



New species of *Loneuroides* García Aldrete (Psocodea: 'Psocoptera': Ptiloneuridae) from Colombia, and description of the male *L. venezolanus* García Aldrete

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Abstract

Six species of Colombian *Loneuroides* García Aldrete are here described and illustrated; also, the male of *L. venezolanus* García Aldrete is described, on basis of specimens from Valle del Cauca, Colombia. An updated diagnosis of the genus is presented; two species groups, based on the structure of the hypandrium, are recognized in the genus.

Key words: Neotropics, Epipsocetae, taxonomy

Introduction

Loneuroides García Aldrete (2006) was erected on the basis of two females from the Department of Mérida, Venezuela (Hechizera, Mount Zerpa, and Tabay Mucuy, trail to Lake Sucro). The type species, *L. venezolanus* García Aldrete, was later found in mountains of Valle del Cauca, Colombia (García Aldrete *et al.* 2011a). We recently found, in the Colombian departments of Risaralda, Huila and Valle del Cauca, and in the collection of the Alexander von Humboldt Institute (Villa de Leyva, Boyacá, Colombia), 54 specimens, that represent six undescribed species, and the undescribed male of the type species. These species are described and illustrated and an updated diagnosis of the genus is presented.

Material and methods

Fifty four specimens were studied (51 males and 3 females). Ten males and two females were dissected in 80% ethanol, and their parts were mounted in Canada balsam. Standard measurements, in mm, were taken on parts mounted on the slides, with a filar micrometer whose measuring unit is 136 mm for wings and 53 mm for other parts. Abbreviations of parts measured are as follows: FW and HW: lengths of fore- and hindwings; F, T, t₁-t₃: lengths of femur, tibia and tarsomeres 1–3 of right hindleg; ctt₁: number of ctenidobothria on t₁; Mx4: length of fourth segment of right maxillary palpus; f₁-f_n: lengths of flagellomeres 1-n of right antenna; IO, D and d: minimum distance between compound eyes, antero-posterior diameter and transverse diameter, respectively, of right compound eye, in frontal view of head; PO: d/D.

The specimens studied are deposited in the Museum of the Alexander von Humboldt Institute (MAH), and in the Entomological Museum of the Universidad del Valle, Santiago de Cali, Colombia (MUSENUV).

Results

Loneuroides García Aldrete

Generic diagnosis. Belonging in family Ptiloneuridae. Forewing M five-, seven- or eight-branched. Hindwing M three-, four- or five-branched. Forewing with one crossvein between 2A and wing margin. Pterostigma acutely extended in the middle towards Rs. Subgenital plate wide, posteriorly rounded or slightly pointed, with well defined lateral pigmented areas, joined posteriorly by a narrow band. Gonapophyses complete, v1 long, slender, with a distal field of microspines, v2+3 proximally wide, with a long, acuminate heel, four setae on line on basal lobe, and a well defined pigmented band along inner edge, extended to distal process; this straight, acuminate, bearing microspines on surface. Ninth sternum broad, wider anteriorly, with distinct textured areas anteriorly. Hypandrium of three sclerites, a large central one, flanked by elongate, smaller sclerites. Central sclerite either with an elongate central process flanked by lateral processes, bearing a distinct tuft of macrosetae on either side of central process, or central process short, widely concave, with slender lateral processes, and two small lateral, slender processes, without tufts of macrosetae. Phallosome with side struts V shaped, with two pairs of elongate endophallic sclerites, and a mesal transverse sclerite. Male epiproct meso-anteriorly bulged, with a field of small spines, or not bulged, with field of spines vestigial, reduced to a transverse, pilose, meso-anterior line.

Type species. *Loneuroides venezolanus* García Aldrete.

Key to the males of *Loneuroides*

(the male of *L. tamaensis* n. sp. is not known)

1. Central sclerite of hypandrium with short central process, widely concave posteriorly, with a pair of elongate, slender lateral processes and, ventrally of the latter, a pair of short lateral processes *L. rionegroensis* n. sp.
- Central sclerite of hypandrium with one median posterior process, flanked by a pair of lateral processes 2
2. Epiproct with mesal bulge near anterior border, bearing short spines 3
- Epiproct with mesal bulge vestigial, represented by a line with row of spines, or mesal bulge adjacent to anterior border 5
3. Central sclerite of hypandrium with median process slender, posteriorly straight; lateral processes with an outer bulge, inner border with a slender, sclerotized band *L. ledesmai* n. sp.
- Central sclerite of hypandrium with median process stout, obtusely concave posteriorly; lateral processes blunt ended or pointed. 4
4. Hypandrium as in Fig. 12; phallosome with anterior pair of endophallic sclerites bow shaped, dilated and pointed at both ends; transverse endophallic sclerite stout, V shaped *L. colombianus* n. sp.
- Hypandrium as in Fig. 29; phallosome with anterior pair of endophallic sclerites bow shaped, distal halves more slender than above, club-shaped; transverse endophallic sclerite M shaped, side arms slender, anteriorly concave, with an acute, pointed posterior process. *L. santanderinus* n. sp.
5. Central sclerite of hypandrium with lateral processes stout, blunt ended, bearing distally a slender, sclerotized apophysis. Transverse endophallic sclerite M shaped. *L. venezolanus* García Aldrete
- Central sclerite of hypandrium with lateral processes slender, distally acuminate, bulged on outer border. Transverse endophallic sclerite broadly V shaped *L. bretanaensis* n. sp.

The species of *Loneuroides* are found at the northern end of the Andes Cordillera, in Colombia and Venezuela, in an altitudinal range from 1617 to 2310 m. (Fig. 42).

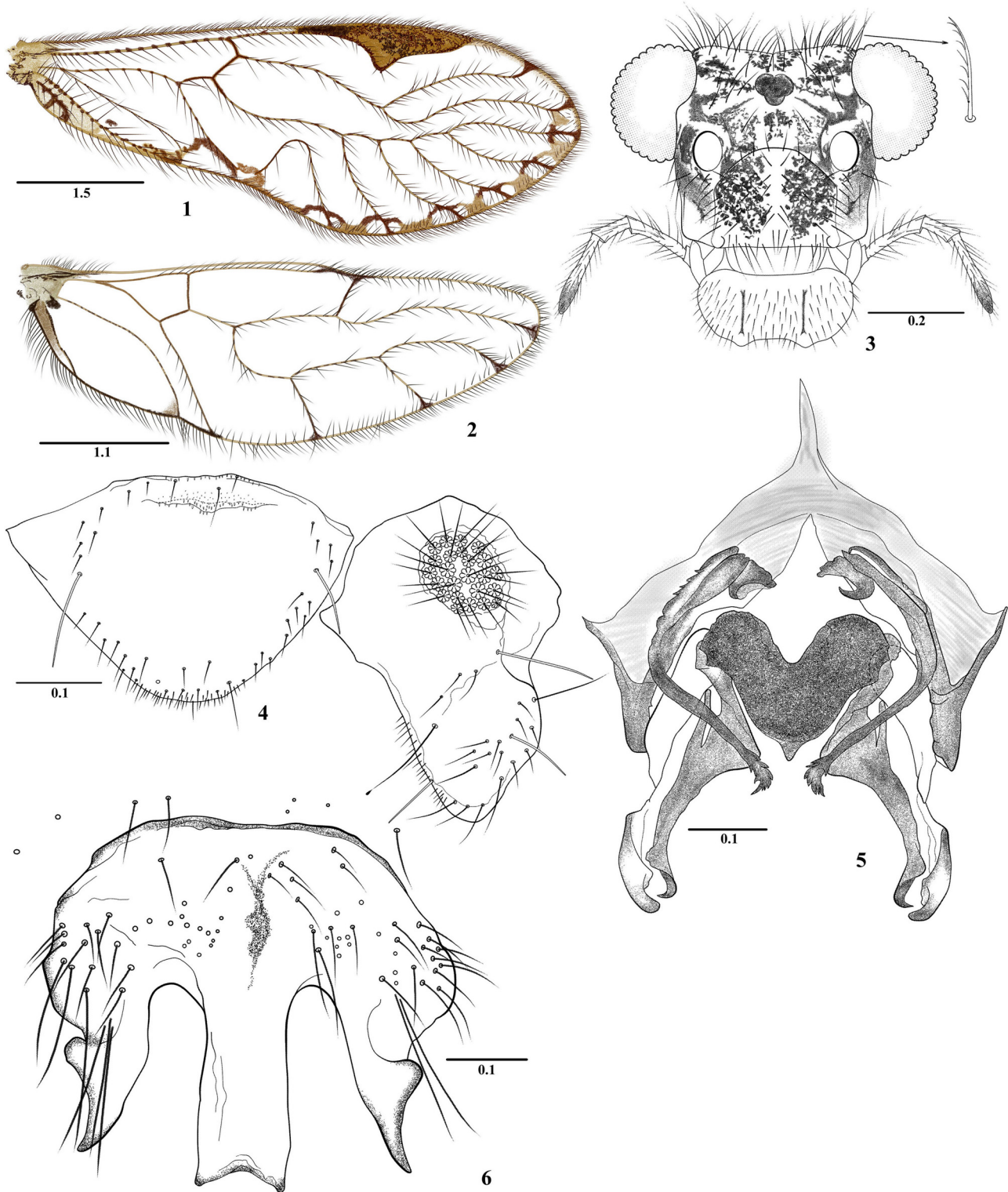
Loneuroides bretanaensis n. sp. Male

(Figs 1–6)

Diagnosis. Differing from *L. ledesmai* n. sp., in having the median posterior process of the central sclerite of the hypandrium wide and obtusely concave posteriorly. Differing from *L. colombianus* n. sp., *L. santanderinus* n. sp., and *L. venezolanus* García Aldrete, in having the lateral processes of the central sclerite of the hypandrium slender and acuminate, directed posteriorly. Differing from *L. rionegroensis* n. sp., in having the central sclerite of the hypandrium with one median posterior process flanked by pointed posterior processes, and by having the forewing M five branched, and the hindwing M three or four branched.

Color (in 80% ethanol). Body pale brown, with ochre and creamy areas. Head pale brown, with brown and creamy areas (Fig. 3). Compound eyes dark brown, ocelli hyaline, with ochre centripetal crescents. Antennae pale

brown; maxillary palps cream, Mx4 pale brown distally. Legs pale brown, coxae with proximal and distal brown ochre spots; femur with little apical brown spot. Forewing with a marginal, pigmented band from R4+5 to confluence of Cu2-1A, with hyaline areas on each side of vein ends at wing margin, from M1 to Cu1a and Cu1b; pterostigma pale brown with ochre spots (Fig. 1). Veins pale brown, with dark brown areolae on setal insertions. Abdomen creamy, with ochre subcuticular areas. Epiproct and paraprocts pale cream, with ochre subcuticular areas; hypandrium pale brown.



FIGURES 1–6. *Loneuroides bretanaensis* n. sp. Male. 1. Forewing. 2. Hindwing. 3. Front view of head. 4. Right paraproct and epiproct. 5. Phallosome. 6. Central sclerite of hypandrium. Scales in mm.

Morphology. As in diagnosis, plus the following: Forewing M of five branches (Fig. 1), hindwing M of three or four branches (Fig. 2). Head pattern (Fig. 3). Central sclerite of hypandrium (Fig. 6) with median posterior process stout, sides almost parallel, obtusely concave distally, with postero-lateral corners pointed; lateral processes long, slender, with small, median protuberance on outer border, apices pointed, directed posteriorly. Phallosome (Fig. 5) anteriorly Y shaped, side struts fused proximally, with stem short, pointed; arms of the side struts proximally dilated on inner borders; two pairs of endophallic sclerites, anterior pair bow shaped, with proximal ends wide, hooked, and distal ends bearing teeth on inner and outer borders; posterior pair wide proximally, narrowing distally, each arm ending in a hook directed outwards, next to external parameres; a mesal, stout, strongly sclerotized transverse sclerite, deeply concave anteriorly and pointed posteriorly. Paraprocts (Fig. 4) broad, elongate, with field of setae distally, and sensory fields with 23–24 trichobothria in basal rosettes. Epiproct (Fig. 4) convex anteriorly, broadly trapeziform, with setae as illustrated, and a mesal, slender, transverse field of microspines next anterior border.

Measurements. FW: 6650, HW: 4437, F: 1575, T: 2800, t1: 1150, t2: 102, t3: 180, ctt1: 34, f1: 1250, f2: 1262, f3: 1050, f4: 887, f5: 550, f6: 475, f7: 390, f8: 270, f9: 280, f10: 260, f11: 280, Mx4: 305, IO: 675, D: 487, d: 350, IO/d: 1.92, PO: 0.71.

Material studied. Holotype male. Colombia. Valle del Cauca, Sevilla. La Estrella. Finca Bretaña, 4°08'29"N: 75° 52' 02.5"W, 2265 m., I.31–II.1.2014. R. González, J. Panche, O. Saenz. Paratypes: four males, same data as the holotype. Led light trap in forest canopy. One male. Risaralda, Santuario de Flora y Fauna Otún-Quimbaya, Robledal, 4°44'N: 75°35'W, 1980 m., 26.IX.–11.X. 2011. G. López. 25 males. Risaralda, Santuario. Planes de San Rafael Natural Municipal Park, 5°07'10.5"N: 76°00'04.5"W, 2071m., 17–18.VII. 2015. R. González, N. Carrejo, N. Calderón, O. Saenz. Led light trap in forest canopy. (MUSENUV).

Etymology. The specific epithet refers to Finca Bretaña, in Sevilla, Valle del Cauca, where the holotype and four paratypes were collected.

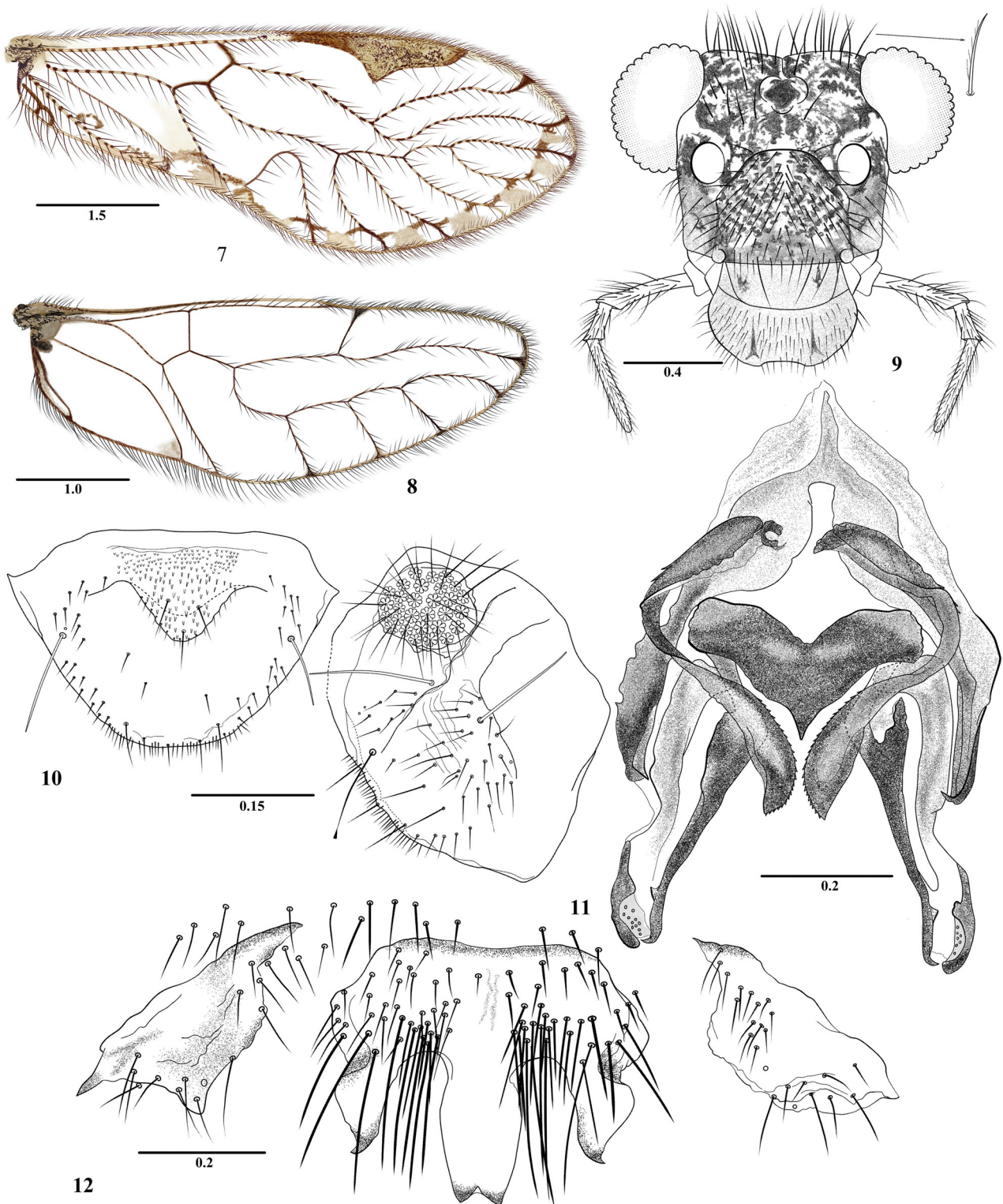
***Loneuroides colombianus* n. sp. Male**

(Figs 7–12)

Diagnosis. Differing from *L. venezolanus* García Aldrete, *L. bretanaensis* n. sp., and *L. santanderinus* n. sp., in having the median posterior process of the central sclerite of the hypandrium wider in the middle, narrowing posteriorly, and by having the lateral processes of the same sclerite short, stout, with outer border widely bulged, with short, acuminate apex directed outwards. Differing from *L. ledesmai* n. sp., by having the median process of the central sclerite of the hypandrium wide, obtusely concave posteriorly. Differing from *L. rionegroensis* n. sp., by having the central sclerite of the hypandrium with one, large median posterior process, flanked by smaller, pointed processes.

Color (in 80% ethanol). Body pale brown, with ochre and creamy areas. Head pale brown, with brown spots on front and postclypeus (Fig. 9); genae cream, with wide brown area; compound eyes dark brown, ocelli hyaline, with ochre centripetal crescents. Antennae and maxillary palps pale brown, Mx4 more pigmented. Legs brown, coxae with proximal and distal ochre spots, hind coxae creamy. Forewing with a marginal, pigmented band from R4+5 to 1A, with clear areas on each side of vein ends, at wing margin, from M1 to Cu1a, Cu1b and distal end of cell Cu1; pterostigma brown with little ochre spots (Fig. 7). Veins pale brown, with dark brown areolae on setal insertions. Abdomen creamy, with ochre subcuticular widespread spots. Epiproct and paraprocts cream, with ochre subcuticular spots; hypandrium brown.

Morphology. As in diagnosis, plus the following: Forewing M five branched; areola postica tall, apically rounded (Fig. 7). Hindwing M four-five branched (Fig. 8). Hypandrium of three sclerites, side sclerites elongate, irregular, with setae as illustrated; central sclerite with median process stout, obtusely concave posteriorly; lateral processes bulged on outer border, distally acuminate, pointed outwards (Fig. 12). Phallosome (Fig. 11), with external parameres slender, distally rounded, bearing pores. Anterior endophallic sclerites bow shaped, pointed at both ends; posterior endophallic sclerites proximally wide, narrowing distally, ending in a short claw; mesal transverse sclerite stout, anteriorly concave, posteriorly pointed (Fig. 11). Paraprocts robust (Fig. 10), with setae as illustrated, with one marginal macrosetae distally spatulate; sensory fields with 33–35 trichobothria on basal rosettes. Epiproct (Fig. 10) wide, trapeziform, setal fields as illustrated, and a distinct meso-anterior bulge, posteriorly rounded, bearing three setae and a field of microspines.



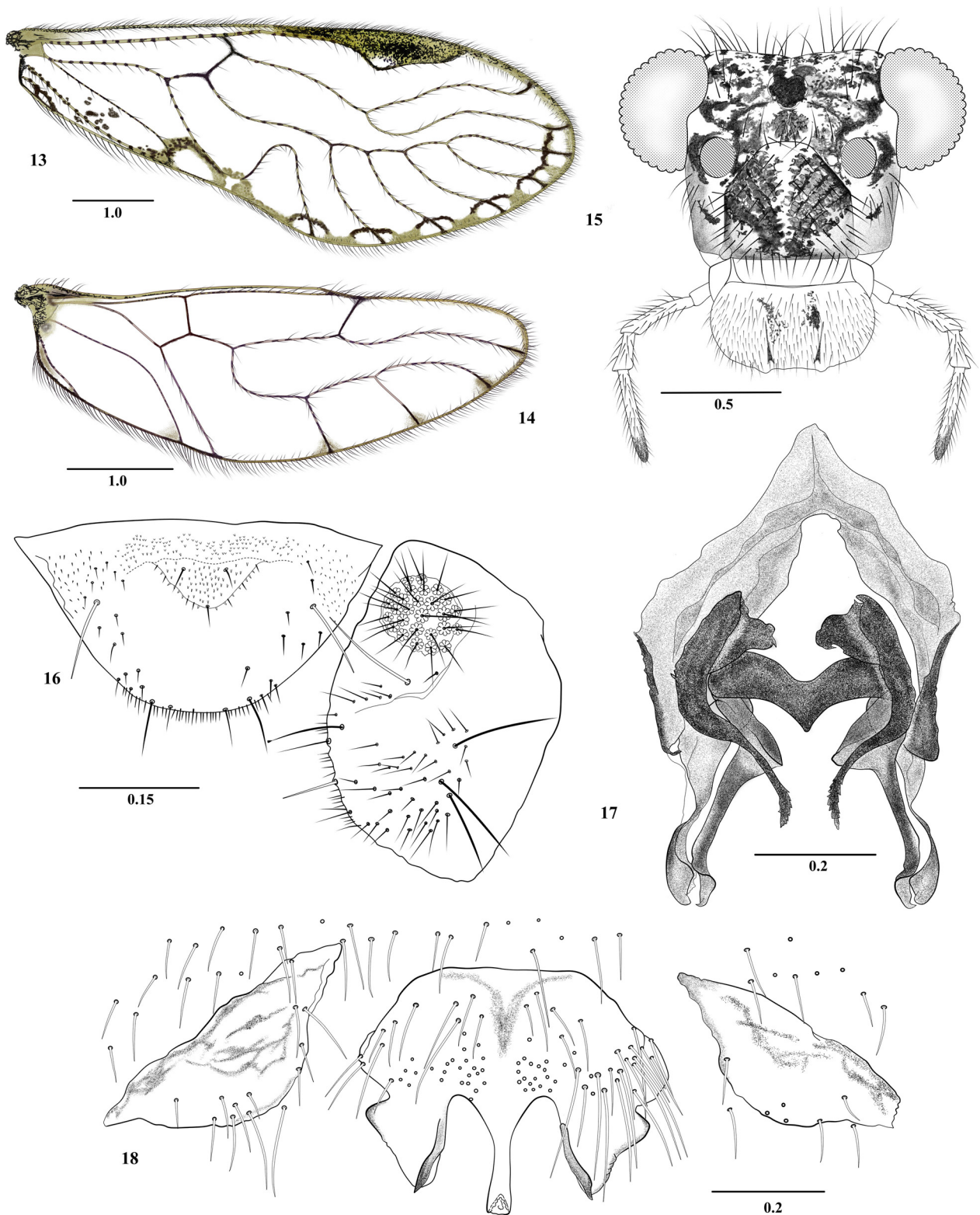
FIGURES 7–12. *Loneuroides colombianus* n. sp. Male. 7. Forewing. 8. Hindwing. 9. Front view of head. 10. Right paraproct and epiproct. 11. Phallosome. 12. Hypandrium. Scales in mm.

Measurements. FW: 6900, HW: 4650, F: 1725, T: 3075, t1: 1262, t2: 105, t3: 167, ctt1: 37, f1: 1350, f2: 1425, f3: 1250, f4: 987, f5: 620, f6: 537, f7: 425, f8: 350, Mx4: 410, IO: 657, D: 550, d: 400, IO/d: 1.64, PO: 0.72.

Material studied. Holotype male. Colombia. Valle del Cauca. Sevilla. La Estrella. Finca Bretaña, 4°08'29"N: 75° 52' 02.5"W, 2265 m., 3.XI. 2013. R. Gonzlez. Shannon light trap. Paratypes: 2 males, Huila, Belén,

Meremberg Natural Reserve, 2° 13' 08.25" N: 76° 07' 01.18" W. 2310 m. 21.I.2015. R. González, O. Saenz, N. Calderón. 10 males. Same locality, 14–15.X.2015. R. González. Led light trap in forest canopy. (MUSENUV).

Etymology. The specific epithet refers to the country of origin of this species, so far endemic to it.



FIGURES 13–18. *Loneuroides ledesmai* n. sp. Male. 13. Forewing. 14. Hindwing. 15. Front view of head. 16. Right paraproct and epiproct. 17. Phallosome. 18. Hypandrium. Scales in mm.

***Loneuroides ledesmai* n. sp. Male**

(Figs 13–18)

Diagnosis. Differing from *L. colombianus* n. sp., *L. bretanaensis* n. sp., *L. santanderinus* n. sp., and *L. venezolanus* García Aldrete, in having the median posterior process of the central sclerite of the hypandrium very slender and posteriorly straight. Differing from *L. rionegroensis* n. sp., in having the central sclerite of the hypandrium with one median, slender posterior process.

Color (in 80% ethanol). Body pale brown, with ochre brown spots. Head pale brown, with brown spots on front and postclypeus (Fig. 15); genae cream, with wide brown area; compound eyes dark brown, ocelli hyaline, with ochre centripetal crescents. Antennae and maxillary palps pale brown, Mx4 more pigmented. Legs pale brown, coxae with proximal and distal ochre spots, hind coxae creamy, hind femur cream with brown spots. Forewing with a marginal, pigmented band from R4+5 to 1A, with clear areas on each side of vein ends at wing margin, from M1 to Cu1a, Cu1b and distal end of cell Cu1; pterostigma brown with little ochre spots (Fig. 13). Veins pale brown, with dark brown areolae on setal insertions. Abdomen creamy, with ochre subcuticular widespread spots. Epiproct and paraprocts cream, with ochre subcuticular area; hypandrium brown.

Morphology. As in diagnosis, plus the following: forewing M of five branches (Fig. 13); areola postica tall, apically rounded; hindwing M of three branches (Fig. 14). Central sclerite of hypandrium with central process wide based, slender beyond base, side processes broad, pointed, bulged on outer border, inner border with a slender, sclerotized band; side sclerites with pointed ends, broadly semi-elliptic, setose (Fig. 18). Phallosome (Fig. 17). Paraprocts (Fig. 16) broad, robust, with setal field as illustrated, sensory fields with 26–29 trichobothria on basal rosettes. Epiproct (Fig. 16) trapeziform, with setae on sides and posteriorly as illustrated, meso-anterior field of microspines on posteriorly rounded bulge, bearing three setae, two anterior and one posterior.

Measurements. FW: 7000, HW: 4750, F: 1642, T: 3050, t1: 1325, t2: 130, t3: 205, ctt1: 33, f1: 1300, f2: 1375, f3: 1162, Mx4: 392, IO: 700, D: 512, d: 380, IO/d: 1.84, PO: 0.74.

Material studied. Holotype male. Colombia. Risaralda, Santuario. Municipal Natural Park Planes de San Rafael (Bocatoma), 0°07'10.5"N: 76°00'04.5"W, 2071m., 17–18.VII.2015. R. González, N. Carrejo, N. Calderón, O. Saenz. Led light trap in forest canopy. Paratypes: 2 males, Colombia. Huila, Belén, Meremberg Natural Reserve, 2° 13' 08.25" N: 76° 07' 01.18" W, 2310 m., 15–16.X.2015. R. González. Led light trap in forest canopy. (MUSENUV).

Etymology. This species is dedicated to Ovidio Ledesma, keeper of the Park Planes de San Rafael, for his help and dedication protecting the Park.

***Loneuroides rionegroensis* n. sp. Male**

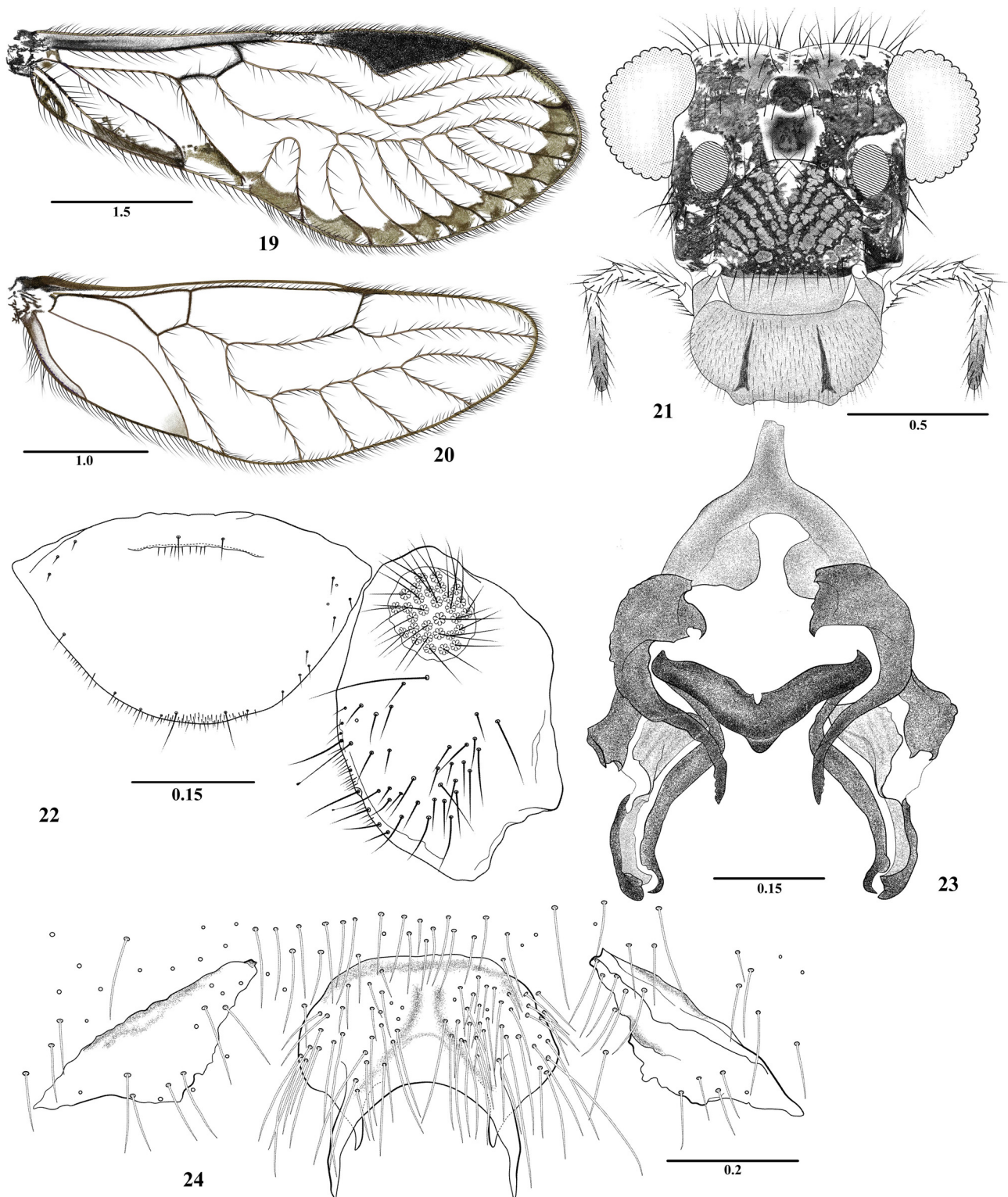
(Figs 19–24)

Diagnosis. This is the only species in the genus, so far known, having the median process of the central sclerite of the hypandrium very short, widely concave, with elongate lateral processes, and two short lateral posterior processes.

Color (in 80% ethanol). Body dark brown, with ochre brown areas. Head brown, with dark brown spots, labrum dark brown (Fig. 21). Compound eyes dark brown, ocelli hyaline, with ochre centripetal crescents. Antennae and maxillary palps brown, Mx4 more pigmented. Front and middle legs dark brown, with femur distally cream; hind legs with coxa, trochanter and femur creamy, tibiae and tarsi brown. Forewing with a marginal, pigmented band from R4+5 to distal half of 1A, with hyaline areas on sides of vein ends at wing margin, from M1 to Cu1b; pterostigma dark brown to black (Fig. 19). Veins pale brown. Abdomen dark brown, with ochre subcuticular spots. Epiproct and paraprocts pale brown, with subcuticular brown ochre spots; hypandrium with brown central sclerite, lateral sclerites brown to dark brown.

Morphology. As in diagnosis, plus the following: Forewing M with seven branches, the branch closer to the areola postica forked. Areola postica narrow, tall, apically rounded (Fig. 19). Hindwing M five or four branched (Fig. 20). Central sclerite of the hypandrium straight anteriorly, rounded on the sides, with median process very short, widely concave posteriorly, with two long lateral processes and, ventrally of the latter, two short, slender lateral processes (Fig. 24). Side sclerites of the hypandrium elongate, bearing setae as illustrated, with anterior border almost straight, and posterior border widely rounded (Fig. 24). Phallosome (Fig. 23) with side struts V

shaped, joined anteriorly, each arm dilated proximally on inner border; external parameres slender; two pairs of endophallic sclerites, the anterior pair bow shaped, much wider proximally, the posterior pair slender, next to external parameres, distally hooked, with apex pointing outwards; one mesal, transverse sclerite, widely V shaped, with rounded posterior apex. Paraprocts (Fig. 22) wide, robust, with setal field as illustrated and sensory fields with 30 trichobothria on basal rosettes. Epiproct (Fig. 22) almost trapeziform, with setae on sides and along posterior border, a field of microsetae along posterior border, and a transverse line near anterior border, with a row of small setae, and two setae between it and the anterior border.

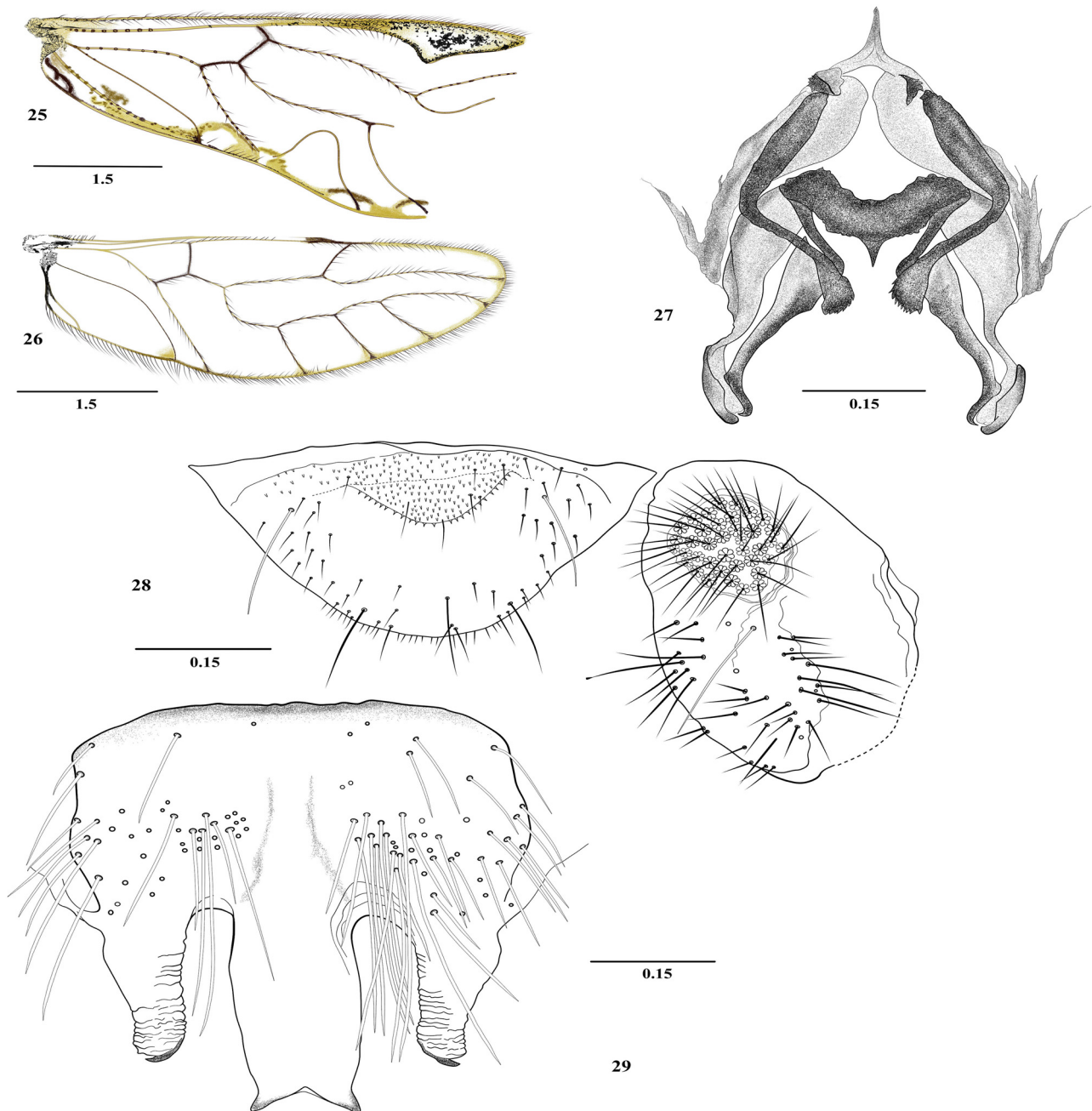


FIGURES 19–24. *Loneuroides rionegroensis* n. sp. Male. 19. Forewing. 20. Hindwing. 21. Front view of head. 22. Right paraproct and epiproct. 23. Phallosome. 24. Hypandrium. Scales in mm.

Measurements. FW: 6075, HW: 4225, F: 1400, T: 2475, t1: 987, t2: 102, t3: 162, ctt1: 31, f1: 975, f2: 957, f3: 837, f4: 837, f5: 837, f6: 837, Mx4: 374, IO: 700, D: 457, d: 330, IO/d: 2.12, PO: 0.72.

Material studied. Holotype male. Colombia, Risaralda, Pueblo Rico. Rio Negro Natural Municipal Park (Bocatoma), 5°12'28.1"N: 76°02'31.5"W, 1617m., 15–16.VII.2015. Led light trap in forest canopy. O. Saenz, N. Carrejo, N. Calderón and R. González (MUSENUV).

Etymology. The specific epithet refers to the Rio Negro Natural Municipal Park.



FIGURES 25–29. *Loneuroides santanderinus* n. sp. Male. 25. Forewing. 26. Hindwing. 27. Phallosome. 28. Right paraproct and epiproct. 29. Central sclerite of hypandrium. Scales in mm.

***Loneuroides santanderinus* n. sp. Male**
(Figs 25–29)

Diagnosis. Differing from *L. bretanaensis* n. sp., *L. colombianus* n. sp., *L. ledesmai* n. sp., and *L. venezolanus*

García Aldrete, in having the lateral processes of the central sclerite of the hypandrium stout, columnar, blunt ended, with a small, sclerotized, pointed projection, directed outwards, and by having the distal third of each process striated. Differing from *L. rionegroensis* n. sp., in that the latter has the central sclerite of the hypandrium widely concave, with two pairs of lateral, slender processes.

Color (in 80% ethanol). Body brown, with dark brown areas. Head missing. Legs pale brown, hind coxae cream with proximal brown spots. Forewing with a marginal, pigmented band from R4+5 (possibly) to confluence of Cu2-1A, with clear areas on each side of vein ends at wing margin; pterostigma clear with small ochre spots on membrane (Fig. 25). Veins pale brown, with dark brown areolae on setal insertions. Abdomen pale cream, with extensive ochre subcuticular spots. Epiproct, paraprocts and hypandrium pale brown.

Morphology. As in diagnosis, plus the following: Forewing mutilated, but with indication of having a marginal pigmented band, as in the other species of the genus. Areola postica tall, wide based, with apex rounded (Fig. 25). Hindwing M four branched (Fig. 26). Central sclerite of the hypandrium (Fig. 29) with median process stout, obtusely concave posteriorly, the postero-lateral apices directed meso-caudally. Phallosome (Fig. 27) anteriorly Y shaped, with stem short, pointed, each arm of the side struts widely dilated proximally on inner border. Two pairs of endophallic sclerites, anterior pair bow shaped, proximal half wider than distal one, distally dilated, bearing a row of short spines along posterior border; posterior pair proximally wide, narrowing distally, ending in a hook, directed outwards, next to external parameres. A mesal, strongly sclerotized, M shaped transverse sclerite, concave anteriorly and with a median pointed process posteriorly. Paraprocts (Fig. 28) large, semi-elliptic, with distal field of setae as illustrated; sensory fields with 37 trichobothria on basal rosettes. Epiproct (Fig. 28) almost straight anteriorly, rounded posteriorly, with setae on sides and posterior border as illustrated; a large, mesal, dense setal field, on a posteriorly rounded bulge, near anterior border.

Measurements. HW: 5075, F: 1825, T: 3425, t1: 1400, t2: 155, t3: 200, ctt1: 39.

Material studied. Holotype male. Colombia, Santander North, National Natural Park Tamá. Toledo, La Camacha Trail, Pozo Negro, 7°21'N: 72°28'W, 2213 m., 23.X.–2.XI.2003. C. Leal. Malaise trap. IAvH-E161354 (4029) (MAH).

Etymology. The specific epithet refers to the Colombian Department of Santander North, where the holotype was collected.

***Loneuroides tamaensis* n. sp. Female**

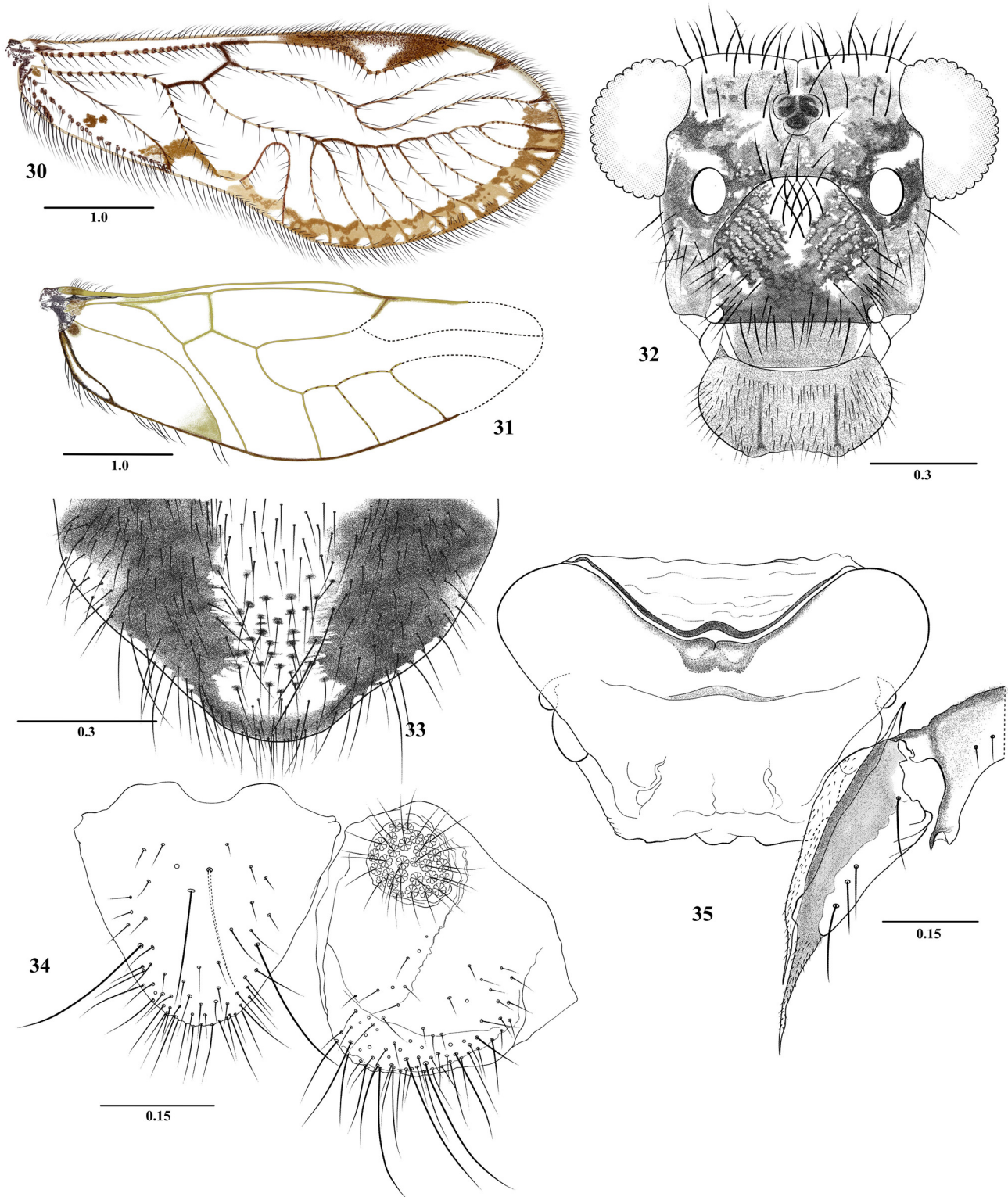
(Figs 30–35)

Diagnosis. Differing from the known species in the genus, in having the forewing M eight branched, the branch nearest the areola postica forked (see also Discussion, below).

Color (in 80% ethanol). Body dark brown, with ochre brown spots. Head brown, with dark brown spots (Fig. 32). Compound eyes dark brown, ocelli hyaline, with ochre centripetal crescents. Fore legs brown, hind legs cream, frontal and middle coxae with dark brown spots, hind coxae with proximal and distal brown spots; femur with apical brown ring. Forewing with a marginal, pigmented band from R4+5 to confluence of Cu2-1A, with clear areas on sides of some vein ends at wing margin; pterostigma brown with large, central clear area (Fig. 30). Veins pale brown, with dark brown areolae on setal insertions. Abdomen brown, with ochre subcuticular spots. Epiproct and paraprocts pale brown; subgenital plate with dark brown lateral and clear central area, with dark brown areolae on setal field.

Morphology. As in diagnosis, plus the following: Areola postica narrow, tall, almost reaching M, apex rounded (Fig. 30). Hindwing M four branched (Fig. 31). Subgenital plate (Fig. 33) broad, posteriorly rounded, with setae and pigmented areas as illustrated. Gonapophyses (Fig. 35), v1 long, slender, acuminate, v2+3 proximally wide, with a pointed heel, v3 with a row of four large setae, as illustrated, distal process straight, acuminate, with a field of microspines. Ninth sternum (Fig. 35) trapeziform, the anterior border wider than the posterior one; an irregular pigmented band anteriorly as illustrated. Paraprocts (Fig. 34) broadly triangular, rounded posteriorly, with setae as illustrated and sensory fields with 28 trichobothria in basal rosettes. Epiproct (Fig. 34) elongate, approximately triangular, posteriorly rounded, with setae as illustrated.

Measurements. FW: 7475, F: 1725, T: 3087, t1: 1300, t2: 120, t3: 207, ctt1: 36, Mx4: 450, IO: 725, D: 520, d: 375, IO/d: 1.93, PO: 0.72.



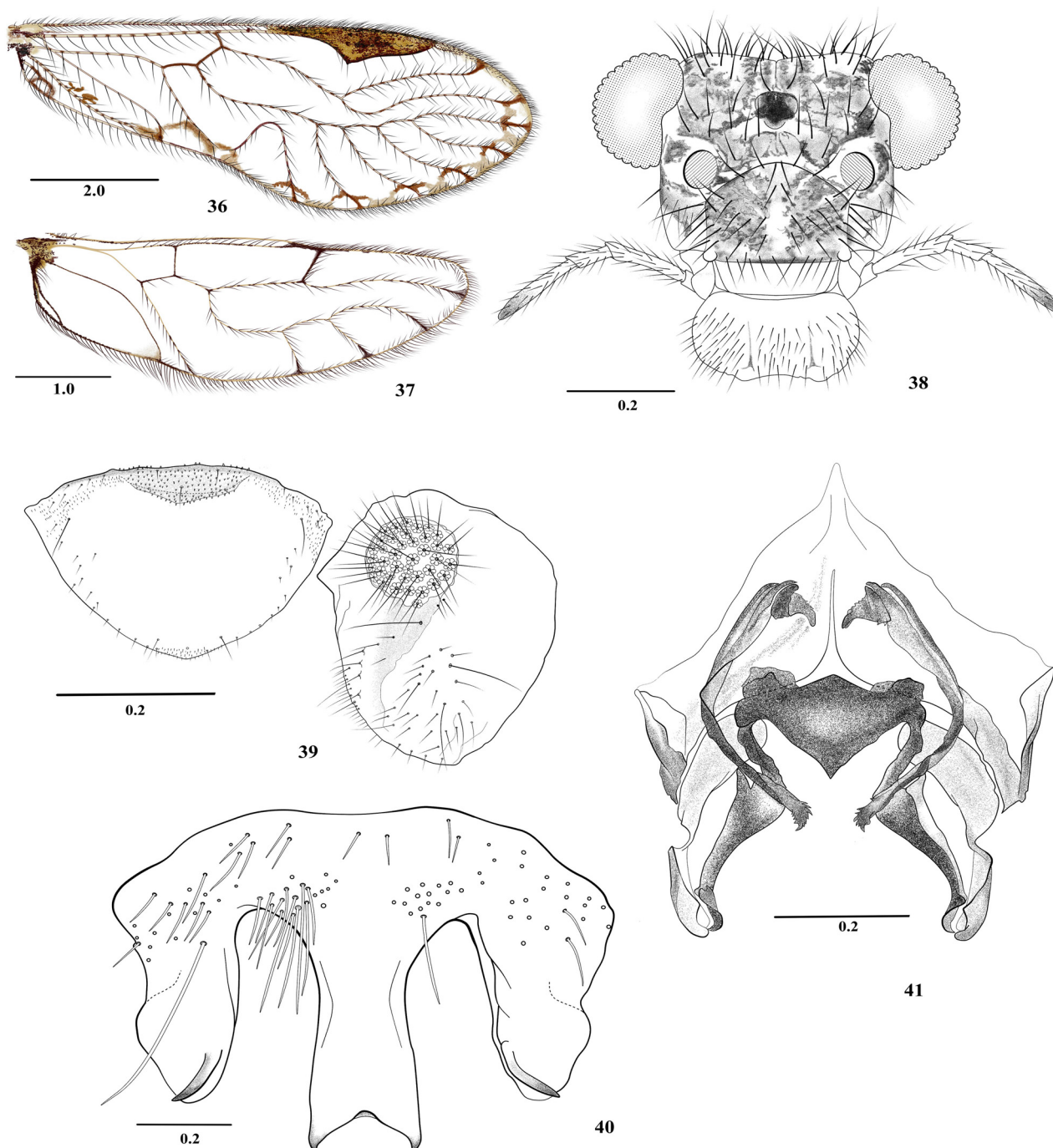
FIGURES 30–35. *Loneuroides tamaensis* n. sp. Female. 30. Forewing. 31. Hindwing. 32. Front view of head. 33. Subgenital plate. 34. Right paraproct and epiproct. 35. Ninth sternum and left gonapophyses (ventral view). Scales in mm.

Material studied. Holotype female. Colombia, Santander North, National Natural Park Tamá, Toledito Trail, 7°20'N: 72°29' W, 1970 m., Malaise trap. (MAH, IAvH-E146093. Code 3900). 1 paratype female. Same locality. 6.VIII.2005, 1821m. Malaise trap. (MAH, IAvH-E161364. Code 5180).

Etymology. The specific epithet refers to the National Natural Park Tamá, in the Department of Santander North, Colombia.

***Loneuroides venezolanus* García Aldrete, Male**
(Figs 36–41)

Color. (In 80% ethanol). Body, head (Fig. 38), legs, epiproct, paraprocts and wings as in the original female diagnosis (García Aldrete, 2006) plus the following: Hypandrium yellowish, phallosome dark brown.



FIGURES 36–41. *Loneuroides venezolanus* García Aldrete. Male. 36. Forewing. 37. Hindwing. 38. Front view of head. 39. Right paraproct and epiproct. 40. Central sclerite of hypandrium. 41. Phallosome. Scales in mm.

Morphology. As in generic diagnosis plus the following: Outer cusp of lacinial tip broad, with 6–7 denticles. Wings (Figs 36 and 37). Hindwing with M three branched (four branched in the female). Central sclerite of hypandrium (Fig. 40) with median posterior process stout, slightly constricted proximally, obtusely concave posteriorly, with postero-lateral corners pointed, directed posteriorly; lateral processes robust, blunt ended, each

bearing a slender, pointed apophysis distally. Phallosome (Fig. 41) Y shaped anteriorly, with stem short, pointed; each arm of the side struts broad, with the inner border rounded. Two pairs of endophallic sclerites, anterior pair bow shaped, proximally wide, hooked, distally slender, with ends spiny; posterior pair proximally wide, narrowing distally, hooked, with apices directed outwards, next to external parameres. A mesal, transverse, strongly sclerotized, broadly M shaped sclerite, convex anteriorly and pointed posteriorly. Paraprocts (Fig. 39) broad, elliptic, with setal field as illustrated and sensory fields with 38 trichobothria in basal rosettes. Epiproct (Fig. 39) broad, convex anteriorly, rounded posteriorly, with setae on sides and posterior border, and an anterior field with short spines mesally, on a slight bulge, next to anterior border.

Measurements. FW: 6175, HW: 4150, F: 1530, T: 2775, t1: 1175, t2: 100, t3: 182, ctt1: 33, f1: 1200, f2: 1300, f3: 850, Mx4: 380, IO: 687, D: 480, d: 355, IO/d: 1.93, PO: 0.73.

Material studied. Colombia. Valle del Cauca. Yumbo. Dapa. Finca Palo Alto, 3°34'9.0"N: 76°34'13.6"W, 1866 m., 26–28.III.2011. 2 males. J. Mendivil. 1 female, same locality, 16.X.2010. Led light trap six meters from ground level. R. González (MUSENUV).

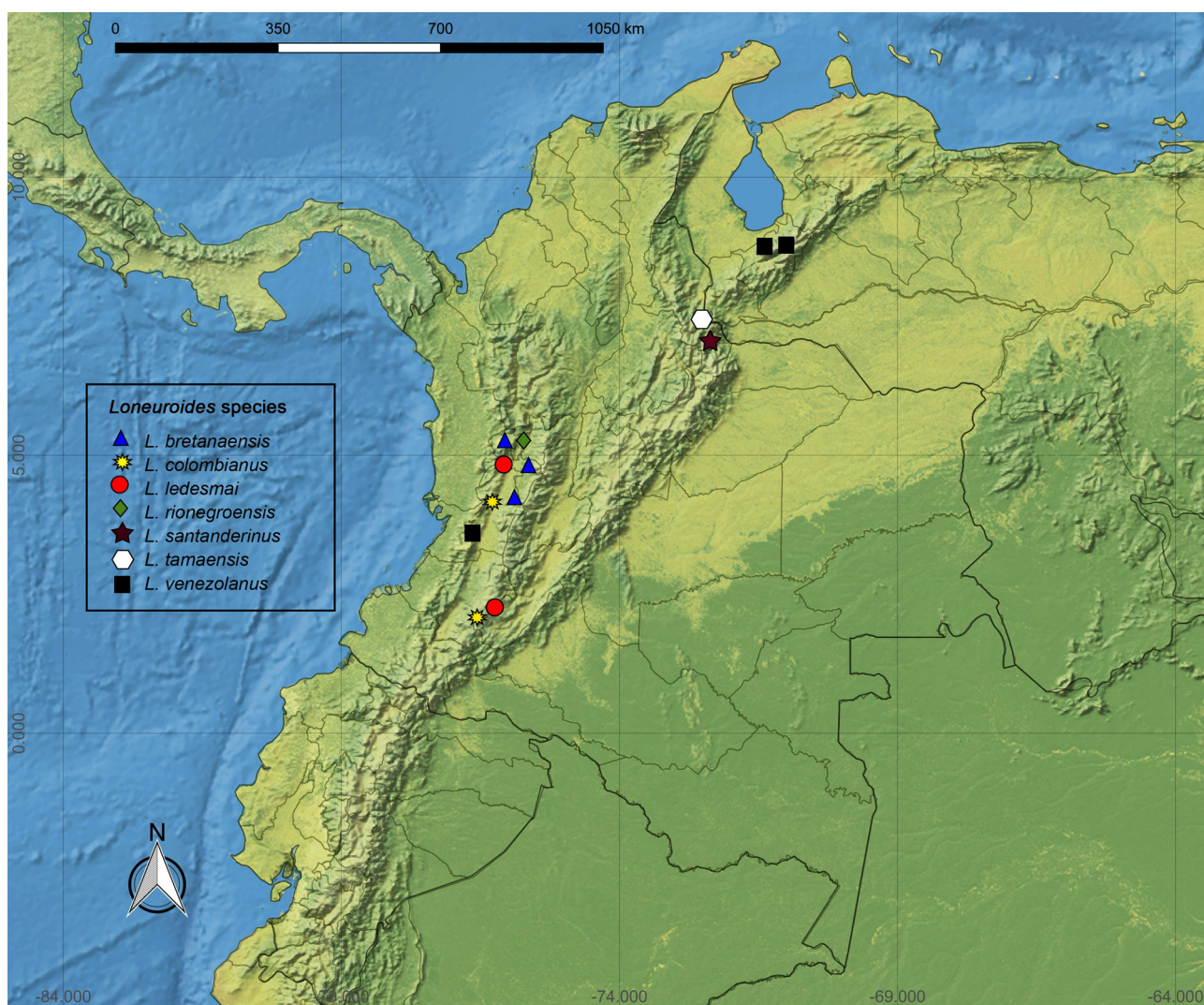


FIGURE 42. Distribution of the species of *Loneuroides* García Aldrete.

Discussion

Among the 12 genera of Ptiloneuridae, only *Brasineura* Silva Neto & García Aldrete, *Loneura* Navás, *Ptiloneura* Enderlein, and *Ptiloneuropsis* Roesler, have the hindwing vein M branched. Of these, only *Ptiloneura bidorsalis* Enderlein, and several species of *Loneura* have a forewing with pterostigma, areola postica and marginal

pigmented band particularly similar to that found in the species of *Loneuroides*. The latter differs from the above in having a crossvein from vein 2A to the wing margin. Therefore these three genera appear to constitute a cluster of related genera. Besides, the hypandrium in *Loneuroides* and in *Ptiloneura* is of three sclerites, a large central sclerite flanked by smaller sclerites, and in *Loneura*, a much larger genus, the hypandrium may be of one, three or five sclerites (García Aldrete *et al.*, 2011b).

On account of the number of M branches of the forewing, the possibility of *L. tamaensis* **n. sp.**, being the female of either *L. bretanaensis* **n. sp.**, *L. colombianus* **n. sp.**, *L. ledesmai* **n. sp.**, or *L. santanderinus* **n. sp.**, could be ruled out. But it could well be the female of *L. rionegroensis* **n. sp.**, on account of the same character, and in the similarity of the areola postica in both species; so in describing it here, we risk a possible future synonymy.

On basis of the hypandrium structure in the species of *Loneuroides*, two species groups can be recognized, as follows:

Species Group I. Central sclerite of the hypandrium with central process very short, widely concave posteriorly, with one pair of slender lateral posterior processes. Species included: *L. rionegroensis* **n. sp.**

Species Group II. Central sclerite of the hypandrium with central process long, flanked by a pair of lateral processes. Species included: *L. bretanaensis* **n. sp.**, *L. colombianus* **n. sp.**, *L. ledesmai* **n. sp.**, *L. santanderinus* **n. sp.**, and *L. venezolanus* García Aldrete.

Lienhard (*in litt.*) has correctly pointed out that the short, broad, widely concave central process of the central sclerite of the hypandrium of *L. rionegroensis*, is homologous with the elongate, two-pointed central processes of the other species.

In the second group *L. ledesmai* **n. sp.**, stands apart from the other species by having the median process of the central sclerite of the hypandrium slender and posteriorly straight; *L. bretanaensis* **n. sp.**, and *L. colombianus* **n. sp.** are considered sister species on basis of the lateral processes of the central sclerite of the hypandrium, and the shape of the transverse endophallic sclerite. Likewise, *L. santanderinus* **n. sp.**, and *L. venezolanus* García Aldrete are recognized as sister species, on basis of the structure of the central sclerite of the hypandrium, and the shape of the transverse endophallic sclerite.

The structure of the central sclerite of the hypandrium in the species of Group II is unique to *Loneuroides*, but a central sclerite of the hypandrium of the type observed in *L. rionegroensis* **n. sp.** has also been observed in *Euplocania guentherbuchi* González, García Aldrete & Carrejo (2015). Also, the pterostigma shape of *Loneuroides* has also been observed in several species of *Euplocania* (see González *et al.*, 2015), *Loneura* (see Castro, 2007), *Timnewia* (see García Aldrete, 2006), and in one species of *Triplocania* (personal observation of A. N. García Aldrete).

Setal tufts in the central sclerite of the hypandrium, such as the ones in the species of Group II of *Loneuroides*, have also been observed in *Loneura jinotegaensis* García Aldrete, *L. mirandaensis* García Aldrete (see García Aldrete, 2007), and in several undescribed Colombian species of *Loneura*.

The presence of the same characters (shape of pterostigma, hypandrium structure, hypandrial setal tufts) in different ptiloneurid genera is puzzling, and at least it may be an indication of relatedness in the genera involved.

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