BIOTAXONOMY OF TEPHRITOIDEA
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A Revision of the Neotropical genera *Molynocoelia* Giglio-Tos, *Pseudophorellia* Lima, and *Alujamyia*, n. gen. (Diptera: Tephritidae)

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ABSTRACT

The genera *Molynocoelia* Giglio-Tos and *Pseudophorellia* Lima are revised, and the new genus *Alujamyia* is described. These three genera are here recognized as the *Molynocoelia* group. All three genera are restricted to the Neotropical Region. *Alujamyia* includes four species from the Greater Antilles and northern Mesoamerica: *A. bella*, n. sp. (Mexico); *A. farri*, n. sp. (Cuba, Jamaica); *A. isolata*, n. sp. (Hispaniola, Puerto Rico); and *A. sexvittata*, n. sp. (Guatemala, Mexico). *Molynocoelia* includes four species from Mesoamerica and Brazil: *M. grossa*, n. sp. (Costa Rica); *M. lutea* Giglio-Tos (Mexico to Costa Rica); *M. separata*, n. sp. (Costa Rica); and *M. plumosa*, n. sp. (Brazil). *Pseudophorellia* includes 25 species from Hispaniola and Mexico to Bolivia: *P. acrostichalis*, n. sp. (Bolivia); *P. antica*, n. sp. (Costa Rica); *P. anypsilon*, n. sp. (Colombia, Costa Rica, Panamá); *P. bipunctata*, n. sp. (Ecuador); *P. brevilobata*, n. sp. (Peru); *P. confluens*, n. sp. (Venezuela); *P. decora*, n. sp. (Costa Rica); *P. diffusa*, n. sp. (Costa Rica); *P. distincta*, n. sp. (Colombia); *P. enkerlini*, n. sp. (southern Mexico, Costa Rica); *P. fenestrata*, n. sp.

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(Panamá); *P. flavicauda*, n. sp. (Colombia); *P. flavida*, n. sp. (Dominican Republic); *P. fuscoapicata*, n. sp. (Panamá); *P. hansoni*, n. sp. (Costa Rica); *P. maculata* Lima (Brazil); *P. marginata*, n. sp. (Ecuador); *P. quadricincta*, n. sp. (Costa Rica, Panamá); *P. reducta*, n. sp. (Brazil); *P. semilunata*, n. sp. (Panamá); *P. setosa*, n. sp. (Costa Rica); *P. stonei* Lima (Panamá); *P. tica*, n. sp. (Colombia, Costa Rica, French Guiana, Panamá); *P. tristeza*, n. sp. (Surinam); and *P. vespiformis*, n. sp. (Venezuela). Keys to the species of each genus are provided, as are illustrations of pertinent diagnostic characters for all species. Phylogenetic relationships of the *Molynocoelia* group are analyzed. The group may be most closely related to the Paleotropical genera *Callistomyia* and *Alincocallistomyia*, and this larger clade is possibly related to the Toxotrypanini or Adramini. A cladistic analysis supports the *Molynocoelia* group, with *Alujamyia*, *Molynocoelia*, and *Pseudophorellia* as monophyletic taxa, and tests hypotheses of relationships among the species within each genus.

INTRODUCTION

Alujamyia, n. gen., *Molynocoelia* Giglio-Tos, and *Pseudophorellia* Lima are endemic Neotropical genera of fruit flies that are here hypothesized to be closely related and are recognized as the *Molynocoelia* group. Except for their descriptions and a brief review by Foote (1980), the treatment of *Molynocoelia* and *Pseudophorellia* in the previous tephritid literature has been limited to inclusions in keys and catalogs. The group is poorly known, as is illustrated by the fact that only three of the 33 species here recognized were previously described. Their biology is almost totally unknown, except that most if not all of the species appear to be restricted to primary forests, and at least some of them are presumably wasp mimics based on their appearance. Their host plants are unknown. This revision was undertaken to promote the study of these little-known flies, and to further resolve the relationships among the Neotropical genera of Tephritidae.

MATERIALS AND METHODS

Morphological terminology follows White *et al*. (1999) and McAlpine (1981). Wing bands are labeled on Figs. 14, 18, 39, and 71.

Acronyms for the institutions where specimens are deposited are as follows:

AMNH — American Museum of Natural History, New York, USA
CBF — Colección Boliviana de Fauna, Museo Nacional de Historia Natural, La Paz, Bolivia
CMP — Carnegie Museum of Natural History, Pittsburgh, USA
IEXV — Instituto de Ecología, Xalapa, Mexico
IML — Instituto Miguel Lillo, Tucumán, Argentina
IMZ — Museo ed Istituto di Zoologia Sistematica, Universitá di Torino, Italy
INBio — Instituto de Biodiversidad, Santo Domingo de Heredia, Costa Rica
INPA — Instituto Nacional de Pesquisas da Amazonia, Manaus, Brazil
IOC — Instituto Oswaldo Cruz, Rio de Janeiro, Brazil
IZAM — Universidad Central de Venezuela, Maracay, Venezuela
LACM—Natural History Museum of Los Angeles County, Los Angeles, USA
MCZ — Museum of Comparative Zoology, Harvard University, Cambridge, USA
MEUP — Museo de Entomología, Universidad de Panamá, Panamá

SVM—Sanidad Vegetal, SARH, Mexico City, Mexico
TAUI — Tel Aviv University, Tel Aviv, Israel
UCD — University of California, Davis, USA
USNM — National Museum of Natural History, Smithsonian Institution, Washington, USA
USP — Museu de Zoologia, Universidade de São Paulo, Brazil
USU — Utah State University, Logan, USA
UVGC — Universidad del Valle, Guatemala City, Guatemala

The depository is the same as in the barcode number unless another acronym is indicated preceding the number.

Methods used for analysis of phylogenetic relationships are discussed in that section. The data were analyzed using PAUP version 4.0 beta (Swofford, 2000). The cladogram figures were produced with Winclada (© K.C. Nixon, 2002).

TAXONOMY

Key to the genera of the *Molynocoelia* group

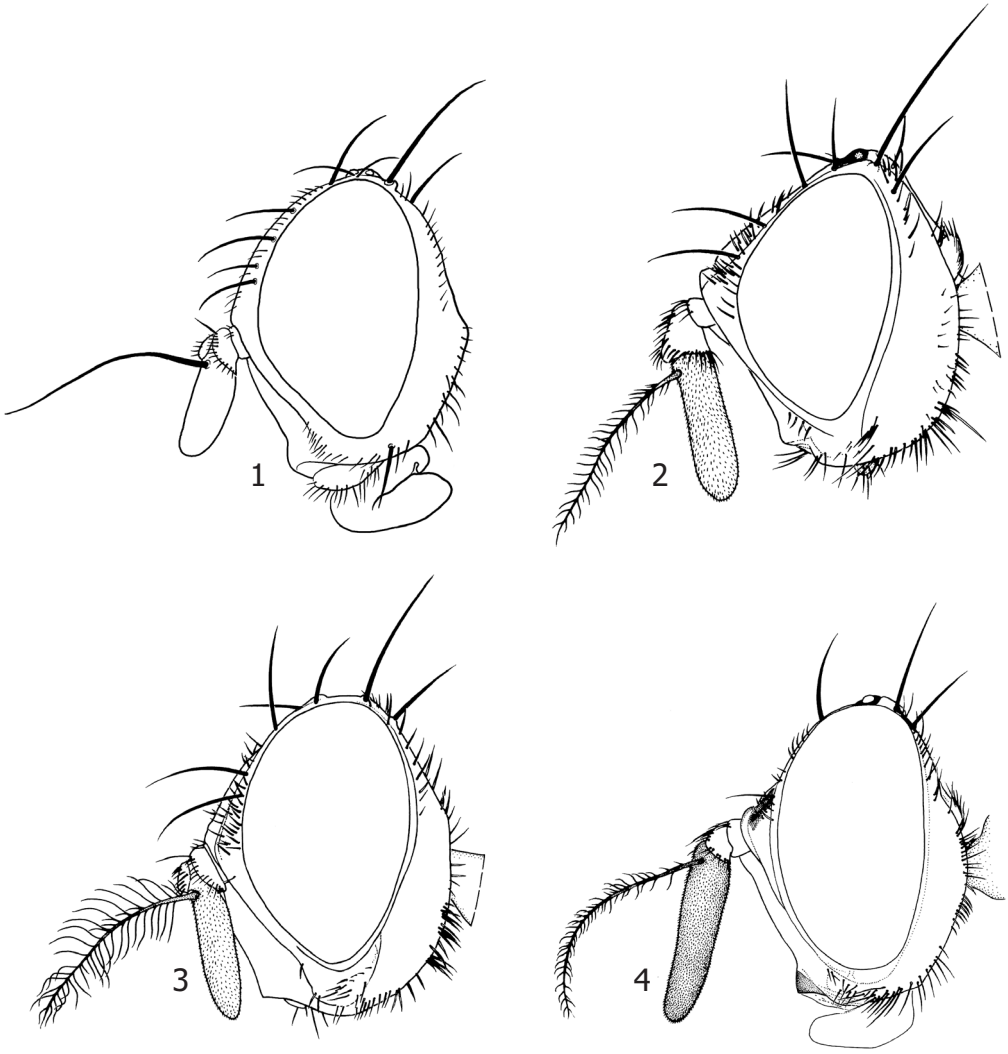
1. Basal section of vein Cu and usually vein Cu_1 setulose dorsally; abdominal syntergite 1+2 with 1 to several "richardiid-like" lateral setae larger than others (Figs. 55-57, 96-99); ocellar seta small and weak or absent (Figs. 55-59); phallus with bilobed spiculose membranous basal lobe on glans (Figs. 107-108) ..... ***Pseudophorellia*** **Lima**
-. Basal section of vein Cu and vein Cu_1 without dorsal setulae; abdominal syntergite 1+2 without outstanding lateral setae (Figs. 11, 29-32, 36); ocellar seta well developed (Figs. 1-3); phallus without membranous basal lobe on glans **2**
2. Wing without radial-medial band (Figs. 12-18); crossveins R-M and DM-Cu covered by same band (subapical band); arista bare or with few minute basal hairs (Fig. 1); propleuron with outstanding seta, at least twice as long as setulae (Fig. 9); acrostichal seta absent (Figs. 5-8, 29) .....***Alujamyia*****, n. gen.**
-. Wing with short radial-medial band (Figs. 37-41) often connected to discal band to form Y-shaped mark; crossveins R-M and DM-Cu covered by different bands; arista plumose (Figs. 2-3); propleuron without outstanding seta, setulae subequal; acrostichal seta present (Figs. 30-32) ..... ***Molynocoelia*** **Giglio-Tos**

Alujamyia Norrbom, n. gen.

Type species: *Alujamyia sexvittata*, n. sp., by present designation.

Diagnosis

Alujamyia differs from other New World genera of Tephritidae by the following combination of characters: arista nearly bare, with only a few minute basal hairs; thorax mostly bare of microtrichia; propleuron with outstanding seta; acrostichal seta absent; radial-medial band absent; and crossvein R-M covered by subapical band. In the key to genera of Trypetinae of Foote (1980), species of *Alujamyia* will run to couplet 14. They differ from *Pseudophorellia* as indicated in the key above, and from *Hetschkomyia* Hendel and *Ischyropteron* Bigot in lacking acrostichal setae (the acrostichal seta is present in the latter genera, not absent as indicated by Foote 1980).

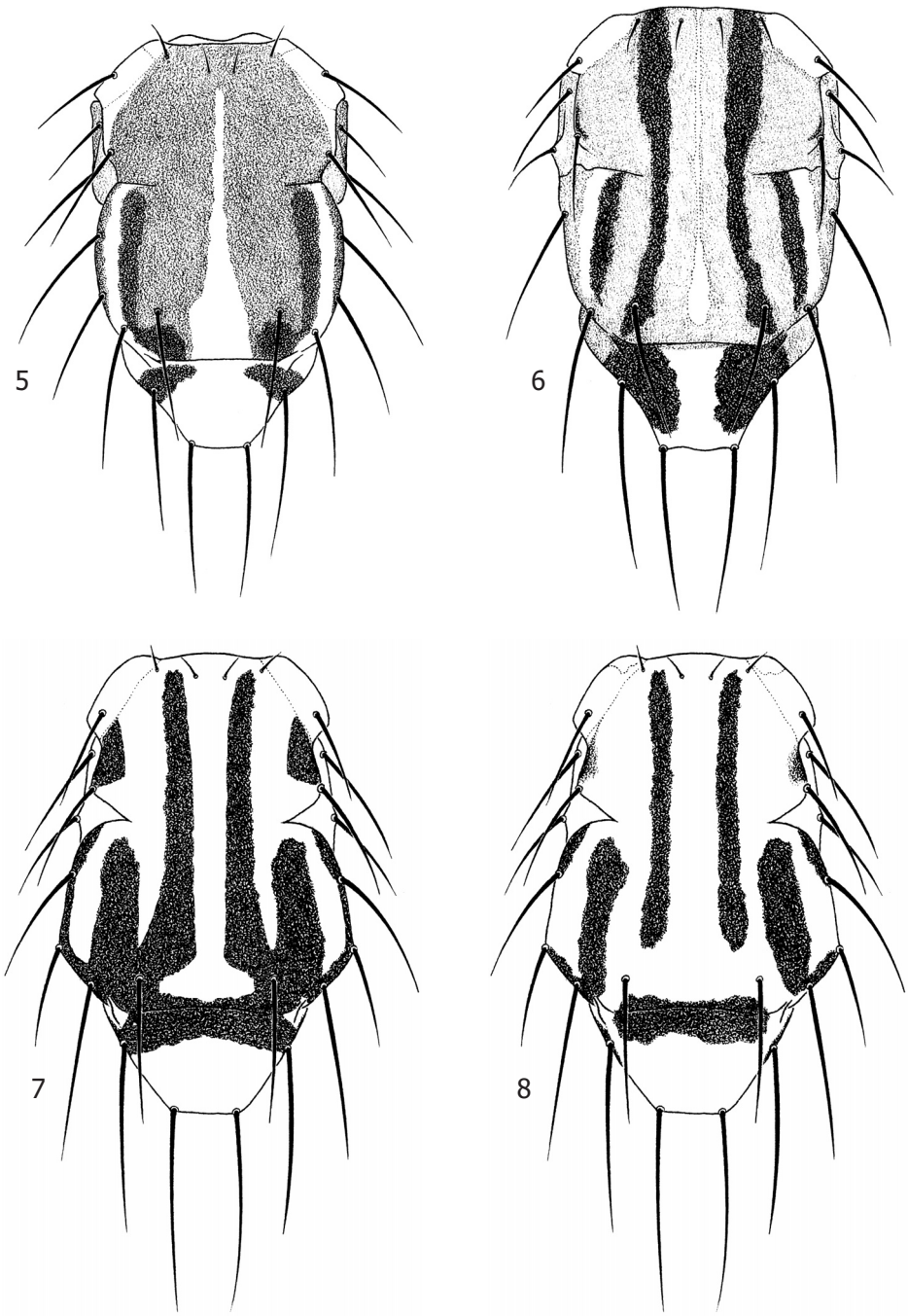


Figs. 1-4. Head, lateral view. 1. *Alujamyia isolata* (Dominican Rep.: Parque Los Haitises, USNM00052505). 2. *Molynocoelia lutea* (Costa Rica: SE Río Naranjo, USNM00052502). 3. *M. plumosa* (Brazil: Serra do Navio, USNM00056028). 4. *Pseudophorellia tica* (Costa Rica: Cerro Rincon, USNM00052209).

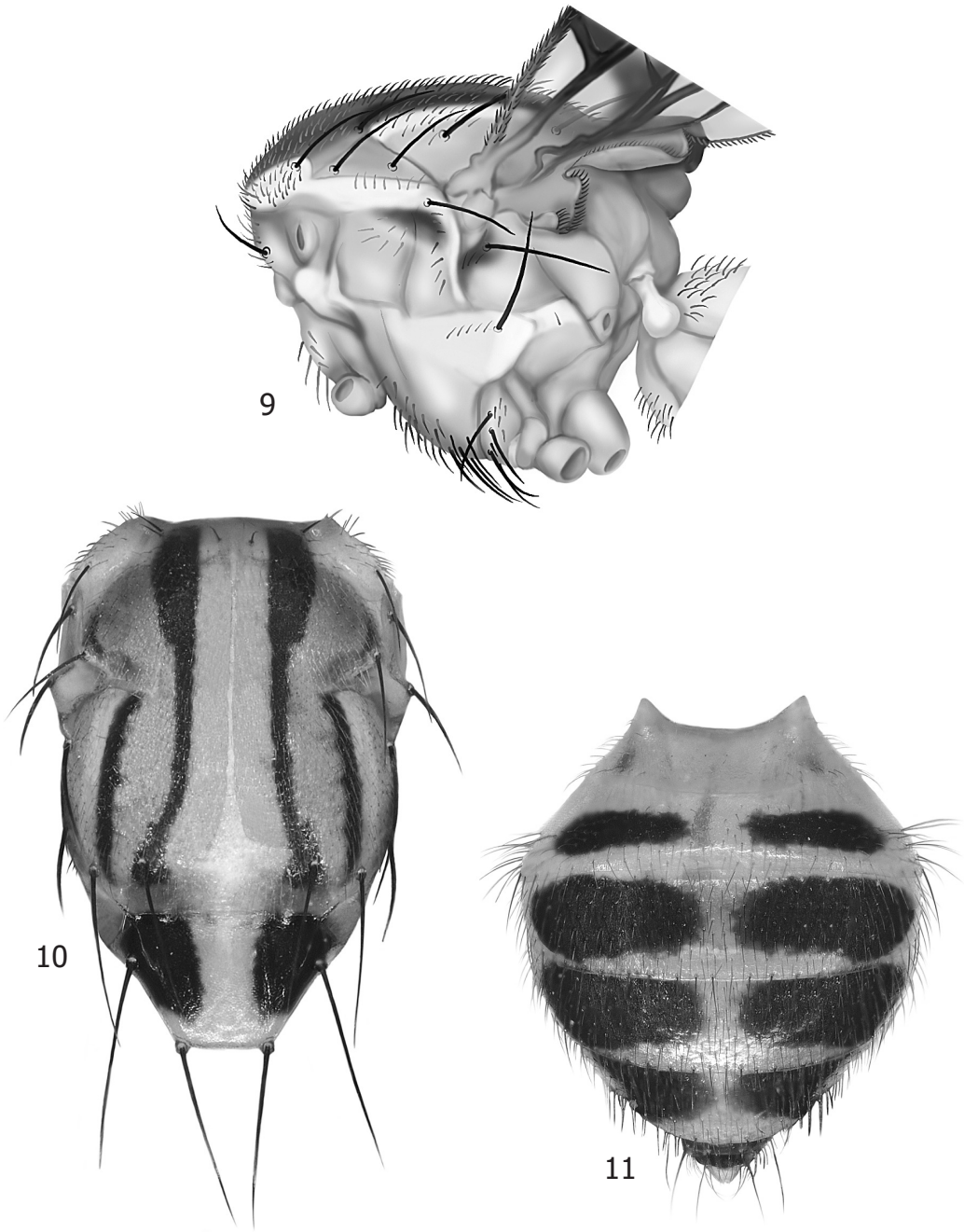
Description

Mostly yellow or orange flies, usually with some brown markings (Fig. 29). Body length 4.0-5.0 mm.

Head (Fig. 1). Ocellar and postocellar setae present; 3-4 frontal setae; 2 orbital setae. Parafacial narrow, no more than 0.33 times as wide as first flagellomere, microtrichose along margin of eye. Face microtrichose. Orbital plate and sometimes area around ocellar tubercle without



Figs. 5-8. Thorax, dorsal view. 5. *Alujamyia bella* (Mexico: Bungalows Santa Lucia, USNM00055911). 6. *A. isolata* (Dominican Rep.: Parque Los Haitises, USNM00052504). 7. *A. sexvittata* (holotype). 8. Same (Mexico: La Union, USNM00056337).



Figs. 9-11. *Alujamyia isolata* (Dominican Rep.: Parque Los Haitises). 9. Thorax, lateral view (USNM00052504). 10. Thorax, dorsal view (USNM00052506), photo. 11. Abdomen, dorsal view (USNM00052506), photo.

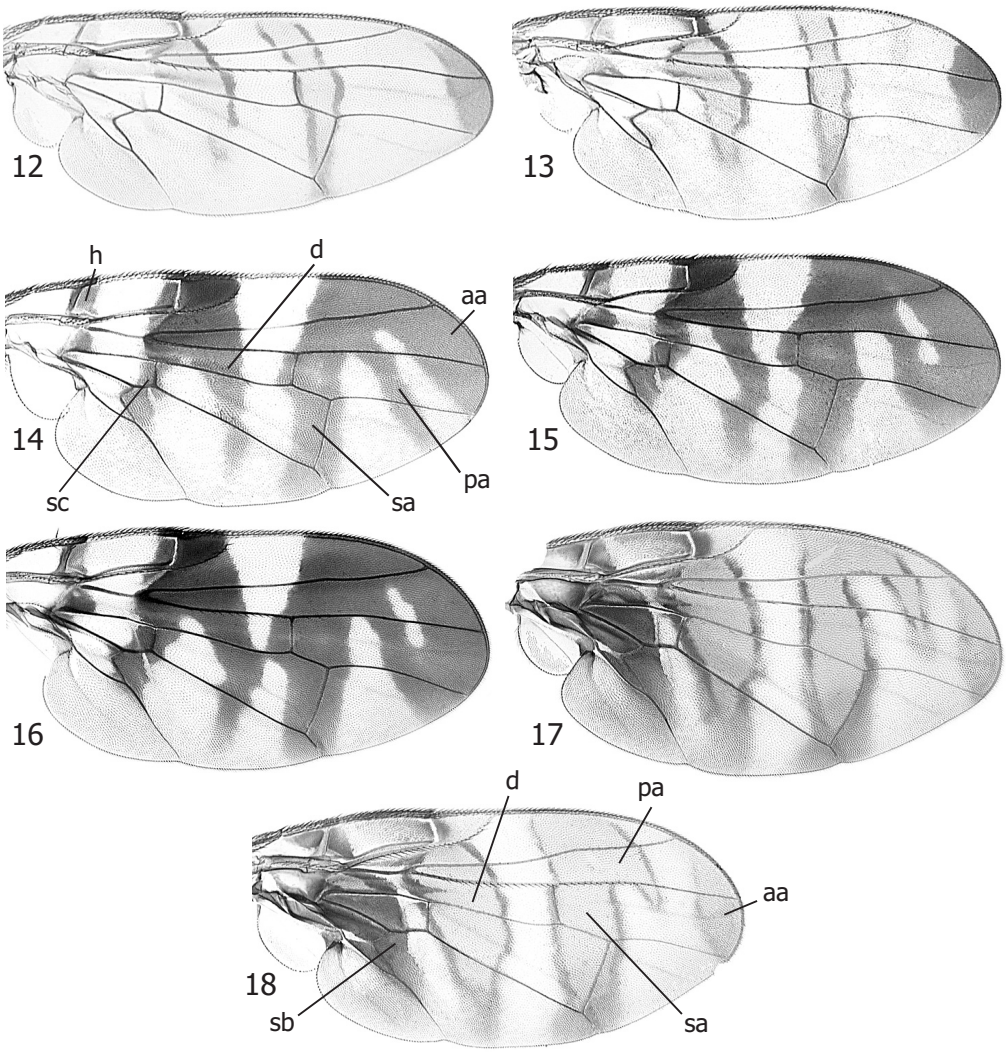
microtrichia. First flagellomere moderately long, 2.5-3.6 times as long as wide, reaching or almost reaching ventral facial margin. Arista almost bare, with only minute basal hairs.

Thorax (Figs. 5-10, 29). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, anatergite, lateral margin of mediotergite, small postsutural area on scutum lateral to supra-alar seta, most or all of subscutellum, and sometimes scutellum laterally or ventrally. Scutum yellow or orange, with 2-3 clear or white vittae (paired postsutural sublateral vitta aligned with intra-alar seta, and unpaired medial vitta, latter not clearly observed in *A. farri* or *sexvittata*; best observed in fluid preserved specimens, often not visible in dried specimens); usually with 1-3 pairs of dark brown vittae; sometimes with presutural lateral brown mark. Scutellum flat, with relatively sharp angle between disk and sides; sparsely setulose only on lateral and apical margins of disk (*A. bella*) or entirely bare; with dark brown lateral mark on at least basal 0.25, usually extended onto disk or with separate basal mark(s) on disk. Pleuron orange except white areas (dorsal margin of anepisternum, dorsal spot on katepisternum; not always apparent in dried specimens), occasionally with small brown markings on anepisternum, katepisternum or anepimeron. Propleuron with outstanding seta more than twice as long as setulae. 1 postpronotal, 2 notopleural, 1 presutural and 1 postsutural supra-alar, 1 intra-alar, 1 postalar, 2 scutellar setae, 1 dorsocentral seta, aligned with postalar or intra-alar seta. Acrostichal seta absent. Medial and lateral scapular setae present. Katepisternal seta present, usually large, weak to moderately large in *A. farri*. Anepimeron without setulae posteroventrally. Katepimeron and/or dorsal margin of meron with 1-6 setulae.

Legs. Femora without spines or stout spinelike setae.

Wing (Figs. 12-18). Basal section of vein Cu and vein Cu_1 nonsetulose dorsally. Vein R_{4+5} densely setulose dorsally to beyond crossvein R-M, usually to level of crossvein DM-Cu, and occasionally almost to apex. Crossvein R-M relatively close to crossvein DM-Cu, more than 0.67 distance from crossvein BM-Cu to crossvein DM-Cu (ratio of second to third sections of vein M 2.2-3.7), and covered by subapical band. Cell bcu with posteroapical lobe half as long to subequal to broadest width of cell. Wing bands yellow, often with narrow brown margins, or entirely brown. Pattern including: narrow humeral band from crossvein H to base of cell bcu (Figs. 14-16), or narrow or broad subbasal band from crossvein H to apex of cell bcu (Figs. 12-13, 17-18); subcostal band (sometimes absent) from pterostigma to apex of cell bcu, broadly connected to discal band anteriorly to form inverted-U (Figs. 14-16); well developed discal band not covering crossvein R-M; subapical band covering crossveins R-M and DM-Cu, usually separate from discal band, connected to or separate from apical bands anteriorly; anteroapical band sometimes reduced to apical spot; and posteroapical band sometimes reduced or absent.

Abdomen (Figs. 11, 29). At least tergites 3-5 each with brown band, often medially interrupted, or pair of spots. Syntergite 1+2 without outstanding lateral seta. Male terminalia: Lateral surstylus very short, poorly differentiated from epandrium, their outline nearly oval in posterior view (Figs. 19-20). Medial surstylus with lateral prensiseta minute or absent. Glans (Figs. 21-24) short and stout, mostly sclerotized; with mostly membranous or lightly sclerotized dorsolateral lobe with slender medial sclerite on ventral side and elongate, slender Y-shaped sclerite on dorsal side; without membranous basal lobe. Female terminalia: Oviscape short, length 0.6-0.7 mm. Eversible membrane with dorsal spicules reduced, consisting of 6-8 basal



Figs. 12-18. Wing, photo. 12. *Alujamyia bella* (Mexico: La Union). 13. Same (Colima, Carretera Manzanillo). 14. *A. farri* (Cuba: Upper Ovando River). 15. *A. isolata* (Puerto Rico: Bayamon). 16 (Dominican Rep.: Parque Los Haitises, USNM00052507). 17. *A. sexvittata* (Guatemala: San Francisco). 18. Same (Mexico: La Union). Abbreviations for wing bands: aa = anteroapical; d = discal; h = humeral; pa = posteroapical; sa = subapical; sc = subcostal.

rows of spicules slightly smaller than ventral spicules and well separated, broad, distal area of minute spicules. Ventral spicules extensive, basally larger and in numerous V-shaped rows, gradually decreasing in size and less clearly aligned in rows distally; subbasally rows extending laterally and slightly onto dorsal side. Aculeus (Figs. 25-27) short, length 0.50-0.65 mm, base stout in dorsoventral axis; gradually tapered to long, acute, simple tip. 3 spermathecae spherical, without obvious surface sculpture (Fig. 28).

Etymology

This genus (gender feminine) is named in honor of Martín Aluja (Instituto de Ecología, Xalapa, Mexico), who has done so much to advance the study of fruit fly behavior. To discover the habits of its species (and those of *Molynocoelia* and *Pseudophorellia*), whose biology is totally unknown, may be a suitable challenge to him and others interested in Neotropical fruit flies.

Key to the species of *Alujamyia*

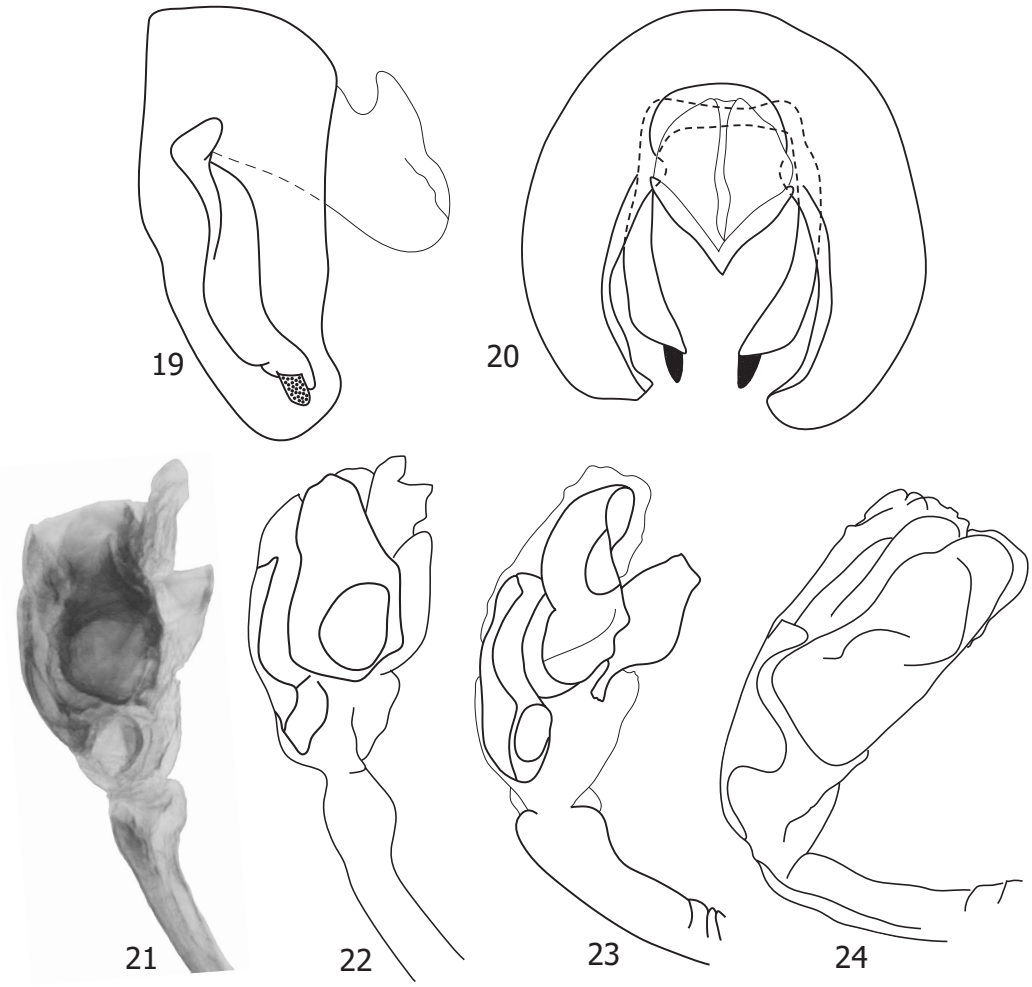
1. Wing (Figs. 14-16) with subcostal band from pterostigma to base of cell cu_1; distal margin of discal band arising at or close to apex of pterostigma; subapical band more or less parallel to crossvein DM-Cu, connected anteriorly to complete anterior and posteroapical bands; setae dark brown to black (Greater Antilles) **2**
-. Wing (Figs. 12-13, 17-18) without subcostal band; discal band more proximal, its distal margin arising closer to base of pterostigma; subapical band curving anterobasally and separated from anteroapical band (latter often reduced to apical spot); posteroapical band absent or incomplete, not reaching posterior wing margin; setae orange to orange brown (Mexico, Guatemala) **3**
2. Anteroapical and posteroapical bands not connected posteriorly, hyaline area between them reaching posterior wing margin (Fig. 14); scutellum with pair of dark brown lateral marks not extending beyond midlength, and pair of separate, weaker spots on disk near midlength (Fig. 29); scutum with 0-2 pairs of pale to moderate brown vittae (Cuba, Jamaica) ..... ***farri*, n. sp.**
-. Anteroapical and posteroapical apical bands connected posteriorly, hyaline spot or spots between them isolated from posterior wing margin (Figs. 15-16); scutellum with 2 large dark brown lateral marks, covering at least basal 0.75 of side and lateral third of disk (Figs. 6, 10); scutum with 2 pairs of dark brown vittae (Hispaniola, Puerto Rico) ... ***isolata*, n. sp.**
3. Scutum with 0-1 pair of dark brown vittae (Fig. 5); wing with subbasal, discal and subapical bands narrow, subbasal band yellow and often difficult to observe, discal band not covering crossvein BM-Cu (Fig. 12-13); posteroapical band, if present, not connected to subapical band; scutellum sparsely setulose on margins (Mexico: Colima, Guerrero, Veracruz) ..... ***bella*, n. sp.**
-. Scutum (Figs. 7-8) with 3 pairs of dark brown vittae or spots; wing with subbasal, discal and subapical bands very broad, subbasal band mostly brown, discal band covering much of crossvein BM-Cu (Figs. 17-18); posteroapical band connected anteriorly to subapical band; scutellum without setulae (Guatemala, Mexico: Guerrero, Quintana Roo) ... ***sexvittata*, n. sp.**

***Alujamyia bella* Norrbom, n. sp.**
(Figs. 5, 12-13, 21-22, 25)

Cryptodacus sp.: Foote, 1980: 24, 69, Fig. 52 [wing of La Union specimen].

Diagnosis

This is the only species of *Alujamyia* with the posteroapical wing band absent or not connected to the subapical band, and with the margins of the scutellum sparsely setulose. It lacks a brown submedial scutal vitta, which is usually present in the other three species, and usually has a somewhat L- or J-shaped sublateral vitta (absent in La Union specimens), medially curved and expanded posteriorly.



Figs. 19-24. Male terminalia. 19. *Alujamyia farri* (Cuba: Upper Ovando River), epandrium and surstyli, lateral view. 20. Same, posterior view. 21. *A. bella* (Mexico: Llano Grande, USNM00055072), glans, photo. 22. *A. bella* (Mexico: La Union), glans. 23. *A. farri* (Cuba: Upper Ovando River), glans. 24. *A. sexvittata* (Mexico: La Union), glans.

Description

Body length 4.0-5.0 mm. Mesonotum length 1.9-2.3 mm. Wing length 3.8-4.5 mm. Setae orange to orange brown.

Head. Antenna yellow except most of arista brown; first flagellomere moderately long, 2.5-2.7 times as long as wide, reaching or almost reaching ventral facial margin.

Thorax. Mesonotum (Fig. 5) mostly orange. Scutum orange except single median and paired lateral white vittae (sometimes poorly differentiated) and usually (except in La Union

specimens) paired, somewhat L- or J-shaped, dark brown sublateral vitta mesal to white vitta and between intra-alar and dorsocentral setae, extending from transverse suture to or almost to posterior margin, then turning mesally and usually expanding, separated from marks on scutellum. Scutellum with apex white and with paired dark brown mark on base laterally, extending onto lateral part of disk and including base of basal seta; sparsely setulose only on lateral and apical margins of disk. Pleuron entirely orange except white areas. Mediotergite entirely orange (most Veracruz specimens) or narrowly to broadly dark brown medially.

Legs. Entirely orange.

Wing (Figs. 12-13). With 4-5 bands or spots: subbasal band yellow, narrow, posterior part often indistinct; discal band yellow with narrow brown margins, moderately broad, its distal margin arising from near base of pterostigma, its proximal margin touching or almost touching anterior end of crossvein BM-Cu; subapical band yellow with narrow brown margins, not parallel to crossvein DM-Cu, its proximal margin without sharp bends; anteroapical band reduced to apical spot in cells r_{2+3} and r_{4+5}, entirely brown, proximal margin convex; posteroapical band absent (La Union specimens, 2 Colima specimens) or incomplete, narrow, yellow, at most extended posteriorly to middle of cell r_{4+5}, but usually reaching vein R_{4+5} (reduced to spot in apex of cell r_1 in 1 Colima and 2 Veracruz specimens), not connected to subapical band anteriorly.

Abdomen. Tergites 3, 4 and 5 each with pair of sublateral, longitudinally medial, dark brown bands or spots, relatively broad in longitudinal direction on tergite 5, narrower on tergites 3 and 4, usually narrowly medially separated on tergite 3 (more separated in La Union specimens), broadly separated on tergites 4 and 5. Male terminalia: Epandrium orange. Glans (Figs. 21-22) relatively short and stout. Female terminalia: Oviscape orange, 0.65-0.80 mm long. Aculeus (Fig. 25) 0.46-0.53 mm long, gradually tapered to long, acute tip.

Comments

The specimens from La Union (presumably the site in Guerrero) lack scutal vittae and have a relatively reduced wing pattern, but as there is overlap in the latter with some specimens from Colima and Veracruz, they are tentatively regarded as conspecific with the other specimens.

Material Examined

Holotype ♂ (IEXV; USNM00056008), MEXICO: Veracruz: Teocelo, Llano Grande, 840 m, 12 Feb 1991, A. Zúñiga and E. Piedra, DT-30-648.

Paratypes: MEXICO: Colima: Armería [W of], Km 25 on Manzanillo-Cuyutlán hwy., Jackson trap in guava orchard (1♀; USNM00055182); Bungalows Santa Lucia, Faro de la Audiencia, Km 18 Manzanillo a Santiago, Jackson trap in tropical almond, Mar 1987 (1♂; USNM00055911); Carretera Manzanillo-Cihuatlán, Km 23, ex Jackson Cuelure trap, 14 Mar 1989 (1♂; USNM00055081); Carretera Manzanillo, between posts 278 and 280, ex Jackson Trimedlure trap, 27 Jan 1989, J.A. Rivera (1♀; USNM00055964); Cuyutlán, trampa Jackson, arbol silvestre, 12 Mar 1984, P. Perea (1♀; SVM); Empacadora del Pacifico, Tecomán-Pascuales Hwy., 25 Nov 1987, J.A. Rivera (1♂; USNM00056467); Manzanillo, Julipa, Jackson Cuelure trap, 23 Feb 1988, F.J. Figeroa (1♂; USNM00056047). [Guerrero?]: La Union, 25 Jan 1957, P.A.B. (or P.A.C.), no. 807.8 (or 807.10) (2♂1♀; USNM00055981-83). Veracruz: Apazapan, Huerta de la Sra. Leticia Lagunes, McPhail trap with protein and borax in *Mangifera indica* tree, 16 Feb 2000, M. Aluja (1♂; USNM00055185); Apazapan, McPhail trap 9 in chico

zapote orchard, 28 Feb 2001, M. Aluja, (1♂; USNM00213602); same, 7 Mar 2001, (1♀; USNM00213630); same, McPhail trap 2 in chico zapote orchard, 28 Feb 2002, (1♂; USNM00215041); Apazapan, 550 m, 19 Jun 1991, G. Quintero and L. Quiroz, DT-30-651 (1♂; IEXV; USNM00056419); same, 7 Aug 1991, DT-30-656 (1♀; IEXV; USNM00055904); same, 29 Jan 1992, DT-30-653 (1♂1♀; IEXV; USNM00055322-23); same, 18 Mar 1992, DT-30-658 (2♂; IEXV; USNM00055975-76); same, 26 Mar 1992, DT-30-655 (2♀1?; IEXV; USNM00056431-33), (1♂1♀; USNM00056429-30); same, 1 Apr 1992, DT-30-652 (2♀; IEXV; USNM00056030-31); same, 8 Apr 1992, DT-30-657 (2♂; IEXV; USNM00055902-03); same, 15 Apr 1992, DT-30-654 (1♀; IEXV; USNM00056428); Teocelo, Llano Grande, 840 m, 1 Jan 1991, A. Zúñiga and E. Piedra, DT-30-650 (1♀; USNM00056117); same, 8 Jan 1991, DT-30-649 (1♀; IEXV; USNM00055364); same, 29 Jan 1991, DT-30-646 (2♀; IEXV; USNM00055913-14); same, 19 Feb 1991, DT-30-647 (1♂; USNM00055072).

Etymology

The name of this species is an adjective meaning beautiful.

Alujamyia farri Norrbom, n. sp.

(Figs. 14, 19-20, 23, 29)

Diagnosis

This species and *A. isolata* are the only two species of *Alujamyia* with a subcostal wing band from the pterostigma to the base of cell cu_1 and complete anteroapical and posteroapical bands connected to the subapical band. *Alujamyia farri* differs from *A. isolata* as indicated in the key and in the diagnosis of *A. isolata*. It also differs in lacking or having paler brown scutal vittae than *A. isolata*.

Description

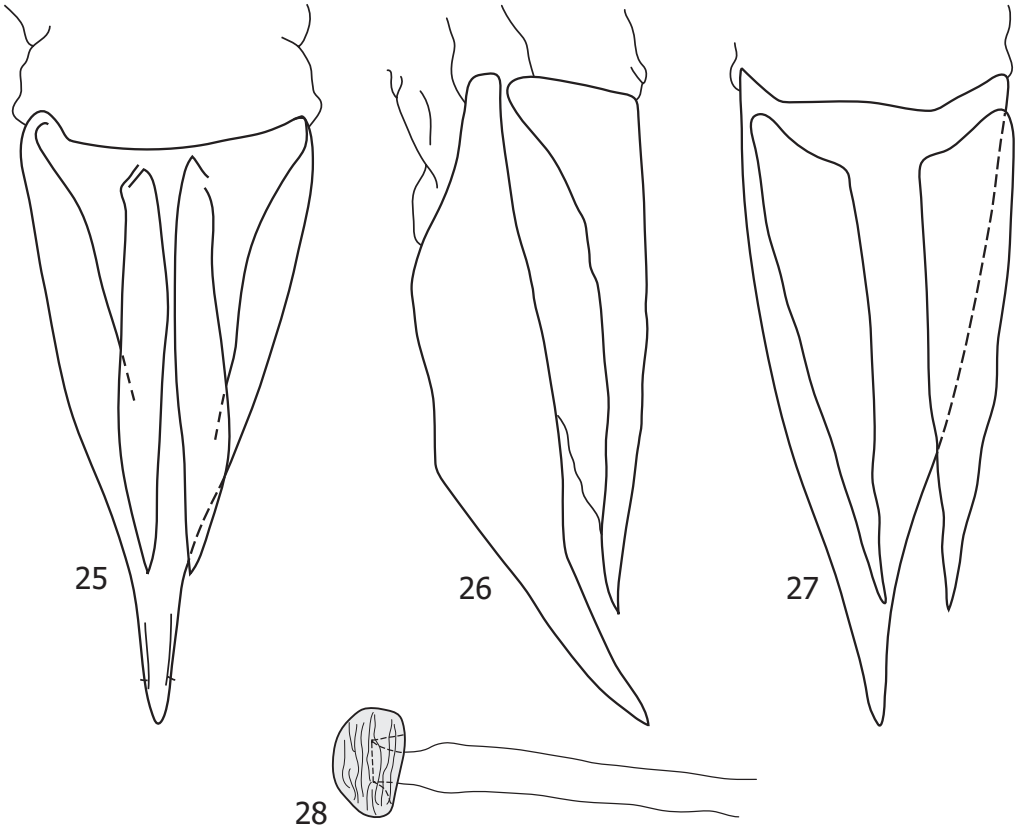
Body length 4.5 mm. Mesonotum length 2.0-2.1 mm. Wing length 4.1-4.5 mm. Setae dark red brown to black (Fig. 29).

Head. Antenna yellow except most of arista brown; first flagellomere moderately long, 2.7-2.9 times as long as wide, reaching or almost reaching ventral facial margin.

Thorax. Mesonotum mostly orange. Scutum orange with single median and paired lateral white vittae (sometimes poorly differentiated) and sometimes (Jamaican specimens) paired, slender, moderate brown submedial vitta from near anterior margin almost to level of dorsocentral seta; in holotype also with very narrow, moderate brown sublateral vitta on mesal margin of white vitta, extending from near transverse suture to level of dorsocentral seta. Scutellum with apex white and with paired dark brown mark on base laterally, touching or including base of basal seta, also with smaller, paired, paler brown spot near midlength on lateral part of disk; entirely without setulae. Pleuron and mediotergite entirely orange except white areas. Katepisternal seta weakly to moderately developed, 0.33-0.50 times as long as anepimeral seta.

Legs. Orange except much of hindtibia sometimes slightly darker orange brown.

Wing (Fig. 14). With 6 entirely brown bands: humeral band narrow; subcostal band broadly connected anteriorly with discal band to form inverted-U; subapical band more or less parallel to crossvein DM-Cu, well separated from discal band, its proximal margin with strong bend



Figs. 25-28. Female terminalia. 25. *Alujamyia bella* (Mexico: La Union), aculeus, ventral view. 26-27. *A. isolata* (Puerto Rico: Bayamon), aculeus, lateral and ventral views. 28. *A. isolata* (Puerto Rico: Bayamon), spermatheca.

along vein M (less pronounced in Morant Point male); and complete anteroapical and posteroapical bands, both connected to subapical band anteriorly but separated posteriorly.

Abdomen. All tergites, except female tergite 6, each with pair of broad dark brown bands, narrowly separated medially, broad and medial in longitudinal direction except narrower and subapical on syntergite 1+2. Male terminalia: Epandrium (Figs. 19-20) orange. Glans (Fig. 24) relatively short and stout, dorsolateral lobe well developed. Female terminalia: Oviscape dark brown, 0.6 mm long. Aculeus gradually tapered to long, acute tip.

Material Examined

Holotype ♀ (FSCA; USNM00055987), JAMAICA: St. Catharine: Worthy Park, 2.2 mi. N on Camperdown Road, 12 May 1969, R.E. Woodruff.

Paratypes: JAMAICA: St. Thomas: Morant Point, 20 Apr 1958, T.H. Farr (1♂;

USNM00056444). CUBA: eastern ORIENTE [GUANTÁNAMO]: upper Ovando R., 1000-2000 ft., 17-20 Jul 1936, Darlington (1♂; MCZ; USNM00056093).

Comments

The terminalia of the holotype were not dissected, but the apical part of the aculeus is visible within the oviscape.

Etymology

This species is named for Thomas Farr, one of the most prolific collectors of insects in Jamaica, who collected one of the type specimens.

***Alujamyia isolata* Norrbom, n. sp.**

(Figs. 1, 6, 9-11, 15-16, 26-28)

Diagnosis

This is the only species of *Alujamyia* with any of the following characters: the scutal submedial brown vitta broadest anteriorly; the mid- and hindfemora partly dark brown; and the anteroapical and posteroapical bands connected posteriorly to form an isolated hyaline spot or spots between them. It also has the largest dark brown scutellar markings for this genus.

Description

Body length 4.0-5.5 mm. Mesonotum length 1.9-2.3 mm. Wing length 4.1-4.6 mm. Setae dark brown to black.

Head (Fig. 1). Antenna yellow except most of arista brown; first flagellomere moderately long, 2.9-3.0 times as long as wide, reaching or almost reaching ventral facial margin.

Thorax (Figs. 6, 9-10). Scutum orange with single median and paired lateral white vittae (sometimes poorly differentiated) and 2 pairs of unconnected dark brown vittae: submedial vitta extending to anterior margin, broadest anterior to transverse suture, then becoming slender, extending and curving slightly laterally, usually reaching dorsocentral seta; sublateral vitta narrow, on mesal margin of white vitta, extending from transverse suture to level of intra-alar seta; also often with small, linear dark brown spot anterior to presutural supra-alar seta. Scutellum with apex and middle third of disk white and with large paired dark brown mark on basal 0.75-0.80 laterally and on lateral third of disk; entirely without setulae. Pleuron mostly orange except white areas, with small brown anepisternal spot just ventral to anepisternal seta, and sometimes small anterior spot on anepimeron. Mediotergite entirely orange or with paired brown submedial vitta.

Legs. Orange except most of hindtibia, apical 0.4-0.5 of mid- and hindfemora, and sometimes subapical posterior spot on forefemur dark brown to black.

Wing (Figs. 15-16). With 6 entirely brown bands: humeral band narrow; subcostal band broadly connected anteriorly with discal band to form inverted-U; subapical band more or less parallel to crossvein DM-Cu, sometimes (2 males) narrowly connected to discal band along vein M, its proximal margin with strong bend along vein M; and complete anteroapical and posteroapical bands, both connected to subapical band anteriorly, and connected to each other posteriorly forming isolated hyaline spot or spots in radial cells.

Abdomen (Fig. 11). All tergites, including female tergite 6, each with pair of broad dark brown bands, narrowly separated or narrowly connected medially, very broad and medial in longitudinal direction on tergites 3-5, narrower on female tergite 6 and narrower and subapical on syntergite 1+2. Male terminalia: Epandrium orange. Glans relatively short and stout, dorsolateral lobe well developed. Female terminalia: Oviscape dark brown, 0.7 mm long. Aculeus (Figs. 26-27) 0.55 mm long, gradually tapered to long, acute tip. Spermatheca as in Fig. 28.

Material Examined

Holotype ♀ (USNM00214059), PUERTO RICO: Aguadilla: Aguadilla, multilure trap in *Terminalia catappa*, 15 Jan 2003, D. Borrero.

Paratypes: DOMINICAN REPUBLIC: Azua: E side of crest Sierra Martin Garcia, 7 km WNW Barrero, 18°21'N 70°58'W, 860 m, cloud forest adjacent to disturbed forest, 25-26 Jul 1992, C. Young, R. Davidson, S. Thompson and J. Rawlins (1♂; CMP; USNM00052509). Hato Mayor: Parque Los Haitises, 3 km W Cueva de Arena, 19°04'N 69°29'W, 20 m, mesic lowland forest, 7-9 Jul 1992, R. Davidson, J. Rawlins, S. Thompson and C. Young (2♂3♀; CMP, USNM; USNM00052504-08). PUERTO RICO: Aguadilla: Aguadilla, multilure trap in *Terminalia catappa*, 15 Jan 2003, D. Borrero (1♀; USNM00214060); Hatillo, Road 129 Km 6.5, Bo. Campo alegre, Sector 10, in front of Renuevo Auto Sales, trap #111-08A, 6 Feb 2003, L.C. Sotomayo, (1♀; USNM00214002). Bayamón: Bayamón, "SJP", in trap, 17 May 1937, H.G. Taylor, San Juan No. 6852 (1♀; USNM00052510). Ponce: Coamo, Rd. 723, Km 7.5, trap in *Syzygium jambos*, 12 Oct 2002, J. Pérez, (3♀; USNM00213993-95).

Etymology

The name of this species is an adjective referring to the isolated hyaline spot or spots between the anteroapical and posteroapical wing bands.

Alujamyia sexvittata Norrbom, n. sp.

(Figs. 7-8, 17-18, 24)

Cryptodacus sp.: Foote 1980: 24.

Diagnosis

This is the only species of *Alujamyia* whose wing pattern includes a broad, dark brown subbasal band and a posteroapical band that is incomplete but connected to the subapical band anteriorly. It also has the most extensive mesonotal dark brown markings of any species of *Alujamyia*, with 3 pairs of scutal vittae or spots, including a lateral dark brown spot or vitta covering the base of the postsutural supra-alar seta, and it is the only species with the basal brown marks of the scutellum connected medially.

Description

Body length 4.0-5.0 mm. Mesonotum length 1.9-2.6 mm. Wing length 4.1-5.0 mm. Setae orange to orange brown.

Head. Antenna yellow except most of arista brown; first flagellomere moderately long, 3.2-3.6 times as long as wide, reaching or almost reaching ventral facial margin.

Thorax (Figs. 7-8). Scutum orange with single median and paired lateral white vittae (sometimes poorly differentiated) and 3 pairs of dark brown vittae, connected posteriorly

(except in La Union male), including: submedial vitta extending narrowly to or almost to anterior margin, gradually broadening posteriorly, extending almost to level of dorsocentral seta or usually beyond; sublateral vitta broad, interrupted at transverse suture, postsutural part on mesal margin of white vitta, expanding posteriorly to cover base of intra-alar seta, presutural part usually broad spot extending laterally almost to presutural supra-alar seta, occasionally narrower or paler; lateral vitta extended from transverse suture and including postsutural supra-alar seta, sometimes (La Union male) broadly interrupted posterior to seta. Scutellum with apex white and with dark brown band on basal 0.25-0.33 laterally and on disk, or (La Union male) with 3 dark brown marks (1 on each side narrowly separated from band across disk); entirely without setulae. Pleuron orange except white areas or (holotype, Chetumal, and Veracruz specimens) with small to medium sized brown marks ventromedially on anepisternum and medially on katepisternum. Subscutellum, at least laterally, and mediotergite dark brown.

Legs. Entirely orange.

Wing (Figs. 17-18). With 5 bands, yellow with narrow brown margins except subbasal band: subbasal band broad, mostly brown, extending from humeral crossvein to beyond apex of cell bcu; discal band broad, its distal margin arising from near base of pterostigma, and its proximal margin crossing crossvein BM-Cu; subapical band broad, not parallel to crossvein DM-Cu, its proximal margin without sharp bends; anteroapical band isolated, not extended anteriorly beyond apex of vein R_{2+3}; posteroapical band anteriorly connected to subapical band in cell r_1 and sometimes also in cell r_{2+3}, but incomplete, ending posteriorly in cell r_{4+5} (in 1 Llano Grande female reaching vein M).

Abdomen. Tergites 3, 4 and 5 each with single complete or pair of narrowly separated dark brown bands, medial in longitudinal direction, and moderately broad on tergites 4 and 5, narrower on tergite 3. Male terminalia: Epandrium orange. Glans (Fig. 24) moderately long, medial apical sclerites relatively well developed. Female terminalia: Oviscape orange, 0.7 mm long. Aculeus 0.55 mm long, gradually tapered to long, acute apex.

Material Examined

Holotype ♂ (USNM00050334), GUATEMALA: Petén: San Francisco, 16°47'56"N 89°56'7"W, 230 m, 15 Jun 1995, J. López.

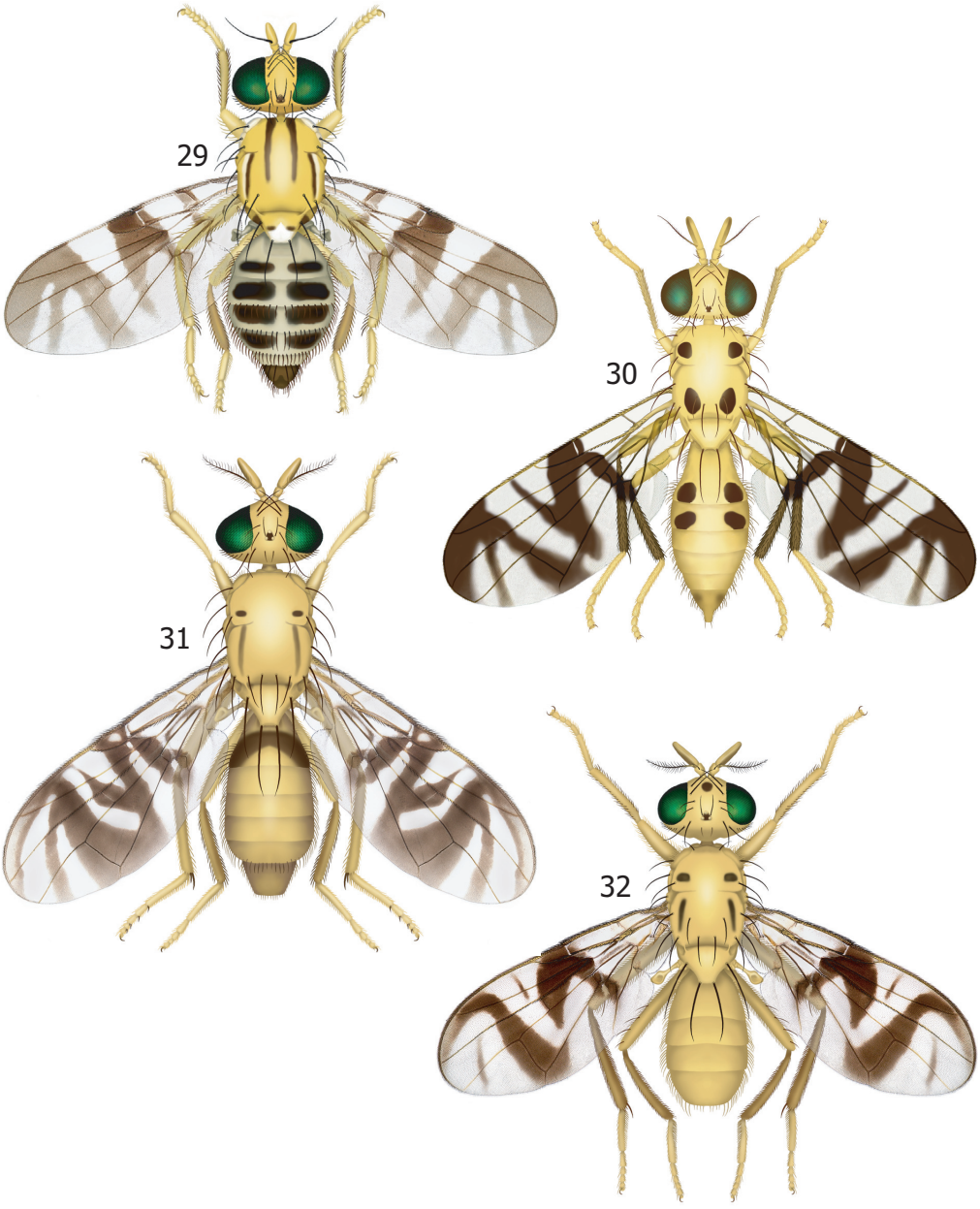
Paratypes: GUATEMALA: Petén: San Benito, Centro de Operaciones, 16°55'16"N 89°54'3"W, 120 m, 8 May 1995, J. López (1♀; UVGC; USNM00050347). MEXICO: [Guerrero?]: La Union, 25 Jan 1957, G.R.S., no. 807.2 (1♂; USNM00056337). Quintana Roo: Chetumal, Santa Elena, 21 Oct 1974, H. Sanchez R. (1♀; USNM00055075). Veracruz: Apazapan, Apazapan, 550 m, 5 Mar 1992, G. Quintero and L. Quiroz, DT-30-663 (4♀; IEXV; USNM00055968-71); same, 1 Apr 1992, DT-30-662 (1♀; USNM00056424); Teocelo, Llano Grande, 840 m, 22 Jan 1991, A. Zúñiga and E. Piedra, DT-30-661 (1♀; IEXV; USNM0005444); same, 19 Feb 1991, DT-30-660 (1♀; IEXV; USNM00056107); same, 26 Feb 1991, DT-30-659 (1♀; USNM00056446).

Etymology

The name of this species is an adjective referring to the six brown stripes on the scutum.

Molynocoelia Giglio-Tos

Molynocoelia Giglio-Tos, 1893: 11 (Type species *Molynocoelia lutea* Giglio-Tos, by monotypy), 1895: 59 [additional description]; Hendel, 1914a: 80 [in key], 1914b: 4 [in key],



Figs. 29-32. Habitus, dorsal view. 29. *Alujamyia farri* female (holotype). 30. *Molynocoelia lutea* female (Costa Rica: SE Río Naranjo, USNM00052502). 31. *M. plumosa* female (Brazil: Serra do Navio, USNM00056028). 32. *M. separata* male (holotype).

10 [catalog]; Curran, 1934: 287 [in key]; Aczél, 1950: 191 [catalog]; Foote, 1967: 31 [catalog], 1980: 7 [in key], 35 [review]; Norrbom *et al*., 1999b: 168 [catalog].

Diagnosis

Molynocoelia differs from other New World genera of Tephritidae by the following combination of characters: Arista plumose, hairs at least half as long as width of first flagellomere; thorax mostly bare of microtrichia; 2 frontal, ocellar, postocellar, and acrostichal setae present; medial scapular seta absent; scutellum with 2 marginal setae, flat, entirely yellow, including laterally, setulose on margins and sometimes laterally on disk, but always with broad medial bare area; wing with short radial-medial band often connected to discal band to form Y-shaped mark; and vein Cu not setulose.

Description

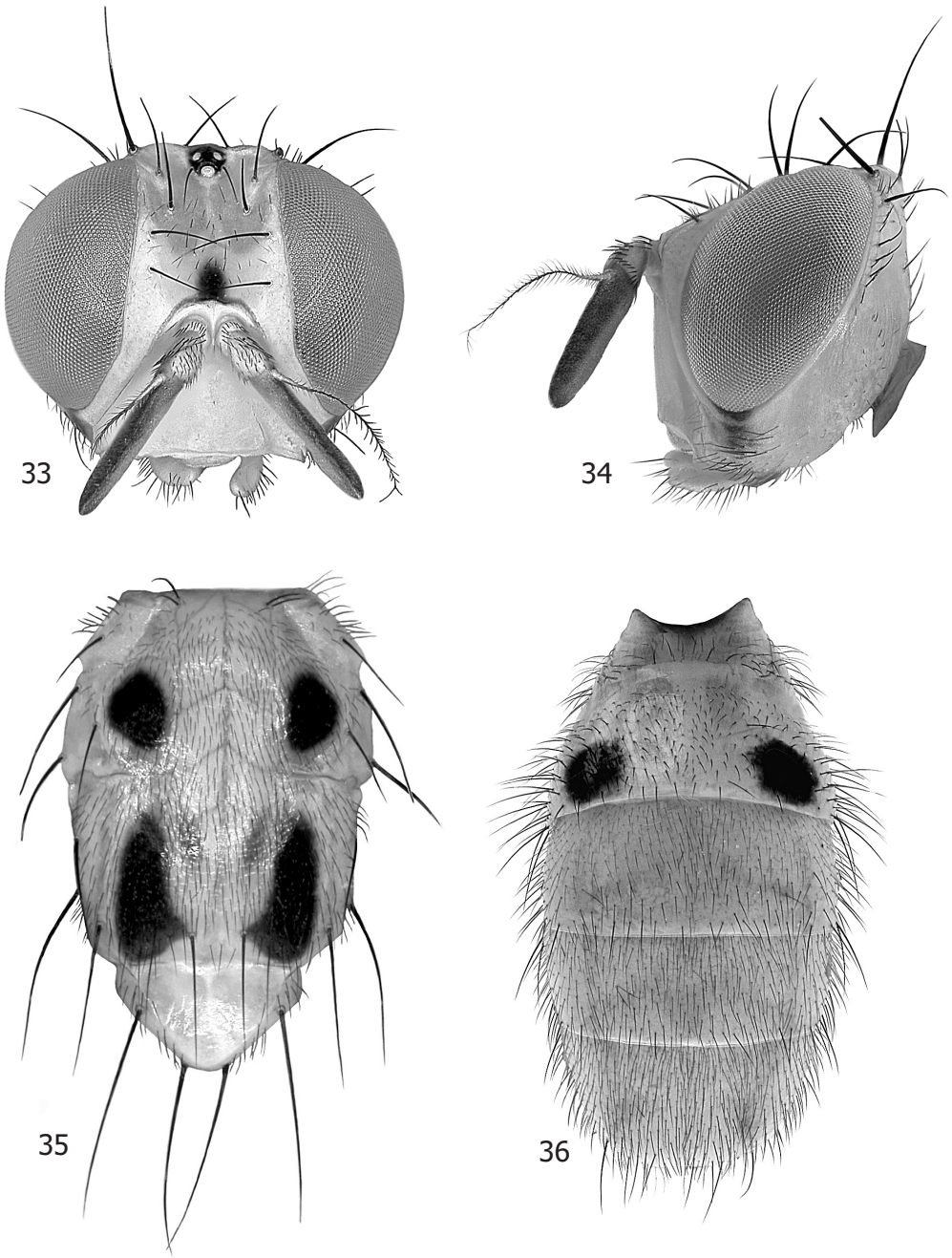
Yellow to orange flies with brown markings (Figs. 30-32). Body length 5.0-7.0 mm.

Head (Figs. 2-3). Ocellar and postocellar setae present (latter absent in 1 female of *M. plumosa*). 2 frontal setae; 2 orbital setae. Parafacial moderately broad, half or more width of first flagellomere, bare except microtrichose margin along eye. Orbital plate and sometimes parts of face or frons without microtrichia. First flagellomere moderately long to long, 3.2-6.0 times as long as wide, almost reaching to distinctly exceeding ventral facial margin. Arista short to long plumose, hairs at least half width of first flagellomere.

Thorax (Figs. 30-32, 35). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, parts of subscutellum, laterotergite and mediotergite, and sometimes scutellum laterally or ventrally, or small postsutural area on scutum lateral to supra-alar seta. Scutum yellow, with weak or dark brown spot anteromesal to presutural supra-alar seta, and with moderate to dark brown postsutural vitta or oval spot between levels of intra-alar and dorsocentral setae (in *M. lutea* and *M. grossa* sometimes extended to level of acrostichal seta); sometimes with paired postsutural sublateral whitish or clear vitta (usually poorly differentiated from yellow areas, among specimens examined observed only in those dried from alcohol; unpaired medial vitta not observed). Scutellum flat, with sharp angle between disk and sides; setulose on margins and sometimes laterally on disk, but always with broad medial bare area; entirely yellow, including laterally. Pleura entirely yellow. Propleuron without outstanding seta (no setulae more than 1.5 times as long as others). 1 postpronotal, 2 notopleural, 1 presutural and 1 postsutural supra-alar, 1 intra-alar, 1 postalar, 1 acrostichal, 2 scutellar, 1-2 anepisternal, and 1 anepimeral setae well developed. 1 dorsocentral seta, aligned slightly anterior to midway between postsutural supra-alar and intra-alar setae, with intra-alar seta, or between these levels. Medial scapular seta absent. Lateral scapular seta present. Katepisternal seta present or absent. Anepimeron setulose posteroventrally. Katepimeron setulose on at least anterior third.

Legs. Femora without spines or stout setae.

Wing (Figs. 37-41). Basal section of vein Cu and vein Cu_1 nonsetulose dorsally. Vein R_{4+5} densely setulose dorsally to or almost to apex. Crossvein R-M well separated from crossvein DM-Cu, often by distance greater than length of DM-Cu, and not covered by subapical band. Cell bcu with posteroapical lobe approximately 0.67 times as long as broadest width of cell. Wing pattern with most of infuscated areas dark brown; subcostal band from apex of cell bcu at least to vein R_1, usually fused to discal band in pterostigma and/or in cell r_1; discal band



Figs. 33-36. *Molynocoelia grossa*, photos. 33. Head, anterodorsal view (Costa Rica: Res. Biol. A. Brenes, USNM00214050). 34. Same, lateral view. 35. Thorax, dorsal view (Costa Rica: Zurquí, USNM00048539). 36. Male abdomen (Costa Rica: Res. Biol. A. Brenes, USNM00214050).

extended across middle of cell dm, sometimes interrupted (*M. separata*); short radial-medial band separated from discal band (*M. separata*) or connected to it to form Y-shaped mark; subapical band connected to or separated from discal band posteriorly and connected to anteroapical band anteriorly; anteroapical and posteroapical bands well developed. Crossvein R-M covered by radial-medial band or discal band.

Abdomen (Figs. 30-32, 36). Entirely yellow (*M. separata*), or mostly yellow with brown markings on syntergite 1+2 and often on tergite 3 and/or male tergite 5 or female tergite 6. Syntergite 1+2 without outstanding lateral setae. Male terminalia: Lateral surstylus relatively short and blunt (Figs. 42-44). Medial surstylus with medial prensiseta well developed, lateral prensiseta minute or absent. Glans (Figs. 45-46) relatively stout, mostly sclerotized, without basal membranous lobe. Female terminalia: Eversible membrane with ventral group of spicules larger and more extensive than dorsal spicules, extending to dorsolateral side of membrane. Aculeus (Figs. 47-49) very short, 0.4-0.6 mm long, parallel-sided, then tapering rapidly in apical fourth or less to short, slender apex. 2-3 spermathecae (Fig. 50), spherical, with short neck, surface sparsely covered with minute acute spicules.

Key to the species of *Molynocoelia*

1. Discal band complete and connected to radial-medial band, which covers crossvein R-M (Figs. 37-40); abdomen with dark brown markings at least on syntergite 1+2 (Figs. 30-31) ... **2**
-. Discal band interrupted in posterior third of cell dm (Fig. 41); radial-medial band separate from discal band; crossvein R-M covered by discal band; abdomen without brown markings (Fig. 32) (Costa Rica) ..... ***separata*, n. sp.**
2. Abdomen yellow except inverted V-shaped brown mark on syntergite 1+2 (Fig. 31); scutum with brown spot anteromesal to presutural supra-alar seta relatively small and faint; postsutural brown vitta narrow, not extended mesally to level of dorsocentral seta; wing with subapical band broad, hyaline area between it and discal band less than half as broad as subapical band measured along vein M (Fig. 40); arista long plumose, hairs longer than basal width of first flagellomere (Fig. 3) (Brazil: Amapá) ..... ***plumosa*, n. sp.**
-. Abdomen (Figs. 30, 36) with pair of apical sublateral brown spots on syntergite 1+2 and sometimes on tergite 3 and/or male tergite 5 or female tergite 6; scutum (Figs. 30, 35) with brown spot anteromesal to presutural supra-alar seta small to large, usually dark; postsutural brown vitta or spot broad, extended mesally beyond level of dorsocentral seta, often including its base; wing with subapical band narrow, hyaline area between it and discal band at least 1.5 times as broad as subapical band measured along vein M (Figs. 37-39); arista short plumose, hairs approximately half basal width of first flagellomere (Fig. 2) (Mexico to Costa Rica) **3**
3. Gena with distinct brown spot bordering eye (Fig. 34); frons anteriorly with small oval brown spot more than half as wide as ocellar tubercle (Fig. 33); facial carina entirely finely microtrichose; abdomen without brown spots on tergite 3 (Fig. 36) (Costa Rica) .... ***grossa*, n. sp.**
-. Gena without brown spot; frons yellow anteriorly or with minute brown spot less than half as wide as ocellar tubercle; facial carina entirely nonmicrotrichose; abdomen often with pair of apical sublateral brown spots on tergite 3 (Fig. 30) (Mexico to Costa Rica) .... ***lutea* Giglio-Tos**

***Molynocoelia grossa*, n. sp.**
(Figs. 33-37)

Diagnosis

Molynocoelia grossa differs from *M. plumosa* and *M. separata* by all of the following characters: scutal postsutural brown vitta broad, extended mesally beyond level of dorsocentral seta; wing with subapical band narrow, hyaline area between it and discal band at least 1.5 times as broad as subapical band measured along vein M; and abdomen with pair of apical sublateral brown spots on syntergite 1+2. It further differs from *M. plumosa* in lacking dorsal spicules on the eversible membrane and in having the narrow apical part of the aculeus longer. It differs from *M. lutea* in having a brown genal spot, an anterior brown spot on the frons more than half as wide as the ocellar tubercle, the facial carina entirely microtrichose, and by its larger size.

Description

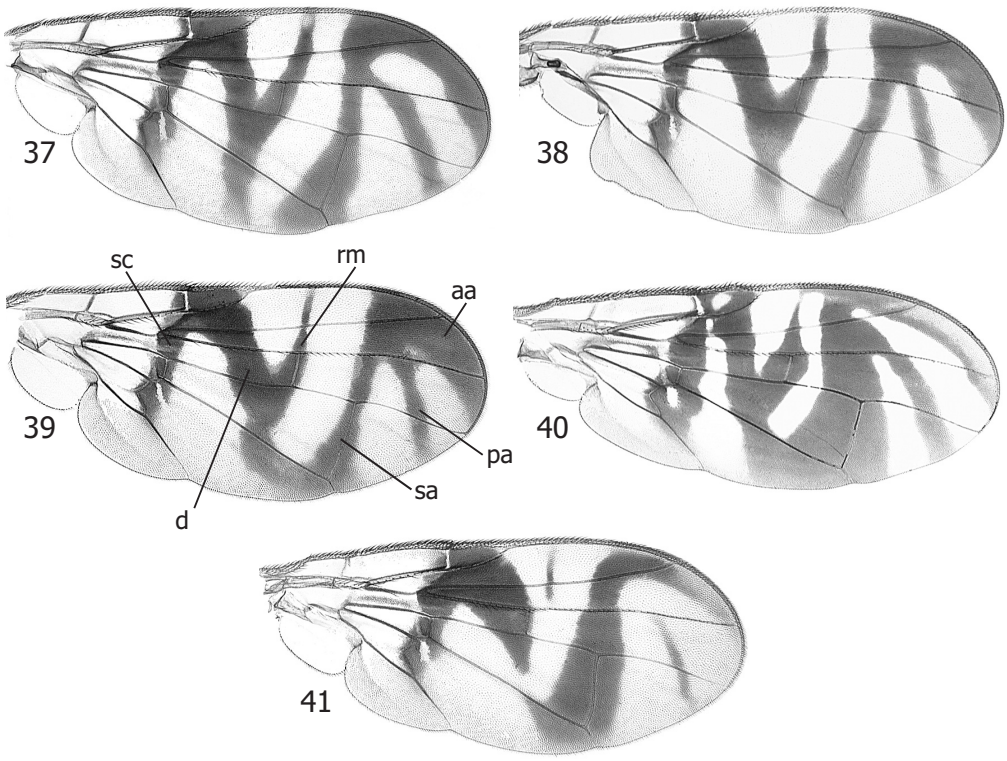
Body length 7.0-8.0 mm. Mesonotum length 2.9-3.5 mm. Wing length 6.7-7.5 mm. Setae dark brown, setulae mostly brown.

Head (Figs. 33-34). Yellow except brown ocellar tubercle, brown spot anteriorly on frons, as long as and more than half as wide as ocellar tubercle, and brown spot on gena bordering eye. Facial carina entirely finely microtrichose. Parafacial moderately broad, half width of first flagellomere. Postocular setae moderately large, distinct, occiput without setulae near postoculars. Antenna yellow except dorsal margin and apex of first flagellomere and most of arista brown; first flagellomere long, 4.4-5.0 times as long as wide, exceeding ventral facial margin; arista short plumose, hairs approximately half as long as basal width of first flagellomere.

Thorax (Fig. 35). Scutum with 2-3 pairs of brown markings: presutural mark anteromesal to presutural supra-alar seta circular or oval, usually large and dark (small and pale in male paratype); postsutural mark broad, extended mesally beyond level of dorsocentral seta, sometimes almost to acrostichal seta, variable in length, extended anteriorly at least to midpoint between levels of postsutural supra-alar and intra-alar setae or at most to midpoint between transverse suture and level of postsutural supra-alar seta, extended posteriorly beyond level of intra-alar seta; sometimes (female paratype) with small, moderate brown, submedial spot, aligned with acrostichal and postsutural supra-alar setae. Subscutellum and mediotergite usually dark brown except narrowly medially (entirely yellow in male paratype). Dorsocentral seta approximately 0.67 distance from level of postsutural supra-alar seta to level of intra-alar seta. One well developed anepisternal seta. Katepisternal seta absent. Anatergite microtrichose on posteroventral 0.2 or less; postsutural lateral margin of scutum bare; scutellum partially microtrichose laterally and sometimes ventrally.

Legs. Mostly yellow. Midtibia sometimes partially pale to moderate brown. Hindtibia moderate to dark brown.

Wing (Fig. 37). With 6 brown bands: Subcostal band narrow; discal band complete, sometimes (holotype) strongly constricted anterior to vein Cu_1; radial-medial band connected to discal band to form Y-shaped mark with apical arm covering crossvein R-M; subapical band narrow, narrowly connected to or separated from discal band on posterior wing margin, hyaline space



Figs. 37-41. Wing, photo. 37. *Molynocoelia grossa* (Costa Rica: Zurquí, USNM00048539). 38. *M. lutea* (Mexico: Montes Azules, USNM00052487). 39. Same (Costa Rica: SE Río San Naranjo, USNM00052495). 40. *M. plumosa* (Brazil: Serra do Navio). 41. *M. separata* (holotype). Abbreviations for wing bands: aa = anteroapical; d = discal; pa = posteroapical; rm = radial-medial; sa = subapical; sc = subcostal.

between them extended across at least anterior 0.75 of cell cu_1 and its width in cell dm more than twice width of subapical band along vein M; anteroapical band entirely dark brown, similar to subapical band in color, hyaline area posterior to it extended almost to vein R_{2+3}; and posteroapical band connected to or narrowly separated from subapical band.

Abdomen (Fig. 36). Yellow, with large paired apical sublateral brown spot on syntergite 1+2; male tergite 5 sometimes with smaller, paler paired sublateral spot. Male terminalia: Epandrium yellow with paired lateral brown spot. Lateral surstylus slightly narrowed apically. Glans moderately large. Female terminalia: Oviscape 1.0 mm long, somewhat funnel-shaped with apical third almost parallel-sided; yellow, basal half pale brown dorsally. Eversible membrane without dorsal spicules (except those from ventral group extending onto dorsolateral side); ventral spicules in inverted V-shaped rows, divided anteriorly, largest medially and laterally. Aculeus 0.55 mm long, mostly parallel-sided, rapidly tapered at distal fourth to slender, triangular, sharply pointed tip. 3 spermathecae.

Egg (based on 4 eggs dissected from abdomen of female paratype). Length 0.55-0.59 mm, width 0.24-0.25 mm. Short, stout, oval, anterior end with distinct nipple-like micropyle near longitudinal axis, posterior end somewhat truncate with one corner much more produced. Chorion reticulate, strongly on anterior end.

Material Examined

Holotype ♂ (INBio; USNM00050134), COSTA RICA: San José: Zurquí de Moravia, 1600 m, Malaise trap, Sep 1995, P. Hanson.

Paratypes: COSTA RICA: Alajuela: Reserva Biológica A. Brenes, San Ramón, 900 m, Malaise trap, Feb-Mar 2000, P. Hanson (1♂; USNM00214050). San José: Zurquí de Moravia, 1600 m, Malaise trap, Apr 1995, P. Hanson (1♀; USNM00048539).

Etymology

The name of this species is an adjective referring to its large size.

Molynocoelia lutea Giglio-Tos

(Figs. 2, 30, 38-39, 42-43, 45, 47-48, 50-54)

Molynocoelia lutea Giglio-Tos, 1893:11, 1895: 60 [additional description and type data]; Foote, 1967: 31 [catalog]; Norrbom *et al*., 1999b: 168 [catalog].

Diagnosis

Molynocoelia lutea differs from *M. plumosa* and *M. separata* by all of the following characters: scutal postsutural brown vitta broad, extended mesally beyond level of dorsocentral seta; subapical band narrow, hyaline area between it and discal band at least 1.5 times as broad as subapical band measured along vein M; and abdomen with pair of apical sublateral brown spots on syntergite 1+2 and often on tergite 3 and/or male tergite 5 or female tergite 6. It further differs from *M. plumosa* in lacking dorsal spicules on the eversible membrane and in having the narrow apical part of the aculeus longer. It differs from *M. grossa* in lacking a brown genal spot, lacking or having a smaller brown spot anteriorly on the frons, completely lacking microtrichia on the facial carina, and by its smaller size.

Description

Body length 5.3-6.8 mm. Mesonotum length 1.8-2.5 mm. Wing length 4.4-5.8 mm. Setae dark brown, setulae yellow to brown.

Head (Fig. 2). Entirely yellow except brown ocellar tubercle and rarely (3 females, Costa Rica: SE Río Naranjo) minute brown spot anteriorly on frons, shorter than and less than half as wide as ocellar tubercle. Facial carina entirely without microtrichia. Parafacial moderately broad, half width of first flagellomere. Postocular setae small to moderate sized, but distinct, occiput without setulae near postoculars. Antenna yellow except dorsal margin and apex of first flagellomere and most of arista brown; first flagellomere moderately long to long, 3.2-4.1 times as long as wide, almost reaching to slightly exceeding ventral facial margin; arista short plumose, hairs approximately half as long as basal width of first flagellomere.

Thorax (Fig. 30). Scutum with 2 pairs of large dark brown markings; presutural mark circular or oval, anteromesal to presutural supra-alar seta; postsutural mark broad, ovoid to subcircular, extended mesally beyond level of dorsocentral seta, sometimes to level of acrostichal seta, highly variable in length, extended anteriorly at least to level of dorsocentral seta or at most to

level of postsutural supra-alar seta, extended posteriorly beyond level of intra-alar seta. Subscutellum entirely yellow. Mediotergite sometimes with narrow sublateral brown vitta. Dorsocentral seta 0.5-0.7 distance from level of postsutural supra-alar seta to level of intra-alar seta. One well developed anepisternal seta. Katepisternal seta usually weak or absent (moderately to well developed in 2 Costa Rican females (Escazú; SE Río Naranjo)). Anatergite without microtrichia on dorsal 0.67 or more; postsutural lateral margin of scutum bare; scutellum usually partially microtrichose laterally and ventrally.

Legs. Yellow except mid- and hindtibiae usually moderate to dark brown.

Wing (Figs. 38-39). With 6 brown bands: Subcostal band narrow; discal band complete; radial-medial band connected to discal band to form Y-shaped mark with apical arm covering crossvein R-M; subapical band narrow, often separated posteriorly from discal band, hyaline space between them usually extended into cell cu_1 and its width in cell dm at least 1.5 times width of subapical band along vein M; anteroapical band entirely dark brown, similar to subapical band in color, hyaline area posterior to it not extended to vein R_{2+3}; and posteroapical band usually connected to subapical band, narrowly separated from it in 2 Mexican males (holotype; Córdoba).

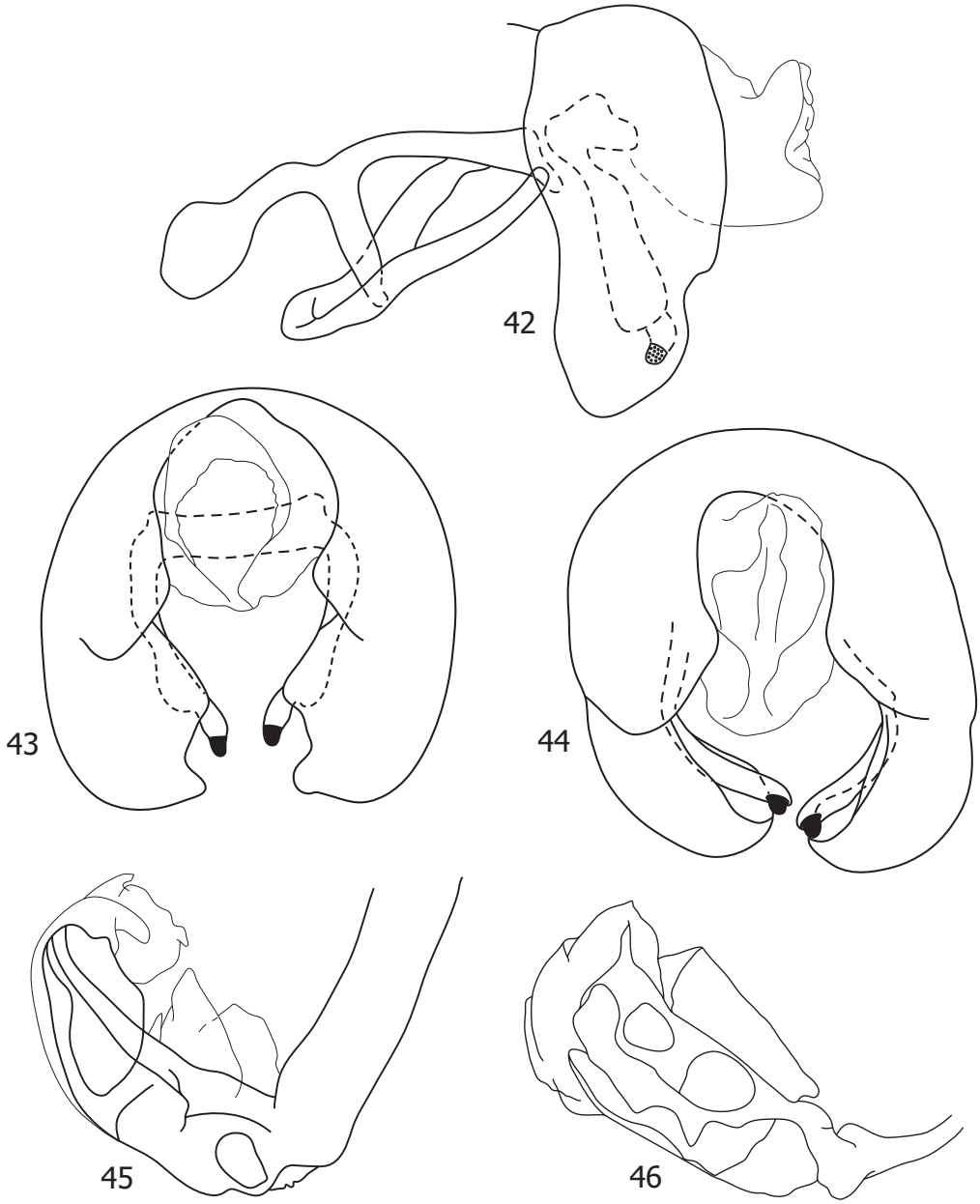
Abdomen (Fig. 30). Yellow, with large paired apical sublateral brown spot on syntergite 1+2, similar, often smaller, paired sublateral brown spots usually on tergite 3 (absent in 3 males and 2 females from Costa Rica) and male tergite 5 (absent in 1 Costa Rican male), and smaller, often paler, paired spot occasionally on female tergite 6. Male terminalia: Epandrium yellow, usually with paired lateral brown spot. Lateral surstylus (Figs. 42-43) slightly narrowed apically. Glans (Fig. 45) moderately large. Female terminalia: Oviscape 0.95-1.10 mm long, somewhat funnel-shaped with apical third almost parallel-sided; yellow, base often brown dorsally. Eversible membrane without dorsal spicules (except those from ventral group extending onto dorsolateral side); ventral spicules in inverted V-shaped rows, divided anteriorly, largest medially and laterally. Aculeus (Figs. 47-48) 0.55-0.60 mm long, mostly parallel-sided, rapidly tapered at distal fourth to slender, triangular, sharply pointed tip. 3 spermathecae (Fig. 50).

Egg (Figs. 51-54) (based on 6 eggs dissected from abdomens of 2 females (Costa Rica: SE Río Naranjo, USNM00052492-3)). Length 0.50-0.52 mm, width 0.19-0.25 mm. Short, stout, oval, anterior end with distinct nipple-like micropyle near longitudinal axis, posterior end somewhat truncate with one corner much more produced. Chorion reticulate, strongly on anterior end.

Material Examined

Holotype ♂ (IMZ), MEXICO: Veracruz: Tuxpango [18°49'N 97°1'W], [1855-56?], A.L.J. Sumichrast. It has some setae broken and has a light covering of dust and debris, but is otherwise in good condition. It bears only the following labels: "106", "1223", "Molynocoelia lutea Giglio-Tos ♂", and "HOLOTYPE ♂ Molynocoelia lutea Giglio-Tos labeled by Norrbom". Giglio-Tos (1893) did not provide type data other than stating that he described the male sex from Mexico (as indicated in publication title), but later (Giglio-Tos, 1895) he said that he had a single male from Tuxpango collected by "Sumichr."

Other specimens: COSTA RICA: Alajuela: Upala, 20 km S, 12 Mar 1991, F.D. Parker (1♀; USU; USNM00052491). Guanacaste: Río Naranjo, 3 km SE, various dates, all months except Nov (most from Dec-Apr), 1991-1993, F.D. Parker (2♂18♀; USU, USNM; USNM00050056, USNM00052494-96, -98-99, USNM00055365, USNM00056039-41,



Figs. 42-46. Male terminalia. 42. *Molynocoelia lutea* (Mexico: Cordoba), epandrium and surstyli, lateral view. 43. Same, posterior view. 44. *M. plumosa* (Brazil: Serra do Navio), epandrium and surstyli, posterior view. 45. *M. lutea* (Mexico: Cordoba), glans. 46. *M. plumosa* (Brazil: Serra do Navio), glans.

USNM00056065, USNM00056395, USNM00056504, USNM00056514, -17-19, -21), (2♂9♀; USNM00052490, -92-93, -97, USNM00052500, -02-3, USNM00055078, USNM00055989, USNM00056004, USNM00056062, USNM00056336, USNM00056456). Limón: Res. Biol. Hitoy Cerere, R. Cerere, Estación Hitoy-Cerere, 100 m, 13 Apr 1992, G. Carballo (1♀; INBio000373731); Reserva Biol. Hitoy Cerere, Valle de la Estrella, 100 m, Malaise trap, 22 Jan-4 Mar 1994, G. Carballo (1♀; INBio0003303758). San José: San Antonio de Escazú, 24-30 Jan 1988, F.D. Parker (1♀; USNM00052489). GUATEMALA: Escuintla: Palín, Granja El Coronel, 14°24'N 90°42'W, 9 Feb 1993, J. López (1♂; USNM00052501). MEXICO: Chiapas: Ocosingo, Chajul, Reserva Montes Azules, 27 Apr-5 May 1986, F. Arias, R. Barba and L. Cervantes (1♀; IEXV; USNM00052487). Veracruz: Córdoba, 20 Jul 1966, J.S. Buckett, M.R. and R.C. Gardner (1♂; UCD; USNM00052488); Xalapa, Jardín Botanico, 1440 m, 10 Jul 1991, V. Hernández-Ortiz, DT-30-645 (1♀; IEXV; USNM00056492).

Molynocoelia plumosa Norrbom, n. sp.

(Figs. 3, 31, 40, 44, 46, 49)

Molynocoelia sp.: Foote, 1980: 35, fig. 81.

Diagnosis

Molynocoelia plumosa differs from the other species of *Molynocoelia* in all of the following characters: arista long plumose, hairs longer than basal width of first flagellomere; dorsocentral seta aligned with intra-alar seta; 2 well developed anepisternal setae; subapical band very broad, hyaline area between it and discal band less than half as broad as subapical band measured along vein M; and abdomen yellow except inverted V-shaped brown mark on syntergite 1+2. *M. plumosa* differs at least from *M. lutea* and *M. grossa* in having the narrow apical part of the aculeus shorter (female of *M. separata* is unknown).

Description

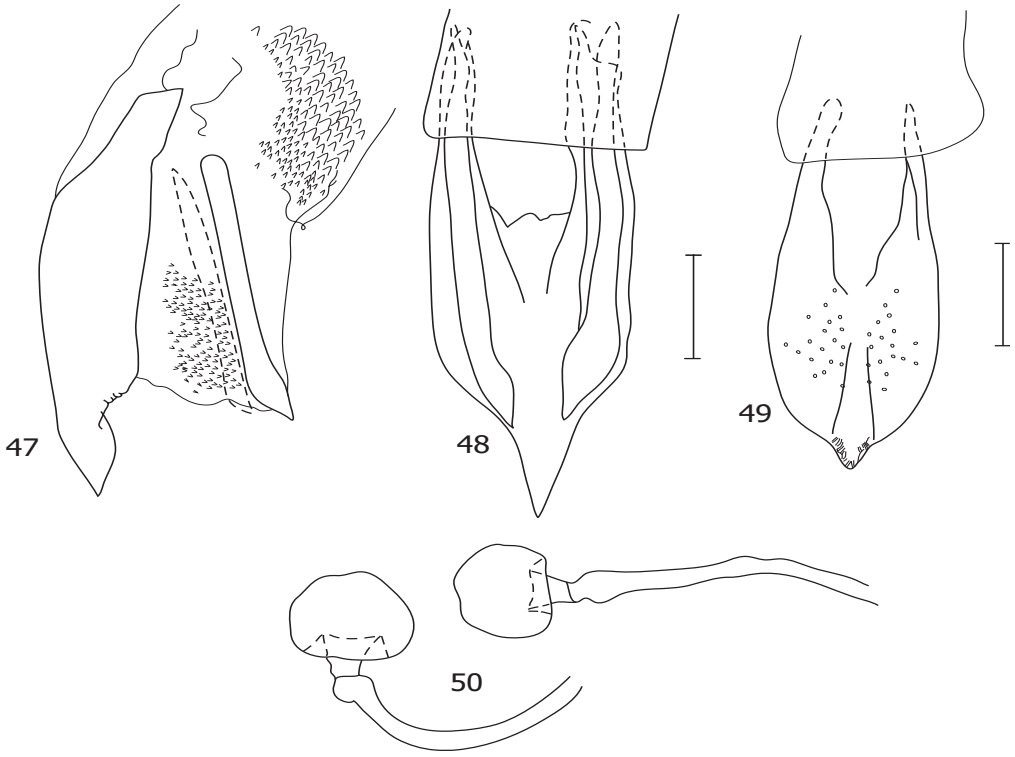
Body length 6.3-6.8 mm. Mesonotum length 2.7-2.8 mm. Wing length 5.7-6.0 mm. Setae dark brown, setulae yellow.

Head (Fig. 3). Frons yellow except brown ocellar tubercle. Facial carina entirely microtrichose. Parafacial moderately broad, 0.6 times width of first flagellomere. Postocular setae small, but distinct, occiput without setulae near postoculars. Antenna yellow except dorsal margin and apex of first flagellomere and most of arista pale brown; first flagellomere long, 6 times as long as wide, exceeding ventral facial margin; arista long plumose, hairs 1.25 times basal width of first flagellomere.

Thorax (Fig. 31). Scutum with small, weak brown spot anteromesal to presutural supra-alar seta; with narrow postsutural brown vitta between levels of dorsocentral and intra-alar setae. Mediotergite with lateral brown vitta. Dorsocentral seta aligned with intra-alar seta. Scutellum more acute apically than in *M. lutea*. 2 well developed anepisternal setae. Katepisternal seta well developed. Anatergite entirely microtrichose; postsutural lateral margin of scutum microtrichose; scutellum entirely bare.

Legs. Entirely yellow.

Wing (Fig. 40). With 6 brown bands: Subcostal band broader posteriorly; discal band complete;



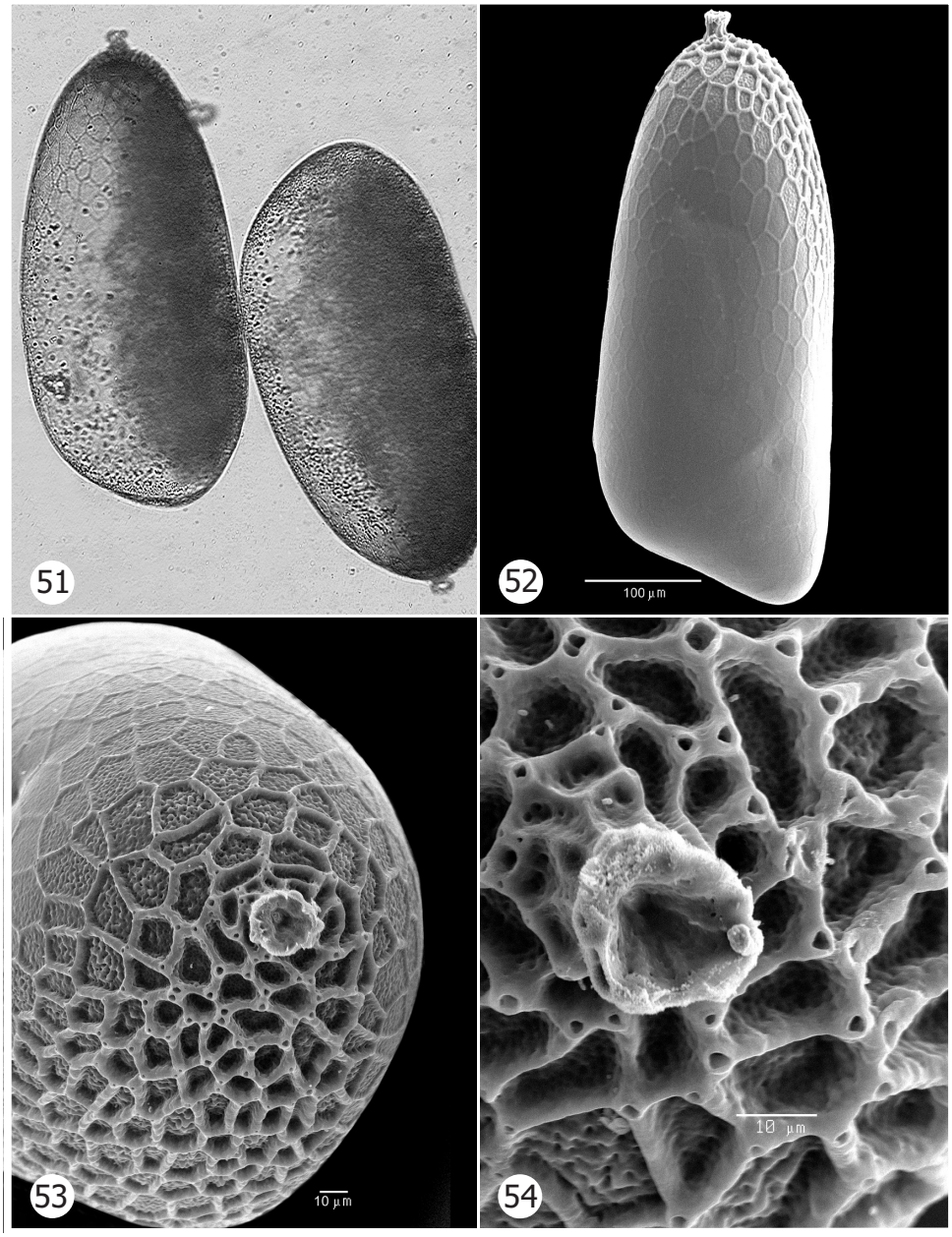
Figs. 47-50. Female terminalia. 47. *Molynocoelia lutea* (Mexico: Montes Azules, USNM00052487), aculeus, lateral view. 48. *M. lutea* (Costa Rica: SE Río Naranjo, USNM00052492), aculeus, dorsal view. 49. *M. plumosa* (Brazil: Serra do Navio), aculeus, dorsal view. 50. *M. lutea* (Mexico: Montes Azules), spermathecae (2 of 3).

radial-medial band connected to discal band to form Y-shaped mark with apical arm covering crossvein R-M; subapical band broad, especially posteriorly, sometimes connected to radial-medial band along costa and/or in cell r_{4+5}, hyaline space between subapical and discal bands not extended into cell cu_1 and its width in cell dm less than half width of subapical band along vein M; anteroapical band partly light brown, lighter than subapical band, hyaline area posterior to it extended anteriorly to or beyond vein R_{2+3}; posteroapical band connected to or narrowly separated from subapical band.

Abdomen (Fig. 31). Yellow except inverted V-shaped brown mark on syntergite 1+2. Male terminalia: Lateral surstylus (Fig. 44) rounded apically. Glans (Fig. 46) large and stout. Female terminalia: Oviscape 1.0 mm long, yellow. Eversible membrane with dorsal spicules in small oval pattern far from base of aculeus, spicules largest medially, almost as large as largest ventral spicules; ventral spicules in inverted V-shaped rows, divided anteriorly, largest medially and laterally. Aculeus (Fig. 49) 0.4 mm long, mostly parallel-sided, rapidly tapered at distal eighth to short, slender, triangular, sharply pointed tip. 2 spermathecae.

Material Examined

Holotype ♀ (USP; USNM00056026), BRAZIL: AMAPÁ: Serra do Navio, 19 Oct 1957, K. Lenko.



Figs. 51-54. Egg, *Molynocoelia lutea* (Costa Rica: SE Río Naranjo, USNM00052492-93). 51. Two eggs, photo. 52. Entire egg, SEM. 53. Chorion sculpture, anterior end, SEM. 54. Micropyle, SEM.

Paratypes: Same data as holotype (1♂; USP; USNM00056027), (1♀; USNM00056028).

Etymology

The name of this species is an adjective referring to its long plumose arista.

***Molynocoelia separata* Norrbom, n. sp.**

(Figs. 32, 41)

Diagnosis

Molynocoelia separata differs from the other species of *Molynocoelia* in all of the following characters: facial carina bare except dorsomedial patch of microtrichia; discal band interrupted in cell dm; radial-medial band separate from discal band; crossvein R-M covered by discal band; and abdomen without brown markings.

Description

Body length 5.7 mm. Mesonotum length 2.3 mm. Wing length 5.1 mm. Setae dark brown, setulae yellow to dark brown.

Head. Frons yellow except small oval brown spot anteriorly and brown ocellar tubercle. Facial carina bare except medial patch of microtrichia on dorsal half. Parafacial moderately broad, 0.55 times width of first flagellomere. Postocular setae small, poorly differentiated from numerous setulae on occiput. Antenna yellow except dorsal margin of first flagellomere and most of arista pale brown; first flagellomere relatively long, 3.8 times as long as wide, almost reaching ventral facial margin; arista short plumose, hairs approximately half as long as basal width of first flagellomere.

Thorax (Fig. 32). Scutum with dark brown oval spot anteromesal to presutural supra-alar seta; with narrow postsutural brown vitta between levels of dorsocentral and intra-alar setae, extended anteriorly almost to transverse suture, and posteriorly almost to level of acrostichal seta. Mediotergite entirely yellow. Dorsocentral seta slightly anterior to midpoint between levels of postsutural supra-alar seta and intra-alar seta. One well developed anepisternal seta. Katepisternal seta well developed. Anatergite without microtrichia on dorsal half; postsutural lateral margin of scutum bare; scutellum partially microtrichose laterally and ventrally.

Legs. Yellow except most of mid- and hindtibiae dark brown.

Wing (Fig. 41). With 6 brown bands: Subcostal band broadly connected to discal band anteriorly; discal band interrupted in posterior third of cell dm, anterior part covering crossvein R-M; radial-medial band slender, separate from discal band, extended from costa into cell r_{2+3}; subapical band moderately broad, hyaline space between it and posterior part of discal band not extended into cell cu_1 and its width in cell dm approximately 0.67 times width of subapical band along vein M; anteroapical band partly pale brown, paler than subapical band, hyaline area posterior to it extended anteriorly almost to vein R_{2+3}; posteroapical band slender, well separated from subapical band.

Abdomen (Fig. 32). Entirely yellow, without brown markings. Male terminalia: Epandrium yellow. Medial surstylus with lateral prensiseta minute. Female terminalia: Unknown.

Material Examined

Holotype ♂ (INBio001275766), COSTA RICA: Heredia: Estación Biológica La Selva, 10°26'N 84°01'W, 50-150 m, Apr 1993, ALAS project.

Etymology

The name of this species is an adjective referring to its separated wing bands.

Pseudophorellia Lima

Pseudophorellia Lima, 1934: 139 (Type species *Pseudophorellia maculata* Lima, by original designation); Aczél, 1950: 249 [catalog]; Foote, 1967: 39 [catalog], 1980: 8 [in key], 44 [review]; Norrbom *et al*., 1999b: 196 [catalog].

Diagnosis

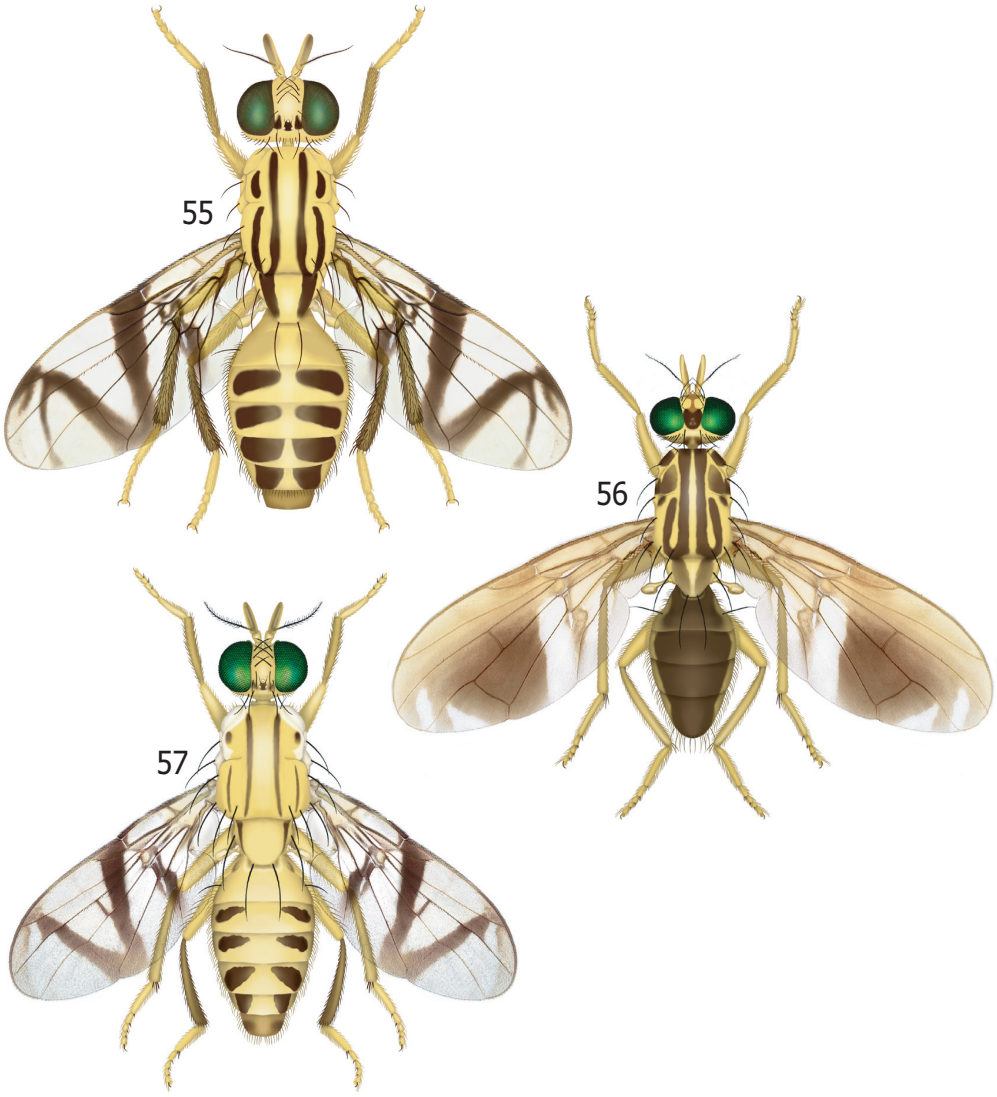
Pseudophorellia differs from other genera of Tephritidae in having a bilobed membranous spiculose basal lobe on the glans (Figs. 102, 107-108), the spermatheca densely covered with broad tubercles (Figs. 123, 125, 127, 148-158), and syntergite 1+2 with one to several "richardiid-like" well differentiated lateral preapical setae (Figs. 55-57, 96-99). The first two characters, to my knowledge, are unique or nearly so; species of *Baryglossa* Bezzi (Blepharoneurinae), from the Afrotropical Region, have two basal membranous lobes on the glans, but they lack minute spicules as in *Pseudophorellia*. Only *Callistomyia* Bezzi and *Alincocallistomyia* Hardy, from the Australasian and Oriental Regions, have similar outstanding setae on syntergite 1+2. Other useful diagnostic characters for *Pseudophorellia* include: ocellar seta minute or absent; arista long pubescent to plumose; thorax mostly bare of microtrichia; medial scapular seta absent; posterior orbital, postpronotal, presutural supra-alar, and/or acrostichal setae often absent; scutellum with 2-3 marginal setae, flat, setulose on margins and medially; wing with transverse bands, usually including a short radial-medial band connected to discal band to form Y-shaped mark, or with broad costal band only; and at least basal section of vein Cu setulose dorsally.

Description

Yellow to orange flies, usually with dark brown markings (Fig. 55-57). Body length 5.5-12.5 mm.

Head (Figs. 4, 55-59). Ocellar seta absent or minute, shorter than length of ocellar tubercle. Usually 3-4 frontal setae (0 in *P. vespiformis*, 1 in *P. tica*, 2 in several other species). 1-2 orbital setae. Arista long pubescent to short plumose, largest hairs 0.15-0.60 times as long as width of first flagellomere.

Thorax (Figs. 55-57, 60-65). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, parts of laterotergite, subscutellum and mediotergite, and sometimes posterior or dorsal areas of anepisternum and anepimeron, narrow postsutural lateral or posterior margins of scutum, and/or laterally or ventrally on scutellum. Scutum dark brown with 3 yellowish vittae (*P. vespiformis*) or yellow, usually with submedial and postsutural sublateral brown vittae; often with presutural sublateral brown spot or vitta; sometimes with paired postsutural sublateral whitish or clear vitta, often poorly differentiated from yellow areas (observed mainly in specimens dried from alcohol among those examined; unpaired medial vitta not observed). Scutellum flat, often with distinct angle between sides and disk; densely setulose on margins and most of disk; disk entirely yellow, with paired lateral brown vitta, or with basomedial brown mark with convex margin; laterally yellow, occasionally with basal brown spot, or entirely pale brown. Propleuron sometimes with 1-2 setulae slightly darker or larger, but none more than 1.5 times as long as others. 0-1 postpronotal, 2 notopleural, 0-1



Figs. 55-57. Habitus, dorsal. 55. *Pseudophorellia anypsilon*, female (Costa Rica: 14 km S Cañas, USNM00052202). 56. *P. confluens*, male (holotype). 57. *P. marginata*, female (Ecuador: Tiputini, USNM00054109).

presutural and 1 postsutural supra-alar, 1 intra-alar, 1 postalar, and 1 anepisternal setae. Usually 2 scutellar setae (3 in *P. distincta*). Usually 1 dorsocentral seta, occasionally minute (*P. vespiformis*) or absent, usually aligned with or near intra-alar seta or in several species more anteriorly, at most midway between supra-alar and intra-alar setae. Acrostichal seta absent, except in *P. acrostichalis* and *P. distincta*. Medial scapular seta absent. Lateral scapular seta

present. Anepimeral seta usually well developed (small or weak in *P. brevilobata* and *P. vespiformis*). Katepisternal seta usually small and hairlike or absent. Anepimeron sometimes setulose posteroventrally. Katepimeron usually with 1 to many setulae.

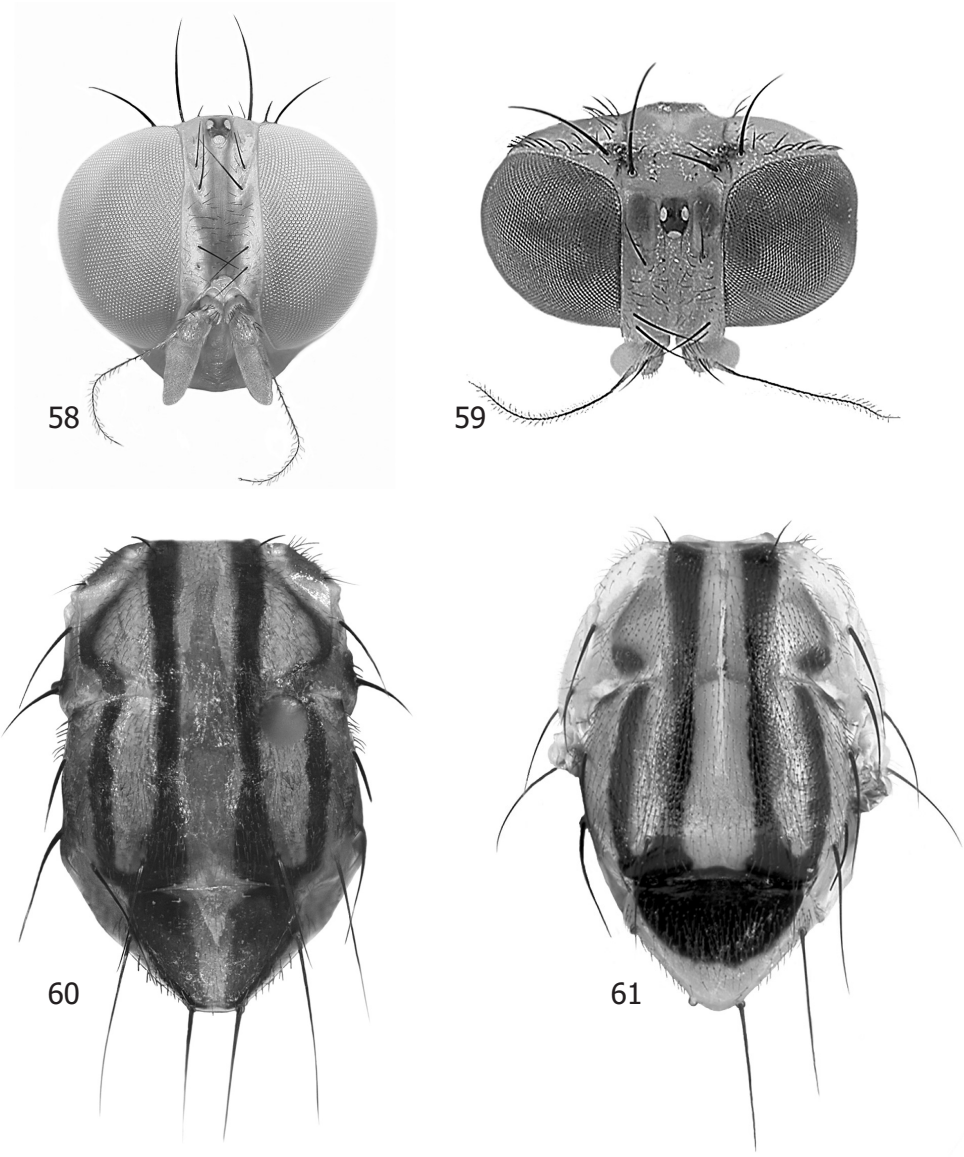
Legs. Male forefemur often with row of ventral setae stout and spinelike. Mid- and hindfemora with anteroventral and posteroventral rows of setae often weakly differentiated, the former setae rarely, the latter sometimes moderately stout, sometimes more so in male. Midfemur with 1-3 well differentiated subapical posterior setae, sometimes part of row of smaller setae.

Wing (Figs. 66-94). Basal section of vein Cu and usually part of vein Cu_1 setulose dorsally. Vein R_{4+5} densely setulose dorsally to beyond level of DM-Cu. Crossvein R-M at 0.58-0.80 distance from crossvein BM-Cu to crossvein DM-Cu, not covered by subapical band (although it and crossvein DM-Cu covered by broad, fused discal and subapical bands in *P. confluens* and *P. hansoni*; Figs. 73, 82-84). Cell bcu with posteroapical lobe half as long to subequal to broadest width of cell. Wing with broad costal band only (*P. tica* and *P. vespiformis*; Figs. 92, 94) or with transverse bands, including: subcostal band from apex of cell c to apex of cell bcu; discal band from pterostigma to posterior margin in cell cu_1; subapical band covering DM-Cu; radial-medial band connected to discal band to form Y-shaped mark (usually absent in *P. anypsilon*; Figs. 68-69), or middle of wing, including crossveins R-M and DM-Cu, covered by broad brown area (presumably fused discal and subapical bands; Figs. 73, 82-84); anteroapical and posteroapical bands usually connected to subapical band.

Abdomen (Figs. 55-57, 95-100). Usually yellow, rarely entirely so, most often with paired sublateral brown spots on two or more tergites, sometimes with brown bands or mostly brown with posterior margin of one or more tergites yellow. Syntergite 1+2 with one to several outstanding lateral subapical setae. Male terminalia: Lateral surstylus moderately long, usually with small hooklike or tablike, posteriorly directed, subapical lobe just proximal to level of prensisetae (Figs. 101, 103-104). Medial surstylus closely associated with lateral surstylus and with 2 well developed prensisetae. Glans (Figs. 102, 107-108) with bilobed basal lobe, membranous with minute spicules; mostly weakly sclerotized; distal half divided into dorsal, large medial, and small ventral lobes. Female terminalia: Eversible membrane (Figs. 109-119) with ventral group of spicules larger and more extensive than dorsal spicules, extending to dorsolateral side of membrane. Aculeus (Figs. 120-122, 124, 126, 128-147) short, 0.60-1.05 mm long; tip trilobed (except in *P. flavida* and *tica*). 3 spermathecae (Figs. 123, 125, 127, 148-158), subspherical to long cylindrical, surface densely covered by broad tubercles.

Key to the species of *Pseudophorellia*

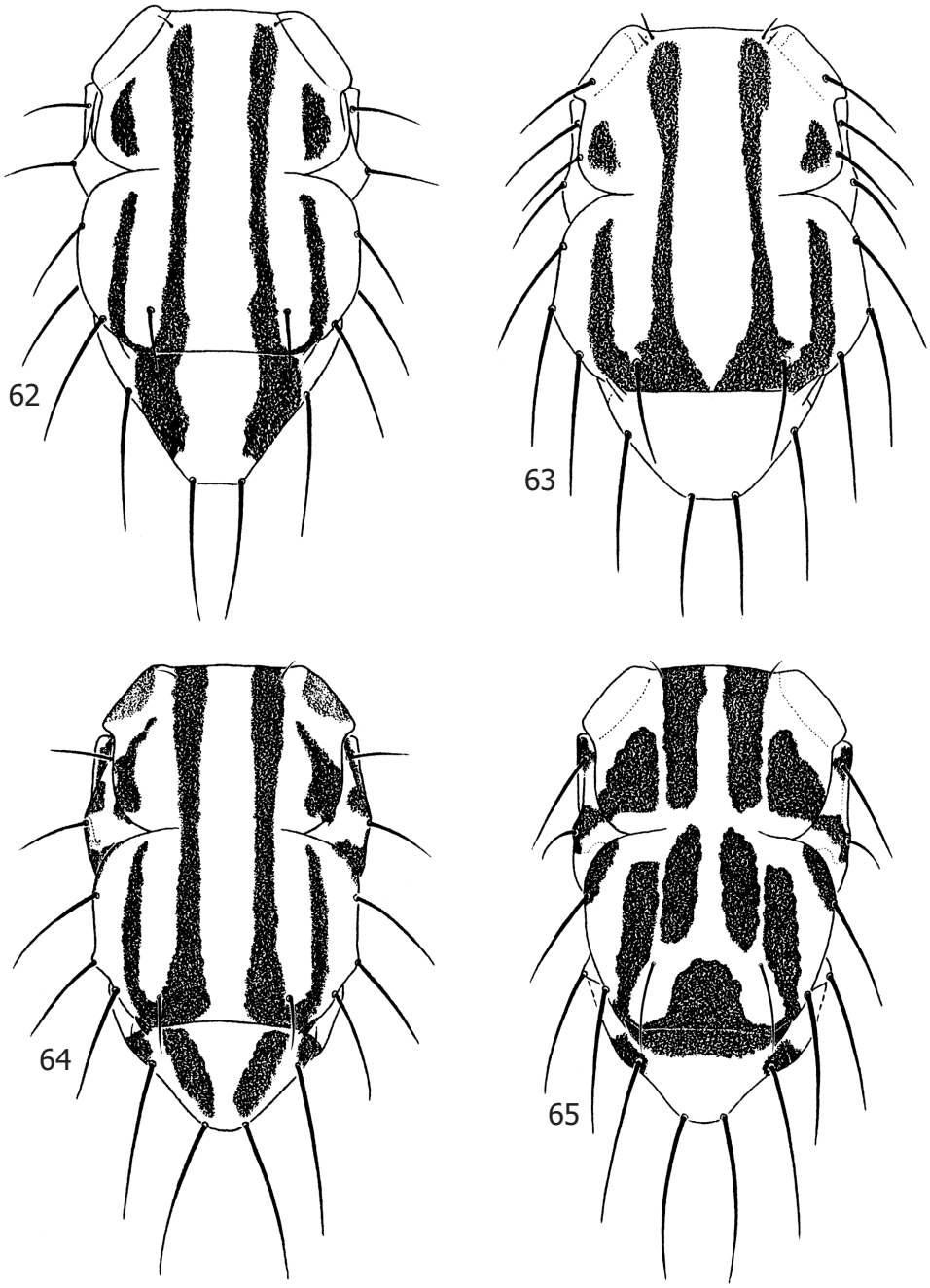
1. Wing (Figs. 92, 94) with only broad costal band, without dark markings posterior to vein M; scutum (Fig. 65) with large dark brown medial mark on posterior margin separated from submedial vittae; abdomen petiolate. **2**
-. Wing (Figs. 66-91, 93) with dark markings or bands extended to posterior margin at apex of cell cu_1; scutum without large posteromedial brown mark, at most with submedial vittae narrowly connected on posterior margin (Figs. 55-57, 60-64); abdomen not petiolate **3**
2. Postpronotal lobe entirely yellow (Fig. 65) or rarely with medial, lateral brown area; cell br with posterior margin hyaline on apical half, not completely covered by costal band (Fig. 92); frons with 1 frontal seta and usually with median brown or dark orange vitta; dorsocentral seta small to well developed (rarely absent), aligned midway to 0.75 distance



Figs. 58-61. Head and thorax, photos. 58. *Pseudophorellia antica* (holotype), head, anterodorsal view. 59. *P. semilunata* (holotype), head, dorsal view. 60. *P. antica* (holotype), thorax, dorsal view. 61. *P. semilunata* (holotype), thorax, dorsal view.

from supra-alar seta to intra-alar seta (Colombia, Costa Rica, French Guiana, Panamá) .... ***tica*, n. sp.**

-. Postpronotal lobe mostly brown; cell br completely covered by costal band, entirely pale brown (Fig. 94); frons without frontal setae and without median vitta; dorsocentral seta minute, aligned with intra-alar seta (Venezuela) ..... ***vespiformis*, n. sp.**

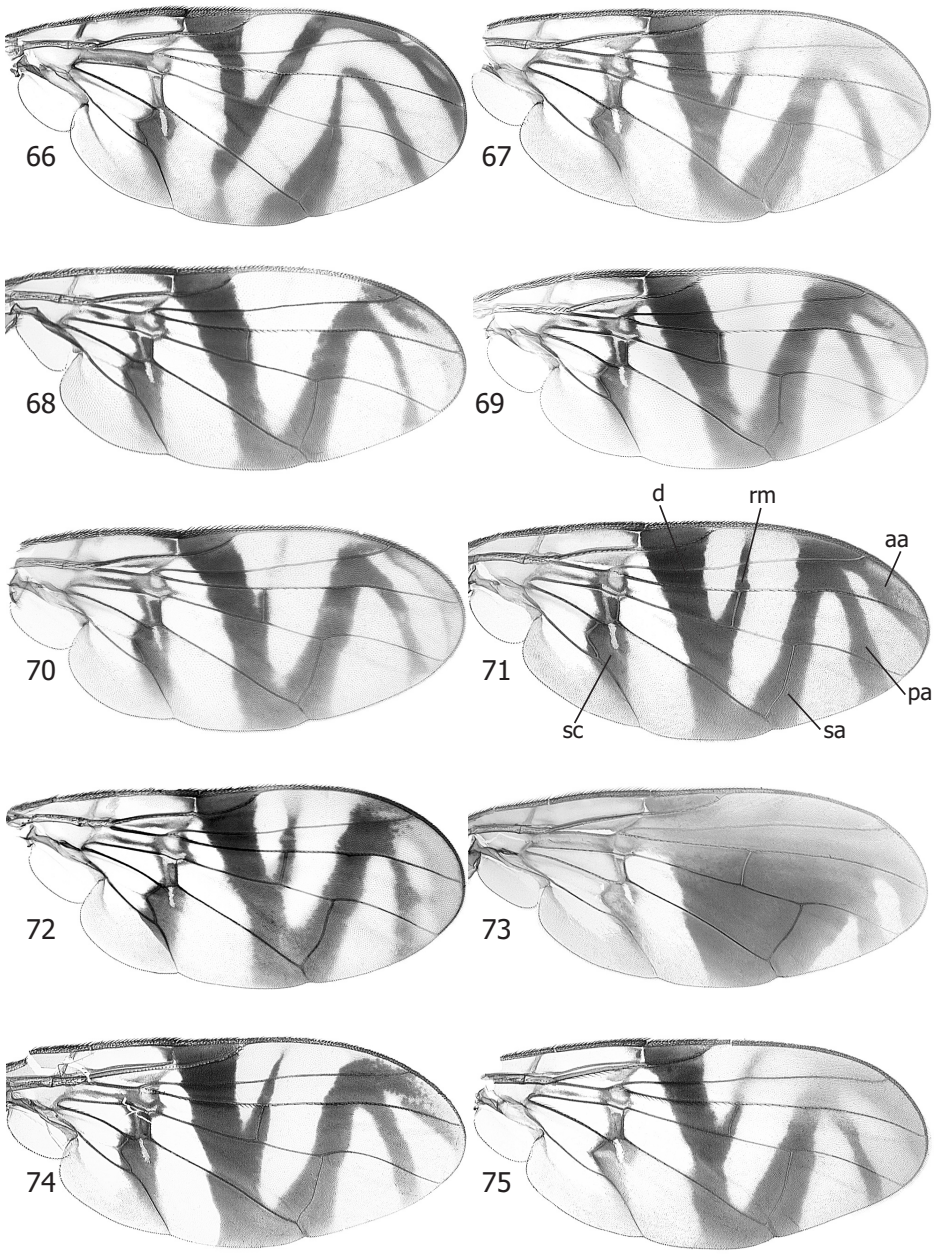


Figs. 62-65. Thorax, dorsal view. 62. *Pseudophorellia anypsilon* (Costa Rica: 14 km S Cañas, USNM00052202). 63. *P. enkerlini* (Mexico: Socunusco, USNM00052193). 64. *P. hansoni* (Costa Rica: Zurquí, USNM00052189). 65. *P. tica* (Costa Rica: 20 km S Upala, USNM00052205).

3. Wing (Figs. 73, 82-84) medially with single broad mark covering both crossveins R-M and DM-Cu; abdomen with broad, uninterrupted brown bands or mostly brown **4**
-. Wing (Figs. 66-72, 74-81, 85-91, 93) with crossvein R-M covered by radial-medial band or discal band; crossvein DM-Cu covered by subapical band; these bands separated at least in most of cells r_{4+5} and dm; abdomen pattern variable, but usually with paired spots on some tergites (Fig. 55, 57, 95, 97, 100), rarely (Figs. 98-99) with uninterrupted bands or mostly brown **5**
4. Wing (Fig. 73) with cell r_1 entirely yellow or pale brown; hyaline mark in middle of cell m not extended into cell r_{4+5}; orbital plate covered by brown mark (Fig. 56); facial carina without brown vitta; postpronotal seta present (Venezuela) ..... ***confluens*, n. sp.**
-. Wing (Figs. 82-84) with 1-2 hyaline spots or a band in middle of cell r_1; hyaline mark in middle of cell m extended into cell r_{4+5}; orbital plate yellow; facial carina with brown vitta on ventral third or more; postpronotal seta usually absent (Costa Rica) ..... ***hansoni*, n. sp.**
5. Wing (Figs. 66-72, 74-77, 79-81, 85-91, 93) with radial-medial band usually distinct from discal band and separate from subapical band anteriorly (rarely absent), if connected, only in cell r_1 or by paler yellow areas; anteroapical and posteroapical bands separated by hyaline area touching apex of vein M (except in *P. fuscoapicata*); scutellum entirely yellow, with paired brown vitta laterally on disk, or rarely with single semicircular brown mark medially (on disk only). **6**
-. Wing (Fig. 78) with discal, radial-medial and subapical bands broadly fused in cells r_1 and r_{2+3} and with anteroapical and posteroapical bands entirely fused, distal half of wing orange brown except for large oval hyaline area in cells r_{4+5} and dm between crossveins R-M and DM-Cu and triangular hyaline area in cell m; scutellum with basal third laterally and most of disk orange brown except for shallow semicircular yellow basomedial area (Panamá) ... . ***fenestrata*, n. sp.**
6. Acrostichal and postocellar setae well developed; radial-medial band and anteroapical band connected along costa by dark brown area, as dark as those bands along crossveins R-M and DM-Cu (Figs. 66, 76); scutellum entirely brown laterally (sometimes faintly), disk yellow ... **7**
-. Acrostichal and postocellar setae absent; radial-medial and anteroapical bands separated along costa or connected by yellow area much paler than those bands along crossveins (Figs. 67-72, 74-75, 77, 79-80, 85-91, 93); scutellum yellow laterally (Figs. 55, 57, 60-63), disk usually with paired brown lateral vitta **8**
7. Subapical band incomplete anteriorly and not connected to anteroapical band (Fig. 66); scutum with complete submedial brown vitta; scutellum with 2 pairs of large marginal setae only; 2 frontal setae (Bolivia) ..... ***acrostichalis*, n. sp.**
-. Subapical band complete anteriorly and connected to anteroapical band (Fig. 76); scutum without submedial brown vitta; scutellum with small medial marginal seta between the normal 2 pairs; 3 frontal setae (Colombia) ..... ***distincta*, n. sp.**
8. Scutum entirely yellow, without dark vittae; radial-medial band broadened anteriorly (Fig. 80); cell r_1 with areas between transverse bands yellow; posterior half of discal band recurved, in line with radial-medial band, ending in basal half of margin of cell cu_1; vein Cu_1 nonsetulose dorsally; aculeus with long slender apex, not trilobed (Fig. 139) (Hispaniola) ..... ***flavida*, n. sp.**
-. Scutum with 2 pairs of dark brown vittae (55, 57, 60-63); radial-medial band not broadened anteriorly (Figs. 67-72, 74-75, 77, 79, 85-91, 93); cell r_1 with areas between transverse

bands hyaline, or if yellow, margins of transverse bands usually diffuse in that cell; posterior half of discal band in line with anterior part extended to pterostigma; vein Cu_1 setulose dorsally on at least basal fifth; aculeus tip trilobed, with at least small lateral lobes (Figs. 121-122, 126, 128-129, 131-133, 135, 137-138, 141-145, 147) **9**

9. Scutellum entirely yellow (Fig. 63); abdomen yellow, with similar paired sublateral brown spots on tergites 3-5 and female tergite 6 (similar to Figs. 55, 57), sometimes also on syntergite 1+2 (*P. maculata*) **10**
-. Scutellum with paired lateral brown vitta on disk on at least basal 0.67 (Figs. 55, 57, 60, 62) or with semicircular basomedial brown mark (Fig. 61); abdomen pattern variable, often with similar paired brown spots (Figs. 55, 57), but sometimes with bands rather than spots on some or all tergites (Fig. 98), or without spots or with dissimilar brown markings on tergites 3, 4 or 5 (Figs. 95, 97, 100) **13**
10. Posterior orbital seta, postpronotal seta, and presutural supra-alar seta present; scutal submedial brown vitta connected posteriorly to sublateral vitta and at least narrowly to opposite submedial vitta (Fig. 63); aculeus tip with lateral lobe more than half as long as medial lobe (Fig. 137) (southern Mexico, Costa Rica) ..... ***enkerlini*, n. sp.**
-. Posterior orbital seta and presutural supra-alar seta absent; postpronotal seta weak or absent; scutal submedial brown vitta connected to or separated from sublateral vitta, but not connected to opposite submedial vitta posteriorly (similar to Figs. 55, 57); aculeus tip with lateral lobe less than 0.25 times as long as medial lobe (Figs. 129, 133, 141) (female unknown in *P. maculata*) **11**
11. Syntergite 1+2 with pair of sublateral brown spots; scutal submedial brown vitta connected posteriorly to sublateral brown vitta (similar to Figs. 55, 62); anepisternum with medial vertical brown band (Brazil: Rio de Janeiro) ..... ***maculata* Lima**
-. Syntergite 1+2 without sublateral brown spots; scutal submedial and sublateral vittae slender, not connected posteriorly (similar to Fig. 57); anepisternum without brown markings **12**
12. Radial-medial band uninterrupted in cell r_{2+3} (Fig. 72); anteroapical and posteroapical bands complete; eversible membrane with most dorsal spicules subequal to ventrolateral spicules, in discrete area, without minute spicules distally (Fig. 110) (Peru) ..... ***brevilobata*, n. sp.**
-. Radial-medial band absent in cell r_{2+3} (Fig. 88); anteroapical and posteroapical bands incomplete, faint, or absent; eversible membrane with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus (Fig. 115) (Brazil: Amazonas) ... ***reducta*, n. sp.**
13. Scutellum with single large semicircular basomedial brown mark (Fig. 61); cells r_1 and r_{2+3} diffuse yellow between transverse bands (Fig. 89); anepisternum without brown markings (Panamá) ..... ***semilunata*, n. sp.**
-. Scutellum with paired lateral brown vitta on disk (Figs. 55, 57, 60); if cells r_1 and r_{2+3} yellow between transverse bands, anepisternum usually with vertical brown band **14**
14. Radial-medial band absent or reduced to narrow mark bordering crossvein R-M and/or spot in cell r_1 (Figs. 68-70, 86); postpronotal seta and presutural supra-alar seta absent; abdomen yellow, with paired sublateral brown spots on tergites 3-5 and female tergite 6 (Fig. 55, 57) **15**
-. Radial-medial band complete, occasionally faint anteriorly (Figs. 67, 74-75, 79, 81, 87, 90-91, 93); postpronotal seta present, except sometimes in *P. quadricincta*, which has complete



Figs. 66-75. Wing, photo. 66. *Pseudophorellia acrostichalis* (Bolivia: Cerro Uchumachi, USNM00056059). 67. *P. antica* (holotype). 68. *P. anypsilon* (Costa Rica: 14 km S Cañas, USNM00052202). 69. Same (Panama: Altos de Pacora, USNM00214692. 70. Same (Colombia: Lebrija, USNM00213693). 71. *P. bipunctata* (holotype). 72. *P. brevilobata* (holotype). 73. *P. confluens* (Venezuela: Rancho Grande, USNM00052484). 74. *P. decora* (holotype). 75. *P. diffusa* (holotype). Abbreviations for wing bands: aa = anteroapical; d = discal; pa = posteroapical; rm = radial-medial; sa = subapical; sc = subcostal.

bands rather than spots on abdominal tergites (Fig. 98); presutural supra-alar seta present or absent **16**

15. Radial-medial band reduced to narrow mark bordering crossvein R-M (Fig. 86); scutellar vitta narrow (Fig. 57); male forefemur with ventral row of setae slender, similar to female (Ecuador) ..... ***marginata*, n. sp.**

-. Radial-medial band usually absent or reduced to narrow mark in cell r_1, base rarely distinct from discal band (Fig. 68-70); scutellar vitta moderately broad (Figs. 55, 62); male forefemur on apical half with 1-2 ventral setae stout, spinelike (Colombia, Costa Rica, Panamá) ..... ***anypsilon*, n. sp.**

16. Anteroapical and posteroapical bands separated by hyaline area extended from apex of vein M at least to vein R_{4+5} (Figs. 67, 71, 74-75). **17**

-. Anteroapical and posteroapical bands entirely fused, wing without subapical hyaline area touching apex of vein M (Fig. 81) (Panamá). ..... ***fuscoapicata*, n. sp.**

17. Anepisternum with vertical brown band; occiput often with paired brown spot or vitta ventral to vertical setae or on margin of median and lateral occipital sclerites; cells r_1 and r_{2+3} with diffuse yellow areas, often fading posteriorly, obscuring borders of transverse bands (Figs. 67, 75, 87); postpronotal lobe sometimes partly or mostly brown; syntergite 1+2 often with brown band or pair of spots **18**

-. Anepisternum and occiput without brown markings; cells r_1 and r_{2+3} with 2 transverse hyaline areas clearly delimiting borders of transverse bands (Figs. 71, 74, 79, 90-91, 93); postpronotal lobe and syntergite 1+2 without brown markings **20**

18. One orbital seta; syntergite 1+2 yellow, tergites 3 and 4 with moderate sized brown submedial spots, their lateral margins much more medial than those of large brown markings covering most of tergites 5 and 6 (Fig. 97) (Costa Rica) ..... ***diffusa*, n. sp.**

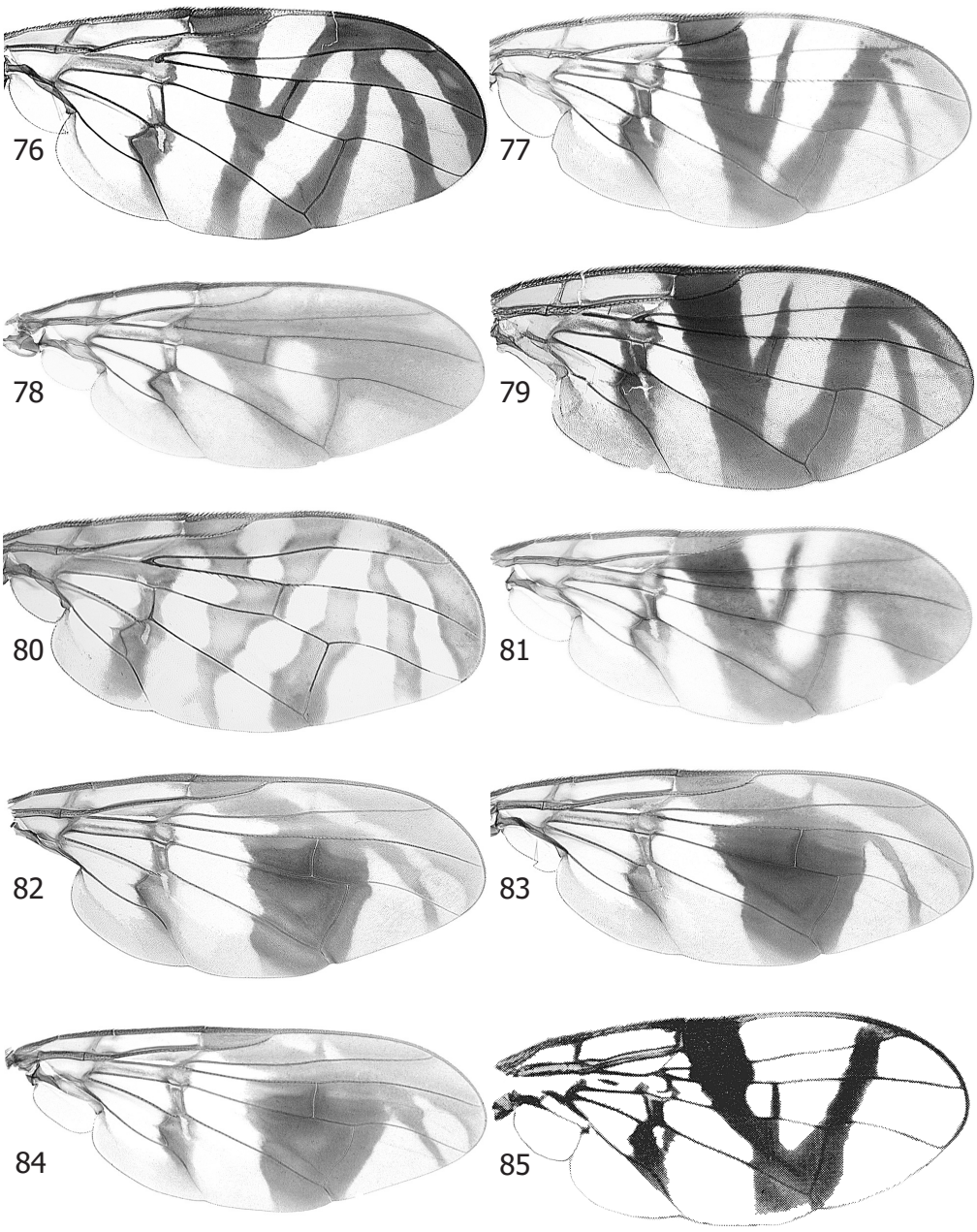
-. Two orbital setae; syntergite 1+2 with brown band (Fig. 98) or pair of spots, tergites 3 and 4 with bands or with large brown spots similar in size and more or less aligned with those on tergite 5 ..... **19**

19. Orbital setae both well anterior to anterior ocellus (Fig. 58), distance between posterior seta and anterior ocellus about 0.8 distance between orbital setae; postpronotal lobe largely brown, postpronotal seta weak but present (Fig. 60); presutural sublateral vitta sinuous; vertical brown band on anepisternum aligned with posterior notopleural seta; syntergite 1+2 and tergites 3-5 each with pair of large brown spots; orbital plate without brown spot (Costa Rica) ..... ***antica*, n. sp.**

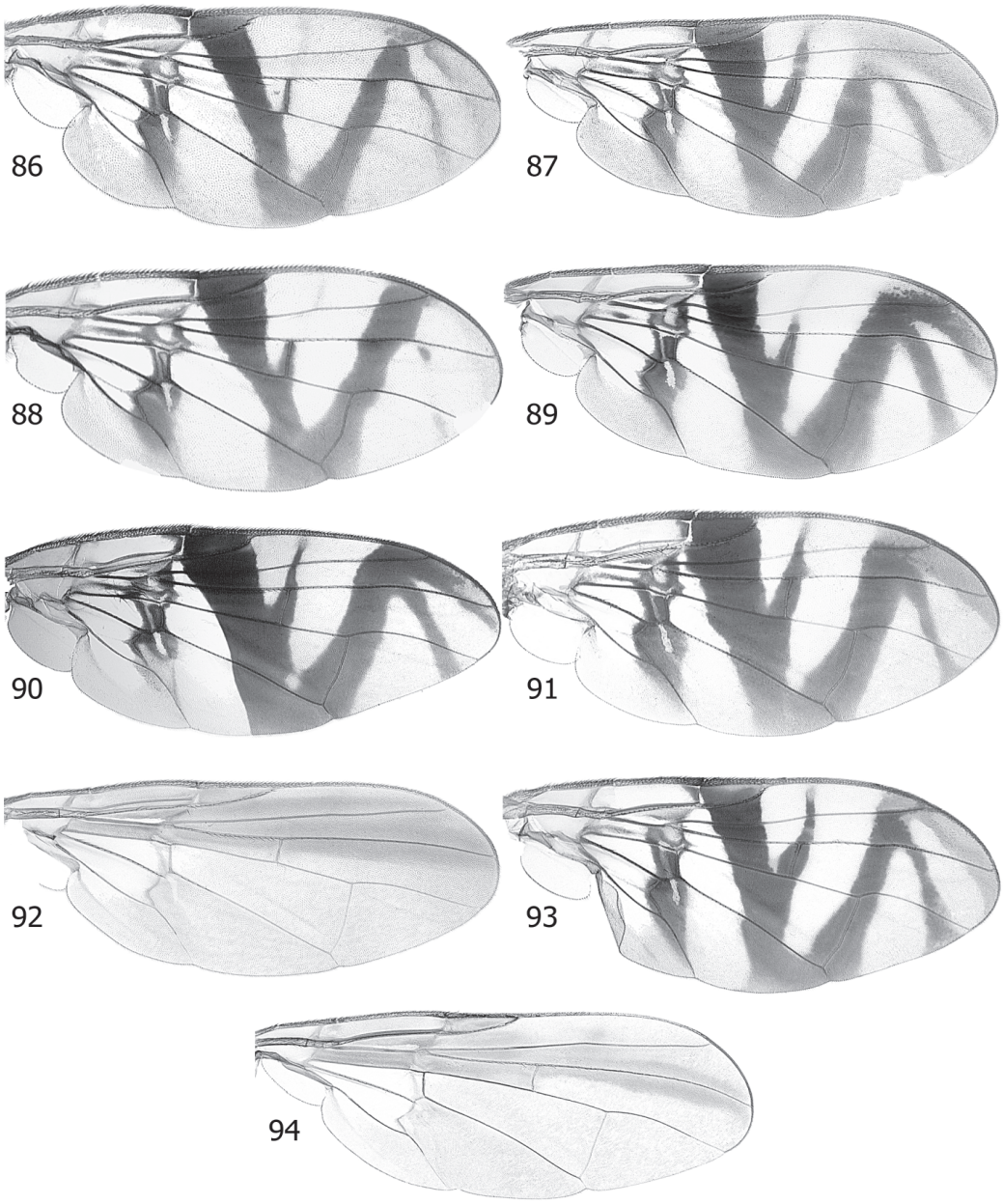
-. Posterior orbital seta posterior to anterior ocellus; postpronotal lobe yellow, postpronotal seta absent; presutural sublateral vitta nearly straight; vertical brown band on anepisternum aligned slightly posterior to anterior notopleural seta; syntergite 1+2 and tergites 3-5 each with uninterrupted medial band (Fig. 98); orbital plate with brown spot (Costa Rica, Panamá) ..... ***quadricincta*, n. sp.**

20. Scutellum with brown vitta short, extended less than 0.67 distance to apex of scutellum; aculeus very slender, tip with lateral lobe minute (Fig. 145) or projecting slightly more dorsally than medial lobe (Fig. 121), without small tooth on medial side. **21**

-. Scutellum with brown vitta longer, extended at least 0.67 distance to apex (similar to Fig. 62); aculeus broader, tip with lateral lobe well developed and in same plane as medial lobe (Fig. 135, 138, 144, 147), lateral lobe sometimes with small tooth on medial side (Figs. 135, 147) **22**



Figs. 76-85. Wing, photo. 76. *P. distincta* (holotype). 77. *Pseudophorellia enkerlini* (Mexico: Mazapa de Madera, USNM00052195). 78. *P. fenestrata* (holotype). 79. *P. flavicauda* (holotype). 80. *P. flavida* (holotype). 81. *P. fuscoapicata* (holotype). 82. *P. hansoni* (Costa Rica: Zurquí, USNM00052190). 83. Same (Buenos Aires, INBIO0003307603). 84. Same (Tierras Morenas, INBIO0003303683). 85. *P. maculata* (holotype, copied from Lima 1953, Fig. 4).



Figs. 86-94. Wing, photo. 86. *P. marginata* (holotype). 87. *P. quadricincta* (Costa Rica: Estación Pitilla). 88. *P. reducta* (Brazil: R. Campina, USNM00052215). 89. *Pseudophorellia semilunata* (holotype). 90. *P. setosa* (holotype). 91. *P. stonei* (holotype). 92. *P. tica* (Costa Rica: 20 km S Upala, USNM00052204). 93. *P. tristeza* (holotype). 94. *P. vespiformis* (holotype).

21. Brown spots on tergite 5 and female tergite 6 large and dark; orbital plate with brown spot; aculeus tip with lateral lobe minute (Fig. 145); eversible membrane with dorsal spicules gradually becoming minute distally, extending almost to aculeus (Panamá) ... ***stonei* Lima**
-. Brown spot on tergite 5 pale and diffuse; brown spot on tergite 6 small, circular, and dark (Fig. 95); orbital plate yellow; aculeus tip with lateral lobe almost 0.33 times as long as medial lobe (Fig. 121); eversible membrane with dorsal spicules nearly equal in size, arranged in smaller oval pattern (Fig. 109) (Ecuador) ..... ***bipunctata*, n. sp.**
22. One orbital seta; katepisternal seta weak or absent; aculeus tip with small tooth on mesal side of lateral lobe (Figs. 135, 147) **23**
-. Two orbital setae; katepisternal seta moderately well developed; aculeus tip without tooth on lateral lobe (Fig. 138, 144) **24**
23. Presutural supra-alar seta present; tergite 3 without pair of brown spots, and spots on tergite 4 small and weak (Costa Rica) ..... ***decora*, n. sp.**
-. Presutural supra-alar seta absent; tergites 3 and 4 each with pair of large dark brown spots (Fig. 100) (Suriname) ..... ***tristeza*, n. sp.**
24. Abdomen entirely yellow; orbital plate with brown spot (Colombia) ..... ***flavicauda*, n. sp.**
-. Abdominal tergite 5 and female tergite 6 each with pair of large dark brown spots; orbital plate yellow (Costa Rica) ..... ***setosa*, n. sp.**

Pseudophorellia acrostichalis Norrbom, n. sp.

(Figs. 66, 108, 120, 148)

Diagnosis

Pseudophorellia acrostichalis differs from all other species of *Pseudophorellia* in having the dorsocentral seta in the middle of the submedial scutal vitta (in other species it is on a yellow area or is barely included in the lateral side of the submedial vitta if the latter is broad). It differs from other species except *P. distincta* in having the scutellum brown laterally and in having acrostichal and postocellar setae. These two species also have the radial-medial and anteroapical bands connected at the anterior wing margin and have more extensive microtrichial patterns on the thorax than in other species. In addition to having a complete submedial scutal vitta, *P. acrostichalis* differs further from *P. distincta* in having the subapical band incomplete anteriorly and not connected to the anteroapical band, and in having only 2 frontal and 2 scutellar setae.

Description

Body length 7.0-8.5 mm. Mesonotum length 2.6-3.5 mm. Wing length 7.3-9.2 mm. Setae dark brown, setulae brown to dark brown.

Head. Yellow except ocellar tubercle brown and narrow, weak to moderate brown, vitta on margin of median and lateral occipital sclerites. Face entirely microtrichose. Frons with 2 frontal setae and 2 orbital setae. Ocellar seta absent. Postocellar seta well developed. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere relatively short, twice as long as wide, not reaching ventral facial margin; arista long pubescent, hairs 0.20-0.25 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of

anepisternum, notopleuron, postsutural scutum lateral to supra-alar seta and along posterior margin (posterior to level of acrostichal seta), most of scutellum laterally and ventrally and basolaterally on disk, small posterodorsal and sometimes posteromedial areas on anepisternum, dorsal margin of anepimeron, most or all of katatergite, all of anatergite, mediotergite except medial third, all of subscutellum, anteriorly on meron, and on metapleuron. Yellow to orange, with following dark brown markings: complete submedial scutal vitta, covering dorsocentral seta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta, sometimes (male Cerro Uchumachi paratype) paler than submedial vitta, extending anteriorly half way to transverse suture or nearly to suture; sometimes (holotype) narrow lateral vitta connected to anterior end of submedial vitta, running along lateral margin of scutum to presutural supra-alar seta; ovoid spot on margin of notopleuron and scutum posteroventral to presutural supra-alar seta; sometimes (3 of 5 specimens) small spot, sometimes faint, between posterior notopleural seta and postsutural supra-alar seta near posterior margin of transverse suture; scutellum laterally, from base to apical seta, although sometimes becoming paler apically, also including basal seta; and lateral vitta on subscutellum and mediotergite. Propleuron with 1-2 setulae slightly stronger and darker than others. Medial scapular seta absent. Postpronotal, lateral scapular, 2 notopleural, presutural and postsutural supra-alar, acrostichal, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, anepimeral, and katepisternal setae well developed. Dorsocentral seta well developed, at 0.4-0.6 of distance from level of postsutural supra-alar seta to level of intra-alar seta. Anepimeron without setulae posteroventrally. Katepimeron and/or dorsal margin of meron with 1 to several setulae.

Legs. Male forefemur with ventral row of setae slightly to distinctly more stout than in female, sometimes spinelike. Male mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated.

Wing (Fig. 66). With 6 dark brown bands. Cell bc yellow; cell c yellow, anterior margin brown; basal half of cell br mostly brown or yellow with streaks of brown; area bordering base of vein Cu yellow to subhyaline. Subcostal band present, but anterior half intermittently yellow. Discal and radial-medial bands connected to form Y-shaped mark with slightly narrower distal branch covering crossvein R-M. Discal band reaching posterior wing margin in middle of cell cu_1. Subapical band usually connected to discal band posteriorly (separated from it in male Cerro Uchumachi paratype), ended at or slightly anterior to vein R_{4+5} anteriorly, separated from anteroapical band, but connected to posteroapical band. Anteroapical band connected to radial-medial band in cell r_1, almost entirely dark brown; posteroapical band 0.55-0.67 times as broad as anteroapical band and not narrowed or expanded distally. Vein R_{4+5} densely setulose to apex dorsally. Basal section of vein Cu and basal third of vein Cu_1 setulose dorsally.

Abdomen. Yellow to orange, syntergite 1+2 and tergites 3-5 with pale to dark brown, sublateral marks forming broad vitta, mesal margins often diffuse. Syntergite 1+2 with elongate preapical lateral seta, but also with long apical lateral seta, and other tergites with several long lateral setae so that seta on syntergite 1+2 not as distinctive as in other species. Male terminalia: Epandrium yellow. Lateral surstylus with triangular subapical lobe, slightly shorter than wide. Glans (Fig. 108) membranous except long flat ventrobasal plate, dorsoapical margin of dorsal lobe, and sclerites at junction of dorsal and medial lobes and along dorsal margin of medial lobe; ventral lobe small.

Female terminalia: Oviscape orange, 1.1 mm long. Eversible membrane with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, decreasing to minute distally and extending almost to base of aculeus. Ventral spicules in V-shaped rows, medial rows and especially lateral most spicules largest. Aculeus 0.6 mm long, stout, slightly tapering; apex (Fig. 120) trilobed, medial lobe large, lateral lobe less than 0.2 times as long as medial lobe, slightly laterally directed. Spermatheca (Fig. 148) long cylindrical.

Material Examined

Holotype ♂ (CBF; USNM00056108), BOLIVIA: La Paz: Nor Yungas, above Coroico, Cerro Uchumachi, summit, GPS 16°12'43"S 67°42'49"W, primary forest, 16 Apr 2001, A.L. Norrbom and G.A. Kung.

Paratypes: Same locality as holotype, 6 Apr 2001, A.L. Norrbom (1♂1♀; USNM00056059-60). BOLIVIA: La Paz: N of Caranavi, Cumbre Alto Beni, 15°40'19"S 67°29'35"W, Malaise traps, 7-15 Apr 2004, S.D. Gaimari & M. Hauser (1♂1♀; CDFA USNM00213272-73).

Comments

The aculeus of the USNM female paratype was partially everted after mounting (Fig. 120), but apparently it was damaged in that process, as its tip was lost during dissection of the abdomen to examine the spermathecae.

Etymology

The name of this species is an adjective referring to the presence of acrostichal setae.

Pseudophorellia antica Norrbom, n. sp.

(Figs. 58, 60, 67)

Diagnosis

Pseudophorellia antica differs from all other species of *Pseudophorellia* in having 2 orbital setae that are both well anterior to the anterior ocellus. It resembles *P. fuscoapicata*, *P. diffusa* and *P. quadricincta* in having the anepisternum with a vertical brown band and the discal and subapical bands complete and separate except posteriorly. *Pseudophorellia antica* further resembles the latter two species in having the normally hyaline areas in cells r_1 and r_{2+3} yellowish, with the margins of the transverse bands less distinct in these cells, but differs in having a brown spot on the anepimeron, having the postpronotal lobe mostly brown, the presutural sublateral vitta strongly sinuous, and the anepisternal band aligned with the posterior notopleural seta. *Pseudophorellia fuscoapicata* also differs from *P. antica* by these characters, except for having a brown anepimeral spot, and further differs in having fused anteroapical and posteroapical wing bands.

Description

Body length 7.0 mm. Mesonotum length 3.35 mm. Wing length 8.20 mm. Setae dark brown, setulae yellow to brown.

Head (Fig. 58). Yellow except brown ocellar tubercle, orange brown, somewhat arrowhead-shaped medial vitta on frons, extended from ocellar tubercle to anterior margin, and small brown spot on occiput touching but mostly ventral to vertical setae. Orbital plate yellow. Face with antennal groove microtrichose; carina bare except dorsal margin. Frons with 2 frontal setae and 2 orbital setae, both orbital setae well anterior to anterior ocellus, distance from posterior seta to level of anterior margin of anterior ocellus about 0.8 distance between orbital setae.

Ocellar seta and postocellar seta absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 3 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs 0.33 times as long as basal width of first flagellomere.

Thorax (Fig. 60). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, part of scutellum ventrally, most of subscutellum, lateral margin of mediotergite, posteroventral half of anatergite, anterodorsal and posteroventral areas of katatergite, and much of metapleuron. Yellow, with following dark brown markings or areas: most of postpronotal lobe; complete submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; sinuous, complete, presutural sublateral vitta, anterior part curved to lateral margin of scutum, posterior end connected to postsutural vitta; slender transverse spot between posterior notopleural seta and postsutural supra-alar seta along posterior margin of transverse suture; lateral 0.4 of disk of scutellum (brown mark approximately twice as broad as medial yellow area), extended to apical seta and barely touching basal seta, not connected medially; subscutellum and mediotergite except narrowly medially; broad vertical band across middle of anepisternum aligned with posterior notopleural seta, connected to spot on posterior half of notopleuron, including posterior seta, but not connected to sublateral vitta on scutum; and weaker central spot on anepimeron. Propleuron with 1-2 setulae slightly stronger and darker than others. Medial scapular, presutural supra-alar, and acrostichal setae absent. Postpronotal seta weak. Dorsocentral seta moderately well developed, aligned slightly anterior to intra-alar seta. Katepisternal seta absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron with 0-1 setulae posteroventrally. Katepimeron with several setulae dorsally.

Legs. Male forefemur with ventral row of setae small and weak, barely differentiated from setulae. Mid- and hindfemora with anteroventral and posteroventral rows of setae poorly differentiated.

Wing (Fig. 67). With 6 dark brown or yellow bands. Areas of cells r_1 and r_{2+3} between discal, radial-medial and subapical bands slightly diffuse yellow, obscuring borders of radial-medial, subapical, and anteroapical bands, which fade to yellow anteriorly (anteroapical band entirely yellow). Cell bc, base and anterior margin of cell c, and base of cell br yellow; basal half of cell br with brown medial streak. Subcostal band interrupted in cell c, yellow in cell sc and parts of cells r_1 and br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly, yellow in cell r_1 and most of cell r_{2+3}. Subapical band broadly connected to discal band in cell cu_1, and fading to yellow in cells r_1 and r_{2+3} where connected to anteroapical and posteroapical bands. Anteroapical band entirely yellow; posteroapical band brown, less than half as broad as anteroapical band, not expanded distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal third of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired broad sublateral dark brown spots on syntergite 1+2 and tergites 3-5, relatively narrowly separated medially, especially on male tergite 5 which is almost entirely dark brown. Syntergite 1+2 with 1 well differentiated, preapical lateral seta. Male terminalia: Epandrium yellow. Lateral surstylus with triangular subapical lobe. Glans not examined. Female terminalia: unknown.

Material Examined

Holotype ♂ (INBio0003307035), COSTA RICA: Cartago: Refugio Nacional de Fauna Silvestre Tapantí, Quebrada Segunda, 1150 m, Malaise trap, Nov 1994, G. Mora.

Comments

The holotype, which was first preserved in alcohol, appears to be slightly teneral, but its color patterns are well developed.

Etymology

The name of this species is an adjective meaning in front, referring to the relatively anterior position of the orbital setae, which are well in front of the anterior ocellus.

***Pseudophorellia anypsilon* Norrbom, n. sp.**

(Figs. 55, 62, 68-70, 132, 149, 159)

Diagnosis

Pseudophorellia anypsilon is the only species of *Pseudophorellia* with the discal and subapical bands well developed and connected only posteriorly that has crossvein R-M covered by the discal band or less commonly by the barely differentiated base of the radial-medial band (Figs. 68-70).

Description

Body length 5.5-7.0 mm. Mesonotum length 2.45-3.10 mm. Wing length 4.6-6.0 mm. Setae dark brown, setulae yellow to brown.

Head (Fig. 55). Yellow except brown ocellar tubercle and brown spot on orbital plate, often connected posteriorly. Face mostly microtrichose, with small ventral bare area on carina. Frons with 3 frontal setae (4 in 1 female; posterior seta weak in Colombian female) and usually 2 orbital setae (1 in 2 specimens). Ocellar seta weak, approximately as long as ocellar tubercle. Postocellar seta absent. Parafacial narrow. Antenna yellow except dorsal margin of first flagellomere and most of arista brown; first flagellomere moderately long, 2.50-3.33 times as long as wide, almost reaching ventral facial margin; arista long pubescent, hairs 0.25-0.33 times as long as basal width of first flagellomere.

Thorax (Figs. 55, 62). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, subscutellum, narrow lateral margin of mediotergite, at least ventral and posterior half of anatergite, posteroventrally on katatergite, and on metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected to submedial vitta posteriorly; slightly curved presutural sublateral vitta; large lateral vitta on disk of scutellum, extended to or almost to apex; subscutellum except narrowly medially; and all of mediotergite except sometimes narrowly dorsomedially. Pleuron entirely yellow. Propleuron with setulae subequal or with 1-2 setulae stronger but at most 1.5 times longer than others. Medial scapular, presutural supra-alar, and acrostichal setae absent. Postpronotal seta usually absent, weak in 3 specimens. Dorsocentral seta well developed, aligned slightly anterior to intra-alar seta. Katepisternal seta weak. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron with several or more setulae posteroventrally. Katepimeron with 1 to several setulae anteriorly and/or dorsally.

Legs. Male forefemur with 1-2 short, stout spinelike ventral setae on distal half, much stronger than in female. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated.

Wing (Figs. 68-70). With 5-6 dark brown or yellow bands. Cell bc, base and anterior margin of cell c, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow in cells c and sc. Radial-medial band absent or reduced to narrow yellow mark across cell r_1 or rarely (Colombian female and 2 Panamanian specimens) with base barely differentiated from discal band. Crossvein R-M covered by discal band or base of radial-medial band. Subapical band broadly connected to discal band in cell cu_1 and often cell dm, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band with posterior 0.5-0.7 yellow; posteroapical band half as broad to nearly as broad as anteroapical band, distal half sometimes paler, apex slightly expanded. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal 0.55-0.70 of vein Cu_1 setulose dorsally.

Abdomen (Fig. 55). Yellow, with paired, large, broad, dark brown spots on tergites 3-5 in male and tergites 3-6 in female; all similar in size and aligned, those on tergite 5 slightly longer in female, considerably longer in male. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Epandrium yellow. Lateral surstylus with relatively large and broad subapical lobe, hooklike proximally, rounded distally. Glans membranous except long flat ventrobasal plate, dorsal and apical margins of dorsal lobe, and sclerites at junction of dorsal and medial lobes. Female terminalia: Oviscape 0.65-0.85 mm long, mostly yellow, dorsally apical 0.25-0.40 brown, broader medially, ventrally with similar brown area but extreme apex yellow medially. Eversible membrane with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus; ventral spicules in V-shaped rows, mostly similar in size. Aculeus (Fig. 132) 0.52-0.60 mm long, slender, rapidly tapered on basal half and then nearly parallel-sided; apex trilobed, lateral lobe approximately half as long as medial lobe, acute, posteriorly directed. Spermatheca (Fig. 149) short cylindrical to cylindrical, 1.5-3.0 times as long as wide.

Egg (Fig. 159) (based on 1 egg dissected from abdomen of Costa Rican female). With small lobes on both ends directed at 30-40° from longitudinal midline, that on anterior (micropyle) end recurved. Surface entirely strongly reticulated, densely so on lobes.

Material Examined

Holotype ♀ (USNM00214194), PANAMÁ: Panamá: Parque Nacional Chagres, Altos de Pacora [9°15'28"N 79°21'24"W], McPhail traps, 1997, C.A. Korytkowski.

Paratypes: COLOMBIA: Santander: Lebrija, Dec 1991, V.J. Martinez O. (1♀; USNM00213693). COSTA RICA: Guanacaste: 14 km S Cañas, 26-30 Oct 1990, F.D. Parker (1♀; USU; USNM00052202). PANAMÁ: Panamá: Parque Nacional Chagres, Altos de Pacora, McPhail traps, 1997, C.A. Korytkowski (3♂9♀; USNM, MEUP, INBio, TAUI; USNM00214680-82, USNM00214684-92); Altos de Pacora, Villa Myrtha, trap 549, 20 Jan 1995, C.A. Korytkowski (1♂; MEUP); Altos de Pacora, Lote H4, McPhail trap 557, 9 Sep 1994, C.A. Korytkowski (1♀; USNM00213707); same, trap 572, 20 Jan 1995 (1♀; MEUP); same, trap 573, 21 Jul 1995 (2♀; USNM00213705-06); same, trap 558, 4 Aug 1995 (1♂1♀;

USNM00213747-48); same, trap 573, 15 Sep 1995 (1♀; USNM00213749); same, trap 537, 4 Mar 1997 (1♂1♀; QMBA; USNM00213691-92) (3♀; MEUP) (1♂1♀; USNM00213689-90).

Etymology

The name of this species is an adjective referring to its wing pattern, which usually lacks the Y-shaped mark found in most species of *Pseudophorellia*.

***Pseudophorellia bipunctata* Norrbom, n. sp.**

(Figs. 71, 95, 109, 121)

Diagnosis

Pseudophorellia bipunctata is most similar to *P. stonei*, which also has the radial-medial band complete, thoracic pleuron entirely yellow, scutellar brown vitta short, one orbital seta, postpronotal seta present, presutural supra-alar seta absent, and aculeus very slender. It differs in having the brown spot on abdominal tergite 5 pale and diffuse, and the brown spot on tergite 6 small, circular, and dark, the orbital plate without a brown mark, the aculeus tip with lateral lobe almost 0.33 times as long as medial lobe, projecting slightly more dorsally than medial lobe (Fig. 121), and the eversible membrane with dorsal spicules nearly equal in size, in oval pattern.

Description

Body length 6.6 mm. Mesonotum length 3.12 mm. Wing length 6.7 mm. Setae dark brown, most setulae pale brown.

Head. Yellow except ocellar tubercle brown. Face entirely microtrichose. Frons with 3 frontal setae and 1 orbital seta (latter missing in holotype, but only 1 alveolus). Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 3 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs slightly more than 0.33 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and yellow medial area of subscutellum, narrow lateral margin of mediotergite, posterodorsal half of anatergite, anterodorsally and posteroventrally on katatergite, anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, narrowly connected posteriorly to submedial vitta, but only by pale brown area; small pale presutural sublateral spot; short, broad lateral vitta on disk of scutellum, extended less than half distance to apex; subscutellum except medially; and mediotergite except narrow medial vitta. Pleuron entirely yellow. Propleuron with 1 setula slightly larger and darker than others. Medial scapular, presutural supra-alar, acrostichal and katepisternal setae absent. Dorsocentral seta well developed, aligned slightly anterior to intra-alar seta. Postpronotal, lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron with several setulae posteroventrally. Katepimeron with 1 to several setulae anteriorly or dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 71). With 6 dark brown or yellow bands. Costal cells, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow in cells c, sc, r_1 and part of br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly, partly yellow in cell r_1. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band partly yellow along costal margin; posteroapical band half as broad as anteroapical band, expanded distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen (Fig. 95). Yellow, with paired brown spots only on tergites 5 and 6 in female; that on tergite 5 pale, diffuse; that on tergite 6 small, circular, dark brown and well defined. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape at least 0.8 mm long (not dissected), yellow. Eversible membrane (Fig. 109) with dorsal spicules moderate sized but smaller than ventral spicules, all nearly equal in size, in oval pattern. Aculeus (Fig. 121) at least 0.65 mm long (not fully everted), extremely slender (0.05 mm wide at narrowest point), gradually tapered; apex trilobed, medial lobe slightly ventrally curved, lateral lobe posteriorly directed, slightly but distinctly more dorsally directed than medial lobe, less than 0.33 times as long as medial lobe, acute. Spermatheca not dissected.

Material Examined

Holotype ♀ (at USNM, for eventual deposition in Ecuador; USNM00052221), ECUADOR: NAPO: Reserva Etnica Waorani, Onkone Gare Camp, 1 km S, Transect Ent., 0°39'10"S 76°26'W, 220 m, Insecticidal fogging, terra firme forest, Transect 4, Station 3, 21 Jun 1996, T.L. Erwin *et al*., Project MAXUS Lot 1022.

Comments

Two males (USNM00053498, 00052222) were captured in the Onkone Gare Camp area by Erwin *et al*. (one on the same day as the holotype, the other on 29 Jun 1994). They differ from the holotype in having an elongate brown spot on the orbital plate, minute ocellar seta, aristal hairs half as long as width of first flagellomere, presutural sublateral spot slightly closer to lateral margin of scutum, postpronotal seta absent, forefemur with 3-4 short, very stout, spinelike ventral setae, and tergites 3-5 with large, paired dark brown spots. More specimens from this area are needed to determine whether these males represent another species or are conspecific with the holotype of *P. bipunctata*.

Etymology

The name of this species is an adjective referring to the pair of distinct spots on female abdominal tergite 6.

Pseudophorellia brevilobata Norrbom, n. sp.

(Figs. 72, 110, 133)

Diagnosis

Pseudophorellia brevilobata resembles *P. enkerlini* and *P. reducta* in lacking brown scutellar markings, and especially the latter species in scutal markings and aculeus shape (gradually tapered, lateral lobe of tip relatively small). It differs from *P. enkerlini* in lacking posterior orbital, postpronotal, and presutural supra-alar setae, and having the brown scutal vittae slender and not connected posteriorly. It differs from *P. reducta* in having the radial-

medial band and the anteroapical and posteroapical bands complete, and the eversible membrane with most dorsal spicules similar in size, not diminishing distally (Fig. 110).

Description

Body length 7.5 mm. Mesonotum length 3.2 mm. Wing length 6.3 mm. Setae dark brown, setulae yellow to brown.

Head. Yellow except ocellar tubercle brown, and paired elongate brown mark on orbital plate. Face entirely microtrichose. Frons with 3 frontal setae and 1 orbital seta. Ocellar seta weak, shorter than length of ocellar tubercle. Postocellar seta absent. Parafacial narrow. Antenna yellow except dorsal margin of first flagellomere and most of arista brown; first flagellomere moderately long, almost 3.5 times as long as wide, almost reaching ventral facial margin; arista short plumose, hairs half as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, subscutellum, lateral margin of mediotergite, ventral and posterior 0.67 of anatergite, posteroventrally on katatergite, and metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, separated from submedial vitta posteriorly; slightly elongate presutural sublateral spot near lateral margin of scutum; mediotergite; and subscutellum except narrowly medially. Scutellum and pleuron entirely yellow. Propleuron with 1 setula slightly longer and stronger than others. Postpronotal, medial scapular, presutural supra-alar, and acrostichal setae absent. Dorsocentral seta moderately well developed, aligned slightly anterior to intra-alar seta. Anepimeral seta small (less than 0.33 times as long as anepisternal seta), weak, yellow. Katepisternal seta absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, and 1 anepisternal setae well developed. Anepimeron with several setulae posteroventrally. Katepimeron with several setulae anteriorly and dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae poorly differentiated in female.

Wing (Fig. 72). With 6 dark brown or yellow bands. Area in cell r_1 between discal, radial-medial and subapical bands slightly diffuse yellow, obscuring borders of radial-medial band and to lesser extent subapical band, which fade to yellow anteriorly. Cells bc and cell c and area bordering base of vein Cu yellow. Cell br yellow basally with medial brown streak. Subcostal band yellow in cells sc and r_1. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow, partly yellow in cell r_1. Subapical band broadly connected to discal band in cell cu_1 and posterior third of cell dm, connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band mostly yellow; posteroapical band complete, approximately half as broad as anteroapical band, with narrow connection to it in middle of cell r_{4+5}. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired, large, dark brown, sublateral, longitudinally medial spots on tergites 3-6 in female; spots broader than long, except quadrate on female tergite 6. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape 1.0 mm long, yellow, dorsally distal half, narrowing to distal third

laterally, diffuse pale brown. Eversible membrane (Fig. 110) with most dorsal spicules subequal to ventrolateral spicules, in discrete area, without minute spicules distally. Ventral spicules in V-shaped rows, several medial, posterior rows smaller, more anterior and lateral rows narrowly interrupted anteriorly. Aculeus (Fig. 133) 0.65 mm long, stout, basal part slightly tapering, distal half gradually tapering; apex with lateral lobes small, less than 0.15 times as long as medial lobe.

Material Examined

Holotype ♀ (IML; USNM00052217), PERU: HUANUCO: Tingo María, Río Huallaga, 700 m, Jan 1947, Weyrauch, W.K.W. 1713.

Etymology

The name of this species is an adjective referring to the short lateral lobe of the aculeus.

***Pseudophorellia confluens* Norrbom, n. sp.**
(Figs. 56, 73, 101-102, 107, 134, 150)

Diagnosis

Pseudophorellia confluens and *P. hansoni* differ from all other species of *Pseudophorellia* by their wing patterns, in which the discal and subapical bands are fused to form a large dark area covering the medial third of the wing and both crossveins R-M and DM-Cu. *Pseudophorellia confluens* differs from *P. hansoni* in head markings (no vitta on facial carina, brown area on frons covering most of orbital plate, and paired brown occipital vitta mainly on median sclerite), having a postpronotal seta, and in its less extensive hyaline areas of the wing (Fig. 73), in particular cells r_1 and r_{2+3} without hyaline areas, and the hyaline area in the middle of cell m not extended into cell r_{4+5}.

Description

Body length 8.0-9.5 mm. Mesonotum length 3.25-4.20 mm. Wing length 7.9-10.0 mm. Setae red brown to dark brown, setulae yellowish to brown.

Head (Fig. 56). Yellow except pale to moderate brown genal spot ventral to eye, paired brown vitta on ventral half of median occipital sclerite curved dorsally onto lateral occipital sclerite ventral to lateral vertical seta or sometimes with separate, diffuse brown spot ventral to latter seta, large oval or U-shaped dark brown mark on ocellar tubercle and orbital plate, usually (3 of 4 type specimens) extended anteriorly as narrow orange to brown vitta sometimes reaching anterior margin of frons and broadened. Facial carina yellow. Face microtrichose except ventral third of carina. Frons with 3-4 frontal setae, and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial 0.33-0.40 times as wide as first flagellomere. Antenna yellow except most of arista brown; first flagellomere moderately long, 3.5-3.7 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs 0.20-0.25 times as long as basal width of first flagellomere.

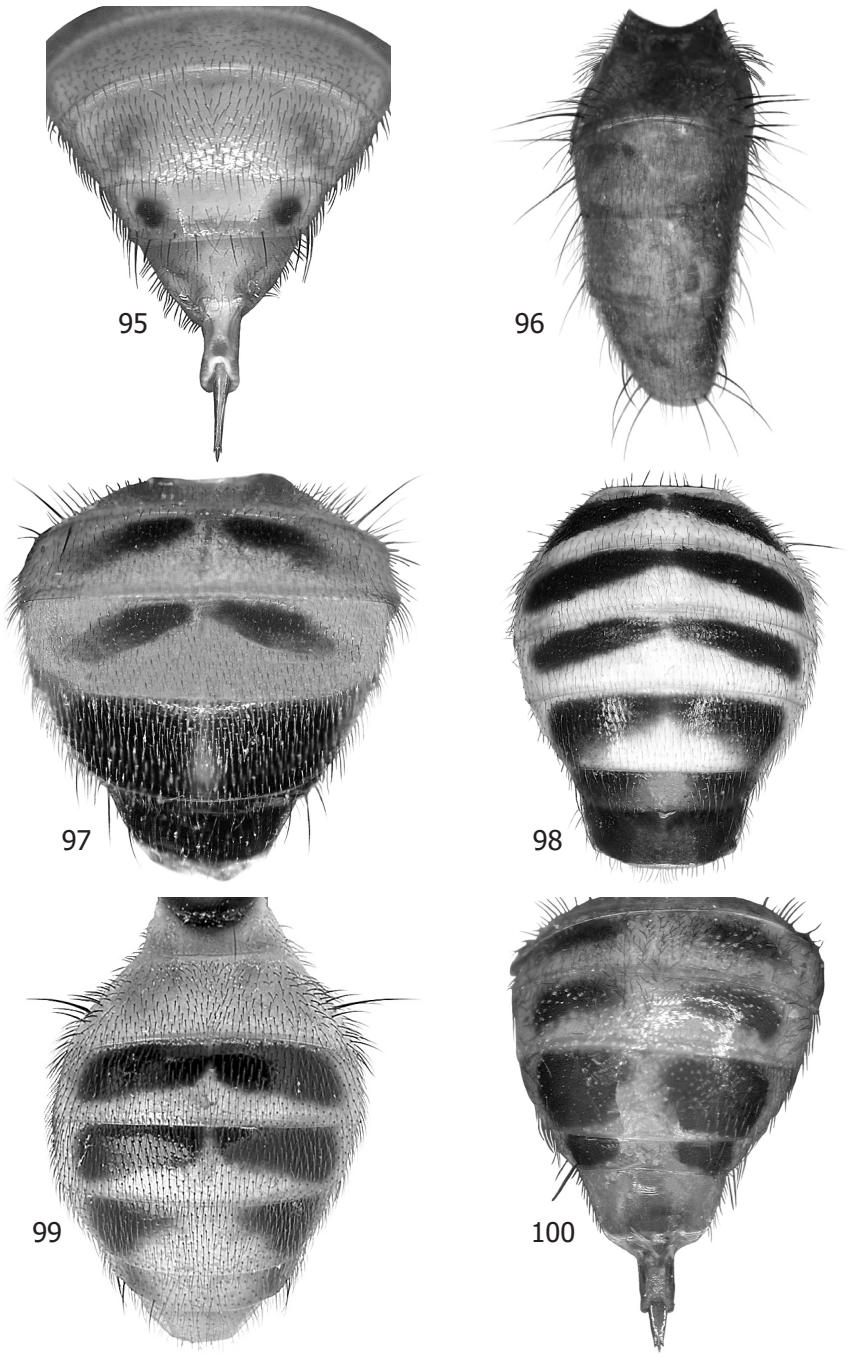
Thorax (Fig. 56). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, scutellum ventrally, subscutellum, broadly along margin of mediotergite and anatergite, and posteroventrally and anteroventrally on katatergite, and on metapleuron. Yellow, with following brown markings or areas (dark brown unless otherwise noted): most of postpronotal lobe; complete submedial scutal vitta, not connected posteriorly to opposite vitta,

but broadened anteriorly and usually almost connected, and usually (except holotype) also broadly connected to brown area on postpronotal lobe; postsutural sublateral vitta, connected posteriorly to submedial vitta; broad presutural sublateral vitta, connected at least posteriorly to broad spot on notopleuron and extreme lateral margin of scutum; transverse spot between posterior notopleural seta and postsutural supra-alar seta, usually with paler and narrower posterior extension ventrolateral to latter seta; spot on most of notopleuron except small areas around each seta and along transverse suture, connected to lateral presutural vitta on scutum; broad sublateral vitta on disk of scutellum, extended almost to apex, often paler and more diffuse than scutal vittae; subscutellum and mediotergite orange to orange brown except narrowly medially, margins sometimes darker brown; orange-brown or pale brown vertical band from anterior part of katepisternum across middle of anepisternum aligned between anterior and posterior notopleural setae but closer to anterior seta, usually not reaching dorsal margin of anepisternum; orange-brown or pale brown vertical spot or band on anepimeron, sometimes extended onto posterior part of katepisternum or connected to anterior band across pleuron to form large V-shaped mark; orange or orange brown spot on laterotergite above posterior spiracle, and another on meron. Propleuron with setulae subequal or with 1-2 stronger and darker than others, but no more than 1.5 times as long. Medial scapular, presutural supra-alar, and acrostichal setae absent. Postpronotal seta small. Dorsocentral seta small to moderately developed, aligned with or slightly posterior to intra-alar seta. Katepisternal seta weak or absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron without setulae posteroventrally. Katepimeron without setulae.

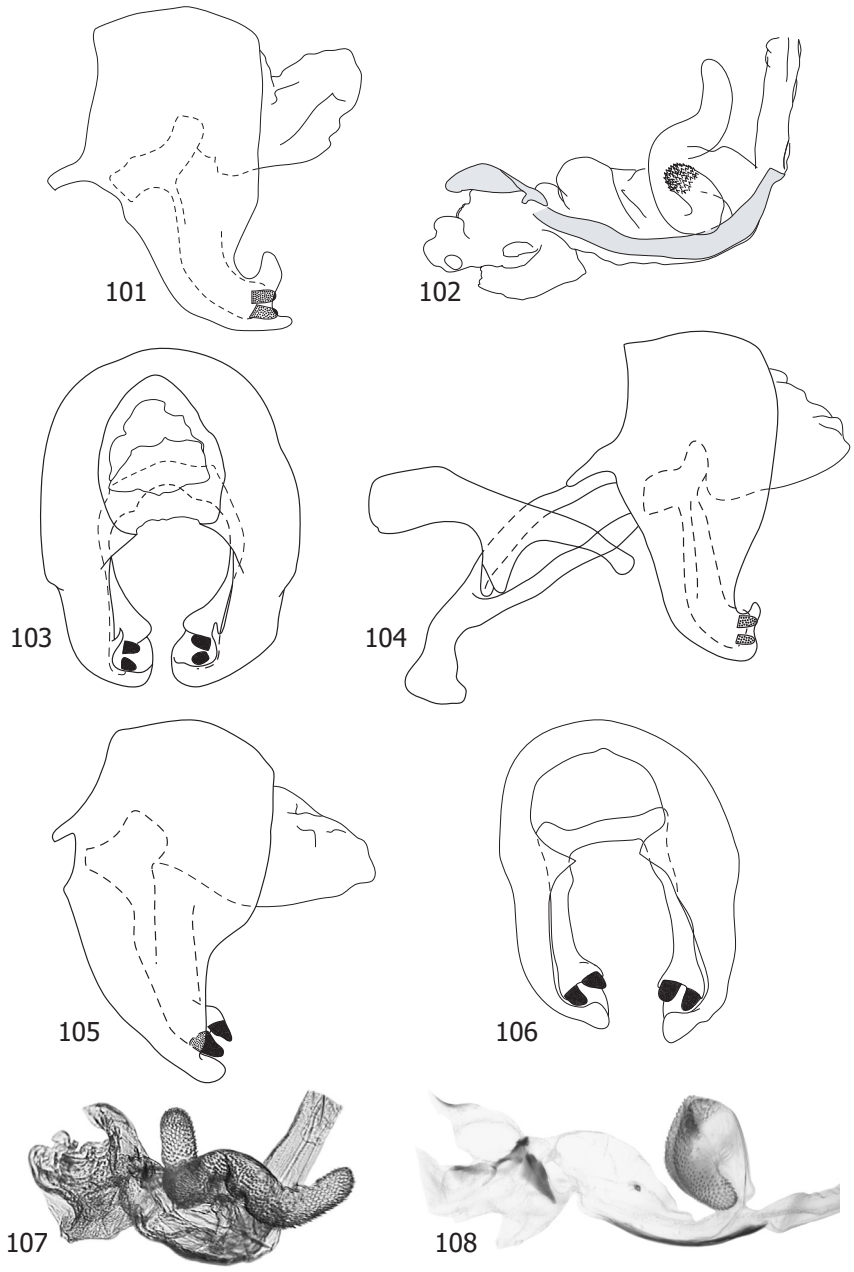
Legs. Male forefemur with ventral row of setae spinelike. Mid- and hindfemora with anteroventral and posteroventral rows of setae slightly to moderately differentiated, especially posteroventral row on midfemur in male.

Wing (Fig. 73). Largely brown and yellow except posterobasally. Cells bc and c, base of cell r_1, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow. Discal, subapical, and anteroapical and posteroapical bands broadly connected to cover distal half of wing except 2 small hyaline areas, 1 in cell m between subapical and posteroapical bands, and 1 subapically in cell r_{4+5} between apical bands; this large infuscated area dark brown posterior to vein R_{4+5} and basal to hyaline area in cell m, gradually or rapidly fading to yellow anteriorly and distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

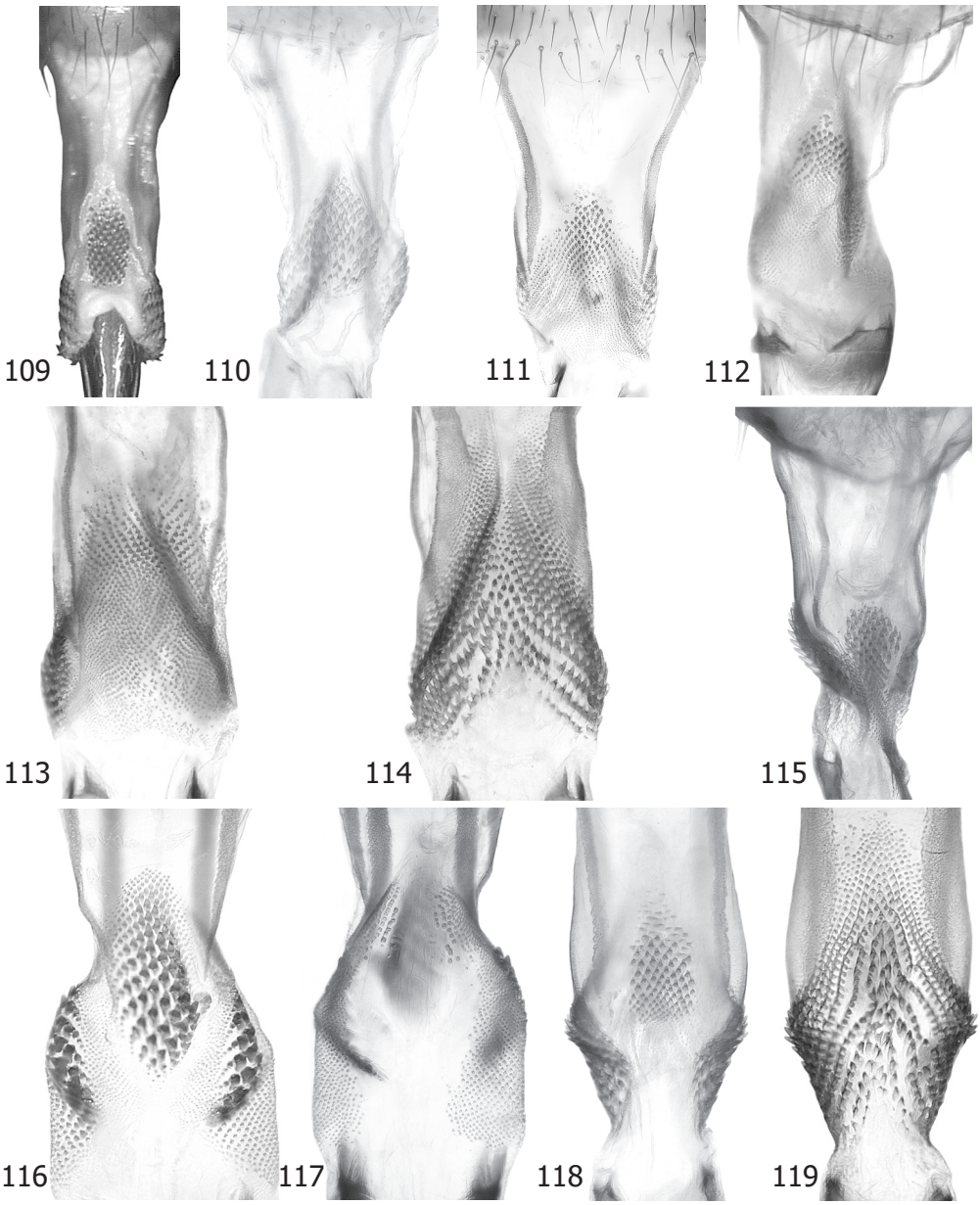
Abdomen (Fig. 56). Tergites brown except yellow base of syntergite 1+2 and narrow lateral margin extending to tergite 5. Syntergite 1+2 with 1 well differentiated, preapical lateral setae. Male terminalia: Epandrium mostly moderate brown. Lateral surstylus with relatively long, slender subapical lobe, hooklike in lateral view (Fig. 101). Glans (Figs. 102, 107) membranous except long flat ventrobasal plate, dorsal and apical margins of dorsal lobe, sclerites at junction of dorsal and medial lobes, and parts of medial lobe; medial lobe relatively short; ventral lobe small. Female terminalia: Oviscape 1.1-1.3 mm long; entirely brown dorsally and ventrally. Eversible membrane with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus. Aculeus (Fig. 134) 0.90-0.95 mm long, moderately stout, gradually tapering, 0.08-0.09 mm wide at narrowest; apex trilobed, lateral lobe 0.33 times as long as medial lobe, posteriorly



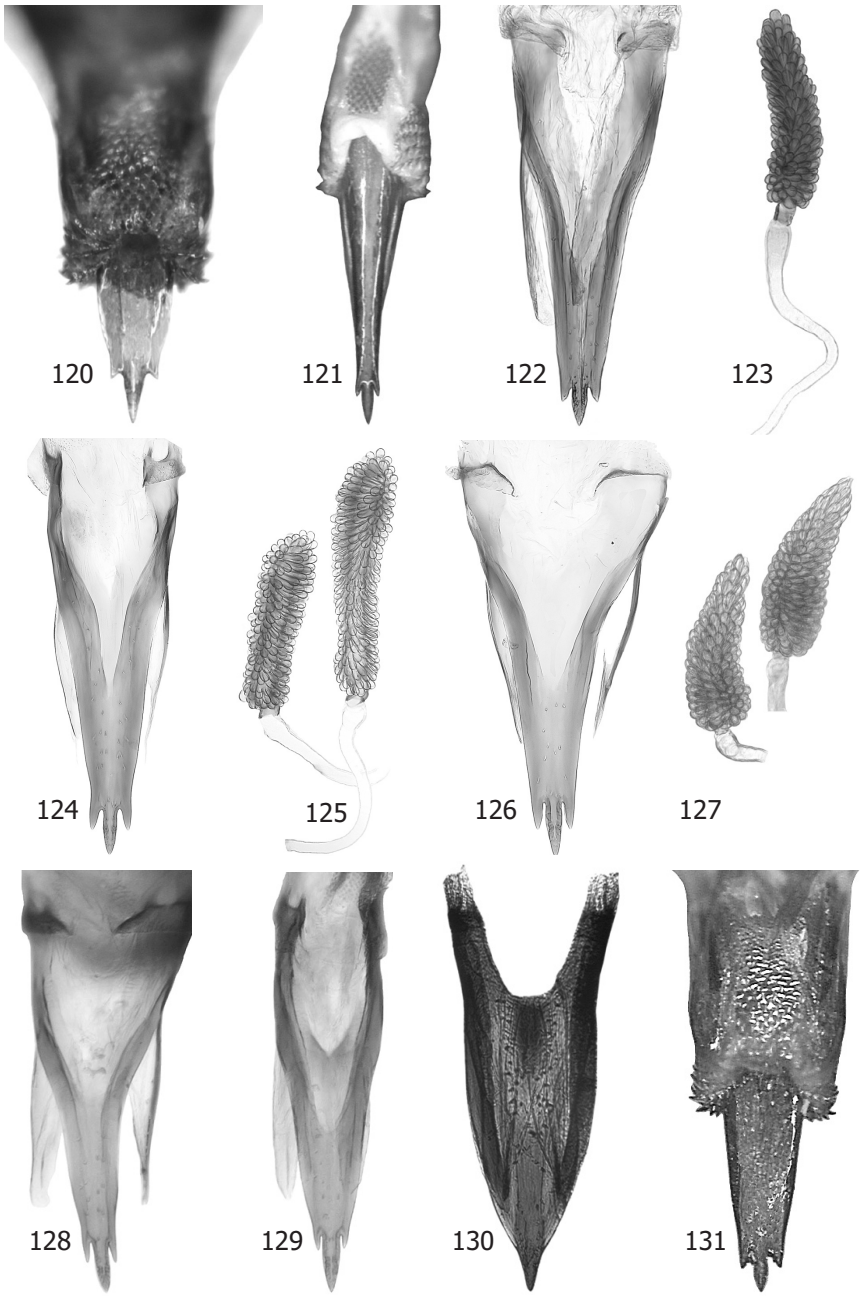
Figs. 95-100. Abdomen, photo. 95. *Pseudophorellia bipunctata* (holotype). 96. *P. distincta* (holotype). 97. *P. diffusa* (holotype). 98. *P. quadricincta* (Costa Rica: Estación Pitilla). 99. *P. semilunata* (holotype). 100. *P. tristeza* (holotype).



Figs. 101-108. Male terminalia. 101. *Pseudophorellia confluens* (Venezuela: Rancho Grande, USNM00052485), epandrium and surstyli, posterior view. 102. Same, glans (spicules shown only on left apical part of basal lobe). 103. *P. reducta* (Brazil: R. Campina, USNM00052215), epandrium and surstyli, posterior view. 104. Same, lateral view. 105. *P. vespiformis* (holotype), epandrium and surstyli, lateral view. 106. Same, posterior view. 107. *P. confluens* (Venezuela: Rancho Grande), basal lobe of glans, photo. 108. *P. acrostichalis* (Bolivia: Cerro Uchumachi, USNM00056059), glans, photo.



Figs. 109-119. Eversible membrane, photo. 109. *Pseudophorellia bipunctata* (holotype), dorsal view. 110. *P. brevilobata* (holotype), dorsal view. 111. *P. fenestrata* (holotype), dorsal view. 112. *P. marginata* (holotype), dorsal view. 113. *P. setosa* (holotype), dorsal view. 114. Same, ventral view. 115. *P. reducta* (holotype), dorsal view. 116. *P. tica* (Costa Rica: 20 km S Upala, USNM00052207), dorsal view. 117. Same, ventral view. 118. *P. tristeza* (holotype), dorsal view. 119. Same, ventral view.



Figs. 120-131. Aculeus, dorsal view, and spermathecae (1 or 2 of 3 shown), photos. 120. *Pseudophorellia acrostichalis* (Bolivia: Cerro Uchumachi, USNM00056060). 121. *P. bipunctata* (holotype). 122-123. *P. diffusa* (holotype). 124-125. *P. fenestrata* (holotype). 126-127. *P. fuscoapicata* (holotype). 128. *P. marginata* (holotype). 129. *P. reducta* (holotype). 130. *P. tica* (Costa Rica: 20 km S Upala, USNM00052207). 131. *P. tristeza* (holotype).

directed. Spermatheca (Fig. 150) moderately long, cylindrical, tapering apically.

Egg (based on 3 damaged eggs dissected from abdomen of female paratype USNM00056120). Similar to that of *P. hansoni*. 2.0-2.1 mm long, 0.5-0.6 mm wide, with small lobes on both ends directed at 30-40º from longitudinal midline, that on anterior (micropyle) end 0.12-0.15 mm long, that on posterior end 0.10 mm long. Surface entirely strongly reticulated, densely so on lobes.

Material Examined

Holotype ♂ (IZAM; USNM00052486), VENEZUELA: Aragua: Carretera Maracay-Choroní, 1575 m, 29 Mar 1957, F. Fernández Yépez and C.J. Rosales.

Paratypes: VENEZUELA: Aragua: Rancho Grande, 1100 m, 18 Jun 1968, F. Fernández Yépez and C.J. Rosales (1♀; IZAM; USNM00056120); Rancho Grande, 1100 m, 1 Nov 1950, F. Fernández Yépez (1♂1♀; USNM00052484-85).

Etymology

The name of this species is a noun in apposition meaning confluence, referring to its largely fused wing bands.

Pseudophorellia decora Norrbom, n. sp.

(Figs. 74, 135, 151)

Diagnosis

Pseudophorellia decora is most similar to *P. tristeza*, which also has a small tooth on the lateral lobe of the aculeus tip, the orbital plate yellow, 1 orbital seta, postpronotal seta present, brown scutellar vitta elongate, anepisternum yellow, and complete radial-medial band. It differs by: presutural supra-alar seta present; aculeus narrower, more rapidly tapered; abdominal tergite 3 without pair of brown spots, and brown spots on tergite 4 small and weak.

Description

Body length 7.4 mm. Mesonotum length 3.5 mm. Wing length 7.0 mm. Setae dark brown, most setulae yellow to pale brown.

Head. Yellow except ocellar tubercle brown. Face entirely microtrichose. Frons with 3 frontal setae and 1 orbital seta. Ocellar seta weak, shorter than length of ocellar tubercle. Postocellar seta absent. Parafacial slightly more than 0.33 times as wide as first flagellomere. Antenna yellow except most of arista brown; first flagellomere moderately long, 3.2 times as long as wide, almost reaching ventral facial margin; arista long pubescent, hairs 0.33 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and yellow medial area of subscutellum, narrow lateral margin of mediotergite, anatergite except small anteromedial area, anterodorsally and posteroventrally on katatergite, anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; small presutural sublateral spot; lateral vitta on disk of scutellum, extended 0.75 distance to apex; subscutellum except medially; and mediotergite except narrow medial vitta. Pleuron entirely yellow. Propleuron with 1 setula slightly larger and darker than others. Medial scapular and acrostichal setae absent. Dorsocentral seta well developed, aligned slightly posterior to intra-alar seta. Katepisternal seta weak. Postpronotal,

lateral scapular, 2 notopleural, presutural supra-alar, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron with several setulae posteroventrally. Katepimeron with several setulae anteriorly and dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 74). With 6 dark brown or yellow bands. Cell bc, most of cell c, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow in cells c, sc, r_1 and part of br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly, partly yellow in cell r_1. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band partly yellow along costal margin; posteroapical band moderately broad, 0.67 times as broad as anteroapical band, not expanded distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal third of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired brown spots on tergites 4-6 in female; that on tergite 4 small, faint, aligned with lateral margin of that on tergite 5; those on tergites 5 and 6 large, broad, dark brown. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape 1.15 mm long, yellow, apical half on dorsal side dark brown. Eversible membrane with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus. Ventral spicules in V-shaped rows, smaller anteriorly, but otherwise mostly similar in size. Aculeus (Fig. 135) 0.78 mm long, slender (0.08 mm at narrowest point), rapidly tapered on basal third and then nearly parallel-sided; apex trilobed, lateral lobe slightly more than one-third as long as medial lobe, relatively stout, with minute tooth on medial side, posteriorly directed. Spermatheca (Fig. 151) short cylindrical, slightly tapered apically.

Material Examined

Holotype ♀ (USU; USNM00052219), COSTA RICA: Alajuela: 20 km S Upala, 19 Feb 1991, F.D. Parker.

Etymology

The name of this species is an adjective meaning beautiful, in reference to its general appearance.

Pseudophorellia diffusa Norrbom, n. sp.

(Figs. 75, 97, 122-123)

Diagnosis

Pseudophorellia diffusa is one of only three species of the genus that have the following combination of characters: anepisternum with a vertical brown band; the discal and subapical bands complete and separate except posteriorly; and the normally hyaline areas in cells r_1 and r_{2+3} yellowish, with the margins of the transverse bands less distinct in these cells. *Pseudophorellia diffusa* differs from the other two species, *P. antica* and *P. quadricincta*, in having only one orbital seta, by its abdominal spot pattern (tergites 3 and 4 with small, submedial spots, and tergites 5 and 6 with very large spots; *P. antica* has similar sized spots and *P. quadricincta* has bands on these tergites and syntergite 1+2), and by the alignment of the brown anepisternal band between the notopleural setae, only slightly closer to the level of the posterior seta.

Description

Body length 8.6 mm. Mesonotum length 3.62 mm. Wing length 8.6 mm. Setae dark brown, setulae yellow to brown.

Head. Yellow except brown ocellar tubercle and very small brown spot on occiput ventral to medial vertical seta. Face with antennal groove microtrichose; carina bare except dorsal margin. Frons with 2 frontal setae (also a weak third seta on one side) and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except distal 0.85 of arista pale brown; first flagellomere moderately long, 3.25 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs 0.33 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and middle of subscutellum, lateral margin of mediotergite, posterior half of anatergite, and anterodorsally (on right side only) and posteroventrally on katatergite (longer than on other sclerites), anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: small, diffuse brown spot near middle of postpronotal lobe; complete submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; small presutural lateral spot; small, paler spot ventral to posterior notopleural seta and another between posterior notopleural and postsutural supra-alar setae; medial vertical band on anepisternum, fading ventrally, aligned slightly closer to posterior than to anterior notopleural seta; large lateral vitta on disk of scutellum, extended to apex; subscutellum except medially; and mediotergite except narrow medial vitta. Propleuron with setulae subequal, none more than 1.5 times as long as others. Medial scapular, presutural supra-alar, acrostichal, and katepisternal setae absent. Postpronotal seta small. Dorsocentral seta well developed, aligned slightly posterior to intra-alar seta. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron with 0-1 setulae posteroventrally. Katepimeron with 1-2 setulae dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 75). With 6 dark brown or yellow bands. Areas of cells r_1 and r_{2+3} between discal, radial-medial and subapical bands diffuse yellow, obscuring borders of radial-medial, subapical, and anteroapical and posteroapical bands, which fade to yellow or pale brown anterior to vein R_{4+5} (anteroapical band entirely yellow). Costal cells, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band intermittently yellow and pale brown. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band entirely yellow; posteroapical band half as broad as anteroapical band, not narrowed or expanded distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal third of vein Cu_1 setulose dorsally.

Abdomen (Fig. 97). Yellow, with paired, large, brown spots on tergites 3-5 in female; those on tergites 3 and 4 smaller, more medial (fading laterally), those on tergite 5 extremely large,

nearly touching medially and extended to posterior margin and nearly to anterior and lateral margins. Tergite 6 entirely dark brown. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape 1.3 mm long, dark brown dorsally and ventrally. Eversible membrane with dorsal spicules smaller than ventral spicules anteriorly, gradually decreasing to minute distally and extending continuously almost to aculeus. Ventral spicules in V-shaped rows. Aculeus (Fig. 122) 0.9 mm long, relatively slender (0.09 mm at narrowest point), rapidly tapered at basal third and then gradually to apex; apex trilobed, lateral lobe approximately 0.33 times as long as medial lobe, relatively stout, posteriorly directed. Spermatheca (Fig. 123) cylindrical, 3-4 times as long as wide.

Material Examined

Holotype ♀ (INBio002496254), COSTA RICA: Puntarenas: Fila Cruces, Entrada de los Atunes, 1200 m, 4 May 1996, I.A. Chacon, LS 306000 571100, #8236.

Etymology

The name of this species is an adjective referring to the diffuse yellow areas in cells r_1 and r_{2+3}.

Pseudophorellia distincta Norrbom, n. sp.

(Figs. 76, 96)

Diagnosis

Pseudophorellia distincta differs from all other species of *Pseudophorellia* in having a small medial marginal seta on the scutellum between the normal basal and apical pairs. It and *P. acrostichalis* are the only species of *Pseudophorellia* that have postocellar and acrostichal setae and the scutellum brown laterally (sometimes faintly). They also have the radial-medial and anteroapical bands connected at the anterior wing margin and have more extensive microtrichial patterns on the thorax than in other species. *Pseudophorellia distincta* further differs from *P. acrostichalis* in having the subapical band complete, lacking a submedial scutal vitta, and in having 3 frontal setae.

Description

Body length 9.0 mm. Mesonotum length 3.80 mm. Wing length 9.7 mm. Setae dark brown, setulae brown to dark brown.

Head. Yellow except ocellar tubercle. Face entirely microtrichose. Frons with 3 frontal setae and 2 orbital setae. Ocellar seta absent. Postocellar seta well developed. Parafacial narrow. Antenna yellow except dorsal and apical margins of first flagellomere pale brown and most of arista brown; first flagellomere relatively short, 2.2 times as long as wide, not reaching ventral facial margin; arista long pubescent, hairs 0.2 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, notopleuron, postsutural scutum lateral to supra-alar seta and along posterior margin (posterior to level of acrostichal seta), most of scutellum laterally and ventrally and on base of disk, posterodorsal half of anepisternum, margins of anepimeron, anterodorsally and posteroventrally on katatergite, mediotergite except narrow medial bare area, all of subscutellum and anatergite, anteriorly on meron, and on metapleuron. Yellow to orange except: narrow, moderate brown sublateral postsutural scutal vitta, from level of postsutural

supra-alar seta to level of intra-alar seta; dark brown ovoid spot on margin of notopleuron and scutum posteroventral to presutural supra-alar seta; pale brown area on scutellum laterally, from base to apical seta, also including basal seta; and moderate brown lateral vitta on subscutellum and mediotergite. Propleuron with 2-3 setulae slightly stronger and darker than others. Medial scapular seta absent. Postpronotal, lateral scapular, 2 notopleural, presutural and postsutural supra-alar, acrostichal, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, anepimeral, and katepisternal setae well developed. Dorsocentral seta well developed, at about 0.67 distance from level of postsutural supra-alar seta to level of intra-alar seta. Anepimeron without setulae posteroventrally. Katepimeron and dorsal margin of meron with several setulae.

Legs. Male forefemur with ventral row of setae stout and spinelike. Male midfemur with anteroventral row of setae weakly differentiated, posteroventral row well differentiated, moderately stout; both rows on hindfemur weakly differentiated.

Wing (Fig. 76). With 6 dark brown bands. Costal cells, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band present, but anterior half intermittently yellow. Discal and radial-medial bands connected to form Y-shaped mark with slightly narrower distal branch covering crossvein R-M. Discal band reaching posterior wing margin in middle of cell cu_1. Subapical band not connected posteriorly to discal band, but connected to radial-medial band in cell r_1 and to anteroapical and posteroapical bands in cells r_1 and r_{2+3}, respectively. Anteroapical band almost entirely dark brown; posteroapical band only slightly narrower than anteroapical band, not narrowed or expanded distally. Vein R_{4+5} densely setulose to apex dorsally. Basal section of vein Cu and basal third of vein Cu_1 setulose dorsally.

Abdomen (Fig. 96). Entirely orange. Syntergite 1+2 with an elongate preapical lateral seta, but also with a long apical lateral seta and other tergites with several long lateral setae so that seta on syntergite 1+2 is not as distinctive as in other species. Male terminalia: Epandrium orange. Lateral surstylus with rounded, triangular subapical lobe, shorter than wide. Glans membranous except long flat ventrobasal plate, most of dorsal lobe, and sclerites at junction of dorsal and medial lobes; ventral lobe small. Female terminalia: unknown.

Material Examined

Holotype ♂ (USNM00052192), COLOMBIA: Cundinamarca: Carpanta Reserve, 45.8 km E of Bogotá, "X = 998.850, Y = 1′045.750″, 11 Aug 1988, E.A. Lisowski.

Comments

The Carpanta Reserve (approximate center 4°34'N 73°41'W) is between 2340-3340 m altitude (Dimitri Forero, pers. comm).

Etymology

The name of this species is an adjective referring to its distinctive wing pattern and additional pair of scutellar setae.

Pseudophorellia enkerlini Norrbom, n. sp.

(Figs. 63, 77, 136-137, 152)

Molynocoelia sp.: Aluja, 1984: 231 [habitus photo].
Molynocoelia sp. near *lutea*: Aluja *et al*., 1987: 324.

Diagnosis

Pseudophorellia enkerlini differs from other species of *Pseudophorellia* in having complete submedial brown vittae that are connected at the posterior margin of the scutum, and the scutellum entirely yellow. Of the other species with similar thoracic and abdominal markings and wing patterns, only *P. maculata*, *P. reducta*, and *P. brevilobata* also lack brown markings on the scutellum. Those species differ in lacking posterior orbital, presutural supra-alar, and usually postpronotal setae. *Pseudophorellia maculata* and *P. brevilobata* also have more slender scutal vittae, with the submedial vitta not connected to the sublateral vitta, and have the lateral lobe of the aculeus tip smaller, whereas *P. reducta* further differs from *P. enkerlini* in having a pair of brown sublateral spots on abdominal syntergite 1+2.

Description

Body length 6.6-8.0 mm. Mesonotum length 3.00-4.00 mm. Wing length 6.2-8.2 mm. Setae dark brown, setulae yellow to brown.

Head. Yellow except ocellar tubercle brown, and often (5 of 10 specimens) broad U-shaped brown mark on vertex and orbital plate. Face entirely microtrichose. Frons with 3 frontal setae (rarely 2 or 4 on one side) and 2 orbital setae (1 on left side in holotype). Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 3.0-3.5 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs 0.20-0.33 times as long as basal width of first flagellomere.

Thorax (Fig. 63). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and middle of subscutellum, broadly along margin of mediotergite and anatergite, and anterodorsally and posteroventrally on katatergite (longer than on other sclerites), anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: complete submedial scutal vitta, narrowly connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; large presutural sublateral spot or vitta; subscutellum except narrowly medially; and all of mediotergite. Scutellum and pleuron entirely yellow. Propleuron with setulae subequal or with 1 stronger and darker than others, but no more than 1.5 times as long. Medial scapular and acrostichal setae absent. Presutural supra-alar and postpronotal setae sometimes smaller than normal, but distinctly present. Dorsocentral seta well developed, aligned with or slightly anterior to intra-alar seta. Katepisternal seta weak. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron usually without setulae posteroventrally. Katepimeron with 0-2 setulae on dorsal margin.

Legs. Male forefemur with ventral row of spinelike setae. Mid- and hindfemora with anteroventral and posteroventral rows of setae differentiated, especially the latter, often moderately stout in male.

Wing (Fig. 77). With 6 dark brown or yellow bands. Costal cells, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow anteriorly. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly, especially in Costa Rican male. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band mostly or entirely yellow; posteroapical band slender, 0.33-0.67 times as broad as anteroapical band, in Costa Rican male weak along vein M. Vein R_{4+5} densely setulose

almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired, large, broad, dark brown spots on tergites 3-5 and female tergite 6; those on tergites 3 and 4 shorter, but about as broad and aligned with those on tergite 5 (and 6 in female), which extend to or almost to posterior margin. Syntergite 1+2 with 1 (rarely 2) elongate, well differentiated, preapical lateral seta. Male terminalia: Epandrium yellow. Lateral surstylus with relatively large and broad subapical lobe, hooklike proximally, rounded distally. Glans membranous except long flat ventrobasal plate, dorsal and apical margins of dorsal lobe, sclerites at junction of dorsal and medial lobes, and parts of medial lobe; ventral lobe small. Female terminalia: Oviscape yellow. Eversible membrane with dorsal spicules all much smaller than ventral spicules, gradually decreasing to minute distally, extending almost to aculeus. Aculeus (Fig. 136-137) 0.69 mm long, moderately stout, slightly tapered; apex trilobed, lateral lobe large, more than half as long as medial lobe, posteriorly directed. Spermatheca (Fig. 152) cylindrical, tapering apically.

Material Examined

Holotype ♂ (IEXV; USNM00052198), MEXICO: Chiapas: Mazapa de Madera, Dec 1982, McPhail trap, Programa MoscaMed.

Paratypes: Same data as holotype (2♂3♀; IEXV, USNM; USNM00052195-200). MEXICO: Chiapas: Soconusco region, McPhail trap in mango, Programa MoscaMed (2♂1♀; IEXV, USNM; USNM00052193-4, USNM00052201). COSTA RICA: Alajuela: RNVS Cano Negro, Cano Negro, Playuelas, 20 m, 10-31 Oct 1992, K. Flores, L-N 319100, 450200 (1♂; INBio000943880).

Etymology

This species is named in honor of the late Dieter Enkerlin, who helped establish the research program of Programa MoscaMed, Sanidad Vegetal, Mexico (now Campaña Nacional Contra Moscas de la Fruta), whose personnel collected most of the type series.

Pseudophorellia fenestrata Norrbom, n. sp.

(Figs. 78, 111, 124-125)

Diagnosis

Pseudophorellia fenestrata differs from other species of *Pseudophorellia* by its wing pattern (Fig. 78), in which the discal, radial-medial, subapical and apical bands are largely fused so that the apical half of the wing is orange brown except for a large oval hyaline area in cells r_{4+5} and dm and a triangular hyaline area in cell m. The color pattern of the scutellum, mostly orange brown except for a shallow semicircular basal yellow area, the extreme apex, and the distal half laterally, is also distinctive.

Description

Body length 8.0-9.2 mm. Mesonotum length 3.35-3.70 mm. Wing length 8.6-9.3 mm. Setae dark brown, setulae mostly orange, on thorax mostly brown.

Head. Yellow except diffuse pale brown vitta on ventral half of facial carina, pale brown genal spot ventral to eye, paired brown lateral vitta on median occipital sclerite curved dorsally onto lateral occipital sclerite ventral to lateral vertical seta, U-shaped brown mark on ocellar tubercle and orbital plate, and moderately broad orange to brown medial vitta reaching anterior margin of frons and sometimes (1 of 3 specimens) connected to mark on ocellar tubercle. Face

microtrichose except most of carina (obscured by dust in type specimens). Frons with 2-3 frontal setae, and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial 0.33-0.40 times as wide as first flagellomere. Antenna yellow, with pedicel orange, and dorsal half or more of first flagellomere and most of arista brown; first flagellomere moderately long, 2.7-2.9 times as long as wide, reaching or almost reaching ventral facial margin; arista long pubescent, hairs 0.25 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, subscutellum, broadly along margin of mediotergite and anatergite, and posteroventrally on katatergite, and on metapleuron. Yellow, with following markings or areas: most of postpronotal lobe orange to pale brown; complete dark brown submedial scutal vitta, almost even in width, not connected posteriorly to opposite vitta nor anteriorly to brown area on postpronotal lobe; dark brown postsutural sublateral vitta, connected posteriorly to submedial vitta; slightly curved presutural sublateral vitta, brown, sometimes paler anteriorly, not connected to spot on notopleuron; transverse brown mark between posterior notopleural seta and postsutural supra-alar seta along transverse suture, extending posteriorly to or almost to intra-alar seta; brown spot on most of notopleuron; single unpaired orange brown mark on scutellum, covering basal third to half laterally and most of disk except extreme apex and semicircular yellow basal area that extends medially to level of basal seta; subscutellum except narrowly medially and all of mediotergite dark brown; brown vertical band from anterior part of katepisternum across middle of anepisternum aligned midway between anterior and posterior notopleural setae, broadened dorsally on anepisternum; brown vertical spot on posterior part of katepisternum; brown vertical spot or band on anepimeron; posteroventral brown spot on katatergite; elongate brown mark on anatergite; and brown spot on meron. Propleuron with setulae subequal or with 1-2 slightly stronger and darker than others. Medial scapular, presutural supra-alar, and acrostichal setae absent. Dorsocentral seta well developed, aligned slightly anterior to intra-alar seta. Katepisternal seta absent. Postpronotal, lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron without setulae posteroventrally. Katepimeron without setulae.

Legs. Male forefemur with ventral row of setae spinelike. Mid- and hindfemora with anteroventral and posteroventral rows of setae slightly differentiated.

Wing (Fig. 78). Largely orange brown except posterobasally. Cell bc, base of cell c, base of cell r_1, basal half of cell br, and area bordering base of vein Cu pale orange. Subcostal band orange brown, narrow in cell bm, broadly connected to discal band from costa to vein M. Discal and radial medial bands completely fused and broadly connected to subapical band in cells r_1 and r_{2+3}, and discal and subapical bands also connected posteriorly in cell cu_1, but separated medially by large oval hyaline area in cells r_{4+5} and dm. Subapical band broadly connected to completely fused anteroapical and posteroapical bands so that posterior third of wing entirely orange brown except for triangular hyaline area in cell m. Anterior margin of orange brown area sometimes paler from pterostigma to wing apex. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal 0.15 of vein Cu_1 setulose dorsally.

Abdomen. Tergites brown except lateral margin of syntergite 1+2 and more narrowly on tergites 3 and 4, and short narrow posteromedial yellow spots on syntergite 1+2, tergite 3, and sometimes tergite 4. Syntergite 1+2 with 1-2 well differentiated, preapical lateral setae. Male

terminalia: Epandrium mostly moderate brown. Lateral surstylus with short, blunt, subapical lobe. Glans membranous except long flat ventrobasal plate and dorsal margin of dorsal lobe; medial lobe relatively short; ventral lobe small. Female terminalia: Oviscape 1.1-1.2 mm long; entirely brown dorsally and ventrally. Eversible membrane (Fig. 111) with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously and broadly almost to aculeus. Aculeus (Fig. 124) 0.76-0.85 mm long, moderately stout, gradually tapering, 0.08 mm wide at narrowest; apex trilobed, lateral lobe 0.4-0.5 times as long as medial lobe, posteriorly directed. Spermatheca (Fig. 125) moderately long, 3-5 times as long as wide, cylindrical.

Material Examined

Holotype ♀ (USNM00213745), PANAMA: Panamá: Parque Nacional Chagres, Altos de Pacora, Desvio, McPhail trap 530, 3 Feb 1995, C.A. Korytkowski.

Paratypes: PANAMA: Panamá: Parque Nacional Chagres, Altos de Pacora, Desvio, McPhail trap 530, 17 Feb 1995, C.A. Korytkowski (1♀; USNM00213746); same, 23 Jun 1995 (1♂; USNM00213741).

Etymology

The name of this species is an adjective meaning having a window, referring to the oval hyaline spot between the discal and subapical bands.

Pseudophorellia flavicauda Norrbom, n. sp.

(Figs. 79, 138)

Diagnosis

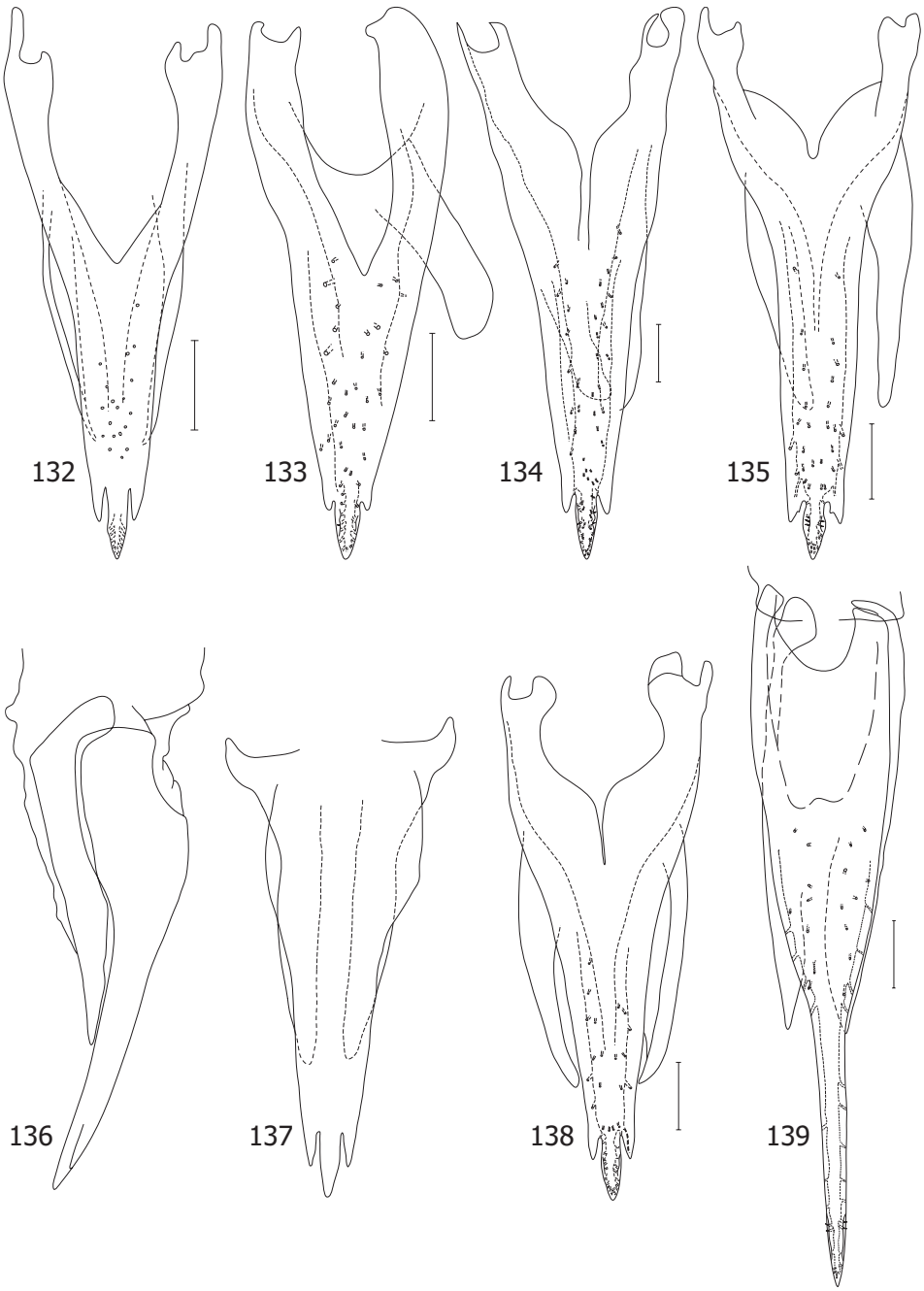
Pseudophorellia flavicauda differs from most species of *Pseudophorellia* in having the abdomen entirely without brown markings. The only species similar in this respect (*P. acrostichalis, P. distincta* and *P. flavida*) lack thoracic markings and/or have acrostichal setae, and further differ in wing pattern. In chaetotaxy, body markings and wing pattern, *P. flavicauda* is most similar to *P. setosa*, which differs in having female abdominal tergites 5 and 6 each with pair of large dark brown spots and the orbital plate yellow.

Description

Body length 7.3 mm. Mesonotum length 3.58 mm. Wing length 6.6 mm. Setae dark brown, setulae yellow to brown.

Head. Yellow except ocellar tubercle and U-shaped brown mark on vertex and orbital plate brown. Face entirely microtrichose. Frons with 3 frontal setae and 2 orbital setae. Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 3.2 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs 0.20-0.33 times as long as basal width of first flagellomere.

Thorax. Pattern of microtrichia in holotype somewhat obscured by dustlike debris, but apparently without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and yellow medial area of subscutellum, narrow lateral margin of mediotergite, broad posterior margin of anatergite, anterodorsally and posteroventrally on katatergite, anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite



Figs. 132-139. Aculeus, dorsal view except 136 lateral. 132. *Pseudophorellia anypsilon* (Costa Rica: 14 km S Cañas, USNM00052202). 133. *P. brevilobata* (holotype). 134. *P. confluens* (Venezuela: Rancho Grande, USNM00056120). 135. *P. decora* (holotype). 136-137. *P. enkerlini* (Mexico: Mazapa de Madera). 138. *P. flavicauda* (holotype). 139. *P. flavida* (holotype).

vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; lateral vitta on disk of scutellum, extended 0.67 distance to apex; subscutellum except medially; and all of mediotergite. Pleuron yellow (holotype with pale brown medial marks on anepisternum and katepisternum probably due to internal material and not true cuticular markings). Propleuron with 2 setulae slightly larger and darker than others. Medial scapular and acrostichal setae absent. Dorsocentral seta well developed, aligned slightly anterior to intra-alar seta. Katepisternal seta weaker than normal, but moderately large. Postpronotal, lateral scapular, 2 notopleural, presutural supra-alar, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron posteroventrally and katepimeron obscured by debris.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 79). With 6 dark brown or yellow bands. Costal cells, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow in cells c, sc, r_1 and part of br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly, partly yellow in cell r_1. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band partly yellow along costal margin; posteroapical band moderately broad, more than half as broad as anteroapical band, apex slightly expanded. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen. Yellow, without brown spots. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape 1.05 mm long, yellow, dorsally with broad, inverted-V shaped, diffuse brown area on posterior margin. Eversible membrane with dorsal spicules relatively small anteriorly, smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus. Aculeus (Fig. 138) 0.8 mm long, slender (0.07 mm at narrowest point), rapidly tapered on basal half and then nearly parallel-sided; apex trilobed, lateral lobe approximately one-third as long as medial lobe, of medium breadth, posteriorly directed.

Material Examined

Holotype ♀ (FSCA; USNM00052218), COLOMBIA: Cauca: Río Micay Lopez, approx. 90 m, 20 May 1977, M.A. Tidwell, Malaise trap.

Etymology

The name of this species is a noun in apposition in reference to its yellow abdomen.

Pseudophorellia flavida Norrbom, n. sp.

(Figs. 80, 139, 153)

Diagnosis

Pseudophorellia flavida is one of the most distinctive species of *Pseudophorellia*, differing from all other species in lacking brown thoracic markings and by its extremely long and slender aculeus tip. Other useful diagnostic characters include: posterior orbital, ocellar, postocellar, presutural supra-alar and acrostichal setae absent; postpronotal seta present; radial-medial band

broadened anteriorly and separated from discal and anteroapical bands in cell r_1 by yellow areas; vein Cu_1 without dorsal setulae; eversible membrane with separate anterior and posterior areas of dorsal spicules; and aculeus tip not trilobed.

Description

Body length 7.8 mm. Mesonotum length 2.54 mm. Wing length 7.0 mm. Setae dark brown, setulae mostly pale brown to brown.

Head. Yellow except ocellar tubercle and large genal spot brown. Face entirely microtrichose. Frons with 4 frontal setae and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial slightly broadened, but less than 0.33 times as wide as first flagellomere. Antenna yellow except most of arista pale brown; first flagellomere relatively short and broad, twice as long as wide, not reaching ventral facial margin; arista long pubescent, hairs 0.15-0.20 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, postsutural scutum lateral to supra-alar seta, all of subscutellum, narrowly along margin of mediotergite, all of anatergite, katatergite except small central bare spot, anteriorly on meron, and on metapleuron. Entirely yellow except mediotergite pale red brown. Propleuron with setulae subequal, none more than 1.5 times as long others. Medial scapular, presutural supra-alar, acrostichal and katepisternal setae absent. Dorsocentral seta well developed, aligned slightly anterior to intra-alar seta. Lateral scapular, postpronotal, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron posteroventrally and katepimeron without setulae.

Legs. Mid- and hindfemora without well differentiated anteroventral and posteroventral rows of setae in female.

Wing (Fig. 80). With 6 pale brown bands with slightly darker margins. Areas of cell r_1 between discal, radial-medial, and subapical bands yellow, but margins of bands distinct. Costal cells, base of cell r_1, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band connected anteriorly to discal band. Discal and radial-medial bands connected to form Y-shaped mark with distal branch covering crossvein R-M broadened anteriorly and similar in width to proximal branch; both narrowed along vein R_{4+5}. Discal band reaching posterior wing margin in middle of cell cu_1. Subapical band not connected posteriorly to discal band; interrupted at vein R_{4+5}; anterior part connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical and posteroapical bands similar to other bands in color, relatively broad, posteroapical band 0.67 times as broad as anteroapical band. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu setulose dorsally; vein Cu_1 bare.

Abdomen. Mostly yellow, with paired, short, broad, pale brown spots on posterior margins of syntergite 1+2 and tergites 3 and 4 in female. Syntergite 1+2 with 2-3 elongate, well differentiated, lateral setae in preapical to apical area; other tergites each with several outstanding lateral setae. Male terminalia: Unknown. Female terminalia: Oviscape 1.35 mm long, yellow. Eversible membrane dorsally with small oval anterior area of spicules almost as large as ventral spicules, with bare medial area, distal third with long oval area with minute spicules extending almost to aculeus. Aculeus (Fig. 139) 1.03 mm long, strongly tapered on

basal half to elongate, very slender (0.04 mm wide) apical half; apex simple, without lobes. Spermathecae (Fig. 153) ovoid, approximately 1.5 times as long as wide.

Comments

This is the only species of *Pseudophorellia* known from the Antilles.

Material Examined

Holotype ♀ (CMP; USNM00052223), DOMINICAN REPUBLIC: PEDERNALES: Las Abejas cloud forest, 38 km NNW Cabo Rojo, 18°09'N 71°38'W, 1160 m, 14 Jul 1987, R.L. Davidson and J.E. Rawlins. The holotype appears to have been originally preserved in fluid. Its scutum is slightly wrinkled and has some brown spots that seem to be due to underlying tissues rather than cuticular markings.

Etymology

The name of this species is an adjective referring to the yellow color of the areas in cell r_1 and the entirely yellow mesonotum, which lacks dark markings.

***Pseudophorellia fuscoapicata* Norrbom, n. sp.**
(Figs. 81, 126-127)

Diagnosis

Pseudophorellia fuscoapicata differs from all other species of *Pseudophorellia* except *P. fenestrata* in having the anteroapical and posteroapical wing bands completely fused, with no hyaline area touching the apex of vein M (Fig. 81). It is easily distinguished from *P. fenestrata*, which has more extensively connected wing bands and a single broad brown area on the scutellum, among other differences. *Pseudophorellia fuscoapicata* most closely resembles *P. antica*, *P. diffusa*, and *P. quadricincta*, which also have a vertical brown band on the anepisternum and except for their unfused apical bands are similar in wing pattern. Those species differ in having cells r_1 and r_{2+3} yellow between the discal and subapical bands.

Description

Body length 7.0 mm. Mesonotum length 2.85 mm. Wing length 6.6 mm. Setae dark brown, setulae yellow to brown.

Head. Yellow except brown ocellar tubercle. Face with antennal groove microtrichose; carina bare except possibly dorsally. Frons with 2-3 frontal setae and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except dorsal margin of first flagellomere pale brown and most of arista brown; first flagellomere moderately long, 2.8 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs 0.2 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, part of scutellum ventrally, most of subscutellum, lateral margin of mediotergite, posteroventral half of anatergite, anterodorsal and posteroventral areas of katatergite, and much of metapleuron. Yellow, with following dark brown markings or areas: complete submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; slightly curved, presutural sublateral

vitta, pale except spotlike posterior end, separated from postsutural vitta; transverse mark between posterior notopleural seta and postsutural supra-alar seta along posterior margin of transverse suture; spot on margin of notopleuron and scutum anterodorsal to posterior notopleural seta; lateral 0.3 of disk of scutellum (brown mark slightly narrower than medial yellow area), extended to apical seta and barely touching basal seta, not connected medially; subscutellum and mediotergite except narrowly medially; vertical band across middle of anepisternum aligned between anterior and posterior notopleural setae; isolated faint spot on posterior half of notopleuron, including posterior seta; anterior spot on katepisternum aligned with band on anepisternum; and large medial spot on anepimeron. Propleuron with 2 setulae slightly stronger and darker than others. Medial scapular and acrostichal setae absent. Presutural supra-alar seta weakly present on left side only (slightly longer than lateral scapular). Postpronotal seta weak but moderately long. Dorsocentral seta weak, half as long as and aligned with intra-alar seta. Katepisternal seta absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron with 1-2 setulae posteroventrally. Katepimeron with several setulae dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae poorly differentiated in female.

Wing (Fig. 81). With 5 dark brown or yellow bands. Cells bc and c, base of cell br, most of cell bm, and anterior margin of cell bcu yellow; cell br basal to subcostal band with brown medial streak. Subcostal band interrupted in cell c, yellow in cell sc and parts of cells r_1, br, and cu_1. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow but entirely brown and extended to costa. Subapical band broadly connected to discal band in cell cu_1 and posterior third of cell dm, fading to orange brown in cells r_1 and r_{2+3} where connected to anteroapical and posteroapical bands. Anteroapical and posteroapical bands entirely fused (no hyaline area touching apex of vein M) and entirely orange brown. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen. Mostly orange, with moderately large (ca. as long as wide), paired sublateral dark brown spot on syntergite 1+2, and broad, narrowly medially separated dark brown bands on tergites 3-6. Syntergite 1+2 with 1 well differentiated, preapical lateral seta. Male terminalia: unknown. Female terminalia: Oviscape 0.98 mm long, entirely brown. Eversible membrane with dorsal spicules in elongate oval, moderately large anteriorly, decreasing to minute posteriorly. Ventral spicules in V-shaped rows. Aculeus (Fig. 126) 0.65 mm long, rapidly tapered on basal half and then gradually tapered; apex trilobed, lateral lobe half as long as medial lobe, acute, posteriorly directed. Spermatheca (Fig. 127) moderately long, 3 times as long as wide, cylindrical, tapering apically.

Material Examined

Holotype ♀ (USNM00213742), PANAMA: Panamá: Parque Nacional Chagres, Cerro Jefe, Dona Julia, McPhail trap 528, 16 Sep 1994, C.A. Korytkowski.

Etymology

The name of this species is an adjective referring to the infuscated apex of the wing.

***Pseudophorellia hansoni* Norrbom, n. sp.**
(Figs. 64, 82-84, 140, 161)

Diagnosis

Pseudophorellia hansoni and *P. confluens* differ from all other species of *Pseudophorellia* by their wing patterns, in which the discal and subapical bands are fused to form a large dark area covering the medial third of the wing and both crossveins R-M and DM-Cu. *Pseudophorellia hansoni* differs from *P. confluens* in head markings (facial carina with brown vitta on ventral third or more, orbital plate yellow, paired brown occipital vitta broader on lateral sclerite), the postpronotal seta usually absent, and the hyaline areas of the wing more extensive (Figs. 82-84), in particular cell r_1 with a hyaline area, and that in the middle of cell m extended into cell r_{4+5}.

Description

Body length 7.8-9.5 mm. Mesonotum length 3.1-4.1 mm. Wing length 8.1-10.2 mm. Setae dark brown, setulae brown to dark brown.

Head. Yellow except pale to moderate brown genal spot ventral to eye and the following dark brown markings: median vitta on frons, from anterior margin to ocellar tubercle, broader anteriorly; vitta on ventral 0.33-0.67 of facial carina; and paired, straight or ventrally expanded vitta on margin of occipital sclerites (usually broader on lateral sclerite than on median sclerite), extending dorsally to vertical setae. Orbital plate yellow. Face with antennal groove microtrichose; carina bare except dorsal third or less. Frons with 2-4 frontal setae (usually 3), and usually 1 orbital seta (2 in 1 female from Zurquí, USNM00048625). Ocellar and postocellar setae absent. Parafacial narrow. Antenna mostly pale to moderate brown, basal fifth of arista, first flagellomere basally and ventrally, and sometimes scape and pedicel yellow; first flagellomere moderately long, 3.2-3.9 times as long as wide, reaching or almost reaching ventral facial margin; arista long pubescent, hairs 0.20-0.25 times as long as basal width of first flagellomere.

Thorax (Fig. 64). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, scutellum ventrally, subscutellum, broadly along margin of mediotergite and anatergite, and posteroventrally and usually anteroventrally on katatergite, anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: most of postpronotal lobe; complete submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; broad presutural sublateral vitta, extended to lateral margin of scutum and with medial margin concave; spot on notopleuron, usually including posterior notopleural seta and sometimes also anterior seta, connected to anepisternal vitta and often to lateral presutural vitta on scutum; transverse spot between posterior notopleural seta and postsutural supra-alar seta; sometimes a spot mesal to or including postalar seta, often paler than other markings; broad sublateral vitta on disk of scutellum, occasionally almost connected subapically (very narrowly touching in 1 male, Buenos Aires, INBio0003307602); extreme base of scutellum laterally, separated from vitta on disk by narrow paler brown or yellow area; subscutellum and mediotergite except medially; vertical band from anterior part of katepisternum, across middle of anepisternum aligned between anterior and posterior notopleural setae but closer to anterior seta, part on katepisternum sometimes broad or with posterior extension; large spot on anepimeron, sometimes extended onto posterior part of katepisternum or sometimes a separate spot on the

latter, occasionally connected to anterior band across pleuron to form large V-shaped mark; large spot on laterotergite above posterior spiracle; and large ventral spot on meron and often metapleuron. Propleuron with setulae subequal or with 1-2 stronger and darker, but no more than 1.5 times as long as others. Medial scapular, presutural supra-alar, and acrostichal setae absent. Postpronotal seta usually absent (small in 1 female, Zurquí, USNM00048482). Dorsocentral seta small to moderately developed (absent in 1 male, Zurquí, USNM00052190), aligned with or slightly posterior to intra-alar seta. Katepisternal seta weak or absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron with 1 or more setulae posteroventrally. Katepimeron with 1 to several setulae on dorsal margin.

Legs. Male forefemur with ventral row of setae spinelike. Mid- and hindfemora with anteroventral and posteroventral rows of setae slightly to well differentiated, especially posteroventral row on midfemur, and more so in male.

Wing (Fig. 82-84). With 4 dark brown or yellow bands. Cell bc, anterior margin of cell c, base of cell r_1, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow anteriorly. Discal and subapical bands broadly connected to form large mark in middle of wing that includes crossveins R-M and DM-Cu; this mark yellow anteriorly, dark brown posterior to vein R_{4+5} or middle of cells br and r_{4+5}, and incised to varying extent by proximal hyaline area in cell r_{2+3}. Posteroapical band often narrow, connected to the large medial spot on R_{4+5} or anteriorly in cell r_{4+5}, at least posterior half brown. Anteroapical band yellow, very broad, extended proximally along costa at least 0.67 distance from apex of vein R_{2+3} to that of vein R_1, occasionally (3 specimens, San Gerardo, Las Alturas, and Buenos Aires) connected along costa with the large medial spot, usually also connected or almost connected to large medial spot in middle of cell r_1 by slender band or spot (presumably radial-medial band), and/or along veins R_{2+3} or R_{4+5}, between them, or anteriorly in cell r_{2+3} (4 Zurquí, 2 Guanacaste specimens). Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal third to half of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with broad, longitudinally medial, dark brown bands on all tergites or mostly brown; syntergite 1+2 with narrow medial and apical yellow bands; tergites 3 and 4 and usually female tergite 5 with apical yellow band. Male tergite 5 entirely brown or occasionally with small apical, medial yellow spot. Female tergite 6 entirely brown. Lateral margins of tergites, especially syntergite 1+2, sometimes narrowly paler brown or yellow. Syntergite 1+2 with 1-4 (usually 2-3) well differentiated, preapical lateral setae. Male terminalia: Epandrium yellow to moderate brown. Lateral surstylus with broad subapical lobe. Glans membranous except long flat ventrobasal plate, dorsoapical margin of dorsal lobe, sclerites at junction of dorsal and medial lobes, and along parts of medial lobe; ventral lobe small. Female terminalia: Oviscape 1.08-1.20 mm long; mostly or entirely brown dorsally and ventrally, sometimes with diffuse yellow or pale brown medial, apical area. Eversible membrane with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus. Aculeus (Fig. 140) 0.60-0.75 mm long, stout, gradually tapering, 0.08 mm wide at narrowest point; apex trilobed, lateral lobe 0.33-0.38 times as long as medial lobe, posteriorly directed.

Egg (Fig. 161) (based on 2 eggs dissected from abdomen of female paratype INBio0003307604). 1.5 mm long, 0.5 mm wide, with small lobes on both ends directed at 30-

40° from longitudinal midline, that on anterior (micropyle) end 0.10-0.12 mm long, that on posterior end 0.06 mm long. Surface entirely strongly reticulated, densely so on lobes.

Comments

The specimens from the southern Pacific side of Costa Rica (San Gerardo, Buenos Aires, Las Alturas) have generally more extensive brown body markings.

Material Examined

Holotype ♀ (INBio; USNM00052189), COSTA RICA: San José: Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, Malaise trap, Mar 1992, P. Hanson.

Paratypes: COSTA RICA: Guanacaste: Tilarán, Tierras Morenas, Río San Lorenzo, 800 m, Malaise, 30 Sep-1 Nov 1993, G. Rodriguez, L_N_ 283950-424500 #2423 (1♀; INBio0003303683); Parque Nacional Guanacaste, Estación Cacao, SW side Volcan Cacao, 1000-1400 m, LN 323300 375700, Jul 1991, C. Chaves (1♂; INBio000322853); Volcan Cacao, 1400 m, 29 Mar 1997, M.A. Zumbado, L-N 323700, 376700, #46351 (1♀; INBio002563912). Puntarenas: Reserva Biol. Monteverde, Estación La Casona, 1520 m, E. Bello, Dec 1990, L-N 253250, 449700 (1♂; INBio000430334); Area de Conservación Arenal, Monteverde, Cerro Amigos, 1840 m, 29 Aug 1993, M.A. Zumbado, LS 250850_449250, #2342 (1♂; INBio0001937636); San Luis, Monteverde, Buen Amigo, 1000-1350 m, Nov 1995, Z. Fuentes, L-N 250850, 449250, #6456 (1♀; INBio0002357965); Buenos Aires, Sabanas Esperanza, 1840 m, Malaise trap, 24 Apr-6 Jun 1999, R. Villalobos (2♂1♀; INBio0003307602-04); San Vito, Estación Biol. Las Alturas, 8°57'N 82°50'W, 2100 m, May 1995, P. Hanson (1♀; USNM00048508). San José: Zurquí de Moravia, 10°03'N 84°01'W, 1600 m, Malaise trap, May 1992, P. Hanson (1♂; USNM00052190); same, Apr-May 1993 (1♀; USNM00048482); same, Jun 1995 (1♀; USNM00048497); same, Aug 1995 (1♀; UCRSJ; USNM00048625); same, Oct 1995 (1♂; USNM00050087); Río Savegre at San Gerardo de Dota, 9°33'N 83°48'W, 2200 m, 12 Jan 1996, C.W. Young (1♂; CMP; USNM00052191).

Etymology

This species is named for Paul Hanson, the collector of the holotype, whose Malaise trap samples provided numerous valuable specimens to this and many other systematic studies of Costa Rican insects.

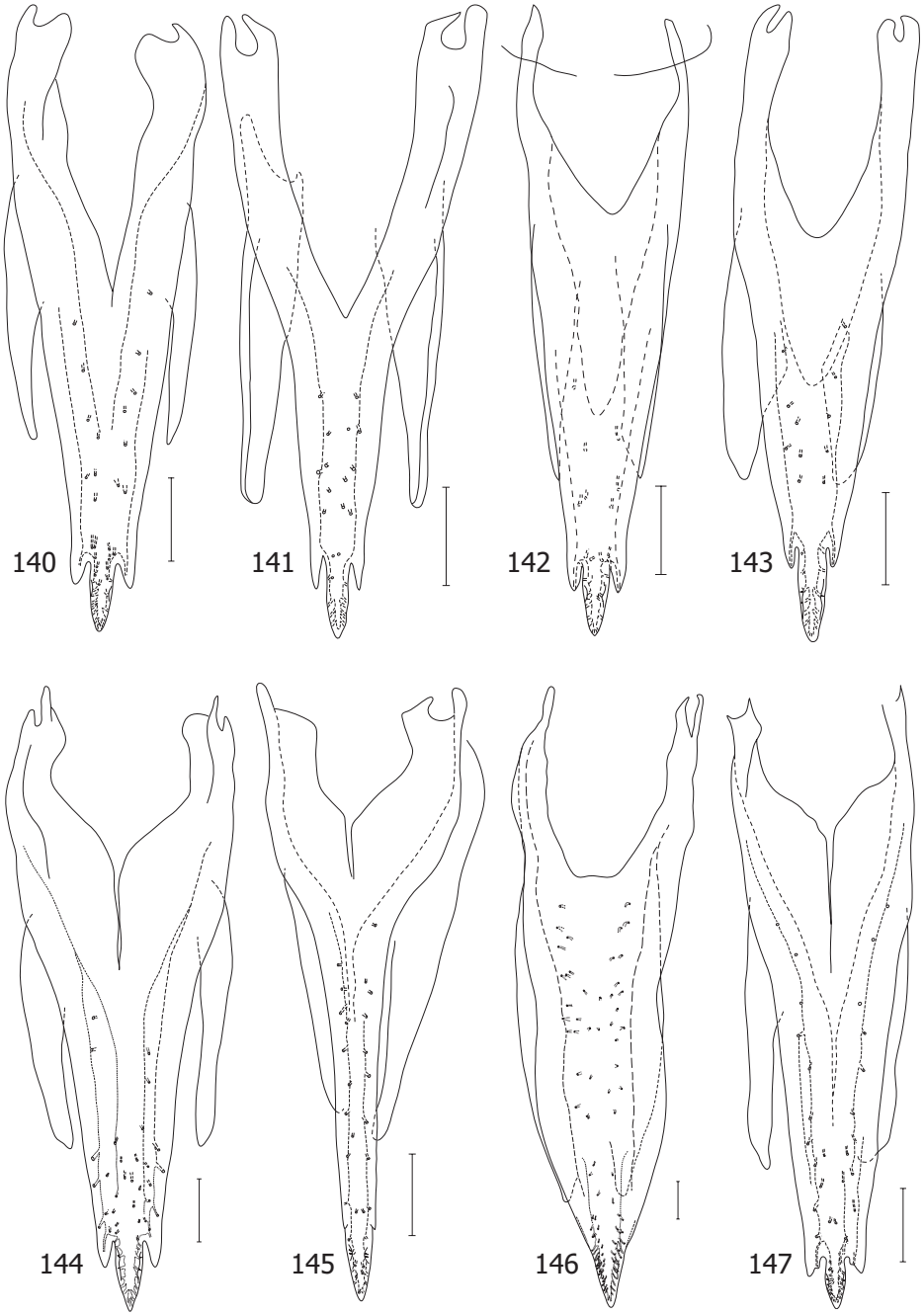
Pseudophorellia maculata Lima

(Fig. 85)

Pseudophorellia maculata Lima, 1934: 140; Lima, 1953: Fig. 4 [wing]; Foote, 1967: 39 [catalog]; Norrbom *et al*., 1999b: 196 [catalog].

Diagnosis

Pseudophorellia maculata resembles *P. enkerlini*, *P. reducta*, and *P. brevilobata* in lacking brown scutellar markings, and *P. reducta*, *P. marginata*, and *P. anypsilon* in wing pattern, particularly in having the radial-medial band and sometimes the anteroapical and posteroapical bands reduced. It differs from all four species in having a pair of dark brown spots on syntergite 1+2 and a vertical brown band on the anepisternum. It further differs from *P. enkerlini* in lacking posterior orbital and presutural supra-alar setae, from *P. reducta* and *P. marginata* in having slightly broader, posteriorly connected, brown scutal vittae, and from *P. brevilobata* in having the radial-medial band absent in cell r_{2+3} and the anteroapical and posteroapical bands absent.



Figs. 140-147. Aculeus, dorsal view. 140. *Pseudophorellia hansoni* (Costa Rica: Buenos Aires, INBio0003307604). 141. *P. marginata* (holotype). 142. *P. quadricincta* (Costa Rica: Estación Pitilla). 143. *P. reducta* (holotype). 144. *P. setosa* (holotype). 145. *P. stonei* (holotype). 146. *P. tica* (French Guiana: Mana R., USNM00052211). 147. *P. tristeza* (holotype).

Description

Body length 6 mm. Wing length 5.75 mm.

Head. Yellow except brown ocellar tubercle and paired triangular brown spot on orbital plate. Frons with 3 frontal setae and 1 orbital seta. Ocellar and postocellar setae absent. First flagellomere moderately long but not reaching ventral facial margin; arista distinctly pilose.

Thorax. Yellow, with following dark brown markings or areas: narrow submedial scutal vitta, weak at transverse suture, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected to submedial vitta posteriorly; large oval presutural sublateral spot; subscutellum; mediotergite; and medial vertical band on anepisternum. Scutellum entirely yellow. Postpronotal seta weak; Medial scapular, presutural supra-alar, acrostichal, and katepisternal setae absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, dorsocentral, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed.

Legs. Mid- and hindtibiae dark brown.

Wing (Fig. 85). With 4 dark brown bands. Cell br yellow basally with medial brown streak. Subcostal band yellow in cells sc, r_1, and part of br. Radial-medial band reduced to narrow mark bordering crossvein R-M, absent in cells r_1 and r_{2+3}; connected to discal band. Subapical band broadly connected to discal band in cell cu_1 and posterior half of cell dm. Anteroapical and posteroapical bands absent. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and more than basal half of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired, large, dark brown, longitudinally medial, sublateral spots on syntergite 1+2 and tergites 3-5; spots broader than long, except on male tergite 5. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Epandrium yellow. Lateral surstylus with subapical lobe. Female terminalia: Unknown.

Comments

Lima provided the following data for the holotype: ♂ (IOC), BRAZIL: Rio de Janeiro: Rio de Janeiro, Praia Vermelha, Escola Superior de Agricultura, in office, 9 Apr 1931, P. Alves (vial no. 755, wing slide 1343, genitalia slide 1852). It was not available for loan from the Instituto Oswaldo Cruz, but Jorge Anderson Guimarães kindly examined it during a visit and sent me via Roberto Zucchi sketches of its head, thorax and abdomen in dorsal view. The above description is based on those sketches and Lima's original description. I have presumed that the acrostichal seta is absent, rather than the dorsocentral seta, as stated by Lima.

Pseudophorellia marginata Norrbom, n. sp.

(Figs. 57, 86, 112, 128, 141)

Diagnosis

Pseudophorellia marginata differs from other species of *Pseudophorellia* by its dark scutellar markings, which are narrow and close to the margin of the disk. It is similar *to P. maculata* and *P. reducta* in having a reduced radial-medial band and often faint or incomplete anteroapical and posteroapical bands, and to *P. reducta* and *P. brevilobata* in having slender scutal vittae that are not connected posteriorly. All three of those species lack brown

scutellar markings, and at least *P. reducta* and *P. brevilobata* have a more gradually tapered aculeus with shorter lateral lobes, whereas *P. maculata* also differs in having a pair of brown spots on abdominal syntergite 1+2 and a brown vertical band on the anepisternum.

Description

Body length 6.5 mm. Mesonotum length 2.13-2.81 mm. Wing length 4.5-5.8 mm. Setae dark brown, setulae yellow to brown.

Head (Fig. 57). Yellow except ocellar tubercle brown, and paired oval pale brown mark on posterior part of orbital plate lateral to ocelli. Face microtrichose except small ventral area on carina. Frons with 3-4 frontal setae (1 weak in male) and 1-2 orbital setae (1 in male; 2 in 1 female; 1-2 in other female). Ocellar seta weak and shorter than length of ocellar tubercle (females) or absent (male); postocellar seta absent. Parafacial narrow. Antenna yellow except dorsal margin of first flagellomere and most of arista brown; first flagellomere moderately long, 3.25-3.40 times as long as wide, almost reaching ventral facial margin; arista long pubescent to short plumose, hairs 0.33-0.40 times as long as basal width of first flagellomere.

Thorax (Fig. 57). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, subscutellum, narrow lateral margin of mediotergite, ventral and posterior half of anatergite, posteroventrally on katatergite, and on metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, separated from (females) or connected to (male) submedial vitta posteriorly; diffuse, pale brown presutural sublateral spot near lateral margin of scutum (absent in holotype); slender, elongate lateral vitta on disk of scutellum, extended at least 0.75 length of scutellum or almost to apical seta; subscutellum and mediotergite except medially. Pleuron entirely yellow. Propleuron with 1-2 setulae slightly longer and stronger than others. Postpronotal, medial scapular, presutural supra-alar, and acrostichal setae absent. Dorsocentral seta well developed, aligned with or slightly anterior to intra-alar seta. Katepisternal seta absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron setulose posteroventrally. Katepimeron setulose anteriorly. Meron with several setulae on dorsal margin.

Legs. Forefemur with ventral row of setae not spinelike, not much stronger in male than in female. Mid- and hindfemora with anteroventral and posteroventral rows of setae poorly differentiated.

Wing (Fig. 86). With 5-6 dark brown or yellow bands. Cell bc, anterior margin of cell c, and area bordering base of vein Cu yellow. Basal half of cell br yellow with medial brown streak. Subcostal band yellow in cells c, sc and r_1. Radial-medial band reduced to narrow mark bordering crossvein R-M, connected to discal band. Subapical band broadly connected to discal band in cell cu_1 and sometimes slightly into cell dm, connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band mostly yellow; posteroapical band slender, less than half as broad as anteroapical band (holotype) or absent, apex not expanded. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal 0.75 of vein Cu_1 setulose dorsally.

Abdomen (Fig. 57). Yellow, with paired, large, dark brown, sublateral spots on tergites 3-5 in male and 3-6 in female; broader than long, except on male tergite 5 and female tergite 6.

Syntergite 1+2 with 1-2 elongate, well differentiated, preapical lateral setae. Male terminalia: Epandrium yellow. Lateral surstylus with very broad, hooklike, subapical lobe. Glans (exposed, but not dissected) membranous except long flat ventrobasal plate, dorsal and apical margins of dorsal lobe, and perhaps parts of medial lobe; ventral lobe small. Female terminalia: Oviscape 0.8 mm long, orange, dorsoapical half diffuse pale brown, especially laterally. Eversible membrane (Fig. 112) with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus. Ventral spicules in V-shaped rows, mostly similar in size. Aculeus (Figs. 128, 141) 0.63 mm long, slender, rapidly tapered on basal half and then nearly parallel-sided; apex trilobed, lateral lobe approximately 0.33 times as long as medial lobe, acute, posteriorly directed.

Material Examined

Holotype ♀ (at USNM, for eventual deposition in Ecuador; USNM00054726), ECUADOR: NAPO: Reserva Etnica Waorani, Onkone Gare Camp, 1 km S, Transect Ent., 0°39'10"S 76°26'W, 220 m, Insecticidal fogging, terra firme forest, Transect 4, Station 8, 5 Feb 1996, T.L. Erwin *et al*., Project MAXUS Lot 1438.

Paratypes: Same data as holotype except Transect 1, Station 2, 9 Jul 1995, Lot 1132 (1♂; USNM00056106); ECUADOR: NAPO: Reserva Etnica Waorani, Tiputini Biodiversity Station, 0°37'55"S 76°8'39"W, 216 m, Insecticidal fogging, terra firme forest, Transect 8, 6 Feb 1999, T.L. Erwin *et al*., Lot 2077 (1♀; USNM00054109).

Etymology

The name of this species is an adjective referring to the markings on its scutellum.

Pseudophorellia quadricincta Norrbom, n. sp.

(Figs. 87, 98, 142, 157)

Diagnosis

Pseudophorellia quadricincta is one of the few species of *Pseudophorellia* with complete transverse bands on the abdominal tergites. The other species with similar abdominal patterns have much different scutellar markings, with a single basomedial brown area (Figs. 61, 65), and/or much different wing patterns, with only a costal band (Figs. 92, 94) or with the discal and subapical bands broadly connected (Figs. 82-84). Of the species with the discal and subapical bands complete and separate except posteriorly, it is one of only three that also have the anepisternum with a vertical brown band and the normally hyaline areas in cells r_1 and r_{2+3} yellowish, with the margins of the transverse bands less distinct in these cells. *Pseudophorellia quadricincta* further differs from the other two species with these characters, *P. antica* and *P. diffusa*, in having the presutural sublateral vitta slender, complete, and nearly straight, the brown anepisternal band aligned closer to the anterior notopleural seta, and as indicated in the diagnosis sections for the other two species.

Description

Body length 6.7-7.0 mm. Mesonotum length 2.70-3.10 mm. Wing length 6.20-6.60 mm. Setae dark brown, setulae yellow to brown.

Head. Yellow except ocellar tubercle brown, orbital plate sometimes (paratype) with elongate pale brown mark, and occiput with small brown spot touching but mostly ventral to lateral

vertical seta. Face with antennal groove microtrichose; carina bare except dorsal margin. Frons with 3 frontal setae (holotype with 2 on left side) and 2 orbital setae. Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 2.7-3.1 times as long as wide, almost reaching ventral facial margin; arista long pubescent, hairs 0.20-0.25 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal and medial parts of subscutellum, ventral side of scutellum, lateral margin of mediotergite, posteroventral half of anatergite, posteroventral part of katatergite, and much of metapleuron. Yellow, with following dark brown markings or areas: complete submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; slender, complete, nearly straight presutural sublateral vitta; slender transverse spot between posterior notopleural seta and postsutural supra-alar seta along posterior margin of transverse suture; lateral fourth of disk of scutellum, extended to apical seta but not including basal seta, not connected medially; subscutellum and mediotergite except medially; vertical band from anterior part of katepisternum, across middle of anepisternum aligned slightly posterior to anterior notopleural seta, connected or almost connected to spot on posterior 0.55-0.75 of notopleuron, touching or narrowly including posterior seta, but not connected to sublateral vitta on scutum; spot on laterotergite above posterior spiracle (in paratype only); and ventral spot on meron. Propleuron with 1-2 setulae slightly stronger and darker than others. Medial scapular, presutural supra-alar, and acrostichal setae absent. Postpronotal seta weak (similar to lateral scapular seta) or absent. Dorsocentral seta moderately well developed, aligned with intra-alar seta. Katepisternal seta small and weak or absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron with 1-2 setulae posteroventrally. Katepimeron with several setulae dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 87). With 6 dark brown or yellow bands. Areas of cells r_1 and r_{2+3} between discal, radial-medial and subapical bands slightly diffuse yellow, obscuring borders of radial-medial, subapical, and anteroapical bands, which fade to yellow anteriorly (anteroapical band sometimes mostly yellow). Cell bc, cell c, especially base and anterior margin, and area bordering base of vein Cu yellow. Basal half of cell br with yellow and brown medial streak. Subcostal band interrupted in cell c, yellow in cell sc and parts of cells r_1 and br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrowing anteriorly, fading anteriorly in cell r_1. Subapical band broadly connected to discal band in cell cu_1, anteriorly fading to yellow in cells r_1 and r_{2+3}, connected to anteroapical and posteroapical bands in cells r_1, r_{2+3}, and sometimes r_{4+5}. Anteroapical band broadly to mostly yellow; posteroapical band brown, no more than half as broad as anteroapical band, not expanded distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen (Fig. 98). Yellow, with longitudinally medial dark brown bands on syntergite 1+2 and tergites 3-5. Female tergite 6 mostly brown, diffusely paler medially. Syntergite 1+2 with 1 well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia:

Oviscape 0.9 mm long, entirely brown. Eversible membrane with dorsal spicules in elongate oval, moderately large anteriorly but smaller than ventral spicules, decreasing to minute posteriorly. Ventral spicules in V-shaped rows. Aculeus (Fig. 142) 0.72 mm long, gradually tapered; apex trilobed, lateral lobe 0.35-0.47 times as long as medial lobe, acute, posteriorly directed. Spermatheca (Fig. 157) long cylindrical, 5-6 times as long as wide.

Material Examined

Holotype ♀ (USNM00213744), PANAMA: Panamá: Parque Nacional Chagres, Altos de Pacora, Desvio, McPhail trap 531, 3 Feb 1995, C.A. Korytkowski.

Paratype: COSTA RICA: Guanacaste: Parque Nacional Guanacaste, Estación Pitilla, 9 km S Santa Cecilia, 700 m, Malaise trap, Feb 1995, P. Rios (1♀; INBio0003307140).

Etymology

The name of this species is an adjective referring to the four complete bands on its abdomen.

***Pseudophorellia reducta*, n. sp.**

(Figs. 88, 103-104, 115, 129, 143, 154, 160)

Diagnosis

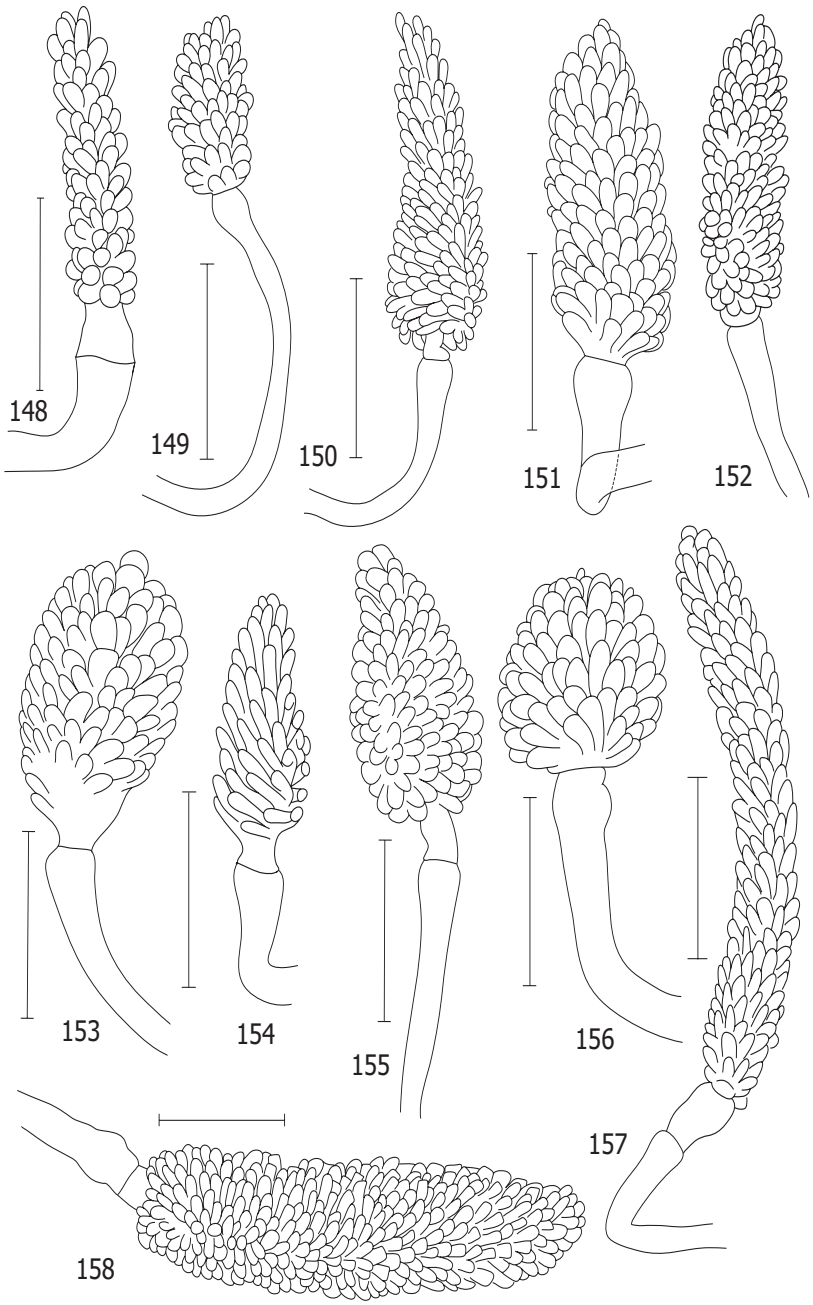
Pseudophorellia reducta resembles *P. enkerlini*, *P. maculata*, and *P. brevilobata* in lacking brown scutellar markings, and especially the latter species in scutal markings and aculeus shape (gradually tapered, lateral lobe of tip relatively small). It differs from *P. enkerlini* in lacking posterior orbital, postpronotal, and presutural supra-alar setae, from *P. maculata* in lacking a pair of brown spots on syntergite 1+2 and a brown vertical band on the anepisternum, and from both species in having the brown submedial and sublateral scutal vittae slender and not connected posteriorly. It differs from *P. brevilobata* in having the radial-medial band absent in cell r_{2+3} and the anteroapical and posteroapical bands incomplete, faint, or absent, and the eversible membrane with dorsal spicules gradually decreasing to minute distally and extending almost to the aculeus. In wing pattern and scutal markings *P. reducta* is similar *to P. marginata*, which differs in having slender scutellar vittae and a more slender aculeus with longer lateral lobes.

Description

Body length 6.5 mm. Mesonotum length 2.8-2.9 mm. Wing length 5.2-5.4 mm. Setae dark brown, setulae yellow to brown.

Head. Yellow except ocellar tubercle brown, and paired triangular brown mark on orbital plate. Face microtrichose except ventral third to half of carina. Frons with 3 frontal setae and 1 orbital seta. Ocellar seta weak and shorter than length of ocellar tubercle (male) or absent; postocellar seta absent. Parafacial narrow. Antenna yellow except dorsal margin of first flagellomere and most of arista brown; first flagellomere moderately long, 3.6 times as long as wide, almost reaching ventral facial margin; arista short plumose, hairs half as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, subscutellum, narrow lateral margin of mediotergite, ventral and posterior 0.67 of anatergite, posteroventrally on katatergite, and metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, separated from submedial vitta posteriorly; diffuse



Figs. 148-158. Spermatheca. 148. *Pseudophorellia acrostichalis* (Bolivia: Cerro Uchumachi, USNM00056060). 149. *P. anypsilon* (Costa Rica: 14 km S Cañas, USNM00052202). 150. *P. confluens* (Venezuela: Rancho Grande, USNM00056120). 151. *P. decora* (holotype). 152. *P. enkerlini* (Mexico: Mazapa de Madera). 153. *P. flavida* (holotype). 154. *P. reducta* (holotype). 155. *P. stonei* (holotype). 156. *P. tristeza* (holotype). 157. *P. quadricincta* (Costa Rica: Estación Pitilla). 158. *P. setosa* (holotype).

presutural sublateral spot near lateral margin of scutum; subscutellum and mediotergite except narrowly medially. Scutellum and pleuron entirely yellow. Propleuron with 1-2 setulae slightly longer and stronger than others. Postpronotal, medial scapular, presutural supra-alar, and acrostichal setae absent. Dorsocentral seta moderately to well developed, aligned slightly anterior to intra-alar seta. Katepisternal seta short and weak or absent. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron with several setulae posteroventrally. Katepimeron with 1-2 setulae anteriorly or dorsally.

Legs. Male forefemur with 2-3 short, stout spinelike ventral setae on distal half, much stronger than in female. Mid- and hindfemora with anteroventral and posteroventral rows of setae poorly differentiated.

Wing (Fig. 88). With 4-6 dark brown or yellow bands. Cell bc, base of cell c, and area bordering base of vein Cu yellow. Cell br yellow basally with medial brown streak. Subcostal band yellow in cells sc and r_1. Radial-medial band reduced to narrow mark bordering crossvein R-M and sometimes (male) narrow, faint mark in cell r_1; connected to discal band. Subapical band broadly connected to discal band in cell cu_1 and posterior third of cell dm, connected to anteroapical and posteroapical bands (if present) in cells r_1 and r_{2+3}. Anteroapical band slender and faint (male) or absent; posteroapical band slender and reduced to spots in cells r_{4+5} and m (male) or absent. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal 0.33-0.60 of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired, large, dark brown, longitudinally medial, sublateral spots on tergites 3-5 in male and 3-6 in female; spots generally broader than long, except on male tergite 5 and female tergite 6, more quadrate in male. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Epandrium yellow. Lateral surstylus with relatively long, slender, hooklike subapical lobe (Fig. 103-104). Glans membranous except long flat ventrobasal plate, dorsal and apical margins of dorsal lobe, sclerites at junction of dorsal and medial lobes, and parts of medial lobe; ventral lobe small. Female terminalia: Oviscape 1.0 mm long, orange, dorsally with diffuse pale brown spot posterolaterally. Eversible membrane (Fig. 115) with dorsal spicules moderate sized anteriorly, but smaller than ventral spicules, gradually decreasing to minute distally and extending continuously almost to aculeus. Ventral spicules in V-shaped rows, several medial, posterior rows smaller, more anterior and lateral rows narrowly interrupted anteriorly. Aculeus (Figs. 129, 143) 0.71 mm long, stout, basal part slightly tapering, distal half gradually tapering; apex trilobed, lateral lobe small, approximately 0.2 times as long as medial lobe, acute, posteriorly directed. Spermatheca (Fig. 154) short cylindrical, tapering apically.

Egg (Fig. 160). (based on 3 eggs dissected from abdomen of holotype): 1.2-1.3 mm long, 0.40-0.45 mm wide, with small lobes on both ends directed at 30-40° from longitudinal midline, that on anterior (micropyle) end recurved. Surface entirely strongly reticulated, densely so on lobes.

Material Examined

Holotype ♀ (INPA; USNM00052216), BRAZIL: AMAZONAS: [Manaus] C[ampus] Univ[ersidade Federal do Amazonas], 23 Dec 1979, J.A. Rafael.

Paratype: BRAZIL: AMAZONAS: Manaus, R. Campina, 2 Dec 1981, Rafael and Bindá (1♂; INPA; USNM00052215).

Etymology

The name of this species is an adjective referring to its reduced wing pattern.

***Pseudophorellia semilunata* Norrbom, n. sp.**

(Figs. 59, 61, 89, 99)

Diagnosis

Pseudophorellia semilunata differs from all other species of *Pseudophorellia* by its scutellum, which is yellow except for the single, large, semicircular brown mark on the disk, which extends medially two-thirds of the distance to the apex. *Pseudophorellia tica* and *P. vespiformis* have a smaller basomedial brown scutellar mark, and they also have a basal brown mark on the scutellum laterally, which is absent in *P. semilunata*.

Description

Body length 6.5-7.5 mm. Mesonotum length 2.8-3.3 mm. Wing length 6.2-6.8 mm. Setae dark brown, most setulae pale brown.

Head (Fig. 59). Mostly yellow; ocellar tubercle brown; occiput sometimes with small brown spot touching vertical setae; orbital plate sometimes largely diffuse, pale brown. Face microtrichose except ventral half to most of carina. Frons with 2 frontal setae (left side of holotype with posterior seta broken and a third weak seta anteriorly) and 1 orbital seta. Ocellar seta weak, shorter than length of ocellar tubercle. Postocellar seta absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 2.7-2.8 times as long as wide, but not reaching ventral facial margin; arista long pubescent, hairs almost 0.33 times as long as basal width of first flagellomere.

Thorax (Fig. 61). Without microtrichia except possibly part of propleuron (covered by debris in types), dorsal margin and medial area of subscutellum, lateral margin of mediotergite, posterior margin of anatergite, posteroventrally on katatergite, posteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: complete submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; small presutural sublateral spot, with narrow, curved, slightly to distinctly fainter brown vitta extending from it anteriorly; slender transverse mark between posterior notopleural seta and postsutural supra-alar seta along posterior margin of transverse suture, then turning posteriorly and extending to postalar seta, sometimes paler posterior to postsutural supra-alar seta; single, uninterrupted, large, semicircular to subtrapezoidal, brown mark on disk of scutellum, extended ca. 0.67 distance to apex; subscutellum except medially; and all of mediotergite except dorsomedially. Pleuron mostly yellow to orange. Scutellum yellow laterally. Propleuron with setulae subequal, none more than 1.5 times as long as others. Medial scapular, postpronotal, presutural supra-alar, and acrostichal setae absent. Katepisternal seta small and weak or absent. Dorsocentral seta moderately well developed, aligned slightly anterior to intra-alar seta. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron without setulae posteroventrally. Katepimeron with 1-2 setulae dorsally.

Legs. Male forefemur with 3-5 short, stout spinelike ventral setae on distal half, much stronger than in female. Mid- and hindfemora with anteroventral and posteroventral rows of setae moderately differentiated in male, weakly differentiated in female.

Wing (Fig. 89). With 6 dark brown bands. Areas of cells r_1 and r_{2+3} between discal, radial-medial and subapical bands diffuse yellow, but borders of bands distinct except subapical band anteriorly in cell r_1. Cells bc and c, basal half of cell br, and base and anterior margin of cell bcu yellow. Subcostal band interrupted in cell c. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band extending anteriorly at least to vein R_{2+3} but not reaching costa, sometimes paler in anterior half of cell r_{2+3} and cell r_1 or absent in cell r_1. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band paler brown bordering costa and distally; posteroapical band moderately broad, 0.50-0.67 times as broad as anteroapical band, nearly parallel-sided. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen (Fig. 99). Yellow, with brown markings on tergites 3-5 in male, 3-6 in female; tergite 3 with dark brown band, nearly interrupted medially; tergite 4 with pair of narrowly separated dark brown bands; tergite 5 with more widely separated pair of triangular dark brown marks; and tergite 6 of female with pair of smaller, paler brown, sublateral spots. Syntergite 1+2 with 1-2 elongate, well differentiated, preapical lateral setae. Male terminalia: Epandrium yellow. Lateral surstylus with short, triangular, subapical lobe. Glans membranous except long flat ventrobasal plate and dorsal margin of dorsal lobe; medial lobe relatively short; ventral lobe small. Female terminalia: Oviscape 0.92 mm long, mostly yellow, diffusely pale brown laterally on dorsal side. Eversible membrane with dorsal spicules subequal to ventral spicules. Aculeus missing on holotype. Spermathecae not dissected.

Material Examined

Holotype ♀ (USNM00215497), PANAMÁ: Panamá: Parque Nacional Chagres, Altos de Pacora, fogging canopy, 25 May 2002, C.A. Korytkowski.

Paratypes: PANAMA: Panamá: Parque Nacional Chagres, Altos de Pacora, Chayotera, McPhail trap 547, 17 Feb 1995, C.A. Korytkowski (1♂; MEUP; USNM00213752); Altos de Pacora, Lote H4, trap 573, 15 Sep 1995, C.A. Korytkowski (1♂; USNM00213751).

Etymology

The name of this species is an adjective referring to the half-moon shaped mark on the scutellum.

Pseudophorellia setosa Norrbom, n. sp.

(Figs. 90, 113-114, 144, 158)

Diagnosis

Pseudophorellia setosa is most similar to *P. flavicauda*, which has similar thoracic markings, wing pattern, and chaetotaxy, including postpronotal, presutural supra-alar, and 2 orbital setae present. It differs in having female abdominal tergites 5 and 6 each with a pair of large dark brown spots, the orbital plate without a brown spot, and the dorsal spicules of the eversible membrane more extensive.

Description

Body length 9.0 mm. Mesonotum length 4.37 mm. Wing length 8.6 mm. Setae dark brown, most setulae brown.

Head. Yellow except ocellar tubercle brown. Face entirely microtrichose. Frons with 4 frontal setae and 2 orbital setae. Ocellar and postocellar setae absent. Parafacial slightly broadened, half width of first flagellomere. Antenna yellow except most of arista brown; first flagellomere moderately long, 3 times as long as wide, almost reaching ventral facial margin; arista long pubescent, hairs almost 0.33 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and medial area of subscutellum, narrow lateral margin of mediotergite, anatergite except anteromedial area, anterodorsally and posteroventrally on katatergite, anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: narrow submedial scutal vitta, fading anteriorly and barely extended beyond transverse suture, not connected posteriorly to opposite vitta; postsutural sublateral vitta, not connected posteriorly to submedial vitta; large lateral vitta on disk of scutellum, extended almost to apex; subscutellum except small dorsomedial spot; and all of mediotergite. Pleuron entirely yellow. Propleuron with 1 setula slightly larger and darker than others. Medial scapular and acrostichal setae absent. Dorsocentral seta well developed, aligned slightly anterior to intra-alar seta. Katepisternal seta short, but well developed. Postpronotal, lateral scapular, 2 notopleural, presutural supra-alar, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron without setulae posteroventrally. Katepimeron setulose dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 90). With 6 dark brown or yellow bands. Cell bc, base and anterior margin of cell c, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band interrupted in cell c, yellow in cells sc, r_1 and part of br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly, partly yellow in cell r_1. Subapical band broadly connected to discal band in cell cu_1 and narrowly in cell dm, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band partly yellow in distal half; posteroapical band moderately broad, 0.67 times as broad as anteroapical band, not expanded distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal 0.4 of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired, dark brown spots only on tergites 5 and 6 in female; spot on tergite 5 extremely long and broad, subquadrate, covering all but narrow lateral, medial, and posterior yellow areas. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape 1.45 mm long, entirely dark brown. Eversible membrane (Fig. 113-114) with dorsal spicules relatively small anteriorly, smaller than ventral spicules, gradually decreasing to minute distally, extending continuously almost to aculeus and relatively extensively laterally. Ventral spicules in V-shaped rows, mostly well developed, more anterior and lateral rows narrowly interrupted anteriorly. Aculeus ((Fig. 144) 1.0 mm long, moderately broad (0.1 mm at narrowest point), rapidly tapered on basal half and then gradually tapered; apex trilobed, lateral lobe approximately four-tenths as long as medial lobe, acute, posteriorly directed. Spermatheca (Fig. 158) long cylindrical.

Material Examined

Holotype ♀ (USU; USNM00052220), COSTA RICA: Alajuela: 20 km S Upala, 6 Jan 1991, F.D. Parker.

Etymology

The name of this species is an adjective referring to its relatively extensive complement of setae compared to the most similar species of *Pseudophorellia*.

***Pseudophorellia stonei* Lima**

(Figs. 91, 145, 155)

Pseudophorellia stonei Lima, 1953: 140; Foote, 1967: 39 [catalog]; Norrbom *et al*., 1999b: 196 [catalog].

Diagnosis

Pseudophorellia stonei is most similar to *P. bipunctata*, which also has the radial-medial band complete, thoracic pleuron entirely yellow, scutellar brown vitta short, one orbital seta, postpronotal seta present, presutural supra-alar seta absent, and aculeus very slender. It differs in having the brown spots on female abdominal tergites 5 and 6 large and dark, the orbital plate with a brown mark, the aculeus tip with lateral lobe minute, and the eversible membrane with dorsal spicules gradually becoming minute distally, extending almost to aculeus.

Description

Body length 7.8 mm. Mesonotum length 3.45 mm. Wing length 6.8 mm. Setae dark brown, setulae yellow to pale brown.

Head. Yellow except ocellar tubercle and U-shaped brown mark on vertex and orbital plate brown. Face entirely microtrichose. Frons with 3 frontal setae and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 3 times as long as wide, almost reaching ventral facial margin; arista long pubescent, hairs almost 0.33 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and yellow medial area of subscutellum, narrow lateral margin of mediotergite, posterior half of anatergite, and anterodorsally and posteroventrally on katatergite, anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; small presutural sublateral spot; short, broad lateral vitta on disk of scutellum, extended to its midlength; subscutellum and mediotergite except narrowly medially, especially on latter. Pleuron entirely yellow. Propleuron with setulae subequal. Medial scapular, presutural supra-alar, and acrostichal setae absent. Dorsocentral seta well developed, aligned slightly anterior to intra-alar seta. Katepisternal seta weak. Postpronotal, lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron without setulae posteroventrally. Katepimeron with 1-2 setulae dorsally.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 91). With 6 dark brown or yellow bands. Costal cells, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band yellow in cells c, sc and part of br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band entirely yellow; posteroapical band paler distally, less than half as broad as anteroapical band, with apex slightly expanded. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen. Yellow, with paired, large, broad, dark brown spots only on tergites 5-6 in female. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape yellow, distal margin brown. Eversible membrane with dorsal spicules all much smaller than ventral spicules, gradually becoming minute distally, extending continuously almost to aculeus. Aculeus (Fig. 145) 0.78 mm long, very slender, 0.04 mm wide at base of lobes, trilobed, lateral lobe minute, posteriorly directed. Spermatheca relatively short, ovoid or tapered (Fig. 155; Lima 1953, Fig.4).

Material Examined

Holotype ♀ (USNM00052213), PANAMÁ: Barro Colorado Island, Apr-May 1942, J. Zetek, no. 4952 (both wings slide-mounted).

Comments

Most of the large setae on the holotype are missing, and the descriptions of their size is based on the size of the alveoli. I dissolved Lima's slide mount of the abdomen of the holotype to better view the shape of the aculeus. It is now preserved in glycerin. The abdomen was over cleared in the original dissection, and it is difficult to see its color pattern.

Pseudophorellia tica **Norrbom, n. sp.**

(Figs. 4, 65, 92, 116-117, 130, 146, 162-167)

Diagnosis

Pseudophorellia tica and *P. vespiformis* are very wasplike in appearance and differ from other *Pseudophorellia* species by all of the following characters: facial carina with sharp margins and entirely nonmicrotrichose; at most 1 frontal seta (0 in *P. vespiformis*); wing pattern with single, broad, costal band, but no transverse bands; scutum with submedial brown vitta ending posteriorly midway between transverse suture and posterior margin, and the latter with a large medial brown spot extending onto scutellum where its margin is convex; and abdomen petiolate. *Pseudophorellia tica* differs from *P. vespiformis* as follows: frons with at least partial brown or dark orange medial vitta; 1 frontal seta present; postpronotal lobe entirely yellow or rarely with lateral brown area; dorsocentral seta small to moderately developed (rarely absent), aligned 0.50-0.75 distance from supra-alar seta to intra-alar seta; costal band not covering posterior margin of cell br on apical half; and lateral surstylus with subapical lobe. The shape of the aculeus, relatively stout, mainly tapered only on distal third, with simple (not trilobed) apex is otherwise unknown within *Pseudophorellia*, although the female of *P. vespiformis* is not known.

Description

Body length 8.5-11.5 mm. Mesonotum length 2.4-4.0 mm. Wing length 7.7-10.0 mm. Setae dark brown, setulae yellowish, often brown on or bordering brown areas.

Head (Fig. 4). Yellow except following dark brown markings: broad, often rectangular or trapezoidal mark on anterior margin of frons, extending laterally to frontal seta; brown spot on anterior part of orbital plate, at least narrowly separated from medial vitta except in French Guianan female; narrow medial vitta, dark brown on ocellar tubercle, but often paler or orange and fading anteriorly, often connected to anterior mark; paired brown vitta on lateral margin of medial occipital sclerite, dorsally extending to or almost to medial vertical seta and slightly onto lateral occipital sclerite ventral to lateral vertical seta; often with narrow, often diffuse or paler band on ventral margin of facial carina. Face with antennal groove microtrichose; carina entirely bare, relatively broad and with distinct margins. Frons with 1 frontal seta, and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial 0.33-0.40 times as wide as first flagellomere. Antenna mostly brown, especially dorsal half of first flagellomere, or with all or parts of scape, pedicel, base of first flagellomere, and base of arista yellow; first flagellomere relatively long, 4.5-5.5 times as long as wide, extending beyond ventral facial margin; arista short plumose, hairs 0.5-0.6 times as long as basal width of first flagellomere.

Thorax (Fig. 65). Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, small postsutural area on scutum lateral to supra-alar seta, much of subscutellum, broadly along lateral margin of mediotergite, posterodorsal half to two-thirds of anatergite (entirely in Colombian male), posteroventral third to two-thirds of katatergite, anteriorly and ventrally on meron, on metapleuron, and sometimes ventrally on scutellum. Yellow, with following brown markings or areas (dark brown unless otherwise noted): broad submedial scutal vitta, usually interrupted at transverse suture (in 2 specimens narrowed but continuous) and ending posteriorly midway between transverse suture and posterior margin, not reaching level of dorsocentral seta, not connected to opposite vitta; large medial mark on posterior margin, elongate ovoid anteriorly, extending almost to or usually slightly beyond level of dorsocentral seta, posterolaterally with narrow extension along posterior margin; broad postsutural sublateral vitta, anteriorly extended almost to transverse suture, posteriorly narrowly connected to posterior medial mark; very broad presutural sublateral vitta, almost triangular, with medial margin slightly convex, connected posteriorly to spot on posterior part of notopleuron; vitta or spot, dark brown between transverse suture and supra-alar seta, usually paler posterior to supra-alar seta, curved and ending ventrolateral to postalar seta, vitta entirely absent in French Guianan female; small spot surrounding anterior notopleural seta, connected to anepisternal band; narrow spot surrounding posterior notopleural seta, connected to presutural sublateral vitta on scutum, and usually with narrow extension along lateral margin of scutum sometimes connected to anterior notopleural spot; broad basal, medial, posteriorly convex mark on disk of scutellum, continuous with posterior medial mark on scutum, extended posteriorly at most midway to apex; spot on scutellum laterally, ventral to or sometimes touching or including basal seta, but separated from basal mark on disk, margins often diffuse (especially in Colombian male, in which spots extend faintly but broadly along margin of side and disk almost to apical seta); lateral 0.2-0.4 of subscutellum and mediotergite; narrow ring bordering anterior spiracle; narrow vertical band on anepisternum aligned with anterior notopleural seta; vertical band or V-shaped mark on katepisternum, sometimes absent or

usually pale brown or orange; narrow vertical band on posterior part of anepimeron, not aligned with posterior part of V-shaped mark on katepisternum; spot on laterotergite above posterior spiracle, and another on meron. Postpronotal lobe entirely yellow, or rarely (French Guianan female) with lateral brown area. Propleuron usually with setulae subequal, at most 1 setula slightly stronger and darker but no more than 1.5 times as long as others. Medial scapular, postpronotal, presutural supra-alar, acrostichal, and katepisternal setae absent. Dorsocentral seta small to moderately developed (absent in French Guianan female), aligned 0.50-0.75 distance from supra-alar seta to intra-alar seta. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal and anepimeral setae well developed. Anepimeron posteroventrally and katepimeron setulose.

Legs. Male forefemur usually without differentiated ventral row of setae, rarely (Est. Agujas, INBio002478870) with 1-2 small spinelike setae. Mid- and hindfemora with anteroventral and posteroventral rows of setae slightly to moderately differentiated, posteroventral row on midfemur sometimes spinelike.

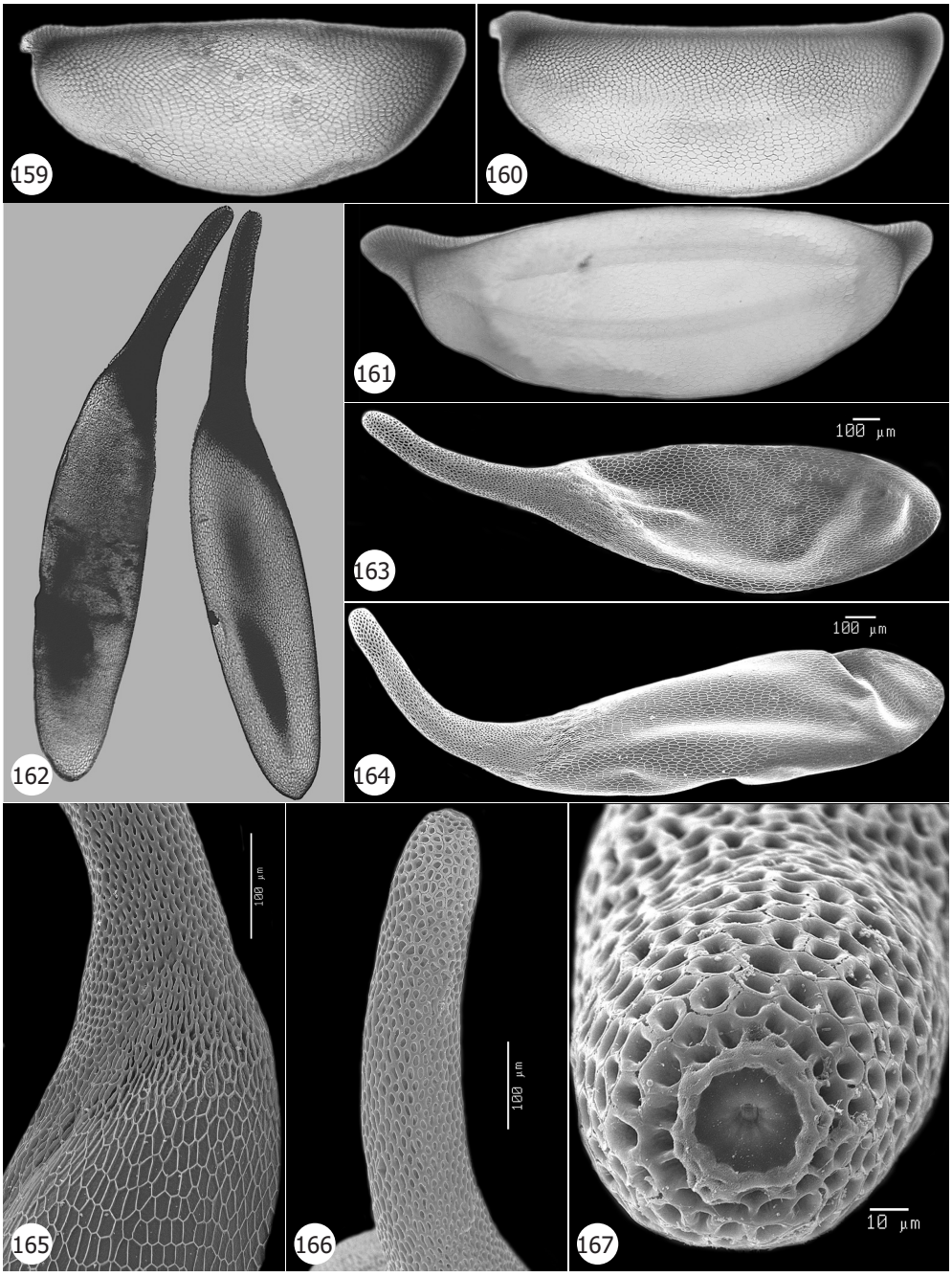
Wing (Fig. 92). With vespid-mimic pattern. Cell bc, extreme base of cell br, and area bordering base of vein Cu yellow. Cells c and sc, cell r_1 except narrow hyaline streak along base of vein Rs, cell r_{2+3}, anterior third to half of cell r_{4+5}, and cell br except posterior margin on apical half pale to moderate brown, forming broad costal band. Posterior half of wing hyaline except small diffuse spot basally in cell cu_1 along veins Cu_2 and A_1+Cu_2. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal 0.1-0.3 of vein Cu_1 setulose dorsally (French Guianan female and Est. Agujas male, INBio0003307519, with only single seta on vein Cu_1).

Abdomen. Petiolate; syntergite 1+2 narrow and parallel-sided basally. Tergites with broad brown bands covering all but much of base of syntergite 1+2, and apical margins of syntergite 1+2, tergites 3 and 4, usually tergite 5, and sometimes female tergite 6. Syntergite 1+2 with 1 (rarely 2) well differentiated, preapical lateral setae. Male terminalia: Epandrium mostly pale to dark brown. Lateral surstylus with tab-shaped or slightly rounded subapical lobe, about as long as wide. Glans membranous except long flat ventrobasal plate, dorsal and apical margins of dorsal lobe, sclerites at junction of dorsal and medial lobes, and dorsal and apical margins of medial lobe; ventral lobe small. Female terminalia: Oviscape 0.85-1.00 mm long; entirely brown dorsally and ventrally. Eversible membrane (Fig. 116-117) with dorsal spicules in oval pattern, ending well before base of aculeus, small anteriorly and laterally, increasing to almost as large as ventrolateral spicules near distal end of pattern. Ventrally with medial bare area, broadening distally. Anteriormost spicules medium sized, in irregular oblique rows, decreasing to minute distally, but sublaterally (extending onto dorsal side) with group of very large spicules. Aculeus (Figs. 130, 146) 0.6-0.8 mm long, stout, slightly narrowed basal to midlength, then broadened, gradually tapering on distal third; apex simple, acute. Spermatheca cylindrical.

Egg (Figs. 162-167) (based on 3 eggs dissected from abdomen of female paratype USNM00052207). 2.00-2.70 mm long, 0.50-0.58 mm wide, with large lobe on anterior (micropyle) end, 0.65-1.00 mm long, directed at approximately 30° from longitudinal midline. Posterior end rounded, without lobe. Surface entirely strongly reticulated, densely so on lobe.

Comments

The yellow markings on the abdomen are generally less extensive in the Costa Rican specimens from southern Puntarenas. The male from Colombia differs from the other specimens in



Figs. 159-167. Egg. 159. *Pseudophorellia anypsilon* (Costa Rica: 14 km S Cañas, USNM00052202). 160. *P. reducta* (holotype). 161. *P. hansoni* (Costa Rica: Buenos Aires, INBIO0003307604). 162-167. *P. tica* (Costa Rica: 20 km S Upala, USNM00052207). 159-164. Entire egg. 165-166. Chorion sculpture. 167. Micropyle. 159-162. Photo. 163-167. SEM.

extent of anatergite microtrichia and scutellum color, and the female from French Guiana differs in lacking the dorsocentral seta and in several head and thoracic markings, but its aculeus is very similar to those of the Costa Rican females examined.

Material Examined

Holotype ♀ (INBio002029943), COSTA RICA: Guanacaste: Parque Nacional Guanacaste, 9 km S Santa Cecilia, Estación Pitilla, LN 330200 380200, 700 m, Aug 1994, C. Moraga.

Paratypes: COLOMBIA: Cauca: Río Micay Lopez, 90 m, Malaise trap, 25 Aug 1977, M.A. Tidwell (1♂; FSCA; USNM00052210). COSTA RICA: Alajuela: R.F. San Ramón, Río San Lorencito, 5 km N of Colonia Palmareña, LN 244500 470700, 900 m, 13-18 Jun 1993, I Curso Scarabeidae (1♂; INBio001365508); Upala, 20 km S, 28 Oct 1990, F.D. Parker (1♀; USU; USNM00052208); same, 5 Feb 1991 (1♀; USNM00052207); same, 12 Feb-5 Mar 1991 (1♀; USNM00052206); same, 12-30 Apr 1991 (1♀; USU; USNM00052205); same, 30 Apr-6 May 1991 (1♂; USNM00052204). Guanacaste: 12 km SE La Cruz, Cerro El Hacha, LN 329200 368000, 300 m, May 1988, M. Espinoza (1♂; INBio000661680); Parque Nacional Guanacaste, 9 km S Santa Cecilia, Estación Pitilla, 5°25'40"W, 700 m, Aug 1988, GNP Biodiversity Survey (2♂; INBio001054134, INBio001054141); Estación Pitilla, Sendero Nacho, LN 330200 380200, 700 m, Malaise trap, Feb 1991, C. Moraga (1♂; USNM; INBio0003307340); Estación Pitilla, LN 330200 380200, 700 m, May 1990, II curso Parataxon. (1♂; USNM; INBio000241908). Limón: Sector Cerro Cocori, finca de E. Rojas, LN 286000 567500, 150 m, 26 Mar-24 Apr 1992, F.A. Quesada (1♂; USNM; INBio000802025). Puntarenas: Cerro Rincon, 8°31'N 83º28'W, 10 m, Malaise trap, Jan 1991, P. Hanson (1♀; USNM00052209); Parque Nacional Corcovado, Estación Agujas, Los Charcos, LS 275500 523500, 600-745 m, Malaise trap, 15 Jun-15 Jul 1999, J. Azofeifa (1♂; USNM; INBio0003307606); same, LS 276350 523500, 600 m, Malaise trap, 17 Apr-16 May 1999, J. Azofeifa (1♂; INBio0003307519); Estación Agujas, Sendero Purruja, LS 276750 526550, 300 m, 20-24 Jun 1996, A. Azofeifa (1♂; INBio002474870); Golfito, 2 Aug 1957, A. Menke (1♀; LACM; USNM00056544). FRENCH GUIANA: Mana River, Jun 1917, Acc. 6008 (1♀; CMP; USNM00052211). PANAMÁ: Panamá: Parque Nacional Chagres, Altos de Pacora, McPhail trap, 26 Apr 1999, C.A. Korytkowski (1♀; MEUP; USNM00214862); Altos de Pacora, Desvio, trap 554, 16 Mar 1995, C.A. Korytkowski (1♀; MEUP); same, McPhail trap 532, 6 Jan 1995, (1♀; MEUP); Altos de Pacora, Lote H4, 23 Jun 1995, C.A. Korytkowski (1♀; MEUP; USNM00214863); same, trap 556, 20 Jan 1995 (1♀; MEUP); same, trap 551, 26 Jul 1996 (1♀; MEUP); Altos de Pacora, Villa Myrtha, trap 563, 17 Feb 1995, C.A. Korytkowski (1♀; USNM00213735); same, trap 549, 26 May 1995 (1♀; USNM00213739); same, trap 550, 11 Oct 1996 (1♀; MEUP) (1♀; USNM00213750).

Etymology

The name of this species is a noun in apposition used in Costa Rica to refer to inhabitants of the country.

Pseudophorellia tristeza Norrbom, n. sp.

(Figs. 93, 100, 118-119, 131, 147, 156)

Diagnosis

Pseudophorellia tristeza is most similar to *P. decora*, which also has a small tooth on the lateral lobe of the aculeus tip, the orbital plate yellow, 1 orbital seta, postpronotal seta present, long brown

scutellar vitta, anepisternum yellow, and complete radial-medial band. It differs by: presutural supra-alar seta absent; aculeus broader, less rapidly tapered; and abdominal tergites 3 and 4 each with a pair of large dark brown spots.

Description

Body length 7.8 mm. Mesonotum length 3.54 mm. Wing length 7.2 mm. Setae dark brown, setulae yellow to pale brown.

Head. Yellow except ocellar tubercle brown. Face entirely microtrichose. Frons with 3 frontal setae and 1 orbital seta. Ocellar and postocellar setae absent. Parafacial narrow. Antenna yellow except most of arista brown; first flagellomere moderately long, 3.25 times as long as wide, almost reaching ventral facial margin; arista long pubescent, hairs 0.33 times as long as basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, dorsal margin and yellow medial area of subscutellum, narrow lateral margin of mediotergite, posterodorsal half of anatergite, anterodorsally and posteroventrally on katatergite, anteriorly on meron, and on metapleuron. Yellow, with following dark brown markings or areas: complete, narrow submedial scutal vitta, not connected posteriorly to opposite vitta; postsutural sublateral vitta, connected posteriorly to submedial vitta; small presutural sublateral spot; lateral vitta on disk of scutellum, extended 0.67 distance to apex; subscutellum except medially; and all of mediotergite. Pleuron entirely yellow. Propleuron with 1 setula slightly larger and darker than others. Medial scapular, presutural supra-alar, and acrostichal setae absent. Dorsocentral seta well developed, aligned slightly posterior to intra-alar seta. Katepisternal seta weak. Postpronotal, lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar, 1 anepisternal, and anepimeral setae well developed. Anepimeron with 1-2 setulae posteroventrally. Katepimeron setulose on anterior half.

Legs. Mid- and hindfemora with anteroventral and posteroventral rows of setae weakly differentiated in female.

Wing (Fig. 93). With 6 dark brown or yellow bands. Cell bc, base and narrow anterior margin of cell c, basal half of cell br, and area bordering base of vein Cu yellow. Subcostal band interrupted in cell c, yellow in cells sc, r_1 and part of br. Discal and radial-medial bands connected to form Y-shaped mark with much narrower distal branch covering crossvein R-M; radial-medial band narrow anteriorly, partly yellow in cell r_1. Subapical band broadly connected to discal band in cell cu_1, and connected to anteroapical and posteroapical bands in cells r_1 and r_{2+3}. Anteroapical band entirely yellow; posteroapical band half as broad as anteroapical band, expanded distally. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu and basal half of vein Cu_1 setulose dorsally.

Abdomen (Fig. 100). Yellow, with paired, large, broad, dark brown spots on tergites 3-6 in female; those on tergites 3 and 4 shorter and slightly paler, but aligned with those on tergites 5 and 6. Syntergite 1+2 with 1 elongate, well differentiated, preapical lateral seta. Male terminalia: Unknown. Female terminalia: Oviscape 1.35 mm long, yellow, diffusely pale brown medially on distal half of dorsal side. Eversible membrane (Fig. 118-119) with dorsal spicules

moderate sized anteriorly, but smaller than ventral spicules, decreasing to minute distally but ending well before aculeus. Ventral spicules in V-shaped rows, smaller anteriorly, but otherwise mostly similar in size. Aculeus (Fig. 131, 147) 0.9 mm long, moderately broad (0.09 mm at narrowest point), gradually tapered; apex trilobed, lateral lobe almost one-third as long as medial lobe, relatively stout, with minute tooth on medial side, posteriorly directed. Spermatheca (Fig. 156) short, subspherical.

Material Examined

Holotype ♀ (AMNH; USNM00052214), SURINAME: Raleigh Vallen-Voltzberg Res., Voltzberg Camp, 90 m, 29 Jan-13 Feb 1982, J. Carpenter and D. Trail.

Etymology

The name of this species, which I was describing the morning of September 11, 2001, is dedicated to all victims of senseless violence. The name is a Spanish noun in apposition meaning sadness.

***Pseudophorellia vespiformis* Norrbom, n. sp.**

(Figs. 94, 105-106)

Diagnosis

Pseudophorellia vespiformis and *P. tica* are very wasplike in appearance and can be easily recognized from other *Pseudophorellia* species by all of the following characters: facial carina with sharp margins and entirely nonmicrotrichose; at most 1 frontal seta (0 in *P. vespiformis*); wing pattern with single, broad, costal band, but no transverse bands; scutum with submedial brown vitta ending posteriorly midway between transverse suture and posterior margin, and the posterior margin with a large medial brown spot extending onto scutellum where its margin is convex; and abdomen petiolate. *Pseudophorellia vespiformis* differs from *P. tica* as follows: frons without medial brown vitta; frontal setae absent; postpronotal lobe mostly brown; dorsocentral seta minute, aligned with intra-alar seta; anepimeral seta weak; costal band covering all of cell br; and lateral surstylus without subapical lobe.

Description

Body length 12.5 mm. Mesonotum length 4.0 mm. Wing length 12.0 mm. Setae dark red brown, setulae yellowish to brown.

Head. Yellow to pale brown except following markings: broad, irregular dark orange and brown transverse mark on anterior margin of frons; somewhat H-shaped dark brown mark on ocellar tubercle, orbital plate, vertex, and lateral margin of medial occipital sclerite, extending slightly onto lateral occipital sclerite ventral to lateral vertical seta; red brown band on ventral margin of facial carina; and diffusely moderate brown posterior part of postgena. Face with antennal groove microtrichose; carina entirely bare, relatively broad and with distinct margins. Frons without frontal setae, with 1 orbital seta. Ocellar and postocellar setae absent. Parafacial relatively narrow. Antenna mostly brown, except scape ventrally, base of first flagellomere, and base of arista yellow; first flagellomere relatively long, 5.5 times as long as wide, extending beyond ventral facial margin; arista short plumose, hairs slightly more than half basal width of first flagellomere.

Thorax. Without microtrichia except part of propleuron and narrow adjacent area of anepisternum, small postsutural area on scutum lateral to supra-alar seta, all of subscutellum and mediotergite, part of ventral side of scutellum, anatergite except anterior bare area, posterodorsal half of katatergite, anteriorly and ventrally on meron, and on metapleuron. Yellow and orange, with following brown markings or areas (dark brown unless otherwise noted): postpronotal lobe; broad submedial scutal vitta, narrowed at transverse suture and ending posteriorly midway between transverse suture and posterior margin, not connected to opposite vitta; large medial mark on posterior margin, elongate triangular anteriorly, extending beyond posterior end of submedial vitta but not connected to it, posterolaterally with narrow extension along posterior margin; broad postsutural sublateral vitta, anteriorly extended almost to transverse suture and very narrowly separated from submedial vitta, posteriorly connected to posterior medial mark; very broad presutural sublateral vitta, almost triangular, with medial margin slightly convex, connected posteriorly to V-shaped mark on notopleuron; spot between posterior notopleural seta and postsutural supra-alar seta along posterior margin of transverse suture; inverted V-shaped mark surrounding anterior and posterior notopleural setae in separate forks, connected to sublateral scutal vitta; broad basal, medial, posteriorly convex mark on disk of scutellum, continuous with posterior medial mark on scutum, extended posteriorly 0.25 distance to apex; spot on basal third of scutellum laterally, touching basal seta but separated from basal mark on disk; rest of scutellum diffuse red brown, apically fading to yellow; subscutellum except narrowly yellow medially; mediotergite mostly red brown, darker laterally; propleuron mostly red brown; narrow ring bordering anterior spiracle; broad, diffusely margined, vertical band on anepisternum aligned with anterior notopleural seta, and smaller band on posterior margin; vertical V-shaped mark on katepisternum, anterior fork larger; broad vertical band on posterior 0.67 of anepimeron, not aligned with posterior part of V-shaped mark on katepisternum; all of anatergite and posterior spot on laterotergite dorsal to posterior spiracle; and posterior spot on meron. Propleuron with setulae subequal. Medial scapular, postpronotal, presutural supra-alar, acrostichal and katepisternal setae absent. Dorsocentral seta minute, barely differentiated from setulae, aligned slightly anterior to intra-alar seta. Lateral scapular, 2 notopleural, postsutural supra-alar, intra-alar, postalar, basal and apical scutellar setae well developed. One anepisternal seta (broken in holotype, but from size of base probably small to moderately developed). Anepimeral seta weak, about half as long as notopleural setae. Anepimeron setulose posteroventrally. Katepimeron setulose on anterior half.

Legs. Male forefemur with ventral row of setae very weakly differentiated. Male midfemur with 1 short stout posteroventral seta, and hindfemur with 0-1 anteroventral seta (1 present on left side only in holotype), but otherwise anteroventral and posteroventral rows of setae weakly differentiated.

Wing (Fig. 94). With vespid-mimic pattern. Cell bc, extreme base of cell br, and area bordering base of vein Cu yellow. Base of cell c, all of cells sc and r_1 except narrow hyaline streak along base of vein Rs, all of cell r_{2+3}, anterior third to half of cell r_{4+5}, and all of cell br pale brown, forming broad costal band, fading anteriorly along margin in cells r_1 and r_{2+3}. Posterior half of wing hyaline except small diffuse spot basally in cell cu_1 along veins Cu_2 and A_1+Cu_2. Vein R_{4+5} densely setulose almost to apex dorsally. Basal section of vein Cu setulose dorsally; vein Cu_1 nonsetulose.

Abdomen. Petiolate; syntergite 1+2 narrow and parallel-sided basally. Tergites dark red brown except narrow yellow band on apical margin of syntergite 1+2. Syntergite 1+2 with 1 well

differentiated, preapical lateral seta. Male terminalia: Epandrium mostly pale to dark brown. Lateral surstylus without subapical lobe (Figs. 105-106). Glans mostly membranous except long flat ventrobasal plate, dorsoapical margin of dorsal lobe, and sclerites at junction of dorsal and medial lobes (perhaps also parts of medial lobe; glans is slightly over cleared and shriveled in holotype). Female terminalia: Unknown.

Material Examined

Holotype ♂ (IZAM; USNM00052212), VENEZUELA: Barinas: La Chimenea, 1500 m, 21-24 Jun 1974, J.L. Garcia and J. Salcedo.

Etymology

The name of this species is an adjective referring to its wasplike appearance.

PHYLOGENETIC RELATIONSHIPS AND CLASSIFICATION

The phylogenetic relationships and classification of *Molynocoelia* and *Pseudophorellia* have received scant attention in the previous tephritid literature. Foote (1980) was unable to classify *Pseudophorellia* further than belonging to the Trypetinae, and Norrbom *et al*. (1999a) treated both it and *Molynocoelia* as unplaced genera of Trypetinae. Foote (1980) suggested that *Molynocoelia* may belong in the Gastrozonini (Dacinae), but other than having a plumose arista it seems to have little in common with that group, and it lacks the synapomorphies hypothesized by Korneyev (1999) for the Dacinae (the proctiger is not large; at least *M. lutea* and *M. grossa* have three spermathecae, whereas Dacinae have two).

The main objective of the cladistic analysis conducted in this study was to test the monophyly of each of the genera included in the *Molynocoelia* group (*Alujamyia*, *Molynocoelia*, and *Pseudophorellia*) and to investigate the relationships among their species. In order to determine character polarities, the relationship of the *Molynocoelia* group to other genera of Trypetinae was also investigated.

The *Molynocoelia* group may be most closely related to the Paleotropical genera *Callistomyia* Bezzi and *Alincocallistomyia* Hardy. All five genera share a similar pattern of spicules on the eversible membrane and usually have setulae on the katepimeron or dorsal margin of the meron (see below). The sister group of this clade is unknown. One possibility is the Toxotrypanini (sensu Norrbom *et al*. 1999a), which includes the Neotropical genera *Hexachaeta* Loew, *Anastrepha* Schiner, and *Toxotrypana* Gerstaecker. Evidence for the close relationship of the *Molynocoelia* group to the Toxotrypanini includes certain wing pattern elements common to many but not all species of most of the included genera, particularly the presence of a radial-medial band usually connected to the discal band and presence of anteroapical and posteroapical bands. Their absence probably is secondary in *Toxotrypana*, which is closely related to *Anastrepha* based on other characters, and in the species of *Anastrepha* and *Pseudophorellia* with vespid mimic or other derived patterns. Considering the high degree of convergence in the wing patterns of unrelated Tephritoidea with such "spider-mimic" patterns, however, leaves some doubt about the reliability of these characters for resolving phylogeny at this level. An alternative hypothesis of relationship is that the *Molynocoelia* group, *Callistomyia* and *Alincocallistomyia* are more closely related to the Adramini, based on the usual presence of setulae on the katepimeron, a presumably apomorphic state within the Trypetinae. More extensive study of the Adramini and of the distribution of this

character in other Tephritidae is needed to further test that hypothesis, but that was beyond the scope of this study. Katepimeral setulae are lacking in the Toxotrypanini and all of the other Neotropical genera of Trypetinae examined and in the species of Phytalmiinae in the USNM, whereas they are present in most species of Adramini studied (11 of the 26 genera were examined).

The classification by Korneyev (1999) of several of the above taxa that may be related to the *Molynocoelia* group as well as the character support for that classification is also pertinent to this discussion. These characters were investigated in the *Molynocoelia* group, but their analysis is inconclusive. Korneyev (1999) placed *Hexachaeta*, *Callistomyia*, and *Alincocallistomyia* in the tribe Hexachaetini, whereas Norrbom *et al*. (1999a) grouped *Hexachaeta*, *Anastrepha*, and *Toxotrypana* in the Toxotrypanini, with the inclusion of *Hexachaeta* based mainly on the molecular analysis of Han and McPheron (1997). Korneyev (1999) also considered the Hexachaetini to be possibly related to the Xarnutini (*Xarnuta* Walker and *Platystomopsis* Hering) based mainly on the following characters: 1) 3 or more pairs of scutellar setae in the ground plan (symplesiomorphy); 2) 2 midtibial spurs (symplesiomorphy); 3) well developed black proepisternal seta (synapomorphy, but absent in *Alincocallistomyia*); 4) anterior surface of midfemur with row of setae or spines (synapomorphy); 5) eyes high (synapomorphy?); 6) elongate first flagellomere (synapomorphy); 7) 3 frontal setae on anterior two-thirds of frons (polarity?); 8) 2 orbital setae on posterior fourth of frons (polarity?); and 9) ocellar seta very short (synapomorphy?). All of these characters are present in some *Alujamyia*, *Molynocoelia*, or *Pseudophorellia*, but none that appear to be unique synapomorphies of the *Molynocoelia* group, *Callistomyia*, *Alincocallistomyia*, the Toxotrypanini and/or the Adramini or of those taxa plus the Xarnutini are present in all of the species. Within the *Molynocoelia* group, only *P. distincta* has three pairs of scutellar setae, and loss of the middle seta appears to be a highly homoplastic character (*Callistomyia* also have only two pairs, as noted by Korneyev, and the third pair has also been lost in most other Trypetinae, including the Adramini). Most *Pseudophorellia* and *Alujamyia* species have a second enlarged midtibial spur, but it is difficult to score some species for this character, as there is intergradation in the size of the second spur within these genera. Most Adramini lack a second large spur, but two are present in *Coelopacidia* Enderlein. *Alujamyia* species have a well differentiated propleural seta, and *Pseudophorellia* species often have a slightly differentiated seta or setae, but if this is a synapomorphy for the Xarnutini, Toxotrypanini, and the *Molynocoelia* group then there is reversal in some lineages. It is interpreted to have arisen independently in *Hexachaeta*, *Callistomyia*, and *Alujamyia* in the cladistic analysis conducted in this study (see below). It should also be noted that *Xarnuta stellaris* Hardy does not have any strongly differentiated propleural setae, nor do any of the Adramini examined. I think it is doubtful that the row of anterior setae on the midfemur is a synapomorphy for the *Molynocoelia* group, *Callistomyia*, *Alincocallistomyia*, the Toxotrypanini and the Xarnutini only—this character is more widespread, although variably expressed (*e.g*., in some *Anastrepha*, *Euphranta* Loew, *Parastenopa* Hendel, *Rhagoletis* Loew, and *Oedicarena* Loew among the few trypetine genera I checked). It is clearly present in *Pseudophorellia acrostichalis*, *P. distincta*, and *P. tica* and is weakly differentiated in other *Pseudophorellia* species. Similarly, large eyes, 3 frontal setae, and 2 orbital setae high on the frons (the latter two of which Korneyev, 1999 listed only as similarities), as well as absence of the intra-postalar seta (which Korneyev indicated as a possible synapomorphy of the

Hexachaetini) occur in many or most other Trypetinae (including many Adramini) and are not strong evidence that the Toxotrypanini, *Callistomyia*, *Alincocallistomyia*, and the *Molynocoelia* group form a monophyletic group. The long first flagellomere, present in most species of the *Molynocoelia* group, and the reduced ocellar seta may have more significance, but they are not consistently present in the Toxotrypanini and occur in various other Trypetinae (*e.g*., Adramini have the ocellar seta reduced or absent and often have an elongate antenna). The reduced ocellar seta is interpreted in the cladistic analysis of this study as a synapomorphy of the Adramini + Toxotrypanini + *Callistomyia* and *Alincocallistomyia* + the *Molynocoelia* group, with reversal in *Molynocoelia*, *Alujamyia*, and some *Hexachaeta*.

To summarize, I have discovered no unique diagnostic characters or synapomorphies for a clade including the Toxotrypanini and/or the Adramini, *Callistomyia* and *Alincocallistomyia*, and the *Molynocoelia* group, but the mosaic pattern of apomorphies present in the various genera may indicate that some or all of these groups may be closely related. Further testing of this hypothesis is needed.

To analyze the phylogenetic relationships within the *Molynocoelia* group, I included representative species of Adramini (*Celidodacus obnubilus* (Karsch), *Conradtina acroleuca* (Wiedemann), and *Euphranta canadensis* (Loew)), Toxotrypanini (*Anastrepha limae* Stone, *Hexachaeta colombiana* Lima, and *H. fallax* Lima), *Alincocallistomyia* (*A. imitator* Hardy), and *Callistomyia* (*C. icarus* (Osten Sacken) and *C. pavonina* Bezzi) in the matrix as well as all species of *Alujamyia*, *Molynocoelia*, and *Pseudophorellia*. *Toxotrypana*, which is clearly closely related to *Anastrepha*, but has a highly derived wing pattern and chaetotaxy, was not included, nor was *Xarnuta* because of the difficulty in coding its much different wing pattern. The two included species of *Hexachaeta* are from different species groups (Hernández-Ortiz, 2000). For the outgroup I used *Rhagoletis basiola* (Osten Sacken), with a few characters (6, 32, 46) scored with the state that is more likely the plesiomorphic state for the Trypetinae.

The characters used are listed in Appendix 1. For the remainder of this discussion a number following a "#" refers to a character from the Appendix; state 1 is assumed if none is indicated after a period following the character number. The distributions of the character states are shown in Table 1. A few characters have slight intraspecific variation. For variable species, the more common state is shown first. In the cladistic analysis variable species were scored as polymorphic.

The matrix in Table 1 was analyzed using PAUP, version 4. A heuristic search was conducted with some multistate characters coded as ordered as indicated in Appencix 1 (#7, 16, 17, 22, 27, 34, 39, 54, 60) and using random addition sequence, tree bisection-reconnection branch swapping, and 500 replicates to avoid bias from the matrix order. This search resulted in 27,117 trees of length 272 steps (consistency index (ci) = 0.5368, homoplasy index (hi) = 0.6066, retention index (ri) = 0.8053, rescaled consistency index (rci) = 0.4322). The strict consensus tree from these trees is shown in Figure 168. Repeating this search with different seed numbers, increasing hold to 3, or with 100 or 1000 replicates produced slightly varying numbers of trees, but the consensus tree was the same for all resulting sets of trees. Successive weighting (baseweight = 10) following these searches resulted in 24 trees of length 786 (ci = 0.6552, hi = 0.4084, ri = 0.8848, rci = 0.5798). The consensus tree from this set of trees is shown in Figure 169, and one of the original trees is shown with the character state changes plotted in Figure 170.

A heuristic search with all multistate characters coded as unordered and using random

Table 1

Character state distributions in species of *Molynocoelia*, *Alujamyia* and *Pseudophorellia*. Character numbers refer to Appendix 1. States for polymorphic species are shown in additional rows, the more common state first.

Taxa	Character numbers																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Outgroup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C. acroleuca	0	0	0	1	3	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	1
E. canadensis	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
C. obnubilus	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1
H. colombiana	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
H. fallax	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	1
A. limae	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C. icarus	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	1	0	2	0	0	0	0	0	0	0	0	1	0
C. pavonina	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0
										1												0										
A. imitator	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
M. lutea	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	2	3	0	0	0	0	2	0	0	0	0	0	1	0	0	0	1
		2																														
M. grossa	0	2	0	0	0	0	1	0	0	0	0	0	0	0	1	2	3	0	0	0	0	2	0	0	0	0	0	1	0	0	0	1
M. separata	0	2	0	0	0	0	1	0	0	0	0	0	1	0	1	2	3	0	0	0	0	2	0	0	0	0	0	1	0	0	0	1
M. plumosa	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	2	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0
A. bella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	1	0	0	6	1	0	0	0	0	1	0
																						0										
A. sexvittata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1	2	1	0	6	1	0	0	0	0	1	0
																					2											
A. farri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	2	0	0	0	6	1	0	0	0	0	1	0
																					0	1										
A. isolata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	2	2	0	0	6	1	0	0	0	0	1	0
																						1										
P. acrostichalis	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	1	1	1	0	0	2	0	1	0	0	0	1
																							0									
P. distincta	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	2	0	1	0	0	0	1
P. flavida	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0
P. flavicauda	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	3	0	0	0	1	1	0	0	1	0	0	1	0	0	1	0
P. setosa	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	1	3	0	0	0	2	1	0	0	1	0	0	1	0	0	1	0
P. decora	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	3	0	0	0	1	2	0	0	1	0	0	1	0	0	1	0
P. tristeza	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	3	0	0	0	1	2	0	0	1	0	0	1	0	1	1	0
P. stonei	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	1	3	0	0	0	1	2	0	0	2	0	0	1	0	1	1	0
P. bipunctata	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	3	0	0	0	1	2	0	0	2	0	0	1	0	1	1	0
P. enkerlini	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	3	0	0	0	1	2	0	0	0	0	0	1	0	0	1	0
				0																												
P. anypsilon	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	1	3	0	0	0	1	2	0	0	1	0	0	1	1	1	1	0
								1																					0			
P. marginata	0	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	1	3	0	0	0	2	2	0	0	1	0	0	1	1	1	1	0
								1													1	1										
P. reducta	0	0	0	1	0	0	0	1	1	1	0	0	1	0	0	2	3	0	0	0	2	2	0	0	0	0	0	1	1	1	1	0
P. maculata	0	0	0	1	0	?	0	1	1	1	0	?	?	?	?	1?	?	0	?	0	1	2	0	0	0	0	1	1	0	1	1	?
P. brevilobata	0	0	0	1	0	0	0	1	1	1	0	0	0	0	0	2	3	0	0	0	2	2	0	0	0	0	0	1	1	1	1	0
P. quadricincta	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	1	3	0	0	0	1	2	1	0	1	0	1	1	1	1	1	0
				1																									0			

Table 1 (cont.)

Taxa	Character numbers																												
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
Outgroup	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C. acroleuca	0	1	0	1	1	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	7	0	0	1	0	0	0	0	0	0	0
E. canadensis	0	1	0	1	1	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
C. obnubilus	0	2	0	1	1	2	0	0	0	2?	0	0	1	0	0	2	?	0	0	3	9	0	0	0	0	0	0	0	0	0	0
H. colombiana	1	2	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
H. fallax	1	1	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0	0	0
A. limae	0	2	1	0	0	0	0	0	1	2?	0	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0
C. icarus	0	2	0	1	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	3	8	1	0	0	0	0	1	?	0	0	0
C. pavonina	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	3	8	1	0	0	0	0	1	1	0	0	0
A. imitator	1	2	0	1	0	?	0	0	0	1	0	0	0	0	0	0	0	1	0	3	8	1	0	?	?	?	?	1	0	0	0
M. lutea	0	1	1	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0	2	0	0	0
			0										1			1															
M. grossa	0	1	1	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	1	0	2	0	0	0
																1															
M. separata	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	1	0	1	0	?	?	?	?
M. plumosa	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	1	0	0	1	1	1	0	0	1	0	1	0	1	0	0	0
																		1													
A. bella	0	1	0	1	0	0	0	2	0	5	1	1	0	1	1	0	1	0	0	2	4	0	0	1	0	1	0	1	0	0	0
																				0											
A. sexvittata	0	0	0	1	0	0	0	2	0	5	1	1	0	0	1	0	1	0	0	2	4	0	0	1	0	1	0	1	0	0	0
A. farri	0	0	1	1	0	0	0	1	0	5	1	0	0	1	0	0	0	0	0	1	3	0	0	1	0	1	0	?	0	0	?
A. isolata	0	0	0	1	0	0	0	1	0	5	1	0	0	1	0	0	0	0	0	1	3	0	0	1	0	1	0	1	0	0	0
P. distincta	1	2	0	1	0	1	2	0	0	2	0	0	0	0	0	0	0	1	0	1	0	1	0	1	1	0	2	?	?	?	?
																1															
P. acrostichalis	0	2	0	1	0	1	2	0	0	2	0	0	0	0	0	0	0	1	0	1	3	1	0	1	1	0	2	1	1	0	1
P. flavida	0	2	1	0	0	?	1	0	0	2	0	0	0	0	0	0	0	2	0	1	2	1	0	?	?	?	?	1	0	0	1
P. flavicauda	0	2	0	?	0	?	2	0	0	2	0	0	1	0	0	1	0	0	1	1	0	2	0	?	?	?	?	1	1	0	1
P. setosa	0	2	0	1	0	?	2	0	0	2	0	0	1	0	0	1	0	0	1	1	6	2	0	?	?	?	?	1	1	0	1
P. decora	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	0	1	1	6	2	0	?	?	?	?	1	1	1	1
P. tristeza	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	0	1	1	5	2	0	?	?	?	?	1	1	1	1
P. stonei	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	0	1	1	6	2	0	?	?	?	?	1	2	0	1
P. bipunctata	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	0	1	1	6	2	0	?	?	?	?	1	1	0	?
P. enkerlini	0	2	1	0	0	1	2	0	0	2	0	0	1	0	0	1	0	0	1	1	5	2	0	1	1	0	2	1	1	0	1
				1																											
P. anypsilon	0	2	1	1	0	1	2	0	0	5	0	0	1	0	0	1	0	0	1	1	5	2	0	1	1	0	2	1	1	0	1
										3																					
P. marginata	0	2	1	1	0	0	2	0	0	3	0	0	1	0	0	1	0	0	1	1	5	2	0	1	1	0	2	1	1	0	1
																				0											
P. reducta	0	2	1	1	0	1	2	0	0	3	0	0	1	0	0	1	0	0	1	0	5	2	0	1	1	0	2	1	2	0	1
																				1											
P. maculata	0	2	1	?	0	?	2	0	0	3	0	0	1	0	0	1	0	0	1	0	3	2	0	1	1	0	?	?	?	?	?
P. brevilobata	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	3	1	1	5	2	0	?	?	?	?	1	2	0	1
P. quadricincta	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	3	1	1	7	2	0	?	?	?	?	1	1	0	1

Table 1 (cont.)

Taxa	Character numbers																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
P. antica	2	0	1	0	1	0	1	0	1	1	0	0	1	0	0	1	3	1	0	0	1	2	1	0	1	0	2	1	0	1	1	0
P. fuscoapicata	0	0	1	0	0	0	0	1	1	1	0	0	1	0	0	1	3	0	0	0	1	2	1	0	1	0	2	1	0	1	1	0
							1																							0		
P. diffusa	0	0	0	0	1	0	1	1	1	1	0	0	1	0	0	1	3	1	0	0	1	2	1	0	1	0	1	1	0	1	1	0
P. semilunata	0	0	0	1	1	0	1	1	1	1	0	0	1	0	0	1	3	0	0	0	1	2	1	0	4	0	0	1	1	1	1	0
				0	0																											
P. hansoni	1	0	0	0	2	0	0	1	1	1	0	1	1	0	0	1	3	1	0	0	1	2	1	0	1	1	2	1	1	1	1	0
								0																					0			
P. confluens	1	0	0	1	2	0	0	1	1	1	0	0	0	0	0	1	3	1	0	0	1	2	1	0	1	0	2	1	0	1	1	0
P. fenestrata	1	0	0	1	2	0	0	1	1	1	0	1	1	0	0	1	3	1	0	0	1	2	1	0	5	1	2	1	0	1	1	0
							1																									
P. vespiformis	0	1	0	1	2	0	2	1	1	1	1	0	1	0	0	2	2	1	0	0	2	2	1	1	3	1	2	1	1	1	1	0
P. tica	1	1	0	1	2	0	2	1	1	1	1	0	1	0	0	2	2	0	0	0	2	2	1	1	3	1	2	1	1	1	1	1
																		1					0									

addition sequence, tree bisection-reconnection branch swapping, and 500 replicates produced 438 trees (265 steps, ci = 0.5472, hi = 0.5962, ri = 0.7906, rci = 0.4326). The strict consensus tree from these trees is shown in Figure 171. Increasing the hold to 3 and the number of replications to 1000 yielded 542 trees, but the consensus tree was the same. Successive weighting following these searches resulted in 24 trees of length 776 (ci = 0.6624, hi = 0.4046, ri = 0.8714, rci = 0.5772). The consensus tree from this set of trees is shown in Figure 172, and one of the original trees with the character state changes is shown in Figure 173. It should be noted that in both cases (with some characters ordered or all characters unordered) the weighted and unweighted consensus trees differ concerning the relationships of some species within *Pseudophorellia*, that is, the weighted trees were not among the original sets of unweighted trees.

The trees that resulted from the unweighted searches (Figs. 168, 171) are not highly resolved, but most of the unresolved nodes are among the outgroup taxa and within *Pseudophorellia*. In all of the trees, the *Molynocoelia* group and each of its three genera (*Alujamyia*, *Molynocoelia*, and *Pseudophorellia*) are supported as monophyletic. In both sets of trees from the weighted analyses (Figs. 169-170, 172-173) the Adramini are the most basal clade, followed by the Toxotrypanini, with *Callistomyia* + *Alincocallistomyia* as the sister group of the *Molynocoelia* group. The close relationship between *Callistomyia* + *Alincocallistomyia* and the *Molynocoelia* group is supported by the pattern of spicules on the eversible membrane (#60); the ventral group of spicules is more extensive than the dorsal group and extends onto the dorsolateral side of the membrane. The presence of setulae on the katepimeron or dorsal margin of the meron (#36) can be interpreted as another synapomorphy for this clade (Fig. 170) or for these genera plus the Adramini. Unambiguous synapomorphies for the *Molynocoelia* group include: the highly reduced thoracic microtrichia (#17); and the surstyli relatively short (#56).

The hypothesis that *Molynocoelia* and *Alujamyia* are sister taxa is supported by at least the following synapomorphies: ocellar seta not greatly reduced (#9.0); and medial surstylus with lateral prensiseta minute or absent (#58). The former character is a reversal in this analysis and

Table 1 (cont.)

Taxa	Character numbers																												
	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
P. antica	0	2	1	1	0	0	2	0	0	2	0	0	1	0	0	1	0	3	1	1	3	2	0	1	1	0	?	?	?	?	?
P. fuscoapicata	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	0	1	1	3	2	0	?	?	?	?	1	1	0	1
P. diffusa	0	2	1	1	0	?	2	0	0	2	0	0	1	0	0	1	0	3	1	1	5	2	0	?	?	?	?	1	1	0	1
P. semilunata	0	2	1	1	0	1	2	0	0	2	0	0	1	0	0	1	0	3	1	1	5	2	0	1	1	0	2	1	?	?	?
P. hansoni	0	2	1	1	0	1	2	0	0	4	0	0	1	0	0	2	0?	4	1	1	7	2	0	1	1	0	2	1	1	0	1
P. confluens	0	2	1	0	0	1	2	0	0	4	0	0	1	0	0	2	0?	4	1	1	7	2	0	1	1	0	2	1	1	0	1
P. fenestrata	0	2	1	0	0	1	2	0	0	4	0	0	1	0	0	1	0	4	1	1	7	2	0	1	1	0	2	1	1	0	1
P. vespiformis	0	2	1	1	0	0	1	0	0	4	0	0	?	1	0	0	?	5	?	0	7	2	1	1	0	0	2	?	?	?	?
P. tica	0	2	1	1	0	0 1	2	0	0	4	0	0	?	1	0	0	?	5	?	0	7	2	1	1	1	0	2	1	0	0	1

is relatively homoplasious within the Trypetinae, but great reduction or loss of a prensiseta is uncommon.

Alujamyia is supported as a monophyletic group by a suite of synapomorphies of which the following are consistent on all trees: arista nearly bare (#16.0; unique within the genera analyzed); propleuron with outstanding seta (#19; also occurs in *Hexachaeta* and *Callistomyia*); scutellum usually with brown markings on basal half or more, including laterally (#25.6, #26.1); radial-medial band absent (#42.5); crossvein R-M covered by subapical band (#43; unique); and discal band reduced posteriorly (#46; assumes reversal in *A. sexvittata*). Loss of the acrostichal seta (#31), which also occurs within *Callistomyia* and in most species of *Pseudophorellia*, and loss of the scutellar setulae (#34.0; assumes reversal in *A. bella*) may also be synapomorphies. Within the genus, the Mesoamerican species *A. bella* and *A. sexvittata* are clearly closely related, as indicated by six unambiguous synapomorphies: subbasal band present (#40.2); discal band shifted basally, touching or almost touching crossvein BM-Cu (#44); discal and subapical bands yellow with dark margins (#47); anterior part of subapical band basally curved (#49); posteroapical band reduced (#52.2); and the abdominal markings (#53.4). The relationships among the Mesoamerican clade and the two Antillean species, *A. farri* and *A. isolata*, are not fully resolved. In some trees (e.g., Fig. 170), if characters are plotted assuming slow optimization, a sister group relationship between the two Antillean species is supported by the presence of a humeral band (#40.1) and the discal band reduced posteriorly (#46; assumes convergence in *A. bella*).

Molynocoelia is supported as a monophyletic group by the following unambiguous synapomorphies: 2 frontal setae (#7.1; assumes homoplasy within *Pseudophorellia*); parafacial relatively broad (#15); arista plumose (#16.2; assumes homoplasy within *Pseudophorellia*); and the discal and subapical bands connected posteriorly (#48). Loss of the medial scapular seta (#28) may be interpreted as another synapomorphy (Fig. 170; assumes homoplasy in *Pseudophorellia*), or as a synapomorphy of the *Molynocoelia* group, with reversal in *Alujamyia* (Fig. 173). The shape of the egg (Figs. 51-52), which is short and stout with an oblong truncate

Figs. 168-169. Consensus trees from analysis of *Molynocoelia* group with some characters ordered. 168. Consensus tree from unweighted analysis. 169. Consensus tree from weighted analysis.

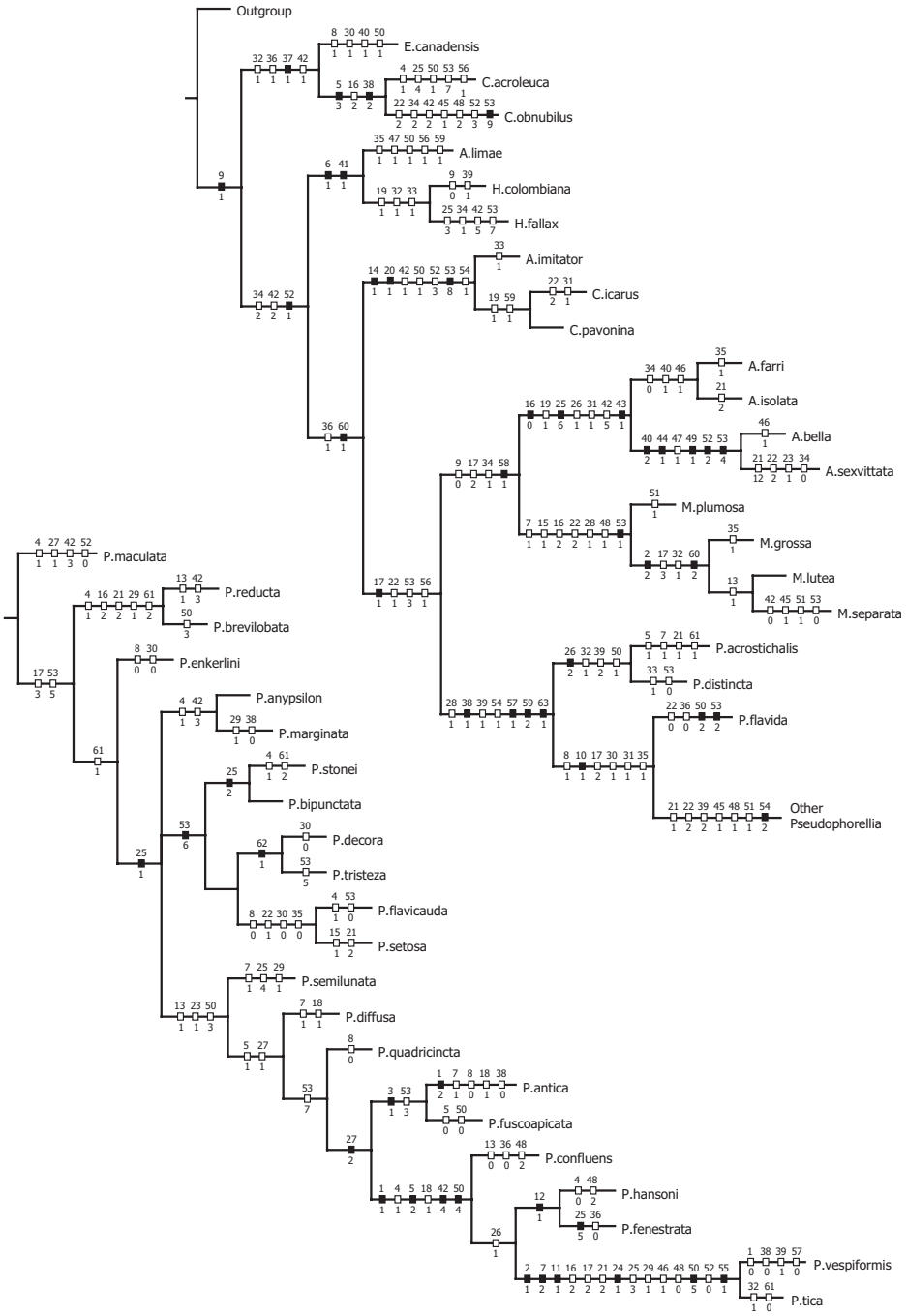
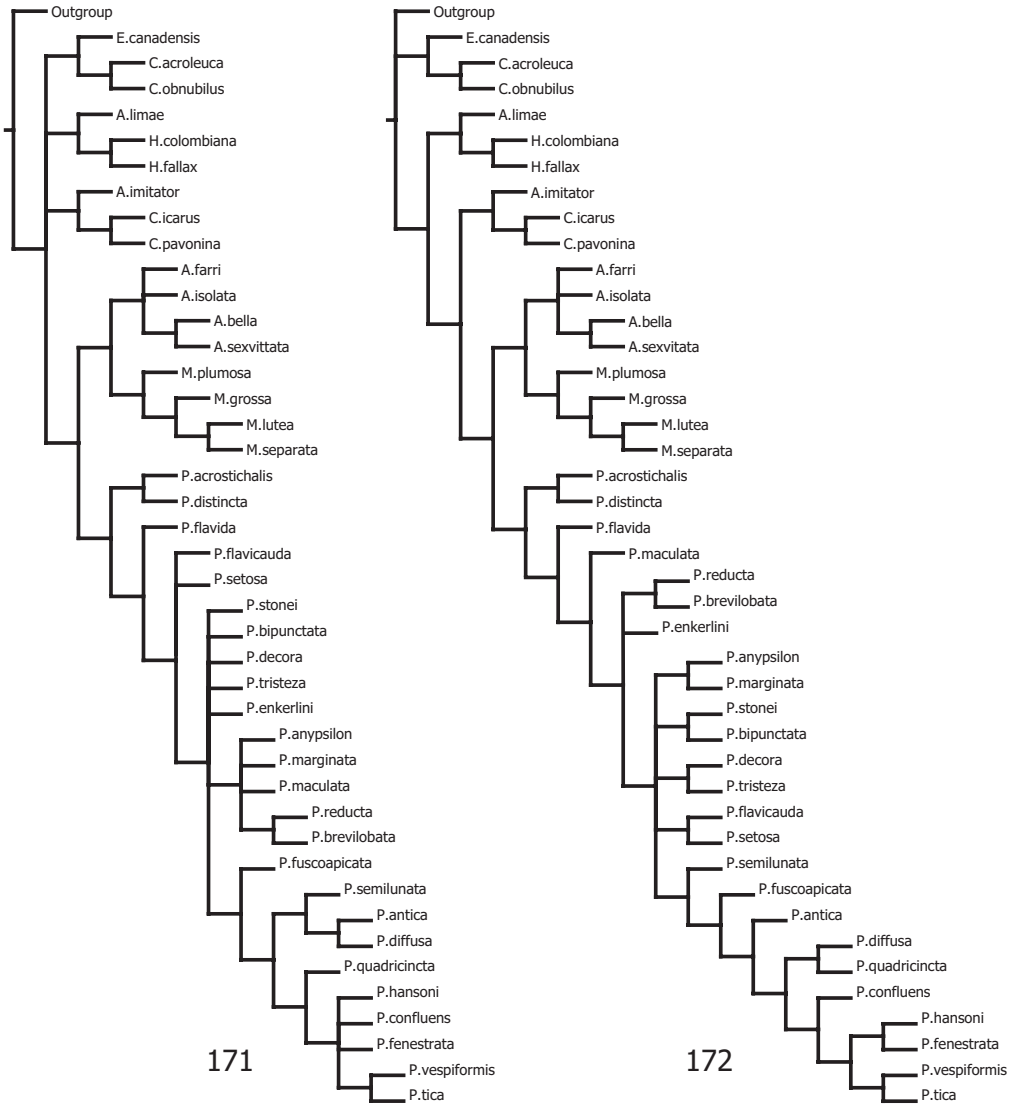


Fig. 170. One of 24 most parsimonious trees resulting from weighted analysis of *Molynocoelia* group with some characters ordered. Character numbers refer to Table 1. Character state changes plotted using slow optimization.



Figs. 171-172. Consensus trees from analysis of *Molynocoelia* group with all characters unordered. 171. Consensus tree from unweighted analysis. 172. Consensus tree from weighted analysis.

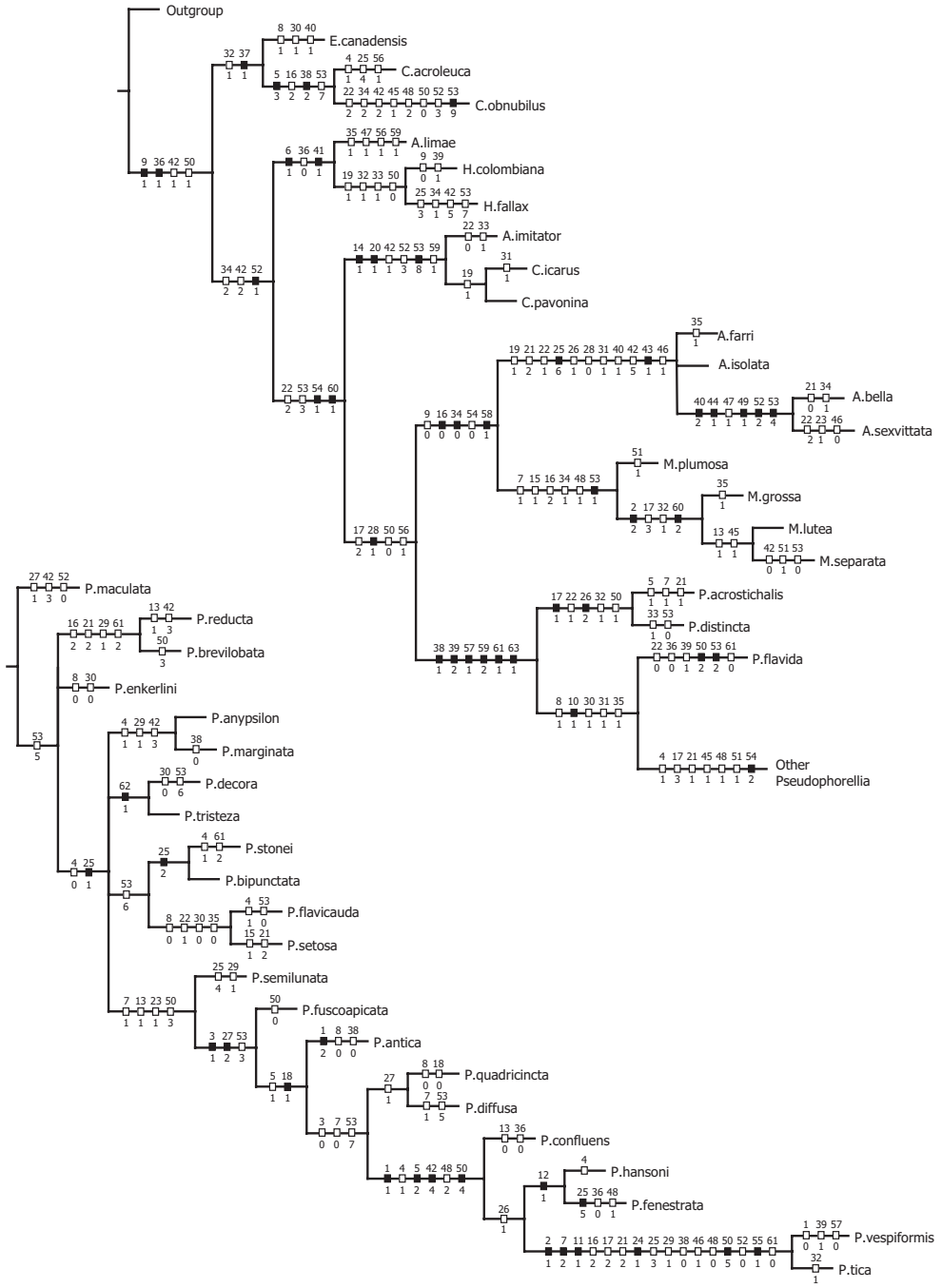


Fig. 173. One of 24 most parsimonious trees resulting from weighted analysis of *Molynocoelia* group with all characters unordered. Character numbers refer to Table 1. Character state changes plotted using fast optimization.

posterior end, could be an additional synapomorphy for *Molynocoelia*, but it is known only for *M. grossa* and *M. lutea*. The following relationships within *Molynocoelia* were supported in all of the analyses. The Brazilian species *M. plumosa* is the sister group of the three Mesoamerican species, *M. grossa*, *M. lutea* and *M. separata*, which share the following synapomorphies: frons with oval anterior brown spot (#2); thorax more extensively nonmicrotrichose (#17.3); dorsocentral seta displaced anteriorly (#32); and eversible membrane without dorsal group of spicules (#60.2; unknown in *M. separata*). Among the Mesoamerican species, *M. grossa* appears to be the sister group of *M. lutea* + *M. separata*, whose relationship is supported by the less extensively microtrichose face (#13) and possibly the more distal position of the posterior end of the discal band (#45), which is variable in *M. lutea*.

Pseudophorellia is supported as a monophyletic group by the following synapomorphies in all analyses: male forefemur with stout, spinelike setae ventrally (#38; assumes reversal in 4 species; unknown in 12 others); vein Cu setulose dorsally (#39; also occurs in some *Hexachaeta*); and spermathecal surface densely covered by broad tubercles (#63; unique). Two male characters that are unknown for *P. flavida* are also possible synapomorphies for the genus: lateral surstylus with a subapical lobe near level of prensisetae (#57; unique; assumes reversal in *P. vespiformis*); and glans with bilobed, spiculose, membranous basal lobe (#59.2; unique). These are interpreted as generic synapomorphies in all trees (including all that resulted from successive weighting) in which *P. acrostichalis* + *P. distincta* is the sister group of the rest of *Pseudophorellia* (e.g., Figs. 170, 173). The trilobed aculeus tip (#61) may also be a synapomorphy for *Pseudophorellia* if the simple tips in *P. flavida* and *P. tica* are due to reversal (Fig. 173). Other possible synapomorphies include: medial scapular seta absent (#28; also occurs in *Molynocoelia*); and syntergite 1+2 with outstanding lateral seta or setae (#54); the latter, which also occurs in *Alincocallistomyia* and *Callistomyia*, can be interpreted as a synapomorphy for those genera plus the *Molynocoelia* group, with reversal in *Alujamyia* + *Molynocoelia*). The shape of the egg (Figs. 151-159), especially the presence of a broad lobe bearing the micropyle, could be an additional synapomorphy for *Pseudophorellia*, but it is known for only five species.

Within *Pseudophorellia*, either the Antillean species *P. flavida* or the Andean clade *P. acrostichalis* + *P. distincta*, is the sister group of the remaining species, which form a well defined subgroup. Both hypotheses are equally parsimonious in the unweighted analysis with some characters ordered (Fig. 168), but in the other analyses trees with the latter relationship are shorter. Support for *P. flavida* as the most basal taxon includes the presence of dorsal setulae on vein Cu_1 (#39.2) in the other species except *P. vespiformis*, and the aculeus tip trilobed (#61) in the other species except *P. tica*. Assuming that *P. flavida* has the plesiomorphic state of characters 57 and/or 59 would also support that relationship. Support for the alternate hypothesis, that *P. acrostichalis* + *P. distincta* is the sister group of the rest of *Pseudophorellia* (Figs. 169-173) includes: postocellar seta absent (#10; unique); and acrostichal seta absent (#31; also occurs in *Callistomyia* and *Alujamyia*). In the weighted trees the loss of the posterior orbital seta (#8) and the presutural supra-alar seta (#30) and the reduction or loss of the katepisternal seta (#35) also support this relationship, with reversal assumed in several species (particularly *P. flavicauda* and *P. setosa*).

The species of *Pseudophorellia* exclusive of *P. acrostichalis*, *P. distincta* and *P. flavida* form a clade that is supported as monophyletic by numerous synapomorphies, of which the following are consistently present on all trees: scutum with submedial brown vitta (#21); discal

band ending in apical half of cell cu_1 (#45); discal and subapical bands connected posteriorly (#48); anteroapical band at least partially paler than subapical band or absent (#51); and syntergite 1+2 with subapical lateral seta or setae well differentiated (#54.2). The thorax nearly without microtrichia (#17.3) is usually interpreted as an additional synapomorphy, but it is unstudied in *P. maculata* and in trees where that species is the sister group of the remaining species it can be interpreted as a synapomorphy of the entire clade (e.g., Fig. 173) or only the species exclusive of *P. maculata* (e.g., Fig. 170).

Within this large clade the basal relationships are poorly resolved, but two smaller clades are present in all trees. *Pseudophorellia reducta* and *P. brevilobata* are grouped by at least their longer plumose arista (#16.2), posteriorly separated scutal vittae (#21.2; also occurs in some *P. marginata*), and small lateral lobe of the aculeus tip (#61.2). A larger subclade including *P. semilunata*, *P. fuscoapicata*, *P. antica*, *P. quadricincta*, *P. diffusa*, *P. confluens*, *P. hansoni*, *P. fenestrata*, *P. tica* and *P. vespiformis* is supported by at least two synapomorphies: facial carina with ventral half or more nonmicrotrichose (#13; assumes reversal in *P. confluens* and homoplasy in *P. reducta*); and scutum with brown spot or transverse mark posterior to notopleuron (#23; unique to this group and some *P. acrostichalis*). Within this large subclade, *P. confluens*, *P. hansoni*, *P. fenestrata*, *P. tica* and *P. vespiformis* are always grouped in a clade supported at least by the following synapomorphies: frons with narrow medial vitta (#1.1; assumes reversal in *P. vespiformis*; *P. antica* has a similar but broader vitta); occiput with paired brown vitta (#5.2; unique); and discal, radial-medial, and subapical bands fused anteriorly (#42.4, #50.4). The relatively long lobe on the anterior end of the egg (known for *P. confluens*, *P. hansoni* and *P. tica*; see Figs. 161-167) might also be a synapomorphy for this group or for it and some or all other species of the larger *semilunata*-*vespiformis* clade. The strongly wasplike species *P. tica* and *P. vespiformis* are sister taxa, supported by numerous synapomorphies, including the following that are unambiguous on all trees: frons with broad anterior mark (#2); 0-1 frontal setae (#7.2); facial carina broad, with sharp margins (#11); arista long plumose (#16.2); scutum with submedial vitta not extended to posterior margin (#21.2) and with large posteromedial brown area (#24); scutellum with single, short, basomedial brown area (#25.3); postpronotal seta absent (#29; assumes homoplasy in *P. hansoni*, *P. quadricincta*, *P. semilunata* and some other species); wing with only broad costal band (#50.5); and abdomen petiolate (#55). In the weighted trees *P. hansoni* and *P. fenestrata* are recognized as sister taxa based on the brown vitta on the facial carina (#12), and this clade is the sister group of *P. tica* + *P. vespiformis* based on the lateral brown mark on the scutellum (#26). *Pseudophorellia confluens* and *P. hansoni* also share a unique synapomorphy, however, the discal and subapical bands broadly fused (#48.2), which suggests that they could be more closely related.

Relationships among the other species of the *semilunata*-*vespiformis* clade are poorly resolved. In the weighted trees (Figs. 169-170, 172-173) *P. semilunata* is the most basal taxon; all of the other species have a vertical brown band on the anepisternum (#27; unique to this group and *P. maculata*). In the unweighted trees in the analysis with all characters unordered (Fig. 171) *P. fuscoapicata* occupies this position; the other species are grouped by their occipital markings (#5) and infuscated areas of cells r_1 and r_{2+3} between the transverse bands (#50). In the weighted analysis with some characters ordered (Fig. 169-170), *P. fuscoapicata* and *P. antica* are sister species, based on their very narrow frons (#3; unique) and similar abdomen patterns (#53.3), and this clade is the sister group of the *P. confluens*-*vespiformis* clade, both of which have a brown spot or band on the anepimeron (#27.2; unique).

The more basal relationships within the largest clade of *Pseudophorellia* (the clade exclusive of *P. acrostichalis*, *P. distincta* and *P. flavida*) also are poorly resolved. In the unweighted trees (Figs. 168, 171) the species other than *P. flavicauda* and *P. setosa* form a subclade supported by 5 synapomorphies: loss of the posterior orbital seta (#8; assumes reversal in 5 species); scutum with presutural sublateral vitta (#22.2); loss of the presutural supra-alar seta (#30; assumes reversal in *P. enkerlini* and *P. decora*); reduction or loss of the katepisternal seta (#35); and abdominal pattern (#53.5; assumes homoplasy). In the weighted trees (Figs. 169-170, 172-173) *P. flavicauda* and *P. setosa* form a species pair based on reversals in these same five characters. In the weighted trees, *P. maculata*, followed by the *P. reducta* + *P. brevilobata* clade and *P. enkerlini*, are the most basal taxa. *Pseudophorellia maculata* is a poorly known species in which many characters remain unstudied, and its position at the base of this clade is supported, rather weakly, only by a homoplasious character (abdominal pattern, #53) and, if characters are plotted using slow optimization (e.g., Fig. 170), the assumption that it has more plesiomorphic states of characters 17 and/or 61. The clade with the species other than *P. maculata*, *P. reducta*, *P. brevilobata* and *P. enkerlini* is supported by the color pattern of the scutellum (#25); the former four species lack markings. In the weighted trees and many unweighted trees the following species pairs are also recognized: *P. stonei* + *P. bipunctata*, supported by their short scutellar vitta (#25.2; unique) and reduced abdominal markings (#53.6); *P. decora* + *P. tristeza*, supported by the tooth on the lateral lobe of the aculeus tip (#62; unique); and *P. anypsilon* + *P. marginata*, supported at least by their reduced radial-medial band (#42.3). In many unweighted trees, including all of the trees from the analysis with all characters unordered (Fig. 171), the *P. anypsilon* + *P. marginata* clade is grouped with *P. maculata* and *P. reducta* + *P. brevilobata* based on the reduced radial-medial band (#42.3; assumes reversal in *P. brevilobata*) and in some trees the brown markings of the orbital plate (#4) and/or the loss of the postpronotal seta. In the weighted trees *P. stonei* + *P. bipunctata* and *P. flavicauda* + *P. setosa* are always somehow grouped (e.g., Figs. 170, 173), usually along with *P. decora* + *P. tristeza*, but the position of the latter clade varies.

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APPENDIX 1

Characters used in the cladistic analysis of the *Molynocoelia* group

State 0 is hypothesized to be plesiomorphic unless otherwise stated. The transformation series (ordered or unordered) is indicated for multistate characters.

Head

1. Frons (medial markings): 0) yellow medially; 1) with narrow orange brown or brown medial vitta; 2) with orange brown medial vitta, extending to lateral margin along orbital plate but not anteriorly.
2. Frons (anterior markings): 0) without brown anterior marking or if medial vitta present at most slightly broadened anteriorly; 1) with broad, transverse brown mark anteriorly; 2) with oval anterior brown spot. Unordered.
3. Frons width (measured at vertex in dorsal view): 0) greater than 0.5 times as wide as eye; 1) narrow, less than 0.5 times as wide as eye.
4. Orbital plate (markings): 0) entirely yellow; 1) with brown markings.
5. Occiput color: 0) entirely yellow; 1) with paired brown spot ventral to vertical setae; 2) with paired brown vitta ventral on margin of medial and lateral occipital sclerites; 3) mostly brown or with large triangular brown area from eye margin to margin of medial occipital sclerite. Unordered.
6. Orbital plate (microtrichia): 0) bare; 1) microtrichose.
7. Number of frontal setae: 0) 3-4; 1) 2; 2) 0-1. Ordered.
8. Number of orbital setae: 0) 2; 1) 1.
9. Ocellar seta: 0) longer than length of ocellar tubercle; 1) absent or shorter than ocellar tubercle.
10. Postocellar seta: 0) present; 1) absent.
11. Facial carina relatively broad and with sharp margins: 0) no; 1) yes.
12. Facial carina with medial brown vitta ventrally: 0) no; 1) yes.
13. Facial carina (microtrichia): 0) entirely or mostly microtrichose; 1) with ventral half or more bare.
14. Facial carina with round gray or brown spot (sometimes diffuse) ventrally: 0) no; 1) yes.
15. Parafacial (width): 0) narrow, no more than 0.4 times as wide as first flagellomere; 1) moderately broad, 0.5 or more times as wide as first flagellomere.
16. Arista: 0) almost bare, with only a few minute basal hairs; 1) pubescent (hairs no more than 0.33 times as long as width of first flagellomere; 2) short to long plumose (longest hairs approximately half or more as wide as first flagellomere. State 1 is hypothesized as plesiomorphic. Ordered.

Thorax

17. Thorax (microtrichia): 0) mostly microtrichose or (*A. imitator*) microtrichose except most of scutum; 1) bare except notopleuron, postsutural scutum lateral to supra-alar seta and on posterior margin, parts of scutellum (at most laterally, ventrally, and on base of disc), posterior and/or dorsal areas of anepisternum and anepimeron, parts of propleuron and narrow adjacent area of anepisternum, and parts of subscutellum, laterotergite, mediotergite, meron and metapleuron; 2) bare except postsutural scutum lateral to supra-alar seta and parts of propleuron and narrow adjacent area of anepisternum, parts of subscutellum, laterotergite, mediotergite, meron and metapleuron, and sometimes

scutellum laterally or ventrally; 3) bare except parts of propleuron and narrow adjacent area of anepisternum, parts of subscutellum, laterotergite, mediotergite, meron and metapleuron, and sometimes scutellum laterally or ventrally. Ordered.

18. Postpronotal lobe (color): 0) yellow; 1) partially to entirely brown. [Scored state 0 for *P. tica* in which the lobe is yellow except for a lateral brown area in the French Guianan female; scored state 1 for *P. diffusa* which has a small central brown area.]
19. Propleuron: 0) without outstanding seta (no setulae more than 1.5 times as long as others); 1) with one outstanding seta (at least twice as long as setulae).
20. Scutum with unpaired dark medial vitta: 0) no; 1) yes.
21. Dark submedial scutal vitta: 0) absent; 1) present, connected posteriorly to sublateral vitta; 2) present, separated posteriorly from sublateral vitta. Unordered.
22. Dark sublateral scutal markings: 0) absent; 1) comprising postsutural spot or vitta only; 2) including presutural and postsutural spots or vittae. Ordered.
23. Spot or transverse mark between posterior notopleural seta and postsutural supra-alar seta: 0) absent;1) present.
24. Scutum with large medial dark brown spot on posterior margin such that medial yellow area is Y-shaped and posteriorly forked: 0) no; 1) yes.
25. Dorsum of scutellum (color): 0) entirely yellow; 1) with paired brown vitta on at least basal 0.67 of lateral margin of disk, isolated from lateral markings (i.e., on side of scutellum), if present; 2) with paired brown vitta on basal half of lateral margin of disk, isolated from lateral markings; 3) with single broad, short basomedial area with convex posterior margin; 4) with single broad, long medial area extended from base almost to apex; 5) mostly brown except shallow semicircular yellow basomedial area; 6) at least sometimes with brown basal area extended from sides of scutellum or with spots or band aligned with those brown lateral areas (if continuous medially, posterior margin not convex). Unordered.
26. Scutellum laterally (color): 0) entirely yellow; 1) at least with basal dark brown area; 2) entirely brown to apical seta. Unordered.
27. Pleuron (brown markings): 0) entirely yellow, sometimes with white areas, or (some *A. isolata* and *sexvittata*) with small, isolated brown spots on anepisternum, katepisternum or anepimeron; 1) with vertical medial dark band on anepisternum, sometimes extended onto katepisternum; 2) with vertical medial dark band on anepisternum, sometimes extended onto katepisternum and also with spot or vertical band on anepimeron. Ordered. [*H. fallax* and *C. icarus*, which have most of the katepisternum and anepimeron brown, and *C. pavonina*, which sometimes has much of the anepimeron brown, were also coded state 0; the markings are reddish in *P. confluens*, like its mediotergite.]
28. Medial scapular seta: 0) present; 1) absent.
29. Postpronotal seta: 0) present; 1) absent.
30. Presutural supra-alar seta: 0) present; 1) absent.
31. Acrostichal seta: 0) present; 1) absent.
32. Dorsocentral seta (alignment): 0) aligned with or slightly anterior or posterior to intra-alar seta, and with or posterior to postalar seta; 1) aligned 0.40-0.75 distance from postsutural supra-alar to intra-alar seta, and anterior to postalar seta.
33. Scutellar marginal setae: 0) 2 pairs; 1) 3 pairs. Korneyev (1999) considered state 1 to be plesiomorphic for the Tephritidae and Trypetinae, but so few Trypetinae have this state

that its occurrence in those taxa may be due to reversal.

34. Scutellum (setation): 0) entirely bare; 1) setulose on margins and sometimes laterally on disk, but disk broadly bare medially; 2) with margins and disk entirely setulose. Ordered.
35. Katepisternal seta: 0) large, strong; 1) weak or absent.
36. Katepimeron and dorsal margin of meron (setation): 0) without setulae; 1) with 1 or more setulae.
37. Anatergite: 0) without setulae; 1) with long, slender setulae.

Legs

38. Forefemur (setation): 0) in both sexes with single ventral row of slender setae; 1) in both sexes with single ventral row of setae, male with 1 or more setae on apical half stout, spinelike; 2) in both sexes with 2 rows of stout, spinelike setae. Unordered.

Wing

39. Cubital vein (dorsal setation): 0) entirely bare dorsally; 1) setulose only on basal section (proximal to fork of Cu_1 and Cu_2); 2) setulose on basal section and basal 0.10-0.75 of vein Cu_1. Ordered.
40. Basal part of wing (humeral and subbasal bands): 0) without humeral or subbasal bands; 1) with humeral band (from crossvein H to base of cell bcu); 2) with subbasal band (from crossvein H to apex of cell bcu). Unordered.
41. Short basicostal band present from crossvein H and apex of vein R_1 posteriorly to vein M, with paler area in cell c: 0) no; 1) yes.
42. Discal and radial-medial bands: 0) discal band and short radial-medial (or accessory costal) band separated, discal band covering crossvein R-M; 1) anterior half of discal band absent, posterior half joined to radial-medial band to form long, oblique or concave band; 2) discal band and short radial-medial band connected to form Y-shaped mark with posterior arm covering crossvein R-M; 3) as state 1, with radial-medial band reduced, absent in cell r_{2+3}; 4) broadly fused, indistinguishable; 5) only a convex or straight discal band crossing pterostigma and cell dm. Unordered.
43. Crossvein R-M near crossvein DM-Cu and covered by subapical band: 0) no; 1) yes.
44. Discal band shifted basally, touching or almost touching crossvein BM-Cu: 0) no; 1) yes.
45. Discal band ending proximal to midpoint between veins A_1+Cu_2 and Cu_1: 0) yes; 1) no.
46. Discal band reaching posterior wing margin: 0) yes; 1) no.
47. Discal and subapical band (color): 0) mostly or entirely brown; 1) mostly yellowish with dark brown margins.
48. Discal and subapical bands (posterior connection): 0) separated along posterior wing margin; 1) connected along posterior wing margin; 2) broadly fused in cells cu_1, dm, r_{4+5}, and r_{2+3}. Unordered.
49. Subapical band: 0) more or less parallel to crossvein DM-Cu; 1) not parallel to crossvein DM-Cu, anteriorly curved or angled more proximally.
50. Areas in cells r_1 and r_{2+3} between discal, radial-medial, and subapical (or anteroapical) bands: 0) hyaline, bands separated; 1) hyaline except for connection only in cell r_1 of radial-medial and anteroapical bands (as dark as those bands); 2) yellow only in cell r_1 between distinctly delimited darker transverse bands; 3) diffuse yellow, often fading posteriorly, often obscuring borders of transverse bands; 4) entirely infuscated or with only oblique hyaline areas (*P. hansoni*), transverse bands (or broad spot formed by fused bands) extended to posterior margin; 5) entirely infuscated by broad costal band which does not extend posterior to vein M. Unordered.

51. Anteroapical band: 0) similar to subapical band in color; 1) at least partially paler than subapical band or absent.
52. Posteroapical wing band: 0) absent; 1) complete or fused only with anteroapical band; 2) reduced, only base present; 3) covered by large posteroapical spot (fused subapical and apical bands). Unordered.

Abdomen

53. Abdomen (color): 0) entirely yellow or orange; 1) yellow except V-shaped brown mark or paired sublateral brown spots on syntergite 1+2 (often also with brown spots on tergite 3 and/or male tergite 5 and sometimes female tergite 6); 2) yellow, with paired, short, broad, pale brown spots on posterior margins of syntergite 1+2 and tergites 3 and 4; 3) yellow, with paired sublateral brown spots on syntergite 1+2 and tergites 3-5; 4) yellow, with paired sublateral brown spots on tergites 3-5, female tergite 6 yellow; 5) yellow, with paired sublateral brown spots on tergites 3-5 and female tergite 6 (spots narrowly connected or separated on tergites 3-4 in *P. semilunata*); 6) yellow, with paired sublateral brown spots only on tergite 5 and female tergite 6 (in *P. decora* also with small diffuse spot on tergite 4); 7) all tergites with brown bands or mostly brown (at least posterior margin of syntergite 1+2 yellow); 8) yellow, with basal and lateral margins of tergites dark brown (band is medial rather than basal on syntergite 1+2); 9) brown except large circular yellow area on syntergite 1+3 and tergite 3. Unordered.
54. Abdominal tergite setation: 0) tergites sometimes with lateral setae or setulae larger, but not with one or several exceptionally larger setae; 1) tergites each with several outstanding lateral setae; 2) syntergite 1+2 with 1-2 exceptionally well differentiated lateral preapical setae. Ordered.
55. Syntergite 1+2 (shape): 0) broad or slightly narrow basally, lateral margins not parallel; 1) narrow, parallel-sided basally (petiolate).

Male terminalia

56. Surstyli: 0) elongate; 1) relatively short.
57. Lateral surstylus (in lateral view): 0) without subapical lobe; 1) with triangular or hooklike subapical lobe at or proximal to level of prensisetae.
58. Medial surstylus (prensisetae): 0) with both prensisetae well developed; 1) with medial prensiseta well developed, lateral prensiseta minute or absent.
59. Glans: 0) without basal lobe; 1) with simple spiculose, membranous, basal lobe; 2) with bilobed spiculose, membranous, basal lobe. Unordered.

Female terminalia

60. Eversible membrane: 0) with dorsal and ventral areas of spicules similar or if the latter larger, not extending to dorsolateral part of membrane; 1) with ventral area of spicules in inverted V-shaped rows, much more extensive than dorsal spicules and extending to dorsolateral part of membrane, dorsal spicules restricted to medial area; 2) with ventral area of spicules in inverted V-shaped rows, extending to dorsolateral part of membrane, dorsomedial spicules absent. Ordered.
61. Aculeus tip: 0) not trilobed; 1) trilobed, lateral lobe large; 2) trilobed, lateral lobe small. Unordered. [*E. canadensis* which has 3 pairs of steps or lobes was also coded state 0.]
62. Lateral lobe of aculeus tip with small tooth on medial side: 0) no (or aculeus not trilobed); 1) yes.
63. Spermathecal surface densely covered with broad tubercles: 0) no; 1) yes.