



Ectopsocidae (Psocodea: ‘Psocoptera’) from Valle del Cauca and NNP Gorgona, Colombia

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Abstract

The results of a survey of the psocid family Ectopsocidae in Valle del Cauca and NNP Gorgona, are here presented. Fifteen species were identified, in the genera *Ectopsocus* (14 species), and *Ectopsocopsis* (one species); four of the *Ectopsocus* species are new to science and are here described and illustrated. The male of *E. thornstoni* García Aldrete is here described. Records of *Ectopsocopsis cryptomeriae* (Enderlein), *Ectopsocus briggsi* McLachlan, *E. californicus* Banks, *E. columbianus* Badonnel, *E. maindroni* Badonnel, *E. meridionalis* Ribaga, *E. pilosus* Badonnel, *E. richardsi* Pearman, *E. titschacki* Jentsch, and *E. vilhenai* Badonnel, are provided. Ten species were found only in Valle del Cauca, two species were found only in the NNP Gorgona, and three species were found at both sites. The specimens studied are deposited in the Entomological Museum, Universidad del Valle, Santiago de Cali, Colombia (MUSENUV).

Key words: Taxonomy, neotropics, *Ectopsocus*, *Ectopsocopsis*

Introduction

The family Ectopsocidae is represented in the neotropics by 29 species in three genera: *Ectopsocus* McLachlan, *Ectopsocopsis* Badonnel and *Belipsocus* García Aldrete. The richest country for this family in the neotropics is Mexico, with 21 species, 20 species in *Ectopsocus* (García Aldrete, 1991) and one species in *Ectopsocopsis*. In Colombia, the additions and corrections (Lienhard, 2012) to the world catalogue of Psocoptera (Lienhard & Smithers, 2002) indicate that only five species have been recorded: *Ectopsocus columbianus* Badonnel, *E. meridionalis* Ribaga, *E. richardsi* Pearman, *E. titschacki* Jentsch and *E. californicus* Banks, but Sarria *et al.* (unpubl. data) recorded in NNP Gorgona five morphospecies of *Ectopsocus*, which were not identified.

Upon examining specimens in the reference collection of the Entomological Research Group at the Universidad del Valle (GIE), and specimens collected in several localities in Valle del Cauca, 15 species were found, four of them undescribed, and one, *E. pilosus* Badonnel, representing a new record in the Americas. The purpose of this paper is to describe and illustrate the new species, and to list the species in Valle del Cauca and NNP Gorgona. An identification key to the above species is included.

Materials and methods

Four hundred thirty specimens were available for study, 53 females and 40 males were dissected in 80 % ethanol, and their parts (head, right wings and legs and genitals) were processed according to González *et al.* (2011). The parts mounted on slides were measured and photographed with a Canon T3i camera and Helicon Focus program.

Measurements are given in microns. Abbreviations of parts measured are as follows: FW, HW: lengths of right

fore- and hind- wings, F, T, t_1 and t_2 : lengths of femur, tibia and tarsomeres 1 and 2 of right hind leg, respectively, Mx4: length of IV palpomere, of right maxillary palpus, f_1 -fn: lengths of flagellomeres 1-n, of right antenna, ctt_1 : number of ctenidobothria on t_1 , IO: minimum distance between compound eyes, D: antero-posterior diameter of right compound eye, d: transverse diameter of right compound eye, all in dorsal view of head, PO: d/D. The studied material, including types and other specimens, is deposited in the Entomological Museum of the Universidad del Valle, Santiago de Cali, Colombia (MUSENUV).

Results

Key to the species of Ectopsocidae from Valle del Cauca and NNP Gorgona

1. Females 2
- Males 14
2. Subgenital plate with a single apical lobe 3
- Subgenital plate with two apical lobes 4
3. Macropterous; subgenital plate with apical lobes subrectangular, short, without setae. Gonapophyses incomplete, with V1 and V2 fused, V3 short, stout and with apical setae; ninth sternum sclerotized, covered by a squamous membrane, spermapore visible *Ectopsocopsis cryptomeriae* Enderlein
- Brachypterous; subgenital plate with apical lobes bell-shaped, short and broad basally, with apical setae. Gonapophyses complete, V1 and V2 membranous, V3 with marginal and apical setae. Ninth sternum membranous, spermapore not visible *Ectopsocus richardsi* Pearman
4. Forewings with light brown spots in margin of veins and R-M union or with a brownish pigmentation pattern and hyaline fenestrae in several cells 5
- Forewings without a pigmentation pattern, rather uniform in coloration 9
5. Forewings with light brown spots at distal ends of veins, R-M union and antero-posterior margin of pterostigma (*briggsi* complex) ...6
- Forewings with a complex pattern of coloration brown or light brown and several hyaline fenestrae 8
6. Spine of the paraproct margin simple *Ectopsocus californicus* Banks
- Spine of the paraproct margin bifid 7
7. Apical lobes of subgenital plate long and straight. Marginal spine of paraprocts asymmetric *Ectopsocus meridionalis* Ribaga
- Apical lobes of subgenital plate relatively short and curved inward. Marginal spine of paraprocts symmetric *Ectopsocus briggsi* McLachlan
8. Forewings with dark brown pigmentation pattern; posterior half with six hyaline fenestrae in antero-posterior margins of R_1 , anterior margin of R_{4+5} , M_1 , M_2 and M_3 cells. Pterostigma light brown, with dark apex. Hindwing margin glabrous *Ectopsocus andinus* n. sp.
- Forewings with light brown pigmentation pattern; posterior half with seven hyaline fenestrae in antero-posterior margins of R_1 , anterior margin of R_{2+3} , R_{4+5} , M_1 , M_2 and M_3 cells. Pterostigma opaque with base and apex brown. Hindwing margin with setae *Ectopsocus thorn-toni* García Aldrete
9. Forewings light brown or brown 10
- Forewings pale creamy or pale yellowish 12
10. Apical lobes of subgenital plate short, stout, apically blunt, with 3-4 long setae; marginal spine of paraprocts simple, long and sharp; forewings stout and with long setae, with additional row in margin (from Sc to R_{4+5}); hindwing with setae on margin *Ectopsocus pilosus* Badonnel
- Apical lobes of subgenital plate subtriangular and long. 11
11. Sensory fields of paraprocts with nine trichobotria, eight in basal rosettes, transverse row with 5-6 long setae; subgenital plate with apical lobes stout, curved inward, with four setae *Ectopsocus vilhenaioides* n. sp.
- Sensory fields of paraprocts with seven trichobotria, six in basal rosettes, transverse row with 4 long setae; subgenital plate with two brown lateral spots and a longitudinal unpigmented central area; apical lobes almost straight and slender, with three short setae *Ectopsocus columbianus* Badonnel
12. External valves of gonapophyses lobulated, short and stout; spermapore comma-shaped, well sclerotized *Ectopsocus valvilobatus* n. sp.
- External valve of gonapophyses not lobulated 13
13. Apical lobes of subgenital plate short, with two short setae in apex; marginal spine of paraprocts long, robust and simple *Ectopsocus maindroni* Badonnel
- Apical lobes of subgenital plate very short, blunt, with three or four setae in margin and apex; marginal spine of paraprocts short, robust and bifid *Ectopsocus titschacki* Jentsch
14. Brachypterous *Ectopsocus richardsi* Pearman
- Macropterous 15
15. Clunium with a basal sclerotized process and without apical comb; phallosome with external parameres slender and sharp, internal parameres fused; with numerous radular sclerites and with a sclerotized caudal, sword shaped projection

	.....	<i>Ectopsocopsis cryptomeriae</i> (Enderlein)	
-.	Clunium without a basal sclerotized process and with apical comb	.....	16
16.	Forewings with light brown spots in margin of veins and R-M union or with a brownish pigmentation pattern and several hyaline fenestrae in several cells	.....	17
-.	Forewings of rather uniform coloration	.....	18
17.	Phallosome with distal half of external parameres stout and curved outward, internal parameres fused into a V-shaped structure apically blunt	.....	<i>Ectopsocus andinus</i> n. sp.
-.	Phallosome with distal half of external parameres stout and curved inward, internal parameres fused to form a W-shaped structure	.....	<i>Ectopsocus thorntoni</i> García Aldrete
18.	Forewings light brown or brown	.....	19
-.	Forewings slightly cream or light yellow	.....	21
19.	Clunium subrectangular, with apical and preapical comb of short teeth and with a central field of small tubercles	.....	<i>Ectopsocus pilosus</i> Badonnel
-.	Clunium cone-shaped, with apical comb and two tubercular fields	.....	20
20.	Internal parameres of phallosome fused, cup-shaped with a stout, keeled apex	.....	<i>Ectopsocus vilhenaioides</i> n. sp.
-.	Internal parameres of phallosome fused, cup-shaped with a broad apex	.....	<i>Ectopsocus vilhenai</i> Badonnel
21.	External parameres of phallosome slightly sclerotized, internal parameres fused in an inverted cup-shaped structure, with two long radular sclerites apically projected. Clunium with apical comb only	.....	<i>Ectopsocus titschacki</i> Jentsch
-.	External parameres of phallosome well sclerotized	.....	22
22.	External parameres of phallosome short, stout, with spinulose surface; clunium membranous with apical comb discontinuous in apical half and with two preapical tubercular fields	.....	<i>Ectopsocus maindroni</i> Badonnel
-.	External parameres of phallosome long, with distal half stout, internal parameres fused in a V-shaped structure; clunium vase-shaped, with two antero-lateral fields of dense, large tubercles	.....	<i>Ectopsocus gorgonaensis</i> n. sp.

Ectopsocus andinus n. sp.

(Figures 1–10)

Diagnosis. Belonging in species group *Fenestratus* of Thornton & Wong (1968). Forewing coloration pattern complex (Fig. 1), similar to the Mexican species *E. chiapensis* García Aldrete, and *E. chiapensoides* García Aldrete; differing from the former in having the external parameres curved outward, in having the aedeagal arch pointed, and in having a single, large endophallic sclerite; the posterior side projections of the hypandrium are slender and pointed, and the apical lobes of the subgenital plate bear two distal setae and one setae on the outer margin. It differs from the latter, in having a hyaline area at the fork of Rs-M in the forewing, in having the aedeagal arch pointed, in having a single large endophallic sclerite, in having the posterior side projections of the hypandrium slender and pointed, and in having the apical lobes of the subgenital plate slender, and with one setae on the outer margin of each lobe.

Description. Male. Color. Head dark brown, compound eyes black, ocelli brown with centripetal crescents ochre. Thoracic terga dark brown, coxae with basal halves dark brown, apical halves yellowish. Distal half of forewing brown with three hyaline fenestrae in M_1 , M_3 , apical and basal region of R_1 and basal R_{4+5} cells. Basal half of forewing with transverse band from nodulus to Cu_1 , with two hyaline fenestrae in cell Cu . Sc cell light brown, opaque. Pterostigma light brown with dark apex (Fig. 1). Hindwings light cream, with opaque apex in R and Cu cells, subcostal cell light brown. Abdomen light brown with brown, subcuticular dorso-lateral bands.

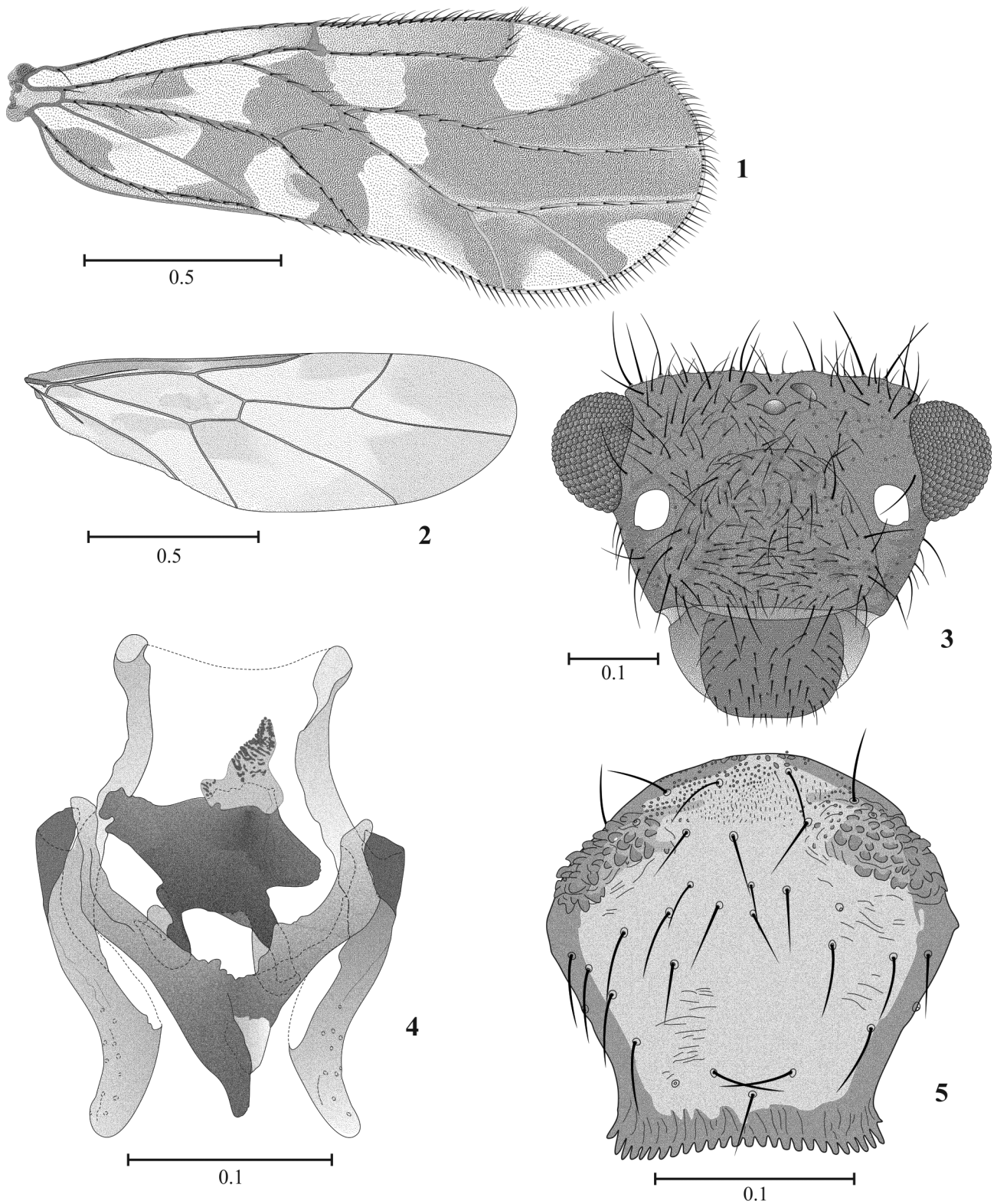
Morphology. Head as illustrated (Fig. 3). Forewings with thick setae on veins and margins, additional row from Sc to R_{4+5} ; hindwings with glabrous margins (Fig. 2). Phallosome with external parameres stout and curved outward, distally blunt. Aedeagal arch stout, distally pointed. A single, large, irregular endophallic sclerite (Fig. 4), with an anterior projection, and two slender, posterior projections. Hypandrium subrectangular, wider posteriorly, slightly concave, with two side, slender, pointed posterior projections (Fig. 6). Paraprocts rhomboid, without transverse row of setae, sensory fields with nine trichobothria, eight issuing from basal rosettes; marginal spines asymmetric, short and bifid (Fig. 7). Epiproct semicircular, apex not-pigmented (Fig. 7). Clunium vase-shaped, with two antero-lateral tubercular fields; apical comb with 26 stout teeth (Fig. 5).

Measurements. FW: 1775, HW: 1475, F: 360, T: 640, t_1 : 195, t_2 : 67, ct_1 : 17, f_1 : 310, f_2 : 190, f_3 : 182, f_4 : 130, f_5 : 110, f_6 : 97, f_7 : 92, f_8 : 85, f_9 : 85, f_{10} : 82, f_{11} : 110, $Mx4$: 92, IO: 310, D: 100, d: 142, IO/d: 2.18, PO: 1.42.

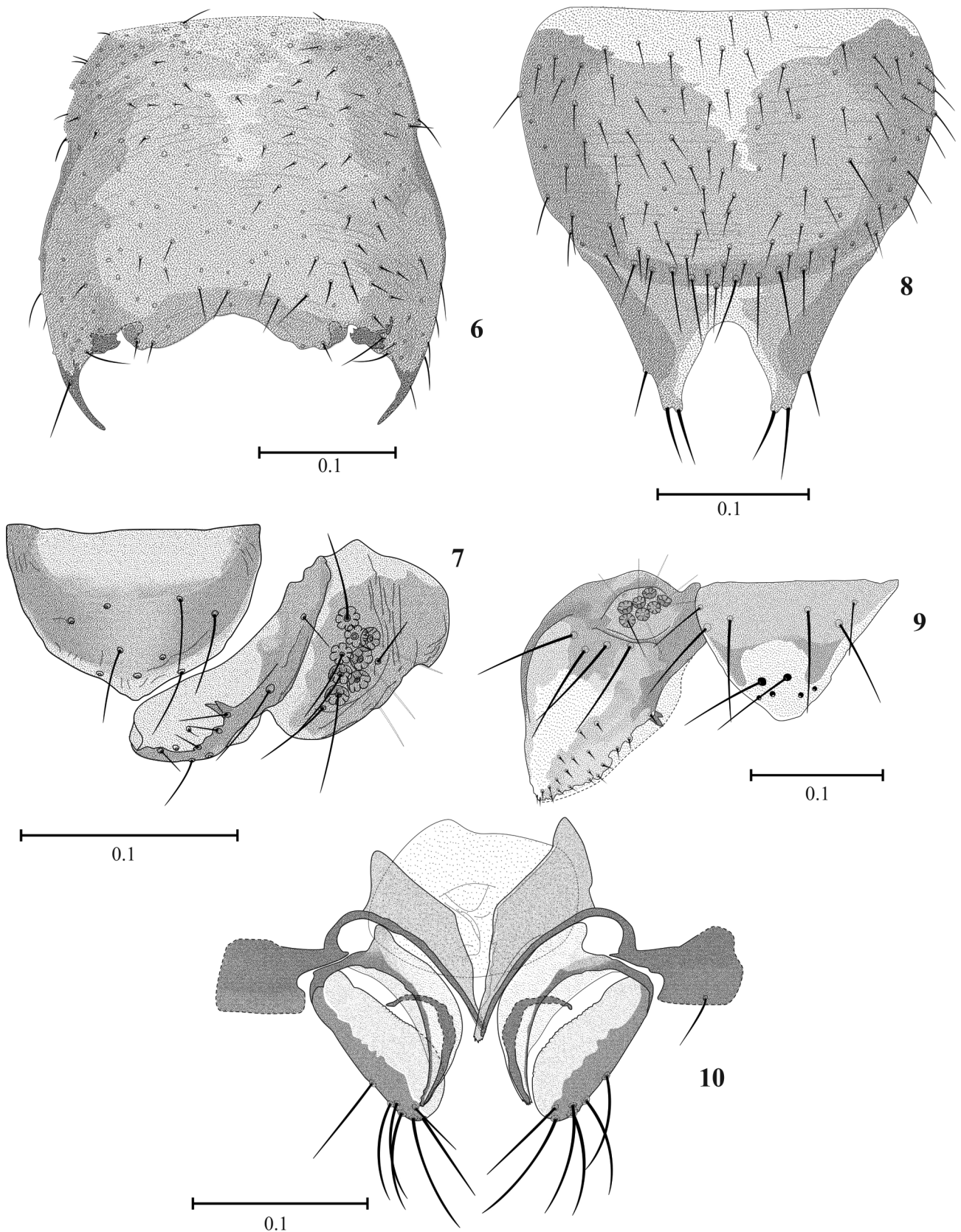
Female. Color. Same as the male, subgenital plate brown, inner margin of distal lobes not pigmented, outer margin dark brown.

Morphology. Subgenital plate subrectangular, with abundant setae; subapical transverse row of 11–12 long setae; apical lobes triangular, blunt, with three stout setae, two distal and one in outer margin (Fig. 8).

Gonapophyses: dorsal valves elongate, curved basally, with a marginal sclerotized band; ventral valves short, boomerang-shaped, external valves stout, with a non-pigmented inner margin and seven setae along outer margin. Ninth sternum membranous, spermapore not visible (Fig. 10). Paraprocts rhomboid, transverse, with a row of four elongate setae; sensory fields with eight trichobothria, seven on basal rosettes; marginal spines short, bifid and asymmetric (Fig. 9). Epiproct bell shaped, apex not pigmented.



FIGURES 1–5. *Ectopsocus andinus* n. sp. Male. 1. Forewing. 2. Hindwing. 3. Front view of head. 4. Phallosome. 5. Clunium. Scales in mm.



FIGURES 6–10. *Ectopsocus andinus* n. sp. Male. 6. Hypandrium. 7. Epiproct and right paraproct. Female. 8. Subgenital plate. 9. Epiproct and left paraproct. 10. Gonapophyses and ninth sternum. Scales in mm.

Measurements. FW: 1450, HW: 1175, F: 330, T: 530, t_1 : 172, t_2 : 82, ctt_1 : 12, f_1 : 202, f_2 : 110, f_3 : 110, f_4 : 85, f_5 : 75, f_6 : 65, f_7 : 65, f_8 : 60, f_9 : 65, f_{10} : 60, f_{11} : 85, Mx4: 102, IO: 350, D: 77, d: 130, IO/d: 2.69, PO: 1.68.

Specimens studied. Holotype male. **COLOMBIA.** Valle del Cauca, Cali, Quebrada Honda, 03° 26' 04.9" N: 76° 38' 03.7" W, 1818 m, 23.i.2013, MUSENUV slide cod. 25596, O. Saenz. Paratypes: 1 male and 3 females, same data as the holotype, 30.i.2013, MUSENUV slide cod. 25597-25600, N. Calderón & R. González. Tulúa, Jardín Botánico Juan María Céspedes (JBJMC), 04° 01' 45.1" N: 76° 10' 03.7" W, 1121 m, 14.i.2012, 1 male, MUSENUV slide cod. 25601, O. Saenz & N. Calderón.

Etymology. The specific name refers to the Andes cordillera, where this species was found.

Ectopsocus gorgonaensis n. sp.

(Figures 11–17)

Diagnosis. *Ectopsocus gorgonaensis*, *E. andinus*, and *E. chiapensis* share general characteristics of phallosome structure and clunium. In this group of species the aedeagal arch is stout, and the clunium has a pair of antero-lateral tubercular fields, but they differ in that the first one has wings unmarked; the aedeagal arch is stout, keel-shaped, the external parameres are proximally slender, distally stout, straight and blunt ended. Also, the clunium has a small papillar field in the middle, next to the clunial comb.

Description. Male. Color. Thoracic tergum and head light brown. Compound eyes black, ocelli hyaline. Forewings light brown with pterostigma slightly darker, hindwings hyaline, with light brown veins. Legs light yellow, coxae with basal half light brown. Abdomen light cream, with dorso-ventral subcuticular, light brown bands.

Morphology. Head as illustrated (Fig. 13). Margins and veins of forewings with slender setae, hindwings with row of 17 setae between R_1 and R_{4+5} (Fig. 12). Phallosome with three endophallic sclerites: two small, rounded, and a large, central one, with middle area stout and acuminate, flanked by large quadrate area and stout long lobe, distally blunt (Fig. 16). Hypandrium trapeziform, wider posteriorly; posterior border as illustrated (Fig. 17). Paraprocts ovoid, with nine trichobothria, eight in basal rosettes, without transverse row of setae; marginal spines asymmetric, bifid, short and sharp (Fig. 15). Epiproct bell shaped, setal field and pigmentation as illustrated (Fig. 15). Clunium vase-shaped, wider anteriorly, with two large antero-lateral fields of dense tubercles; posterior field of papillae as in diagnosis; clunial comb with 26 short stout teeth (Fig. 14).

Measurements. FW: 1025, HW: 940, F: 320, T: 490, t_1 : 170, t_2 : 95, ctt_1 : 15, f_1 : 200, f_2 : 122, f_3 : 117, f_4 : 95, f_5 : 80, f_6 : 72, f_7 : 72, f_8 : 72, f_9 : 72, f_{10} : 70, f_{11} : 87, Mx4: 80, IO: 270, D: 77, d: 135, IO/d: 2, PO: 1.75.

Specimens studied. Holotype male. **COLOMBIA.** Cauca, Guapi, NNP Gorgona, Blanca Beach, 02° 56' 52.7" N: 78° 11' 32.4" W, 3 m, 19.x.2010, MUSENUV slide cod. 25602, R. González. Paratypes: 1 male, Cauca, Guapi, NNP Gorgona, Gorgonilla Beach, 02° 56' 39.2" N: 78° 12' 45.0" W, 4 m, 26.xi.2009, MUSENUV slide cod. 25603, F. Sarria & R. González.

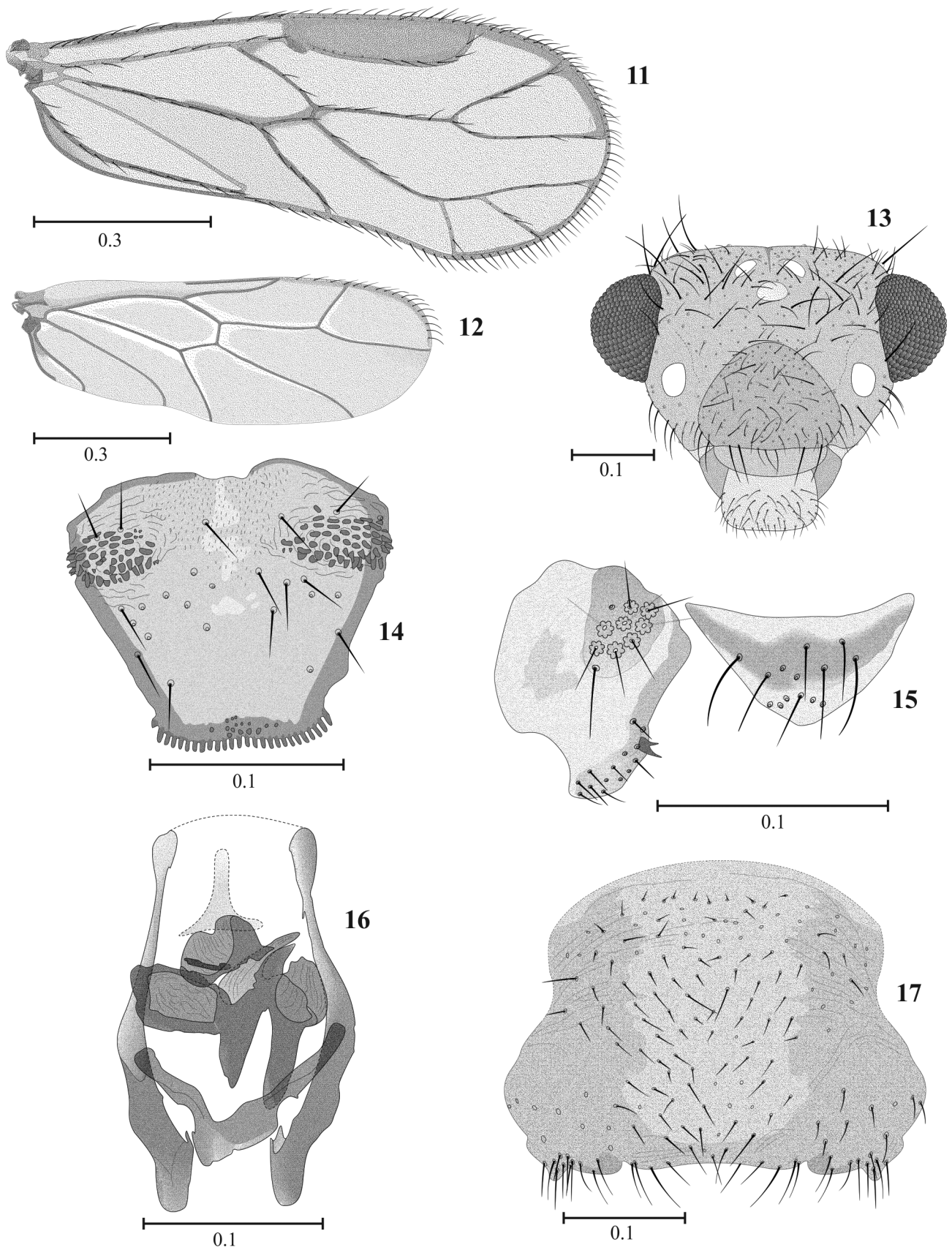
Etymology. The specific name refers to the NNP Gorgona, type locality of this species.

Ectopsocus valvilobatus n. sp.

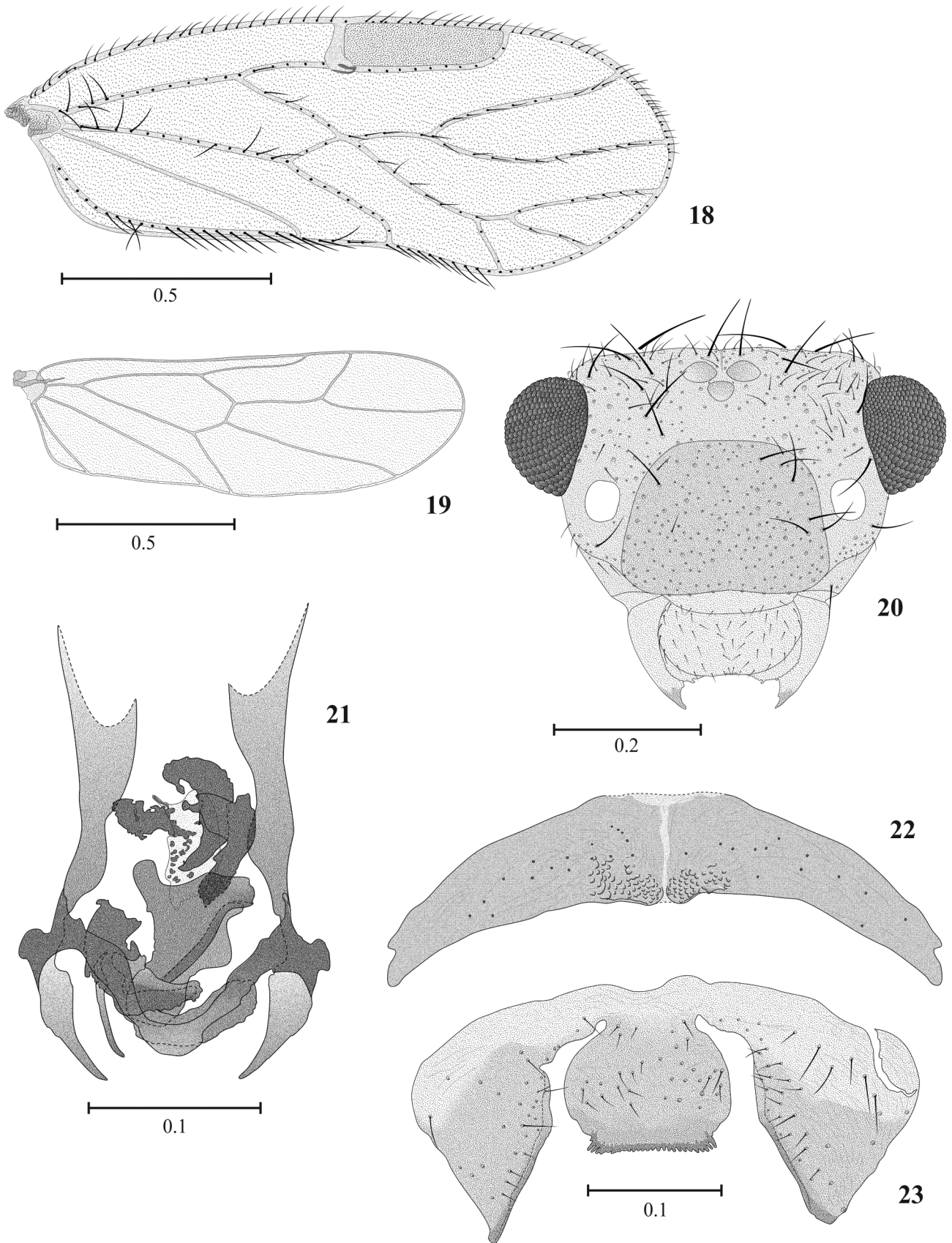
(Figures 18–28)

Diagnosis. *E. valvilobatus* is similar in shape, morphology of clunium and wings to *E. titschacki*, but it has an aedeagal arch stout, apically rounded, V-shaped, while in the latter the internal parameres are fused in a wide apical structure with two subtriangular lateral projections. In *E. valvilobatus* the eighth abdominal tergite has two papillar fields in the middle of the posterior margin (Fig. 22), absent in *E. titschacki*. In addition, the females of *E. valvilobatus* have lobed external valves, quite different from those in *E. titschacki*.

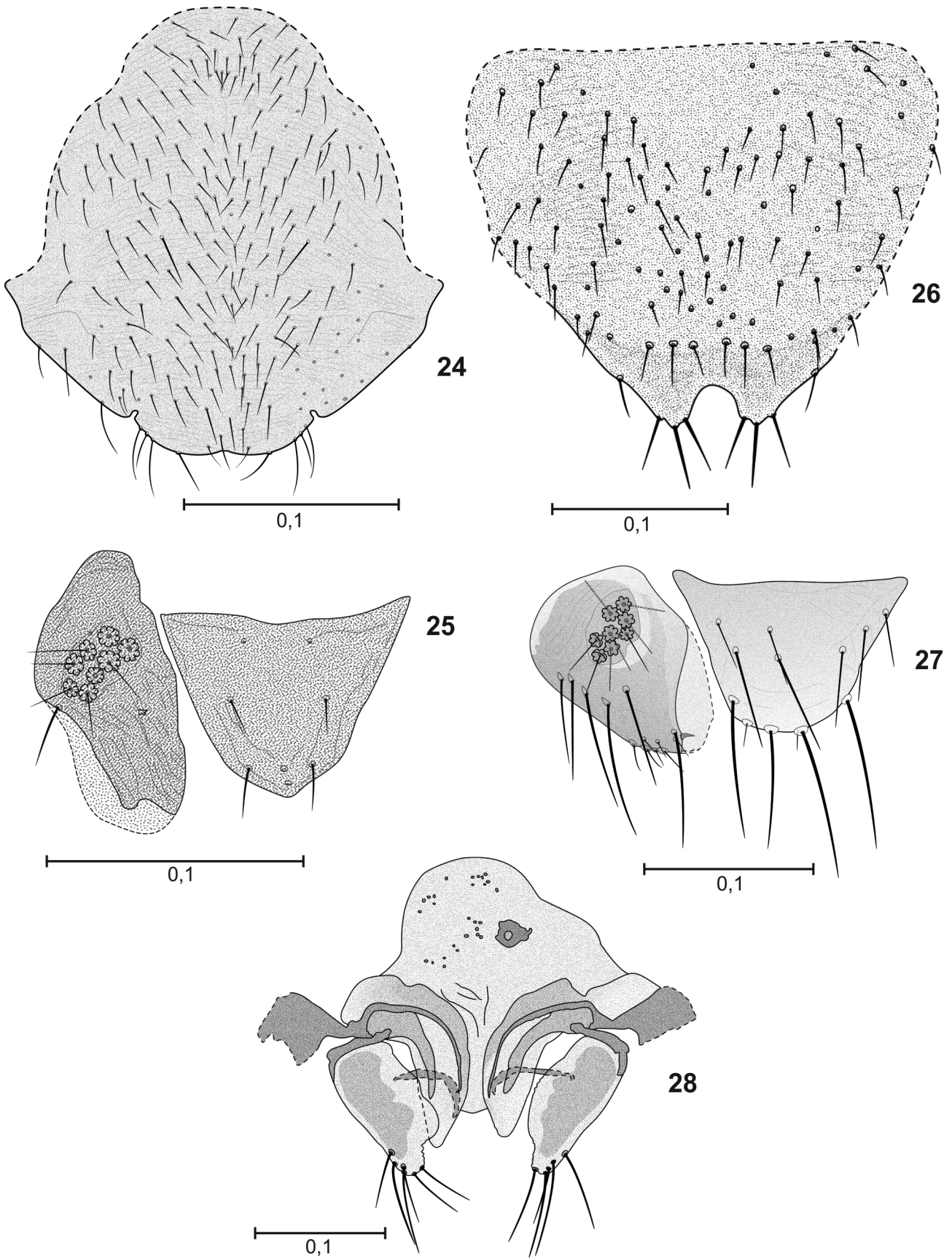
Description. Male. Color. Head creamy, compound eyes black, ocelli hyaline. Thoracic terga pale brown. Legs pale yellow. Fore- and hind- wings creamy, with veins and margins light brown, abdomen pale yellow with dorsal subcuticular bands pale brown



FIGURES 11–17. *Ectopsocus gorgonaensis* n. sp. Male. 11. Forewing. 12. Hindwing. 13. Front view of head. 14. Clunium 15. Epiproct and right paraproct. 16. Phallosome. 17. Hyandrium. Scales in mm.



FIGURES 18–23. *Ectopsocus valvilobatus* n. sp. Male. 18. Forewing. 19. Hindwing. 20. Front view of head. 21. Phallosome. 22. Eight tergite. 23. Clunium. Scales in mm.



FIGURES 24–28. *Ectopsocus valvilobatus* n. sp. Male. 24. Hypandrium. 25. Epiproct and right paraproct. Female. 26. Subgenital plate. 27. Epiproct and right paraproct. 28. Gonapophyses and ninth sternum. Scales in mm.

Morphology. Head as illustrated (Fig. 20). Short setae on forewings veins and margins (Fig. 18). Hindwing margin glabrous (Fig. 19). Hypandrium broad, with setae as illustrated, longer than maximum width, posterior border slightly lobed (Fig. 24). Six endophallic sclerites present (Fig. 21): three anterior, two crescent shaped and one sinuous; three posterior, one stout, “handle” shaped, one sinuous, with a pair of sharp projections and one arcuate, inverted. Paraprocts broadly elliptic, without transverse row of setae, sensory fields with nine trichobothria, eight in basal rosettes; marginal spines asymmetric, short and bifid (Fig. 25). Epiproct bell-shaped, with setae as illustrated (Fig. 25). Clunium (Fig. 23), apical comb with 26–29 teeth apically blunt.

Measurements. FW: 1600, HW: 1275, F: 440, T: 630, t_1 : 950, t_2 : 90, ctt_1 : 15, f_1 : 260, f_2 : 118, f_3 : 110, f_4 : 92, f_5 : 77, f_6 : 77, f_7 : 57, f_8 : 60, f_9 : 55, f_{10} : 47, f_{11} : 70, Mx4: 122, IO: 370, D: 110, d: 162, IO/d: 2.28, PO: 1.47.

Female. Color. Same as the male; subgenital plate with apical lobes light brown.

Morphology. Subgenital plate broad, with setae as illustrated (Fig. 26); subapical transverse row with six stout setae (Fig. 26). Gonapophyses: ventral and dorsal valves membranous, with a small, sclerotized marginal band, external valve with lobed apex and six setae. Ninth sternum membranous, with a well sclerotized comma-shaped spermapore (Fig. 28). Paraprocts ovoid, with a transverse row of 4–5 long setae; marginal spines bifid, symmetric and short; sensory fields with nine trichobothria, eight in basal rosettes (Fig. 27). Epiproct bell-shaped, setae as illustrated (Fig. 27).

Measurements. FW: 1650, HW: 1300, F: 400, T: 620, t_1 : 870, t_2 : 90, ctt_1 : 15, f_1 : 260, f_2 : 110, f_3 : 105, f_4 : 87, f_5 : 70, f_6 : 70, f_7 : 50, f_8 : 55, f_9 : 52, f_{10} : 45, f_{11} : 70, Mx4: 120, IO: 390, D: 107, d: 167, IO/d: 2.33, PO: 1.56.

Specimens studied. Holotype male, **COLOMBIA.** Cauca, Guapi, NNP Gorgona, Gorgonilla Beach, 02° 56' 39.2" N: 78° 12' 45.0" W, 4 m, 19.x.2010, MUSENUV slide cod. 25604, R. González. Paratypes: 2 males and 2 females, same data as the holotype MUSENUV slide cod. 25605-25608. Valle del Cauca, Buenaventura, Punta Soldado, 03° 48' 5" N: 77° 0' 40" W, 8 m, 4.iv.2010, 1 males and 1 females, MUSENUV slide cod. 25609-25610, R. González.

Etymology. The specific name refers to the strongly lobed external valves of the female.

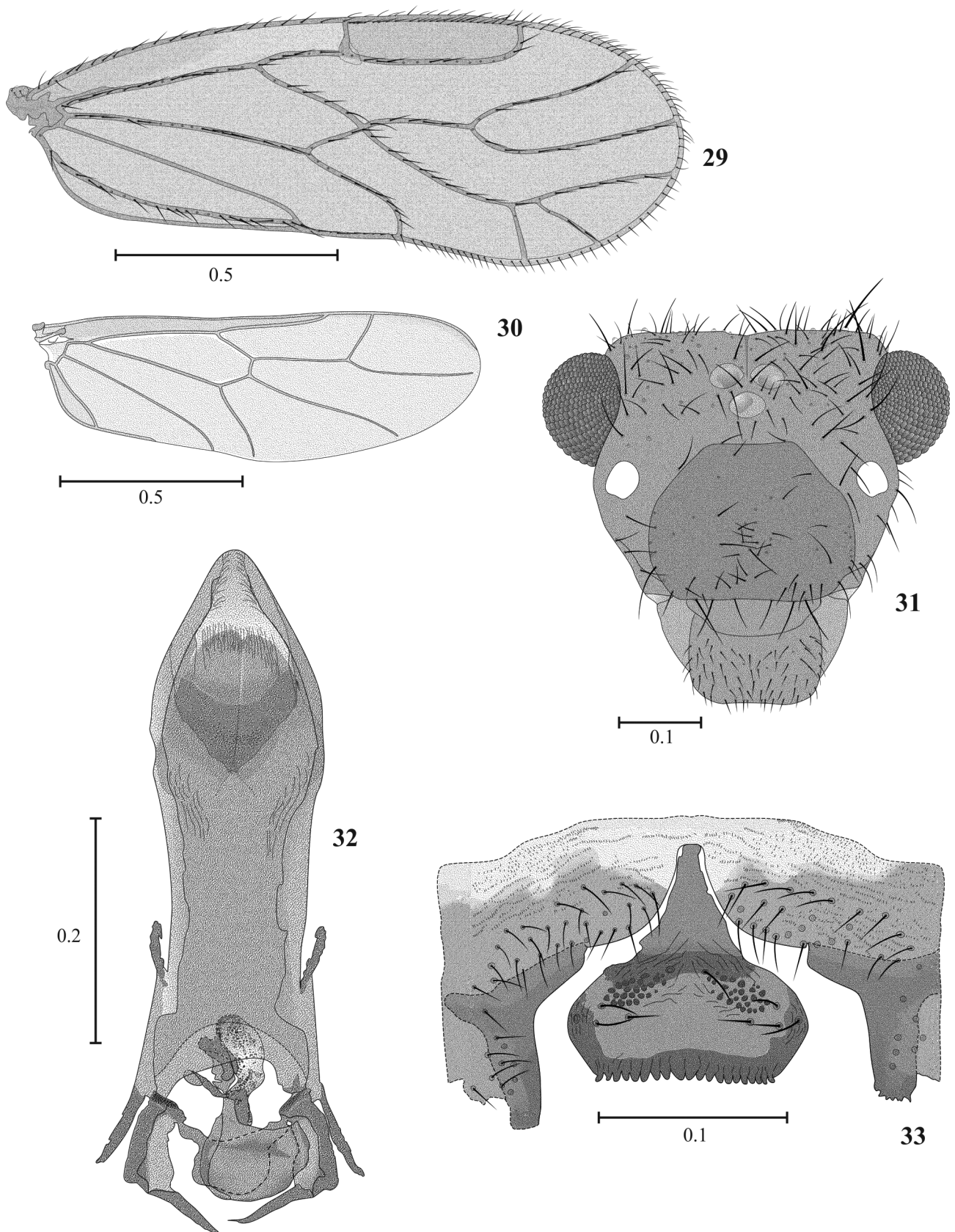
Ectopsocus vilhenaioides n. sp.

(Figures 29–39)

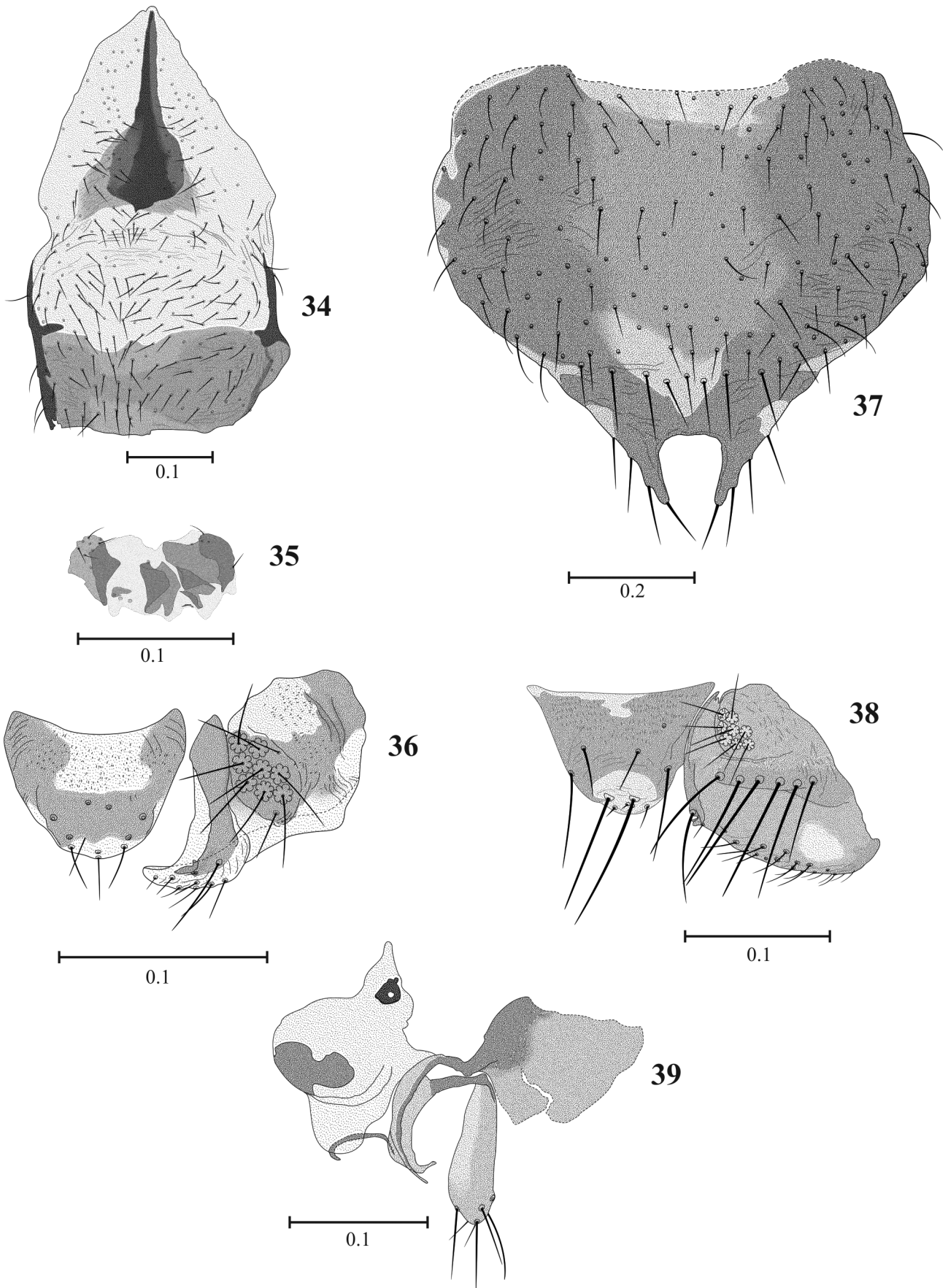
Diagnosis. Belonging in species group *Cinctus*, of Thornton & Wong (1968). Close to *E. vilhenai* Badonnel, from which it differs in that the aedeagal arch is stout, rounded posteriorly, lacking the rounded side lobes of the former, also, the phallosome lacks the anterior elongate apophysis; the median sclerite of the clunium is more slender anteriorly, the papillar fields have few papillae, dispersed in a wide area, and the clunial comb has 21–22 short teeth, while in *E. vilhenai*, the median sclerite of the clunium is much stouter anteriorly, the papillae are densely packed in each field, and the clunial comb has 27 long teeth. The apical lobes of the subgenital plate in *E. vilhenai* are stout, and the plate has a rounded papillar field next to the gap between the apical lobes (Badonnel 1955); this papillar field is absent in *E. vilhenaioides*, and the apical lobes are slender.

Description. Male. Color. Head pale brown. Compound eyes black, ocelli hyaline, with centripetal crescents brown. Thoracic terga dark brown; forewings opaque brown, veins slightly darker. Hindwings opaque, veins dark brown. Legs light brown. Abdomen pale brown with dorso-lateral subcuticular bands dark brown.

Morphology. Head as illustrated (Fig. 31). Forewing veins with short, stout setae, margins with very short, slender setae (Fig. 29); hindwing margin glabrous (Fig. 30). Phallosome elongate, with subtriangular base and a prebasal V-shaped spot. Mesally covered by a membrane slightly sclerotized; with two pairs of slender marginal sclerites in mesal and apical position. External parameres short, basal half stout, apical half acute, bent mesally, with apex slightly curved and sharp. Aedeagal arch cup-shaped with a stout keeled apex. Two endophallic sclerites (Fig. 32): anterior sclerite sinuous and posterior sclerite globose. Hypandrium ovoid, posterior border with three irregular sclerites (Fig. 35), anterior half with a V-shaped, sclerotized subcuticular area, subapical margin with a dark brown transverse band (Fig. 34). Paraprocts without transverse row of setae, sensory fields with nine trichobothria, eight in basal rosettes, marginal spines bifid, elongate and strongly asymmetric (Fig. 36). Epiproct bell-shaped, with apex and base not pigmented (Fig. 38). Clunium cone-shaped, posterior half round, anterior half elongate and subtriangular, with two small papillar areas, apical comb with 21–22 short, stout teeth (Fig. 33).



FIGURES 29–33. *Ectopsocus vilhenaoides* n. sp. Male. 29. Forewing. 30. Hindwing. 31. Front view of head. 32. Phallosome. 33. Clunium and eighth tergum. Scales in mm.



FIGURES 34–39. *Ectopsocus vilhenaioides* n. sp. Male. 34. Hypandrium. 35. Apical sclerites of hypandrium. 36. Epiproct and left paraproct. Female. 37. Subgenital plate. 38. Epiproct and left paraproct. 39. Gonapophyses and ninth sternum. Scales in mm.

Measurements. FW: 1525, HW: 1225, F: 360, T: 600, t_1 : 240, t_2 : 95, ctt_1 : 10, f_1 : 235, f_2 : 110, f_3 : 117, f_4 : 68, Mx4: 135, IO: 320, D: 100, d: 147, IO/d: 2.17, PO: 1.47.

Female. Color. Same as the male; subgenital plate brown with a longitudinal central area light brown. Apical lobes brown with a subtriangular basal area not pigmented.

Morphology. Subgenital plate subrectangular, distal lobes subtriangular, elongate, slightly inclined; with 4 setae, gap between lobes high. Subapical transverse row with 11 setae (Fig. 37). Gonapophyses: ventral valves short and curved, dorsal valves membranous, with a small, sclerotized marginal band, external valves with rounded apex and seven stout setae. Ninth sternum membranous, with a sclerotized central plate and circular spermapore (Fig. 39). Paraprocts ovoid; transverse row of 5–6 long setae, sensory fields with nine trichobothria, eight in basal rosettes; marginal spines bifid, asymmetric, short and robust (Fig. 38). Epiproct bell-shaped, posterior border not pigmented (Fig. 38).

Measurements. FW: 1400, HW: 1150, F: 350, T: 570, t_1 : 215, t_2 : 93, ctt_1 : 16, f_1 : 217, f_2 : 90, f_3 : 105, f_4 : 80, f_5 : 75, f_6 : 73, f_7 : 60, f_8 : 60, f_9 : 63, f_{10} : 58, Mx4: 98, IO: 370, D: 110, d: 162, IO/d: 2.28, PO: 1.47.

Specimens studied. Holotype male. **COLOMBIA.** Valle del Cauca, El Cerrito, Cerrito adentro E4, 03° 38' 45.4" N: 76° 09' 21.9" W, 2010 m, 17.viii.2012, MUSENUV slide cod. 25611, O. Saenz. Paratypes: 3 males and 3 females, same data as the holotype MUSENUV slide cod. 25612-25617. Valle del Cauca, Cali, Universidad del Valle Campus, 03° 22' 38.11" N: 76° 32' 3.73" W, 980 m, 02.x.2010, 4 males and 2 females, MUSENUV slide cod. 25618-25623, R. González. Cali, La Buitrera, 03° 22' 20.5" N: 76° 34' 11.3" W, 1153 m, 16.vii.2009, 2 males, MUSENUV slide cod. 25624-25625, R. González. Buenaventura, El Naranjo, 03° 46' 51.6" N: 76° 42' 58" W, 511 m, 19.ix.2012, 1 male and 1 female, MUSENUV slide cod. 25626-25627, O. Saenz & N. Calderón. Cali, Pueblo Pance, 03° 19' 43.4" N: 76° 38' 18.9" W, 1616 m, 04.xi.2012, 1 female, O. Saenz & N. Calderón.

Etymology. The specific name refers to the resemblance with *E. vilhenai* Badonnel, 1955.

Records of Ectopsocidae in Valle del Cauca and NNP Gorgona

Ectopsocus briggsi McLachlan, 1899.

Records. Valle del Cauca, La Cumbre, Montañitas, 03° 38' 11.1" N: 76° 31' 53.3" W, 1665 m, 05.v.2012, 1 female, MUSENUV slide cod. 25628, O. Saenz & N. Calderón. Valle del Cauca, La Cumbre, S1, 03° 38' 17.9" N: 76° 33' 41.7" W, 1716 m, 14.ix.2012, 1 female, MUSENUV slide cod. 25629, O. Saenz. Valle del Cauca, La Cumbre S2, 03° 38' 18.1" N: 76° 32' 55.3" W, 1783 m, 14.ix.2012, 1 female, MUSENUV slide cod. 25630, O. Saenz. Valle del Cauca, el Cerrito, cerrito adentro E4, 03° 38' 51.0" N: 76° 09' 26.6" W, 1979 m, 19.viii.2012, 1 female, MUSENUV slide cod. 25631, C. Saldaña.

Ectopsocus californicus Banks, 1903.

Records. Valle del Cauca, La Cumbre, Montañitas, 03° 38' 11.1" N: 76° 31' 53.3" W, 1665 m, 05.v.2012, 1 female, MUSENUV slide cod. 25632, O. Saenz & N. Calderón.

Ectopsocus columbianus Badonnel, 1986.

Records. Valle del Cauca, Cali, La Buitrera, 03°22' 20.5" N: 76° 34' 11.3" W, 1153 m, 25.vii.2010, 1 female, MUSENUV slide cod. 25633, R. González. Buenaventura, El Naranjo, 03° 46' 51.6" N: 76° 42' 58" W, 511 m, 19.ix.2012, 1 female, MUSENUV slide cod. 25634, O. Saenz & N. Calderón. Cali, Campus Universidad del Valle, 03° 22' 38.11" N: 76° 32' 3.73" W, 980 m, 22.vi.2010, 1 female, R. González.

Ectopsocus maindroni Badonnel, 1935.

Records. Cauca, Guapi, NNP Gorgona, Gorgonilla Beach, 02° 56' 39.2" N: 78° 12' 45.0" W, 4 m, 26.xi.2009, 3 males and 2 females, MUSENUV slide cod. 25635-25639, F. Sarria & R. González. Valle del Cauca, Cali, La Buitrera, 03° 22' 20.5" N: 76° 34' 11.3" W, 1153 m, 16.vii.2009, 1 male, R. González.

Ectopsocus meridionalis Ribaga, 1904.

Records. Valle del Cauca, La Cumbre, Montañitas, 03° 38' 11.1" N: 76° 31' 53.3" W, 1665 m, 05.v.2012, 3

females, MUSENUV slide cod. 25640-25642, O. Saenz & N. Calderón. La Cumbre, S1, 03° 38' 17.9" N: 76° 33' 41.7" W, 1716 m, 14.ix.2012, 3 females, MUSENUV slide cod. 25643-25645, O. Saenz. El Cerrito, Cerrito Adentro E2, 03° 38' 41.2" N: 76° 09' 34.8" W, 1859 m, 2 females, MUSENUV slide cod. 25646-25647, C. Saldaña. Cerrito Adentro, E3, 03° 38' 46.6" N: 76° 09' 32.9" W, 1960 m, 19.ix.2012, 1 female, MUSENUV slide cod. 25648, C. Saldaña. Cali, Quebrada Honda, 03° 26' 04.9" N: 76° 38' 03.7" W, 1818 m, 14.iv.2012, 1 female, MUSENUV slide cod. 25649, R. González. Cali, Campus Universidad del Valle, 03° 22' 38.11" N: 76° 32' 3.73" W, 980 m, 23.xii.2010, 3 females, MUSENUV slide cod. 25650-25652, R. González. Cali, La Buitrera, 03° 22' 20.5" N: 76° 34' 11.3" W, 1153 m, 25.vi.2011, 2 females, MUSENUV slide cod. 25653-25654, R. González. Cali, San Antonio, 03° 30' 38.3" N: 76° 37' 13.8" W, 1990 m, 14.iv.2012, 1 female, MUSENUV slide cod. 25655, R. González. Cali, Pueblo Pance, 03° 19' 43.4" N: 76° 38' 18.9" W, 1616 m, 04.xi.2012, 2 females, MUSENUV slide cod. 25656-25657, O. Saenz & N. Calderón.

Ectopsocus pilosus Badonnel, 1967.

Records. Valle del Cauca, Cali, Campus Universidad del Valle, 03° 22' 38.11" N: 76° 32' 3.73" W, 980 m, 22.vi.2010, 2 males and 2 females, MUSENUV slide cod. 25658-25661, R. González. San Antonio, 03° 30' 38.3" N: 76° 37' 13.8" W, 1990 m, 22.ix.2012, 1 male and 1 female, MUSENUV slide cod. 25662-25663, R. González. Dagua, ca. Bellavista, Km 45-vía al mar, 03° 37' 01.7" N: 76° 39' 11.02" W, 1125 m, 19.vi.2010, 2 females, MUSENUV slide cod. 25664-25665, R. González.

Ectopsocus richardsi Pearman, 1929.

Records. Valle del Cauca, Cali, Campus Universidad del Valle, crickets colony, 03° 22' 38.11" N: 76° 32' 3.73" W, 980 m, 22.vi.2011, 1 male and 2 females, MUSENUV slide cod. 25666-25668, K. Ospina.

Ectopsocus titschacki Jentsch, 1939.

Records. Valle del Cauca, Buenaventura, Punta Soldado, 03° 48' 05" N: 77° 0' 40" W, 8 m, 09.iv.2011, 3 males, 3 females, MUSENUV slide cod. 25669-25674, R. González. Cali, Campus Universidad del Valle, 03° 22' 38.11" N: 76° 32' 3.73" W, 980 m, 21.xii.2010, 2 females and 3 males, MUSENUV slide cod. 25675-25679, R. González. Cali, La Buitrera, 03° 22' 20.5" N: 76° 34' 11.3" W, 1153 m, 28.x.2012, 2 females, MUSENUV slide cod. 25680-25681, R. González. Cauca, Guapi, NNP Gorgona, Palmeras Beach, 02° 56' 28.6" N: 78° 12' 21.4" W, 28 m, 17.x.2010, 2 males and 1 female, MUSENUV slide cod. 25682-25684, R. González. Cauca, Guapi, NNP Gorgona, Gorgonilla Beach, 02° 56' 39.2" N: 78° 12' 45.0" W, 4 m, 16.x.2010, 2 males, R. González.

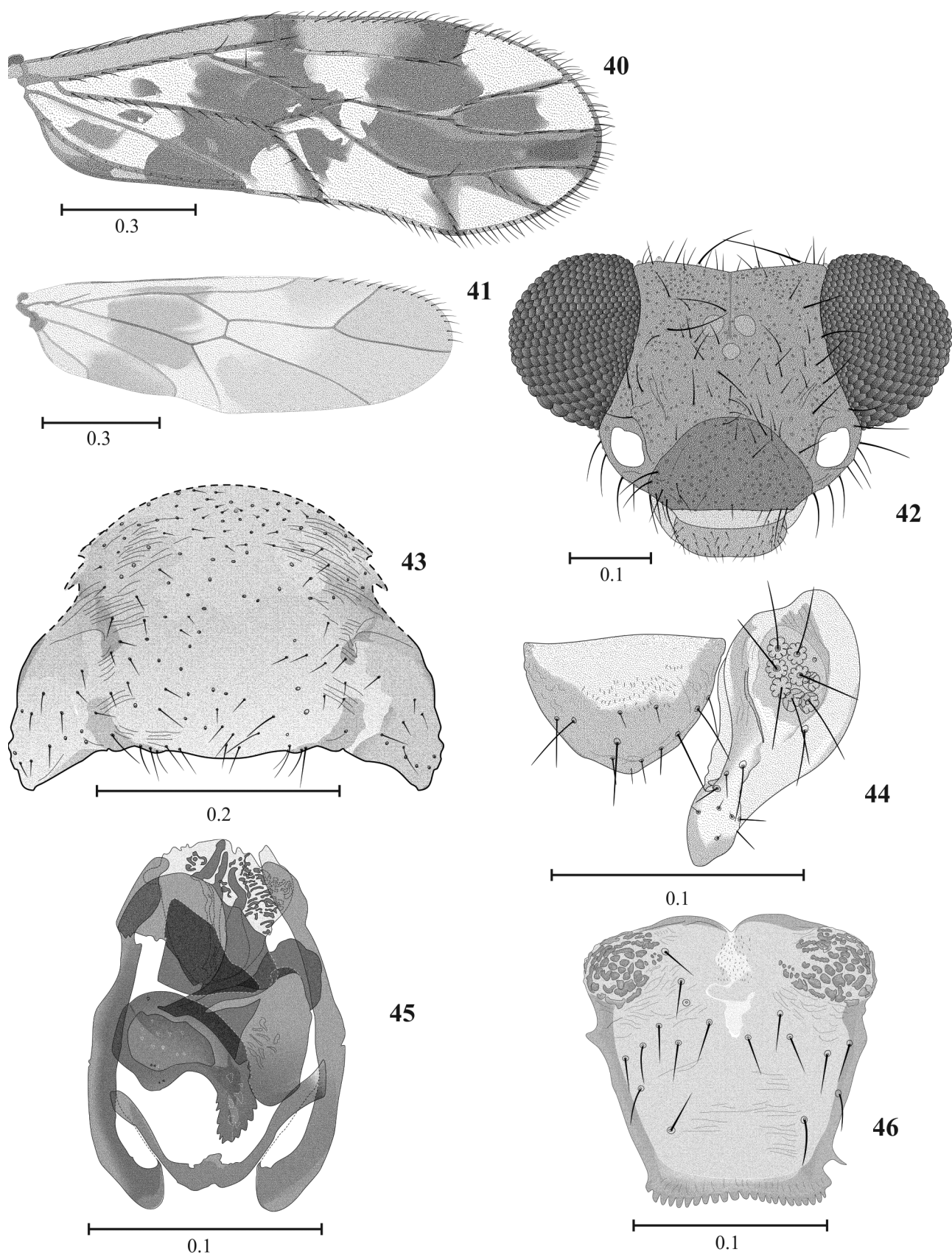
Ectopsocus thorntoni García Aldrete, 1991.

Male description

(Figs. 40–46)

Diagnosis. *Ectopsocus thorntoni* presents a wings coloration pattern similar to *E. andinus*, *E. chiapensis* and *E. chiapensoides*, but differs in the hindwings, which have a row of 19 marginal setae. The phallosome structure is similar to *E. andinus* and *E. chiapensis*, but *E. thorntoni* has external parameres elongate, with the apex blunt, stout and slightly curved inward and aedeagal arch W-shaped (Fig. 45). Besides, it has three endophallic sclerites: a stout anterior sclerite, a mesal subtriangular sclerite, stout and curved, and an apical sclerite comma-shaped, with acute apex, covered by small denticles; this apical sclerite is absent in the two other species. This species is sexual dimorphic, notably in the size of the compound eyes, much larger in the males).

Male. Color. Compound eyes black, ocelli hyaline. Thoracic tergum light brown, head light brown. Legs creamy, with transverse light brown spots; forewing with hyaline fenestrae in M_1 , M_3 , apical and basal margin of R_1 , apical margin of R_{2+3} and basal R_{4+5} cells; basal half with a transverse pigmented band from nodulus to apical margin of anal cell. Pterostigma opaque with anterior and posterior ends dark brown (Fig. 40). Hindwings light cream, with a transverse, pale brown band from R to anal cells. Abdomen creamy, with dorso-lateral, subcuticular pale brown bands.



FIGURES 40–46. *Ectopsocus thorntoni* García Aldrete. Male. 40. Forewing. 41. Hindwing. 42. Head 43. Hypandrium. 44. Epiproct and left paraproct. 45. Phallosome. 46. Clunium. Scales in mm.

Morphology. Compound eyes of males much larger than in the females (Fig. 42). Forewings with setae in veins and margins, extra row between Sc and R₄₊₅ (Fig. 40). Hindwings with 19 marginal setae between R₁ and R₄₊₅ (Fig. 41). Hypandrium subtrapezoidal, anterior margin narrow, postero-lateral margin elongate, apex with depressed middle lobe (Fig. 43). Paraprocts ovoid, without transverse row of setae; sensory fields with nine trichobothria, eight in basal rosettes; marginal cones short, bifid and asymmetrical (Fig. 44). Epiproct semicircular with basal area not-pigmented. Clunium trapezoidal, anterior margin with a medial slit not pigmented; antero-lateral margin with two groups of large papillae; apical comb with 23 blunt apex elongate teeth (Fig. 46).

Measurements. FW: 1375, HW: 1150, F: 340, T: 510, t1: 190, t2: 75, ctt1: 15, f1:235, f2: 152.5, f3: 157.5, f4: 117.5, f5: 95, f6: 90, f7: 80, Mx4: 90, IO: 220, D: 160, d: 225, IO/d: 0.97, PO: 1.40.

Records. Cauca, Guapi, NNP Gorgona, Gorgonilla Beach, 02° 56' 39.2" N: 78° 12' 45.0" W, 4 m, 16.x.2010, 1 male and 2 females, MUSENUV slide cod. 25685-25686-25694, R. González. NNP Gorgona, La Camaronera Beach, 02° 57' 13.3" N: 78° 11' 48.6" W, 15 m, 23.ii.2011, 1 female, MUSENUV slide cod. 25695, F. Sarria.

Ectopsocus vilhenai Badonnel, 1955.

Records. Valle del Cauca, El Cerrito, Cerrito Adentro, E4, 03° 38' 51.0" N: 76° 09' 26.6" W, 1979 m, 19.viii.2012, 1 male, MUSENUV slide cod. 25696, O. Saenz.

Ectopsocopsis cryptomeriae (Enderlein, 1907).

Records. Valle del Cauca, Cali, Campus Universidad del Valle, 03° 22' 38.11" N: 76° 32' 3.73" W, 980 m, 22.vi.2010, 1 male and 1 female, MUSENUV slide cod. 25697-25698, R. González.

Discussion

Ectopsocus gorgonaensis and *E. valvilobatus* could not be assigned to any of the species groups established by Thornton & Wong (1968); they each may require a species group of their own.

The additions and corrections (Lienhard, 2012) to the world catalogue of Psocoptera (Lienhard & Smithers, 2002) list for Colombia only five species of Ectopsocidae: *Ectopsocus californicus* Banks, *E. columbianus* Badonnel, *E. meridionalis* Ribaga, *E. richardsi* Pearman, and *E. titschacki* Jentsch, none of them recorded in Valle del Cauca or NNP Gorgona. Here we record 15 species; four are new to science, and six are new records for Colombia. In Valle del Cauca we found 13 species, three are new to science and two of them are endemic; in the NNP Gorgona, we found five species, two new to science and one endemic. The two regions share one new species, *E. valvilobatus*, found in the Pacific coastal region of Valle del Cauca and in the beaches of NNP Gorgona.

The information here presented places Colombia as the second richest country for Ectopsocidae in the Americas, compared to Mexico with 21 species, of which 10 are endemic (García Aldrete, 1991). In Brazil, another megadiverse country, only six species have been recorded to date (García Aldrete & Mockford, 1999) (Table 1). The richest country for Ectopsocidae is China (Li, 2002), with 50 species recorded, in the genera *Ectopsocus* McLachlan (16 species), *Ectianocullus* Li (one species), *Estipulaceus* Li (11 species), and *Ectopsocopsis* Badonnel (22 species).

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TABLE 1. Neotropical and Caribbean species of Ectopsocidae and distribution. *New species, **New records for Colombia. **VC:** Valle del Cauca, **NNPG:** National Natural Park Gorgona.

Species	Distribution
<i>Ectopsocopsis cryptomeriae</i> Enderlein **	Brazil, Colombia (VC), Cuba, Jamaica, Mexico, Paraguay, Puerto Rico, Venezuela
<i>Belipsocus chiquibulensis</i> García Aldrete	Belize
<i>Ectopsocus andinus</i> *	Colombia (VC)
<i>Ectopsocus briggsi</i> McLachlan	Chile, Colombia (VC), Mexico, Venezuela
<i>Ectopsocus californicus</i> Banks	Argentina, Colombia (VC), Guatemala, Mexico
<i>Ectopsocus chiapensis</i> García Aldrete	Mexico
<i>Ectopsocus chiapensoides</i> García Aldrete	Mexico
<i>Ectopsocus columbianus</i> Badonnel	Colombia (VC), Venezuela
<i>Ectopsocus eermoedi</i> García Aldrete	Mexico
<i>Ectopsocus formosus</i> García Aldrete	Mexico
<i>Ectopsocus gorgonaensis</i> *	Colombia (NNPG)
<i>Ectopsocus maindroni</i> Badonnel **	Colombia (VC, NNPG), Cuba, Jamaica, Mexico, Puerto Rico, Venezuela
<i>Ectopsocus meridionalis</i> Ribaga	Colombia (VC), Jamaica, Mexico
<i>Ectopsocus mexicanus</i> García Aldrete	Mexico
<i>Ectopsocus obscurus</i> García Aldrete	Mexico
<i>Ectopsocus ornatus</i> Thornton	Jamaica, Puerto Rico
<i>Ectopsocus pacificus</i> García Aldrete	Mexico
<i>Ectopsocus pictus</i> Mockford	Cuba
<i>Ectopsocus pilosus</i> Badonnel**	Colombia (VC)
<i>Ectopsocus psychodelicus</i> Turner	Jamaica
<i>Ectopsocus pumilis</i> Banks	Brazil
<i>Ectopsocus striatellus</i> Navás	Argentina
<i>Ectopsocus ribagai</i> Enderlein	Brazil, Puerto Rico
<i>Ectopsocus richardsi</i> Pearman	Argentina, Brazil, Colombia (VC), Mexico, Panama
<i>Ectopsocus thibaudi</i> Badonnel	Guadeloupe, Guianas, Mexico, Puerto Rico
<i>Ectopsocus thorntoni</i> García Aldrete	Colombia (NNPG), Mexico
<i>Ectopsocus titschacki</i> Jentsch	Brazil, Colombia (VC, NNPG), Costa Rica, Cuba, Guatemala, Mexico, Suriname, Trinidad, Venezuela
<i>Ectopsocus tuxtlarum</i> García Aldrete	Mexico
<i>Ectopsocus vachoni</i> Badonnel	Argentina, Chile, Mexico
<i>Ectopsocus vilhenaoides</i> *	Colombia (VC)
<i>Ectopsocus valvilobatus</i> *	Colombia (VC, NNPG)
<i>Ectopsocus veracruzensis</i> García Aldrete	Mexico
<i>Ectopsocus vilhenai</i> Badonnel **	Brazil, Colombia (VC, NNPG), Cuba, Jamaica, Mexico, Nicaragua, Venezuela
<i>Ectopsocus yucatanus</i> García Aldrete	Mexico
Species totals by country	Mexico (21), Colombia (15), Brazil (6), Jamaica (6), Venezuela (6), Cuba (5), Puerto Rico (5), Argentina (4), Chile (2), Guatemala (2), Paraguay (1), Belize (1), Costa Rica (1), Guadeloupe (1), Guianas (1), Nicaragua (1), Suriname (1), Trinidad (1).

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