measurements of antennal segments of *Adelopsis singularis* n. sp., holotype (L, length; W, width. 50 units = 0.65 mm).

	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°
L	13,0	9,0	7,4	6,2	6,0	4,8	6,0	3,0	5,2	5,2	7,2
W	4,5	3,7	3,0	3,0	3,0	3,8	5,5	5,0	5,6	5,6	4,8

Etymology. – The specific name, “*singularis*”, refers to the unique characteristics observed in the male genital segment, aedeagus and spermatheca.

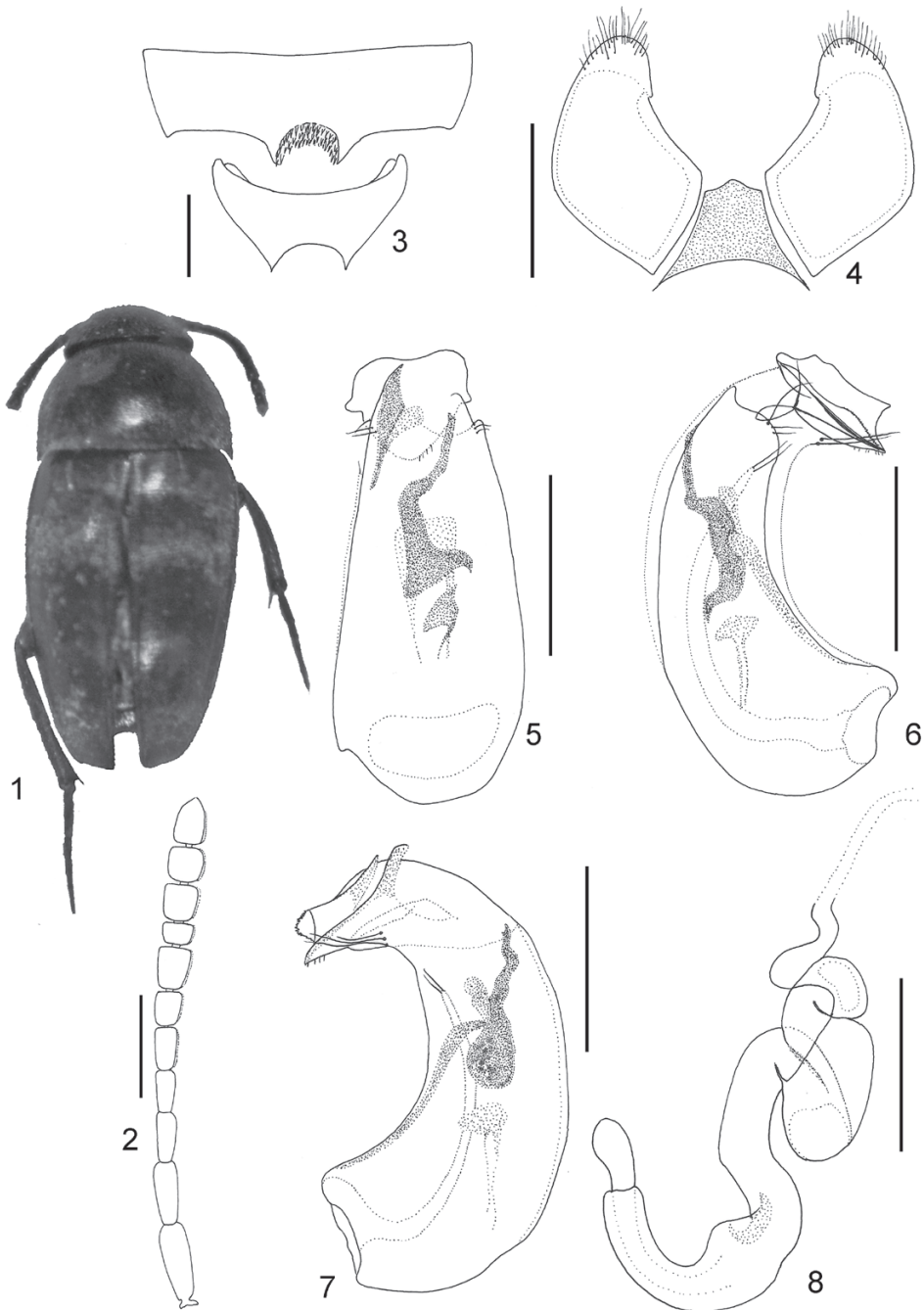


Fig. 1-8. – *Adelopsis singularis* n. sp. – 1-7, ♂: 1, habitus; 2, antenna; 3, uroventrites 4 and 6; 4, genital segment, ventral view; 5-7, aedeagus (5, dorsal view; 6, right lateral view; 7, left lateral view). – 8, ♀, spermatheca. (Scale bar: fig. 2-7, 0.2 mm; fig. 8, 0.1 mm).

Discussion. – *Adelopsis ruficollis* (Portevin, 1903) and *A. heterocerus* Portevin, 1907, were the only species in the genus *Adelopsis* recorded from Bolivia. As in the case of *A. singularis* n. sp., these specimens were collected in Cochabamba Department.

Taking into account the descriptions of the first two species by PORTEVIN (1903, 1907) and JEANNEL (1936), *Adelopsis singularis* n. sp. can be easily differentiated by its larger size, the structure of the antennae with less transverse segments and the less rounded tip of elytra, but particularly by the large eyes and fully grown metathoracic wings. Marked differences can also be observed in the aedeagus, and although the stylet of the internal sac in new taxon is long, robust and contoured as in the other two cited species, the apical area of the right lobe is completely different from that described by JEANNEL (1936) for both *A. ruficollis* and *A. heterocerus*.

Possibly, *Adelopsis barbula* Salgado, 2013, from Peru, is most closely related to *A. singularis* n. sp. The shared characters of these two species can be seen in the antennae, genital segment, aedeagus and spermatheca. The most significant differences are observed in uroventrites 4 and 6, which do not resemble each other at all; the shape of the stylet of the internal sac, and the general shape of the lamina of the right lobe are also different, and also, there are fewer microsetae on the ventral side of the lamina in *A. singularis* n. sp. (see SALGADO, 2013). Given its main characters, and along with *A. barbula*, this new taxon should be included in the “*bernardi*” group (SALGADO, 2010), though in both species the left lobe of the aedeagus is atrophied, which was not indicated by SALGADO (2010) for the species of this group.

***Ptomaphagus (Tupania) flabellatus* Szymczakowski, 1961**

Ptomaphagus (Tupania) flabellatus Szymczakowski, 1961: 148.

Material examined. – **Brazil.** São Paulo State, Bocaina, 1 ♂ and 1 ♀ (paratypes) (Museum of the Polish Academy of Sciences).

Description of the female. – Length 4.70 mm. Dark brown colouration, tarsi of legs and basal segments of antennae slightly lighter. Antennae with segment 3 shorter than 2, segments 4 to 10 transverse and 6 to 10 flattened and discoid. Apical areas of elytra broadly arcuate, almost subtruncate.

Three different parts can be seen in the spermatheca (fig. 9): a broadly dilated apical region, with a lateral protuberance, a long arcuate middle region and a short basal region resembling a loop or a broadly open coil.

Note. – The male is not described here as this study centres on the description of the female. For further information, see SZYMCAKOWSKI (1961).

Discussion. – *Ptomaphagus (Tupania) flabellatus* can clearly be differentiated by the shape of the spermatheca from the four species described from Mexico by PECK (1977), belonging to the subgenus *Tupania* Szymczakowski, 1961, and from the already known *P. (T.) forticornis* Matthews, 1888, also from Mexico (see PECK, 1977: fig. 133-140). However, the flattened discoid antennal segments 6 to 10 in *P. (T.) flabellatus* are more similar to the antennae of *P. (T.) yuvila* Peck, 1977, and *P. (T.) orientalis* Peck, 1977. Of all the species of *Tupania*, *P. (T.) costarica* Peck, 2003, is the most similar to and most difficult to differentiate from *P. (T.) flabellatus*, as both are very similar in length, colour, shape of antennae, aedeagus and, in particular, spermatheca (SZYMCAKOWSKI, 1961; PECK, 2003).

***Ptomaphagus (Tupania) boliviensis* n. sp. (fig. 10-12)**

HOLOTYPE: ♀, Bolivia, Department of Cochabamba, Pampa Grande, 16°40'01”S - 66°29'03”W, 2110 m, 9.VIII.2001, baited pitfall, humid montane forest, *A. C. Hamel & A. Pascall leg.* (OUMNH).

Diagnosis. – Antennal segment 2 longer than 3; antennal club flabellate; apical area of elytra in weakly pointed curve; spermatheca with very characteristic shape, lacking protuberance in anterior region.

Description of the female holotype. – Length 4.30 mm; width 2.15 mm. Body twice as long as wide; shape elongate, oval-shaped and convex (fig. 10). Colour shiny reddish, sides of head, last six antennal segments and femora of intermediate and posterior legs darker. Pubescence yellowish, fine, short and recumbent, though some erect setae dispersed in mid and posterior region of the elytra. Head wide (1.3 mm), robust and densely punctured; eyes full developed and pigmented. Metathoracic wings normally developed.

Antennae moderately long (1.33 mm), just over twice as long as pronotum; antennal segments 4 to 10 transverse, last segments clearly separated and 5 to 10 expanded laterally, forming a flabellate antenna; also, segment 2 longer than 3, lateral expansion of segments 7 to 10 similar (fig. 11) (table II).

Pronotum slightly wider than base of elytra, almost twice as wide as long (1.88); sides of pronotum weakly rounded in anterior half and almost parallel in posterior half; somewhat sinuous in lateral view; posterior vertices pointed backwards; transverse striae poorly marked, almost blurred in the disc area.

Elytra convex, approximately 1.4× longer than wide altogether, with transverse striae oblique to the suture and close together, though slightly more separated than those on the pronotum; widest in the middle; elytral tips separately rounded. Mesoventral process (= mesosternal carina) weakly protruding.

Table II. – Measurements of antennal segments of *Ptomaphagus (Tupania) boliviensis* n. sp., holotype (L, length; W, width. 50 units = 0.65 mm).

	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°
L	17,5	11,0	6,8	5,0	3,2	3,0	6,8	5,6	9,0	9,0	19,0
W	7,7	6,5	6,0	6,3	8,5	13,2	16,5	16,5	18,5	16,5	10,0

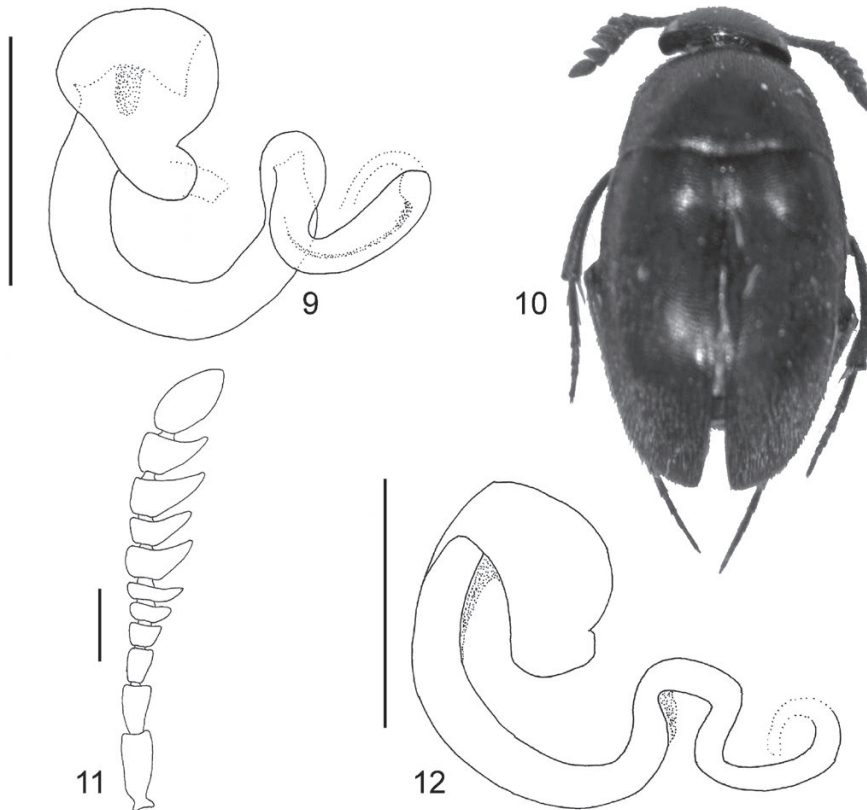


Fig. 9-12. – *Ptomaphagus (Tupania) spp.*, ♀. – 9, *P. (T.) flabellatus* Szymczakowski, spermatheca. – 10-12, *P. (T.) boliviensis* n. sp.: 10, habitus; 11, antenna; 12, spermatheca. (Scale bars: 0.2 mm).

Legs. Anterior tibiae cone-shaped and robust, intermediate tibiae uniform, slightly arcuate inwards and posterior tibiae straight.

Spermatheca very characteristic (fig. 12), long, with apical region expanded and lacking process; mid region long and arcuate, basal region with two coils or broad clearly defined arch shapes.

Etymology. – The gentile used to name the new taxon underlines the fact that a species in this subgenus has been recorded for the first time in Bolivia.

Discussion. – Geographically, the nearest species is *Ptomaphagus (Tupania) flabellatus* Szymczakowski, 1961, which also has morphological characteristics in common with the new species, as both have similar length, colouration and general structure of the antennae. However, other characteristics clearly differentiate them. For instance, in *P. (T.) boliviensis* n. sp., the lateral expansions of antennal segments 6 to 10 are more developed and 8 is more similar to segments 7 and 10, the apical areas of the elytra forms more strongly pointed arches, and, above all, the spermatheca is very differently shaped, lacking a lateral protuberance in the anterior region and exhibiting two coils or broadly open arches in the posterior region, whereas the other species of *Tupania* have only one (fig. 9, 12).

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