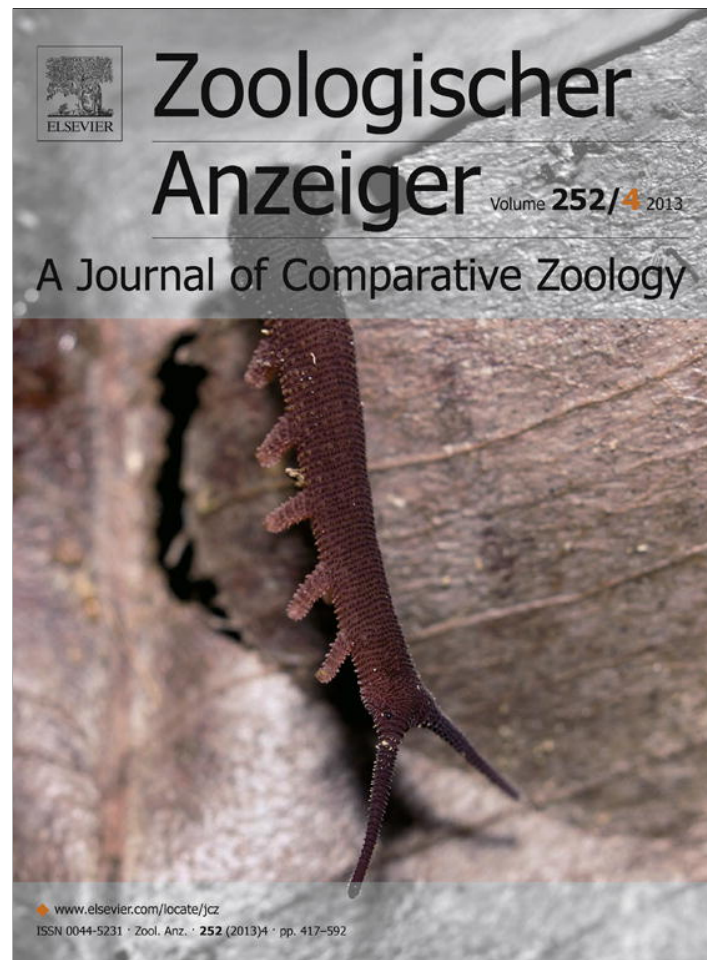


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Systematics and phylogeny of the Andean genera *Leptopeltus* Bernhauer and *Leptopeltoides* gen. nov. (Coleoptera: Staphylinidae), with biogeographical notes

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ABSTRACT

The genus *Leptopeltus* Bernhauer, 1906 (Staphylininae: Staphylinini), distributed from western Venezuela to northwestern Argentina, is revised using characters of external morphology and male and female genitalia. *Leptopeltus* comprises five species, of which two are described as new: *L. carchiensis* and *L. weyrauchi*. Other valid species of the genus are: *Leptopeltus flavipennis* (Erichson), *L. montivagans* Bernhauer and *L. netolitzkyi* Bernhauer. Lectotypes are designated for *Leptopeltus flavipennis* (Erichson) and *L. netolitzkyi* Bernhauer. *Leptopeltoides* gen. nov., from western Colombia and Ecuador, is described for the following four new species: *Le. chingazensis*, *Le. columbiensis*, *Le. ecuatoriensis* and *Le. napoensis*. Both genera are revised herein, with keys for identification, diagnoses, descriptions, illustrations, a cladogram, and distributional maps. The cladistic analysis shows that *Leptopeltus* and *Leptopeltoides* are both monophyletic genera and sister groups and they belong to a natural group of Neotropical genera of Philonthina (Staphylinini).

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1. Introduction

The Andean genera *Leptopeltus* Bernhauer and *Leptopeltoides* gen. nov. belong to Philonthina, the largest subtribe within Staphylinini, accounting for about 30% of the total of genera described for the tribe (Herman, 2001; Newton and Thayer, 2005). Although broadly distributed in all zoogeographical regions, the Philonthina are particularly diverse in the tropics. Among the 66 genera of Philonthina currently recorded, 19 are known to occur exclusively in the Neotropical region (Herman, 2001; Newton and Thayer, 2005). According to recent panbiogeographic and cladistic biogeographic analyses, the Neotropical region corresponds to the tropics of the New World, in most of Central and South America, southern Mexico, the West Indies, and southern Florida. It does not include the Andean portion of South America, which is assigned to the Andean region and the South American Transition Zone (Morrone, 2006, 2009). Each of these units are defined by biotic components recognized and treated as biogeographic provinces (Morrone, 2009). The genus *Leptopeltus* is currently considered as Neotropical although its species have been recorded at high

altitudes around the 3000 m in the South American Andes (Bernhauer, 1906; Scheerpeltz, 1960). According to Morrone (2006), the high cordilleras of Venezuela, Colombia, Ecuador and Peru at an altitude above 3000 m comprise the North Andean Paramo Province, followed southwards by the Puna province which includes eastern Bolivia, northern Argentina and Chile and southern Peru. Both the North Andean Paramo and the Puna provinces have been assigned to the South American Transition zone which shows an overlap of Neotropical and Andean insect taxa (Morrone, 2006, 2009). Within this context, a question arises concerning the biogeographic origin of *Leptopeltus* and another genera with similar distributional patterns. Both distributional and phylogenetic data are required to assess this question. Most of the 19 genera of Philonthina currently considered as Neotropical have not been revised since their original descriptions more than a century ago (e.g. Sharp, 1884, 1885; Bernhauer, 1906, 1908, 1912). At present there is no existing frame that provides a basis for the development of phylogenetic hypotheses and biogeographic inferences for this, although being a diverse, highly neglected group in the Neotropical Region. Such situation is expected to change as poorly known tropical faunas and underexplored areas are studied, and modern taxonomical methods are applied.

The genus *Leptopeltus* comprises five species distributed from southwestern Venezuela, throughout western Colombia, Ecuador, Peru, Bolivia to northwestern Argentina. Bernhauer (1906)

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established *Leptopeltus* for three species, *Philonthus flavipennis* Erichson, 1840 and two new species, *L. netolitzkyi* and *L. montivagans*. He defined the genus on the basis of the shape of the head and especially that of both the pronotum and abdomen. Our examination of specimens from the Canadian National Collection, Ottawa (Canada), the Museo de Historia Natural at Universidad Nacional Mayor de San Marcos, Lima (Peru), the Naturhistorisches Museum Wien, Vienna (Austria) and the Snow Entomological Collection at University of Kansas, Lawrence (USA) led to the discovery of two new species belonging to *Leptopeltus* and four additional new species, for which a new genus, *Leptopeltoides*, is here established.

The objectives of this study are to revise *Leptopeltus* and *Leptopeltoides* by incorporating new characters from external morphology and genitalia, describe six new species, conduct a cladistic analysis of the species of both genera, outline their geographic distribution and provide a preliminary assessment of their biogeographic affinities.

2. Material and methods

The material studied was borrowed from the following collections:

CNC – Canadian National Collection, Ottawa, USA (Anthony Davies).

Diéguez – private collection of Víctor Manuel Diéguez, Santiago de Chile.

FMNH – Field Museum of Natural History, Chicago, USA (Alfred F. Newton, Margaret K. Thayer).

MACN – Museo Argentino de Ciencias Naturales Bernardino Rivadavia, Buenos Aires, Argentina (Arturo Roig Alsina).

MNHUB – Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (Manfred Uhlig, Bernd Jaeger).

MUSM – Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Perú (Gerardo Lamas).

NMW – Naturhistorisches Museum Wien, Austria (Harald Schilhammer).

SEMC – Snow Entomological Collection, Natural History Museum/Biodiversity Research Center, University of Kansas, Lawrence, USA (Zachary H. Falin).

UNALM – Universidad Nacional Agraria La Molina, La Molina, Perú (Clorinda Vergara).

Techniques for the preparation and examination of male and female genitalia follow Smetana (1982). Descriptions were made using a Leica MZ6 dissecting scope, and several genital features were examined with a Leitz Wetzlar compound microscope. Drawings were made with a camera lucida attached to the compound microscope or dissecting scope. Photographs were taken using a digital camera attached to the dissecting scope. Measurements (given in millimeters) were made with an ocular micrometer. Overall body length was measured from the apex of the labrum to the apex of the abdomen. Other measurements were taken and abbreviated as follows:

HW – head capsule maximum width (measured at widest point)

HL – length of head capsule, from anterior margin of frontoclypeus to neck constriction (along midline)

PW – pronotum maximum width

PL – pronotum length (along midline)

EL – eye length (seen from above)

TL – temple length (from the posterior margin of the eye to the nuchal groove; seen from above)

NW – neck width

S1 – first segment of hind tarsus length

S5 – last segment of hind tarsus length

ETL – elytra length at sides (from humerus to apex; seen from above)

Etl – elytra length along suture

Terminology mainly follows Blackwelder (1936) and Schilhammer (2000) for the external morphology, Smetana and Davies (2000) for the head capsule ridges and Smetana (1995) for characters associated to male and female genitalia.

Biogeographical provinces considered in the geographical distribution of the species follow those of Morrone (2006, 2009). All records and the general distribution given for each species are based strictly on specimens that we have examined. Handwriting on labels of type specimens were compared to the respective author's handwriting as shown by Horn et al. (1990). All locality data were collected from collection data.

3. Results

3.1. Key to genera *Leptopeltus* and *Leptopeltoides*

In Smetana's (1995) key to Holarctic genera of Philonthina, *Leptopeltus* and *Leptopeltoides* will go to couplet 13, where they share with *Bisnius* Stephens, 1829 the last segment of labial palpus not appreciably narrower than preceding segment, the lateral puncture of pronotum bearing long seta separated from the superior line of hypomeron by a distance about equal to diameter of puncture, the front tarsi simple, not dilated, bearing only regular marginal setae, and the sternum 9 with proximal portion reduced, asymmetrical. However, the distinct parameres fused into one solid and short sclerite without sensory peg setae of *Leptopeltus* resemble those of *Belonuchus* Nordmann, 1837 and differ from those present in *Bisnius*. On the other hand, the elongate body of *Leptopeltoides* has a rather *Paederomimus*-like shape, also different from that of *Bisnius*. Additionally, both *Leptopeltus* and *Leptopeltoides* can be separated from other genera of Philonthina by the following combination of characters: head with antero-lateral ridge and short postmandibular ridge; basisternum with transverse carina, mesoventrite with sternacostal carina and sternopleural suture distinctly oblique and front tibiae with dense setae on inner surface along the entire length. Furthermore, the characteristic color pattern of the elytra (Fig. 1A–I) allows prompt recognition of *Leptopeltus* and *Leptopeltoides* among other Neotropical Philonthina.

1. Labrum transverse (Fig. 2A and D); prosternum with distinct keel (Fig. 2H and I); aedeagus with paramere completely fused to median lobe, reduced (Fig. 3D, E, H, I, M–P, S, T) *Leptopeltus* Bernhauer

2. Labrum subconical (Fig. 2F); prosternum without keel (Fig. 2J); aedeagus with paramere fused to median lobe only at base, elongate (Fig. 4C, F, G, J, K, N and O) *Leptopeltoides* gen. nov.

3.2. Genus *Leptopeltus* Bernhauer, 1906 (Figs. 1A–E, 2A–E, H, I, M–O, 3A–V, 6)

Leptopeltus Bernhauer, 1906:337; Bernhauer and Schubert, 1914:365 (catalog); Bruch, 1928:428 (catalog); Scheerpeltz, 1933:1374 (catalog supplement); Blackwelder, 1944:138 (checklist); Blackwelder, 1952:217 (type species); Scheerpeltz, 1960:114 (key to species); Herman, 2001:2696 (catalog); Asenjo, 2004:61 (list); Newton et al., 2005:42 (checklist). Type species: *Philonthus flavipennis* Erichson, subsequent designation by R. Lucas (1920:371).

Diagnosis. The distinct color pattern of the elytra, the prosternum with a distinct keel, the front tibiae setose along its entire length on the inner surface and the aedeagus with paramere reduced,

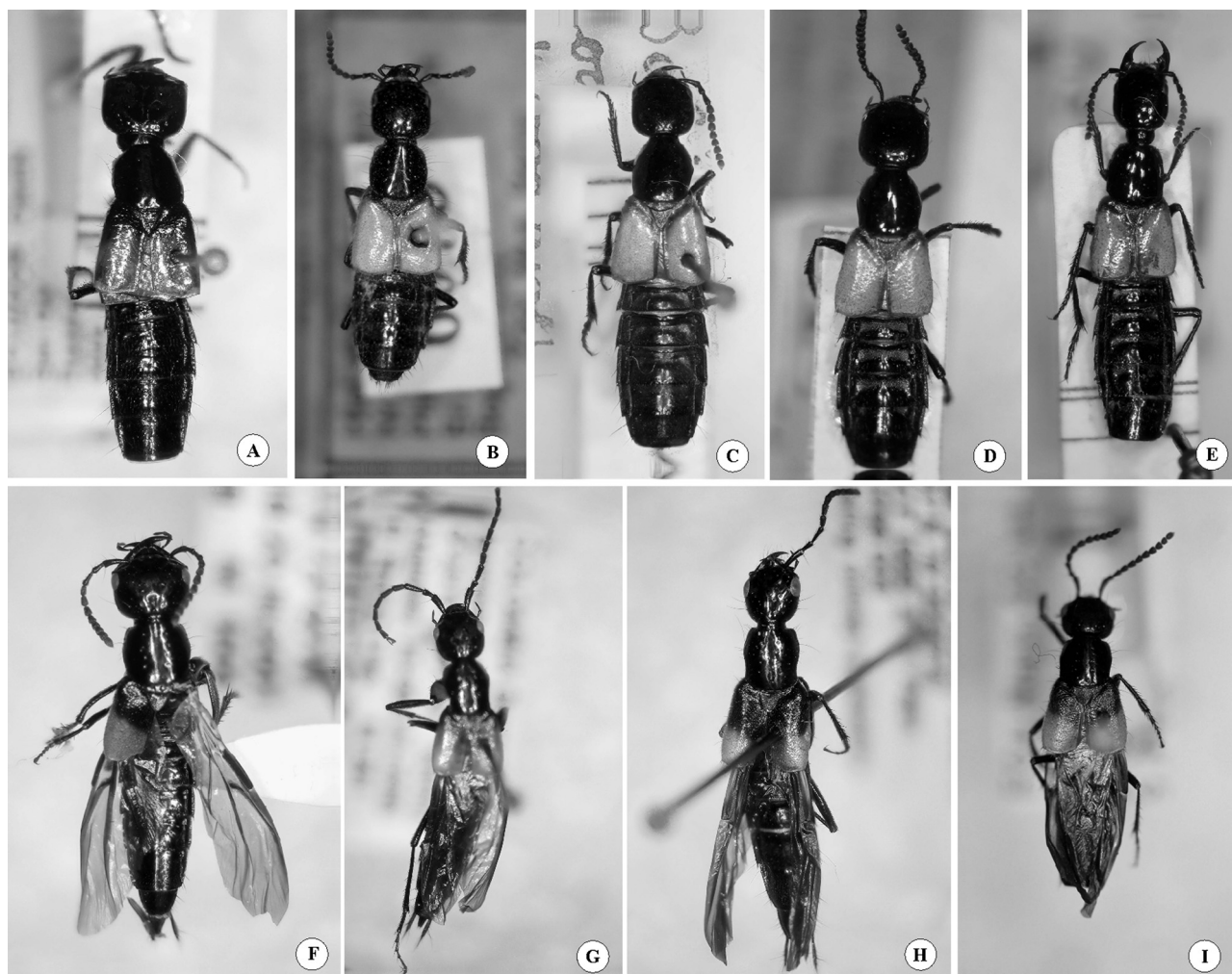


Fig. 1. Type material. (A) *Leptopeltus carchiensis*, holotype (B) *L. flavipennis*. (C) *L. montivagans*. (D) *L. netolitzkyi*. (E) *L. weyrauchi*. (F) *Leptopeltoides chingazensis*, holotype (G) *Le. columbiensis*, holotype (H) *Le. ecuatoriensis*, allotype female (I) *Le. napoensis*.

completely fused to median lobe allow prompt recognition among other Philonthina.

Redescription. Length 8.5–13.2 mm. Body more or less parallel sided, tapering toward sixth visible abdominal tergum (Fig. 1A–E). Coloration. Head and thorax piceous to piceous black; elytra usually mostly testaceous, distinctly darker at base, rarely half dark and half testaceous; abdomen piceous-brunneous to piceous-black; antennae, palpi and legs brunneous to piceous-black.

Head of rounded-quadrangular shape with obtusely rounded hind angles (Fig. 1A–E); slightly wider than long to slightly longer than wide, slightly wider to slightly narrower than pronotum at widest point; epicranium with two pairs of interocular punctures, medial punctures separated by a distance less than three times as large as distance separating medial punctures from lateral punctures; each side of vertex with three to four postocular punctures forming a triangle or a rhomb; dorsal and ventral surface of head with rather rudimentary wave-like microsculpture. Eyes moderately convex, moderately to distinctly shorter than temples seen from above (Figs. 1B, D, 2A, D). Antennae inserted nearer to anterior margin of frontoclypeus than to eyes (Figs. 1B, D, 2A, D), moderately long, moderately widened toward apex; first three segments bearing only sparse macrosetae, segments 4–11 pubescent, segment 3 slightly to distinctly longer than segment 2, segment 4 elongate, segments 8–10 transverse, last segment narrowed anteriorly

and minutely emarginate. Labrum subrectangular, transverse, and completely sclerotized (Fig. 2A and D) with numerous and long macrosetae at apical margin. Mandible moderately prominent; dorsolateral surface grooved; left mandible with two teeth. Maxilla with lacinia elongate and densely setose along entire medial margin, with galea prominent and densely setose at apex. Maxillary palpus moderately long, segment 2 not wider than 1.5 times and about 1.5 times as long as segment 3, last segment fusiform, about 1.5 times as long as segment 3 and not appreciably narrower (Fig. 2B). Gular sutures joined before neck. Mentum about as long as to slightly shorter than submentum (Fig. 2B). Mentum transverse, with anterior margin straight to slightly emarginate, and one seta at each latero-apical angle. Labial palpus moderately long, segments 1 and 2 with sparse setae, first two segments subequal in length, segment 3 fusiform and distinctly longer than segment 2 (Fig. 2B).

Pronotum about as long as wide to slightly longer than wide, slightly broadened at middle; front margin subtruncate, hind margin arcuate, anterior angles obtuse to subangulate, posterior angles rounded (Fig. 1A–E); dorsal surface of pronotum with two rows of punctures sub-parallel to each other, each row with three or more punctures, with two sublateral groups of punctures, each with 4–5 punctures; surface with fine microsculpture of transverse and oblique waves. Prosternum short, triangular, with longitudinal

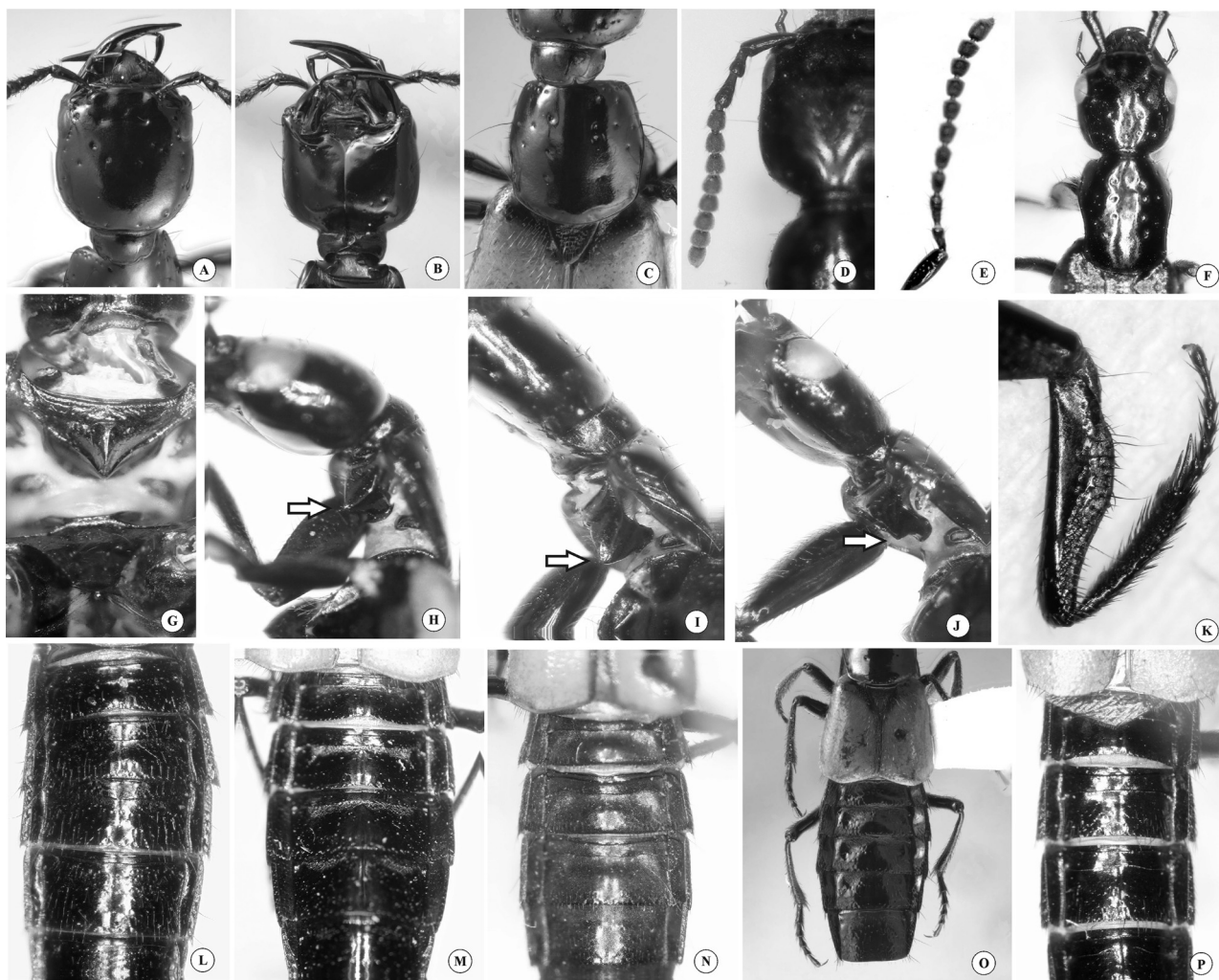


Fig. 2. *Leptopeltus weyrauchi*: (A) head (dorsal view), (B) head (ventral view), (C) neck and pronotum, (O) abdomen. *Leptopeltus montivagans*: (D) antenna, (N) abdomen. *Leptopeltus carchiensis*: (E) antenna, (G and I) prosternum, (K) front femur, (L) abdomen. *Leptopeltus flavipennis*: (H) prosternum, (M) abdomen. *Leptopeltoides columbiensis*: (F) head and pronotum, (J) prosternum, (P) abdomen.

carina distinctly developed along furcasternum and part of basisternum, forming well-defined ridge; basisternum about as long as to slightly longer than furcasternum, with two medio-apical macrosetae (Fig. 2H and I). Legs moderately long; tibiae spinose on lateral face, with ventral setae denser on protibia than on meso- and metatibiae; dorsal surface of all tarsal segments glabrous except for scattered, long marginal setae, and pair of setae at apex of last segment about half as long as claws; first segment of hind tarsus as long as to moderately longer than last segment.

Elytra at suture as long as to distinctly shorter than pronotum at midline (Fig. 2A–E); punctuation moderately coarse, transverse distance between punctures as large as to distinctly larger than diameter of one puncture.

Abdomen. Paired prototergal glands present on tergum 1; terga III–V with anterior and posterior transverse basal carinae (Fig. 2L–O). Hind margin of tergum 8 (sixth visible) arcuate to subtruncate in both sexes.

Male genitalia. Sternum 8 moderately emarginate medio-apically (Fig. 3A). Genital segment with styli of tergum 9 stout and moderately setose apically; tergum 10 truncate to arcuate at apex with two to eight apical setae, with or without subapical macrosetae; sternum 9 pigmented at apex, with proximal portion either asymmetrical, acutely emarginate apically, with three apical setae

at each side of emargination and with or without two long subapical macrosetae (Fig. 3B, F, L, Q and R). Aedeagus with parameres fused to one short sclerite, without sensory peg setae and completely fused to median lobe; median lobe elongate, with apical part narrowed into a subacute, rather blunt apex; internal sac with sclerotized structures (Fig. 3D, E, H, I, M–P, S and T).

Female genitalia. Genital segment with styli of tergum 9 similar to those of male; tergum 10 similar to that of male (Fig. 3J); gonocoxites with second gonocoxites rather short, each with one long macroseta lateroventrally, with a minute stylus (Fig. 3K and V) with two long apical setae.

Immature stages. Unknown.

Bionomics. The species of *Leptopeltus*, as those of other related genera of Philonthina, are considered general predators. Specimens have been collected in flight intercept traps, malaise traps, pitfall traps baited with beef, fish and downed logs.

Distribution. *Leptopeltus* has been recently considered as a Neotropical genus (Herman, 2001; Newton and Thayer, 2005). With five species known at present, current records show this genus to occur in the North Andean Paramo and Puna provinces of the South American Transition zone (Morrone, 2006, 2009) from elevations of 2200 to 4000 m as indicated by trapping data (Figs. 6 and 8A–C).

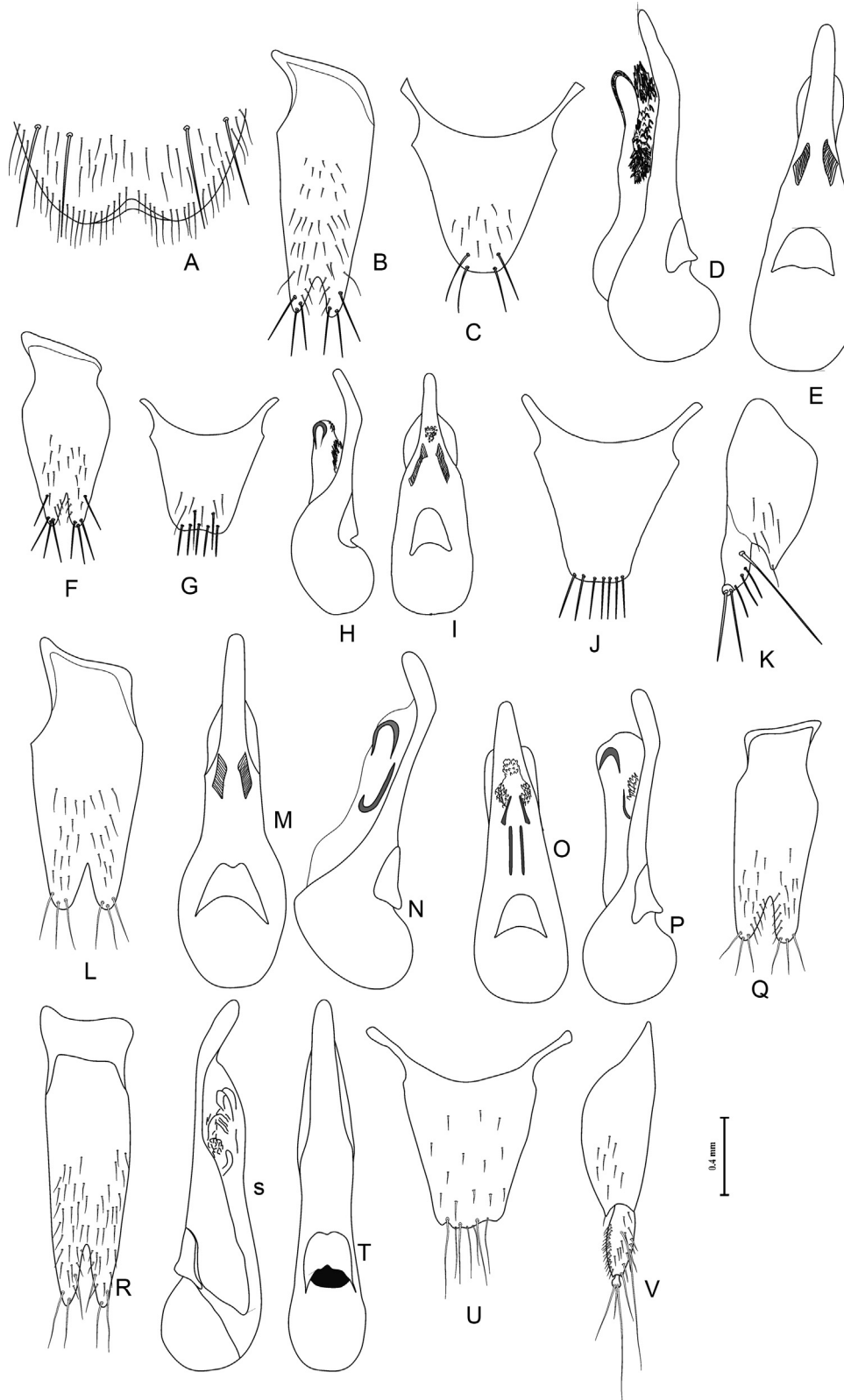


Fig. 3. *Leptopeltus carchiensis*: (A) male sternum 8. (B) Sternum 9. (C) Male tergum 10. (D) Aedeagus (lateral view). (E) Aedeagus (dorsal view). *Leptopeltus flavipennis*: (F) sternum 9. (G) Male tergum 10. (H) Aedeagus (lateral view). (I) Aedeagus (dorsal view). *Leptopeltus montivagans*: (J) female tergum 10. (K) Gonocoxites of female genital segment. (L) Sternum 9. (M) Aedeagus (dorsal view). (N) aedeagus (lateral view). *Leptopeltus netolitzkyi*: (O) aedeagus (dorsal view). (P) Aedeagus (lateral view). (Q) Sternum 9. *Leptopeltus weyrauchi*: (R) sternum 9. (S) Aedeagus (lateral view). (T) Aedeagus (dorsal view). (U) Female tergum 10. (V) Gonocoxites of female genital segment.

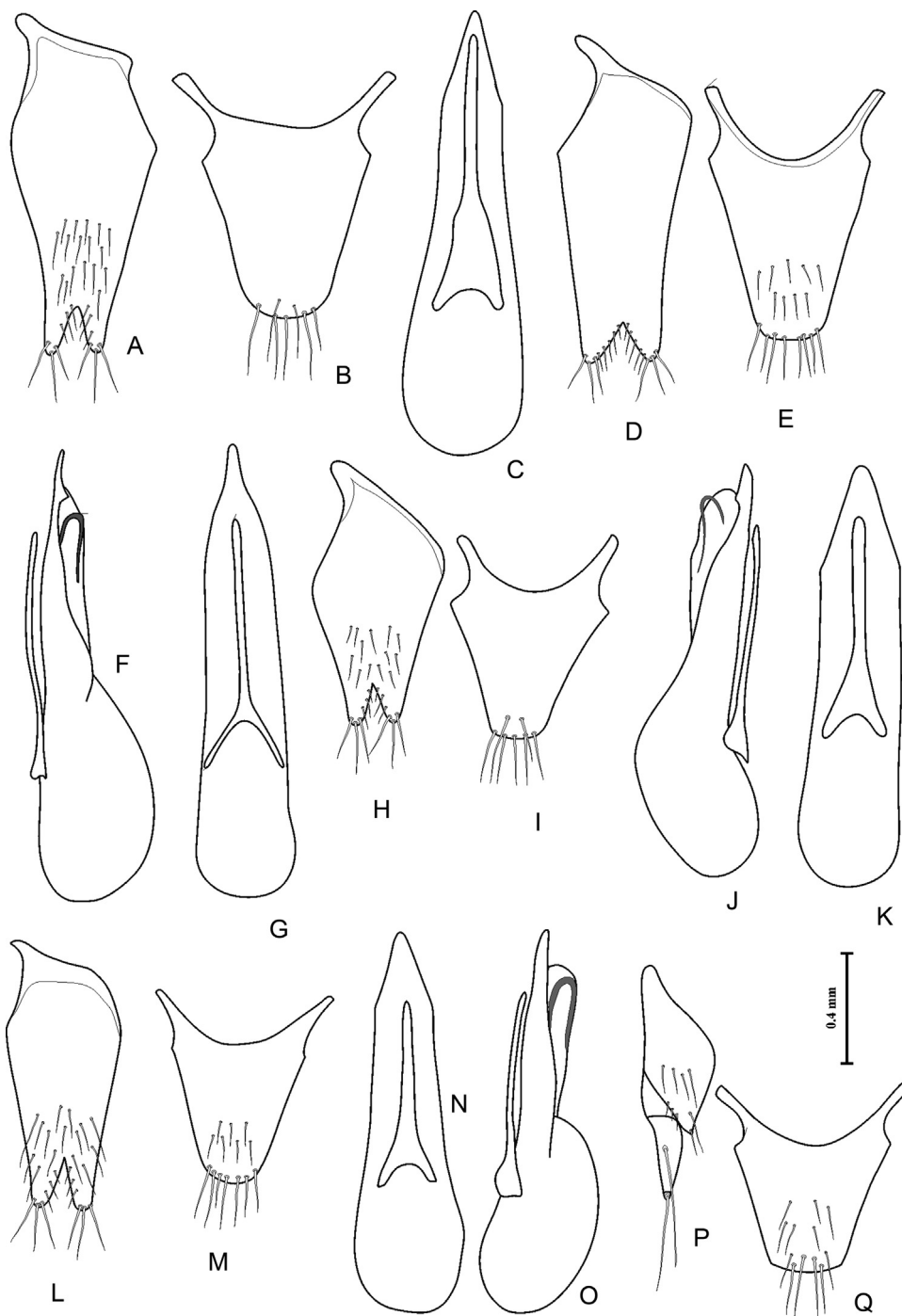


Fig. 4. *Leptopeltoides chingazensis*: (A) sternum 9. (B) Male tergum 10. (C) Aedeagus (dorsal view). *Leptopeltoides columbiensis*: (D) sternum 9. (E) Male tergum 10. (F) aedeagus (lateral view). (G) Aedeagus (dorsal view). *Leptopeltoides ecuatoriensis*: (H) sternum 9. (I) Male tergum 10. (J) Aedeagus (lateral view). (K) Aedeagus (dorsal view). *Leptopeltoides napoensis*: (L) sternum 9. (M) Male tergum 10. (N) aedeagus (dorsal view). (O) Aedeagus (lateral view). (P) Gonocoxites of female genital segment. (Q) Female tergum 10.

3.2.1. Key to species of *Leptopeltus* Bernhauer

- | | |
|--|---|
| 1. Distance separating medial interocular punctures on frons less than twice distance separating medial punctures from lateral punctures (Fig. 2A); elytra mostly testaceous (Fig. 1B–E); abdominal terga III–VI chagrinated (Fig. 2M, N and O)
- Distance separating medial interocular punctures on frons about twice distance separating medial punctures from lateral punctures; elytra piceous in basal half and testaceous in distal half; abdominal terga III–VI not chagrinated (Figs. 1A and 2L) | 2
<i>L. carchiensis</i> sp. nov. |
| 2. Pronotum wider at middle (Fig. 1B and D); abdominal tergum VI without posterior basal transverse carina
- Pronotum wider distally (Fig. 1E); abdominal tergum VI with posterior transverse carina | 2
<i>L. weyrauchi</i> sp. nov. |
| 3. Eyes distinctly longer than 0.5 times length of temples seen from above (Fig. 1B); transverse distance between punctures on elytra larger than diameters of punctures
- Eyes shorter than 0.5 times length of temples seen from above (Fig. 1C and D); transverse distance between punctures on elytra distinctly about as large as diameters of punctures | 4
<i>L. flavipennis</i> (Erichson) |
| 4. Abdominal terga III–VI slightly chagrinated (Fig. 2N); paramere of aedeagus emarginate apically (Fig. 3M)
- Abdominal terga III–VI distinctly chagrinated (Fig. 2M); paramere of aedeagus entire apically (Fig. 3O) | 4
<i>L. montivagans</i> Bernhauer
<i>L. netolitzkyi</i> Bernhauer |

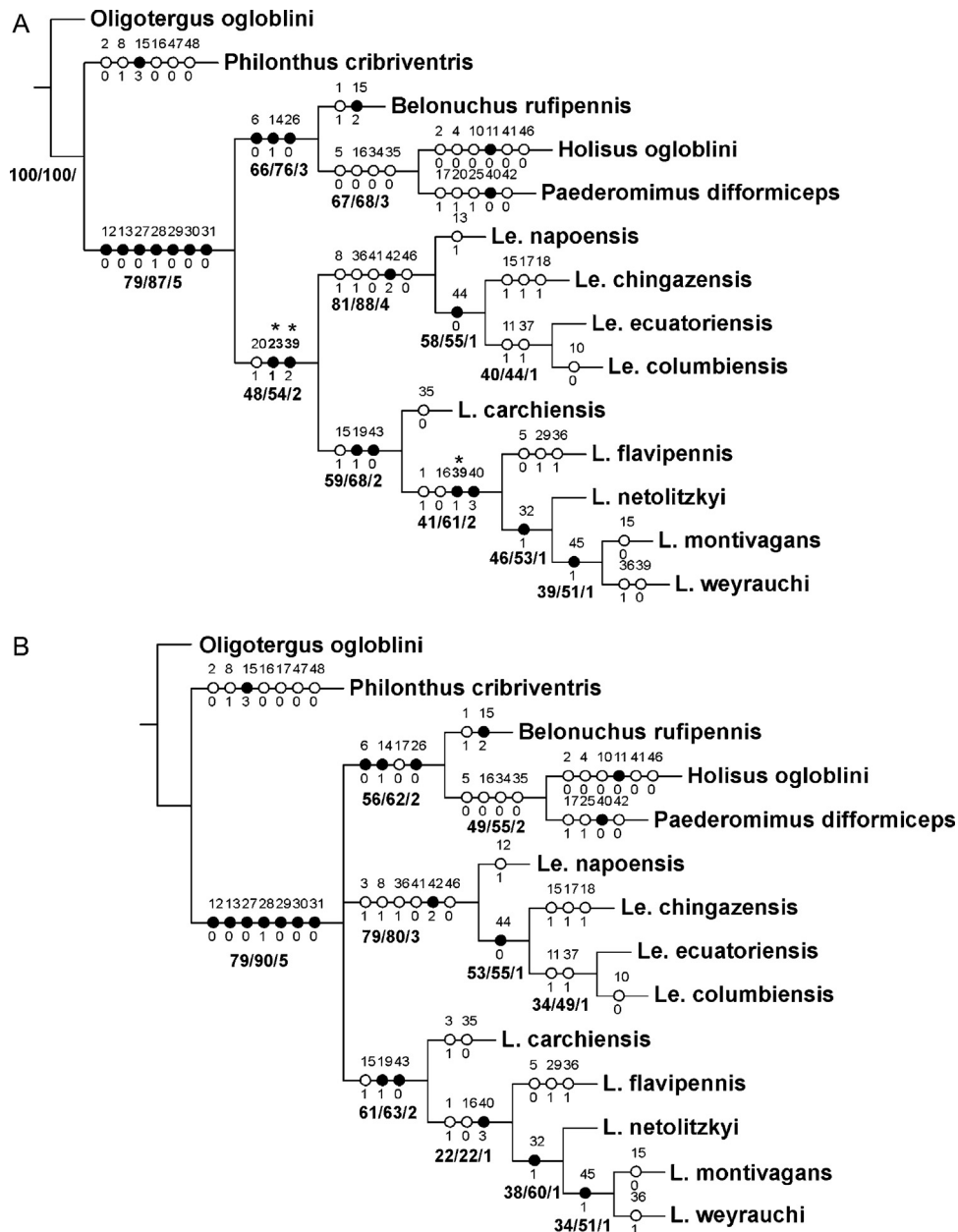


Fig. 5. A. Most parsimonious tree showing relationships between and within *Leptopeltus* and *Leptopeltoides*, including all characters. B. Strict consensus tree showing relationships between and within *Leptopeltus* and *Leptopeltoides*, excluding characters 23, 24, 38 and 39 (*). Black circles: non-homoplasious apomorphies; white circles: homoplasies. *L.* = *Leptopeltus*, *Le* = *Leptopeltoides*. The numbers in bold below the branches are support values (Bremer/Standard Bootstrap/Jackknife).

3.2.2. *Leptopeltus carchiensis* sp. nov.
 (Figs. 1A, 2E, G, I, K, L, 3A-E, 6)

Diagnosis. *Leptopeltus carchiensis* may be recognized among the other species of *Leptopeltus* by the distance separating medial interocular punctures on frons about twice as large as the distance separating medial punctures from lateral punctures, the dorsal rows of pronotum each with three punctures, the front femora distinctly dilated at middle and the elytra with transverse distance between punctures distinctly larger than diameters of punctures.

Description. Body length 13.2 mm. Coloration. Head and thorax piceous to piceous black; elytra mostly testaceous, distinctly darker at base; abdomen piceous-brunneous to piceous-black, iridescent; antennae, palpi and legs piceous to piceous-black.

Head slightly wider than long (HW/HL = 1.15), slightly wider than pronotum (HW/PW = 1.15); distance separating medial interocular punctures on frons about twice as large as distance

separating medial punctures from lateral punctures; infraorbital ridge present, extending not far beyond postgenal ridge. Eyes distinctly shorter than temples (EL/TL = 0.4) seen from above. Antennae with segment 1 longer than segments 2 and 3 combined, segment 5 elongate (Fig. 2E). Mentum with anterior margin slightly emarginate, subequal to submentum in length. Labial palpus with last segment about 1.5 times longer than preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment about 1.5 times longer than segment 3. Neck about 0.5 times as wide as head at widest point.

Pronotum about as long as wide (PW/PL = 1.09), wider at middle, front angles subquadrate; dorsal surface of pronotum with two rows of punctures, each with three punctures. Prosternum with well-defined transverse carina (Fig. 2G and I). Mesoventrite with intercoxal process broad and acute apically. Elytra at sides more than 1.5 times as long as elytra along suture (EtL/Etl = 1.73);

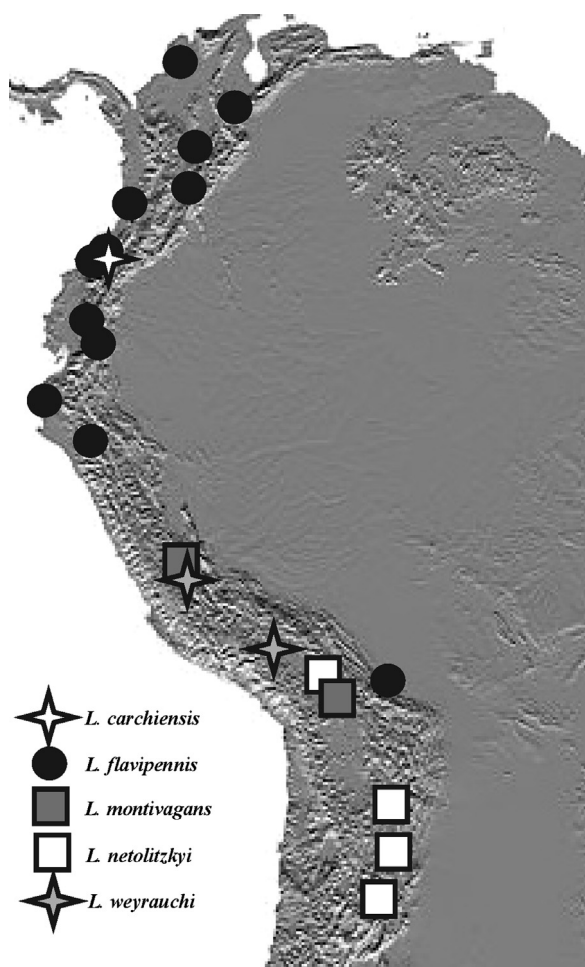


Fig. 6. Geographical distribution of *Leptopeltus* species.

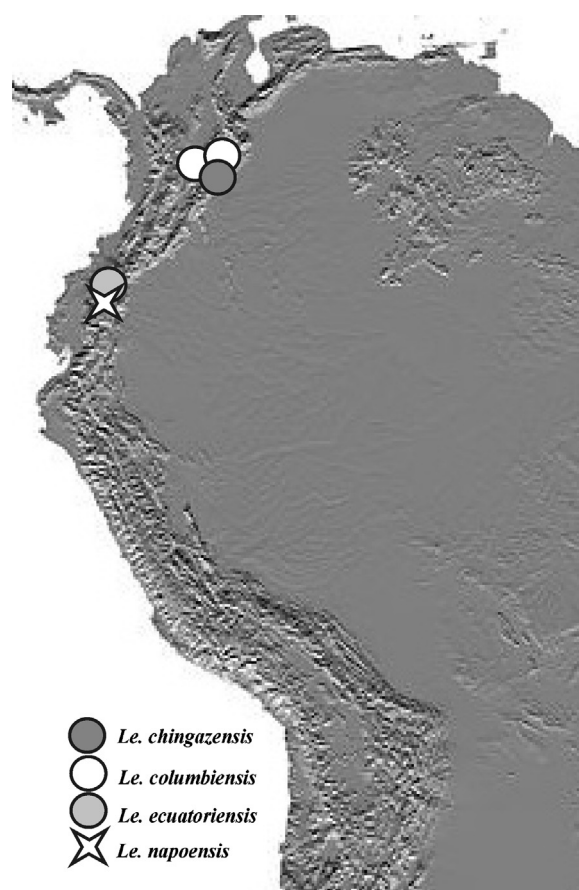


Fig. 7. Geographical distribution of *Leptopeltoides* species.

transverse distance between punctures larger than diameters of punctures. Front femora distinctly dilated at middle (Fig. 2K); first segment of hind tarsus as long as last segment ($S1/S5 = 1.0$). Abdominal terga III–VI without chagrinated, abdominal tergum V with posterior basal transverse carina complete (Fig. 2L).

Male genitalia. Tergum 10 arcuate at apex with two apical setae and two subapical macrosetae (Fig. 3C). Aedeagus with paramere fused to median lobe, slightly emarginate apically; median lobe gradually narrowed from apical half (Fig. 3D and E).

Female genitalia. Unknown.

Geographical distribution. *Leptopeltus carchiensis* has only been recorded from Ecuador (Carchi) between 3300 and 3450 m of altitude (Fig. 6).

Bionomics. Unknown.

Etymology. The specific name refers to the area of origin of this specimen in Ecuador.

Types. Holotype (Fig. 1A), ♂, with labels: 'Ecuador: Carchi, San Gabriel, approx 15 km E, Reserva Biologica Guandera, 01-nov-99, Z. H. Falin, 3300–3450 m, 0°35'11" N, 77°44'37" W, ECU1F99 075, ex. downed logs', 'Holotype *Leptopeltus carchiensis* Chani Posse & Asenjo, 2012' (SEMC).

3.2.3. *Leptopeltus flavipennis* (Erichson, 1840)

(Figs. 1B, 2H, M, 3F–I, 6)

Philonthus flavipennis Erichson, 1840:460; Solsky, 1872:299.

Leptopeltus flavipennis; Bernhauer, 1906:338; Bernhauer and Schubert, 1914:365 (catalog); Scheerpeltz, 1933:1374 (catalog);

Scheerpeltz, 1960:115; Herman, 2001:2696 (catalog); Asenjo, 2004:61 (list).

Diagnosis. *Leptopeltus flavipennis* may be identified among other species of *Leptopeltus* by the eyes slightly to moderately shorter than temples, the dorsal rows of pronotum each with six punctures and the elytra with transverse distance between punctures about as large as diameters of punctures. Furthermore, it differs from *L. carchiensis* and *L. montivagans* by the abdominal terga III–VI distinctly chagrinated.

Redescription. Body length 8.5–11.0 mm. Coloration. Head and thorax piceous to piceous black; elytra usually mostly testaceous and distinctly darker at base or rarely with basal half piceous and distal half testaceous, abdomen piceous-brunneous to piceous-black; antennae, palpi and legs piceous to piceous-black.

Head as long as to slightly wider than long ($HW/HL = 1.0–1.1$), about as wide as to slightly wider than pronotum ($HW/PW = 0.93–1.12$) (Fig. 1B); distance separating medial interocular punctures on frons less than twice as large as distance separating medial punctures from lateral punctures; infraorbital ridge absent. Eyes slightly to moderately shorter than temples ($EL/TL = 0.6–0.9$) seen from above. Antennae with segment 1 about as long as segments 2 and 3 combined, segment 5 quadrate. Mentum with anterior margin straight, shorter than submentum. Labial palpus with last segment about 1.5 times longer than preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment about 1.5 times longer than segment 3. Neck no more than 0.6 times as wide as head at widest point ($NW/HW = 0.5–0.6$).

Pronotum about as long as wide ($PW/PL = 0.98–1.06$), wider at middle, front angles rounded; dorsal surface of pronotum with two rows of punctures, each with six punctures. Prosternum with



Fig. 8. Collecting sites in Peru. (A and B) Cajamarca. (C) Ayacucho.

rudimentary transverse carina (Fig. 2H). Mesoventrite with intercoxal process broad and rounded apically. Elytra at sides more than 1.5 times as long as elytra along suture ($EtL/EtI = 1.55\text{--}1.73$); transverse distance between punctures larger than diameters of punctures. Front femora not distinctly dilated at middle; first segment of hind tarsus about as long as last segment ($S1/S5 = 0.92\text{--}1.18$). Abdominal terga III–VI moderately chagrinated, abdominal tergum V with posterior basal transverse carina complete (Fig. 2M).

Male genitalia. Tergum 10 truncate at apex with 5–6 apical setae and two subapical macrosetae (Fig. 3G). Aedeagus with paramere fused to median lobe, entire apically; median lobe gradually narrowed from apical half (Fig. 3H and I).

Female genitalia. Tergum 10 similar to that of male; second gonocoxites similar to those of *L. montivagans*.

Geographical distribution. According to the material here examined and current records (Herman, 2001; Asenjo, 2004; Newton and Thayer, 2005). *Leptopeltus flavipennis* is distributed along the Andean highlands (2200–3600 m) from western Venezuela to central Bolivia, through Colombia, Ecuador and Peru (Fig. 6).

Bionomics. *Leptopeltus flavipennis* has been found in cloud forest at an altitudinal range of 2200–3600 m.

Types. Lectotype (Fig. 1B), ♂, here designated, with labels: in handwriting [blue label] 'flavipennis Er., Bogota', above [green label] 'Hist.- Coll. (Coleoptera), Nr. 6079, *Philonthus flavipennis* Er., Bogota, Zool. Mus. Berlin', below [red label] 'SYNTYPUS, *Philonthus flavipennis* Erichson, 1840, labeled by MNHUB 2011', 'Lectotype *Philonthus flavipennis* Erichson, 1840 des. Chani Posse 2012' (in MNHUB). Paralectotypes, 1 ♂ and 2 ♀ same labels as above (except for the blue label which is unique to a historical series in MNHUB), with 'Paralectotype *Philonthus flavipennis* Erichson, 1840 des. Chani Posse & Asenjo 2012' (in MNHUB).

Other material examined. In total 26 specimens, including 12 ♂ and 14 ♀.

BOLIVIA: Carrasco: Cochabamba, Serrania de Siberia, Chua Kocha, 25.VIII.1990–6.IX.1990, 2300 m, FMHD#90–233, cloud forest, 2300 m, P. Parrillo & M. Ledezma, No. 173, baited pitfall-beef 2 ♂ (FMNH). **COLOMBIA:** Boyacá: SFF Iguaque Qda. Carrizal, 06-23-V-2000, 3350 m, 5°25' N, 73°27' W, Malaise, P. Reina leg. M.72, 1 ♀ (SEMC). Cali: Lina Quindín Pass, Fassi, 3600 m, Chicago NHMus Bernhauer Collection (printed, white label) 1 ♀ (FMNH). Cundinamarca: PN Chingaza Bosque Palacio, 1/17/01–2/4/01, 2930 m, 0.4°31' N, 73°45' W, Malaise, L. Cifuentes leg. M1258, 1 ♂ (SEMC). Magdalena: PNN Sierra Nevada de Santa Marta, San Lorenzo, 14–31.III.2001, 2200 m, 10°48' N, 73°39' W, Malaise, Cantillo leg. M1466, 1 ♀ (SEMC). Additionally in FMNH, 1 ♂ with labels "Columb.", "flavipennis Er. Columb."; Chicago NHMus Bernhauer Collection (printed, white label). **ECUADOR:** Carchi: San Gabriel, 6.1 km E, El Bosque Arrayanes, 2–4 NOV 1999, Z. H. Falin, 2830 m, 0°32'33" N, 77°47'26" W, ex. Flight intercept trap ECU1F99 095, 2 ♀ (SEMC). Cuenca: Hacienda Mazán, 10 km al Poniente Cuenca/ Camino a Páramo de Arcos, 22.IV–21.V.2012, G. Arriagada, 2890–3132 m, Trampa con calamar, Bosque húmedo montano, 14 ♂ 14 ♀/6 ♂ 6 ♀ (Diéguez); Páramo de Arcos Pueblo Soldados, 21.IV–20.V.2012, G. Arriagada, 2958–3492 m, 15 ♂ 6 ♀ (Diéguez). Napo: Sierra Azul, Hacienda Aragón, 17 FEB–26 MAR 1996/26 APR–6 JUN 1996, P. Hibbs, 2300 m, 0°40'00" S, 77°55'0" W, ECU1H96 007, 2 ♂ 3 ♀ (SEMC). S. of Riomamba: S. of Guamote, 29.I.2011, M. Snizek, 3000 m, 2 ♂ (NMW). **PERU:** Cajamarca, Km17, Camino a Cumbemayo, 2.v.2004, M. Diéguez, 3330 m, 3 ♀ (MUSM). Piura: B.[Bosque] Ramos, Ayabaca, 29.05.2009, 2812 m, Daniel Saavedra, Pitfall trap/pescado, 1 ♂ 1 ♀ (MUSM). **VENEZUELA:** Dr. Moritz, 1868, "flavipennis Er. Gangel. det. Bernhauer, Chicago NHMus Bernhauer Collection (printed, white label), 1 ♀ (FMNH). Dr. Moritz, 1868, male

symbol, “*flavipennis* det. Bernhauer” 1 ♂ (NMW). San Cristóbal: 55 km NE San Cristóbal, 18–22.V.1974, S. Peck, 10,000' [3048 m] 1 ♀ (CNC).

3.2.4. *Leptopeltus montivagans* Bernhauer, 1906 (Figs. 1C, 2D, N, 3J–N, 6)

Leptopeltus montivagans Bernhauer, 1906:339; Bernhauer and Schubert, 1914:365 (catalog); Scheerpeltz, 1960:115; Herman, 2001:2696 (catalog).

Diagnosis. *Leptopeltus montivagans* may be identified among other species of *Leptopeltus* by the eyes distinctly shorter than temples, the pronotum wider anteriorly, the elytra with transverse distance between punctures larger than diameters of punctures, the abdominal terga III–VI slightly chagrinated and the paramere of aedeagus emarginate apically.

Redescription. Body length 11.0–12.6 mm. Coloration. Head and thorax piceous to piceous black; elytra mostly testaceous, distinctly darker at base; abdomen brunneous to piceous-brunneous; antennae, palpi and legs piceous-brunneous to piceous.

Head as long as to slightly longer than wide (HW/HL=0.89–1.00), about as wide as to moderately wider than pronotum (HW/PW=0.88–1.27) (Fig. 1C); distance separating medial interocular punctures on frons less than twice as large as distance separating medial punctures from lateral punctures; infraorbital ridge present. Eyes distinctly shorter than temples (EL/TL=0.30–0.45) seen from above. Antennae with segment 1 about as long as segments 2 and 3 combined, segment 5 elongate (Fig. 2D). Mentum with anterior margin straight, shorter than submentum. Labial palpus with last segment about 1.5 times longer than preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment about 1.5 times longer than segment 3. Neck no more than 0.6 times as wide as head at widest point (NW/HW=0.45–0.53).

Pronotum about as long as wide (PW/PL=0.92–1.03), wider anteriorly, front angles rounded; dorsal surface of pronotum with two rows of punctures, each with six punctures. Prosternum with rudimentary transverse carina. Mesoventrite with intercoxal process narrow and acute apically. Elytra at sides about twice as long as elytra along suture (EtL/Etl=1.74–1.92); transverse distance between punctures about as large as diameters of punctures. Front femora not distinctly dilated at middle; first segment of hind tarsus moderately longer than last segment (S1/S5=1.27–1.38). Abdominal terga III–VI slightly chagrinated, microsculpture rather opaque behind posterior basal transverse carina (Fig. 2N); abdominal tergum V with posterior basal transverse carina complete.

Male genitalia. Tergum 10 truncate at apex with 5–6 apical setae and two subapical macrosetae. Aedeagus with paramere fused to median lobe, emarginate apically; median lobe gradually narrowed from apical half (Fig. 3M and N).

Female genitalia. Tergum 10 similar to that of male (Fig. 3J); second gonocoxites as in Fig. 3K.

Geographical distribution. *Leptopeltus montivagans* has been recorded from Bolivia and Peru (new record) between 3900 and 4000 m of altitude in the Andes (Fig. 6).

Bionomics. Unknown.

Types. Holotype (Fig. 1C), ♀, with labels: female symbol [white label], ‘Bolivia, Hochanden, 4000 meter, Brum. (?), 1884 (?)’ (in Bernhauer’s handwriting) [white label], ‘C. Epplsh. Steind. D.’ [printed white label], ‘*montivagans* Bernh. Typus’ (in Bernhauer’s handwriting) [yellow label], ‘Holotype *Leptopeltus montivagans* Bernhauer, 1906 des. Chani Posse & Asenjo 2012’ (in NMW).

Notes. In the original description Bernhauer (1906) stated that he examined a unique specimen of *L. montivagans* and deposited “in der Sammlung des k. k. naturhistorischen Hofsmuseums in Wien”. The specimen mentioned above agrees with the original

description by Bernhauer (1906), being the holotype fixed by monotypy (ICZN, 1999, Article 73.1.2).

Other material examined. In total 3 specimens, including 1 ♂ and 2 ♀.

BOLIVIA: Perú (?) Bolivien, Hochplateau, *montivagans* det. Bernhauer, Chicago NHMus Bernhauer Collection, 1 ♀ (FMNH); male symbol, Hochanden, Brum.? 87?, *montivagans* Bernh. Cum typo comp. Mus. Inob.collatum, ex coll. Scheerpeltz (blue label), *montivagans* Scheerp., 1 ♂ (NMW). PERU: female symbol, Perou (green label), *Leptopeltus peruvianus* n. sp., ex coll. Scheerpeltz, TYPUS *Leptopeltus peruvianus* O. Scheerpeltz, *peruvianus* Scheerp., 1 ♀ (NMW).

3.2.5. *Leptopeltus netolitzkyi* Bernhauer, 1906 (Figs. 1D, 3O–Q, 6)

Leptopeltus netolitzkyi Bernhauer, 1906:338; Bernhauer and Schubert, 1914:365 (catalog); Bruch, 1928:428; Scheerpeltz, 1960:115; Herman, 2001:2697 (catalog).

Diagnosis. *Leptopeltus netolitzkyi* may be identified among other species of *Leptopeltus* by the eyes distinctly shorter than temples, the pronotum wider at middle, the elytra with transverse distance between punctures larger than diameters of punctures, the abdominal terga III–VI distinctly chagrinated and the paramere of aedeagus entire apically.

Redescription. Body length 12.0–13.0 mm. Coloration. Head and thorax piceous black to black; elytra mostly testaceous, distinctly darker at base; abdomen piceous; antennae, palpi and legs piceous.

Head as long as wide (HW/HL=0.97–1.0), about as wide as to slightly wider than pronotum (HW/PW=1.08–1.18); distance separating medial interocular punctures on frons less than twice as large as distance separating medial punctures from lateral punctures; infraorbital ridge present. Eyes distinctly shorter than temples (EL/TL=0.36–0.42) seen from above. Antennae with segment 1 about as long as segments 2 and 3 combined, segment 5 quadrate. Mentum with anterior margin straight, shorter than submentum. Labial palpus with last segment about 1.5 times longer than preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment about 1.5 times longer than segment 3. Neck no more than 0.6 times as wide as head at widest point (NW/HW=0.45–0.51).

Pronotum about as long as wide (PW/PL=0.92–0.98), wider at middle, front angles rounded; dorsal surface of pronotum with two rows of punctures, each with five punctures. Prosternum with well defined transverse carina. Mesoventrite with intercoxal process narrow and acute apically. Elytra at sides more than 1.5 times as long as elytra along suture (EtL/Etl=1.67–1.74); transverse distance between punctures about as large as diameters of punctures. Front femora not distinctly dilated at middle; first segment of hind tarsus slightly longer than last segment (S1/S5=1.1–1.2). Abdominal terga III–VI distinctly chagrinated; abdominal tergum V with posterior basal transverse carina incomplete.

Male genitalia. Tergum 10 truncate at apex with 5–6 apical setae and two subapical macrosetae. Aedeagus with paramere fused to median lobe, entire apically; median lobe gradually narrowed from base (Fig. 3O and P).

Female. Unknown.

Geographical distribution. *Leptopeltus netolitzkyi* has been recorded from Bolivia and northwestern Argentina between 2500 and 3800 m of altitude (Fig. 6).

Bionomics. Unknown.

Types. Lectotype (Fig. 1D), ♂, with labels: ‘La Paz 3800 m, Bolivien, Netolitzky’, ‘*Leptopeltus netolitzkyi* Bernh. Typus’ (in Bernhauer’s handwriting) [yellow label], ‘Chicago NHMus Bernhauer Collection [printed white label], ‘Lectotype *Leptopeltus netolitzkyi* Bernhauer, 1906 des. Chani Posse & Asenjo 2012’ (in FMNH).

Notes. We designate the lectotype of *L. netolitzkyi* rather than assume that the examined type is the holotype, since in the

original description Bernhauer (1906) gave no information about the number of specimens examined. Therefore, it is possible that this name was based on more than one specimen (ICZN, 1999, Recommendation 73F). The lectotype agrees with the original description by Bernhauer (1906).

Other material examined. In total 5 specimens, including 4 ♂ and one specimen without genitalia.

Argentina: Catamarca: Ollada, 17.2.1915, Jorgensen, C. Bruch, 3000 m, 1 ♂ (MACN). Salta: Piedra de Cuoluio (?), I. 1988, S. Bolle, 3600 m, 1 ♂ (FMNH). Tucumán: San José, Depto Tafi, III. 1935, 2500 m, 1 ♂ (MACN). BOLIVIA: La Paz, 3800 m, netolitzkyi Bh. det. Bernhauer", Chicago NHMus Bernhauer Collection, 1 ♂, 1 without genitalia (FMNH).

3.2.6. *Leptopeltus weyrauchi* sp. nov. (Figs. 1E, 2A–C, O, 3R–V, 6)

Diagnosis. *Leptopeltus weyrauchi* may be identified among other species of *Leptopeltus* by the pronotum wider distally, the elytra with transverse distance between punctures about as large as diameters of punctures and the abdominal tergum VI with posterior basal transverse carina. It differs from *L. netolitzkyi* by the paramere of aedeagus emarginate apically and from *L. montivagans* by the abdominal terga III–VI distinctly chagrinated.

Redescription. Body length 11.0 mm. Coloration. Head and thorax piceous black to black; elytra mostly testaceous, distinctly darker at base; abdomen piceous; antennae, palpi and legs piceous.

Head as long as wide (HW/HL = 1.0), about as wide as pronotum (HW/PW = 0.9); distance separating medial interocular punctures on frons less than twice as large as distance separating medial punctures from lateral punctures (Fig. 2A); infraorbital ridge present. Eyes distinctly shorter than temples (EL/TL = 0.43) seen from above (Fig. 2A). Antennae with segment 1 about as long as segments 2 and 3 combined, segment 5 quadrate (Fig. 2A). Mentum with anterior margin straight, shorter than submentum (Fig. 2B). Labial palpus with last segment about 1.5 times longer than preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment about 1.5 times longer than segment 3. Neck no more than 0.6 times as wide as head at widest point (NW/HW = 0.53).

Pronotum about as long as wide (PW/PL = 1.0), wider at middle, front angles rounded; dorsal surface of pronotum with two rows of punctures, each with five to six punctures (Fig. 2C). Prosternum with rudimentary transverse carina. Mesoventrite with intercoxal process narrow and acute apically. Elytra at sides about twice as long as elytra along suture (Etl/Etl = 1.76); transverse distance between punctures larger than diameters of punctures. Front femora not distinctly dilated at middle; first segment of hind tarsus slightly longer than last segment (S1/S5 = 1.1). Abdominal terga III–VI distinctly chagrinated; abdominal terga V and VI with posterior basal transverse carina incomplete.

Male genitalia. Tergum 10 truncate (Fig. 3U) at apex with 5–6 apical setae and two subapical macrosetae. Aedeagus with paramere fused to median lobe, emarginate apically; median lobe gradually narrowed from apical half (Fig. 3S and T).

Female genitalia. Tergum 10 similar to that of male (Fig. 3U); second gonocoxites as in Fig. 3V.

Geographical distribution. *Leptopeltus weyrauchi* has been recorded from Peru (Puno) at 3900 m and Ayacucho at 3400 m of altitude (Fig. 6).

Bionomics. Unknown.

Etymology. The specific name is the same as that handwritten on the labels by Scheerpeltz and dedicated to Wolfgang K. Weyrauch "in litteris".

Types. Holotype, ♂, with labels: 'Puno, 31.VII.[19]81, R. ORTIZ' [handwritten in white label], 'Holotype *Leptopeltus weyrauchi* Chani Posse & Asenjo, 2012' (in UNALM). Three paratypes: 1♀ 'Perú/Puno/I.I.1948/leg. Weyrauch', 'MHN 1094,

Staphilinidae 1094, ex coll. Scheerpeltz' [blue label], 'TYPUS *Leptopeltus weyrauchi* O. Scheerpeltz' [red label], 'weyrauchi Scheerp.' [green label] (Fig. 1E) (in NMW), 1♀ 'Puno, PERU, 3900 m, II.1948, leg. Weyrauch', 'MHN 1094', '*Leptopeltus* sp. det. Newton 1993' [white label] (in MUSM), 1 ♂ 'PERU: AY [Ayacucho], La Mar prov. [Provincia], Anchiuay Sierra, 13°00'17.2" S, 73°46'09.2" W, 3400 m, 11.v.2007, A. Asenjo', 'Matorral, Fishmeat bait trap, P21.070511.B10' [white label] (in MUSM); each of them with additional label 'Paratype *Leptopeltus weyrauchi* Chani Posse & Asenjo, 2012'.

3.3. Genus *Leptopeltoides* gen. nov. (Figs. 1F–I, 2F, J, P, 4A–Q, 7)

Type species: *Leptopeltoides ecuatoriensis* sp. nov., here designated.

Etymology. The name of the genus is a combination of the genus name *Leptopeltus* and the Greek suffix –oides, meaning "similar to".

Diagnosis. As in *Leptopeltus*, *Leptopeltoides* can be separated from other Philonthina by the color pattern of its elytra and the front tibiae setose on the inner surface along their entire length in addition to (and different from *Leptopeltus*) the prosternum which is rather smooth, without keel, and the aedeagus with paramere elongate, fused to median lobe only at base.

Description. Length 7.6–11.2 mm. Body elongate (Fig. 1F–I). Coloration. Head and thorax piceous to piceous black; elytra piceous to piceous black in basal half and testaceous in distal half; abdomen piceous-brunneous to piceous-black; antennae, palpi and legs piceous to piceous-black.

Head of rounded-quadrangular shape with obtuse hind angles (Fig. 1F–I); as wide as to slightly wider than long, as wide as to slightly wider than pronotum at widest point (Fig. 2F) and with infraorbital ridge; epicranium with two pairs of interocular punctures, medial punctures separated by a distance more than twice as large as distance separating medial punctures from lateral punctures; each side of vertex with three to four postocular punctures forming a triangle or a rhomb; dorsal and ventral surface of head with rather rudimentary wave-like microsculpture. Eyes moderately convex, as long as to moderately shorter than temples seen from above (Fig. 2F). Antennae inserted nearer to anterior margin of frontoclypeus than to eyes (Fig. 2F), moderately long, moderately widened toward apex; first three segments bearing only sparse macrosetae, segments 4–11 pubescent, segment 3 distinctly longer than segment 2, segment 4 and 5 elongate, last segment narrowed anteriorly and minutely emarginate. Labrum subconical, completely sclerotized (Fig. 2F) with numerous and long macrosetae at apical margin. Mandible moderately prominent; dorsolateral surface grooved; left mandible with one tooth. Maxilla with lacinia elongate and densely setose along entire medial margin, with galea prominent and densely setose at apex. Maxillary palpus moderately long, segment 2 not wider than 1.5 times and about 1.5 times as long as segment 3, last segment fusiform, about as long as to distinctly longer than segment 3 and not appreciably narrower (Fig. 2F). Gular sutures joined anteriorly or posteriorly before neck. Mentum about as long as to slightly shorter than submentum. Mentum transverse, with anterior margin straight to slightly emarginate, and one seta at each latero-apical angle. Labial palpus moderately long, segments 1 and 2 with sparse setae, first two segments subequal in length, segment 3 fusiform and as long as to distinctly longer than segment 2.

Pronotum about as long as wide to moderately longer than wide, slightly broadened at middle; front margin subtruncate, hind margin arcuate, anterior angles subangulate, posterior angles obtuse (Fig. 2F); dorsal surface of pronotum with two rows of punctures sub-parallel to each other, each row with five to six punctures, with two sublateral groups of punctures, each with 4–5 punctures; surface with fine microsculpture of transverse

and oblique waves. Prosternum short, triangular, with longitudinal carina slightly developed only along furcasternum or along furcasternum and part of basisternum forming a rather smooth ridge, basisternum longer than furcasternum, with two medio-apical macrosetae (Fig. 2J). Legs moderately long; tibiae spinose on lateral face, with ventral setae denser on protibia than on meso- and metatibiae; dorsal surface of all tarsal segments glabrous except for scattered, long marginal setae, and pair of setae at apex of last segment about half as long as claws; first segment of hind tarsus as long as to moderately longer than last segment.

Elytra at suture moderately shorter than pronotum at midline (Fig. 1F–I); punctuation moderately coarse, transverse distance between punctures as long as diameter of one puncture.

Abdomen. Paired prototergal glands present on tergum 1; terga III–VI with anterior and posterior transverse basal carinae (Fig. 2P). Hind margin of tergum 8 (sixth visible) arcuate to subtruncate in both sexes.

Male genitalia. Sternum 8 moderately emarginate medio-apically. Genital segment with styli of tergum 9 stout and moderately setose apically; tergum 10 arcuate at apex with two to eight apical setae, with or without subapical macrosetae (Fig. 4B, E, I and M); sternum 9 pigmented at apex, with proximal portion asymmetrical, acutely emarginate apically, with three apical setae at each side of emargination (Fig. 4A, D, H and L). Aedeagus with median lobe gradually narrowed from apical third with subacute to acute apex (in dorsal view) and simple in its apical fourth (in lateral view); paramere elongate and entire, stick-like, reaching two thirds of median lobe length to almost the apex (Fig. 4C, F, G, J, K, N and O).

Female genitalia. Genital segment with styli of tergum 9 similar to those of male; tergum 10 subtruncate at apex with two to more apical setae, with two subapical macrosetae (Fig. 4Q); gonocoxites with second gonocoxites rather short, each with one long macroseta lateroventrally, with a minute stylus (Fig. 4P) and one apical setae.

Immature stages. Unknown.

Bionomics. The species of *Leptopeltoides*, as those of other related genera of Philonthina, can be considered general predators. Specimens have been collected by sweeping vegetation, beating rooting vegetation and with pitfall and malaise traps.

Distribution. *Leptopeltoides* with its four species known at present, is distributed in the North Andean Paramo province of the South American Transition zone (Morrone, 2006, 2009) from elevations of 2850 to 3660 m as indicated by trapping data (Fig. 7).

3.3.1. Key to species of *Leptopeltoides* gen. nov.

- | | |
|--|-----------------------------------|
| 1. Antennal segments VIII–X elongate; last segment of labial palpus as long as preceding segment; abdominal tergum VI with posterior basal transverse carina incomplete medially (Fig. 2P) | 2 |
| -Antennal segments VIII–X quadrate; last segment of labial palpus distinctly longer than preceding segment; abdominal tergum VI with posterior basal transverse carina complete medially | 3 |
| 2. Last segment of maxillary palpus about as long as preceding segment; last segment of hind tarsus distinctly longer than first segment | <i>Le. columbiensis</i> sp. nov. |
| -Last segment of maxillary palpus distinctly longer than preceding segment; last segment of hind tarsus about as long as first segment | <i>Le. ecuatoriensis</i> sp. nov. |
| 3. Gular sutures joined anteriorly; mesoventrite without median longitudinal carina | <i>Le. chingazensis</i> sp. nov. |
| -Gular sutures joined posteriorly; mesoventrite with median longitudinal carina | <i>Le. napoensis</i> sp. nov. |

3.3.2. *Leptopeltoides chingazensis* sp. nov. (Figs. 1F, 4A–C, 7)

Diagnosis. *Leptopeltoides chingazensis* may be recognized among the other species of *Leptopeltoides* here described by the antennal segments 8–10 quadrate, the gular sutures joined anteriorly before neck and the prosternum with the mid-longitudinal carina developed only along furcasternum forming a rather obtuse ridge.

Description. Body length 9.2 mm. Coloration. Head and thorax piceous black; elytra piceous to piceous black in basal half and testaceous in distal half; abdomen piceous; antennae, palpi and legs piceous to piceous-black.

Head moderately wider than long (HW/HL = 1.22), slightly wider than pronotum (HW/PW = 1.15); distance separating medial interocular punctures on frons more than twice as large as distance separating medial punctures from lateral punctures; post-mandibular ridge bordering mandibular base almost completely; infraorbital ridge present, extending not far beyond postgenal ridge; gular sutures joined anteriorly before neck. Eyes moderately shorter than temples (EL/TL = 0.73) seen from above. Antennae with segment 1 about as long as segments 2 and 3 combined, segments 8–10 quadrate. Mentum with anterior margin slightly emarginate, shorter than submentum. Labial palpus with last segment about 1.5 times longer than preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment about 1.5 times longer than segment 3. Neck about 0.5 times as wide as head at widest point.

Pronotum about as long as wide (PW/PL = 1.11), wider at middle, front angles rounded; dorsal surface of pronotum with two rows of punctures, each with six punctures. Prosternum with well-defined transverse carina. Mesoventrite without median longitudinal carina; intercoxal process narrow and arcuate apically. Elytra at sides more than 1.5 times as long as elytra along suture (EtL/Etl = 1.67); transverse distance between punctures as large as diameters of punctures. First segment of hind tarsus as long as last segment (S1/S5 = 1.0). Abdominal tergum 6 with posterior basal transverse carina complete.

Male genitalia. Tergum 10 arcuate at apex with 5–6 apical setae and two subapical macrosetae (Fig. 4B); sternum 9 pigmented at apex, with proximal portion asymmetrical, acutely emarginate apically, with three apical setae at each side of emargination (Fig. 4A). Aedeagus with median lobe gradually narrowed from apical third with subacute apex (in dorsal view) and paramere elongate and entire, almost reaching apex (Fig. 4C).

Female genitalia. Unknown.

Geographical distribution. *Leptopeltoides chingazensis* has only been recorded from Colombia (Parque Nacional Chingaza, Cundinamarca) at 3660 m of altitude (Fig. 7).

Bionomics. Unknown.

Etymology. The specific name refers to the area of origin of this specimen in Colombia.

Types. Holotype (Fig. 1F), ♂, with labels: 'Colombia: PN Chingaza Alto de la Bandera, 18-20-III-2001, 3660 m, 0.4° 31' N, 73° 45' W Pitfall, L. Cifuentes leg. M1506', 'Holotype *Leptopeltoides chingazensis* Chani Posse & Asenjo, 2012' (SEMC).

3.3.3. *Leptopeltoides columbiensis* sp. nov.

(Figs. 1G, 2F, J, P, 4D–G, 7)

Diagnosis. *Leptopeltoides columbiensis* may be recognized among other species of *Leptopeltoides* by the eyes slightly shorter than temples, the antennal segments 8–10 elongate, the pronotum wider anteriorly and the first segment of hind tarsus about twice as long as the last segment. It differs from *Le. ecuatoriensis* by having the last segments of both maxillary and labial palpi not longer than the preceding segments.

Description. Body length 10.6–11.2 mm. Coloration. Head and thorax piceous to piceous black; elytra piceous to piceous black in basal half and testaceous in distal half; abdomen

piceous-brunneous to piceous-black; antennae, palpi and legs piceous to piceous-black.

Head as wide as to slightly wider than long (HW/HL = 1.0–1.1), slightly wider than pronotum (HW/PW = 1.14); distance separating medial interocular punctures on frons more than twice as large as distance separating medial punctures from lateral punctures; postmandibular ridge bordering mandibular base only laterally; infraorbital ridge present, extending not far beyond postgenal ridge; gular sutures joined anteriorly before neck. Eyes slightly shorter than temples (EL/TL = 0.83–0.87) seen from above. Antennae with segment 1 about as long as segments 2 and 3 combined, segments 8 to 10 elongate. Mentum with anterior margin straight, shorter than submentum. Labial palpus with last segment about as long as preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment shorter than segment 3. Neck not more than 0.5 times as wide as head at widest point.

Pronotum moderately to slightly longer than wide (PW/PL = 0.78–0.88), wider anteriorly, front angles rounded; dorsal surface of pronotum with two rows of punctures, each with six punctures. Prosternum with mid longitudinal carina developed along furcasternum and part of basisternum forming a well-defined ridge (Fig. 2J); transverse carina of basisternum rudimentary. Mesoventrite without median longitudinal carina; intercoxal process narrow and acute apically. Elytra at sides about twice as long as elytra along suture (EtL/Etl = 1.76–1.94); transverse distance between punctures as large as diameters of punctures. First segment of hind tarsus distinctly longer than last segment (S1/S5 = 1.5–1.8). Abdominal tergum 6 with posterior basal transverse carina incomplete.

Male genitalia. Tergum 10 arcuate at apex with 5–6 apical setae and two subapical macrosetae (Fig. 4E); sternum 9 pigmented at apex, with proximal portion asymmetrical, acutely emarginate apically, with three apical setae at each side of emargination (Fig. 4D). Aedeagus with median lobe gradually narrowed from apical third with acute apex (in dorsal view) and paramere elongate and entire, not reaching apex of median lobe (Fig. 4F and G).

Female genitalia. Unknown.

Geographical distribution. *Leptopeltoides columbiensis* has been recorded from two localities in Colombia (Parque Nacional Chingaza in Cundinamarca and Iguaque in Boyacá) between 2850 and 3300 m of altitude (Fig. 7).

Bionomics. Unknown.

Etymology. The specific name refers to the country of origin of this specimen.

Types. Holotype (Fig. 1G), ♂, with labels: 'Colombia: Boyacá, SFF Iguaque La Planada, 5°25' N, 73°27' W, 2850 m, Malaise, 13-30-VII-2000, P. Reina Leg. M.381', 'Holotype *Leptopeltoides columbiensis* Chani Posse & Asenjo, 2012' (SEMC). Paratypes, 3 ♂, with labels as follows: 'Colombia: Boyacá, SFF Iguaque La Planada, 5°25' N, 73°27' W, 2850 m, Malaise, 21-I/7-II-2001, P. Reina leg. M.1249' 1 (SEMC); 'Colombia: Boyacá, SFF Iguaque Cerro Pan de Azúcar, 5°25' N, 73°27' W, Malaise, 27-III/16-IV-2001, 3300 m, P. Reina Leg. M.1517' 1 (SEMC) and 'A. Cifuentes leg. M1587/Colombia: Cundinamarca, PN Chingaza Charrascales, 0.4°3' N, 73°45' W, 2990 m, Malaise, 29-III/13-IV-2001' 1 (SEMC); each of them with additional label 'Paratype *Leptopeltoides columbiensis* Chani Posse & Asenjo, 2012'.

3.3.4. *Leptopeltoides ecuatoriensis* sp. nov. (Figs. 1H, 4H–K, 7)

Diagnosis. *Leptopeltoides ecuatoriensis* may be identified, and distinguished from *Le. columbiensis*, by the character states given below.

Description. Body length 9.8–10.4 mm. In most character states similar to *Le. columbiensis*, but different as follows: head as wide as to slightly wider than long (HW/HL = 1.0–1.1), slightly wider

than pronotum (HW/PW = 1.15); postmandibular ridge bordering mandibular base almost completely. Eyes slightly to moderately shorter than temples (EL/TL = 0.75–0.90) seen from above. Maxillary palpus with last segment longer than segment 3. Pronotum as long as to slightly longer than wide (PW/PL = 0.88–0.95). First segment of hind tarsus distinctly about as long as last segment (S1/S5 = 1.1).

Male genitalia. Tergum 10 subtruncate at apex with 5–6 apical setae and two subapical macrosetae (Fig. 4I). Aedeagus with median lobe gradually narrowed from apical third with subacute, rather triangular apex (in dorsal view) (Fig. 4J and K).

Female genitalia. Similar to that of *Le. napoensis*.

Geographical distribution. *Leptopeltoides ecuatoriensis* has been recorded from one locality in Ecuador (Pichincha) at 3350 m of altitude (Fig. 7).

Bionomics. Unknown.

Remarks. According to the label data, *Leptopeltoides ecuatoriensis* has been found by sweeping vegetation and beating rooting vegetation.

Etymology. The specific name refers to the country of origin of this specimen.

Types. Holotype, ♂, with labels: 'Ecuador: Pichincha, Quito, 27 km WNW, Campamiento Pichán (above Nono), 24-oct-99, S. Marshall, 3350 m, 0°7'31" N, 78°33'56" W, ex. Sweeping vegetation ECU1F99 010', 'Holotype *Leptopeltoides ecuatoriensis* Chani Posse & Asenjo, 2012' (SEMC). Allotype female (Fig. 1H) same data as holotype but 'ex. beating rooting vegetation ECU1F99 005' (SEMC).

3.3.5. *Leptopeltoides napoensis* sp. nov. (Figs. 1I, 4L–Q, 7)

Diagnosis. *Leptopeltoides napoensis* may be recognized among other species of *Leptopeltoides* by the eyes about as long as temples in dorsal view, the antennal segments 8–10 quadrate, the last segments of both maxillary and labial palpi longer than the preceding segments, the mentum subequal in length to submentum and the gular sutures joined posteriorly before neck.

Description. Body length 7.6–8.0 mm. Coloration. Head and thorax piceous to piceous black; elytra piceous to piceous black in basal half and testaceous in distal half; abdomen piceous-brunneous to piceous-black; antennae, palpi and legs piceous to piceous-black.

Head slightly wider than long (HW/HL = 1.10–1.16), about as wide as pronotum (HW/PW = 0.91–1.06); distance separating medial interocular punctures on frons more than twice as large as distance separating medial punctures from lateral punctures; postmandibular ridge bordering mandibular base only laterally; infraorbital ridge present, extending not far beyond postgenal ridge; gular sutures joined anteriorly before neck. Eyes about as long as temples (EL/TL = 0.92–1.09) seen from above. Antennae with segment 1 slightly shorter than segments 2 and 3 combined, segments 8–10 quadrate. Mentum with anterior margin emarginate, subequal to submentum. Labial palpus with last segment longer than preceding segment. Maxillary palpus with segment 2 longer than segment 3 and moderately swollen; last segment longer than segment 3. Neck not more than 0.5 times as wide as head at widest point.

Pronotum about as long as wide (PW/PL = 1.05–1.09), wider anteriorly, front angles rounded; dorsal surface of pronotum with two rows of punctures, each with six punctures. Prosternum with mid longitudinal carina developed along furcasternum and part of basisternum forming a well-defined ridge; transverse carina of basisternum rudimentary. Mesoventrite with median longitudinal carina; intercoxal process narrow and rounded apically. Elytra at sides about twice as long as elytra along suture (EtL/Etl = 1.96); transverse distance between punctures as large as diameters of punctures. First segment of hind tarsus about as long as to slightly longer than last segment (S1/S5 = 1.0–1.1). Abdominal tergum 6 with posterior basal transverse carina complete.

Male genitalia. Tergum 10 subtruncate at apex with 5–6 apical setae and two subapical macrosetae (Fig. 4M); sternum 9 pigmented at apex, with proximal portion asymmetrical, acutely emarginate apically, with three apical setae at each side of emargination (Fig. 4L). Aedeagus with median lobe gradually narrowed from apical third with subacute apex (in dorsal view) and paramere elongate and entire, not reaching apex of median lobe (Fig. 4N and O).

Female genitalia. Tergum 10 subtruncate at apex with two to more apical setae, with two subapical macrosetae (Fig. 4Q); second gonocoxites rather short, each with one long macroseta lateroventrally, with a minute stylus (Fig. 4P) and one apical setae.

Geographical distribution. *Leptopeltoides napoensis* has been recorded from one locality in Peru (Napo) at 3300 m of altitude (Fig. 7).

Bionomics. Unknown.

Etymology. The specific name refers to the locality of origin of this specimen in Peru.

Types. Holotype (Fig. 11), ♂, with labels: 'Ecuador: Napo, 42 km NW Baeza, 2-6.III.1976, S. Peck, 3300' [1005.84 m], 'Holotype *Leptopeltoides napoensis* Chani Posse & Asenjo, 2012' (CNC). Allotype female same data as holotype (CNC).

4. Cladistic analysis

4.1. Methods

4.1.1. Outgroups

The chosen outgroups used to root the tree included four representatives within Philonthina in the genera *Philonthus* Stephens, 1829 (*P. cribriventris* Bernhauer), *Belonuchus* (*B. rufipennis* (Fabricius)), *Paederomimus* Sharp, 1885 (*P. difformiceps* Sharp), one representative from Hyptiomina (*Holisus ogloblini* Bernhauer) and one representative from the Xanthopygina (*Oligotergus ogloblini* Bernhauer) which is the subtribe sister to Philonthina (Li and Zhou, 2011; Chatzimanolis et al., 2010). Evidence of close sister group relationships between *Leptopeltus* and the other selected genera of Philonthina has been assessed in a previous analysis (Chani-Posse, 2013). Fourteen terminal units were included in the cladistic analysis, the five species of *Leptopeltus* according to the present revision plus the four species of *Leptopeltoides* and the five outgroup taxa. The 49 morphological characters for the outgroup taxa were coded from the examination of specimens.

4.1.2. Characters

Forty-nine characters were used (Appendix 1), from which 38 are derived from external morphology, eight from male genitalia, and three from female genitalia. Multistate characters 7, 11, 15, 17, 39, 42 and 48 were treated as unordered (non-additive) and given equal weight. Following Sereno (2007, 2009), neomorphic (presence/absence) and transformational (transformation from one state to another) characters were treated as separate, independent patterns.

4.1.3. Procedure

The matrix (Appendix 2) was prepared using Mesquite version 2.74 (Maddison and Maddison, 2010) and computed in TNT (Goloboff et al., 2008) with all characters treated as unordered and equally weighted. Space for 99,999 trees was set in the memory. A traditional search was run with 100 replicates of random addition sequences followed by tree bisection-reconnection, saving ten trees per replication. Trees were rooted with *Oligotergus ogloblini* (Xanthopygina). Clade support was assessed by means of standard bootstrap analysis with frequency differences as implemented in TNT with 100 replications of heuristic searches with 100 interactions of random addition of taxa and holding 10 trees per

interaction. The same parameters were used to perform a jackknife analysis. Additionally, Bremer support was estimated by the script Bremer.run (available at <http://tnt.insectmuseum.org/index.php/>) from suboptimal trees up to 10 steps longer than the shortest trees. WinClada v. 1.00.08 (Nixon, 1999) was used for character mapping.

5. Results and discussion

The analysis of the data matrix (Appendix 2) produced one cladogram with 98 steps, a consistency index (CI) of 0.592 and a retention index (RI) of 0.683. Both *Leptopeltus* and *Leptopeltoides* appear as well-supported monophyletic groups (Fig. 5A). The monophyly of *Leptopeltus* is established by the following two synapomorphies: prosternum with keel (19.1) and aedeagus with median lobe arcuate apically in lateral view (43.0). The relationships within *Leptopeltus* are fully resolved and well supported with *L. carchiensis* basal to a major clade (*L. flavipennis* + (*L. netolitzkyi* + (*L. montivagans* + *L. weyrauchi*))) which is defined by the following two synapomorphies: male sternum IX with basal portion moderately asymmetric (39.1) and male tergum X with truncate apex (40.3). The clade (*L. netolitzkyi* + (*L. montivagans* + *L. weyrauchi*)) is supported by one synapomorphy: the abdominal terga III–VI, with chagrinated microsculpture (32.1). Besides these synapomorphies, the sister relationship between *L. montivagans* and *L. weyrauchi* is defined by the aedeagus with paramere apically emarginate (45.1). The monophyly of *Leptopeltoides* is supported by one synapomorphy: aedeagus with median lobe apically acute in dorsal view (42.2). The relationships within *Leptopeltoides* were also fully resolved with *Le. napoensis* basal to a major clade (*Le. chingazensis* + (*Le. ecuatoriensis* + *Le. columbiensis*)) which appears well-supported and defined by one synapomorphy: apex of median lobe hook-like in lateral view (44.0). On the other hand, *Le. ecuatoriensis* and *Le. columbiensis* show a sister-group relationship defined by two homoplastic characters: labial palps with apical segment subequal in length to preceding segment (11.1) and abdominal tergum VI with posterior basal transverse carina complete (37.1).

In the present analysis, *Leptopeltus* is placed as sister group to *Leptopeltoides* and both of them as sister to the three Neotropical representatives of Philonthina. The relationship between *Leptopeltus* and *Leptopeltoides* with the here so-called "Neotropical" clade is defined by high support values and seven synapomorphies: gular sutures joined before neck (12.0) and anteriad (13.0); front tarsi with tarsomeres I–IV more or less cylindrical, not widened distally and not flattened dorsoventrally (27.0), not sexually dimorphic (28.1) and without adhesive setae in both sexes (29.0, 30.0); abdominal tergum II without basal longitudinal carina (31.0). Additionally, *Leptopeltus* and *Leptopeltoides* also appear as a monophyletic clade supported by two synapomorphies: elytra with color pattern (23.1) and male sternum IX with basal portion distinctly asymmetric (39.2). Since caution is advised to define a group based on characters whose plasticity has been largely recognized (coloration) or whose occurrence is widespread (asymmetry of the basal portion of sternum IX in Staphylinini), a doubt may arise regarding the sister-group relationship of these two genera. In order to test the influence associated with such characters (23*, 24*, 38* and 39*), the data set was reanalyzed excluding those characters. This second analysis produced three cladograms with 92 steps, a consistency index (CI) of 0.576 and a retention index (RI) of 0.661 (Fig. 5B). The three trees only differ in the sister-group relationships exhibited by *Leptopeltus* and *Leptopeltoides*. In the first tree *Leptopeltus* and the three Neotropical representatives of Philonthina form a clade placed as the sister group to *Leptopeltoides*. In the second tree *Leptopeltus* is placed as the sister group to the clade including the three Neotropical representatives

of *Philonthina* and *Leptopeltoides*. The last tree shows *Leptopeltus* and *Leptopeltoides* in one clade such as in the first analysis including all characters. In all of the three trees, relationships within these two genera were resolved as in the unique tree obtained from the complete data set (Fig. 5B). Both analyses support *Leptopeltus* and *Leptopeltoides* as two distinct genera closely related to the three Neotropical representatives of *Philonthina* here included. Whether *Leptopeltus* and *Leptopeltoides* are sister groups (or not) may provide further evidence for (or against) the hypothesis of the sister relationship of the North Andean Paramo and Puna provinces (Morrone, 2006, 2009). De Queiroz (2000), Poe and Wiens (2000) and other authors (see Wiens, 2000) conclude that both including and excluding characters of interest can systematically influence the outcome of an analysis, being this influence “context dependent” (de Queiroz, 2000). Among the Neotropical genera of *Philonthina* which are currently known, *Leptopeltus* and *Leptopeltoides* are unique in terms of the characteristic color pattern of the elytra. The asymmetric basal portion of the male sternum IX, although common within Staphylinini, may be more or less distinct in different taxa. In our case, it is noteworthy that a “male sternum IX with basal portion distinctly asymmetric” occurs not only in *Leptopeltoides* but also in *L. carchiensis* which appears at the base of the *Leptopeltus* group. Within this context, we support the inclusion of all characters of interest in the present analysis, and the result showing a sister-group relationship between these two genera.

6. Biogeographical notes

As discussed in the introductory part of this study, current available records for the species of *Leptopeltus* define its distribution as belonging to the North Andean Paramo and Puna provinces of the South American Transition zone, which is deemed to be composed of both Neotropical and Andean insect taxa (Morrone, 2006, 2009). Furthermore, these provinces in particular have been assigned to either the Neotropical (Cabrera and Willink, 1980) or the Andean Region (Morrone, 1994, 1996). The resulting (unique) cladogram from our first analysis as well as one (of the three) most parsimonious tree from the second analysis support Morrone (2006, 2009) concerning the sister relationship of the North Andean Paramo and Puna provinces, as shown by the close phylogenetic relationships between *Leptopeltus* and the new genus *Leptopeltoides*. Additionally, the close relationship between these two genera and other Neotropical representatives of *Philonthina* seem to confirm the Neotropical origin of both genera.

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Appendix 1.

Characters and character states used in the cladistic analysis of *Leptopeltus* and *Leptopeltoides*.

1. Antennae, antennomere V, shape: 0. elongate; 1. quadrate.
2. Head, antero-lateral ridge: 0. absent; 1. present.
3. Head, interocular medial punctures relative to lateral punctures: 0. not longer than twice; 1. distinctly more than twice.
4. Eyes, size relative to size of temples (dorsal view): 0. distinctly shorter than 0.5; 1. 0.5 as long as or longer.
5. Head, infraorbital ridge: 0. absent; 1. present.
6. Head, postmandibular ridge: 0. absent; 1. present.
7. Head, postmandibular ridge relative to mandibular base: 0. bordering almost completely; 1. bordering only laterally; 2. separate.
8. Labrum, shape: 0. distinctly transverse; 1. subconical.
9. Mandible, left; teeth: 0. one; 1. two.
10. Maxillary palps, segment IV (apical) length relative to length of segment III (Mp4L/Mp3L): 0. between 0.5 and 0.8; 1. between 1.0 and 1.8; 2. 2.0 or longer.
11. Labial palps, apical segment, segment III (apical) length relative to length of segment II (Lp3L/Lp2L): 0. shorter; 1. subequal; 2. longer.
12. Gular sutures: 0. joined before neck; 1. not joined before neck and running close to the base.
13. Gular sutures, junction: 0. anterior; 1. posterior.
14. Pronotum, lateral puncture with long seta, position: 0. in superior line or at a distance no more than the diameter of puncture; 1. at a distance three times as large as diameter of puncture.
15. Pronotum, maximum width: 0. wider anterior; 1. wider at middle; 2. subparallel; 3. wider posterior.
16. Pronotum, anterior angles: 0. rounded; 1. subquadrate.
17. Prosternum, development of mid-longitudinal carina: 0. absent (only medial prominence, not carinate, not longitudinal); 1. only along furcasternum; 2. along furcasternum and at least part of basisternum; 3. only along basisternum.
18. Prosternum, shape of longitudinal carina: 0. forming well-defined, sharp ridge at least in its basal part; 1. more or less rounded, from obtuse ridge to smooth longitudinal prominence of prosternum.
19. Prosternum, keel: 0. absent (Fig. 2J); 1. present (Fig. 2H and I).
20. Prosternum, basisternum transverse carina: 0. absent; 1. present.
21. Mesoventrite, medial longitudinal carina: 0. absent; 1. present.
22. Mesoventral intercoxal process, shape: 0. narrow; 1. broad.
 - * 23. Elytra, color pattern: 0. absent; 1. present.
 - * 24. Elytra, color pattern (if present): 0. mostly testaceous; 1. half testaceous, half black to piceous black.
25. Elytra, transverse distance between punctures related to diameter of puncture: 0. 1.0 at most; 1. distinctly more than 1.0.
26. Front tibia, setae on inner surface: 0. scattered along entire length; 1. dense along entire length.
27. Front tarsi, shape: 0. tarsomeres I–IV more or less cylindrical, not widened distally and not flattened dorsoventrally; 1. tarsomeres I–IV more or less flattened dorsoventrally and widened distally.
28. Front tarsi, sexual dimorphism: 0. absent; 1. present.
29. Front tarsi, adhesive setae, males: 0. absent; 1. present.
30. Front tarsi, adhesive setae, females: 0. absent; 1. present.
31. Abdomen, tergum II, basal longitudinal carina: 0. absent; 1. present.
32. Abdomen, terga III–VI, microsculpture, chagrinated: 0. absent; 1. present.
33. Abdomen, terga III–VI, microsculpture, chagrinated (if present): 0. slight (Fig. 2N); 1. distinct (Fig. 2M and O).
34. Abdomen, tergum IV, basal transverse carinae, posterior: 0. absent; 1. present.
35. Abdomen, tergum V, basal transverse carinae, posterior: 0. absent; 1. present.
36. Abdomen, tergum VI, basal transverse carinae, posterior: 0. absent; 1. present.
37. Abdomen, tergum VI, basal transverse carinae, posterior (if present): 0. complete; 1. incomplete.
 - * 38. Male sternum IX, basal portion, symmetry: 0. absent; 1. present.
 - * 39. Male sternum IX, basal portion, symmetry (if absent): 0. slight; 1. moderate; 2. distinct.
40. Male tergum X, apex: 0. emarginate medio-apically; 1. subtruncate apically to wide and subangulate or arcuate apically; 2. subacute; 3. concave medio-apically to truncate.
41. Aedeagus, paramere(s), attachment to median lobe: 0. fused to median lobe only at base, otherwise paramere(s) distinctly separated from median lobe along entire length; 1. fused to median lobe along its (their) entire length, paramere(s) and median lobe hardly distinguishable from each other.
42. Aedeagus, median lobe, apical part, shape, dorsal view: 0. subrectangular; 1. subtruncate to subacute; 2. acute.
43. Aedeagus, median lobe, apical part, shape, lateral view: 0. arcuate; 1. straight.
44. Aedeagus, median lobe, apex (lateral view): 0. hook-like; 1. not hook-like.
45. Aedeagus, paramere, apex, dorsal view: 0. entire; 1. emarginate.
46. Aedeagus, parameres relative to median lobe: 0. paramere(s) is (are) not (or at most slightly) produced over apex of median lobe, usually narrower or at most as wide as median lobe; median lobe appearing as the larger part of the aedeagus; 1. paramere small (short and/or thin), obviously strongly reduced.
47. Ovipositor, distal gonocoxites, macrosetae, number: 0. 2–5; 1. one.
48. Ovipositor, distal gonocoxites, macrosetae, location: 0. along the outer margin; 1. distal; 2. basal.
49. Ovipositor, styli, macrosetae, number: 0. one; 1. two.

Appendix 2.

Data matrix of species of *Leptopeltus* and *Leptopeltoides* plus the outgroups *Oligotergus ogloblini* (Xanthopygina), *Holisus ogloblini* (Hyptiomyina), *Philonthus cribriventris*, *Belonuchus rufipennis* and *Paederomimus difformiceps* (Philonthina). a = polymorphy 0/1.

	1	1111111112	2222222223	3333333334	444444444
	1234567890	1234567890	1234567890	1234567890	1234567890
<i>Oligotergus ogloblini</i>	01?11120?1	1110012000	100?011111	10?110????	?????12?
<i>Belonuchus rufipennis</i>	110110?0?1	20?1210?00	010?000000	00?110?001	111?01120
<i>Holisus ogloblini</i>	000000?0?0	0001000?00	000?000000	?0?000?1?1	01???000?
<i>Paederomimus difformiceps</i>	010100?0?1	20?1001101	010?100000	00?000?000	10???1???
<i>Philonthus cribriventris</i>	00011111?1	2110300?00	000?011111	10?110?002	101?01001
<i>L. carchiensis</i>	01001110?1	2000112011	1111110000	00?000?021	110101???
<i>L. flavipennis</i>	1101011011	2000102011	111a010000	011110?013	110101121
<i>L. montivagans</i>	1100111011	2000020111	1010110000	010110?013	110111121
<i>L. netolitzkyi</i>	1100111011	2000102011	1010110000	011110?013	110101???
<i>L. weyrauchi</i>	1100111011	2000102011	1010110000	0111111003	110111121
<i>Le. columbiensis</i>	0111111100	1000012001	001101000?	00?1111021	021000???
<i>Le. chingazensis</i>	0111110101	2000111101	0011010000	00?1110021	021000???
<i>Le. ecuatoriensis</i>	0111110101	1000012001	0011010000	00?1111021	021000120
<i>Le. napoensis</i>	0111111101	2010012001	1011010000	00?1110021	021100120

References

- Asenjo, A., 2004. Lista preliminar de las especies de Staphylinidae (Coleoptera) registradas para Perú. *Revista Peruana de Entomología* 44, 55–64.
- Bernhauer, M., 1906. Neue Staphyliniden aus Südamerika. 3. Stück. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 56, 322–339.
- Bernhauer, M., 1908. Beitrag zur Staphylinidenfauna von Südamerika. *Archiv für Naturgeschichte* 74, 283–372.
- Bernhauer, M., 1912. Zur Staphylinidenfauna von Südamerika (10. Beitrag). Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 62, 26–48.
- Bernhauer, M., Schubert, K., 1914. Staphylinidae IV. In: Schenkling, S. (Ed.), *Coleopterorum Catalogus*, vol. 5 (57). W. Junk, Berlin, pp. 289–408.
- Blackwelder, R.E., 1936. Morphology of the coleopterous family Staphylinidae. *Smithsonian Miscellaneous Collections* 94, 1–102.
- Blackwelder, R.E., 1944. Checklist of the Coleopterous insects of Mexico, Central America, the West Indies, and South America. Part I. *Bulletin of the U.S. National Museum* 185, xii+188pp.
- Blackwelder, R.E., 1952. The generic names of the family Staphylinidae, with an essay on genotypy. *Bulletin of the U.S. National Museum* 200, i-iv+1–483.
- Bruch, C., 1928. Suplemento al catálogo sistemático de los coleópteros de la República Argentina, III. (Addenda, corrigenda y lista de especies). *Boletín de la Academia Nacional de Ciencias de Córdoba* 29, 419–452.
- Cabrera, A.L., Willink, A., 1980. Biogeografía de América Latina. Segunda edición. Monografía 13. serie biología. Programa Regional de Desarrollo Científico y Tecnológico, Organización de los Estados Americanos, 122pp.
- Chani-Posse, M., 2013. Towards a natural classification of the subtribe Philonthina (Coleoptera: Staphylinidae: Staphylinini): a phylogenetic analysis of the Neotropical genera. *Systematic Entomology* 38, 390–406, <http://dx.doi.org/10.1111/syen.12003>.
- Chatzimanolis, S., Cohen, I.M., Schomann, A., Solodovnikov, A., 2010. Molecular phylogeny of the mega-diverse rove beetle tribe Staphylinini (Insecta, Coleoptera, Staphylinidae). *Zoologica Scripta* 39, 436–449.
- de Queiroz, K., 2000. Logical problems associated with including and excluding characters during tree reconstruction and their implications for the study of morphological character evolution. In: Wiens, J.J. (Ed.), *Phylogenetic Analysis of Morphological Data*. Smithsonian Institution Press, Washington, pp. 192–212.
- Erichson, W.F., 1840. Genera et species Staphylinorum insectorum coleopterorum familiae. F. H. Morin, Berlin, pp. 401–954, pls. 1–5.
- Goloboff, P.A., Farris, J.S., Nixon, K., 2008. TNT, a free program for phylogenetic analysis. *Cladistics* 24, 774–786.
- Herman, L.H., 2001. Catalog of the Staphylinidae (Insecta: Coleoptera), 1758 to the end of the second millennium. Part V. *Bulletin of the American Museum of Natural History* 265, 2441–3020.
- Horn, W., Kahle, I., Friese, G., Gaedike, R., 1990. *Collectiones Entomologicae eine Kompendium über den Verbleib entomologischer Sammlungen der Welt bis 1960. Teil I A bis K und Teil II L bis Z*. Akademie der Landwirtschaftswissenschaften der deutschen Demokratischen Republik, Berlin, 220pp. (Teil I); 353pp. (Teil II).
- ICZN, 1999. *International Code of Zoological Nomenclature*, 4th ed. The International Trust for Zoological Nomenclature/Natural History Museum, London, UK, 306pp.
- Li, L., Zhou, H.Z., 2011. Revision and phylogenetic assessment of the rove beetle genus *Pseudohesperus* Hayashi, with broad reference to the subtribe Philonthina (Coleoptera: Staphylinidae: Staphylinini). *Zoological Journal of the Linnean Society* 163, 679–722.
- Lucas, R., 1920. *Catalogus alphabeticus generum et subgenerum Coleopterorum orbis terrarum totius* (famil., trib., subtr., sect. incl.). *Archiv für Naturgeschichte* (A) 84 (1918), 1–696.
- Maddison, W.P., Maddison, D.R., 2010. *Mesquite: A Modular System for Evolutionary Analysis*. Version 2.74. <http://mesquiteproject.org>
- Morrone, J.J., 1994. Systematics, cladistics, and biogeography of the Andean weevil genera *Macroctyphlus*, *Adioristidius*, *Puranus*, and *Amathynetoides*, new genus (Coleoptera: Curculionidae). *American Museum Novitates* 3104, 1–63.
- Morrone, J.J., 1996. The biogeographical Andean subregion: a proposal exemplified by Arthropod taxa (Arachnida, Crustacea, and Hexapoda). *Neotropica* 42, 103–114.
- Morrone, J.J., 2006. Biogeographic areas and transition zones of Latin America and the Caribbean islands based on panbiogeographic and cladistic analyses of the entomofauna. *Annual Review of Entomology* 51, 467–494.
- Morrone, J.J., 2009. *Evolutionary Biogeography: An Integrative Approach with Case Studies*. Columbia University Press, New York, 304 pp. ISBN: 978-0-231-14378-3.
- Newton, A.F., Thayer, M.K., 2005. Catalog of higher taxa of Staphyliniformia and genera and subgenera of Staphylinioidea. *Field Museum of Natural History, Chicago*. Available from: http://www.fieldmuseum.org/peet_staph/db_1a.html (updated 03.11.05/accessed 18.03.12).
- Newton, A.F., Gutiérrez-Chacón, C., Chandler, D.S., 2005. Checklist of the Staphylinidae (Coleoptera) of Colombia. *Listado de los Staphylinidae (Coleoptera) de Colombia*. *Biota Colombiana* 6 (1), 1–72.
- Nixon, K.C., 1999. WINCLADA (Beta), v.0.z.9. Software published by the author, Ithaca, New York. <http://www.cladistics.com>
- Poe, S., Wiens, J.J., 2000. Character selection and the methodology of morphological phylogenetics. In: Wiens, J.J. (Ed.), *Phylogenetic Analysis of Morphological Data*. Smithsonian Institution Press, Washington, pp. 20–36.
- Scheerpeltz, O., 1933. Pars 129. Staphylinidae VII. In: Schenkling, S. (Ed.), *Coleopterorum Catalogus*. W. Junk, Berlin, pp. 989–1500.
- Scheerpeltz, O., 1960. Zur Kenntnis neotropischer Staphyliniden (Col.). *Beiträge zur Neotropischen Fauna* 2 (2), 65–138.
- Schillhammer, H., 2000. Revision of the East Palaearctic and Oriental species of *Philonthus* Stephens—Part 3. The politus complex. *Koleopterologische Rundschau* 70, 113–176.
- Sereno, P.C., 2007. Logical basis for morphological characters in phylogenetics. *Cladistics* 23, 565–587.
- Sereno, P.C., 2009. Comparative cladistics. *Cladistics* 25, 624–659.
- Sharp, D.S., 1884. *Staphylinidae*. *Biologia Centrali-Americana, Insecta Coleoptera*, vol. 1 (2). Taylor & Francis, London, pp. 313–392.
- Sharp, D.S., 1885. *Staphylinidae*. *Biologia Centrali-Americana, Insecta, Coleoptera*, vol. 1 (2). Taylor & Francis, London, pp. 393–536.
- Smetana, A., 1982. Revision of the subfamily Xantholininae of America North of Mexico (Coleoptera: Staphylinidae). *Memoirs of the Entomological Society of Canada* 12, 1–389.
- Smetana, A., 1995. Rove beetles of the subtribe Philonthina of America north of Mexico (Coleoptera: Staphylinidae): classification, phylogeny and taxonomic revision. *Memoirs on Entomology, International* 3, 1–96.
- Smetana, A., Davies, A., 2000. Reclassification of the north temperate taxa associated with *Staphylinus sensu lato*, including comments on relevant subtribes of Staphylinini (Coleoptera: Staphylinidae). *American Museum Novitates* 3287, 1–88.
- Solsky, S.M., 1872. *Énumération et description des coléoptères de la famille des staphylinides recueillis par Mrs. C. Jelsky et le Baron de Nolken pendant leurs*

- voyages dans l'Amérique du Sud en 1870 et 1871. *Horae Societatis Entomologicae Rossicae* 8 (1871), 289–314.
- Stephens, J.F., 1829. *The Nomenclature of British Insects: Being a Compendious List of Such Species as are Contained in the Systematic Catalogue of British Insects, and Forming a Guide to their Classification.* Baldwin & Cradock, London, 68pp.
- von Nordmann, A., 1837. *Symbolae ad monographiam staphylinorum.* Ex Academiae Caesareae Scientiarum Tomo IV, Petropoli, 167pp., 2 pls.
- Wiens, J.J. (Ed.), 2000. *Phylogenetic Analysis of Morphological Data.* Comparative Evolutionary Biology Series. Smithsonian Institution Press.