



Revision of the shore-fly genus *Peltopsilopa* Hendel (Diptera: Ephydriidae)

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Abstract

The Neotropical shore-fly genus *Peltopsilopa* Hendel is revised and now includes three species: *P. acuta* n.sp.; *P. anisotomoides* (Karsch), new combination; and *P. schwarzi* Cresson. A fourth species name, *P. aspistes* Hendel, is recognized as a junior synonym of *P. anisotomoides* (Karsch). We confirm that *Peltopsilopa* is closely related to *Cressonomyia* Arnaud and that the genus is in the tribe Psilopini, subfamily Discomyzinae. We provide a revised generic diagnosis and key to South American genera of Psilopini to facilitate identification of *Peltopsilopa*. The included species descriptions are extensively documented with illustrations, photographs, and distribution map.

Key words: Discomyzinae, Psilopini, taxonomy, systematics, New World

Introduction

The shore-fly genus *Peltopsilopa* Hendel, 1914 is easily identified because of its well-developed hood- or dome-like scutellum that extends over and beyond the posterior end of the abdomen. This feature, by convergence, is similar to many species of the family Celyphidae, and some investigators have confused specimens of *Peltopsilopa* as celyphids (Karsch 1884). *Peltopsilopa* is placed in the subfamily Discomyzinae and tribe Psilopini for which Mathis & Zatwarnicki (2004) published a key to the included genera.

Specimens of *Peltopsilopa* are rare in collections, and perhaps in nature, and aside from the original descriptions and the few and brief literature entries noted below, we know very little about the genus or its included species. In a revision of *Cressonomyia* Arnaud, Mathis & Zatwarnicki (2004) suggested that this genus and *Peltopsilopa* are perhaps closely related, primarily based on specimens of both genera having darkened wing bases and similar structures of the male terminalia. Herein we comprehensively revise *Peltopsilopa*, providing considerably more locality data for the three species now included in the genus and publishing the first illustrations and descriptions of structures of the male terminalia. We also provide a more extensive and revised diagnosis of *Peltopsilopa* and a key to genera of Psilopini from South America to facilitate identification of the genus.

Before this revision, *Peltopsilopa* comprised three named species that were described in the following chronological order: (1) *Celyphus anisotomoides* Karsch, 1884 (T. Zatwarnicki, *pers. comm.*, confirmed the syntype as a species of *Peltopsilopa*; J. M. Tenorio (1972: 378) had earlier written that this species belonged in the family Ephydriidae, not Celyphidae). (2) *Peltopsilopa aspistes* Hendel, 1914 was described from two specimens collected on the western slope of the Andes (Aracataca, Colombia). (3) *Peltopsilopa schwarzi* Cresson, 1922 was described from two specimens collected on the island of Cuba (Cayamas). Aside from these original descriptions, *Peltopsilopa* has received scant attention in the literature. The genus was listed in Wirth's Neotropical catalog (1968) and in the world catalog of Mathis & Zatwarnicki (1995). Malloch (1941), in one of his last published papers, included a brief synopsis of the genus, as did Cresson (1946) as part of his coverage of the tribe and subfamily for the Neotropics.

Material and methods

The descriptive terminology, with the exceptions noted in Mathis (1986), Mathis & Zatwarnicki (1990a), follows McAlpine (1981). Because specimens are small, usually less than 2.50 mm in length, study and illustration of the male terminalia required use of a compound microscope. We have followed the terminology for most structures of the male terminalia that other workers in Ephydriidae have used (references in Mathis 1986, Mathis & Zatwarnicki 1990a, 1990b), such as surstylus. Zatwarnicki (1996) suggested that the pre- and postsurstylus correspond with the pre- and postgonostylus and that the subepandrial sclerite is the same as the medandrium. The terminology for structures of the male terminalia is provided directly on Figs. 15–18. We use the term basal flagellomere for the large antennomere beyond the pedicel. We prefer this term over “first flagellomere” as there may be more than one flagellomere involved, and basal does not imply a number or numbers. We likewise do not use “postpedicel” (Stuckenberg 1999) for this antennomere because at least the multisegmented arista is beyond the pedicel in addition to the large antennomere, and postpedicel is thus ambiguous and lacking in precision.

Dissections of male terminalia were performed following Clausen & Cook (1971) and Grimaldi (1987). Abdomens were removed with microforceps and macerated in a sodium hydroxide solution. Cleared genitalia were then transferred to glycerin for observation, description, and illustration. The dissected abdomen was placed in a plastic microvial filled with glycerin and attached to the pin supporting the remainder of the insect from which it was removed. These structures for species of *Peltopsilopa* are minute, and for accurate determinations using them, we often had to use a compound microscope to see them clearly.

The species descriptions are composite and not based solely on holotypes. Head and two venational ratios used in the descriptions are based on three specimens (largest, smallest, and one other): facial ratio—narrowest facial width (usually a midheight)/facial height; gena-to-eye ratio—genal height (immediately below maximum eye height)/eye height (mediovertical length); costal vein ratio—the straight line distance between the apices of R_{2+3} and R_{4+5} /distance between the apices of R_1 and R_{2+3} ; M vein ratio—the straight line distance along vein M between crossveins dm-cu and r-m/distance apicad of dm-cu.

The distribution map was made using Quantum GIS 2.8. Longitude and latitude coordinates were obtained for the locality where each specimen was collected and entered into a Microsoft Excel© spreadsheet. If unavailable directly from specimen labels, longitude and latitude were estimated using gazetteers and maps to determine the geographical coordinates. Localities of specimens were plotted on a world land projection, presented within ESRI ArcView layouts and exported as encapsulated postscript (EPS) files.

The habitus illustrations are digital photographs taken with a Visionary Digital System, enhanced using PhotoshopCS3 to adjust the color and make minor corrections (e.g., remove debris). Scanning Electron Microscope (SEM) images were taken with a Hitachi®™ TM3000 desktop unit (Tungsten source).

Although this study was based in large part on specimens in the National Museum of Natural History (USNM), numerous others were borrowed, particularly type specimens of the species previously described. To our colleagues and their institutions listed below who loaned specimens, we express our sincere thanks. Without their cooperation this study could not have been completed.

ANSP	Academy of Natural Sciences of Philadelphia, Pennsylvania (Jon K. Gelhaus and Jason D. Weintraub)
CERPE	Coleção Entomológica da Universidade Federal Rural de Pernambuco (Paschoal Grossi)
CZMA	Coleção Zoológica do Maranhão (Francisco Limeira-de-Oliveira)
DZUP	Universidade Federal do Paraná, Coleção Entomológica Padre Jesus Santiago Moure, Departamento de Zoologia, Curitiba, Paraná, Brazil (Luciane Marinoni)
INPA	Instituto Nacional de Pesquisas da Amazônia, Manaus, Amazonas, Brazil (José Albertino Rafael)
HNHM	Hungarian Natural History Museum, Budapest, Hungary (László Papp)
MZLU	Museum of Zoology, Lund University (Roy Danielsson)
ZMHU	Zoologisches Museum, Humboldt Universität, Berlin, Germany (Joachim Zeigler)

Systematics

Tribe Psilopini Cresson

Psilopini Cresson 1925: 241 (as Psilopinae). Type genus: *Psilopa* Fallén 1823.—Mathis & Zatwarnicki 1995: 30–50 [world catalog].

Heringinae Enderlein 1934: 191. Type genus: *Heringium* Enderlein 1934 (= *Clanoneurum* Becker 1903).

Clanoneurinae Enderlein 1936: 168. Type genus: *Clanoneurum* Becker 1903.

Diagnosis. The tribe Psilopini is distinguished from Discomyzini and other tribes of Ephydriidae by the following combination of characters: Small to moderately small shore flies, body length 1.50–2.50 mm; usually mostly black, shiny, investiture of microtomentum usually sparse, especially on frons and mesonotum. *Head:* Ocellar seta aligned behind anterior ocellus, sometimes only slightly so; reclinate fronto-orbital seta inserted behind or weakly developed, latero-clinate (sometimes well developed, divergent, and slightly proclinate), usually much less than 1/2 length of ocellar seta; arista with 7–14 dorsal rays; conformation of face variable, usually mostly smooth, sometimes shallowly pitted or rugose; gena, including midportion, setulose, its posterior margin rounded. *Thorax:* Mesonotum generally sparsely microtomentose to bare, subshiny or shiny, although variable; supra-alar seta usually lacking, if present, well developed, subequal to postalar seta; arrangement of acrostichal setulae variable; prescutellar acrostichal setae usually present, widely set apart and aligned anterior of posteriormost dorsocentral setae; scutellum usually sparsely setulose; anterior and posterior notopleural setae inserted at about the same level.

Discussion. The tribe Psilopini is closely related to Discomyzini Acloque and these two tribes constitute the subfamily Discomyzinae Acloque (Mathis & Zatwarnicki 1995). There are now six South American genera in Psilopini that can be distinguished by the following key.

Key to genera of Psilopini from South America

1. Scutellum greatly enlarged, extended over and beyond posterior of abdomen. *Peltopsilopa* Hendel
- Scutellum normally developed, not extended posteriorly far over abdomen 2
2. Base of wing blackish, contrasting with remainder of wing. *Cressonomyia* Arnaud
- Base of wing concolorous with rest of wing, usually hyaline or very lightly tinged 2
3. Antenna with pedicel conical, broader apically, without dorsoapical lobe, with dorsoapical spine weak and at most 1/3 as long as basal flagellomere; basal flagellomere from 2–4X as long as wide *Ceropsilopa* Cresson
- Antenna with pedicel short and subtriangular, with dorsoapical lobe, with dorsoapical spine strong and at least half as long as basal flagellomere; basal flagellomere at most 2X as long as wide 4
4. Vein R₂₊₃ close to costa beyond end of vein R₁; crossvein dm-cu with sharp angle at middle *Clanoneurum* Becker
- Vein R₂₊₃ well separated from costa; crossvein dm-cu mostly straight or shallowly arched, not angulate. 5
5. Face smooth, lacking transverse striae *Psilopa* Fallén
- Face with transverse striae *Leptopsilopa* Cresson

Genus *Peltopsilopa* Hendel

Peltopsilopa Hendel 1914: 156. Type species: *Peltopsilopa aspistes* Hendel 1914 (= *Peltopsilopa anisotomoides* (Karsch)), original designation.—Malloch 1941: 125–126 [review].—Wirth 1968: 12 [Neotropical catalog].—Mathis & Zatwarnicki 1995: 37 [world catalog].

Diagnosis. *Peltopsilopa* is distinguished from other genera of Psilopini by the following combination of characters: Small to moderately small shore flies, body length 1.75–2.25 mm; scutellum greatly enlarged, extended over abdomen; microtomentum generally sparse or lacking, appearing subshiny to shiny; mostly black species. *Head:* Head in lateral view with antenna inserted at dorsal 1/3; frons conspicuously wider than long; fronto-orbital setae reclinate and proclinate but sometimes weakly developed; pseudopostocellar setae well developed, subequal to lateral vertical seta, orientation mostly proclinate and slightly divergent; both medial and lateral vertical setae well developed; vertex acutely creased; posterior ocelli situated immediately before creased vertex, these in isosceles triangle. Antenna with basal flagellomere longer than pedicel; scape not exerted; arista with 7–11 dorsal rays. Facial vestiture variable, surface mostly flat and plain, lacking pits and transverse microrugosity or striae; 1 strong

facial seta, mesocline; palpus black; proboscis normally developed, not elongate. *Thorax*: Generally black to deep bluish black, microtomentum sparse to lacking; supra-alar seta absent; prescutellar acrostichal seta well developed; scutellum greatly enlarged, much longer than wide, extended over abdomen; basal scutellar seta over 1/2 length of apical seta; anepisternum with 2 large setae. Wing mostly hyaline to faintly yellowish except for blackish base; crossveins not darkened; vein R_{2+3} extending normally to costal margin, lacking a stump vein; R stem vein bare of setulae dorsally. Knob of halter black. Femora black; forebasitarsomere whitish yellow to yellow, only apical 1–2 tarsomeres blackish. *Abdomen*: Generally bare of microtomentum, shiny, blackish; tergites 3–4 long, 5th tergite very short and lacking prominent, dorsally erect setae along posterior margin. Male terminalia: epandrium in posterior view as an inverted, rounded U (open ventrally), in lateral view wider subventrally; cerci lunate to rod-like, narrower dorsally, sometime with a mediadorsal point; presurstylus much longer than wide, setulose; postsurstylus longer than wide; subepandrial plate wider than long, usually narrowed medially and with each lateral extension slightly enlarged; pregonite bearing 2–4 setulae; aedeagus longer than wide, wider basally in ventral view; phallopodeme in lateral view more or less triangular, keel sometimes irregular, asymmetrical; hypandrium U-shaped, open posteriorly, in lateral view shallow to moderately deep, pocket-like.

Discussion. *Peltopsilopa* is similar and evidently is closely related to *Cressonomyia*, as Mathis & Zatwarnicki (2004) suggested. Both genera share at least three synapomorphies: 1. base of wing darkened; 2. knob of halter blackish brown to black; and 3. postsurstylus angulate, L-shaped. *Peltopsilopa* differs from *Cressonomyia* in having a greatly enlarged, dome-like scutellum that extends posteriorly over most of the abdomen or beyond. Both genera are also only known from the New World, especially tropical areas. Although *Peltopsilopa* is distinctive and readily distinguished from other genera of the tribe Psilopini (enlarged scutellum and setulose gonite that bears setulae in addition to the three long, apical setulae), it should perhaps be recognized as a derived and included lineage within *Cressonomyia*, closely related to the *aciculata* group. This relationship is also evident in the shape of structures of the male terminalia, which are very similar to those of *Cressonomyia*, and appear to represent a variation on a single theme.

Key to species of *Peltopsilopa*

1. Ventral facial emargination very shallowly arched, almost flat (Fig. 7); facial ratio 0.50; dorsal facial seta well developed; scutellar base with a dentate, sharp, short projection laterally (Cuba) *P. schwarzi* Cresson
- Ventral facial emargination conspicuously arched (Figs. 1, 4); facial ratio 0.61–0.63; dorsal facial seta more weakly developed; scutellar base lacking a dentate, sharp, short projection laterally (mainland Neotropics) 2
2. Presurstylus in lateral view (Fig. 31) elongate (length ca. 4.5X width), slender, parallel sided, apex shallowly rounded and drawn to an anteroventral point; postsurstylus in ventral view (Fig. 39) with apex digitiform, not angulate *P. anisotomoides* (Karsch)
- Presurstylus in lateral view (Fig. 16) shorter and more robust (length no more than 3X width), pedunculated with posterior margin conspicuously emarginate, widened at base and apex; postsurstylus in ventral view (Fig. 26) with apical portion angulate, with a short extension at 90° *P. acuta* n.sp.

Peltopsilopa acuta Savaris, Marinoni & Mathis n.sp.

(Figs. 1–3, 10, 13, 15–29, 45, 47, 50, 52)

Diagnosis. This species is similar to *P. anisotomoides* (Karsch) but differs as follows: Body generally shiny, polished, navy blue to dark brown; moderately small shore flies, body length 2.20 mm (Figs. 2–3). *Head*: Frons shiny, polished with metallic luster; ocelli arranged in isosceles triangle, distance between posterior ocelli greater than between either posterior ocellus and anteromedial ocellus; vertex acutely angled, creased. Antenna yellow; dorsum of basal flagellomere tan to brownish yellow; arista with 8–9 dorsal rays. Face shallowly arched, shiny, polished, similar to frons, bearing an inclinate seta at lateral margin at midheight; facial ratio 0.63; ventral facial emargination conspicuously arched. Gena-to-eye ratio 0.19. Maxillary palpus irregularly spatulate, blackish brown (Fig. 1). *Thorax*: Almost entirely deep blue to brownish blue, shiny, microsculptured. Mesonotal length 1.95 mm; acrostichal setae in 2 regular rows on each side, presutural pair slightly enlarged, displaced laterally; scutum deep, navy blue, polished, shiny; scutellum greatly enlarged, longer than scutum, shiny, microsculptured, appearing shallowly and slightly wrinkled, scutellar length 1.45 mm, almost as wide as long, scutellar length-to-width ratio

0.88, shape in lateral view shallowly dome-like, posterior margin bluntly rounded with corners broadly rounded, with basal and apical setae, these small, with a few additional setulae laterally and on dorsal surface, but these not conspicuous, ventral scutellar surface shallowly concave; scutellar base lacking a dentate, sharp, short projection laterally; anepisternum with few small light setulae, except for 2 thicker black setae on posterior margin; katepisternum with a strong dorsal seta. Wing (Fig. 45) mostly hyaline, faintly infusate, tannish, basal fourth, including crossvein r-m, darkened; length 1.95 mm; costal vein ratio 0.86; M vein ratio 1.03. Femora blackish brown except for yellowish apices; tibiae yellow, slightly brownish yellow medially; basitarsomere of foreleg brownish medially, apices yellow, tarsi of mid- and hindlegs yellow to whitish yellow. *Abdomen*: Tergites blackish brown, shiny; tergites much wider than long; length of tergites 3 and 4 subequal; tergite 5 of male partially telescoped into tergite 4, length slightly more than half of tergite 4; sternite 1 smaller than other sternites but not greatly reduced, a narrow, transverse, complete band, anterior margin broadly concave, posterior margin shallowly emarginate; sternite 2 quadrate, slightly wider anteriorly than posteriorly, lateral margins not conspicuously arched, width slightly greater than length; sternites 3 subquadrate, width just slightly greater than length, lateral margins arched; sternite 4 slightly wider than long, posterior margin wider than anterior margin, lateral margins shallowly arched, sternite 5 robustly U-shaped with anterior base longer than depth of posterior concavity (Fig. 13). Male terminalia: Epandrium in posterior view (Fig. 15) as an inverted U, dorsal arch thinner than extended, lateral arms, arms nearly straight, parallel, widest subventrally, in lateral view (Fig. 16) as a tear drop, narrow dorsally, becoming wider ventrally, ventral margin angularly rounded; cercus in posterior view moderately elongate, hemispherical, rounded dorsomedially, medial margin shallowly convex to nearly straight, generally setulose, in lateral view (Fig. 16) lunate; presurstylus in posterior view (Fig. 15) elongate, length about twice base, wider at base with medial, blunt projection, projection bearing 4 setulae, thereafter shallow pedunculate along midlength, apical third tapered to acute point, in lateral view (Fig. 16) with basal foot, posterior margin conspicuously emarginate, projected posteriorly subapically, apex broadly pointed; postsurstylus in lateral view (Fig. 27) more or less L-shaped with narrow, shallowly excavate base, extended process much wider than base, spatulate, parallel sided, apex very shallowly arched, in ventral view (Fig. 26) L-shaped with short arm as a short, digitiform process, long arm shallowly angulate, narrowed basally, apical half bearing short setulae; pregonite in ventral view (Fig. 24) irregularly quadrate, corners rounded, slightly produced at apical corner, bearing 4 setulae, in lateral view (Fig. 29) triangular, base with one angle rounded, the other acutely pointed, apex bearing 4 setulae; aedeagus in ventral view (Fig. 19) robust, longer than wide, pedunculate, lateral margins conspicuously concave, in lateral view (Fig. 21) elongate, slightly wider basally, shallowly pedunculate, apical fourth tapered, apex narrowly rounded; phallapodeme in lateral view (Fig. 21) triangular, keel somewhat rounded rectangular, in ventral view (Fig. 20) hour-glass shaped, spool-like; subepandrial plate in lateral view (Fig. 28) comma-like, in ventral view (Fig. 22) transversely band-like, shallowly arched; hypandrium in lateral view (Fig. 25) robust, longer than wide, posterior portion bifurcate, anterior half quadrate, in ventral view (Fig. 23) U-shaped with base wider and robustly developed, anterior margin broadly rounded, lateral, posterior extensions slightly oriented medially, posterior margin deeply emarginate, emargination bottle-like swollen basally with narrower neck.

Type material. The holotype male of *Peltopsilopa acuta* is labeled “Peru: Loreto[,] Iquitos, Barillal [*sic* =Varillal; 03°53.3'S, 73°21.1'W] 10.11.1984 [10 Nov 1984] leg. L. Huggert/USNM ENT 00118312 [plastic bar code label]/HOLOTYPE ♂ *Peltopsilopa acuta* Savaris, Marinoni & Mathis MZLU [red].” The holotype is double mounted (minuten pin in a rectangular piece of plastic), is in excellent condition (abdomen removed and dissected), and is deposited in MZLU.

Type locality. Peru. Loreto: Iquitos, Varillal Village (03°53.3'S, 73°21.1'W).

Other specimens examined. Neotropical. COSTA RICA. Cartago: Turrialba (CATIE; 09°54.3'N, 83°41'W; 650 m), 26 Feb–08 Jul 1982, 1986, F. B. Peairs, M. Carballo (2♀; USNM). Intercepted in Los Angeles Airport - flowers 30 Sep 2009 (1 ♀; USNM).

PANAMÁ. In shipment, on banana debris (1♀; USNM).

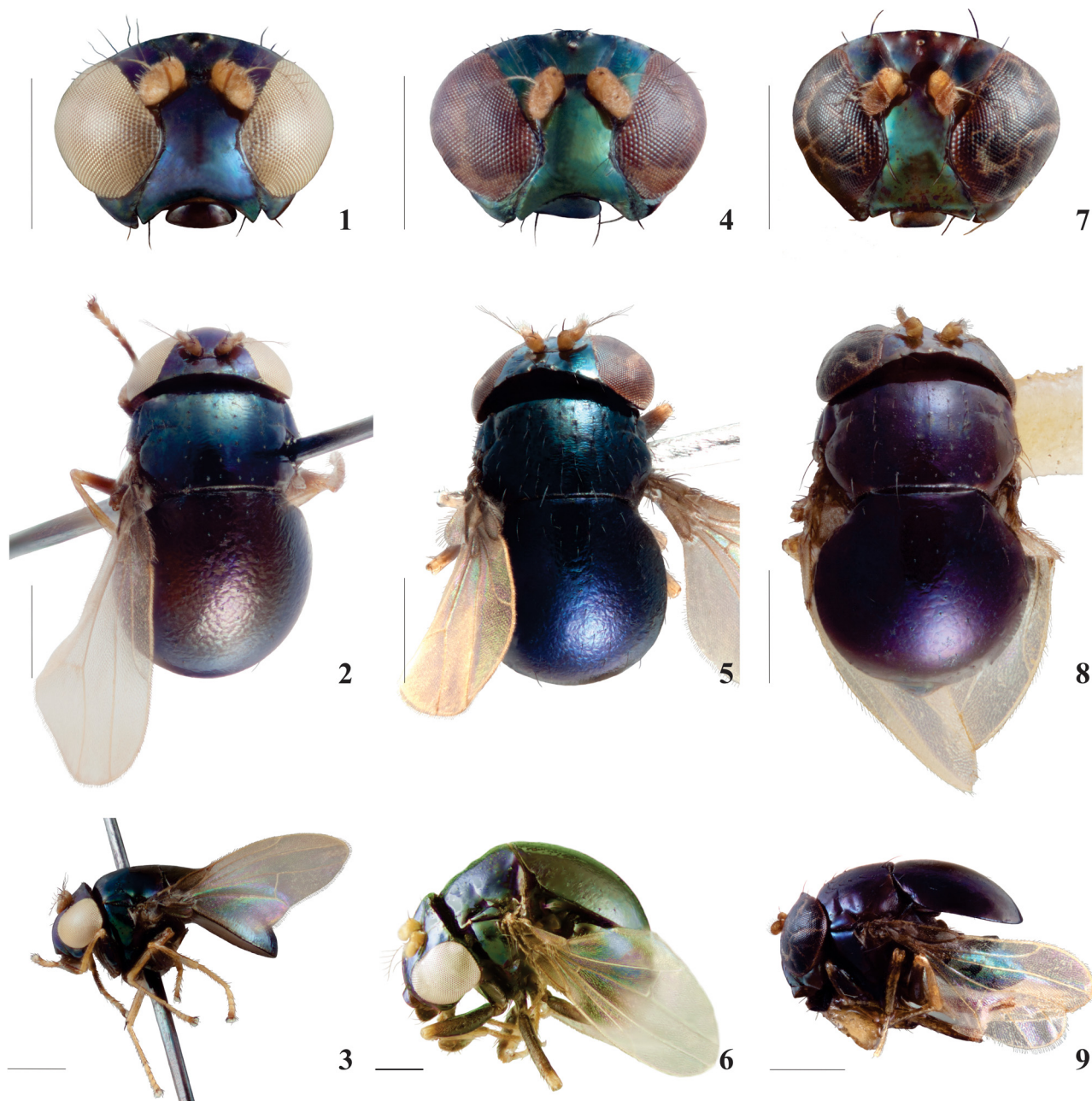
Distribution. *Neotropical*: Costa Rica (Cartago), Panamá, Peru (Loreto) (Fig. 52).

Etymology. The species epithet, *acuta*, is a Latin adjective meaning pointed and refers to the sharply pointed apex of the presurstylus of this species.

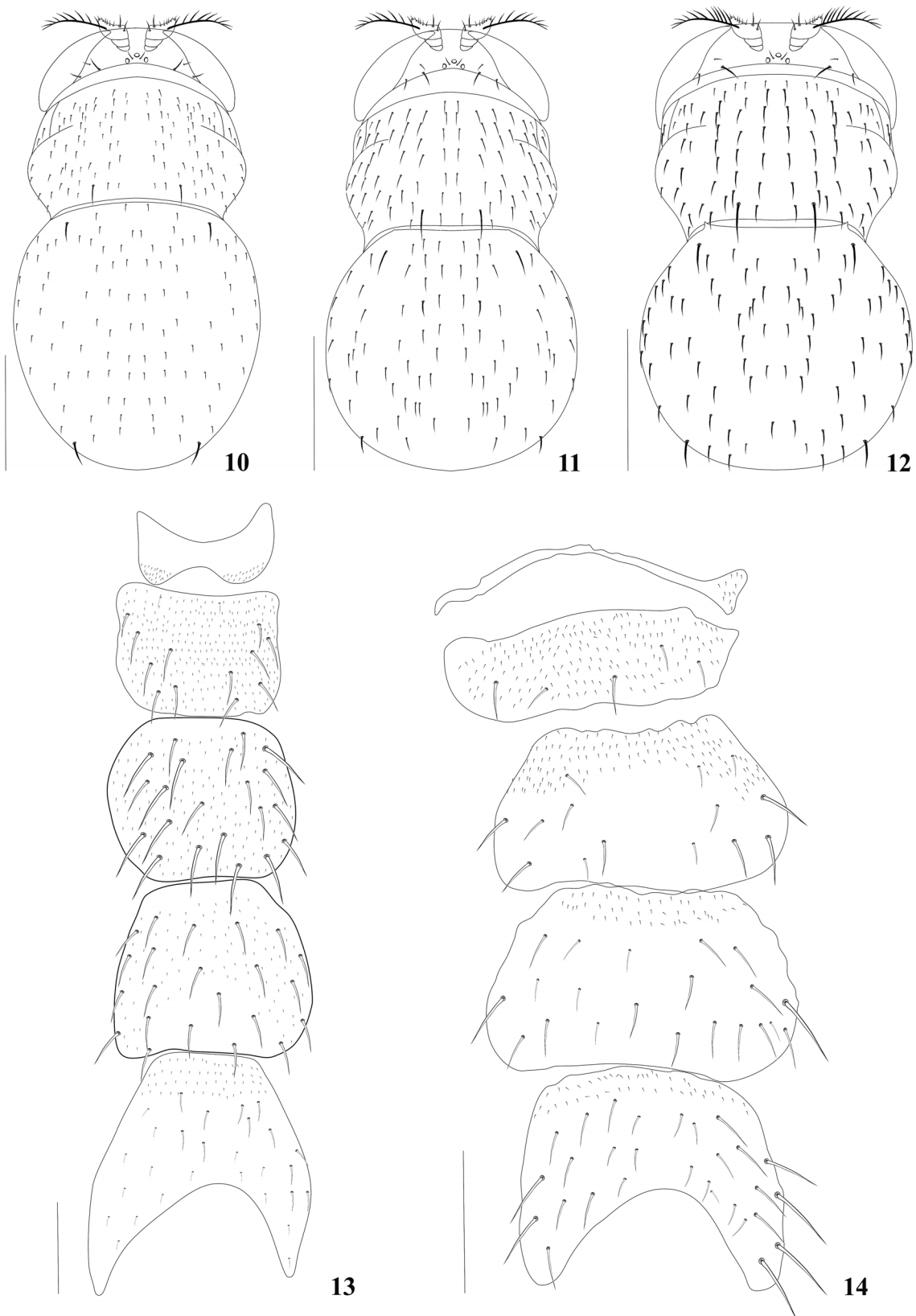
Remarks. This species is distinguished from *P. anisotomoides* primarily by the shape of structures of the male terminalia (see key and figures). In addition, we have noted that the contrasted coloration of the scutum (deep, navy blue) as opposed to the scutellum (brownish blue) of this species is potentially useful although we have noted some

variation. Specimens of *P. anisotomoides* tend to have a unicolorous mesonotum. Likewise, this species has more scutellar setulae.

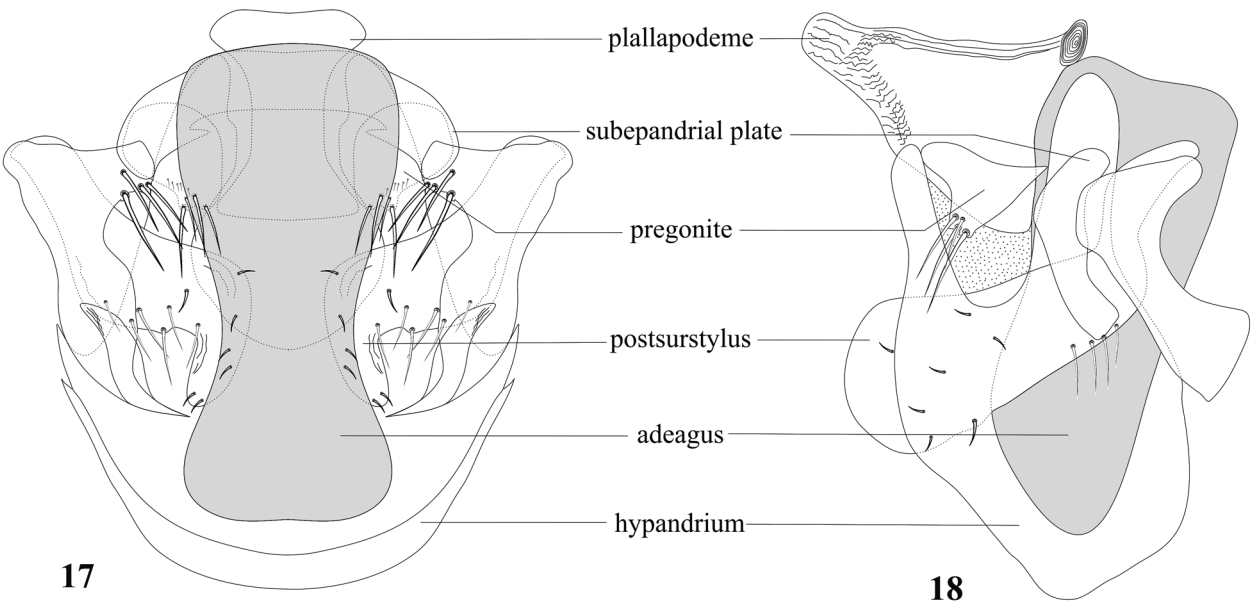
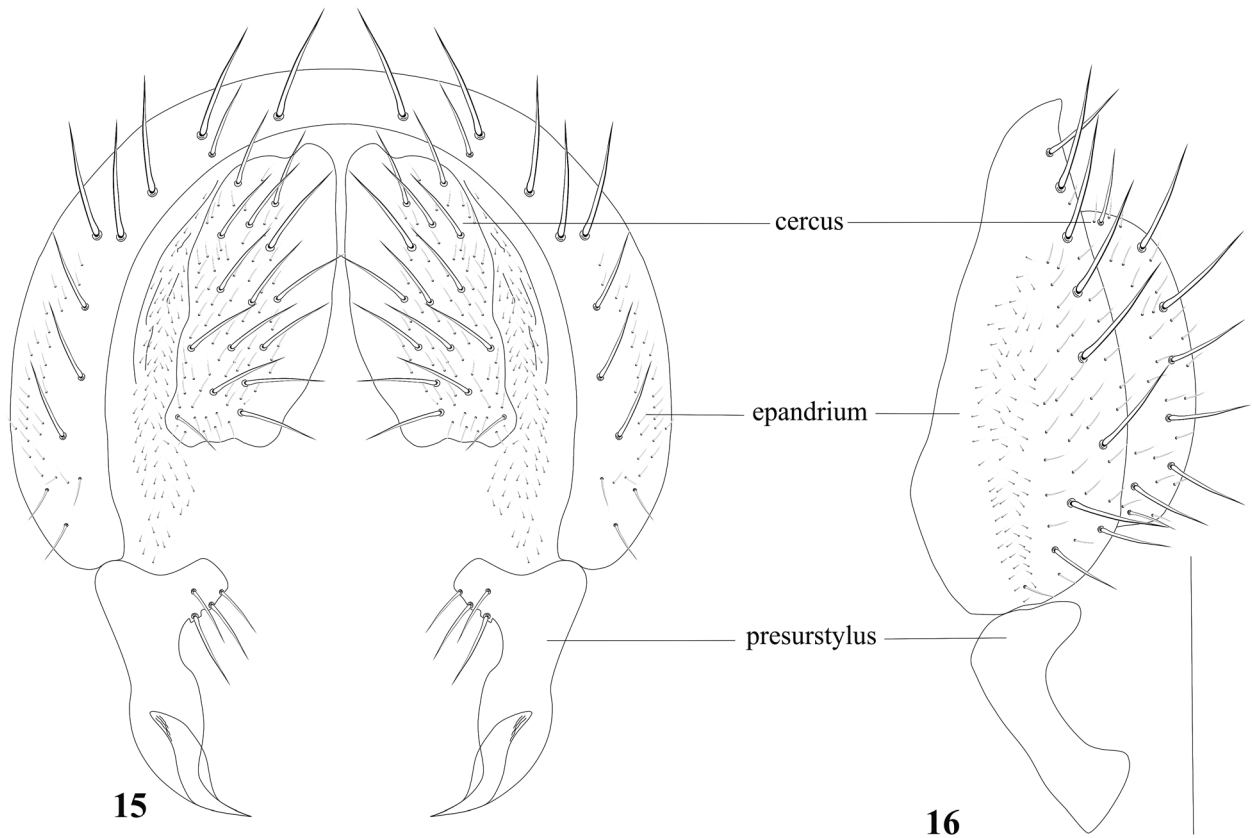
We did not include the specimens from Costa Rica and Panamá in the type series because we lacked a male for dissection and species confirmation. Although not paratypes, we are confident of their conspecificity based on the external characters we discovered and that are included in the diagnosis. We observed that these specimens have conspicuous rows of scutellar setulae, which may be intraspecific variation or perhaps they represent specimens that did not have these setulae broken and missing.



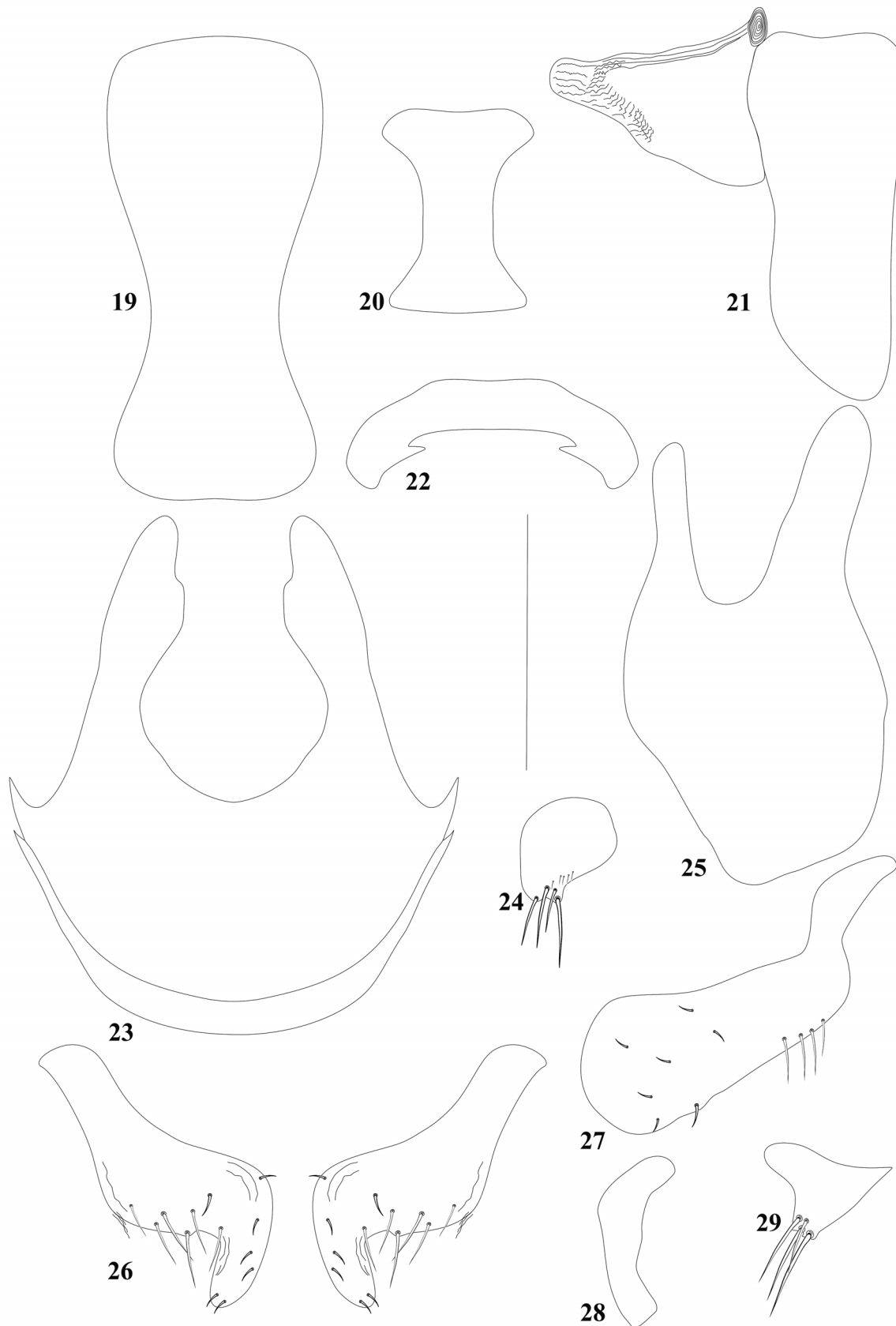
FIGURES 1–6. Adult of *Peltopsilopa* Hendel. (1–3) *P. acuta* n.sp. (Peru. Loreto: Varillal (03°53.3'S, 73°21.1'W; 130 m)). (1) Head, frontal view. (2) Body, dorsal view. (3) Same, lateral view. (4–6) *P. anisotomoides* (Karsch) (Brazil. Pernambuco: Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m)). (4) Head, frontal view. (5) Body, dorsal view. (6) Same, lateral view. (7–9) *P. schwarzi* Cresson (Cuba. Cienfuegos: Cayamas (22°14'N, 80°48'W; 26 m)). (7) Head, frontal view. (8) Body, dorsal view. (9) Same, lateral view. Scale bar = 0.5 mm.



FIGURES 10–14. (10–12) Mesonotal setation, dorsal view. (10) *Peltopsilopa acuta* **n.sp.** (Peru. Loreto: Varillal (03°53.3'S, 73°21.1'W; 130 m)). (11) *P. anisotomoides* (Karsch) (Brazil. Pernambuco: Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m)). (12) *P. schwarzi* Cresson (Cuba. Cienfuegos: Cayamas (22°14'N, 80°48'W; 26 m)). Scale bar = 0.5 mm. (13–14) Sternites 1–5, ventral view. (13) *P. acuta* **n.sp.** (Peru. Loreto: Varillal (03°53.3'S, 73°21.1'W; 130 m)). (14) *P. anisotomoides* (Karsch) (Brazil. Pernambuco: Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m)). Scale bar = 0.1 mm.



FIGURES 15–18. Structures of the male terminalia of *Peltosilopa acuta* n.sp. (Peru. Loreto: Varillal (03°53.3'S, 73°21.1'W; 130 m)). (15) Epandrium, cerci, and presurstylus, posterior view. (16) Same, lateral view. (17) Aedeagus, phallapodeme, postsurstylus, pregonite, hypandrium, and subepandrial plate, ventral view. (18) Same, lateral view. Scale bar = 0.1 mm.



FIGURES 19–29. Structures of the male terminalia of *Peltopsilopa acuta* n.sp. (Peru. Loreto: Varillal (03°53.3'S, 73°21.1'W; 130 m)). (19) Aedeagus, ventral view. (20) Phallapodeme, ventral view. (21) Aedeagus and phallapodeme, lateral view. (22) Subepandrial plate, ventral view. (23) Hypandrium, ventral view. (24) Pregonite, ventral view. (25) Hypandrium, lateral view. (26) Postsurstylus, ventral view. (27) Same, lateral view. (28) Subepandrial plate, lateral view. (29) Pregonite, lateral view. Scale bar = 0.1 mm.

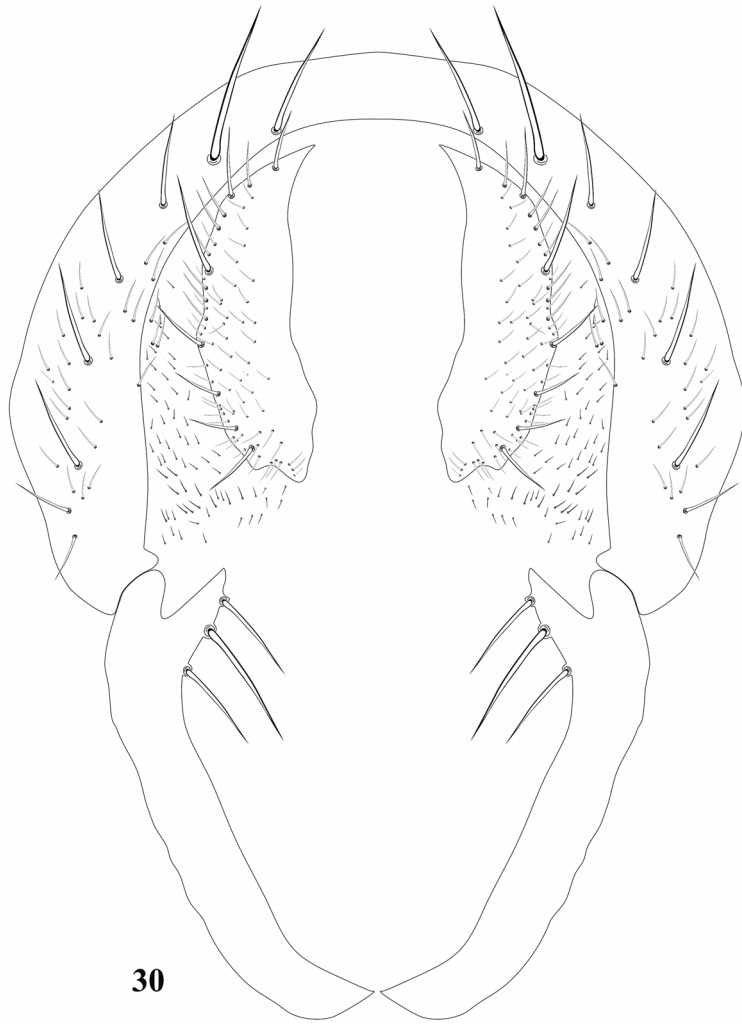
Peltopsilopa anisotomoides (Karsch) NEW COMBINATION

(Figs. 4–6, 11, 14, 30–44, 46, 48, 51, 52)

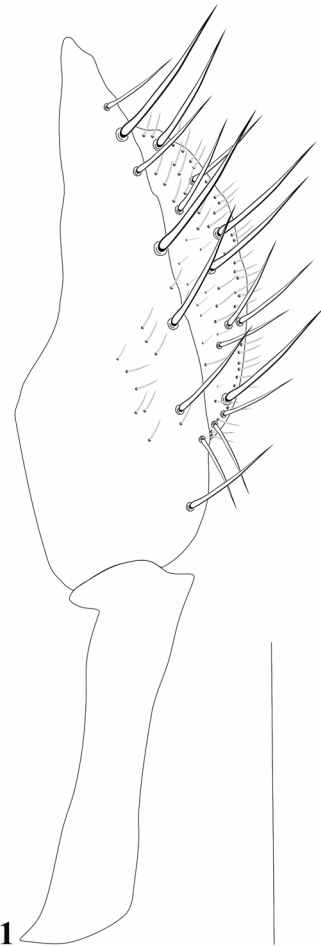
Celyphus anisotomoides Karsch 1884: 173 [“Bengal” (see below); HT ♀, ZMHU].—Tenorio 1972: 378 [identified as an Ephydriidae, not a Celyphidae].

Peltopsilopa aspistes Hendel 1914: 158 [Colombia. Magdalena: Aracataca (10°46.3'N, 74°09.2'W); HT ♂, HNHM].—Malloch 1941: 126 [review].—Cresson 1946: 158 [list, Trinidad].—Wirth 1968: 12 [Neotropical catalog].—Mathis & Zatwarnicki 1995: 37 [world catalog]. NEW SYNONYM

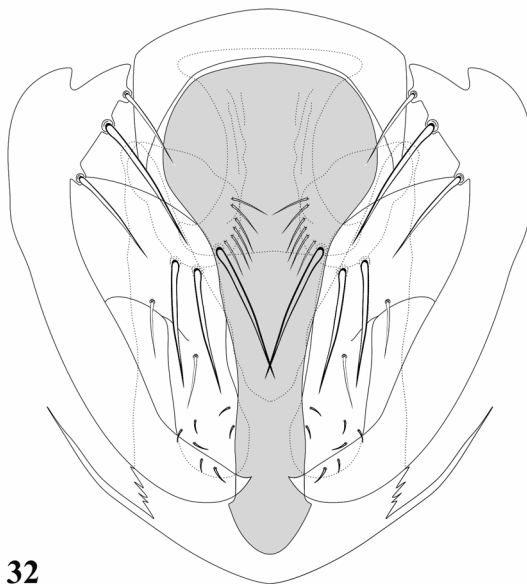
Diagnosis.—This species is distinguished from congeners by the following combination of characters: Body generally shiny, polished, navy blue to dark brown; small to moderately small shore flies, body length 1.95–2.80 mm (Figs. 5–6). *Head:* Frons shiny, polished with metallic luster; ocelli arranged in isosceles triangle, distance between posterior ocelli greater than between either posterior ocellus and anteromedial ocellus; vertex acutely angled, creased. Antenna yellow to brownish yellow; arista with 7–9 dorsal rays. Face shallowly arched, shiny, polished, similar to frons, bearing an inclinate seta at lateral margin at midheight; facial ratio 0.61; ventral facial emargination conspicuously arched (Fig. 4). Gena-to-eye ratio 0.16. Maxillary irregularly spatulate, blackish brown. *Thorax:* Almost entirely blackish blue, shiny, microsculptured. Mesonotal length 1.55 mm; acrostichal setae in 2 regular rows on each side, presutural pair slightly enlarged, displaced laterally; scutellum greatly enlarged, longer than scutum, shiny, microsculptured, appearing wrinkled, scutellar length 1.20 mm, almost as wide as long, scutellar length-to-width ratio 0.87, shape in lateral view shallowly dome-like, posterior margin bluntly rounded with corners broadly rounded, with basal and apical setae, these small, with a few addition setulae laterally and on dorsal surface, but these not conspicuous, ventral scutellar surface shallowly concave; scutellar base lacking a dentate, sharp, short projection laterally; anepisternum with few small light setulae, except for 2 thicker black setae on posterior margin; katepisternum with a strong dorsal seta. Wing (Fig. 46) mostly hyaline, whitish, basal fourth, including crossvein r-m, darkened; length 1.45 mm; costal vein ratio 0.94–1.00; M vein ratio 0.73–0.88. Femora blackish brown except for yellowish apices; tibiae yellow; basitarsomere of foreleg brownish medially, apices yellow, tarsi of mid- and hindlegs yellow to whitish yellow. *Abdomen:* Tergites blackish brown, shiny; tergites much wider than long; length of tergites 3 and 4 subequal; tergite 5 of male partially telescoped into tergite 4, length slightly more than half of tergite 4; sternite 1 greatly reduced, a narrow, transverse, partial band; sternite 2 transversely elongate, oblong, slender, width over 3X length; sternites 3 and 4 similar shaped, trapezoidal, narrower anteriorly, width about twice length, both anterior and posterior margin truncate; sternite 5 robustly U-shaped with anterior margin truncate, anterior 1/4 robust, thick, slightly tapered arms extended posteriorly, posterior margin deeply emarginate (Fig. 14). Male terminalia: Epandrium in posterior view (Fig. 30) as an inverted U, dorsal arch thinner than extended, lateral arms, arms straight, parallel, widest subventrally, in lateral view (Fig. 31) pointed dorsally, thereafter ventrally tapered, ventral 1/3 subquadrate; cercus in posterior view (Fig. 30) elongate, narrowly hemispherical, almost rod-like, pointed dorsomedially, medial margin shallowly sinuous to nearly straight, setulose along lateral margin, in lateral view (Fig. 31) half of an ellipse; presurstylus in posterior view (Fig. 30) elongate, narrow, wider at base, thereafter nearly parallel sided, very shallowly arched, base incised, base bearing 3 setulae medially, apex with pointed, oriented medially, in lateral view (Fig. 31) elongate, narrow, rod-like, apex drawn to anteroventral point; postsurstylus in lateral view (Fig. 40) more or less L-shaped with narrow, shallowly excavate base, extended process much wider than base, parallel sided, apex very shallowly arched, in ventral view (Fig. 39) L-shaped with short, digitiform process at base, thereafter with basal half wide, then narrowed before equally wide, spatulate apical half, apex rounded, bearing 2 basolateral setulae and several setulae on apical half; pregonite in ventral view (Fig. 42) almost as wide as long, bearing 3 apical setulae, in lateral view (Fig. 44) wider basally, short, broadly rounded; aedeagus in ventral view (Fig. 34) with basal 1/3 roundly subquadrate, thereafter apically gradually tapered to digitiform process, parallel sided, apex pointedly rounded and with slight, subapical lateral expansions, these shallowly angulate, in lateral view (Fig. 36) elongate, slightly wider basally, shallowly pedunculate, apex rounded; phallapodeme in lateral view (Fig. 36) with base rectangular, keel somewhat triangular, in ventral view (Fig. 35) hour-glass shaped, more robustly developed basally, apical, crossbar pointed laterally; subepandrial plate in lateral view (Fig. 43) comma-like, in ventral view (Fig. 41) transversely band-like, shallowly arched, slightly enlarged laterally, more deeply emarginate posteriorly; hypandrium in lateral view (Fig. 38) elongate, moderately narrow, pocket-like, in ventral view (Fig. 37) U-shaped, anterior margin bluntly arched with thin, lateral extension, posterior extended arms somewhat parallel to each other, posterior margin deeply emarginate, emargination V-shaped.



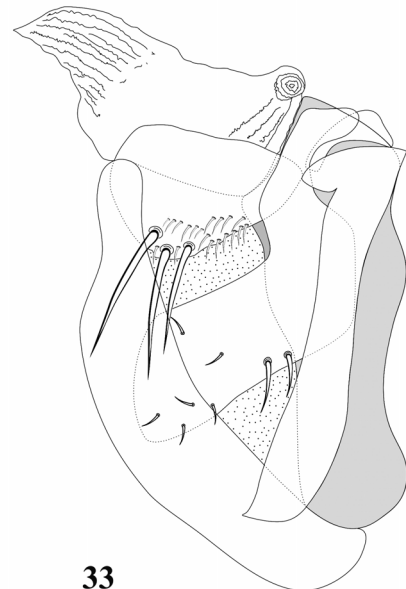
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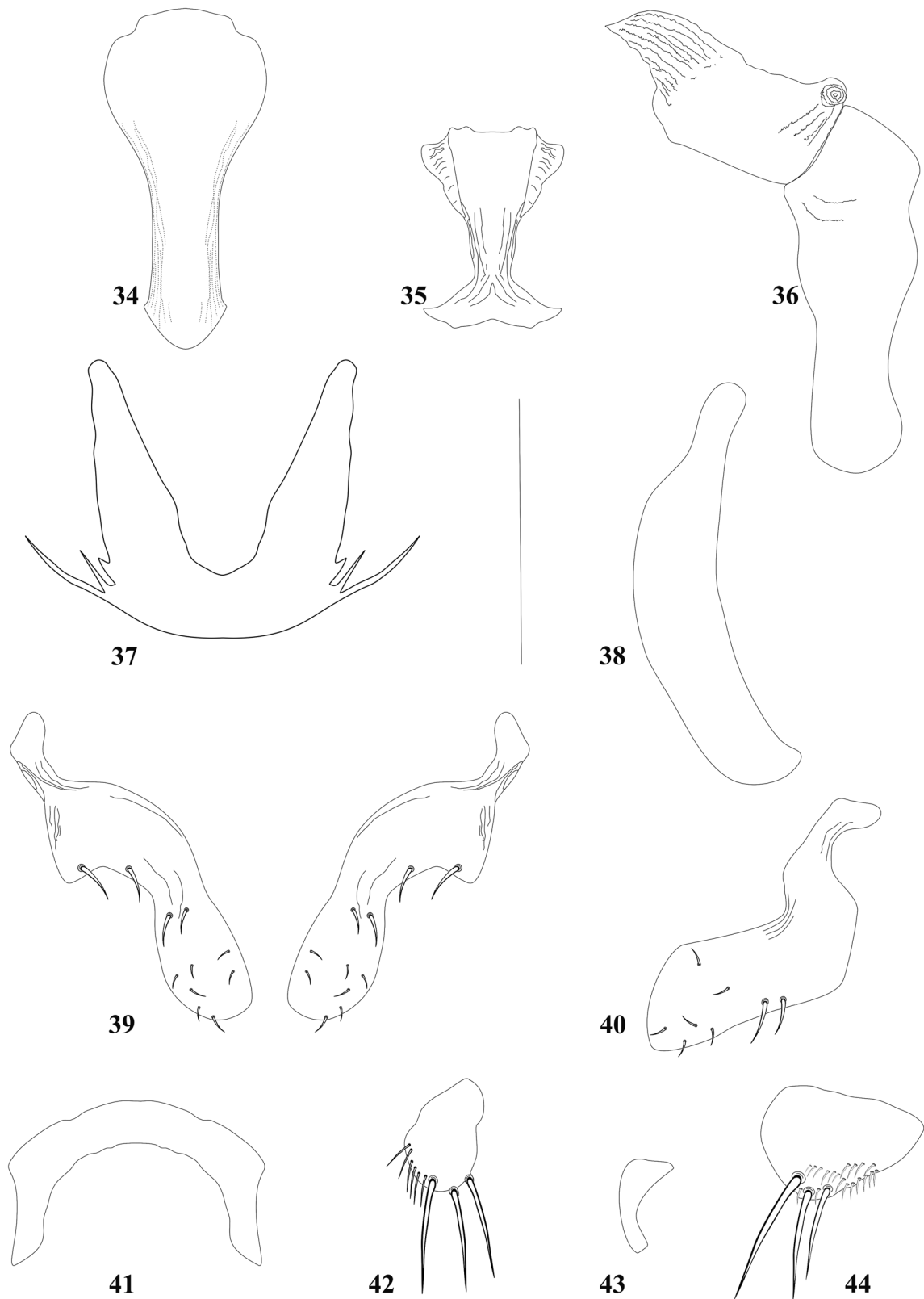


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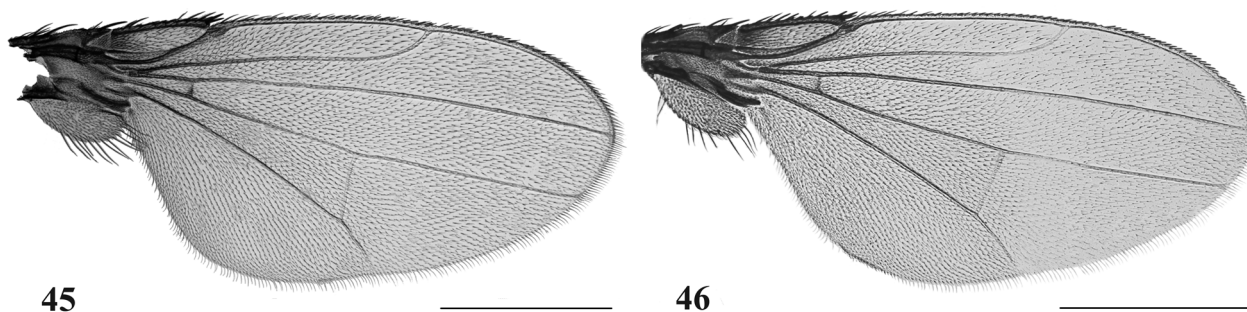


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FIGURES 30–33. Structures of the male terminalia of *Peltopsiopa anisotomoides* (Karsch) (Brazil, Pernambuco: Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m)). (30) Epandrium, cerci, and presurstylus, posterior view. (31) Same, lateral view. (32) Aedeagus, phallapodeme, postsurstylus, pregonite, hypandrium, and subepandrial plate, ventral view. (33) Same, lateral view. Scale bar = 0.1 mm.



FIGURES 34–44. Structures of the male terminalia of *Peltopsilopa anisotomoides* (Karsch) (Brazil, Pernambuco: Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m)). (34) Aedeagus, ventral view. (35) Phallapodeme, ventral view. (36) Aedeagus and phallapodeme, lateral view. (37) Hypandrium, ventral view. (38) Same, lateral view. (39) Postsurstylus, ventral view. (40) Same, lateral view. (41) Subepandrial plate, ventral view. (42) Pregonite, ventral view. (43) Subepandrial plate, lateral view. (44) Pregonite, lateral view. Scale bar = 0.1 mm.



FIGURES 45–46. Wings. (45) *Peltopsilopa acuta* n.sp. (Costa Rica. Intercepted in Los Angeles Airport). (46) *Peltopsilopa anisotomoides* (Karsch) (Brazil. Pernambuco: Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m)). Scale bar = 1 mm.

Type material. The lectotype female of *Celyphus anisotomoides* Karsch, designated herein, is labeled “Ceylon[,] Nietner S./2742/Type [red]/anisotomoides J. Karsch * [yellow; handwritten]/Zool. Mus. Berlin/LECTOTYPE ♀ *Celyphus anisotomoides* Karsch, des. by Savaris, *et al.* 2016 [red].” The lectotype is double mounted (glued to a paper triangle), is in poor condition (wings missing), and is deposited in ZMHU.

The holotype male of *Peltopsilopa aspistes* Hendel is labeled “Aracataca 1912.II.[Feb 1912]/Columbia Ujhelyi/Peltopsilopa aspistes H. typus [red ink] Det. Hendel [“*Peltopsilopa aspistes* H. typus” handwritten]/typus [red border, letters red].” The holotype is double mounted (minuten pin), is in moderately good condition (head and left wing missing), and is deposited in HHNM.

Type locality. Several problems are apparent concerning the provenance and type locality of this species. In Karsch’s original publication (1884: 173), he listed “Bengal” as the country of origin. The only available specimen (ZMHU), however, bears the label “Ceylon.” Moreover, both “Bengal” and “Ceylon” are almost certainly errors, probably from mislabeling, as there is no species of *Peltopsilopa* known from the Old World.

The collector, according to Karsch’s publication, was Johannes [John] Werner Theodor Nietner, a farmer/naturalist living in “Bengal.” He was born on 19 May 1828 in Potsdam, near Berlin, and died in 1874 in Bengal or Sri Lanka (Colombo). The provenance of this specimen, thus, remains a complete mystery, although we suggest that it is undoubtedly from the New World tropics and was mislabeled. Karsch (1884: 173), without further elaboration, wrote a summary sentence on species included in *Celyphus* toward the end of his brief treatment of this genus and noted “Amerika” as a locality. We suggest that perhaps Karsch had a specimen from the New World, probably the Neotropics, and that someone inadvertently mislabeled it. Thus, the lectotype has “Ceylon” on its label, Karsch listed “Bengal” for this specimen in his publication, and as here suggested, the specimen is undoubtedly from the New World tropics!

Other specimens examined. Neotropical. BRAZIL. **Maranhão:** Mirador, Parque Estadual do Mirador, Base da Geraldina (06°37.4'S, 45°52.1'W; sweep net and Malaise trap; 120 m), 15 May–18 Aug 2006, 2012, 2014, F. Limeira-de-Oliveira, J. S. Pinto Júnior, D. W. A. Marques, L. L. M. Santos, L. S. Santos (1♂ 3♀; CZMA). **Pernambuco:** Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m), 8 May 2014, P. Grossi (2♂; CERPE).

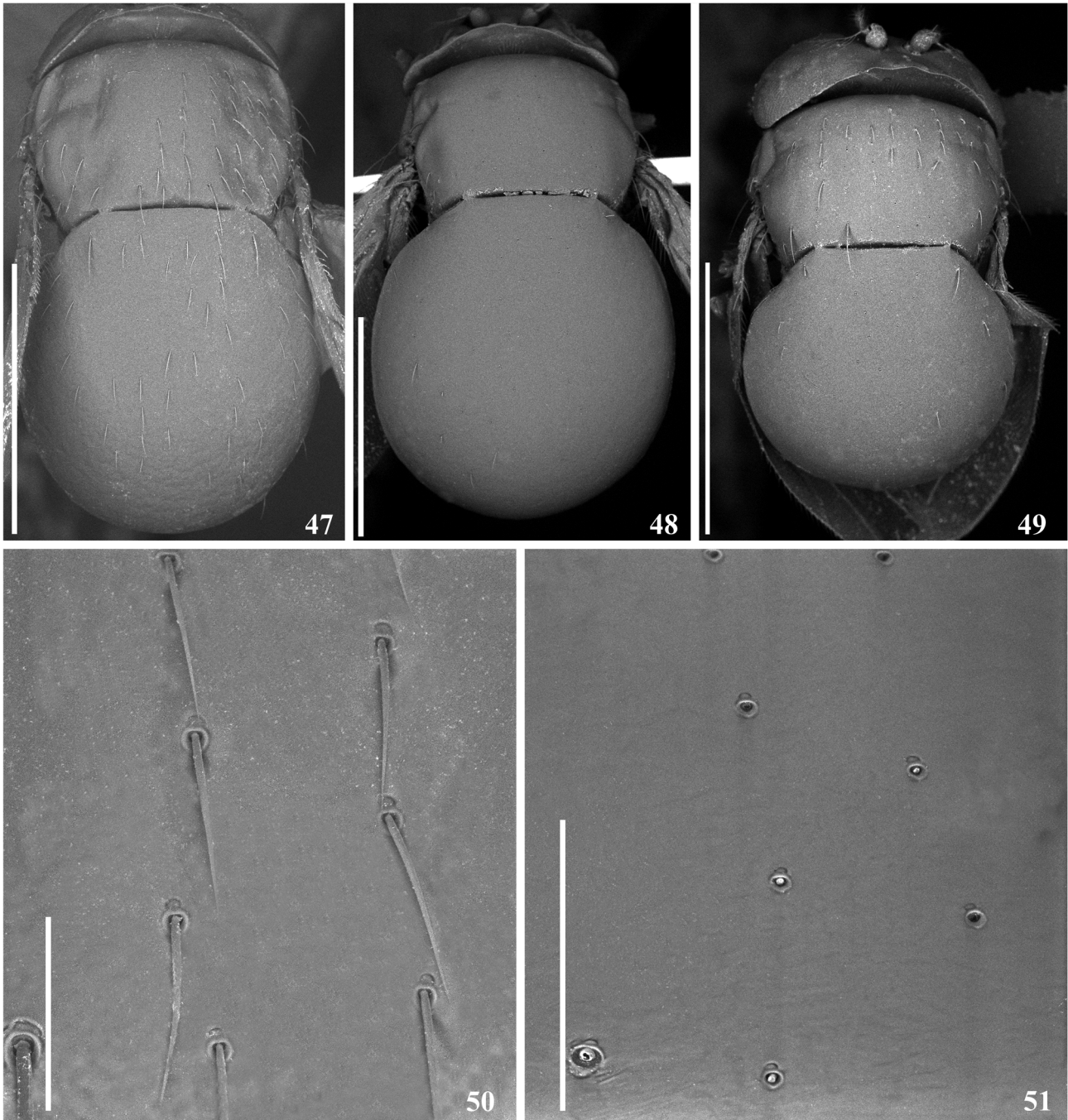
ECUADOR. **Guayas:** Isla Puná (02°51.3'S, 80°08.6'W), 22 Mar 1988, M. Huybenz (1♂; USNM). **Sucumbios:** Santa Cecilia (00°03'S, 76°57.9'W), 25–31 Mar 1969, P. and P. Spangler (1♀; USNM).

VENEZUELA. **Carabobo:** San Estaban (10°25.5'N, 68°0.8'W), 1–6 Jan–27 Dec, 1939–1940, P. Anduze (4♀; USNM); Valle Seco (10°26.9'N, 68°0.3'W), Jan 1940, P. Anduze (1♂; USNM).

Distribution. *Neotropical:* Brazil (Maranhão, Pernambuco), Colombia (Magdalena), Ecuador (Guayas, Sucumbios), Venezuela (Carabobo) (Fig. 52).

Remarks. Only a few males of this species were available for dissection. Structures of the male terminalia of those dissected were essentially identical and are the primary bases for our determination that these specimens represent a single species.

Initially, we had the impression that there was variation in scutellar setation (Figs. 5, 11, 48). Close and detailed observations, however, including use of scanning electron micrographs, revealed that specimens that appeared to have a mostly bare scutellum actually represent a scutellum with broken and missing setulae. The setal sockets, often without a setula, were quite evident in the micrographs (Fig. 51).



FIGURES 47–51. Scanning Electron Microscope. (47) *Peltopsilopa acuta* **n.sp.** (Peru. Loreto: Varillal (03°53.3'S, 73°21.1'W; 130 m)). (48) *P. anisotomoides* (Karsch) (Brazil. Pernambuco: Camaragibe, Condomínio dos Cedros (07°58.6'S, 35°0.3'W; 120 m)). (49) *P. schwarzi* Cresson (Cuba. Cienfuegos: Cayamas (22°14'N, 80°48'W; 26 m)). Scale bar = 1 mm. (50) Normal setulae. Scale bar = 100 μ m. (51) Broken setulae. Scale bar = 200 μ m.

***Peltopsilopa schwarzi* Cresson**

(Figs. 7–9, 12, 49, 52)

Peltopsilopa schwarzi Cresson 1922: 135 [West Indies. Cuba. Cienfuegos: Cayamas (22°14'N, 80°48'W); HT ♀, USNM (25309)]; 1946: 158 [review].—Malloch 1941: 126 [review].—Wirth 1968: 12 [Neotropical catalog].—Mathis & Zatwarnicki 1995: 37 [world catalog].

Diagnosis. This species is distinguished from congeners by the following combination of characters: Body generally shiny, polished, navy blue to dark brown; small to moderately small shore flies, body length 1.77 mm (Figs. 8–9). *Head*: Frons shiny, polished with metallic luster; ocelli arranged in isosceles triangle, distance between

posterior ocelli greater than between either posterior ocellus and anteromedial ocellus; vertex acutely angled, creased. Antenna yellow to brownish yellow; arista with 7–11 dorsal rays. Face shallowly arched, shiny, polished, similar to frons, bearing an inclinate seta at lateral margin at midheight; facial ratio 0.50; ventral facial emargination very shallow, almost flat (Fig. 7); dorsal facial seta well developed. Gena-to-eye ratio 0.16. Maxillary irregularly spatulate, blackish brown. *Thorax*: Almost entirely blackish blue, shiny, microsculptured. Mesonotal length 1.55 mm; acrostichal setae in 2 regular rows on each side, presutural pair slightly enlarged, displaced laterally; scutellum greatly enlarged, longer than scutum, shiny, microsculptured, appearing wrinkled, scutellar length 1.20 mm, almost as wide as long, scutellar length-to-width ratio 0.87, shape in lateral view shallowly dome-like, posterior margin bluntly rounded with corners broadly rounded, with basal and apical setae, these setae small, with a few additional setulae laterally and on dorsal surface, but these not conspicuous, ventral scutellar surface shallowly concave; anepisternum with few small light setulae, except for 2 thicker black setae on posterior margin; scutellar base with a dentate, sharp, short projection laterally; katapisternum with a strong dorsal seta. Wing mostly hyaline, whitish, basal fourth, including crossvein r-m, darkened; wing length 1.45 mm; costal vein ratio 0.94–1.00; M vein ratio 0.73–0.88. Femora blackish brown except for yellowish apices; tibiae yellow; basitarsomere of foreleg brownish medially, apices yellow, tarsi of mid- and hindlegs yellow to whitish yellow. *Abdomen*: Tergites blackish brown, shiny; tergites much wider than long; length of tergites 3 and 4 subequal; tergite 5 of male partially telescoped into tergite 4, length slightly more than half of tergite 4.

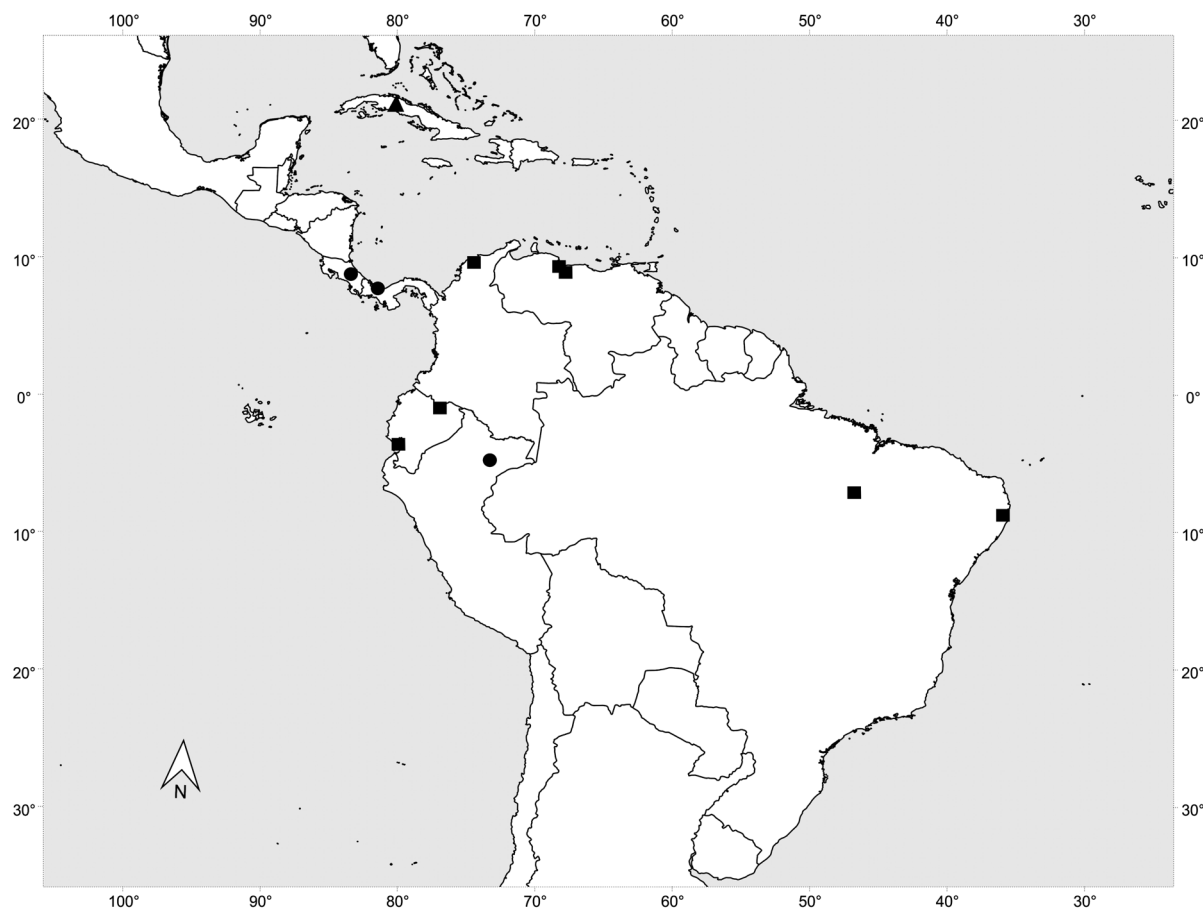


FIGURE 52. Distribution map for *Peltopsilopa*. *Peltopsilopa acuta* n.sp. (●); *P. anisotomoides* (Karsch) (■). *P. schwarzi* Cresson (▲).

Type material. The holotype female of *Peltopsilopa schwarzi* Cresson is labeled “Cayamas 16 5 [16 May; handwritten] Cuba/EASchwarz Collector/Type No. 25309 U.S.N.M. [red; “25309” handwritten/Holo-TYPE *Peltopsilopa* SCHARZI E. T. Cresson Jr [maroon; “*Peltopsilopa* SCHARZI” handwritten]/*Peltopsilopa schwarzi* Cress. [handwritten; back submargin].” The holotype is double mounted (glued to a paper triangle), is in excellent condition, and is deposited in the USNM. A female paratype bearing the same locality label as the holotype but with the date of 5 May is deposited in the ANSP. The holotype is a female, not a “♂?”, as Cresson noted

questionably in the original publication (Cresson 1922: 135). The paratype is a female, although its wings are folded along the sides of the abdomen, partially blocking any view of its abdomen.

Distribution. *Neotropical*: Cuba (Cienfuegos) (Fig. 52).

Remarks. Without a male for dissection, our concept of this species is based solely on external characters, but we are confident of these. The photographic plates, especially of the face, will hopefully convey what we have observed and will serve as the primary basis for our conclusions. The ventral facial emargination of this species is very shallow to nearly flat (Fig. 7), while that of the other two species is conspicuously arched. The face is also narrower, with a facial ratio of 0.50 (at least 0.61 in the other species). The scutellum of this species also bears a short, sharp, tooth-like projection anterolaterally (Figs. 8, 12, 49). The other species either lack these projections or they are rudimentary. We also observed that the cuticle of the mesonotum is slightly smoother and that the setular count of the mesonotal rows is less, and there is one less row. We caution readers, however, that this is based on two specimens (holotype and paratype), and that the series is inadequate to access variation adequately. Again, reference to the photographs and illustrations will hopefully convey our observations of these characters better.

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We thank Allen L. Norrbom (USDA, Systematic Entomology Laboratory), Daniel Negoseki Robalo Costa, Tadeusz Zatwarnicki, Mercedes Lizarralde de Grosso, and an anonymous reviewer for their reviews of the manuscript. Tadeusz Zatwarnicki provided the initial information on the female syntype of *Celyphus anisotomoides* Karsch (ZMHU) and informed us that this syntype is a species in the genus *Peltopsiloa*. We are especially grateful to the curators listed previously who sent specimens or photographs. Their invaluable assistance made this paper possible. We thank CNPq for financial support for this study (Process number 200277/2015-4).

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