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The species group *Amabilis* of the genus *Euplocania* Enderlein (Psocodea: Psocomorpha: Ptiloneuridae)

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Abstract

We here describe and illustrate 11 species of *Euplocania* in species group *Amabilis* from Brazil, Colombia and Ecuador. They raise to 33 the number of species described in the genus. An identification key to the males in the species group is included.

Key words: Barklouse, Epipsocetae, Psocoptera, South America, taxonomy

Introduction

Euplocania Enderlein 1910 is one of 11 genera in the psocopteran family Ptiloneuridae (Silva Neto *et al.,* 2018). It is the second richest genus in the family, with 22 described species and about 38 undescribed ones (González-Obando *et al.* 2017).

García Aldrete *et al.* (2013) recognized eight species groups in *Euplocania*, based on wing pigmentation, number of forewing M veins, shape of pterostigma and hypandrium structure. The genus shows a wide spectrum of morphological variability and the number of species groups was recently increased to 12: *Amabilis*, *Cerata*, *Guentherbuchi*, *Laelsa*¸ *Marginata*, *Yalcona, Zelayensis*, "A", "B", "C", "D" and "E" (González Obando *et al.* 2015; 2017).

Species group *Amabilis* is diagnosed by having the forewing with a broad, pigmented marginal band from R_{4+5} to cells 'a' and cu_2; pterostigma angulate, extended towards Rs; hypandrium of three sclerites, a large central one, flanked by two small ones and by having the central sclerite with two lateral posterior projections (García-Aldrete *et al.* 2013). This group included five described species: *E. amabilis* Enderlein, 1910 (Paraguay), *E. badonneli* New & Thornton, 1988 (Peru, Brazil, Colombia), *E. macarenaensis* González, García Aldrete & Carrejo*,* 2015 (Colombia)*, E. picta* New, 1980 (Brazil) and *E. pictaoides* García Aldrete, 1998 (Peru) and six undescribed species previously reported by García Aldrete *et al.* (2013): *Euplocania* V, *Euplocania* VI, *Euplocania* IX, *Euplocania* X, *Euplocania* XI from Brazil, and *Euplocania* XVI, from Ecuador. In addition, five undescribed Colombian species were found, upon examination of specimens collected in the framework of the project "Revisión Taxonómica y Endemismo de los Psócidos (Insecta: Psocodea: 'Psocoptera') de Areas Protegidas De Colombia", in the Departments of Chocó, Meta, Putumayo, Valle del Cauca and Vaupés. The purpose of this work is to describe and illustrate these 11 species.

Materials and methods

20 males were available for study, ten of which belong to the Grupo de Investigaciones Entomológicas (Departamento de Biología, Facultad de Ciencias Naturales y Exactas, Universidad del Valle, Santiago de Cali, Colombia) collection and are deposited in the Museo de Entomología de la Universidad del Valle (MUSENUV)

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Collection, Santiago de Cali, Colombia. Two males belong to the Instituto Alexander von Humbolt collection (Villa de Leyva, Boyacá, Colombia). The remaining belong to the Instituto Nacional de Pesquisas da Amâzonia (INPA), Manaus, Amazonas, Brazil, and one male belongs to the Smitsonian Institution Collection, Washington, D. C. USA. The location of the specimens studied is indicated in each description.

One to four specimens of each species, that were preserved in 80% ethanol, were dissected and their parts (head, right wings and legs and abdominal terminalia), were mounted on slides in Canada balsam, following standard procedures. Color was recorded by placing whole specimens, before dissection, under a stereoscopic microscope, illuminated with cold, white light at 50X. Parts on the slides were measured, following standard procedures, and the measurements are given in microns; the illustrations were made from digital photographs, taken with a Canon T5i camera and Helicon Focus program, processed in a vector graphics editor. Abbreviations of parts measured are as follows: **al/ah:** areola postica length/height; **ctt1:** number of ctenidiobothria on t1; **f1-fn:** lengths of flagellomeres 1-n of right antenna; **F, T, t1–t3:** lengths of femur, tibia, and tarsomeres 1–3 of right hindleg; **FW** and **HW:** lengths of fore- and hind- wings; **H**: head median length (in dorsal view); **IO, D,** and **d:** minimum distance between compound eyes, antero-posterior diameter and transverse diameter, respectively, of right compound eye, **MxW:** maximum width of head capsule; all in dorsal view of head; **L/W:** forewing length/forewing width; **lp/wp:** pterostigma length/pterostigma width; **l/w:** hindwing length/hindwing width; **Mx4, Mx2:** length of fourth and second segment of right maxillary palpus; **PO:** d/D. Ratio head length (H/d and H/D). Ratio H/MxW. Ratio IO/MxW.

Results

Key to *Euplocania* males in the *Amabilis* species group

1. Central sclerite of hypandrium with postero-lateral processes longer than wide, distally curved inward or not (Figs 24, 60) 2
- Central sclerite of hypandrium with postero-lateral processes almost as wide as long, if longer then distally dilated (Figs 6, 12, 36, 48, 54) 5
2. Central sclerite of hypandrium elongate, postero-lateral processes, straight, stout; mesal endophallic sclerite as in Fig. 59 . . . . . *Euplocania tocantina* **n. sp.**
- Central sclerite of hypandrium with postero-lateral processes curved inward 3
3. Mesal endophallic sclerite with posterior border denticulate (Fig. 29). . . . . *Euplocania katios* **n. sp.**
- Mesal endophallic sclerite with posterior border not denticulate (Fig. 23) 4
4. Mesal endophallic sclerite with two pairs of postero-lateral processes and one pair of anterior processes (Fig. 23) . . . . . *Euplocania equorum* **n. sp.**
- Mesal endophallic sclerite with one pair of postero-lateral processes, not bearing a median, posterior process (see Fig. 24 in New & Thornton 1988). . . . . *Euplocania badonneli* New & Thornton
5. Postero-lateral processes of the central sclerite of hypandrium broad, almost square, with longitudinal lines, each with a short, acuminate process basally, on the inner side (Fig. 6). Mesal endophallic sclerite without median posterior projection (Fig. 5) . . . . . *Euplocania ariasi* **n. sp.**
- Postero-lateral processes of the central sclerite of hypandrium with or without acuminate processes basally on the inner side, if present, not shorter than the outer process (Figs 30, 42). Mesal endophallic sclerite with median posterior processes (Figs 11, 29, 41, 65) 6
6. Postero-lateral processes of the central sclerite of hypandrium with inner acuminate process longer (Fig. 48) or equal (Fig. 42) to the external area 7
- Postero-lateral processes of the central sclerite of hypandrium without acuminate inner process (Fig. 36), or if present, shorter than the external area (Figs 54, 66). 8
7. Mesal endophallic sclerite with median posterior projection short (Fig. 47); central sclerite of hypandrium as in Fig. 48. . . . . *Euplocania metensis* **n. sp.**
- Mesal endophallic sclerite with median posterior projection long (Fig. 41); central sclerite of hypandrium as in Fig. 42 . . . . . *Euplocania manausensis* **n. sp.**
8. Mesal endophallic sclerite M-shaped, with postero median projection longer than the lateral processes (Fig. 35); central sclerite of hypandrium as in Fig. 36 . . . . . *Euplocania lasdelicias* **n. sp.**
- Mesal endophallic sclerite not as above (Figs 11, 53, 65), if M-shaped, the postero median projection shorter than the side processes (Fig. 17), central sclerite of hypandrium variable (Figs 12, 54) 9
9. Mesal endophallic sclerite with postero-lateral projections long, well developed 10
- Mesal endophallic sclerite with postero-lateral projections absent or very short 12
10. Mesal endophallic sclerite with postero-lateral projections longer than the median process; central sclerite of hypandrium with bifurcate lobes flanking a short median arc, ridged longitudinally each side of midline (Fig. 16 in New (1980)) . . . . . *Euplocania picta* New
- Mesal endophallic sclerite with median posterior projection not as long as the lateral projections (Fig. 23) 11

11. Mesal endophallic sclerite with postero-lateral projections bifurcated; central sclerite of hypandrium with posterior processes bearing a field of spines, and with acuminate projection directed inward . . . . . *Euplocania pictaoides* García Aldrete
- Mesal endophallic sclerite with postero-lateral projections not bifurcated; central sclerite of hypandrium with postero-lateral processes (Fig. 18). . . . . *Euplocania ecuatoriana* **n. sp.**
12. Outer border of postero-lateral processes of the central sclerite of hypandrium rounded, spinose as in *E. pictaoides* (Fig. 54); anterior margin of mesal endophallic sclerite almost straight, with postero-median projection twice as long as the width of the sclerite (Fig. 53) . . . . . *Euplocania rafaeli* **n. sp.**
- Outer border of postero-lateral processes of the central sclerite of hypandrium not as above; anterior border of the mesal endophallic sclerite strongly emarginated, V-shaped or with antero-lateral projections, postero-median projections not as above 13
13. Anterior border of mesal endophallic sclerite strongly concave, lateral arms directed forward, V-shaped (Fig. 65); anterior endophallic sclerite strongly emarginated anteriorly . . . . . *Euplocania vaupesiana* **n. sp.**
- Anterior border of mesal endophallic sclerite straight, lateral projections separated (Fig. 11); anterior endophallic sclerite not as above. . . . . *Euplocania caldasi* **n. sp.**

Taxonomic treatment

Euplocania ariasi n. sp. Male
Figs 1–6

Diagnosis. It is close to *E. caldasi* n. sp., *E. ecuatoriana* n. sp., *E. lasdelicias* **n. sp.**, *E. picta* New, *E. pictaoides* García Aldrete, *E. rafaeli* **n. sp.**, and *E. vaupesiana* **n. sp.**, from which it differs by the shape of the postero-lateral processes of the central sclerite of the hypandrium, and by the phallosome endophallic sclerites.

Color (in 80% ethanol) Head pattern (Fig. 3). Compound eyes black, ocelli with ochre centripetal crescents. Labrum pale brown. Genae with dark brown transverse bands. Scape and pedicel pale brown. Maxillary palps brown, Mx4 distally dark brown. Forewings veins brown, with a dark brown spot at wing margin and a clear window surrounding the latter. Pterostigma dark brown (Fig. 1). Hindwings hyaline, with pale brown veins, except Cu, A2 and stem of R which are brown, each vein with a brown spot at wing margin (Fig. 2). Central sclerite of hypandrium pale brown, with median V-shaped dark brown area posteriorly; postero-lateral processes ochre. Epiproct damaged, paraprocts with dark brown curved band on outer border of sensory fields.

Morphology. Head (Fig. 3): H/MxW: 1.51; upper border of compound eyes slightly below the level of the slightly concave vertex, H/d: 3.58; IO/MxW: 0.46; H/D: 2.29. Outer cusp of lacinial tip broad, with seven denticles. Forewings (Fig. 1): L/W: 2.61. Pterostigma: lp/wp: 3.92, areola postica tall, slanted posteriorly, with rounded apex: al/ah: 1.83. Hindwings (Fig. 2): l/w: 2.92. Central sclerite of hypandrium with sides almost parallel, convex anteriorly, with claw-shaped acuminate internal process on the posterior projections, postero median concavity V-shaped, strongly sclerotized, side sclerites lost (Fig. 6). Phallosome (Fig. 5); side struts lost; external parameres sclerotized, broad, rounded posteriorly and forked anteriorly, the two arms slender. Two pairs of endophallic sclerites and one transverse mesal sclerite; antero-median pair with a long proximal projection; mesal sclerite with two latero-posterior projections. Paraprocts (Fig. 4) anteriorly wide; sensory fields with 20 trichobothria on basal rosettes

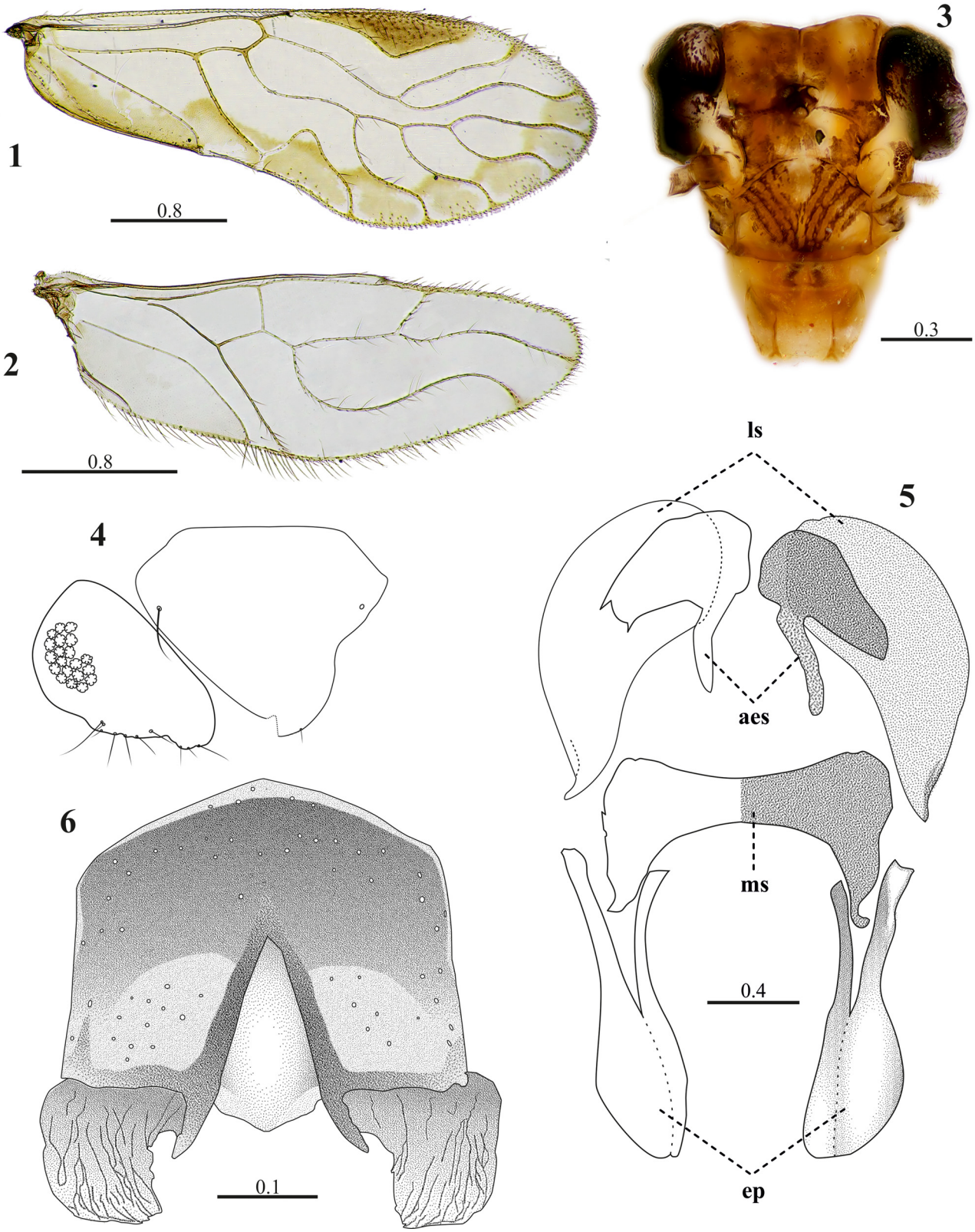
Measurements. FW: 3975, HW: 2850, F: 875, T: 1075, t1: 520, t2: 80, t3: 110, ctt1: 17, f1: 750, f2: 550, IO: 490, D: 470, d: 300, IO/d: 1.63, PO: 0.64.

Specimen studied. Holotype male. **BRAZIL.** Goiás, Xambioá, Rio Araguaia. 11º42’49”S: 50º40’28”W. 8. XII.1982. J. Arias. CDC light trap. INPA.

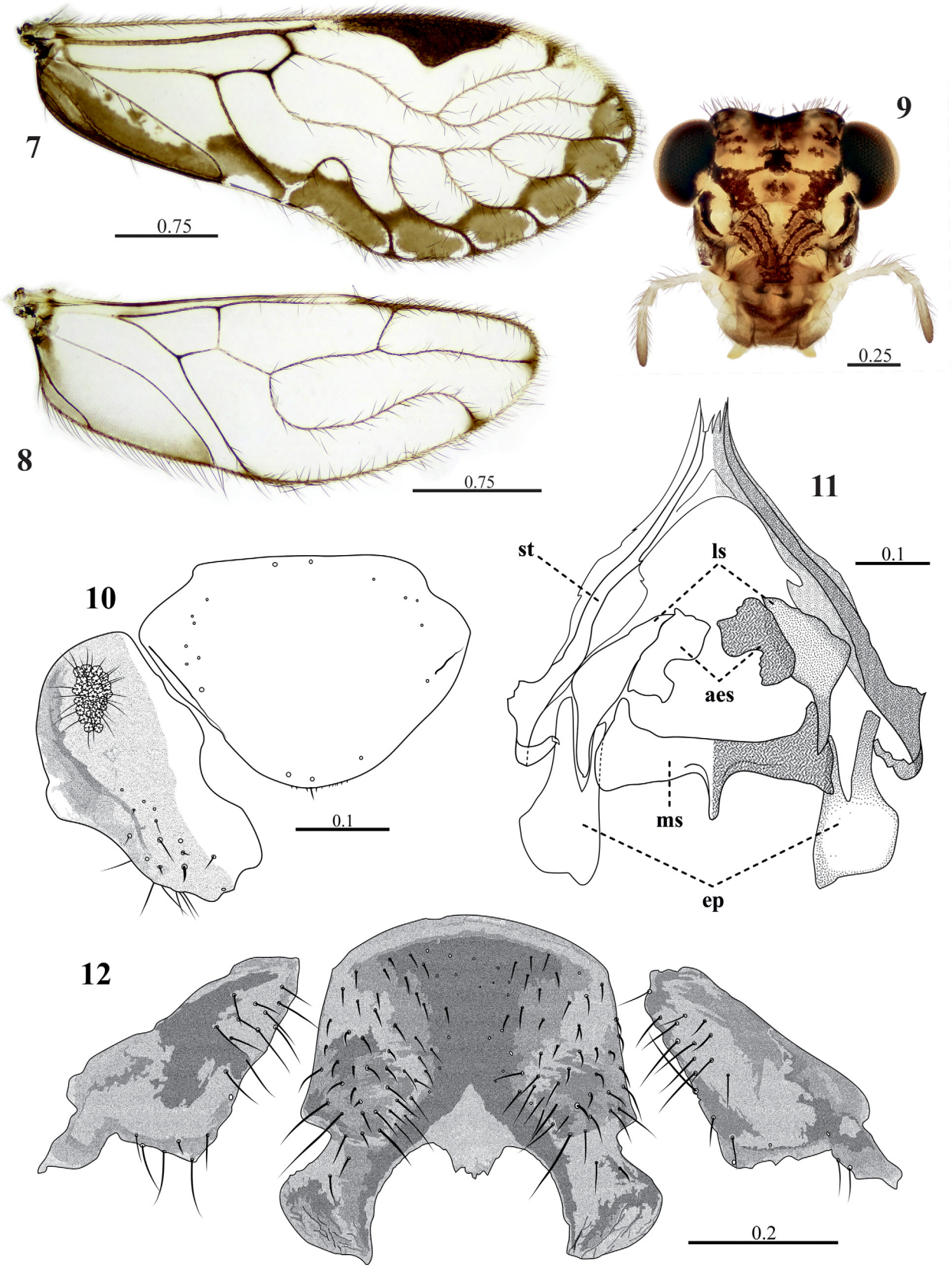
Etymology. This species is dedicated to its collector Jorge Arias, formerly a researcher at the Instituto Nacional de Pesquisas da Amâzonia, Manaus, Amazonas, Brazil.

Euplocania caldasi n. sp. Male
Figs 7–12

Diagnosis. Close to *E. pictaoides, E. vaupesiana* **n. sp.**, *E. ecuatoriana* **n. sp.**, *E. lasdelicias* **n. sp.**, and *E. rafaeli* **n. sp.**, from which it differs by the phallosome structure, particularly the shape of the mesal endophallic sclerite and the antero-mesal endophallic sclerite.



FIGURES 1–6. *Euplocania ariasi* **n. sp.** Male. 1. Forewing. 2. Hindwing. 3. Front view of head. 4. Left paraproct and epiproct. 5. Phallosome. 6. Hypandrium. aes, anterior endophallic sclerite; ep, external parameres; ls, lateral sclerite; ms, mesal sclerite. Scales in mm.



FIGURES 7–12. *Euplocania caldasi* **n. sp.** Male. 7. Forewing. 8. Hindwing. 9. Front view of head. 10. Left Paraproct and epiproct and. 11. Phallosome. 12. Hypandrium. aes, anterior endophallic sclerite; ep, external parameres; ls, lateral sclerite; ms, mesal sclerite; st, side struts. Scales in mm.

Color (in 80% ethanol). Body pale brown, with creamy areas, as indicated below. Head ochraceous, with dark brown pattern as illustrated (Fig. 9). Compound eyes dark brown, ocelli hyaline, with ochre centripetal crescents. Tergal lobes of meso- and metathorax brown. Thoracic mesopleura brown, more pigmented than pro- and metapleura. Legs: hind- and mid- coxae creamy, with proximal dark brown stripe; fore coxa ochraceous with proximal dark brown stripe. Femora, tibia and tarsi pale brown, Forewing veins pale brown, with a dark brown spot at wing margin; first section of vein Rs, vein M, vein Cu1 and cross vein Rs-M, dark brown; pterostigma dark brown (Fig. 7). Hindwings hyaline, veins brown with a dark spot at the apex (Fig. 8). Abdomen creamy, with subcuticular transverse dark spots. Central sclerite of hypandrium brown with a dark brown Y-shaped mark. Epiproct pale brown; paraprocts pale brown, dark brown area on outer border.

Morphology. Head (Fig. 9): H/MxW: 1.56, H/d: 3.87, H/D: 2.6, upper border of compound eyes below the level of the vertex, this emarginate medially, IO/MxW: 0.47; outer cusp of lacinial tip broad, with six denticles. Forewings (Fig. 7). L/W: 2.39, pterostigma elongate, projected in the middle towards Rs, lp/wp: 3.67. Areola postica tall, slanted posteriorly, apex rounded, al/ah: 1.83. Hindwings (Fig. 08): l/w: 2.66. Central sclerite of hypandrium with bifurcated postero-lateral processes, distally broad, flanking a short and denticulate median arch (Fig. 12). Phallosome with side struts V-shaped (Fig. 11), external parameres distally dilated, membranous; lateral endophallic sclerites spindle-shaped, wider in the middle and sharply narrow at the ends. Mesal endophallic sclerite transverse, with two antero-lateral projections, and one postero-median projection. Paraprocts (Fig. 10) elongate, broadly oval, with a setal field distally, sensory fields with 26 trichobothria on basal rosettes. Epiproct wide, broadly triangular, anteriorly straight, posteriorly rounded, posterior border with setae as illustrated (Fig. 10).

Measurements. FW: 4250, HW: 2925, F: 1100, T: 1900, t1: 760, t2: 90, t3: 140, ctt1: 24, f1: 790, f2: 710, f3: 670, f4: 580, f5: 430, f6: 370, f7: 320, f8: 270 Mx4: 250, IO: 560, D: 460, d: 310, IO/d: 1.81, PO: 0.67.

Specimen studied. Holotype male. **COLOMBIA.** Putumayo, Puerto Asís. 00°23’21.0’’N: 76°31’41.9”W. 264 m. 5.III.2014. J. Panche. MUSENUV slide code No. 28993. Led light trap in forest canopy.

Etymology. This species is dedicated to "El Sabio" Francisco José de Caldas y Tenorio (1768–1816), first Colombian scientist and one of the precursors of the fight for the independence of Colombia; whose research, curiosity and desire for knowledge were valuable in a time of darkness for America and Colombia.

Euplocania ecuatoriana n. sp. Male

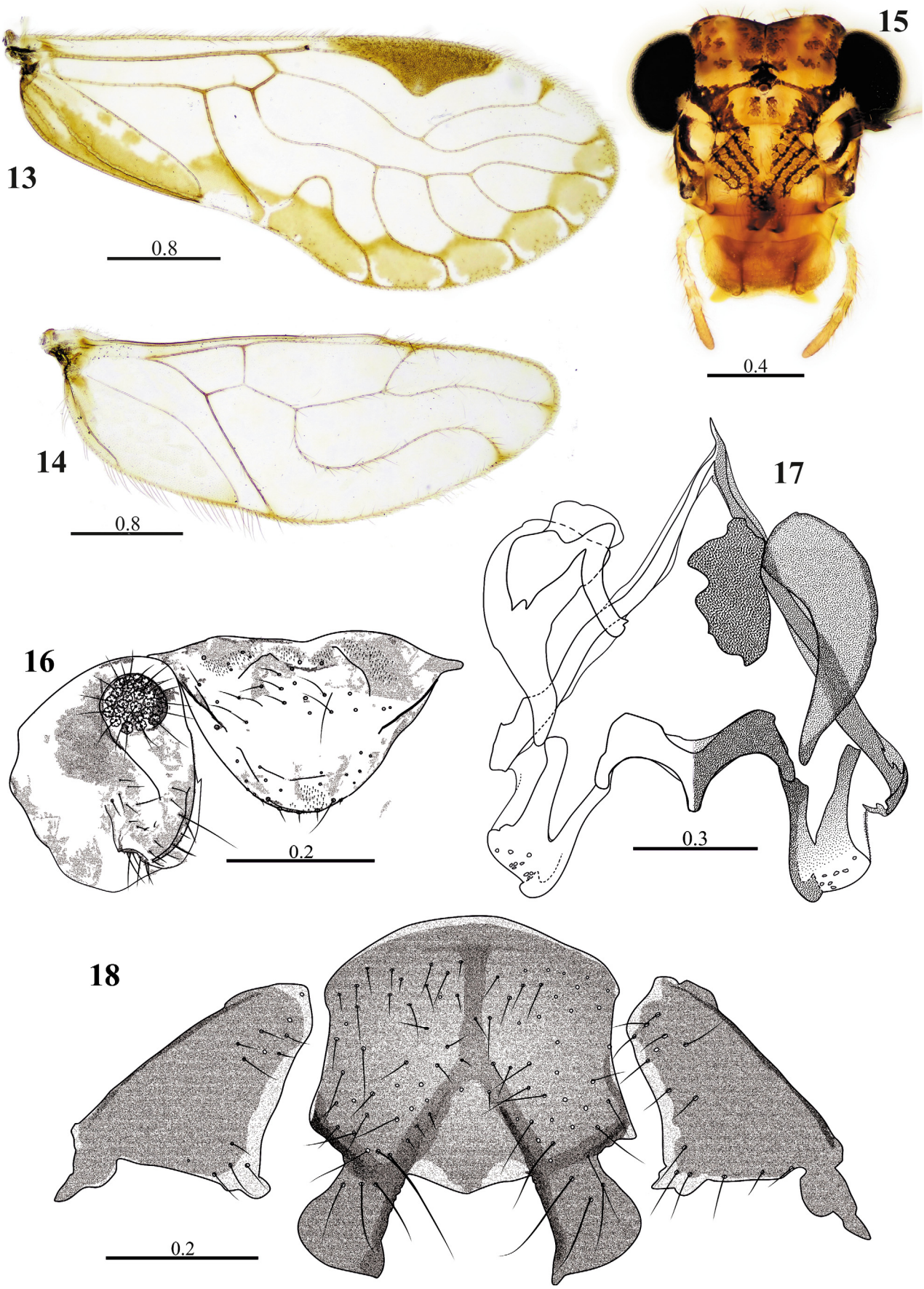
Figs 13–18

Diagnosis. It is related to *E. caldasi* **n. sp.**, *E. rafaeli* **n. sp.**, *E. lasdelicias* **n. sp.**, *E. vaupesiana* **n. sp.**, *E. picta* New, and *E. pictaoides* García Aldrete, from which it differs by the posterior processes of the central sclerite of the hypandrium, and by the shape of the mesal endophallic sclerite.

Color (in 80% ethanol). Head ochraceous, with a dark brown pattern as illustrated (Fig. 15). Forewings veins brown, with a dark brown spot at wing margin surrounded by a clear window. Pterostigma dark brown, slightly less pigmented at the lower angle; first section of vein Rs, vein M, Cu1 and crossvein Rs-M dark brown (Fig. 13). Hindwings hyaline, veins pale brown, with a dark brown spot distally (Fig. 14). Central sclerite of hypandrium pale brown, with median Y-shaped dark brown sclerotization. Epiproct pale brown, paraprocts pale brown, with a dark brown curved band limiting the outer border of the sensory fields.

Morphology. Head (Fig. 15): H/MxW: 1.46, H/d: 3.59, compound eyes large: IO/MxW: 0.5; H/D: 2.55. Vertex concave in the middle. Lacinia with seven denticles. Forewings (Fig. 13). L/W: 2.38, pterostigma elongate, angulate towards Rs, lp/wp: 3.29. Areola postica tall, apex rounded, slanted posteriorly al/ah: 1.07. Hindwings (Fig. 14): l/w: 2.2. Central sclerite of hypandrium bifurcate as in Fig. 18; side sclerites large, broadly triangular. Phallosome with side struts V-shaped (Fig. 17), external parameres with outer border membranous, internally sclerotized, membranous area bearing pores, slightly projected posteriorly. Mesal endophallic sclerite (Fig. 17), M-shaped, with median and lateral posterior projections almost equal in length. Paraprocts (Fig. 16) oval, with setae as illustrated, sensory fields with 32 trichobothria on basal rosettes. Epiproct wide, subtriangular, basally rounded, convex apically, with four macrosetae: two preapical and two medial; two little apical setae; other setae as illustrated (Fig. 16).

Measurements. FW: 4350, HW: 2975, F: 625, T: 1325, t1: 750, t2: 60, t3: 100, ctt1: 14, f1: 240, f2:870, f3:740, f4:600, Mx4: 250, IO: 570, D: 450, d: 320, IO/d: 1.78, PO: 0.71.



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

Specimen studied. Holotype male**. ECUADOR.** Napo. Reserva Étnica Waorani, 1Km S. Onkone Gare Camp. 00º30'10''S: 76º26'0''W. 220m. 11.II.1995. Fogging terre firma forest. T. L. Erwin *et al.*

Etymology. The specific name refers to the country of origin of this species: Ecuador: it is the first species of *Euplocania* described from this country.

Euplocania equorum n. sp. Male

Figs 19–24

Diagnosis. It is close to *E. badonneli* New & Thornton and to *E. katios* **n. sp.** It differs from them by details of the phallosome endophallic sclerites, particularly the mesal sclerite.

Color (in 80% ethanol). Head pattern (Fig. 21). Compound eyes black, ocelli with ochre centripetal crescents. Clypeus, vertex and labrum pale brown. Genae with longitudinal dark brown stripes. Antennae brown. Forewings veins brown, with a dark brown spot at wing margin surrounded by a clear window. Pterostigma dark brown (Fig. 19). Hindwings hyaline, veins brown, with a brown spot at wing margin (Fig. 20). Central sclerite of hypandrium pale brown, with median Y-shaped dark brown area; postero-lateral processes ochraceous with clear border. Epiproct pale, paraprocts with a dark semi-circular band partially limiting the sensory fields.

Morphology. Head (Fig. 21): H/MxW: 1.49, vertex concave; compound eyes large, H/d: 3.06; H/D: 2.03; IO/MxW: 0.47. Outer cusp of lacinial tip broad, with six denticles. Forewings (Fig. 19): L/W: 2.54. Pterostigma: lp/wp: 3.53, areola postica with rounded apex: al/ah: 1.96. Hindwings (Fig. 20): l/w: 2.77. Central sclerite of hypandrium convex anteriorly with a slight notch in the middle, deeply concave posteriorly, latero-posterior processes distally curved inward, side sclerites triangular (Fig. 24). Phallosome (Fig. 23) anteriorly V-shaped, with slender side struts; external parameres membranous, distally broad and rounded; two pairs of endophallic sclerites, and one posterior transverse mesal sclerite, the latter one with two pairs of postero-lateral process and one pair of antero-lateral process, making the sclerite looks like two horses. Paraprocts (Fig. 22) almost elliptic, with a dense setal field distally; sensory fields with 27 trichobothria on basal rosettes. Epiproct (Fig. 22) broad, triangular, rounded posteriorly, setal field on sides and anteriorly; two pairs of large setae, one median and one preapical.

Measurements. FW: 4500, HW: 2975, f1: 960, IO: 520, D: 540, d: 360, IO/d: 1.44, PO: 0.66.

Specimen studied. Holotype male. **BRAZIL.** Pará, Rio Araguaia S. Cenuldo e Conceicudo, Araguaia. 08º20'58.92''S: 49º18'31.32''W. 15 m. XI.1982. J. Arias. CDC light trap. Treetop I. 15m. INPA.

Etymology. The specific name refers to the symmetrical lateral projections in the mesal endophallic sclerite that look like two horses.

Euplocania katios n. sp. Male

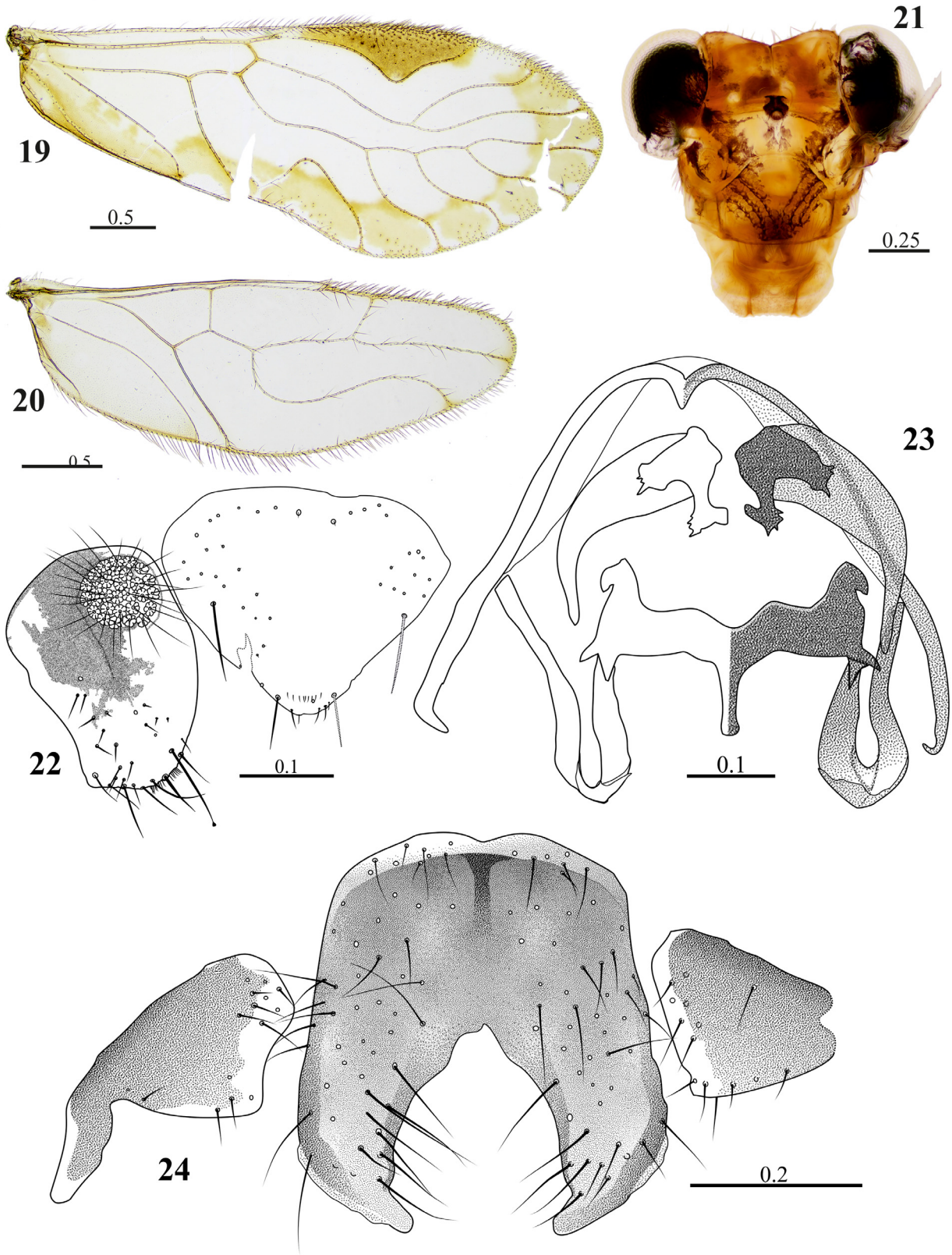
Figs 25–30

Diagnosis. Related to *E. badonneli* New & Thornton and to *E. equorum* **n. sp.**, differing from them by having the posterior border of the mesal endophallic sclerite denticulate and with a pair of rounded antero-lateral processes.

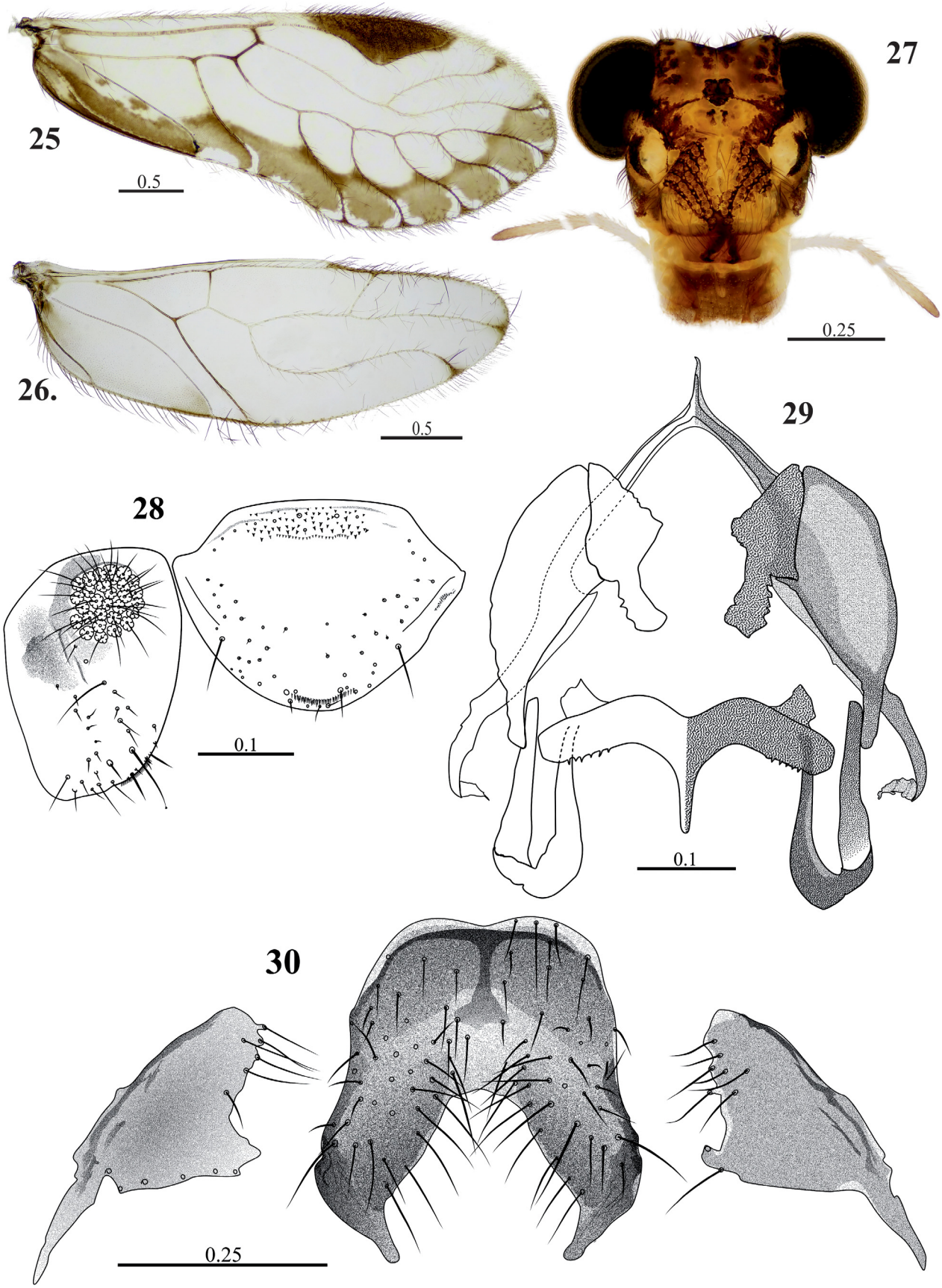
Color (in 80% ethanol). Head pattern (Fig. 27). Compound eyes black, ocelli hyaline with ochre centripetal crescents. Vertex, clypeus and labrum pale brown. Genae with transversal dark brown stripe. Maxillary palps pale brown, Mx4 distally more pigmented. Tergal lobes of meso- and metathorax dark brown, with lateral border clear. Thoracic pleura dark brown, with white spots. Coxae pale brown. Forewings veins brown, with a dark brown spot at wing margin. Pterostigma dark brown (Fig. 25). Hindwings hyaline, veins brown, with a brown spot at wing margin (Fig. 26). Abdomen creamy, with dark subcuticular spots. Central sclerite of hypandrium brown, with median Y-shaped dark brown mark. Postero-lateral processes ochraceous. Epiproct and paraprocts pale brown; paraprocts with dark brown semi-circular band on outer border of sensory fields.

Morphology. Head (Fig. 27): H/MxW: 1.49; compound eyes large, H/d: 3.07; H/D: 2.21; IO/MxW: 0.45. Outer cusp of lacinial tip broad, with seven denticles. Mx4/Mx2: 2.5. Forewings (Fig. 25): L/W: 2.5. Pterostigma: lp/wp: 3.37. Right wing anomalous, without areola postica; areola postica present in left wing, wide and low with rounded and flattened apex. Hindwings (Fig. 26): l/w: 2.56. Central sclerite of hypandrium convex anteriorly with a slight notch in the middle, concave posteriorly, latero-posterior processes distally directed inwards, side sclerites triangular (Fig. 30). Phallosome (Fig. 29) anteriorly V-shaped, with slender side struts; external parameres slightly

sclerotized, distally broad and rounded; two pairs of endophallic sclerites, and one posterior transverse mesal sclerite. Paraprocts (Fig. 28) almost elliptic, with a dense distal setal field; sensory fields with 28 trichobothria on basal rosettes. Epiproct (Fig. 28) broad, semitriangular, rounded posteriorly, setal fields on sides and anteriorly; one macroseta on each side.



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



FIGURES 25–30. *Euplocania katios* **n. sp.** Male. 25. Forewing. 26. Hindwing. 27. Front view of head. 28. Left paraproct and epiproct. 29. Phallosome. 30. Hypandrium. Scales in mm.

Measurements. FW: 4225, HW:2875, F: 1050, T:1800, t1: 740, t2: 100, t3: 130, ctt1: 26, f1: 760, f2: 690, f3: 640, f4: 530, f5:380, f6: 350, f7:310, f8:260, f9:230, f10: 200, f11:230, Mx4: 300, IO: 480, D: 490, d: 350, IO/d: 1.37, PO: 0.71.

Specimens studied. Holotype male. **COLOMBIA.** Chocó. Riosucio, National Natural Park Los Katios, 07°51'12''N: 77°09'11.0''W. 33 m. 25–26.II.2017. N. Carrejo, J. Mendivil, R. González. Led light trap in forest canopy. MUSENUV slide code No. 28994. Paratypes: 3 males, COLOMBIA. Valle del Cauca, Buenaventura, Pericos, Nature Reserve. 03°50'55.7''N: 76°47'14.0''W. 478 m. 16.VIII.2017. J. Panche and J. Hoyos. CDC light trap. MUSENUV slide code No. 28999, 29000. 1 male. Santander, Puerto Parra, San Juan de Carare. 06º42'58.2''N: 74º8'2.37''W. 92 m. 12.X.2017. J. Panche and J. Hoyos. CDC light trap. MUSENUV.

Etymology. The specific name, a noun in apposition, refers to the type locality; the Katios National Natural Park, an UNESCO World Natural Heritage, important in the fauna and flora exchange between Central and South America.

***Euplocania lasdelicias* n. sp. Male**
Figs 31–36

Diagnosis. It is close to *Euplocania caldasi* **n. sp.**, *Euplocania ecuatoriana* **n. sp.** and *Euplocania vaupesiana* **n. sp.**; differing from them by the posterior processes of the central sclerite of the hypandrium, and by the endophallic sclerites, particularly by the postero-median projection of the mesal endophallic sclerite and by the projection in the antero mesal sclerite.

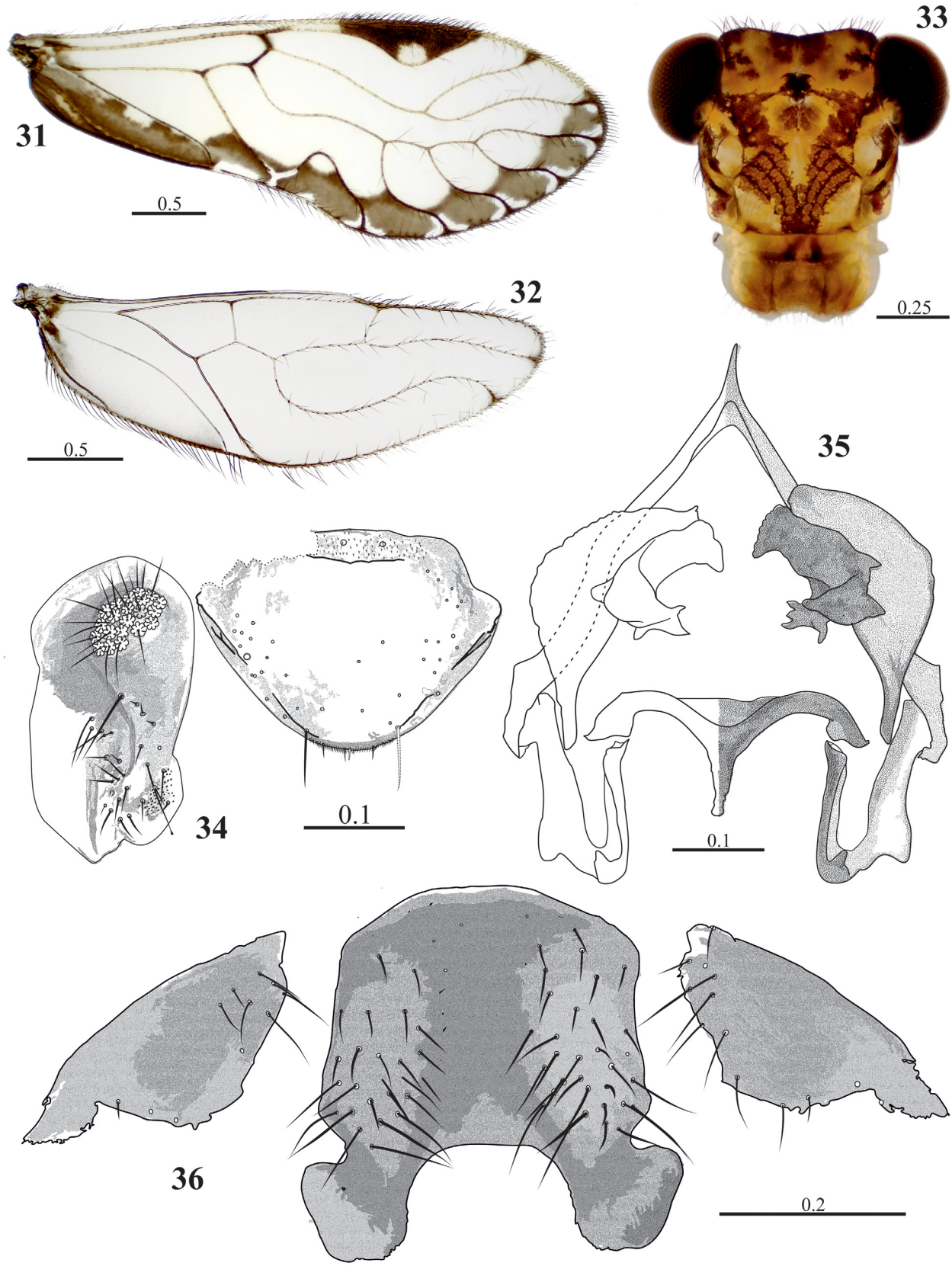
Color (in 80% ethanol). Body pale brown, with creamy areas, as indicated below. Head ochraceous, with dark brown pattern as illustrated (Fig. 33). Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Tergal lobes of meso- and metathorax brown. Thoracic mesopleura brown, more pigmented than pro- and metapleura. Legs: hind- and mid- coxae creamy, with proximal dark brown stripe; fore coxae ochraceous with proximal dark brown stripe. Femora, tibia and tarsi pale brown, Forewings veins brown, with a dark brown spot at wing margin; Vein Rs and crossvein Rs-M dark brown. Pterostigma dark brown, with a hyaline round window at lower angle (Fig. 31). Hindwings hyaline, veins pale brown, R1, R_{2+3} y R_{4+5} with a dark brown spot distally (Fig. 32). Abdomen creamy, with subcuticular transverse dark spots. Clunium and hypandrium brown. Epiproct pale brown, paraproct pale brown, with a dark brown semi-circular band on outer border of sensory field.

Morphology. Head (Fig. 33): H/MxW: 1.42, H/d: 3.52, H/D: 2.4; compound eyes large: IO/MxW: 0.52; Vertex slightly concave in the middle. Outer cusp of lacinial tip broad,Lacinia with seven denticles. Forewings (Fig. 31). L/W: 2.64, pterostigma elongate and angulate: lp/wp: 4.25. Areola postica tall, slanted posteriorly, apex rounded, al/ah: 1.97. Hindwings (Fig. 32): l/w: 2.81. Central sclerite of hypandrium convex anteriorly, concave posteriorly, postero-lateral processes medium sized, distally truncated and outstanding outer side, side sclerites triangular. (Fig. 36). Phallosome anteriorly V-shaped (Fig. 35), external parameres externally membranous, internally sclerotized, membranous area with angulate projection. Antero-mesal endophallic sclerites curved outward, with tridentate postero-distal process. Mesal endophallic sclerite transverse, M-shaped, median process anteriorly wide, posteriorly truncate. Paraprocts (Fig. 34) broad, oval, setose as illustrated, sensory fields with 21 trichobothria on basal rosettes. Epiproct wide, semitriangular, posteriorly rounded, with setae as illustrated (Fig. 34).

Measurements. FW: 3825, HW: 2600, F: 850, T: 1000, t1: 490, t2: 80, t3: 110, ctt1: 18, f1: 670, f2: 610, f3:580, f4:500, f5: 370, f6: 340, f7: 310, f8: 290, f9: 240, f10: 220, f11: 300, IO: 490, D: 390, d: 270, IO/d: 1.81, PO: 0.69.

Specimens studied. Holotype male. **COLOMBIA.** Putumayo, Puerto Asís, Las Delicias, 00°22'09.5''N: 76°31'02''W. 264 m. 23.X.2014. J. Panche. Led light trap in forest canopy. MUSENUV slide code No. 28995. Paratypes: 2 males (in 80% ethanol), same data as the holotype, II.2015, MUSENUV slide code No.28996, 28997. 1 male (in 80% ethanol), Caquetá, San Vicente del Caguán, Laureles, Resguardo Indígena Altamira, 02°27'50.14"N: 74°55'02.06"W. 917 m. 29–30.X.2017. J. Panche. Led light trap in forest canopy. MUSENUV slide code No. 28998.

Etymology. The specific epithet refers to the type locality, Las Delicias, in Puerto Asís, Putumayo, Colombia.



FIGURES 31–36. *Euplocania lasdelicias* **n. sp.** Male. 31. Forewing. 32. Hindwing. 33. Front view of head. 34. Left paraproct and epiproct. 35. Phallosome. 36. Hypandrium. Scales in mm.

***Euplocania manausensis* n. sp. Male**
Figs 37–42

Diagnosis. It is close to *E. metensis* **n. sp.**, from which it differs by the robust mesal endophallic sclerites, 0.25 as wide as long.

Color (in 80% ethanol). Head ochraceous, with dark brown pattern as illustrated (Fig. 39). Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Forewings veins brown, with a dark brown spot at wing margin; first section of vein Rs, vein M and crossvein Rs-M dark brown. Pterostigma dark brown, with a hyaline round window at the lower angle (Fig. 37). Hindwings hyaline, veins pale brown, with a small dark brown spot distally, except A2 (Fig. 38). Hypandrium brown, with median longitudinal stripe dark brown. Paraprocts and epiproct pale brown, paraprocts with a dark brown semi-circular band bordering outer edge of sensory fields.

Morphology. Head (Fig. 39): H/MxW: 1.48, H/d: 3.21, compound eyes large: IO/MxW: 0.42; H/D: 2.4. Vertex concave in the middle. Outer cusp of lacinial tip broad, with seven denticles. Forewings (Fig. 37). L/W: 4.15, pterostigma elongate and projected towards $R_{2+3,}$ lp/wp: 3.47. Areola postica low, elongate, slanted posteriorly, with apex rounded, al/ah: 1.84. Hindwings (Fig. 38): l/w: 2.88. Hypandrium convex posteriorly, posterior processes as illustrated (Fig. 42) flanking a short median arch. Phallosome anteriorly V-shaped (Fig. 41), external parameres membranous, with an inner, long and thin sclerotized bar. Lateral endophallic sclerites stout, wide anteriorly and narrowing posteriorly. Mesal endophallic sclerite transverse; posterior border sinuous with four small projections; anterior border sinuous, with antero-lateral corners projected; postero-median process long, stout, about twice as long the width of the sclerite. Paraprocts (Fig. 40) broadly triangular, setose as illustrated, sensory fields with 28 trichobothria on basal rosettes. Epiproct wide, anteriorly convex, posteriorly rounded, setae as illustrated (Fig. 40).

Measurements. FW: 4250, HW: 2950, F: 1225, T: 1800, t1: 770, t2: 90, t3: 130, ctt1: 25, IO: 470, D: 510, d: 350, IO/d: 1.34, PO: 0.69.

Specimen studied. Holotype male. **BRAZIL.** Amazonas. Manaus, Instituto Nacional de Pesquisas da Amâzonia (INPA). 03º5’40.42’’N: 59º59’21.307’’W. 18–27.IX.1982. J. A. Rafael. Malaise trap.

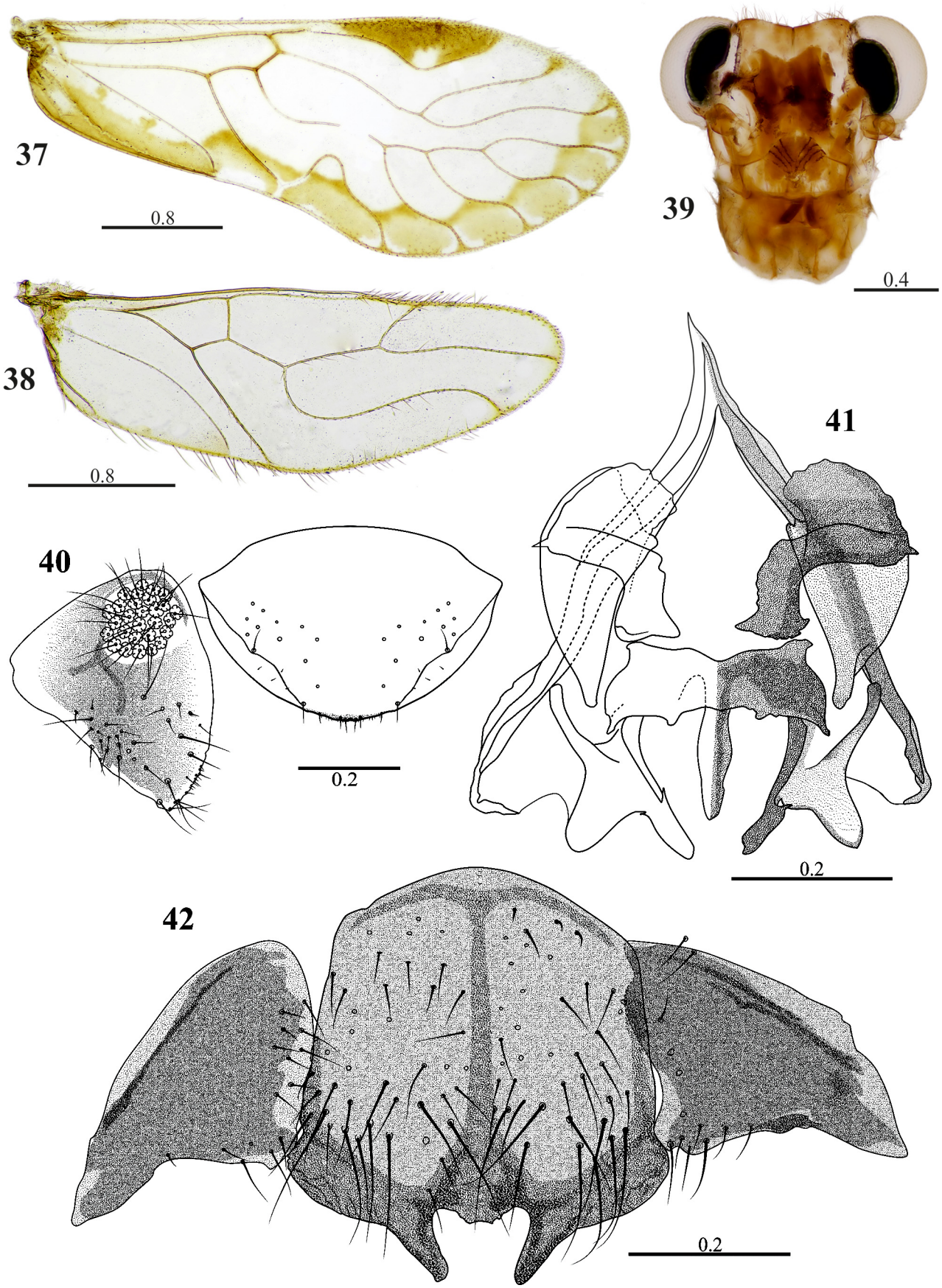
Etymology. The specific epithet refers to the Amazonian city of Manaus, Brazil, where the holotype was collected.

***Euplocania metensis* n. sp. Male**
Figs 43–48

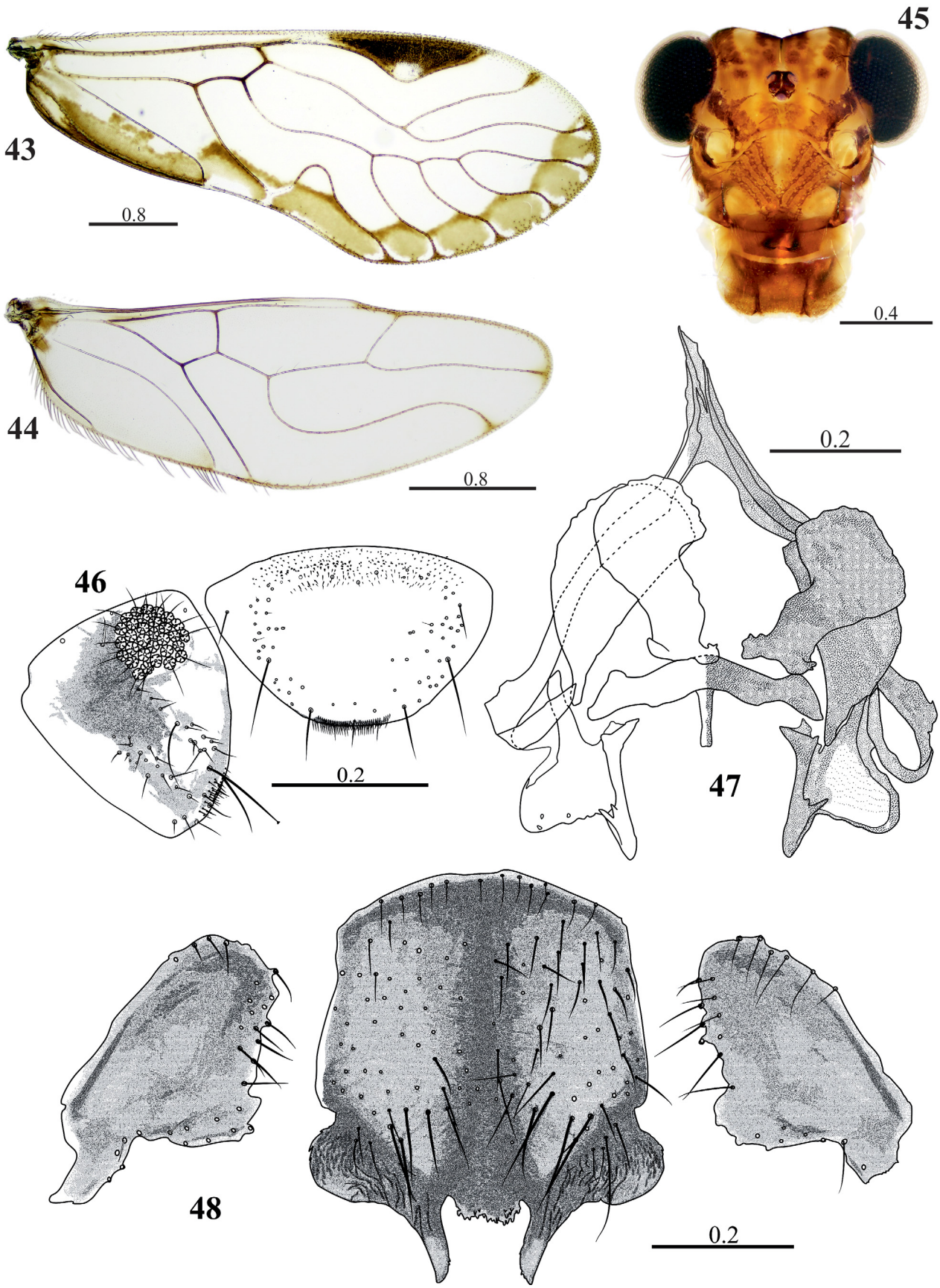
Diagnosis. It is close to *E. manausensis* **n. sp.**, differing from it by the narrow mesal endophallic sclerite, 0.4 times as wide as long; its short postero-median projection, by the spinose process in the posterior concavity of the central sclerite of the hypandrium and by the postero-lateral processes of the central sclerite of the hypandrium, anteriorly globular in *E. metensis* **n. sp.**, and almost straight in *E. manausensis* **n. sp.**

Color (in 80% ethanol). Body creamy, with pale brown areas, as indicated below. Head ochraceous, with dark brown pattern as illustrated (Fig. 45). Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Tergal lobes of meso- and metathorax ochraceous. Thoracic pleura with black stripes and spots. Legs: hind- and mid-coxae creamy, with proximal dark brown stripe; fore coxae pale brown, with proximal dark brown stripe. Femora, tibiae and tarsi creamy. Forewings: veins brown, with a dark brown spot at wing margin; first section of vein Rs, crossvein Rs-M and vein M dark brown. Pterostigma dark brown, with a hyaline round window at the lower angle and a clear area in the proximal third (Fig.43). Hindwings hyaline, veins pale brown, with a dark spot distally, except A2 (Fig 44). Abdomen creamy, with subcuticular dark spots. Hypandrium brown, with median dark brown Y-like area. Epiproct pale brown, paraprocts with dark brown band limiting outer border of sensory fields.

Morphology. As in diagnosis, plus the following: Head (Fig. 45): H/MxW: 1.53, H/d: 3.4, H/D: 2.07; compound eyes large: IO/MxW: 0.46. Vertex emarginate in the middle. Outer cusp of lacinial tip broad, with six denticles. Forewings (Fig. 43): L/W: 2.91, pterostigma angulate and projected towards Rs: lp/wp: 4.67. Areola postica tall, slanted posteriorly, apex rounded, al/ah: 2.2. Hindwings (Fig. 44): l/w: 2.81. Hypandrium convex posteriorly, lateral sides almost parallel, posterior processes flanking a short median arch that has numerous protuberances such as thorns (Fig. 48). Phallosome anteriorly V-shaped (Fig. 47), external parameres membranous, distally dilated, internally sclerotized and projected posteriorly. Lateral endophallic sclerites strong, wide anteriorly, narrowing posteriorly. Mesal endophallic sclerite transverse, posteriorly sinuous and slightly curved upwards, with a slender postero-median projection. Paraprocts (Fig. 46) oval, almost triangular, basally wider, setose as illustrated,



FIGURES 37–42. *Euplocania manausensis* **n. sp.** Male. 37. Forewing. 38. Hindwing. 39. Front view of head. 40. Left paraproct and epiproct. 41. Phallosome. 42. Hypandrium. Scales in mm.



FIGURES 43–48. *Euplocania metensis* **n. sp.** Male. 43. Forewing. 44. Hindwing. 45. Front view of head. 46. Left paraproct and epiproct. 47. Phallosome. 48. Hypandrium. Scales in mm.

sensory fields with 31 trichobothria on basal rosettes. Epiproct wide, triangular, anteriorly rounded, convex posteriorly, with four macrosetae, two preapical and two median, posterior border with three setae and a row microspines as illustrated (Fig. 46).

Measurements. FW: 4650, HW: 3300, f1: 940, IO: 560, D: 510, d: 360, IO/d: 1.56, PO: 0.71.

Specimens studied. Holotype male. **COLOMBIA.** Meta, National Natural Park Sierra de La Macarena, 03°21'N: 72°38'W. 100m. 10.III.2003. Malaise trap. IAvH Collection slide E-163814. Paratypes: 2 males. BRAZIL, Roraima, Rio Uraricoera, Ihla de Maracá. 03º25'3.21''N: 61º39'53.553''W. 21–30.XI.1987. J. A. Rafael. Malaise trap. INPA.

Etymology. The specific epithet refers to the department of Meta, Colombia, where the holotype was collected.

Euplocania rafaeli n. sp. Male

Figs 49–54

Diagnosis. It is close to *E. picta* New, *E. pictaoides* García Aldrete, *E. caldasi* **n. sp.**, *E. vaupesiana* **n. sp.**, *E. ecuatoriana* **n. sp.**, and *E. lasdelicias* **n. sp.**, differing from them by the posterior processes of the central sclerite of the hypandrium, and by details of the mesal endophallic sclerite and antero-mesal endophallic sclerites.

Color (in 80% ethanol). Head ochraceous, with dark brown pattern as illustrated (Fig. 51). Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Legs: hind- and mid- coxae creamy, with proximal dark brown stripes; fore coxa ochraceous with proximal dark brown stripe. Femora, tibia and tarsi pale brown. Forewings veins pale brown, with a dark brown spot at wing margin, surrounded by a clear window; first section of vein Rs, crossvein Rs-M and stem of M dark brown; pterostigma dark brown with a rounded hyaline area at the lower angle (Fig. 49). Hindwings hyaline, veins pale brown with a dark spot distally (Fig. 50). Central sclerite of hypandrium brown. Epiproct pale brown; paraprocts pale brown, with a dark brown curved band limiting the outer side of the sensory fields.

Morphology. As in diagnosis, plus the following: Head (Fig. 51): H/MxW: 1.43, H/d: 2.91, H/D: 2.05; compound eyes large: IO/MxW: 0.45. Vertex concave in the middle. Outer cusp of lacinial tip broad, with six denticles. Forewings (Fig. 49). L/W: 2.50, pterostigma elongate and extended towards Rs, lp/wp: 3.61. Areola postica tall, apex rounded. Hindwings (Fig. 50): l/w: 2.81. Central sclerite of hypandrium with sides almost parallel, postero-lateral processes broad, with inner border straight, rounded outwards, leaving between them a broad, straight concavity, a field of short spines in each process; side sclerites large, broadly rhomboid (Fig. 54). Phallosome anteriorly V-shaped (Fig. 53), external parameres slender, curved inwards, with an internal, long and slender sclerotized bar; lateral endophallic sclerites stout, wide anteriorly and narrowing posteriorly. Mesal endophallic sclerite transverse, trapeziform, anteriorly straight, posteriorly sinuous; with a mid posterior projection long, slender, about three times the width of the sclerite. Paraprocts (Fig. 52) oval, almost triangular, setose as illustrated, sensory fields with 30 trichobothria on basal rosettes. Epiproct wide, semi-triangular, posteriorly rounded, with two preapical macrosetae and two apical normal length setae. Posterior border with a row of four setae and a transverse field of microsetae as illustrated (Fig. 52).

Measurements. FW: 5000, HW: 3375, F: 1225, T: 2125, t1: 860, t2: 100, t3: 140, ctt1: 28, f1: 950, f2:850, IO: 480, D: 520, d: 370, IO/d: 1.30, PO: 0.71.

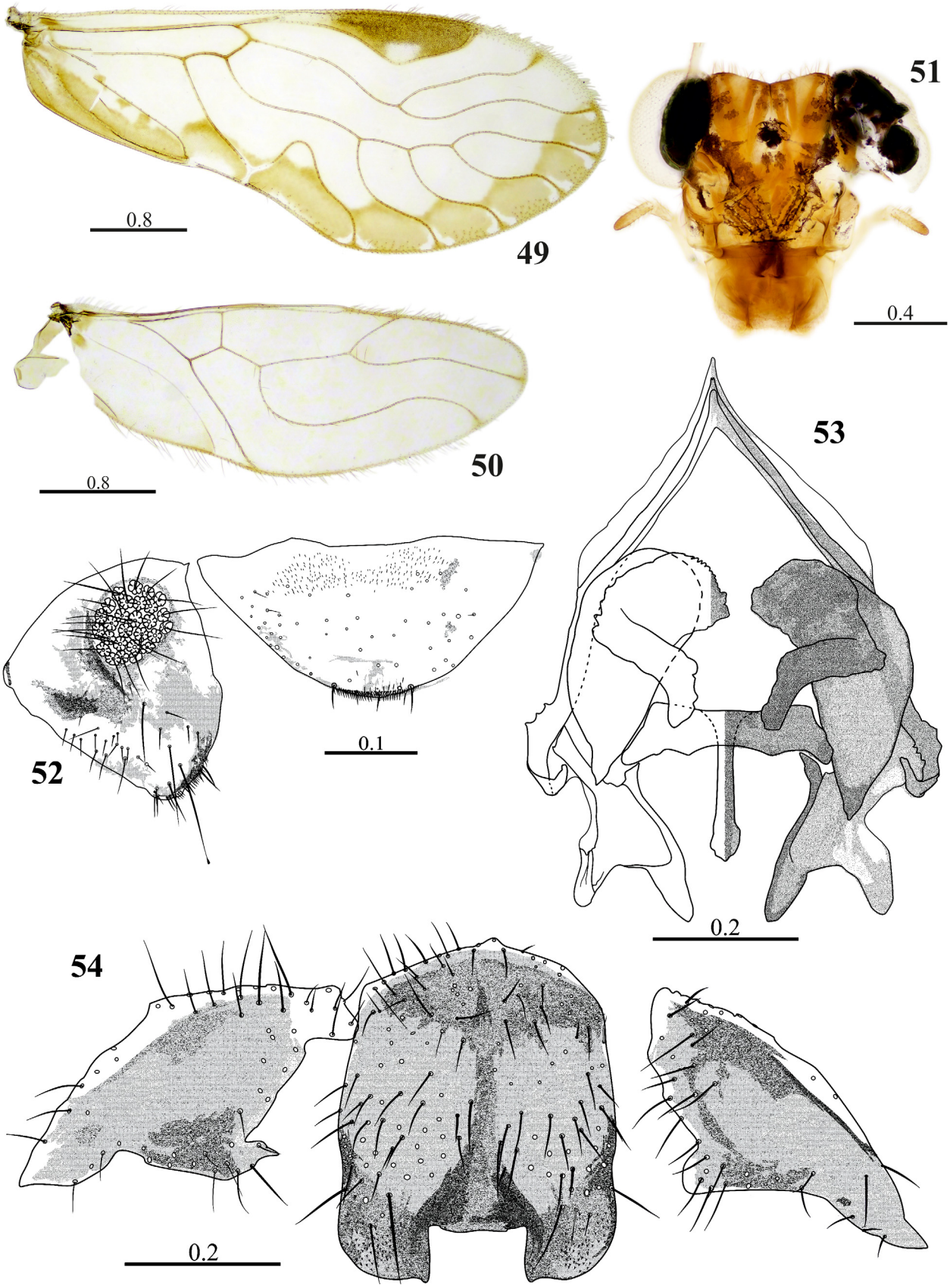
Specimen studied. Holotype male. **BRAZIL.** Paraná. São José dos Pinhais. 25º32'05''S: 49º12'23''W. X.1984. J. A. Rafael. Malaise trap. INPA

Etymology. This species is dedicated to Dr. José Albertino Rafael, a researcher at the Instituto Nacional de Pesquisas da Amâzonia (INPA), in Manaus, Amazonas Brazil, in recognition to his important studies on the taxonomy of Diptera and Zoraptera, who has done much to promote the study of the insect fauna of the Amazon Basin.

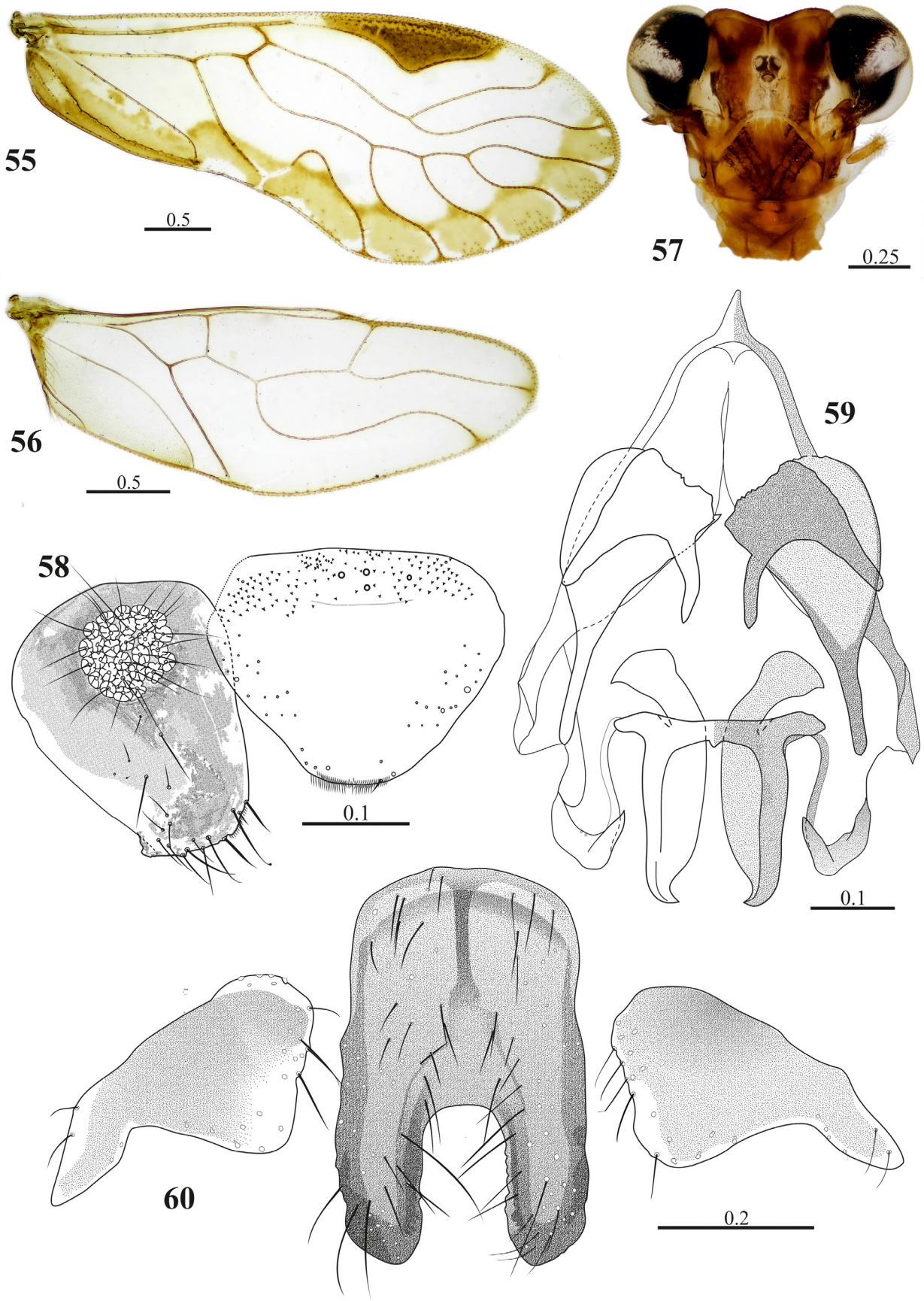
Euplocania tocantina n. sp. Male

Figs 55–60

Diagnosis. It is close to *E. badonneli* New & Thornton, *E. equorum* **n. sp.,** and *E. katios* **n. sp.**, differing from them by having the central sclerite of hypandrium elongate, with stout, straight posterior processes, and by the shape of the mesal endophallic sclerite (Fig. 59).



FIGURES 49–54. *Euplocania rafaeli* **n. sp.** Male. 49. Forewing. 50. Hindwing. 51. Front view of head. 52. Left paraproct and epiproct. 53. Phallosome. 54. Hypandrium. Scales in mm.



FIGURES 55–60. *Euplocania tocantina* **n. sp.** Male. 55. Forewing. 56. Hindwing. 57. Front view of head. 58. Left paraproct and epiproct. 59. Phallosome. 60. Hypandrium. Scales in mm.

Color (in 80% ethanol). Head pattern (Fig. 57). Compound eyes black, ocelli with ochre centripetal crescents. Labrum pale brown. Genae with dark brown stripes. Antennae pale brown. Maxillary palps brown, Mx4 distally dark brown. Forewings veins brown, with a dark brown spot at wing margin and a clear window surrounding it. Pterostigma dark brown (Fig. 55). Hindwings hyaline, with pale brown veins, except Cu, A2 and stem of R which are brown, each vein with a brown spot at wing margin (Fig. 56). Central sclerite of hypandrium pale brown, with median Y-shaped dark brown mark. Postero-lateral processes ochre, with dark brown sides. Epiproct pale brown, paraprocts with dark brown semi-circular band on outer border of sensory fields.

Morphology. Head (Fig. 57): H/MxW: 1.4; compound eyes large, H/d: 3.01; H/D: 2.45; IO/MxW: 0.46. Outer cusp of lacinial tip broad, with seven denticles. Forewings (Fig. 55): L/W: 2.41. Pterostigma: lp/wp: 3.71, areola postica tall, slanted posteriorly, apex round: al/ah: 1.98. Hindwings (Fig. 56): l/w: 2.7. Central sclerite of hypandrium convex anteriorly, deeply concave posteriorly, side sclerites triangular (Fig. 60). Phallosome (Fig. 59) anteriorly V-shaped, external parameres membranous, distally broad, rounded and sclerotized, bearing 2–3 pores on each; two pairs of endophallic sclerites, and one posterior transverse mesal sclerite (Fig. 59); mesal sclerite with two posterior projections as long as 0.85 times the width of mesal sclerite, with enlarged internal border forming a sheet that goes throw below the sclerite and anteriorly to this, the sheet in its anterior projections curved outward. Paraprocts (Fig. 58) broadly elliptic, with a dense setal field distally; sensory fields with 28 trichobothria on basal rosettes. Epiproct (Fig. 58) broadly triangular, straight anteriorly and rounded posteriorly, setae as illustrated.

Measurements. FW: 4225, HW: 3100, f1: 800, Mx4: 240, IO: 470, D: 500, d: 340, IO/d: 1.38, PO: 0.68.

Specimen studied. Holotype male. **BRAZIL.** Pará, Parauapebas, Serra Norte. 06°05’03.1”S: 50°10’35.5’’W. XI.1982. Michael Miles. Light trap. INPA.

Etymology. The specific name, a noun in apposition, makes reference to the big Brazilian river Tocantins ("toucan's beak", in Tupi language).

Euplocania vaupesiana n. sp. Male

Figs 61–66

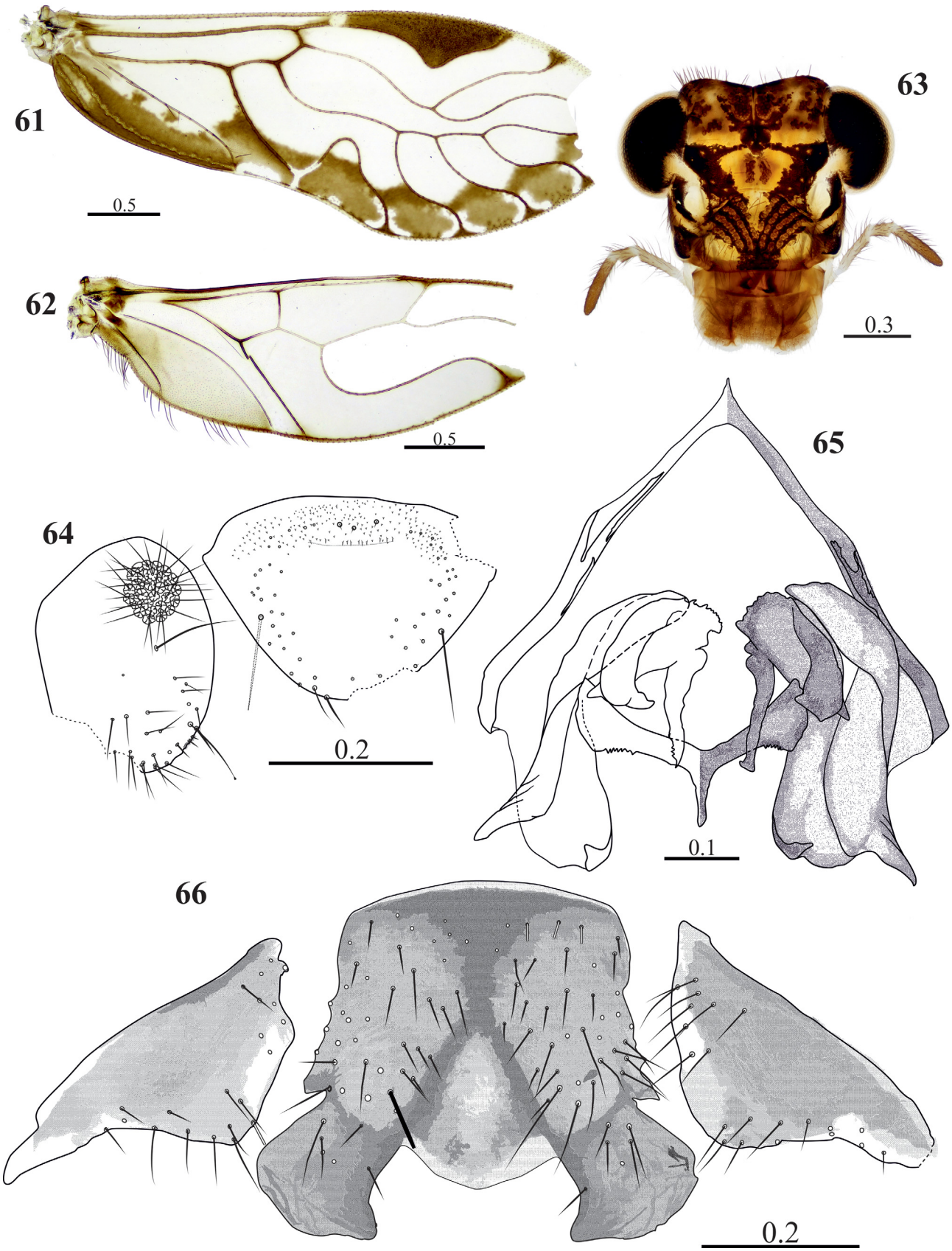
Diagnosis. It is close to *E. picta* New & Thornton, *E. pictaoides* García Aldrete, *E. caldasi* **n. sp**., and *E. ecuatoriana* **n. sp**., from which it differs by the posterior processes of the central sclerite of the hypandrium and by the endophallic sclerites.

Color (in 80% ethanol). Head pattern (Fig. 63). Compound eyes black, ocelli hyaline, with ochre centripetal crescents. Labrum pale brown. Genae with transverse dark brown stripes. Antennae pale brown, distally cream. Maxillary palps brown, Mx4 distally dark brown. Tergal lobes of meso- and metathorax dark brown, with sides pale brown. Thoracic pleura dark brown, with white spots. Coxae pale brown. Forewings veins brown, with a dark brown spot at wing margin. Pterostigma dark brown (Fig. 61). Hindwings hyaline, veins brown, with a brown spot at wing margin (Fig. 62). Abdomen creamy, with dark brown subcuticular bands. Central sclerite of hypandrium pale brown, with median Y-shaped dark brown mark; postero-lateral processes ochre. Epiproct and paraprocts pale brown.

Morphology. Head (Fig. 63): H/MxW: 1.48; compound eyes large, H/d: 3.75; H/D: 2.45; IO/MxW: 0.51. Outer cusp of lacinial tip broad, with six denticles. Mx4/Mx2: 2.27. Forewings (Fig. 61): L/W: 2.35. Pterostigma: lp/wp: 3.19, areola postica tall, posteriorly slanted, side sclerites triangular, al/ah: 1.48. Hindwings (Fig. 62): l/w: 2.56. Central sclerite of hypandrium slightly convex anteriorly, with a short and broad median arc flanked by two postero-lateral process ; side sclerites triangular (Fig. 66). Phallosome (Fig. 65) anteriorly V-shaped, with slender side struts; external parameres membranous, distally broad and rounded, internally with a thin sclerotized band; two pairs of endophallic sclerites, antero-mesal endophallic pair with emarginated borders; mesal endophallic sclerite transverse, obtusely concave anteriorly, posterior borders denticulate on each side of median process (Fig. 65). Paraprocts (Fig. 64) almost elliptic, with a dense setal field distally; sensory fields with 28 trichobothria on basal rosettes. Epiproct (Fig. 64) broad, semioval, rounded posteriorly, setal fields on sides and anteriorly and one large seta on each side.

Measurements. FW: 3875, HW: 2500, F: 925, T: 1175, t1: 550, t2: 90, t3: 140, ctt1: 20, f1: 770, f2:720, Mx4: 250, IO: 570, D: 460, d: 300, IO/d: 1.90, PO: 0.65.

Specimen studied. Holotype male. **COLOMBIA.** Vaupés, Taraira, Mosiro-Itajura Biological Station. 01°3’43.8”S: 69°29’57.28”W. 60 m. 28.IV–25.V.2004. M. Pinzón, M. 4819. Malaise trap. IAvH E-161335.



FIGURES 61–66. *Euplocania vaupesiana* **n. sp.** Male. 61. Forewing. 62. left hindwing. 63. Front view of head. 64. Left paraproct and epiproct. 65. Phallosome. 66. Hypandrium. Scales in mm.

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

Discussion

Species group *Amabilis* of *Euplocania* was diagnosed by García Aldrete *et al.* (2013); it presently includes 16 species, most of which (12 species) are known only from males; two species are known from both sexes (*E. badonneli* and *E. pictaoides*), and two species are known only from females (*E. amabilis* and *E. macarenaensis*) (Table 1).

TABLE 1. Previous reports of morpho-species in *Amabilis* species group of *Euplocania* and sex known of each.

Species	Previously reported as:
Euplocania amabilis Enderlein (female)	
Euplocania ariasi **n. sp.** (male)	*Euplocania* X (García Aldrete *et al.* 2013)
Eplocania badonneli New & Thornton (male, female)	*Euplocania* I (García Aldrete *et al.* 2013)
Euplocania caldasi **n. sp.** (male)	-
Euplocania ecuatoriana **n. sp.** (male)	*Euplocania* XVI (García Aldrete *et al.* 2013)
Euplocania equorum **n. sp.** (male)	*Euplocania* VI (García Aldrete *et al.* 2013)
Euplocania katios **n. sp.** (male)	
Euplocania lasdelicias **n. sp.** (male)	
Euplocania macarenaensis González *et al.*(female)	
Euplocania manausensis **n. sp.** (male)	*Euplocania* IX, (García Aldrete *et al.* 2013)
Euplocania metensis **n. sp.** (male)	*Euplocania* VIII (García Aldrete *et al.* 2013)
Euplocania picta New (male)	-
Euplocania pictaoides García Aldrete (male, female)	
Euplocania rafaeli **n. sp.** (male)	*Euplocania* XI, (García Aldrete *et al.* 2013)
Euplocania tocantina **n. sp.** (male)	*Euplocania* V (García Aldrete *et al.* 2013)
Euplocania vaupesiana **n. sp.** (male)	-

E. amabilis, the type species, was described on basis of one female, collected in San Bernardino, Paraguay (Enderlein 1910), but the location of the type is unknown (Fig. 67). One of us (ANGA), visited San Bernardino in July, 2013, and collected there and in surrounding areas, looking for specimens of *E. amabilis*, assuming that if any specimens were found they would belong to that species, but unfortunately no specimens were found (García Aldrete 2014). In the context of this work, we are well aware that we are possibly creating a synonym, as any of the species included in species group *Amabilis* could be the type species of the genus.

The known females in group *Amabilis* share having the subgenital plate bluntly pointed posteriorly, bearing a setal field in the apex; the broad pigmented lateral areas are joined distally by a pigmented arch, and the ninth sternum is broad, with two anterior sclerotized bands directed postero-medially towards the area of the spermapore, in *E. badonneli* and *E. macarenaensis*, or the ninth sternum is coarse, with irregular lines throughout (*E. pictaoides*). With lone males and lone females, the correct association of the sexes of any species is pure guesswork; in one case, *E. metensis* male, and *E. macarenaensis* female, both from Sierra de la Macarena, Meta (Fig. 67); show a distinctly different forewing venation and pigmentation pattern, ruling out the possibility that the latter could be the female of the former. Although it is necessary to carry out new samplings in the type locality of *E. amabilis,* to find specimens of both sexes of that species, only a study utilizing molecular markers could give information more certain about the association of the sexes.

Based on the morphology of the hypandrium central sclerite and the mesal endophallic sclerite in the different species described, six subgroups of species can be recognized, as follows:

Subgroup Ariasi: Postero-lateral processes of the central sclerite of hypandrium broad, almost square, with

longitudinal lines, each with a short, acuminate process anteriorly on the inner side (Fig. 6). Mesal endophallic sclerite without median posterior projection (Fig. 5). Species included: *E. ariasi* **n. sp.**

Subgroup Badonneli: Central sclerite of hypandrium with postero-lateral processes longer than wide, distally curved inward. Mesal endophallic sclerite with three posterior processes, one median and two short lateral, the last ones sometimes absent. Species included: *E. badonneli* New & Thornton, *E. equorum* **n. sp.** and *E. katios* **n. sp.**

Subgroup Lasdelicias: Forewings pterostigma projection rounded, with a hyaline round window on it. Postero-lateral processes of the central sclerite of hypandrium medium sized, distally truncated and outstanding outer side. Species included: *E. lasdelicias* **n. sp.**

Subgroup Manausensis. Postero-lateral processes of the central sclerite of hypandrium anteriorly slightly or distinctly bulged, with rough thorns, posteriorly forming a short to medium sized projection, directed inwards. Transverse mesal endophallic sclerite with well-developed mid posterior projection. External parameres with strong and sclerotized internal projection. Species included: *E. manausensis* **n. sp.**, *E. metensis* **n. sp.** and *E. rafaeli* **n. sp.**

Subgroup Picta. Forewings pterostigma completely dark, projection angulated. Postero-lateral processes of the central sclerite of hypandrium medium sized, bifurcated, forming an inverted V. Mesal endophallic sclerite with median and usually postero-lateral process. Species included: *E. caldasi* **n. sp.**, *E. ecuatoriana* **n. sp.**, *E. picta* New, *E. pictaoides* García Aldrete, and *E. vaupesiana* **n. sp.**

Subgroup Tocantina: Central sclerite of hypandrium elongate, postero-lateral processes, straight, stout. Mesal endophallic sclerite without median posterior processes. Species included: *E. tocantina* **n. sp.**

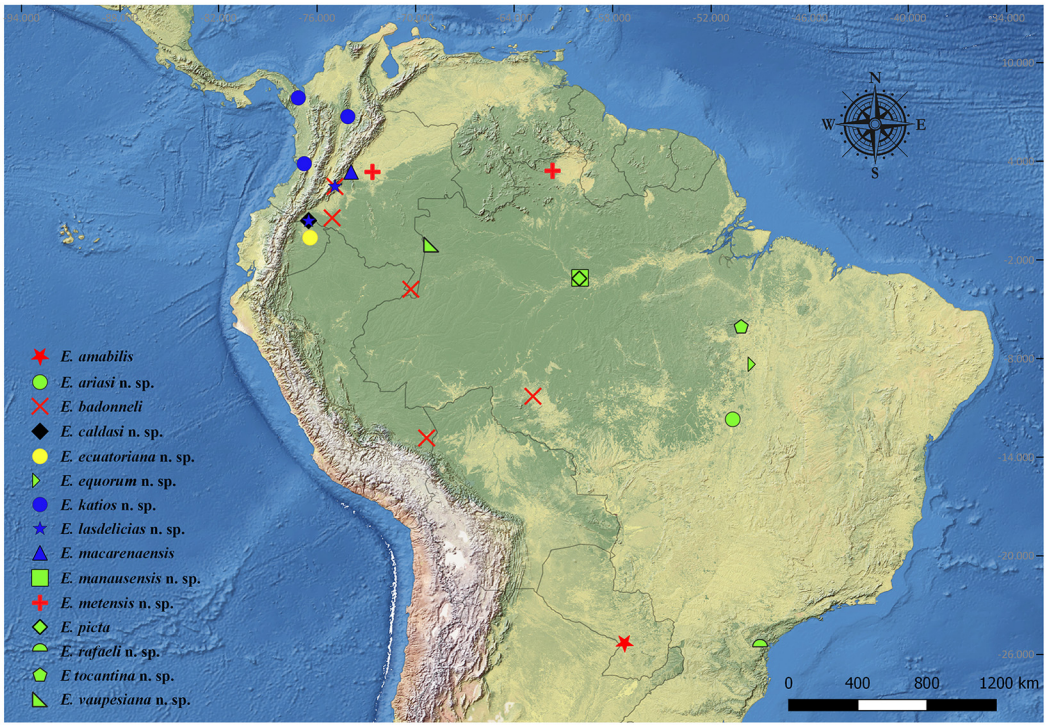


FIGURE 67. Distribution map of the species in species group *Amabilis* of *Euplocania*.

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