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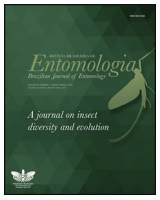

Three new genera of Protandrenini bees from South America (Hymenoptera, Apidae, Andreninae)

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ABSTRACT

Three new genera of Protandrenini bees from South America are described. *Luisanthrena* new genus is proposed to include *L. ruzae,* new species (from Ecuador) and *L. vargasllosai* (Gonzalez & Alvarado, 2019), new combination (from Peru). The new genus *Cisanthrena* includes only the unusual species *Cisanthrena perforata* n. sp. from forested areas of the Andes in Peru. In addition, *Austellurgus* new genus is proposed to accommodate *A. avulsus* (Ramos & Melo, 2006), new combination (southeastern Brazil).

Introduction

Protandrenini is a species rich group of andrenine bees solely distributed in the Americas with approximately 430 described species of which approximately 200 are restricted to South America (Michener, 2007; Moure et al., 2012; Ascher and Pickering, 2020). Members of the tribe are typically rather small to medium-sized (3-10 mm long) with relatively slender and sparsely haired body, nearly nonmetallic integument, usually black with yellow on the face of males but sometimes with yellow or cream-colored markings on all tagmata of both sexes (Michener, 2007). The tribe are mostly found in xeric and temperate areas of the Nearctic region and South America, but poorly represented to nearly absent in humid tropical areas (Michener, 2007). The Protandrenini species diversity in many areas of South America remains largely unexplored and underrepresented in collections. The study of museum specimens from distinct regions has been revealing numerous fascinating new taxa in the tribe in recent years (Gonzalez and Engel, 2011; Gonzalez et al., 2013; Ramos 2014; Ramos and Rozen, 2014; Ramos and Ruz, 2015; Sharifi et al. 2019; Aguiar and Ramos, 2020; Packer, 2021).

Despite that, there are still undoubtedly many undescribed and morphologically distinctive species that await further attention, especially in the South American fauna. An ongoing review of the phylogenetic relationships and generic concepts within the tribe has led to the discovery of yet more taxa that cannot be accommodated within existing genera. As part of a revisionary work of the Protandrenini fauna from South America, here we describe three new genera to accommodate three species from the Andean region (Peru and Ecuador) and one species from southeastern Brazil.

Material and methods

The examined material belongs to the following collections: AMNH, American Museum of Natural History, New York, USA; BMNH, Natural History Museum, London, England; DZUP, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Brazil; MNHP, Muséum National d'Histoire Naturelle, Paris, France; MZSP, Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil. The classification adopted

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here ranks all bees under a single family (Apidae sensu lato) (see Melo and Gonçalves, 2005). The general morphological terminology mostly follows Michener (2007); an elevated and glabrous area in the central portion of the labrum characterizes the labral plate; antennal flagellomeres are indicated as F1–F11, and the metasomal terga and sterna as T1–T7 and S1–S8, respectively. The density of punctation is specified as intervals between punctures measured in puncture diameters (pd). All measurements are given in millimeters (mm).

Images were taken with a Leica MC190 HD video camera attached to a Leica M205C stereomicroscope, and the series of images were processed in the software Helicon Focus 6.7.1 to produce confocal images. The illumination system used the dome and a tracing paper ring around the specimens (Kawada and Buffington, 2016). Final figures were edited in commercial software for small adjustments, such as brightness and contrast.

Results

Protandrenini Robertson, 1904

Austellurgus Ramos & Melo, new genus

(Fig. 1)

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Type species: *Protrandrena avulsa* Ramos & Melo, 2006.

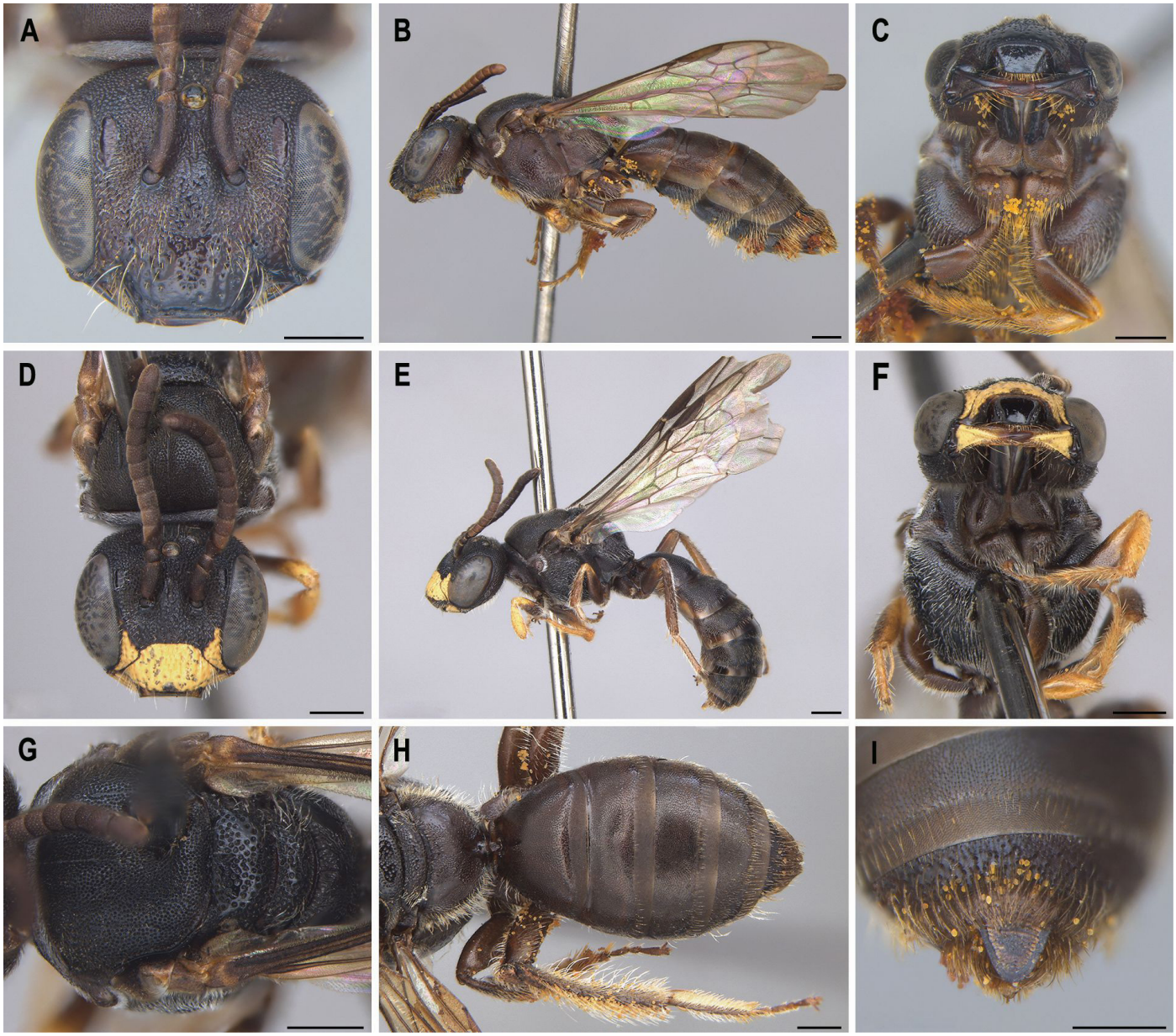

Figure 1 *Austellurgus avulsus* (Ramos & Melo, 2006), paratypes. A, head of female in frontal view. B, female in lateral view. C, labrum and mandible of female in frontal view. D, head of male in frontal view. E, male in lateral view. F, labrum and mandible of male in frontal view. G, mesosoma of male in dorsal view. H, metasoma of female in dorsal view. I, apex of female metasoma, showing the pygidial plate. Scale bar: 0.5 mm.

Diagnosis and comments. This is a very distinctive genus of Protandrenini for the combination of the following features present in both sexes: uniformly dense body punctation, protuberant interantennal area, orbits slightly convergent below, tentorial pit at intersection of outer subantennal and epistomal sutures, antennal flagellum clearly longer than head; well-developed pronotal lamella, forewing with two submarginal cells, and basal portion of metapostnotum striate and glabrous. Female scopa loose with simple hairs (Fig. 1H); middle tibial spur finely toothed on distal half, hind tibial spur straight apically; sterna without modified hairs on premarginal areas. The male is also recognized by the toothed margin of hind tibia; metasoma parallel-sided; postgradular area strongly depressed in relation to disc (Fig. 1E); mandible simple; T2 with shallow lateral fovea; genitalia lacking a basal sclerite.

Ramos and Melo (2006) provided additional diagnostic characters that distinguish *Austellurgus* from other genera of Protandrenini. The presence of a well-developed pronotal lamella is only found in *Pseudopanurgus* Cockerell, *Parapsaenythia* Friese, and females of *Chaeturginus* Oliveira & Moure. *Austellurgus* differs from the first genus mainly by the fore coxa of female unmodified and margin of hind tibia of the male toothed, and it is distinguished from the second genus mainly by the glabrous eyes. The antennal flagellum longer than head, S2 to S5 of female without modified hairs, scopa of female with simple hairs, integumental surface densely punctate, and metapostnotum striate basally differentiate the new genus from *Chaeturginus*.

Description. Moderate-sized bees, body about 7 mm in length. Color dark brown to black, with yellow areas on head and legs of male. Pubescence predominantly sparse with white to pale yellow color; prepygidial and pygidial fimbria brown on female (Fig. 1I). Eyes and basal area of metapostnotum glabrous (Figs. 1A and G); pronotal collar, mesoscutum, scutellum and metanotum with very short hairs; on dorsolateral portion of mesepisternum, very short and gradually increasing in length on lower half of lateral mesepisternum; hind tibial scopa loose, setae long and simple (Fig. 1H); disc of metasomal terga with very short setae and posterior margin with long hairs; metasomal terga without hair bands; disc of sterna with abundant erect, simple, and long hairs on female and decumbent, short, and plumose hairs on male. Integumental surface predominantly closely punctate; metapostnotum with a transversely striate basal depression and dorsal lateral portions unpunctured, finely reticulate (Fig. 1G); disc of metasomal terga closely punctate with punctures becoming finer and shallower on distal terga (Fig. H); marginal zone of metasomal terga micropunctured on female and finely reticulated and shiny on male (Figs. 1E and H); metasomal sterna weakly reticulated among the punctures; pygidial plate with transverse microsculpture on female (Fig. 1I) and absent on male. Facial foveae well marked (Figs. 1A and D); tentorial pit at intersection between outer subantennal and epistomal sutures; eye inner orbits slightly convergent below; antennal flagellum longer than head; mandible simple (Figs. 1C and F); lamella of pronotal collar well developed; omaulus smoothly curved from lateral to anterior mesepisternal surfaces; forewing with two submarginal cells, first submarginal cell distinctly longer than second; pterostigma clearly wider than prestigma, margin within marginal cell convex (Figs. 1A and D); mid tibial spur serrate; hind tibia of male toothed on outer margin; tarsal claws bifid; basal portion of metapostnotum shorter than metanotum; lateral fovea of T2 very shallow, almost inconspicuous; lateral line evident at least on T1–T2; metasoma broader than mesosoma in female and parallel-sided in male; basal portion (adjacent to pregradular area) of metasomal terga shallow in female and distinctly depressed in male (in relation to disc). Apex of S6 slightly U-emarginated; S7 of male with long slender distal lobes, constricted at their bases and with retrorse extensions at the apices; distal process of S8 elongate, gradually tapering apically with very sparse tiny hairs at apices; genitalia lacking a basal sclerite; gonostylus long and fused with gonocoxite.

Included species. The genus currently includes only the type species, *Austellurgus avulsus* (Ramos and Melo, 2006).

Distribution. Southeastern Brazil, in the states of Minas Gerais and Espírito Santo (Ramos and Melo, 2006).

Etymology. The name of the newly proposed genus is a combination of the word from Latin *austellus*, gentle southern wind, plus -*urgus*, taken from the andrenine genus *Panurgus*. The gender is masculine.

Austellurgus avulsus (Ramos & Melo, 2006), new combination
(Fig. 1)

Protandrena avulsa Ramos & Melo, 2006: 44. Holotype female, Brazil: Espírito Santo, Santa Teresa (DZUP, examined); Moure et al., 2007: 49; Ramos & Melo, 2010: 450; Ramos et al., 2015: 340.

Diagnosis and comments. As for the genus (see above). Additional images of external morphology, including male genitalia and associated sterna, are provided by Ramos and Melo (2006).

Material examined. Holotype female (DZUP), 'DZUP 26756' and 'SANTA TERESA—ES\ BRASIL—19/4/1967\ C. & C. T. ELIAS'. Paratypes. Brazil, Espírito Santo: 2 females (MZSP 55287 and 55288) 'CARIACICA—E. STO\ BRASIL 2–8/V/67\ C. & C. T. Elias leg'; 2 males (MZSP 55289 and 55290) 'SANTA TERESA—ES\ BRASIL—19/4/1967\ C. & C. T. ELIAS'.

Luisanthrena Ramos & Melo, new genus
(Figs. 2-3)

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Type species: *Luisanthrena ruzae* Ramos & Melo, new species.

Diagnosis and comments. The new genus is most similar to *Pseudosarus* by its small body size (4.5–5.0 mm in body length), mostly dull and finely punctate integument on head and mesosoma, and rather broadly V-shaped mid-apical emargination of S6 of the male. Both genera are also the only Protandrenini from South America with species that may exhibit a weakly metallic greenish body. *Luisanthrena* differs from *Pseudosarus* mainly in sparse pilosity on head and mesosoma, basal area of metapostnotum finely striate (except female of *L. ruzae* n. sp.), male with yellow marks on head and legs, and male genitalia with the gonostylus without long apical setae. Furthermore, the new genus can be recognized by the combination of the following features: lower paraocular area swollen (Figs. 2A and C), forewing with two submarginal cells, pterostigma large, scopa of female with loose simple hairs, middle tibial spur of the female toothed, basal area of metapostnotum glabrous and about as long as metanotum (Fig. 2B), marginal zone of metasomal terga semi-translucent (Figs. 2B and D), metasomal sternum of female without spines or modified hairs, metatibia of male toothed, distal margin of male S6 slightly U-emarginated (Fig. 3B), S7 of male with slender distal lobes and retrorse apically (Fig. 3C), and genitalia lacking a basal sclerite (Figs. 3E-F).

Description. Small bees, body length between 4-5 mm. Color brown to black, with yellow areas on fore tibia of female and head and legs of male; marginal zone of metasomal terga semi-translucent light brown. Pubescence predominantly sparse and whitish to pale yellow in color; prepygidial and pygidial fimbria light brown in female. Eyes glabrous; pronotal collar with dense plumose hairs; basal portion of metapostnotum predominantly glabrous, except for few tiny hairs on lateral areas; hind tibial scopa loose, setae long and simple; metasomal terga without hair bands; disc of metasomal terga with very short decumbent and sparse hairs, gradually increasing in length on lateral portions; marginal zone of T1-T4 of female and T1-T5 of male glabrous;

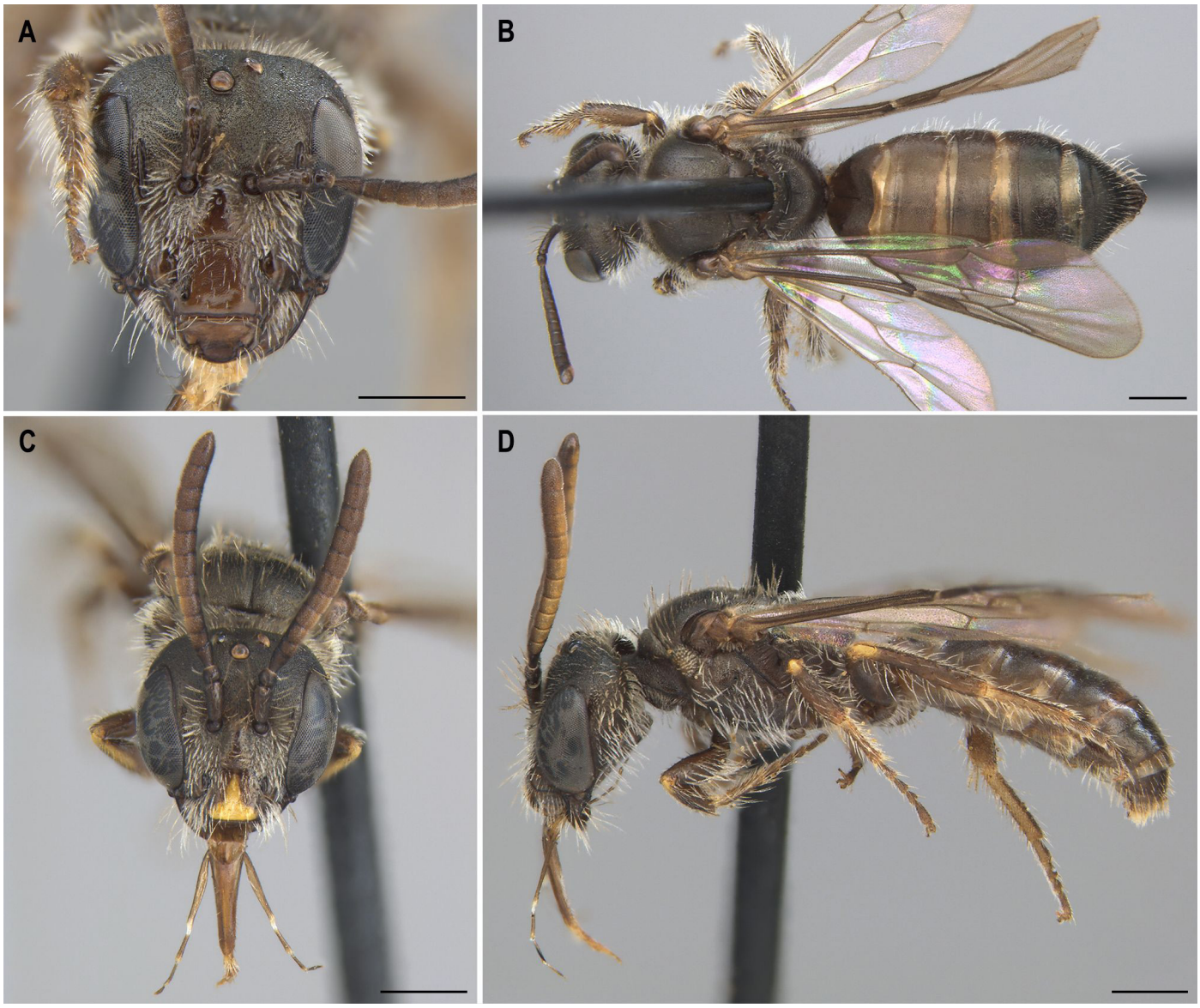

Figure 2 *Luisanthrena ruzae* Ramos & Melo new species, paratypes. A, head of female in frontal view. B, female in dorsal view. C, head of male in frontal view. D, male in lateral view. Scale bar: 0.5 mm.

basal half of sterna with short semidecumbent and sparse hairs; distal half of sterna with erect longer minutely-branched hairs. Integumental surface of head and mesossoma strongly reticulated and finely punctate; metapostnotum depressed and striate basally (except in female of *L. ruzae* n. sp.), remaining portions reticulate; metasomal terga reticulate with shallow sparse punctation; marginal zone of metasomal terga mostly smooth, with inconspicuous reticulation; metasomal sterna weakly reticulate; pygidial plate of female with longitudinal carina, absent in male. Facial foveae well marked; tentorial pit at intersection between outer subantennal and epistomal sutures; eye inner orbits slightly convergent below; antennal flagellum unmodified and longer than head width; mandible simple; pronotal collar without lamella; omaulus smoothly curved from lateral to anterior mesepisternal surfaces; forewing with two submarginal cells, first submarginal cell distinctly longer than second; pterostigma clearly wider than prestigma, margin within marginal cell convex; hind tibia of male toothed on outer margin; tarsal claws bifid; basal portion of metapostnotum as long as metanotum; lateral fovea of T2 evident; lateral line evident at least on T1–T2; metasoma broader than mesosoma in female and variable in male; basal portion (adjacent to pregradular area) of metasomal terga shallow in relation to disc. Apex of S6 slightly U-emarginated (Fig. 3B); S7 of male with slender distal lobes, constricted at their bases and retrorse at the apices (Fig. 3C); S8 truncate basally (Fig. 3D); distal process of S8 elongate, gradually tapering apically, with few tiny hairs at apices (Fig. 3D); S8 with rounded distal apices; genitalia lacking a basal sclerite; gonocoxite without deep oblique impression; gonostylus long and fused with gonocoxite, with few tiny hairs apically; volsella denticulate on opposable surfaces of digitus and cuspis, and along dorsal surface of digitus; digitus longer than cuspis (Figs. 3E-F).

Species included. *Luisanthrena ruzae* Ramos & Melo, new species and *L. vargasllosai* (Gonzalez & Alvarado, 2019) new combination.

Distribution. The new genus is known from the high elevations along the Andes in Ecuador and Peru.

Etymology. The genus name is dedicated to the bee systematist Dr. Luisa Ruz in recognition of her numerous contributions to the understanding of the Protandrenini bee fauna. The name *Anthrena*, an unjustified emendation of *Andrena*, has been used previously to form the names of other andrenine genera. The gender is feminine.

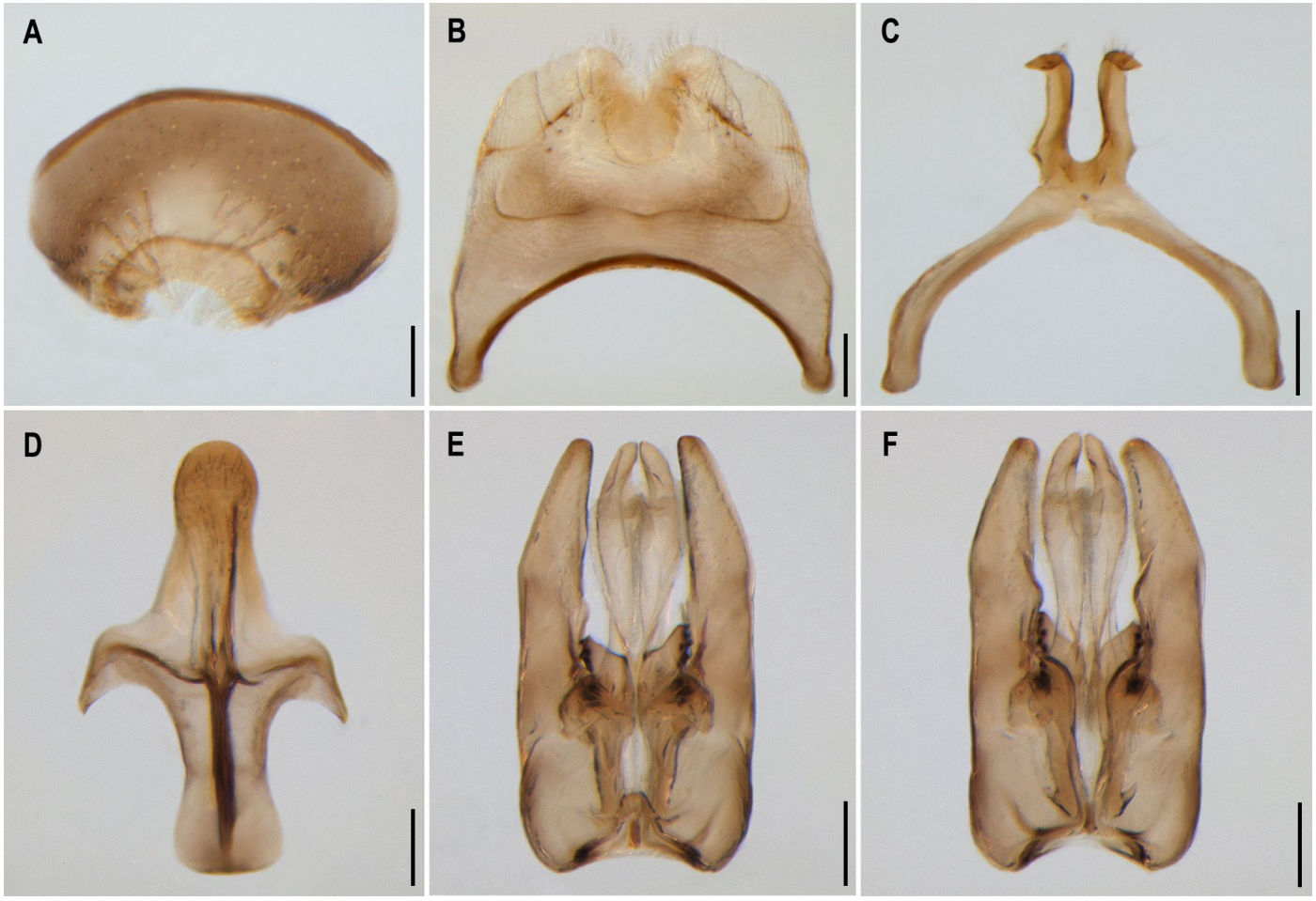

Figure 3 *Luisanthrena ruzae* Ramos & Melo new species, male paratype. A, T7 in postero-dorsal view. B, S6 in ventral view. C, S7 in ventral view. D, S8 in ventral view. e, genitalia in ventral view. f, genitalia in dorsal view. Scale bar 0.2 mm.

***Luisanthrena ruzae* Ramos & Melo, new species**
(Figs. 2-3)

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Diagnosis and comments. The new species can be is easily separated of *L. vargasllosai* n. comb. by the weak metallic green reflections mainly on head and mesosoma, yellow markings on male restricted to a smaller area on clypeus and basal portion of tibia, facial foveae of female very narrow, labral plate of female with straight distal margin; female basal area of metapostnotum without striation (only with mid longitudinal carina), pilosity of head and mesosoma denser and longer, metasoma of male parallel-side, and T7 of male with distal margin emarginated (Fig. 3A).

Description. Holotype female. Approximate body length: 5 mm; maximum head width: 1.24 mm; intertegular distance: 0.95 mm; forewing length: 3.75 mm; maximum width of T2: 1.2 mm. *Coloration*. Integument mostly dark brown with weakly green metallic reflexes, mainly on head and mesosoma; posterior surfaces of F2–F10 yellowish; mid and hind legs, pterostigma and wing veins, spurs, T1-T3 and marginal zone of the metasomal terga, brown; basal spot of fore and mid tibia yellow. Tegula semi-translucent brownish. *Pubescence*. Predominantly whitish, sparse and finely branched, with prepygidial and pygidial fimbria dark brown. Labrum with very sparse and simple setae, except for glabrous labral plate; long on lateral portions of clypeus (ca. 1.2x as long as ocellar diameter); eyes glabrous; on clypeus very sparse and short (ca. 0.5x as long as ocellar diameter); on lower paraocular area dense, decumbent, plumose and short (ca. 1x as long as ocellar diameter); scape with longer erect setae (ca. 1.5x as long as ocellar diameter); on vertex erect and short (about one ocellus diameter); gena with longer and erect setae (about twice ocellus diameter). Pronotal collar with dense and very short erect plumose hairs; mesoscutum with sparse and short hairs; mesoscutum with tiny hairs intermixed by longer pilosity (ca 2x OD); dorsolateral portion of metepisternum with few short decumbent hairs; on lower half of lateral mesepisternum erect and longer (ca 2x OD); scutellum and metanotum with sparse long hairs; basal area of metapostnotum glabrous; propodeum with long and erect plumose hairs; hind tibial scopa loose, setae long and simple, those on anterior surface about 1.5x as long as maximum width of tibia; basitibial plate with coarse setae on basal two-thirds. Disc of T1–T4 with very sparse minutely semi-decumbent setae and longer branched erect hairs on lateral portions; marginal zone glabrous; fimbria of T5–T6 with dense plumose hairs; S1–S5 with sparse erect finely branched hairs. *Integumental surface*. Predominantly with fine punctures; strongly reticulated on head and mesosoma, reticulation weaker on mesosoma. Labral plate smooth and shiny; punctures dense (< 3 pd) on frons, paraocular area, vertex, gena, mesoscutum, scutellum, and metanotum; clypeus and supraclypeal area with very sparse shallow punctures (> 4 pd) and finely reticulate; facial fovea smooth and shiny; ventral portion of gena almost unpunctured

and strongly reticulate; tegula finely reticulate on anterior half and smooth on posterior half; basal portion of metaposnotum with only a mid-longitudinal carina and unpunctured on remaining areas; T1-T5 reticulated and with inconspicuous punctures, including reticulated marginal zone; metasomal sterna weakly reticulated, shiny among punctures; pygidial plate reticulated with evident longitudinal carina. *Structure*. Head as wide as long (width: 1.24; length: 1.26); first labial palpomere flattened, as long as length of the three distal palpomeres combined; labral plate 1.1x as long as wide (length: 0.25; width: 0.23); compound eye 2.1x longer than wide (length: 0.83; width: 0.4), inner orbits slightly convergent below (upper and lower interorbital distance: 0.83 and 0.71); clypeus 1.5x wider than long (width: 0.6; length: 0.4); subantennal sutures subparallel; F1 longer than F2; frontal line slightly marked as carina; gena, in lateral view, narrower than compound eye; mid tibial spurs toothed, as long as basitarsus; hind tibial spurs finely serrate, slightly curved apically, and subequal in length; tarsal claws bifid, teeth subequal; lateral foveae of T2 well-marked and ellipsoid; marginal zone slightly depressed in comparison to disc; pygidial plate V-shaped, with apex slightly rounded.

Paratype male. Approximate body length: 4.05 mm; maximum head width: 1.14 mm; intertegular distance: 0.74 mm; forewing length: 3.5 mm; maximum width of T2: 0.9 mm. Agreeing with female, except for yellow on most of clypeus (inverted T marking), basal third of tibia, small spot on basal portion of mid tibia, and basitibial plate; hind basitarsus yellowish. Head as wide as long (width: 1.14; length: 1.07); labral plate as long as wide (length: 0.25; width: 0.23); compound eye 1.7x longer than wide (length: 0.7; width: 0.4), inner orbits slightly convergent below (upper and lower interorbital distance: 0.8 and 0.54); clypeus 1.6x wider than long (width: 0.5; length: 0.3); F1 longer than F2; subantennal sutures subparallel; frontal line slightly marked as carina; gena, in lateral view, narrower than compound eye; mid tibial spurs finely serrate, as long as basitarsus; hind tibial spurs finely serrate, slightly curved apically, subequal in length; tarsal claws bifid, inner teeth reduced; metasoma parallel-side; lateral foveae of T2 well-marked and ellipsoid; marginal zone slightly depressed in comparison to disc; T7 with distal margin emarginated (Fig. 3A); S6 slightly emarginated on middle portion of distal margin (Fig. 3B).

Flower record. *Taraxacum* sp. (Asteraceae).

Distribution. The new species is reported in Ecuador at elevations around 2500 m.

Material examined. Holotype female (DZUP), "EQUADOR\ Oriente – Ambato\ 2600m\ October 1956". Paratypes. Ecuador, Carchi: 1 male (MNHP) "El Angel\ 1.1.32". Pichincha: 1 male (MNHP) "Route de\ Calderon\ 10.x.30"; 1 female and 2 males (MNHP) "Puembo\ 20.ii.31"; 2 females (MNHP) "Quito\ 21.ii.30\ Taraxacum"; 1 male (MNHP) "Quito\ 25.2.30"; 2 females (MNHP) "Quito\ 28.ii.30"; 1 female (MNHP) "Quito\ iii.30"; 1 male (MNHP) "Quito\ Juin"; 1 female (MNHP) "Quito\ 7.vi.31"; 1 male (MNHP) "Quito\ vi.30"; 2 females (MNHP) "Quito\ x.31"; 3 females and 1 males (MNHP) "Quito\ 23.xi.30"; 2 females and 4 males (DZUP, MNHP) "Rumipamba\ 22.iii.31"; 5 females and 2 males (DZUP, MNHP) "Sambiza".

Etymology. The specific epithet also honors Dr. Luisa Ruz.

Luisanthrena vargasllosai (Gonzalez & Alvarado, 2019), new combination

Andinopanurgus vargasllosai Gonzalez & Alvarado, 2019: 212. Holotype female, Peru: Apurímac, Mina Las Bambas (MUSM, not examined).

Diagnosis and comments. For diagnostic features that distinguished this species from *L. ruzae* n. sp., see above. Images of external morphology, including male genitalia and associated sterna, are presented by Gonzalez et al. (2019).

Distribution. This species occurs at elevations above 4000 m in southern Peru (Central Andes), associated to Puna grasslands (Gonzalez et al., 2019).

Cisanthrena Ramos & Melo, new genus

(Figs. 4-5)

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Type species. *Cisanthrena perforata* Ramos & Melo, new species

Diagnosis and comments. The new genus differs from all other genera of Protandrenini bees by the very coarsely punctate body, pronotum with a transverse lamella, protuberant interantennal area, metapostnotum slightly depressed with few longitudinal striae, rounded propodeum (without flat dorsal surface), marginal zones of metasomal terga smooth and depressed in relation to disc. Male with tentorial pit clearly below intersection between outer subantennal suture and epistomal sulcus (Fig. 4C), strong postgradular depressions on metasomal terga of male (Fig. 4D), T7 with pigidial plate (Fig. 5A), S7 with two short apical lobes not constricted at their bases (Fig. 5C). It seems most similar to *Pseudopanurgus* and can be distinguished from it by the front coxae of females without large hairy apical spine or process, omaulus smoothly curved from lateral to anterior mesepisternal surfaces, scopa composed of sparse simple hairs, and outer margin of the hind tibia of the male toothed. The new genus also resembles *Parapsaenythia*, from which it differs mainly in its glabrous eyes, forewings with two submarginal cells, short and hairless basal portion of metapostnotum, and absence of basal hair bands on the metasomal terga.

Description. Small bees, body length between 5-6 mm. Body mostly black to brownish with yellow markings in females restricted to small spots on tibia of fore- and midlegs, and to head and legs in males. Tibial spurs, wing veins, and tarsi light brown; tegula and marginal zone of metasoma translucent brown. Pubescence predominantly short and very sparse in both sexes. Eyes glabrous; pronotal collar, pronotal lobe, mesepisternum, and lateral corners of propodeum with more dense and finely branched hairs; basal portion of metapostnotum glabrous; female hind tibial scopa loose with long and simple setae; T5–T6 of female with prepygidial and pygidial fimbriae sparse with plumose light brown hairs; T7 of males with very sparse hairs and glabrous pygidial plate; metasomal sterna with semierect long branched hairs in female and decumbent short pilosity in male, without modified specialized hairs. Integument surface very coarsely, deeply, and densely punctate. Metapostnotum and marginal zone of metasomal terga smooth, without punctures; basal portion of metapostnotum deep with longitudinal striations; pygidial plate of females reticulated, smooth in males; sterna of female reticulated with coarse punctures and in male mostly shiny, with weak reticulation and shallow punctures. Head as broad as long, slightly shorter than mesosoma; first labial palpomere shorter than the length of three distal palpomeres combined; maxillary palpus with six subequal palpomeres; outer subantenal suture converging below to inner suture; tentorial pit in intersection between outer subantennal suture and epistomal sulcus; antenna slightly longer than head width, especially in males; facial fovea deep; inner orbits of compound eyes convergent below; mesoscutum with mid and parapsidal lines evident; episternal groove extending below scrobal groove into omaulus area; forewing with two submarginal cells; pterostigma clearly wider than prestigma, margin within marginal cell convex; first submarginal cell longer than second; marginal cell truncate at apex and longer than the distance from its apex to wing tip; mid tibial spur finely serrate; apex of mid tibiae of males with small acute projection; tarsal claws distinctly bifid; hind tibia of male toothed on posterior margin; hind tibial spurs straight apically with similar length; marginal zone of metasomal terga strongly depressed in relation to disc; lateral foveae

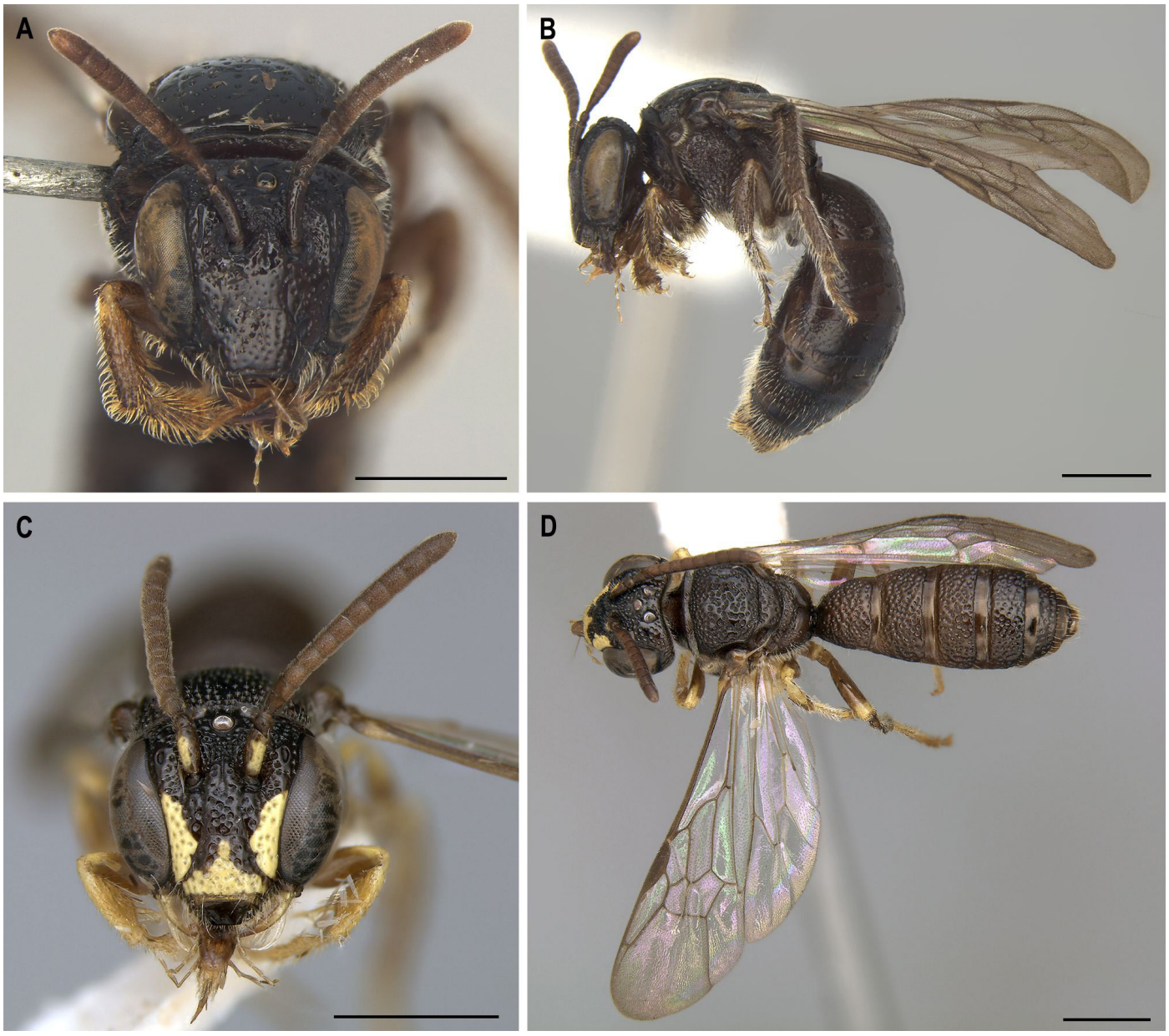

Figure 4 *Cisanthrena perforata* Ramos & Melo new species. A, head of female (holotype) in frontal view. B, female (holotype) in lateral view. C, head of male (paratype) in frontal view. D, male (paratype) in dorsal view. Scale bar: 1.0 mm.

of T2 weakly depressed, inconspicuous; lateral line evident at least on Tl and T2; pygidial plate V-shaped in females, deeply notched apically in males; S6 of male slightly emarginated on distal margin (Fig. 5B); S7 with two short apical lobes not constricted at their bases (Fig. 5C); S8 of male gradually tapering to a distal projection (Fig. 5D); genitalia of male without basal sclerite; volsella with short digitus and cuspis, sclerotized dark teeth present on their opposable surfaces; gonocoxite without deep oblique impression; gonostylus about as long as gonocoxite, not articulated to gonocoxite, and with sparse long branched setae; penis valves simple, not surpassing the gonostylus length (Figs. 5E-F).

Species included. *Cisanthrena perforata* Ramos & Melo, new species.

Distribution. This genus is only known from southeastern Peru.

Etymology. The new genus-group name is a combination of the Latin "cis", meaning "on this side of", in reference to its occurrence on the eastern side of the Andes, in Peru, and *Anthrena*, an unjustified emendation of *Andrena*, used previously to form the names of other andrenine genera. The gender is feminine.

Cisanthrena perforata **Ramos & Melo, new species**

(Figs. 4-5)

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Diagnosis and comments. In addition to the generic characters, this species is easily recognized by the integument largely smooth and shiny between punctures, hairs on fore tibiae of female strongly curved apically (Fig. 4A), fovea of female very narrow (Fig. 4A), and pigidial plate of male with midapical notch (Fig. 5A). In addition, the head of the male exhibit yellow color on mandible, anterior portion of scape, clypeus, and lower paraocular area (Fig. 4C).

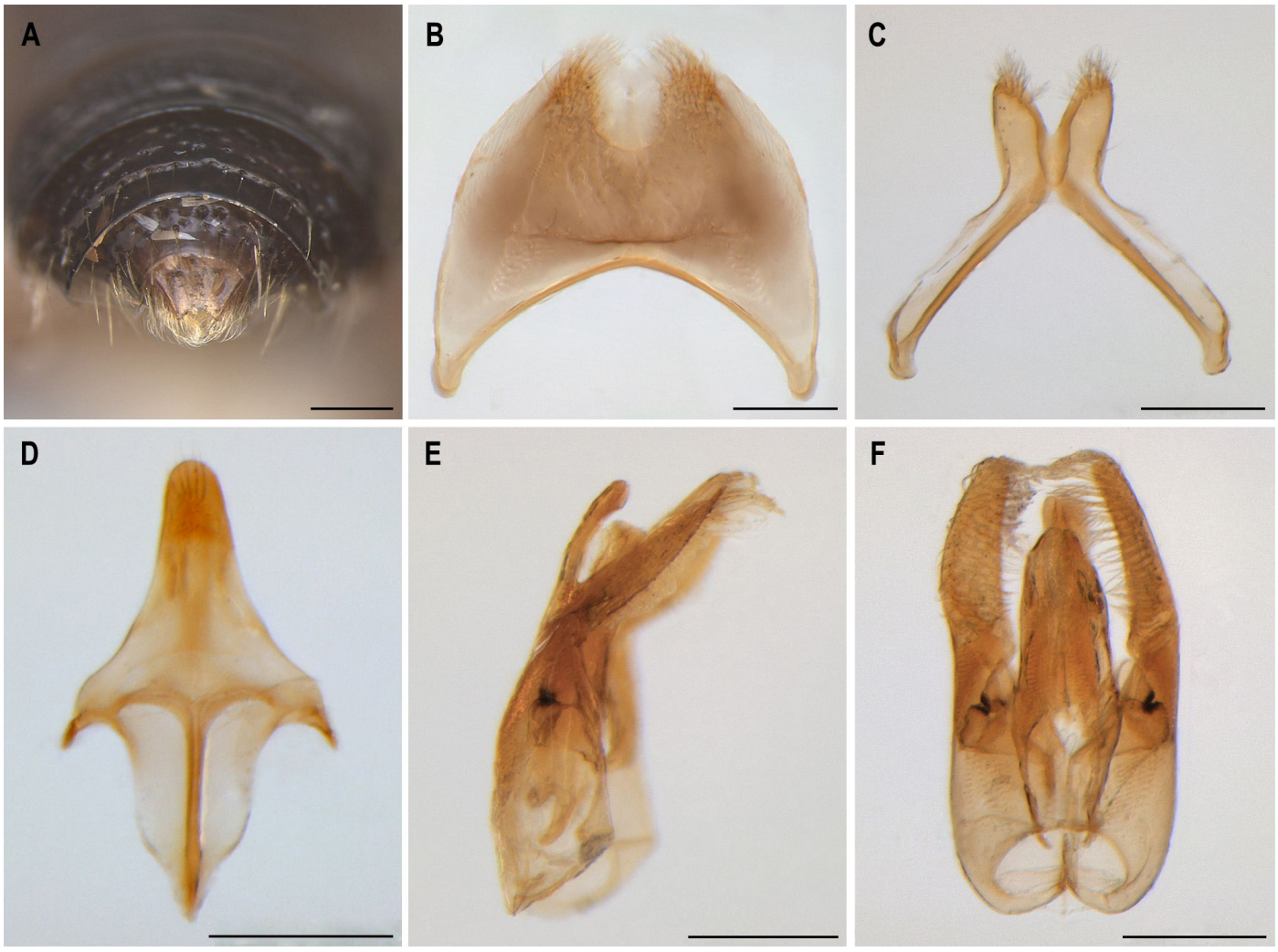

Figure 5 *Cisanthrena perforata* Ramos & Melo new species, male paratype. A, apex of metasoma, showing the T7, in postero-dorsal view. B, S6 in ventral view. C, S7 in ventral view. D, S8 in ventral view. E, genitalia in lateral view. F, genitalia in ventral view. Scale bar 0.2 mm.

Description. Holotype female. Approximate body length: 6.15 mm; maximum head width: 1.6 mm; intertegular distance: 1.2 mm; forewing length: 5.0 mm; T2 maximum width: 1.8 mm. *Coloration*. Integument mostly dark brown; posterior portion of antennal flagellum, distal portion of mandible, pterostigma, legs, and tibial spurs brownish; basal spot of fore and mid tibia yellowish. Tegula and marginal zone of the metasomal terga semi-translucent brownish. *Pubescence*. Predominantly whitish with sparse and very shorty hairs; fore tibia and tarsus with light brown hairs strongly curved apically; prepygidial and pygidial fimbriae brownish. Labrum with very sparse and simple setae, except for glabrous labral plate; long on lateral portions of clypeus (ca. 1.5x as long as ocellar diameter); eyes glabrous; distal half of clypeus with long hairs (ca. 1.5x as long as ocellar diameter); disc of clypeus, supraclypeal area, paraocular area, frons, vertex, gena, mesoscutum, and scutellum with sparse tiny hairs (ca. 1x as long as puncture diameter). Pronotal collar with very short decumbent hairs; posterior margin of pronotal lobe with dense plumose short hairs; lateral portions of metanotum with long erect finely branched hairs; metepisternum with tiny decumbent hairs; dorsolateral portion of mesepisternum with erect finely branched long hairs (ca. 2x as long as puncture diameter), becoming gradually denser and long on lower half (ca. 1.5x as long as ocellar diameter); hairs straight apically on ventral portion of mesepisternum; fore coxa with very long simple hairs (ca. 3.5x as long as ocellar diameter); fore femur, tibia and tarsus with thick hairs, whose apex is strongly curved; basal area of metapostnotum glabrous, remainder with spare tiny hairs; propodeum with tiny hairs and lateral corners with dense long finely branched hairs (ca. 1.2x as long as puncture diameter); hind tibial scopa loose, setae long and simple, those on anterior surface as long as maximum width of tibia (Fig. 4B); basitibial plate with few coarse setae on basal half and glabrous on distal half; disc of T1–T3 with sparse tiny setae; T3 with few longer finely branched erect hairs on lateral portions; T4 with dense and long simple hairs (ca. 1x as long as ocellar diameter) on disc and fringe of long hairs on distal margin (as long as marginal zone length); fimbria on T5–T6 with dense finely branched hairs; marginal zone glabrous; S1–S5 with long erect branched setae on distal half (ca. 3x as long as ocellar diameter). *Integumental surface*. Predominantly with dense coarse deep punctation, mostly smooth and shiny between punctures. Labral plate smooth and shiny without striae; facial fovea finely reticulated, dull; punctures dense (< 1.0 pd) on clypeus, supraclypeal area, frons, lower paraocular area, gena laterally, and vertex; tegula smooth and shiny; upper paraocular area and mesepisternum with contiguous punctures (< 0.5 pd); ventral portion of

gena without punctures; mesoscutum with very sparse punctures (> 2 pd); scutellum and metanotum densely punctate (< 1.0 pd); metepisternum reticulated; basal portion of metapostnotum finely striated, remainder unpunctured; lateral corners of propodeum reticulated with shallow contiguous punctures; hind leg strongly reticulated; disc of T1 and T2 closely punctate (1–2 pd); punctures on disc of T3–T5 finer and shallow; marginal zone of T1–T4 smooth; metasomal sterna reticulated among contiguous fine shallow punctures; pygidial plate weakly reticulated. *Structure*. Head approximately 1.1x broader than long (1.6:1.4); first labial palpomere shorter than the three distal palpomeres combined; labral plate 1.3x longer than broad (0.23:0.29), distal margin straight; compound eyes 2x as long as broad (1.04:0.5), converging below (upper to lower interorbital distance: 1.02:0.83); clypeus 1.4x broader than long (0.6:0.43); subantennal sutures subparallel; F1 longer than F2; frontal line grooved; facial fovea deep and very narrow, 7x longer than broad (0.29:0.04); gena, in lateral view, shorter than compound eyes; parapsidal line impressed and linear, as long as tegula length; median mesoscutal line deeply impressed; basal area of metapostnotum depressed, shorter than scutellum (Fig. 4D); first submarginal cell slightly longer than second; mid tibial spur finely serrate, about 0.8x as long as basitarsus (0.4:0.5); tarsal claws bifid, teeth of similar sizes; hind tibial spurs straight apically, subequal in length; anterior portion of T1 slightly declivous (Fig. 4B); disc of T2–T4 almost flat; T1 and T2 with lateral line; lateral fovea of T2 inconspicuous; marginal zone of metasomal terga strongly depressed in comparison to disc; pygidial plate V-shaped, margin depressed and slightly rounded at apex.

Paratype male. Paratype male. Approximate body length: 5.03 mm; maximum head width: 1.4 mm; intertegular distance: 1.0 mm; forewing length: 4.1 mm; maximum T2 width: 1.1 mm. Similar to female in color except for most of mandible, anterior portion of scape, most of clypeus, lower paraocular area, pronotal lobe, fore and mid tibiae, distal portion of hind femur, and tarsi yellow. Condylar groove of mandible with fringe of long simple hairs (ca. 1.2x as long as ocellar diameter) (Fig. 4C); fore tibia and tarsus with whitish hairs straight apically; fore coxa with sparse short hairs (ca. 1.2x as long as ocellar diameter); hind tibia with very sparse short hairs (ca. 1.2x as long as ocellar diameter); basitibial plate glabrous; T5 and T6 with sparse pubescence, hairs longer than length of marginal zone; S1–S5 with dense decumbent plumose hairs on distal half (ca. 2x as long as ocellar diameter). Mesoscutum with dense punctures (< 1 pd); T1-T4 closely punctate (< 0.5 pd); hind leg smooth and shiny; metasomal sterna smooth and shiny between fine shallow punctures; pygidial plate smooth and shiny (Fig. 5A). *Structure*. Head 1.2x broader than long (1.4:1.15); first labial palpomere shorter than the three distal palpomeres combined (Fig. 4C); labral plate as long as broad (0.18:0.29); compound eyes 1.8x as long as broad (0.88:0.5), converging below (upper to lower interorbital distance: 0.9:0.61); clypeus 1.4x broader than long (0.6:0.43); frontal line indicated as evident sulcus; facial fovea deep and oval, 1.5x longer than broad (0.09:0.06); gena, in lateral view, shorter than compound eyes; mid tibial spur finely serrate, about 0.7x as long as basitarsus (0.26:0.38); tarsal claws bifid; hind tibial spurs straight apically, outer spur shorter than inner one.

Distribution. This species is known only from the forested areas in the oriental portion of the Andes in Peru.

Type material. Holotype female (AMNH) "PERU, Quincemil,\ on branch R.Manu\ Madre de Dios Prov.\ X-16-31-1962" "L.E.Pena\ Collector". Paratype. Peru, Madre de Dios: 1 male (BMNH) "Forested eastern\ foothills of the\ Andes, 2000ft." "PERU: Tingo Maria\ 1km. E. of town.\ Malaise trap, dense\ woodland, 15.viii.1971." "P.S. & H.L. Broomfield".

Etymology. The epithet refers to the deeply punctate integumental surface of the body in this species, from the Latin "perforatus", meaning pierced, perforated.

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Conflicts of interest

The authors declare no conflicts of interest.

Author contribution statement

KSR planned the work with the input of GARM, and wrote the first draft of the manuscript. Both authors critically revised and approved the final version.

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