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Authors: Alfredo E. Giraldo-Mendoza, and Gustavo E. Flores

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A REVISION OF THE PERUVIAN EDROTINI (COLEOPTERA: TENEBRIONIDAE: PIMELIINAE)

ALFREDO E. GIRALDO-MENDOZA¹ and GUSTAVO E. FLORES^{2,*}

¹*Universidad Nacional Agraria La Molina, Museo de Entomología Klaus Raven
Büller, Av. La Molina s/n, Lima 12, Lima, Perú*

²*CONICET, Laboratorio de Entomología, Instituto Argentino de Investigaciones
de las Zonas Áridas (IADIZA, CCT CONICET Mendoza), Casilla de correo 507,
5500 Mendoza, Argentina; e-mail: gflores@mendoza-conicet.gov.ar*

**Corresponding author*

Abstract.— The Peruvian genera of Edrotini (Pimeliinae) are revised. A new genus *Pachacamacius* Flores & Giraldo gen. nov. with two new species, *Pachacamacius aguilaris* Giraldo & Flores sp. nov. (type species) and *Pachacamacius koepeckae* Flores & Giraldo sp. nov., is described. Two species originally described in the genus *Prohyllithus* Kaszab, 1964 are reassigned to two new monotypic genera: *Sechuranus* Flores and Giraldo gen. nov. (type species *Prohyllithus barbatus* Kaszab, 1964) and *Koneus* Giraldo and Flores, gen. nov. (type species *Prohyllithus peruanus* Kaszab, 1981). This article includes diagnoses for five genera and redescrptions or descriptions, distributional data, habitat records and habitus photographs for six species. A dichotomous key for all 11 Peruvian species of Edrotini, drawings of new species' male genitalic features, and distribution maps are also provided. A discussion of the external morphological characters and male genitalia of the new taxa compared to the genera and species previously described and on endemism and zoogeography of Peruvian Edrotini is presented.



Key words.— Taxonomy, Pimeliinae, new genera, arid zone, Peruvian species

INTRODUCTION

Within Tenebrionidae, Pimeliinae constitutes about half the species diversity of the entire family (Matthews *et al.*, 2010) and its members are conspicuous elements of the arthropod fauna in arid and semi-arid regions around the world, in terms of abundance, biomass and diversity (Crawford, 1981). As a result of a cladistic analysis of Pimeliinae, Doyen (1994) merged the former tribes Auchmobini, Edrotini, Eurymetopini, Trientomini, Trimytini and Triorophini under Eurymetopini Casey, 1907, based principally on features of the ovipositor and internal female reproductive tract (spermathecae arising serially from the base of the accessory gland duct and spiculum ventrale lacking basal arms). Later, the tribal name was replaced by Edrotini Lacordaire, 1859 due to nomenclatural priority

(Bouchard *et al.*, 2005). Members of the Edrotini are principally distributed in North and South American continental arid zones, and in Galápagos Islands (Matthews *et al.*, 2010). Doyen included the Asian genus *Ascelosodis* Redtenbacher, 1868 in the tribe due to its similar external morphology and similarities in the female genitalia tract (Doyen, 1994). *Ascelosodis* comprises 27 species distributed in higher altitudes of the Tibetan Plateau and adjacent areas (Shi and Ren, 2007; Shan and Ren, 2016).

In the Americas the tribe includes 50 genera and 391 species of which 43 genera and 336 species/subspecies are in North and Central America (Bousquet *et al.*, 2018) and seven genera and 55 species/subspecies in South America (Marcuzzi, 1954; Kaszab, 1964, 1978, 1981; Finston and Peck, 2004). The South American genera of Edrotini are in need of a thorough revision

given the lack of a comprehensive treatment. Kaszab (1964) revised the Andean genus *Hylithus* Guérin-Méneville to include 21 species/subspecies and described the Peruvian genus *Prohylithus* Kaszab, 1964 with two species; later adding a third species (Kaszab, 1981). Kaszab (1978) reviewed the genus *Arthroconus* Solier, described the new genus *Falsoarthroconus* Kaszab, 1978, both known only from Chile, and provided a key to four South American genera. Kaszab (1981) erected the monotypic Peruvian genus *Idiopsis* Kaszab, 1981, but later replaced the name *Idiopsis* with *Kocakia* Kaszab, 1985, because the first was preoccupied by a dipteran genus (Kaszab, 1985). Van Dyke (1953) and then Finston and Peck (2004) revised the Galápagos Islands endemic genus *Stomion* Waterhouse, 1845 the last using morphometric and cladistic methods found external morphological support for 12 species/subspecies. The known distribution of South American Edrotini (Marcuzzi, 1954, Kaszab, 1964, 1978, 1981, Finston and Peck, 2004, collection data IADIZA, MEKRB) includes Northern Colombia and Venezuela, Ecuador, coastal desert of Peru and Chile, highlands of Peru, Bolivia, Chile and Argentina, central Pampas, Chaco and Patagonia in Argentina and Galápagos islands (Fig. 1).

After careful examination of specimens in South American entomological collections, we recognized two new edrotine species that show a unique combination of characters and deserve to be included in a new genus that we name *Pachacamacius*. In addition, two species assigned to *Prohylithus* by Kaszab (1964, 1981) do not correspond with the generic definition based on the type species (*P. kulzeri* Kaszab, 1964) and we propose that they deserve recognition as separate genera based on characters discussed below. The objectives of this paper are to describe and illustrate a new genus with two new species of Edrotini from Peru, reassign two species previously included in the genus *Prohylithus* to two new genera, and provide a key for Peruvian species of the tribe.

MATERIALS AND METHODS

Type specimens and material examined are deposited in the following collections:

- HNHM – Hungarian Natural History Museum, Budapest, Hungary;
- IADIZA – Instituto Argentino de Investigaciones de las Zonas Áridas, Mendoza, Argentina;
- MEKRB – Museo de Entomología Klaus Raven Büller, Universidad Nacional Agraria La Molina, Lima, Peru;
- MUSM – Museo Nacional de Historia Natural – Universidad Nacional Mayor de San Marcos, Lima, Peru;
- VMDM – V. Manuel Diéguez M., private collection, Santiago, Chile.

Body length was measured dorsally, along the midline, from the anterior margin of the labrum to the apex of elytra; body width was measured in the widest region, at middle of elytral length. Terminology used in the descriptions follows recent papers dealing with Edrotini genera (Finston and Peck, 2004; Smith and Wirth, 2016; Wirth and Smith, 2017). For specialized terms employed for mouthparts we used mandibular cusp (Doyen, 1994: 499; Torre-Bueno *et al.*, 1989) in reference to the pointed process on the dorsolateral margin on both mandibles (Doyen, 1994: 453, Fig. 12, characters 9 and 10, and Finston and Peck, 2004, = tooth), and tooth (pl. teeth) for the acute angulation or short pointed process of the anterior margin of clypeus (Torre-Bueno *et al.*, 1989). Terminology of foreleg was taken from Doyen (1984: Fig. 41). Dissection methods are those used by Tschinkel & Doyen (1980) for genital structures. Terminology of male genitalia was taken from Flores (1996), who used the terminology of Jeanne and Paulian (1944) for Coleoptera. Equivalences with terminology of Matthews *et al.* (2010) are the following: tegmen = parameres, basal lamina of tegmen = basale of parameres, lateral styles of tegmen = apical of parameres, and median lobe = penis. For basal lamina of tegmen/lateral styles length (B/E), and median lobe/tegmen length (L/T) we used the ratios proposed by Flores (1996). Type specimens of Kaszab (1964, 1978, 1981) were studied *in situ* in Budapest Museum (HNHM) by GEF in February 2018.

Digital images were taken with a Canon S50 adapted to a Leica MZ6 stereomicroscope. Final images (Figs. 2–13) were montaged with the image stacking freeware CombineZM (Hadley, 2006). Drawings were made with a camera lucida adapted to a stereoscopic microscope.

The label data from separate labels are given verbatim within square brackets and new lines on the same label are separated by a diagonal slash (/). Distributional maps were prepared using SimpleMappr (Shorthouse, 2010) taking in account the material examined for this paper and distributional data of Kaszab (1964, 1981). For distribution of the species we used the biogeographic classification of Morrone (2014).

RESULTS

Genus *Pachacamacius* Flores and Giraldo, gen. nov.
(Figs. 2, 3, 8, 9, 14, 15, 24)

Type species. *Pachacamacius aguilar* Giraldo & Flores, sp. nov., present designation.

Etymology. The generic name alludes to the god Pachacamac, “creator of the world” in Quechua language, worshiped mainly in the current department of Lima during pre-Columbian times. Gender masculine.

Diagnosis. Within South American Edrotini, *Pachacamacius* can be easily distinguished from other genera by the following combination of characters: eyes protruding outward, not emarginate anteriorly by epicanthus, upper margin lacking supraocular carina and groove (Figs. 8–9), postgenal margin well developed, covering half of posterior margin of eye. Clypeal anterior margin extended beyond epicanthus, lacking teeth, width equal to 1.5 times each epistomal lobe, slightly depressed at sides by genoclypeal sutures (Figs. 8–9). Last maxillary palpomere hatchet-shaped, dorsal cusp on basal half present only on the right mandible (Figs. 8–9). Pronotum with right anterior angles, sloping towards venter, with lateral margins curved, widest at middle. Prosternum convex with

process; mesosternum with a raised process on anterior margin, projecting forward. Epipleuron with anterior fifth abruptly widened towards humeri, not narrowed before apex. Protibiae with distal: proximal width ratio 1.5–2.0×.

Description. Length 5.70–8.00 mm, width 2.80–3.80 mm. Flightless. Body outline oval-elongated. Glabrous. Color gray-black on head and venter, dark brown with dark red on pronotum and elytra, antennae, maxillary and labial palpomeres and legs light brown. **Head.** Labrum light brown, exposed, with round punctures and golden setae, anterior margin truncated with thick short golden setae. Clypeus broad, width of anterior margin not exceeding width of interocular distance, anterior margin straight, with punctures twice the size

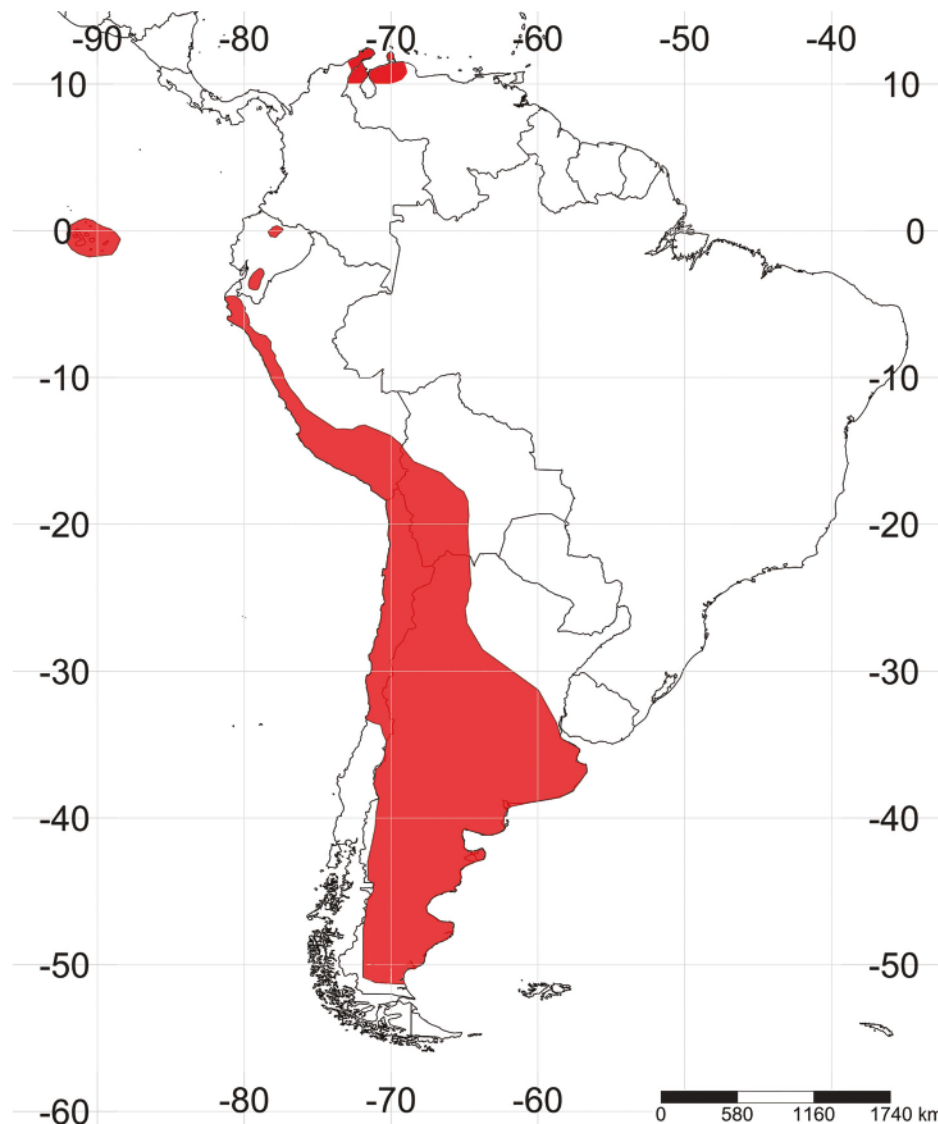


Figure 1. Geographical distribution of Edrotini species in South America. Based on Marcuzzi (1954), Kaszab (1964, 1978, 1981), Finston and Peck (2004) and collection data (IADIZA, MEKRB).

of labral punctures, separated by less than one puncture diameter, confluent, clypeal suture absent (Figs. 8–9). Frons with impressed punctures. Head widest at eyes. Epicanthus prominent in dorsal view. Eyes prominent, densely faceted, projecting outward beyond lateral margins of head, reaching mouthparts in lateral view, not emarginate anteriorly by epicanthus (Figs. 8–9). Antennae filiform, slightly capitate, moderately long, hardly reaching the posterior margin of pronotum. Antennomeres progressively increasing in width, antennomeres I–II spherical and short, antennomere III–VI cylindrical, III longer than remaining, antennomeres VII–X cup-shaped, antennomere XI spindle-shaped; antennomeres IV–XI with sensorial setae, more conspicuous on antennomeres IX–XI. Mentum large, wider than long, hexagonal, anterior margin concave; subgenal process contiguous with submentum and base of mentum, submentum large and rectangular. **Thorax.** Pronotum transverse, 1.45–1.70 times wider than long, rectangular shaped, disc more raised than lateral margins, widest at middle, with round punctures smaller than frons punctures, denser on sides than on disc, surface between punctures flat; anterior angles sloping towards venter, margins slightly carinate, anterior margin almost straight, lateral margins rounded, posterior margin slightly bisinuate. Hypomerion not visible from above, with strong and dense punctures. Prosternum, mesosternum and metasternum glabrous, with punctures more dense than pronotal punctures. Intercostal distances shorter than coxal diameters. Metacoxal cavities closed laterally by metepisternum and metepimeron. Scutellum very small, semi-circular, completely exposed. **Elytra.** Length equal to 2.75–2.77 times pronotal length, oval-elongated, parallel-sided, widest at middle, length 1.39–1.45 times longer than width; disc flat, apical declivity pronounced; humeri not prominent; suture flat, elytra fused along the midline and abdomen; elytral surface with fine and sparse punctures on basal two thirds, separated by one to two puncture diameters, becoming densely granulose on apical declivity, with small protuberances separated by 0.5–1.0 diameters; anterior two-thirds of elytral surface with weakly marked longitudinal striae; area adjacent to the elytral suture with small, shallow, transverse grooves; punctuation, striae and transverse grooves show intraspecific variation. Lateral margin and pseudopleuron absent; epipleuron conspicuous throughout, anteriorly smooth, with numerous transverse small grooves on apical third, anterior fifth 1.5 times as wide as posterior half. **Legs.** Femora and tibiae with punctures separated by a distance equal to one or two puncture diameters, each puncture with a long, gold central seta. Tibiae somewhat laterally compressed, sub-cylindrical, with median section oval, outer and inner margins straight, outer margin smooth, apex with stout setae, dorsal,

ventral and inner faces with fine setae, more dense on ventral face. Pro- and mesotarsomere V twice the length of tarsomeres II–IV separately, subequal to tarsomere I. Metatarsomere IV twice as long as metatarsomeres II and III separately, shorter than metatarsomere I. Apical spurs of protibiae very short, approximately half long as protarsomere I. **Male genitalia.** Rods of sterna IX “U”-shaped. Aedeagus curved 45° dorsally. Basal lamina of tegmen long ($B/E > 1.0$). Lateral styles of tegmen distally adjacent, apex narrow, widest at base, with setae on distal 1/5 of ventral surface. Median lobe moderate ($0.75 < L/T \leq 1.00$), incomplete sheath-shaped, half the width of lateral styles of tegmen, apex rounded (Figs. 14, 15).

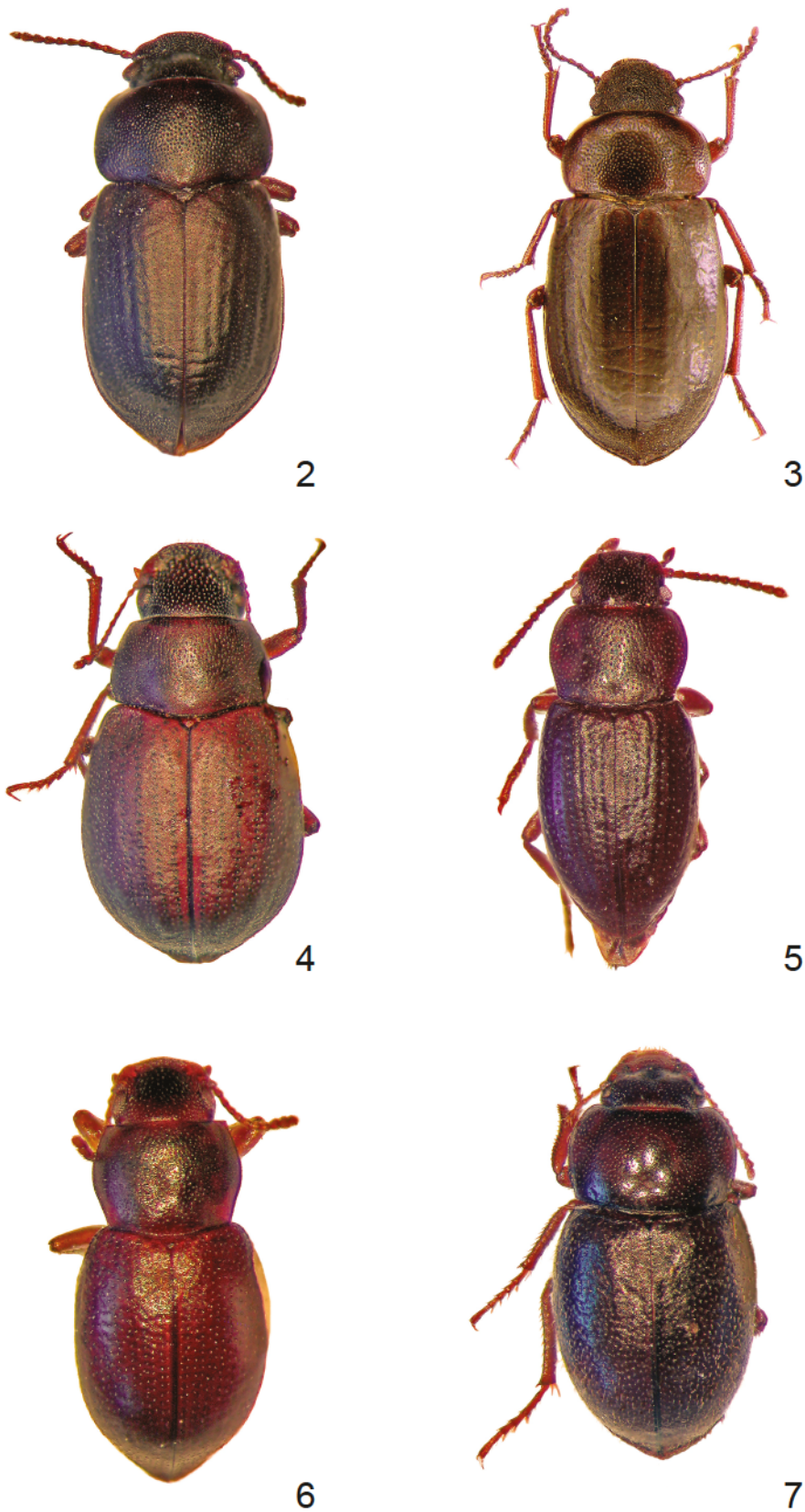
Species included. *Pachacamacius aguilar* Giraldo and Flores, sp. nov. and *P. koepekeae* Flores and Giraldo, sp. nov.

Distribution and habitat. The two known species are recorded from coastal desert and western Andean range of central Peru respectively, associated with consolidated sandy soils. *Pachacamacius* species are apparently morphologically unspecialized and perhaps vagrants that seek refuge under rocks or existing cavities. These species have subelytral cavities scarcely developed and legs moderately elongated, morphological features often seen in tenebrionids less adapted to xeric environments (de los Santos *et al.*, 2000). Their legs have short stout setae on tarsi and small apical spurs on tibiae, not modified for digging (Medvedev, 1965).

***Pachacamacius aguilar* Giraldo and Flores sp. nov.**
(Figs. 2, 8, 14, 15, 24)

Diagnosis. Smaller and shorter species ($L = 5.70$ – 6.60 mm, $L/W = 2.06$). Pronotum dull, punctures on disc separated by one puncture diameter and extent immediately behind anterior angles with punctures separated by two puncture diameters; pronotal punctures twice the size of elytral punctures; posterior angles rounded. Apical elytral declivity well pronounced (Fig. 2).

Description. Length 5.70–6.60 mm, width 2.80–3.20 mm. **Head.** Frons with punctures same size as clypeal punctures, separated by less than one puncture diameter, twice the size of pronotal punctures. Eyes cone shaped, wider than long (Fig. 8). **Thorax.** Pronotum darker in color and strongly punctate, punctures on disc separated by one puncture diameter, extent immediately behind anterior angles with punctures separated by two puncture diameters; lateral margins subparallel, only anterior and posterior angles curved inward; central area of posterior margin extending beyond lateral extents of posterior margin. **Abdomen.** Ventrites with confluent punctures separated by less than one



Figures 2–7. Habitus in dorsal view: 2 – *Pachacamacius aguilari*; 3 – *P. koepekeae*; 4 – *Kocakia opaca*; 5 – *Prohylithus kulzeri*; 6 – *Sechuranus barbatus*; 7 – *Koneus peruanus*.

puncture diameter, outer border of punctures becoming an elevated protuberance. **Legs.** Metatarsal length subequal to metatibial length. **Male genitalia.** Lateral styles of tegmen with proximal margin ventrally bisinuate.

Type material. Holotype, male: [Perú, Lima, Huaura/ Reserva Nacional de Lachay/ 11°21'53"S, 77°22'33"W / 04/06/2018, Coll: A. Giraldo] [*Pachacamacius/ aguilar* sp. n./ HOLOTYPE male/ Det. A. Giraldo and/ G. Flores 2018] (MEKRB). Allotype, female and two paratypes with the same data as holotype (MEKRB). Eight paratypes with the same data as holotype except: 15/06/2000 (4 MEKRB, 2 IADIZA, 2 HNHM). One paratype [Lomas Lachay/30-vii-1964/M. Dourojeanni] (MEKRB).

Etymology. Named "*aguilar*" honoring Peruvian entomologist Pedro G. Aguilar Fernández (1926–2013), for his pioneering research on ecology, morphology and taxonomy of arthropods in the "lomas" ecosystem of the central coast of Peru.

Distribution and habitat. Most specimens were collected by the first author during his bachelor's degree thesis about epigeal assemblages of beetles and a subsequent collecting trip at Reserva Nacional de Lachay. This is a natural protected area that preserves a representative sample of "lomas" ecosystem, vegetation patches founded in hills near to the sea coast and dependent on fogs as water supply (5°00'–18°18'S). This locality is in the Desert biogeographic province (Morrone, 2014). Known only from the type locality, located in central Peru, 105 km north of Lima city; in Peru, Lima region, Huaura province (Fig. 24).

Pachacamacius koepckeae Flores and Giraldo sp. nov.
(Figs. 3, 9, 24)

Diagnosis. Larger species (L = 8.00 mm, L/W = 2.11). Pronotum shiny, punctures on disc separated by two puncture diameters and a smooth, surface impunctate immediately behind anterior angles; pronotal punctures four times the size of elytral punctures; posterior angles obtuse. Apical elytral declivity feebly pronounced (Fig. 3).

Description. Length 8.00 mm, width 3.80 mm. **Head.** Frons with punctures same size as clypeal punctures, separated by less than one puncture diameter, three to four times the size of pronotal punctures. Eyes round, as long as wide, not protruding but projecting outward beyond lateral margins of head (Fig. 9). **Thorax.** The pronotum is lighter in color, punctures on disc separated by two puncture diameters, extent immediately behind anterior angles smooth, impunctate; lateral margins curved, central area of posterior margin almost straight, not extending posteriorly. **Abdomen.** Ventrites with punctures separated by two puncture

diameters, outer border of punctures becoming an elevated crescent-shaped protuberance. **Legs.** Metatarsal length two thirds of metatibial length. **Male genitalia.** Lateral styles of tegmen with proximal margin ventrally straight.

Type material. Holotype, male: [Perú, Lima/San Jerónimo de Surco 2500 m./26/10/2008/ V. M. Diéguez leg.] [*Pachacamacius/ koepckeae* sp. n./ HOLOTYPE male / Det. G. Flores and/ A. Giraldo 2018] (MEKRB). Allotype, female with the same data as holotype (VMDM).

Etymology. Named "*koepckeae*" honoring German zoologist Maria Emilie Ana Koepcke (1924–1971), for her outstanding work as ornithologist, collector, traveler and photographer in Peru, particularly at the province of Huarochiri.

Distribution and habitat. The specimens were collected at a median altitude in western Andean range, in the Desert biogeographic province (Morrone, 2014). Known only from the type locality, located in central Peru, 77 km east of Lima city; in Peru, Lima region, Huarochiri province (11°53'06"S, 76°26'33"W) (Fig. 24).

Genus *Kocakia* Kaszab, 1985
(Figs. 4, 10, 16, 17, 24)

Idiopsis Kaszab, 1981: 78 (nom. praec.).

Kocakia Kaszab, 1985: 54 (nom. nov.).

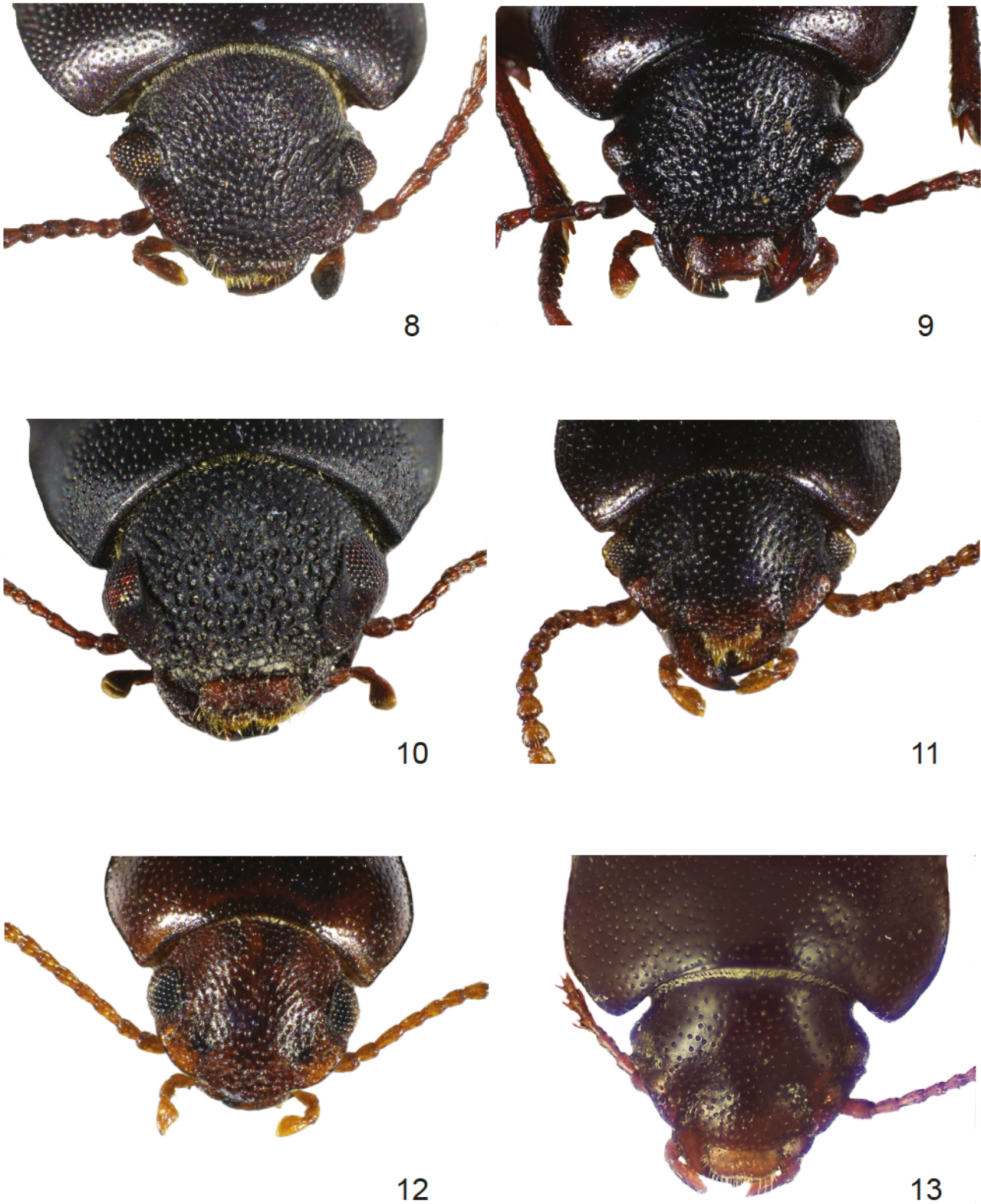
Type species. *Idiopsis opaca* Kaszab, 1981, original designation.

Diagnosis. Eyes round, not protruding, emarginate anteriorly by epicanthus, upper margin with a supraocular groove, with a supraocular carina starting posterior to epicanthus and ending in the middle of upper margin of eye (Fig. 10), postgenal margin inconspicuous, reaching posterior margin of eye. Clypeal anterior margin extended beyond epicanthus, lacking teeth, clypeus deeply depressed at sides by genoclypeal sutures. Last maxillary palpomere hatchet-shaped, mandibles with dorsal cusp on basal half of right mandible (Fig. 10). Pronotum with right anterior angles, lateral margins rounded, widest at posterior third; posterior angles obtuse. Prosternum convex with process; mesosternum with a raised process on anterior margin, projecting forward. Epipleuron with anterior fifth gradually widened towards humeri, not narrowed before apex. Protibiae with distal: proximal width ratio 1.5×.

Kocakia opaca (Kaszab, 1981)
(Figs. 4, 10, 16, 17, 24)

Idiopsis opaca Kaszab, 1981: 78.

Kocakia opaca: Kaszab, 1985: 54 (comb. nov.); Smith *et al.*, 2015: 224 (list).



Figures 8–13. Head, frontal view showing mouthparts: 8 – *Pachacamactus aguilaris*; 9 – *P. koepckeae*; 10 – *Kocakia opaca*; 11 – *Prohylithus kulzeri*; 12 – *Sechuranus barbatus*; 13 – *Koneus peruanus*.

Redescription. Length 5.40–7.25 mm, width 2.75–3.65 mm, $L/W = 1.99$. Flightless. Body outline oval-elongated. Body with dorsal and ventral punctures each bearing a short, decumbent seta, visible at higher magnification (50X). Color mid-gray to dark brown, with antennae, mouthparts and legs light brown (Fig. 4). **Head.** Labrum light brown, exposed, with small punctures and golden setae, anterior margin straight with long golden setae. Clypeus broad, width of anterior margin not exceeding width of interocular distance, anterior margin straight, with punctures twice the size of labral punctures, separated by less than one puncture diameter, clypeal suture obsolete, genoclypeal sutures forming two deep foveae (Fig. 10). Frons with punctures same size as clypeal punctures and twice the size of vertex punctures. Head widest at eyes. Epicanthus prominent in dorsal view. Eyes of medium size, not prominent, densely faceted, not projecting outward beyond lateral margins of head, not reaching mouthparts in lateral view, emarginate anteriorly by epicanthus (Fig. 10). Antennae filiform, slightly capitate, moderate in length, reaching $3/4$ of lateral margin of pronotum. Antennomeres I–VIII cylindrical, III slightly longer than remaining, antennomeres IX–X cup-shaped, antennomere XI spindle-shaped; antennomeres IV–XI with sensorial setae, more noticeable on antennomeres IX–XI. Mentum large, wider than long, hexagonal, anterior margin arcuate; subgenal process contiguous with submentum and base of mentum, submentum large and rectangular. **Thorax.** Pronotum rectangular, 1.68 times wider than long, disc more raised than lateral margins, widest at posterior third, with round punctures same size as frons punctures, uniformly distributed, separated by one to three puncture diameters, surface between punctures flat; right anterior angles, anterior margin concave, carinate only on lateral quarters, lateral margins rounded and central area of posterior margin extending beyond posterior margin. Hypomeron not visible from above, with strong, sparse punctures. Prosternum, mesosternum and metasternum glabrous, punctures denser than pronotal punctures. Intercoxal distances shorter than coxal diameters. Metacoxal cavities closed laterally by metepisternum and metepimeron. Scutellum small, triangular, completely exposed. **Elytra.** Length equal to 3.4 times pronotal length, oval-elongated, widest at middle, length 1.36 times longer than width; disc flat, apical declivity moderate; humeri not prominent; suture flat, elytra fused along the midline and abdomen; elytral surface with fine punctures same size as pronotal punctures, separated by one to two puncture diameters. Lateral margin and pseudopleuron absent; epipleuron conspicuous throughout, anterior fifth 1.5 times as wide as posterior half. **Abdomen.** Ventrites with punctures separated by one or two puncture diameters. **Legs.** Femora and tibiae with punctures

separated by a distance equal to one or two puncture diameters, each puncture with a long, golden, central seta. Tibiae laterally compressed, sub-cylindrical, with outer and inner margins straight, smooth, median section oval, apex with stout setae, dorsal, ventral and inner surfaces with fine setae, more dense on ventral surface. Pro- and mesotarsomere V twice the length of tarsomeres I–IV separately. Metatarsomere IV twice the length of metatarsomeres II and III separately, subequal to metatarsomere I. Spurs of protibiae as long as protarsomere I. **Male genitalia.** Rods of sterna IX “V”-shaped. Aedeagus curved 45° dorsally. Basal lamina of tegmen short ($B/E = 1.0$). Lateral styles of tegmen distally adjacent, apex narrow, proximal margin ventrally convex, widest at base, with setae on distal fifth of ventral surface. Median lobe moderate ($0.75 < L/T \leq 1.00$), forming an incomplete sheath, half the width of lateral styles of tegmen, apex rounded (Figs. 16, 17).

Type material. Three paratypes: [Sechura/ 960 km N Lima/ Peru 18-XI-1970/ Coll: L.E. Peña] [Paratypus 1982/ *Idiopsis/ opaca*/ Kaszab] (HNHM).

Other material examined. PERU: Lambayeque, Chiclayo, near Puerto Eten, Mineroducto El Galeno, $07^\circ 00' 33.85''S$ $79^\circ 46' 52.22''W$, 24m., 31-III-2010, M. Alvarado, 6 (MUSM). Piura, Sechura, Pampa de Yapato, $05^\circ 51' 30''S$ $80^\circ 53' 37''W$, V-2008, A. Giraldo, 4 (MEKRB), Pampa Los Médanos, $05^\circ 36' 35''S$ $80^\circ 49' 54''W$, T. caída, V-2008, A. Giraldo (2 IADIZA, 4 MEKRB), Pampa Monte Jacinto, $05^\circ 41' 26''S$ $80^\circ 46' 06''W$, pitfall traps, V-2008, A. Giraldo (2 MEKRB); SE Piura, 18-XI-1970, L.E. Peña (1 IADIZA).

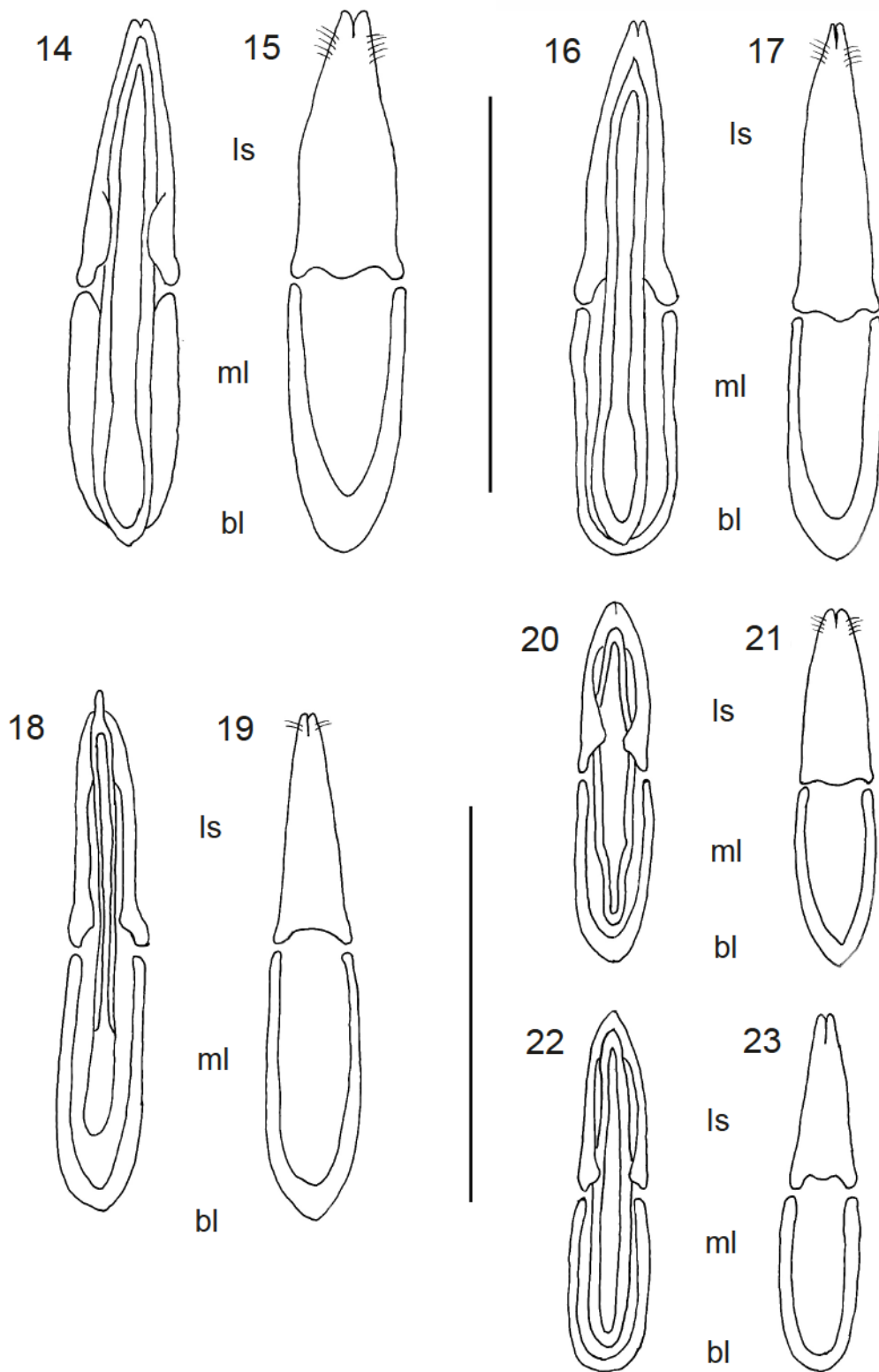
Distribution and habitat. The specimens were collected in several localities of Piura and Lambayeque departments (5° – $7^\circ S$) on different vegetation types, including dry saltmarshes, dunes, scrubs and open savanna in sandy soils (Fig. 24). These localities are in the Desert biogeographic province (Morrone, 2014).

Genus *Prohyolithus* Kaszab, 1964 (Figs. 5, 11, 18, 19, 25)

Prohyolithus Kaszab, 1964: 383.

Type species. *Prohyolithus kulzeri* Kaszab, 1964, original designation.

Diagnosis. Eyes conical, protruding outward, not emarginate anteriorly by epicanthus, upper margin with a supraocular groove, lacking supraocular carina (Fig. 11), postgenal margin well developed, covering posterior margin of eye. Clypeal anterior margin with central area extended beyond epicanthus, armed with a row of teeth directed downwards, clypeus slightly depressed at sides by genoclypeal sutures (Fig. 11). Last maxillary palpomere hatchet-shaped, dorsal cusp on basal half of both mandibles longer on the right than



Figures 14–23. Male genitalia, dorsal and ventral views: (14, 15) *Pachacamacijs aguilaris*; (16, 17) *Kocakia opaca*; (18, 19) *Prohylithus kulzeri*; (20, 21) *Sechuramus barbatus*; (22, 23) *Koneus peruanus*. Abbreviations: bl, basal lamina of tegmen, ls, lateral styles of tegmen, ml, median lobe. Scale bars: 1 mm.

on the left (Fig. 11). Pronotum with anterior angles obtuse, widest at anterior third, with lateral margins concave in anterior half and oblique in posterior half, posterior angles obtuse. Prosternum convex without process; mesosternum flat between mesocoxae. Epipleuron with anterior fifth gradually widened towards humeri, not narrowed before apex. **Abdomen.** Ventrites with punctures separated by one puncture diameter. Protibiae with distal: proximal width ratio 1.5–2.0×.

Prohylithus kulzeri Kaszab 1964
(Figs. 5, 11, 18, 19, 25)

Prohylithus kulzeri Kaszab, 1964: 383; Smith *et al.*, 2015: 224 (list).

Redescription. Length 3.60–4.50 mm, width 1.45–1.80 mm, L/W = 2.42. Flightless. Body outline oval-elongate. Glabrous. Color dark brown and dark red, shiny; head, pronotum and venter dark brown; antennae, maxillary and labial palpomeres and legs orange (Fig. 5). **Head.** Labrum light yellow, visible, with round punctures and golden setae, anterior margin truncated

with thick, short golden setae. Clypeus and frons densely punctate, with punctures same size on both, separated by less than one puncture diameter, larger than labral punctures. Clypeal suture absent (Fig. 11). Head widest at eyes. Epicanthus moderately prominent in dorsal view. Eyes prominent, tapered, densely faceted, projecting outward beyond lateral margins of head, not emarginate anteriorly by epicanthus (Fig. 11), not reaching mouthparts in lateral view. Antennae filiform, slightly capitate, hardly reaching the posterior margin of pronotum. Antennomeres progressively increasing in width, antennomeres I–VII cylindrical, antennomere III longer than remaining, antennomeres VIII–X cup-shaped, antennomere XI spindle-shaped; antennomeres IV–XI with sensorial setae, more noticeable on antennomeres IX–XI. Mentum large, wider than long, trapezoidal, with strong punctation, anterior margin concave, notched; subgenal process contiguous with submentum and base of mentum; submentum small and rectangular (Fig. 11). **Thorax.** Pronotum subquadrate, 1.43 times wider than long, disc more raised than lateral margins, widest before midpoint, with oval punctures. Anterior margin almost straight, right anterior angles, lateral margins carinate, rounded in anterior half, posterior angles obtuse, posterior margin concave. Pronotal surface with oval punctures, similar in size as frons punctures, denser on sides than on disc; punctures strong, separated by one puncture diameter; surface between punctures flat. Prosternum, mesosternum and metasternum glabrous. Hypomeron not visible from above, smooth. Prosternum, mesosternum and metasternum with punctures more dense than pronotal punctures. Intercostal distances shorter than coxal diameters. Metacoxal cavities closed laterally by metepisternum and metepimeron. Scutellum very small, semi-circular, completely exposed. **Elytra.** Length equal to 2.7 times the pronotal length, oval-elongate, parallel-sided, widest at middle length, 1.6 times longer than width; disc moderately flat, apical declivity weak. Elytral punctation strong, arranged in parallel rows and each separated by 1–2 puncture diameters; punctures on striae larger than on interstriae; humeri no prominent; suture flat, elytra fused along the midline and abdomen; pseudopleuron absent; epipleuron conspicuous throughout and smooth, anterior fifth 1.5 times as wide as posterior half. **Abdomen.** Ventrites with punctures separated by one puncture diameter. **Legs.** Femora and tibiae with short, golden setae. Tibiae somewhat laterally compressed, subcylindrical, with outer and inner margins straight, median section oval. Pro- and mesotarsomere V twice as long as tarsomeres I–IV separately. Metatarsomere IV twice as long metatarsomeres II and III separately, subequal to metatarsomere I. Spurs of protibiae very short, approximately half length of protarsomere I. Metafemoral-tibial articulation not reaching elytral

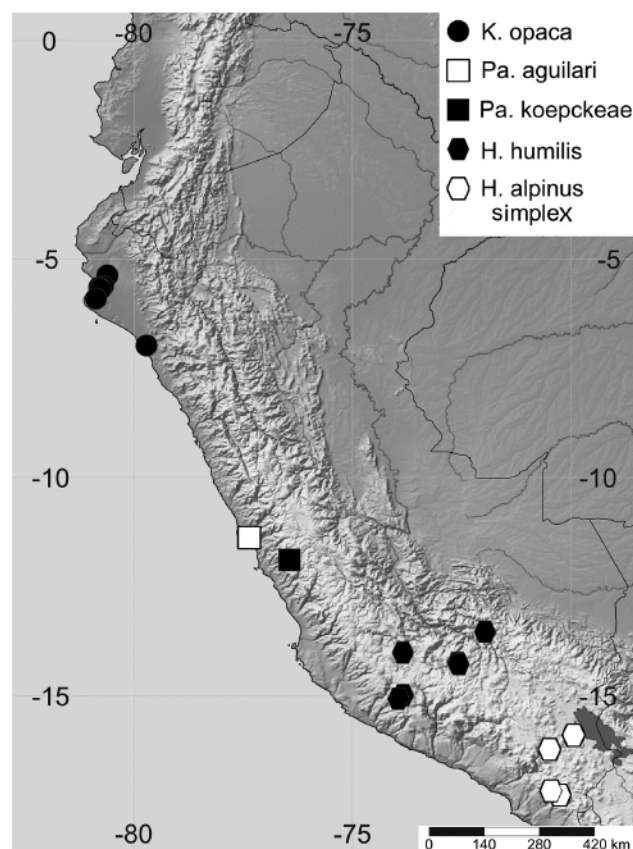


Figure 24. Geographical distribution of five species of Edrotini in Peru. Abbreviations: K = *Kocakia*, Pa = *Pachacamaius*, H = *Hylithus*.

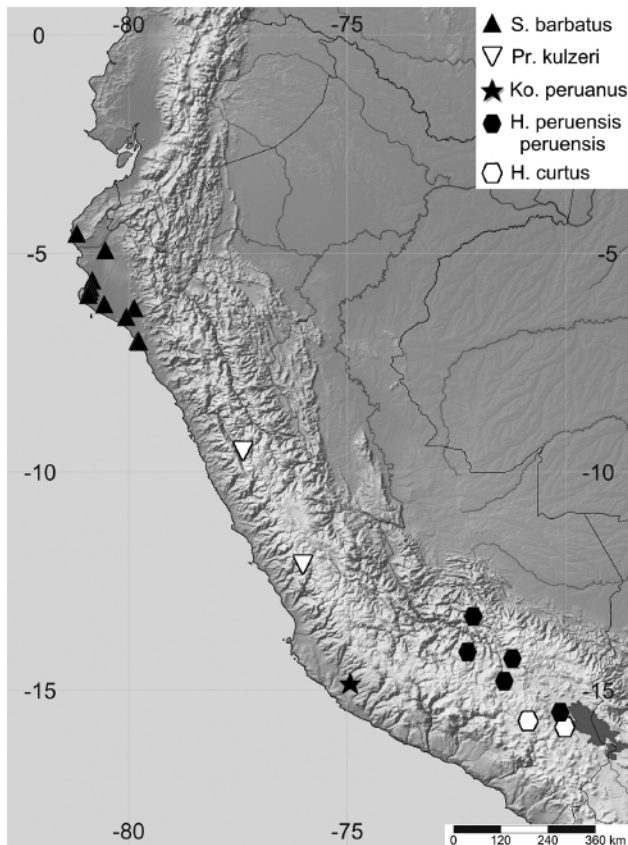


Figure 25. Geographical distribution of five species of Edrotini in Peru. Abbreviations: S = *Sechuranus*, Pr = *Prohyllithus*, Ko = *Koneus*, H = *Hyllithus*.

apex. Pro-, meso- and metatibiae with outer margin smooth, apex with stout setae, dorsal, ventral and inner margins with fine setae, denser on ventral margin. Metatarsal length subequal to metatibial length. **Male genitalia.** Rods of sterna IX "V"-shaped. Aedeagus simple, not curved dorsally. Basal lamina of tegmen long ($B/E > 1.0$). Lateral styles of tegmen distally adjacent, apex narrow, proximal margin ventrally concave, widest at base, with two finer preapical setae on each side of ventral surface. Median lobe moderate ($0.75 < L/T \leq 1.00$), incomplete sheath-shaped, one third width of lateral styles of tegmen, apex rounded, distally narrowed (Figs. 18, 19).

Type material. Two paratypes: [Peru. Huaraz/ 20-V-1954 (other: VI-1954) / leg. H. Löffler] [Paratypus 1964/ *Prohyllithus/ kulzeri/* Kaszab] (HNHM).

Other material examined. PERU. Lima: Yauyos, Laguna Paucarcocha 4237 m., $12^{\circ}05'28''S$ $76^{\circ}00'22''W$, 15-IV-2008, G. Gonzalez (24 MEKRB, 7 IADIZA).

Distribution and habitat. Specimens were collected in two localities in high Andean grasslands "pajonales" surrounding lakes in central Peru (Fig. 25), in the Puna biogeographic province (Morrone, 2014).

Genus *Sechuranus* Flores and Giraldo, gen. nov.
(Figs. 6, 12, 20, 21, 25)

Type species. *Prohyllithus barbatus* Kaszab, 1964, present designation.

Etymology. The name means "of Sechura" in allusion to the place where the known species inhabits: the Sechura desert. Gender masculine.

Diagnosis. Recognized among other South American Edrotini by the following combination of characters: eyes round, not protruding, not emarginate anteriorly by epicanthus, upper margin of eye with a supraocular carina starting posterior to epicanthus and ending in the middle of upper margin of eye, lacking supraocular groove (Fig. 12), postgenal margin inconspicuous, reaching posterior margin of eye. Clypeal anterior margin with central area extended beyond epicanthus, lacking teeth, clypeus slightly depressed at sides by genoclypeal sutures (Fig. 12). Last maxillary palpomere hatchet-shaped, dorsal cusp on basal half of both mandibles longer on the right than on the left. Pronotum with right anterior angles, widest at anterior third, with lateral margins concave; posterior angles obtuse. Prosternum convex without process; mesosternum flat between mesocoxae. Epipleuron with anterior fifth gradually widened towards humeri, abruptly narrowed before apex. Protibiae with distal: proximal width ratio $1.5\text{--}2.0\times$.

Sechuranus barbatus (Kaszab, 1964) comb. nov.
(Figs. 6, 12, 20, 21, 25)

Prohyllithus barbatus Kaszab, 1964: 383; Smith *et al.*, 2015: 224 (list).

Redescription. Length 3.90–4.60 mm, width 1.75–2.10 mm, $L/W = 2.23$. Flightless. Body outline oval-elongate. Body with dorsal and ventral punctures each bearing a short, decumbent seta, visible at higher magnification (50X). Color shiny red-brown with head, pronotum and venter darker; antennae, maxillary and labial palpomeres and legs yellowish (Fig. 6). **Head.** Labrum hidden under clypeus. Clypeus and frons densely punctate, with oval punctures same size on both, separated by less than one puncture diameter. Clypeal suture absent (Fig. 12). Head widest at eyes. Epicanthus not prominent in dorsal view. Eyes not prominent, densely faceted, not projecting outward beyond lateral margins of head (Fig. 12), not reaching mouthparts in lateral view, not emarginate anteriorly by epicanthus. Antennae filiform, slightly capitate, moderately long, hardly reaching the posterior margin of pronotum. Antennomeres progressively increasing in width, antennomeres I–VIII cylindrical, antennomere III longer than remaining, antennomeres IX–X cup-shaped, antennomere XI spindle-shaped; antennomeres

IV–XI with sensorial setae, more noticeable on antennomeres IX–XI. Mentum large, wider than long, trapezoidal and strongly punctuated, anterior margin concave; subgenal process contiguous with submentum and base of mentum, submentum large and rectangular. **Thorax.** Pronotum subquadrate, 1.44 times wider than long, disc more raised than lateral margins, widest at midpoint, anterior margin curved, anterior angles acute, pointed, lateral margins carinate, posterior angles right. Pronotal surface with oval punctures slightly smaller than frons punctures, denser on disc than on sides, separated by 0.5–1.0 puncture diameter; surface between punctures flat. Prosternum, mesosternum and metasternum glabrous. Hypomerion not visible from above, smooth. Prosternum, mesosternum and metasternum with punctures less dense than pronotal punctures. Intercostal distances shorter than coxal diameters. Metacoxal cavities closed laterally by metepisternum and metepimeron. Scutellum very small, semi-circular, completely exposed. **Elytra.** Length equal to 3.05 times the pronotal length, oval-elongate, parallel-sided, widest at middle, 1.54 times longer than width; disc moderately flat, apical declivity weak; elytral punctures equal size as on pronotum, arranged in parallel rows and separated by 1–2 puncture diameters; punctures on striae larger than on interstriae; humeri not prominent; suture flat, elytra fused along the midline and abdomen; pseudopleuron absent; epipleuron smooth and conspicuous throughout, anterior fifth 1.5 times as wide as posterior half. **Abdomen.** Ventrites with punctures separated by more than one puncture diameter. **Legs.** Femora and tibiae with sparse, short, golden setae. Tibiae somewhat laterally compressed, sub-cylindrical, with outer and inner margins straight, apically curved outwards, median section oval, with outer margin smooth, apex with stout setae, dorsal, ventral and inner surfaces with fine, sparse setae, denser on ventral surface. Pro- and mesotarsomere V twice the length of tarsomeres I–IV separately. Metatarsomere IV twice the length of metatarsomeres II and III separately, subequal to metatarsomere I. Spurs of protibiae short, approximately equal in length to protarsomere I. Metatarsal length subequal to metatibial length. **Male genitalia.** Rods of sterna IX “V”-shaped. Aedeagus simple, not curved dorsally. Basal lamina of tegmen long ($B/E > 1.0$). Lateral styles of tegmen distally adjacent, apex narrow, proximal margin ventrally bisinuate, widest at base, with setae on distal fifth of ventral surface. Median lobe moderate ($0.75 < L/T \leq 1.00$), incomplete sheath-shaped, half the width of lateral styles of tegmen, apex rounded (Figs. 20, 21).

Sexual dimorphism. Male with a tuft of setae on ventral surface of mentum; female with sparse normal setae on mentum.

Type material. Allotype: [20 Mi. S. of Olmos, Perú/

III-19-1951] [Ross and Michelbacher/ collectors] [Allotype female 1964/ *Prohyllithus/ barbatus/ Kaszab*] (HNHM).

Other material examined. PERU: Lambayeque, Chiclayo, near Puerto Eten, Mineroducto El Galeno, 06°59'26.46"S 79°47'16.97"W, 15m., 08-IX-2009, S. Carbonel, 3 (MUSM), 07°00'31.88"S 79°45'51.53"W, 18m., 10-IX-2009, S. Carbonel, 3 (MUSM). Lambayeque, Lambayeque, Olmos, 06°26'40"S 80°03'11"W, V-2008, A. Giraldo, 3 (MEKRB). Piura, Sechura, Bayóvar, 05°56'16"S 80°55'09"W, 07-VII-2006, M. Deza, 4 (MEKRB), Dunas Las Partidas, 06°9'19"S 80°33'28"W, V-2008, A. Giraldo, 1 (MEKRB), Pampa Los Médanos, 05°36'35"S 80°49'54"W, V-2008, A. Giraldo, (6 MEKRB, 2 IADIZA), Pampa de Yapato, 05°51'30"S 80°53'37"W, V-2008, A. Giraldo, 1 (MEKRB), Virrilá, 05°46'25"S 80°52'19"W, 07-VII-2006, M. Deza, 3 (MEKRB). Piura, Piura, Tambo Grande, Progreso Bajo, 04°55'05"S 80°31'59"W, 12-II-2014, C. Carrera, 1 (MEKRB). Piura, Talara, Quebrada Pariñas, 04°32'25"S 81°11'15"W, VI-2005, G. Gonzalez, 1 (MEKRB).

Distribution and habitat. The specimens were collected in several localities of Piura and Lambayeque departments (4–7°S) on different vegetation types, including dry saltmarshes, dunes, scrublands and open savanna in sandy soils (Fig. 25). These localities are in the Desert biogeographic province (Morrone, 2014).

Genus *Koneus* Giraldo and Flores, gen. nov.
(Figs. 7, 13, 22, 23, 25)

Type species. *Prohyllithus peruanus* Kaszab, 1981, present designation.

Etymology. The name is an allusion to the god Kon, the creator of the first generation of men according to the myths of the pre-Columbian inhabitants of Paracas and Nasca. Gender masculine.

Diagnosis. *Koneus* gen. nov. can be distinguished from other South American Edrotini by the following combination of characters: eyes round, not protruding, emarginate anteriorly by epicanthus, upper margin with a supraocular groove, lacking supraocular carina (Fig. 13), postgenal margin well developed, covering posterior margin of eye. Clypeal anterior margin extended beyond epicanthus, lacking teeth, clypeus slightly depressed at sides by genoclypeal sutures (Fig. 13). Last maxillary palpomere spindle-shaped, mandibles lacking cusps (Fig. 13). Pronotum with anterior angles rounded, obtuse, lateral margins rounded, widest before midpoint; posterior angles obtuse. Prosternum convex without process; mesosternum flat between mesocoxae. Epipleuron with anterior fifth gradually widened towards humeri, abruptly narrowed before apex. Protibiae apically expanded, distal: proximal width ratio 2.5×.

Koneus peruanus (Kaszab, 1981) comb. nov.
(Figs. 7, 13, 22, 23, 25)

Prohylithus peruanus Kaszab, 1981: 77; Smith *et al.*, 2015: 224 (list).

Redescription. Length 3.50 mm, width 1.75 mm, L/W = 2.00. Flightless. Body outline oval-elongated. With short setae. Color dark brown with antennae, mouthparts and legs light brown (Fig. 7). **Head.** Labrum light brown, visible, with small punctures and golden setae, anterior margin straight with long golden setae. Clypeus broad, width of anterior margin not exceeding width of interocular distance, anterior margin concave, with punctures twice the size of labral punctures, separated by less than two puncture diameters, clypeal suture not marked, genoclypeal sutures forming two superficial foveae (Fig. 13). Frons with punctures same size as clypeal punctures. Head widest at postgenal margin. Epicanthus prominent in dorsal view. Eyes small, not prominent, densely faceted, not projecting outward beyond lateral margins of head, not reaching mouthparts in lateral view, emarginate anteriorly by epicanthus (Fig. 13). Antennae filiform, slightly capitate, moderately long, reaching 3/4 of lateral margin of pronotum. Antennomeres I–VIII cylindrical, III slightly longer than remaining (I–X), antennomeres IX–X cup-shaped, antennomere XI spindle-shaped and longest; antennomeres IV–XI with sensorial setae, more noticeable on antennomeres IX–XI. Mentum large, wider than long, hexagonal, anterior margin concave, notched; subgenal process contiguous with submentum and base of mentum, submentum large and rectangular. **Thorax.** Pronotum rectangular, 1.52 times wider than long, disc more raised than lateral margins, widest before midpoint, with round punctures same size as frons punctures, uniformly distributed, separated by three to four puncture diameters, surface between punctures flat; anterior angles rounded, anterior margin concave, carinate, lateral and posterior margins rounded. Hypomeron not visible from above, with shallow and sparse punctures. Prosternum, mesosternum and metasternum with setae, punctures less dense than pronotal punctures. Intercoxal distances shorter than coxal diameters. Metacoxal cavities closed laterally by metepisternum and metepimeron. Scutellum small, semi-circular, completely exposed. **Elytra.** Length equal to 2.21 times the pronotal length, oval-elongated, widest at middle, length 1.2 times longer than width; disc flat, apical declivity not pronounced; humeri not prominent; suture flat, elytra fused along the midline and abdomen; elytral surface with fine punctures larger than pronotal punctures, separated by two puncture diameters. Lateral margin and pseudopleuron absent; epipleuron conspicuous throughout, anterior fifth 1.5 times as wide as posterior half. **Abdomen.** Ventrites with punctures separated

by four puncture diameters. **Legs.** Femora and tibiae with punctures separated by a distance equal to two or three puncture diameters, each puncture with a long, golden central seta. Tibiae laterally compressed, sub-cylindrical. Protibiae with inner margin straight, smooth, outer margin curved, apically expanded, with a row of spines. Meso- and metatibiae with outer and inner margins straight, smooth, median section oval, apex with stout setae, dorsal, ventral and inner surfaces with fine setae, more dense on ventral surface. Pro- and mesotarsomere V twice the length of protarsomeres I–IV separately. Metatarsomere IV twice the length of metatarsomeres II and III separately, subequal to metatarsomere I. Spurs of protibiae as long as protarsomere I. **Male genitalia.** Rods of sterna IX “V”-shaped. Aedeagus simple, not curved dorsally. Basal lamina of tegmen long (B/E > 1.0). Lateral styles of tegmen distally adjacent, apex narrow, proximal margin ventrally bisinuate, widest at base, lacking setae. Median lobe moderate ($0.75 < L/T \leq 1.00$), incomplete sheath-shaped, half the width of lateral styles of tegmen, apex rounded (Figs. 22, 23).

Type material. Five paratypes: [Loma de/ Nazca, Peru/ 9-Nov-70/ Coll: L.E. Peña] [Paratypus 1982/ *Prohylithus/ peruanus/* Kaszab] (HNHM).

Other material examined. One specimen with the same data as paratypes (IADIZA).

Distribution and habitat. Known only from the type locality. Label data indicates “loma”, referring to vegetation on hills that receive fogs during the winter months of Peruvian coastal desert (Fig. 25). This locality is in the Desert biogeographic province (Morrone, 2014).

DISCUSSION

Pachacamacius gen. nov. belongs to the subfamily Pimeliinae, and possess concealed intersegmental membranes between abdominal ventrites III–IV and IV–V, absent defensive glands, and aedeagus rotated 180° about the longitudinal axis (Watt, 1974, Doyen, 1994, Matthews *et al.*, 2010).

Pachacamacius gen. nov. is distinguished by the combination of characters listed in the diagnosis, which is unique within Edrotini. *Pachacamacius* gen. nov. has a similar overall appearance to *Kocakia* and *Stomion* given the hemispheric body and shares numerous features (e.g. the medium size, antennae reaching or surpassing the mid-point of pronotum, third antennomere long and cylindrical, and elytra oval-elongate with epipleuron conspicuous throughout). *Pachacamacius* gen. nov. differs from *Kocakia* and *Stomion* by eyes projecting outwards beyond lateral margins of head, postgenal margin well developed, and pronotum with anterior angles rounded. *Pachacamacius* gen. nov. and *Kocakia* share the

following characters: prosternum with process, mesosternum elevated on anterior margin between mesocoxae, and aedeagus curved 45° dorsally, features unique to these two genera among those studied.

Two species originally described in the genus *Prohylithus* (*P. barbatus* Kaszab, 1964 and *P. peruanus* Kaszab, 1981) are here reassigned to two new monotypic genera: *Sechuranus* gen. nov. and *Koneus* gen. nov. Both species differ from the type species (*P. kulzeri*) mainly on eyes round and not protruding, anterior margin of clypeus lacking teeth, and epipleuron abruptly narrowed before apex. In contrast, *Prohylithus kulzeri* has conical eyes, protruding outward, anterior margin of clypeus with a row of teeth directed downwards, and epipleuron not narrowed before apex. Similarly, *Sechuranus* gen. nov. differs from *Koneus* gen. nov. by eyes not emarginate anteriorly by epicanthus, upper margin of eye with a supraocular carina, lacking supraocular groove, last maxillary palpomeres hatchet-shaped and mandibles with dorsal cusps. However, in *Koneus* gen. nov. the eyes are emarginate anteriorly by epicanthus, upper margin of eye with supraocular groove, supraocular carina absent, last maxillary palpomeres spindle-shaped, and mandibles lacking cusps. All these character states were used to define genera of Edrotini (Kaszab, 1964, 1978, 1981; Finston and Peck, 2004; Smith and Wirth, 2016; this study). Among the studied genera here, *Koneus* gen. nov. is the only with eyes emarginate anteriorly by epicanthus, but this character state is also present in *Arthroconus* and *Falsoarthroconus*.

Among the current ten South American genera of Edrotini after this study, the male genitalia was only described and figured for two genera: *Hylithus* and *Prohylithus* (Kaszab, 1964). In this contribution, we describe and illustrate the male genitalia of five genera (four for the first time) finding characters to differentiate them. None of the Peruvian genera (*Kocakia*, *Pachacamaci*, *Prohylithus*, *Sechuranus*, *Koneus*) present penis with expansions and clavae as described and figured for all species of *Hylithus* (Kaszab, 1964: Figs. 11–34). In addition to the characters of external morphology stated above shared between *Kocakia* and *Pachacamaci* they share aedeagus curved 45° dorsally, a trait unique among these studied genera.

Due to the fact that the number of the South American genera of Edrotini has changed since Kaszab (1978), the following key is provided:

Key to the genera and species of Peruvian Edrotini

1. Prosternum convex without process; mesosternum flat between mesocoxae 2
- . Prosternum convex with process; mesosternum elevated on anterior margin between mesocoxae ... 9

2. Size less than 3.2 mm in length. Eyes emarginate anteriorly by epicanthus; last maxillary palpomere spindle-shaped; mandibles lacking cusps; protibiae with distal: proximal width ratio 2.5×. Distribution: southern coast of Peru (Figs. 7, 13, 22, 23, 25) *Koneus peruanus* (Kaszab, 1981)
- . Size more than 3.8 mm in length. Eyes not emarginate anteriorly by epicanthus; last maxillary palpomere hatchet-shaped; both mandibles with a dorsal cusp on basal half or only present on the right mandible. Protibiae with distal: proximal width ratio 1.5–2.0× 3
3. Eyes round, not protruding, upper margin with a supraocular carina starting posterior to epicanthus and ending at middle of upper margin of eye, lacking supraocular groove, postgenal margin inconspicuous, reaching the posterior margin of eye. Distribution: northern coast of Peru (Figs. 6, 12, 20, 21, 25) *Sechuranus barbatus* (Kaszab, 1964)
- . Eyes protruding outward, upper margin lacking supraocular carina, with a supraocular groove, postgenal margin well developed, covering posterior margin of eye 4
4. Medium size (5–8 mm). Clypeus triangular, extending beyond epistomal margin. Pronotum widest at middle, with lateral margins concave. Distribution: Argentina, Bolivia, Peru and Chile (Aballay *et al.*: Fig. 16) *Hylithus* Guérin-Méneville, 1834 5
- . Small size (4 mm). Clypeus with medial tooth, only tooth extending past epistomal margin. Pronotum widest at anterior half, with lateral margins concave in anterior half and oblique in posterior half. Distribution: high Andean plateaus of Peru (Figs. 5, 11, 18, 19, 25) *Prohylithus kulzeri* Kaszab, 1964
5. Elytra with base carinate. Distribution: Peru (Arequipa, Puno), Bolivia (Potosi) *Hylithus curtus* Kaszab, 1964
- . Elytra with base not carinate 6
6. Genoclypeal suture short and shallow, only well demarcated in a central area of head; anterior margin of clypeus almost straight except at middle, a short triangular middle area less than half of anterior margin produced beyond epistomal margin. Distribution: Peru (Aurimac, Ayacucho, Cusco) *Hylithus humilis* Erichson, 1847
- . Genoclypeal suture long and deep, extending from anterior margin to middle of head; anterior margin of clypeus bisinuate, a wide triangular area at middle, longer than half of anterior margin produced beyond epistomal margin 7
7. Eyes round, as long as wide; disc of pronotum with punctures separated by three puncture diameters; elytra with punctures of interstitial rows of equal size as punctures in main rows. Distribution: Peru (Moquegua, Puno, Tacna), Bolivia (Potosi) *Hylithus alpinus simplex* Kaszab, 1964

- . Eyes cone shaped, wider than long; disc of pronotum with punctures separated by less than two puncture diameters; elytra with punctures of interstitial rows smaller than punctures in main rows 8
- 8. Prosternum and hypomeron with punctures contiguous, separated by less than one puncture diameter. Distribution: Peru (Madre de Dios, dubious data) . . .
 . . . *Hylithus peruensis complicans* Kaszab, 1964
- . Prosternum and hypomeron with punctures separated by one to two puncture diameters. Distribution: Peru (Apurimac, Cusco, Puno)
 *Hylithus peruensis peruensis* Kaszab, 1964
- 9. Eyes round, not protruding; postgenal margin inconspicuous, reaching posterior margin of eye; pronotum with right anterior angles. Distribution: northern coast of Peru (Figs. 4, 10, 16, 17, 24)
 *Kocakia opaca* (Kaszab 1981)
- . Eyes projecting outward beyond lateral margins of head; postgenal margin well developed, covering posterior margin of eye; pronotum with rounded anterior angles (Figs. 2, 3, 8, 9, 14, 15, 24) *Pachacamacius* Flores and Giraldo **gen. nov.** 10
- 10. Eyes cone shaped, wider than long; clypeus and frons with punctures twice the size of pronotal punctures; pronotum with lateral margins subparallel, only anterior and posterior angles curved inward, posterior angles rounded, posterior margin at middle produced posteriorly (Fig. 2); metatarsal length subequal to metatibial length. Distribution: coastal desert of central Peru
 *P. aguilar* Giraldo and Flores **sp. nov.**
- . Eyes round, as long as wide; clypeus and frons with punctures three to four times the size of pronotal punctures; pronotum with lateral margins curved, posterior angles obtuse, posterior margin almost right, not produced posteriorly (Fig. 3); metatarsal length two thirds of metatibial length. Distribution: western Andean range of central Peru
 *P. koepckeae* Flores and Giraldo **sp. nov.**

Prior to this study, the tribe Edrotini included three genera and nine species/subspecies in Peru of which six were endemic to the country (Smith *et al.*, 2015). With the new taxa described and the nomenclatural changes made here, the Edrotini endemic to Peru consist of five genera and nine species/subspecies. Two of five species/subspecies of *Hylithus* in Peru also inhabit Bolivia (Kaszab, 1964). These genera are distributed in the coastal deserts of western Peru and the Andes (Smith *et al.*, 2015), with the following pattern in specific habitats: *Kocakia* and *Sechuranus* in the northern coastal desert, *Pachacamacius* in the coastal desert and western Andean range of central Peru, *Koneus* in the southern coastal desert, and *Prohylithus* and *Hylithus* in high Andean plateaus. The

Andean uplift was a vicariant event at generic and specific levels that affected most of the genera and subgenera of Pimeliinae (Flores and Pizarro-Araya, 2006). The Edrotini genera studied here present two of the four distribution patterns in relation to the Andes mountain range (Flores and Pizarro-Araya, 2006): a) taxa endemic west of the Andes (*Kocakia*, *Koneus*, *Pachacamacius*, and *Sechuranus*) and b) taxa inhabiting high altitudes in the Andes (*Prohylithus* and *Hylithus*). Possible factors that promoted the Peruvian diversity of Edrotini could be the altitudinal gradient in western Andes and the isolation of vegetation patches in the coastal desert.

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