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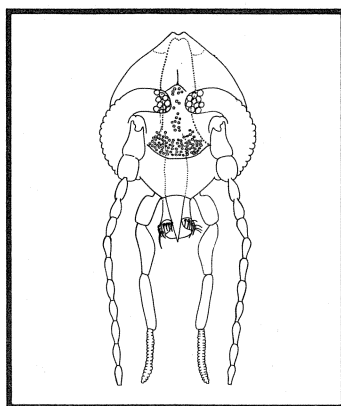


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Preliminary taxonomy of Costa Rican Psychodidae (Diptera), exclusive of Phlebotominae

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Preliminary Taxonomy of Costa Rican Psychodidae (Diptera), exclusive of Phlebotominae

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Abstract: 100 species of Psychodidae, not including the Phlebotominae, are recorded from Costa Rica. Keys are given for all the following taxa, except species of *Maruina*, and descriptions and illustrations are given for all new species: TRICHOMYIINAE: 1. *Trichomyia triangularis*, n.sp., 2. *T. pseudodactylis*, n.sp., 3. *T. brevitarsis* Rapp, 4. *T. saurotis*, n.sp., 5. *T. tritrunacula*, n.sp., 6. *T. xaniostylis*, n.sp., 7. *T. intricata*, n.sp., 8. *T. ptilotis*, n.sp., 9. *T. acanthostyla*, n.sp., 10. *T. clavellata*, n.sp., 11. *T. dolichakhis*, n.sp. PERICOMINI: 12. *Pericoma hansonii*, n.sp., 13. *P. zumbadoi*, n.sp., 14. *P. hespenheidei*, n.sp., 15. *Syntomoza monteverdica*, n.sp. MARUININI: 16. *Maruina (Aculcina) amadora* Hogue, 17. *M. (A.) amada* Hogue, 18. *M. (A.) querida* Hogue, 19. *M. (A.) cholita* Hogue, 20. *M. (A.) muchacha* Hogue, 21. *M. (Maruina) chamaca* Hogue, 22. *M. (M.) chamaquita* Hogue, 23. *M. (M.) chica* Hogue, 24. *M. (M.) dama* Hogue, 25. *M. (M.) vidamia* Hogue, 26. *M. (M.) tica* Hogue, 27. *M. (M.) nina* Hogue, 28. *Alepia alfaroana* (Dyar), 29. *A. valentia*, n.sp., 30. *A. relativa*, n.sp., 31. *Arisemus pilotos*, n.sp., 32. *A. lepidotos*, n.sp., 33. *A. salazari*, n.sp., 34. *Caenobrunettia plegas*, n.sp., 35. *S. laselva*, n.sp., 36. *S. tropicalis*, n.sp., 37. *Armillipora selvica*, n.gen., n.sp., 38. *Balbagathis sylvatica*, n.gen., n.sp., 39. *B. talamanca*, n.sp., 40. *Tonnoira bitenacula*, n.sp., 41. *T. plumaria*, n.sp., 42. *T. moragai*, n.sp. TELMATOSCOPIINI: 43. *Duckhousiella fircatus* (Kincaid), 44. *Telmatoscopus mergacolis*, n.sp., 45. *T. clavatus*, n.sp., 46. *T. congruus*, n.sp. MORMIINI: 47. *Bryopharsos palpiculum*, n.gen., n.sp., 48. *B. claviformosum*, n.sp., 49. *B. clavigum*, n.sp., 50. *B. tritaleum*, n.sp., 51. *Eugenys clavellata*, n.gen., n.sp., 52. *Brunettia bistria*, n.sp., 53. *B. apiculata*, n.sp. PSYCHODINI: 54. *Philosepedon tritaxis*, n.sp., 55. *P. pandiculatus*, n.sp., 56. *P. retartos*, n.sp., 57. *P. atopos*, n.sp., 58. *P. parifurcus*, n.sp., 59. *P. longistylus*, n.sp., 60. *P. ensiger*, n.sp., 61. *P. retusus*, n.sp., 62. *P. bicuspis*, n.sp., 63. *P. hamatus*, n.sp., 64. *P. ancepitis*, n.sp., 65. *P. pollicaris*, n.sp., 66. *P. bicalcaratus*, n.sp., 67. *P. dimorphus*, n.sp., 68. *P. tritenaculus*, n.sp., 69. *P. deceptrix*, n.sp., 70. *P. tripetalis*, n.sp., 71. *P. majorinus*, n.sp., 72. *Psychoda quiniversa*, n.sp., 73. *P. litotes*, n.sp., 74. *P. obeliske*, n.sp., 75. *P. setigera* Tonnoir, 76. *P. alternata* Say, 77. *P. alternata* complex, 78. *P. balaenica*, n.sp., 79. *P. laticaula*, n.sp., 80. *P. apparitia*, n.sp., 81. *P. spondea*, n.sp., 82. *P. articaula*, n.sp., 83. *P. stenostypis*, n.sp., 84. *P. cordiforma*, n.sp., 85. *P. bicordata*, n.sp., 86. *P. savaiiensis* Edwards, 87. *P. buxoides*, n.sp., 88. *P. incompta*, n.sp., 89. *P. mimica*, n.sp., 90. *P. laticeps*, n.sp., 91. *P. psilotes*, n.sp., 92. *P. rhis*,

96. *P. varablanca*, n.sp., 97. *P. bisacula*, n.sp., 98. *P. entolopha*, n.sp., 99. *P. aculeata*, n.sp., 100. *P. flagellata*, n.sp.

Key words: Psychodidae, Trichomyiinae, Psychodinae, taxonomy, Costa Rica.

This is an alpha taxonomic study of the Psychodidae of Costa Rica and does not include the subfamily Phlebotominae which is relatively well known through the works of Murillo & Zeledon (1985), and Young and Duncan (1994). Except for the Phlebotominae, there are few papers dealing with a limited number of Neotropical psychodids (Tonnoir 1929), Enderlein (1937), Quate (1959), Duckhouse (1968, 1972, 1973, 1974, 1974). Less is known of the Neotropical Psychodidae than any other zoogeographic regions, the family is highly developed in the American tropics with many diverse and endemic taxa and future studies will give additional revelations of the remarkable diversity exhibited by this family of small flies.

Classification of the Psychodinae at the tribal level is based on previous works which have treated the world-wide fauna. Quate (1959) defined the tribe Psychodini, which was more clearly defined by Duckhouse (1985). The Pericomini, Maruinini and Mormiini were named by Enderlein (1937) and defined by Duckhouse (1987), based largely on his extensive studies of the Afrotropical and Australasian faunas, but also more widely based on the world faunas; Telmatoscopini was proposed by Vaillant (1975) who has made extensive studies of the Holarctic fauna. The tribal classifications proposed by Duckhouse (1978, 1985, 1987, 1990, 1991) in various publications has been followed for the without attempting a critical reexamination.

MATERIALS AND METHODS

The most interesting specimens have been collected by use of the 2 m Malaise trap. CDC light traps, operated by 4 6-volt batteries, have also yielded good collections.

A few dry mounted specimens in good condition and showing color patterns can be useful, but slide mounts are necessary for accurate identifications. My slide technique is:

1. Clear in 10-20% KOH until abdomen is

clear. It is not necessary to remove wings, care must be exercised to avoid overclearing but delicate specimens, particularly *Psychoda*.

2. Wash in distilled water 10-15 minutes.

3. Dehydrate in methycellosolve (ethylene glycol monomethyl [or monoethyl] ether) 5-10 minutes.

4. Mount and dissect on underside of coverslip in thinned Euparal.

5. Dry at room temperature for 24 hours.

6. Invert coverslip on Euparal on glass slide.

7. Dry upside down in oven until Euparal stabilized.

All specimens were collected by me, except those taken by Malaise traps in Estación Biológico de La Selva and by Dr. Paul Hanson.

TERMINOLOGY

McAlpine (1981) has provided an exemplary model for standardization of terminology in the Diptera and is used as far as possible throughout this paper. Some terminology peculiar to the Psychodidae is defined as follows:

"Facet rows" refer to the rows of facets in the eye bridge and are numbered anterior to posterior, so row 1 is adjacent to the frons.

"Teeth" of the labellum refer to the rod-like, modified hairs at the tip of the labellum in the genus *Psychoda*. While the term may not be technically correct, it is retained because it is descriptive and useful.

Male genitalia of the Psychodinae: Duckhouse (1987) first realized the importance of the sclerotized, keel-like connection of the aedeagal and gonocoxal apodemes in the Maruinini and termed it "ball and socket". Herein it is simply referred to as the "keel."

Female genitalia of the Psychodinae: the spermathecal complex often consists of a pair of "hemispherical lobes" which are basad of the subgenital plate and a "membranous plate" which is dorsal of the lobes and expanded beyond the lobes and extends distad to about the center of the

DISPOSITION OF SPECIMENS

All primary types and many paratypes will be deposited at INBio, Heredia, Costa Rica, paratypes at USNM - National Museum of Natural History, Smithsonian Institution, Washington, D.C.; LACM - Los Angeles County

Museum of Natural History, Los Angeles, California; MNH - Museum of Natural History, London, England; CAS - California Academy of Sciences, San Francisco, California; BBM - Bishop Museum of Natural History, Honolulu, Hawaii; LWQ - Private collection of the author.

KEY TO GENERA

- 1. Eye without eye bridge; flagellomeres pyriform or subcylindrical. 2
 Eye with eye bridge extending medially above antennal sockets, may be short but with distinct medial extension; flagellomeres nodiform, fusiform, or cylindrical . . . PSYCHODINAE 5
- 2(1) Rs 4-branched, 2 longitudinal veins between radial and medial forks 3
 Rs 3-branched, 1 longitudinal vein between radial and medial forks 4
- 3(2) Mouthparts much longer than head; A₁ absent PHLEBOTOMINAE
 Mouthparts shorter than height of head; A₁ distinct although short BRUCHOMYIINAE
- 4(2) CuA₂ long, extends beyond level of medial fork TRICHOMYIINAE, *Trichomyia*
 CuA₂ very short SYCORACINAE, *Sycorax*
- 5(1) Radial and medial forks at or distad of wing center; Rs not pectinate; radial fork at same level as or distad of medial fork 6
 Radial and medial forks basad of wing center; Rs pectinate; radial fork often basad of medial . . 15
- 6(5) Flagellomeres fusiform (barrel- or spindle-shaped) or cylindrical; ♂ surstylus usually with multiple tenacula 7
 Flagellomeres nodiform (flask-shaped with bulbous base and distal neck), except flagellomere 1 may be spherical without neck 9
- 7(6) Pedicel only a little longer than scape; ♂ without allurement organs on head 8
 Pedicel 2-3X length of scape, apicomedial margin projecting beyond base of scape; ♂ with large, long, bilobed, scaly allurement organs arising from back of head below vertex *Syntomoza*
- 8(7) Eye bridge with 4 facet rows; ascoids single, unbranched *Pericoma*
 Eye bridge with 3 facet rows; ascoids with 2 or more branches *Didicrum*
- 9(6) R₅ ending beyond rounded wing apex 10
 R₅ ending in acute apex 11
- 10(9) Eyes contiguous in ♂, separated in ♀; ♂ ascoids a circle of multiple rods on each node, ♀ ascoids paired, palmate, with 4-6 anterior branches; apex of Sc at level of base of R₂₊₃ *Duckhousiella*
 Eyes separated in both sexes; ♂ and ♀ ascoids paired, sinuous rods on each node; apex of Sc distad of base of R₂₊₃. *Telmatoscopus*
- 11(9) Wing vestiture confined to veins 12
 Wing vestiture on membrane as well as veins *Trichopsychoda*
 (*Trichopsychoda* is not recorded in Costa Rica, but believed to be present.)

- 10(9) Eyes contiguous in ♂, separated in ♀; ♂ ascoids a circle of multiple rods on each node, ♀ ascoids paired, palmate, with 4-6 anterior branches; apex of Sc at level of base of R₂₊₃ *Duckhousiella*
 Eyes separated in both sexes; ♂ and ♀ ascoids paired, sinuous rods on each node; apex of Sc distad of base of R₂₊₃. *Telmatoscopus*
- 11(9) Wing vestiture confined to veins 12
 Wing vestiture on membrane as well as veins *Trichopsychoda*
 (*Trichopsychoda* is not recorded in Costa Rica, but believed to be present.)
- 12(11) Ascoids Y-shaped or tridentate 13
 Ascoids with single anterior and posterior branch *Threticus*
 (*Threticus* is not recorded in Costa Rica, but believed to be present.)
- 13(12) Labellum bulbous, without rod-like 'teeth' *Philosepedon*
 Labellum flattened, with 4-5 rod-like 'teeth' *Psychoda*
- 14(5) Flagellomere 1 similar to following 15
 Flagellomere 1 spherical, following segments nodiform *Balbagathis*, n. gen.
- 15(14) Flagellomeres symmetrical, flagellomeres beyond 11 reduced and smaller than preceding 16
 Flagellar segments strongly asymmetrical; terminal flagellomeres not reduced . *Bryopharsos*, n. gen.
- 16(15) Eye bridge prominent, extends mesad of inner margin of antennal foramen; palpus not extending beyond flagellomere 6 17
 Eye bridge small, weakly extending towards midline in small, acute projection that does not extend beyond inner margin of antennal foramen; palpus very long, extends to or beyond flagellomere 12 *Caenobrunettia*, n. gen.
- 17(16) At least basal flagellomeres fusiform or cylindrical 18
 Flagellomeres nodiform with conspicuous circle of sensory pores at center of node; ♂ gonopods slender and pressed together, surstylus without apical tenacula, but with group of rods near base *Armillipora*, n. gen.
- 18(17) All, or at least basal, flagellomeres fusiform, terminal 3 may be reduced; ♂ surstylus with single tenaculum 19
 At least distal flagellomeres cylindrical or nearly so, length more than 4X width, terminal segments not reduced; eye bridge with 4 facet rows; ♂ surstylus with 2 tenacula, 1 apical and 1 subapical, or, 1 apical tenacula and cluster of subapical, short rods *Tonnoira*
- 19(18) Wing normal, length about 2-3X width; eyes may be contiguous 20
 Wing very slender, length 6-8X width; eye bridges widely separated by 5 or more facet diameters; wing not patterned *Maruina*
- 20(19) Eye bridge with 3 facet rows; mouthparts normal, pointed clypeus and inflated labellum extending below head and clearly visible 21
 Eye bridge with 4 facet rows; mouthparts atrophied, barely visible, may appear absent in dorsal view of head; terminal flagellomere very long, about 3X length of preceding *Eugenys*, n. gen.

Subfamily SYCORACINAE

Genus *Sycorax* Haliday

Sycorax Haliday, 1839:745; Duckhouse, 1972:232.

Type species: *Sycorax silacea* Haliday, by monotypy.

Although no species are as yet known from Costa Rica, the genus does occur in South America and I think it will be found in Costa Rica. Specimens are very rare, but additional collecting will probably reveal its presence here and to facilitate the generic recognition, I have included the genus in the key.

Subfamily TRICHOMYIINAE

Genus *Trichomyia* Haliday

Trichomyia Haliday, 1839:745; Quate, 1955:117; Duckhouse, 1972:238.

Type species: *Trichomyia urbica* Haliday; by monotypy.

Head. Eyes hemispherical, lacking eye bridges; occipital foramen pear-shaped, expanded basally from anterior tentorium and converging posteriorly, 2 pairs of apodemes posteriorly, globular thickening on each side just before apex. Antenna with 14, pyriform flagellomeres, apical not reduced; ascoids paired, sinuous rods. Palpus with 3 or 4 palpomeres.

Thorax without allurement organs. Anepisternum with scattered hair sockets on posterior half or bare.

Wing with crossveins developed; R_5 not pectinate; R_{2+3} and R_4 form basal fork; R_5 absent; radial fork distad of medial; R_4 ending in or beyond rounded apex; CuA_1 long, extends beyond medial fork, to or nearly to wing margin.

♂ genitalia complex; gonopod usually highly modified, aedeagus symmetrical; surstylus without tenacula. ♀ genitalia with simple, lobed subgenital plate; sperm ducts annulate, conspicuous, anteriorly provided with dome or saucer-like plate at end of membranous ducts.

Trichomyia is highly developed in the Neotropics with a multitude of species, many of which are still undescribed.

KEY TO SPECIES OF *TRICHOMYIA*

- 1 Apical palpomere clearly longer than subapical; palpus with 4 palpomeres, palpomere 4 clearly longer than 3, ratio = 30:20 2
Apical 2 palpomeres subequal, ratio \pm 20:18 3
- 2(1) ♂ gonostylus cylindrical with curved, rounded apex; gonocoxite with truncate lobe at dorsoapical margin 3. *brevitarsis*
♂ gonostylus bulbous, length about 1.3X width, ending in sharp, beak-like apex; gonocoxite without lobe 4. *saurotis*
- 3(1) Palpus with 4 distinct palpomeres 4
Palpus with 3 palpomeres or first 2 palpomeres partially fused and not clearly separated 5
- 4(3) Palpomere 2 more than 2X size of 1; anepisternum bare, lacking hair scars; ♂ surstylus small, only about 1/4 size of gonocoxite 1. *triangularis*
Palpomeres 1 and 2 subequal in length; anepisternum with dense patch of hair scars on dorsal half of posterior surface; ♂ surstylus large, larger than gonocoxite 2. *pseudodactylis*

- 5(3) ♂ tergite 7 without projections; length of cerci of ♀ less than 2X width 6
 ♂ tergite 7 with pair of long, black rod-like projections; cerci of ♀ long and slender, length about
 4X width 11. *dolichakis*
- 6(5) ♂ gonostylus without spines at apex 7
 ♂ gonostylus ending in black, comblike row of spines 6. *xaniostylis*
- 7(6) ♂ gonostylus without subapical projection 8
 ♂ gonostylus with thumblike, subapical projection on posterior margin; aedeagus with pair of feather-
 like structures at center of central shaft 8. *ptilotis*
- 8(7) ♂ surstylus ending in simple, rounded tip 9
 ♂ surstylus ending in 3 digitate processes (not tenacula) 5. *tritruncula*
- 9(8) ♂ gonostylus long and slender or at least half as large as distal part of gonocoxite 10
 ♂ gonostylus a small, inconspicuous, setose lobe at center of gonocoxite, about as wide as long.
 6. *clavellata*
- 10(9) ♂ gonostylus long and very slender, length several times width, slightly clavate at tip; gonocoxite
 with number of strong spines at apex 9. *acanthostyla*
 ♂ gonostylus about half as large as distal part of gonocoxite; gonocoxite rounded at apex without
 spines 7. *intricata*

1. *Trichomyia triangularis* Quate, n.sp.
 Fig. 1a-c

Large, brown species with 4-segmented palpus, palpomere 1 very short, gonocoxite and gonostylus subequal in length

Male. Palpus 4-segmented, palpomere 1 very small, 2 with sensilla on medial margin, but not in depressed pit; 4 little longer than 3. Antenna with flagellomeres pyriform, none of bases eccentric; ascoids extending to center of succeeding segment (terminal flagellomeres lacking).

Anepisternum bare, lacking hairs. Wing with R_2 little shorter (0.9X) than R_{2+3} ; medial fork complete, base of M_2 present.

Aedeagus ending in 4 slender, sinuous processes (1 missing on holotype and presumed

lost in handling.) Gonocoxite simple, without posterior lobe; gonostylus convex on inner surface, ending in bare, curved hook; paramere large, triangular; surstylus very small, circular in outline.

Measurements: Wing length 2.89 mm., width 1.25 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Heredia, Vara Blanca, 26/VII/93, 1800 m. (INBIO).

Etymology: 'triangulus' L, having three angles; referring to triangular shape of paramere.

This species bears a resemblance to the North American *T. nuda* (Dyar)(Quate, 1955:117), but is easily distinguished by the differences in the morphology of the aedeagus and size of the surstylus.

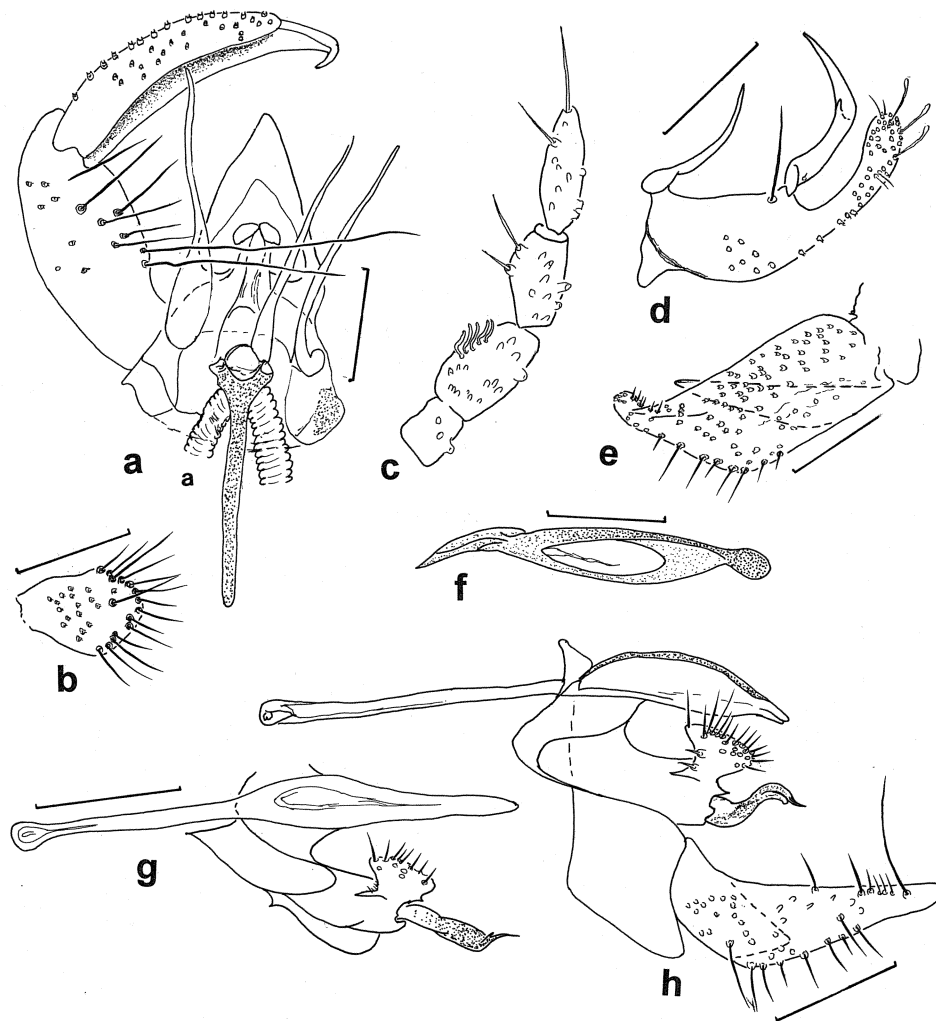


Fig. 1. a-c. *Trichomyia triangularis*, n.sp. a. ♂ right gonopod and aedeagus, dorsal; b. ♂ surstylus; c. palpus. d-f. *T. pseudodactylis*, n.sp. d. ♂ gonopod, dorsal; e. ♂ surstylus, lateral; f. ♂ aedeagus, lateral. g-h. *T. brevatarsis* Rapp. g. ♂ right gonopod & aedeagus, dorsal; h. ♂ genitalia, lateral. Scales lines = 0.1 mm.

2. *Trichomyia pseudodactylis* Quate, n. sp.

Fig. 1d-f

Large species with digitate gonostylus attached to center of gonocoxite.

Male. Single row of large scars paralleling ocular margin. Palpus with 4 palpomeres, 2 with sensilla in depressed pit on inner side; 4 little longer than 3. Antenna 16-segmented; all flagellomeres pyriform, none of bases eccentric;

ascoids extending to center of succeeding segment, terminal flagellomere very small, round.

Anepisternum with patch of hair scars on dorsal half of posterior surface. Wing with R_2 little longer (1.2X) than R_{2+3} , medial fork complete, base of M_2 present.

Gonocoxite ending in long, slightly clavate lobe beyond insertion of gonostylus; gonostylus bare, slender, blade-like; surstylus large, base quadrate, tapering to simple, unadorned apex.

Measurements: Antenna 1.64 mm. Wing length 2.17 mm., width 0.96 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Guanacaste, Volcán Cacao, 14-17/VII/93, 1000 m. (INBIO).

Etymology: 'pseudes' Gr, false; 'daktylos' Gr, finger; referring to digitate gonostylus.

3. *Trichomyia brevitarsis* Rapp

Fig. 1g-h

Trichomyia brevitarsis Rapp, 1945:310; Duckhouse, 1974:61.

Palpus with 4 flagellomeres.

Anepisternum with sparse patch of hair scars on posterior surface, scars separated by several times own diameter.

Distribution: Panama, Costa Rica.

New Records: COSTA RICA, Puentarenas, Manuel Antonio, 1/III/92, sea level; Guanacaste, La Pacifica, 40 km SE of Liberia, 17/VII/93, 100 m.

The Costa Rica specimens agree well with the illustrations and descriptions given by Duckhouse (1974:61). The structures of the aedeagus, gonostylus, and surstylus are distinctive for this species. Additional illustrations of the ♂ genitalia are given to show details from a different perspective.

4. *Trichomyia saurotis* Quate, n.sp.

Fig. 2a-e

Brown, well sclerotized species; wing lightly infuscate; ♂ gonostylus ending in sharp, beak-like processes, surstylus ending in small, apical prolongation.

Male. Irregular triple row of large scars paralleling ocular margin. Palpus with 4 palpomeres, first 3 very small, 1 & 2 partially fused; 2 with sensilla in depressed pit on inner side; 4 about 2X length of 3. Flagellomere 1 subcylindrical, bases of following segments progressively more eccentric proceeding distally; ascoids extending to center of succeeding segment (all specimens lack terminal segments.)

Anepisternum with patch of hair scars on

posterior surface. Wing with R_2 about 3X (2.5-4X) length of R_{2+3} ; base of M_2 lacking.

Gonocoxite with apicolateral lobe, smaller than gonostylus; gonostylus bare, smaller than gonocoxite, spherical with apex ending in sharp, beak-like projection; surstylus ending in apical prolongation, without tenaculum.

Measurements: Wing length 1.45-1.81mm., width 0.58-0.72 mm.

Female. Cerci circular in side view, as long as wide; spermathecal duct annulate, broad and sclerotized, terminating in shape of acorn with basal saucer at base of anterior dome; slender, tenuous tube leading anteriorly from dome.

Measurements: Wing length 1.61-2.02 mm., width 0.63-0.84 mm.

Holotype ♂, allotype ♀, COSTA RICA, Heredia, Estación Biol. La Selva, 1/IV/93 & 1/VI/93 (INBIO). Paratypes, 5 ♂, 2 ♀, same and 12/II/93, 2/V/93, 19/VII/93 (USNM, LACM, LWQ).

Etymology: 'saurotos' Gr, pointed; referring to the pointed apices of the gonostylus and surstylus.

5. *Trichomyia tritruncula* Quate, n.sp.

Fig. 2f-g

Pale species with 3-segmented palpus and relatively long R_{2+3} ; ♂ surstylus ending in three, digitate processes.

Male. Single row of large scars paralleling ocular margin. Palpus with 3 palpomeres, 1 longest and with sensilla in depressed pit on inner side. Antenna with 14 flagellomeres, 1 pyriform, progressively more eccentric beyond flagellomere 1, 16 a small, ovoid apiculus; ascoids extending to center of succeeding segment.

Anepisternum with patch of hair scars on posterior surface. Wing with R_{2+3} much longer than R_2 ; medial fork complete, base of M_2 present.

Gonocoxite without posterior lobe beyond base of gonostylus, gonostylus simple, tapering, slightly curved; surstylus ending in 3 digitate processes, tenaculum lacking; sperm duct very slender, long, origin not visible but appears to

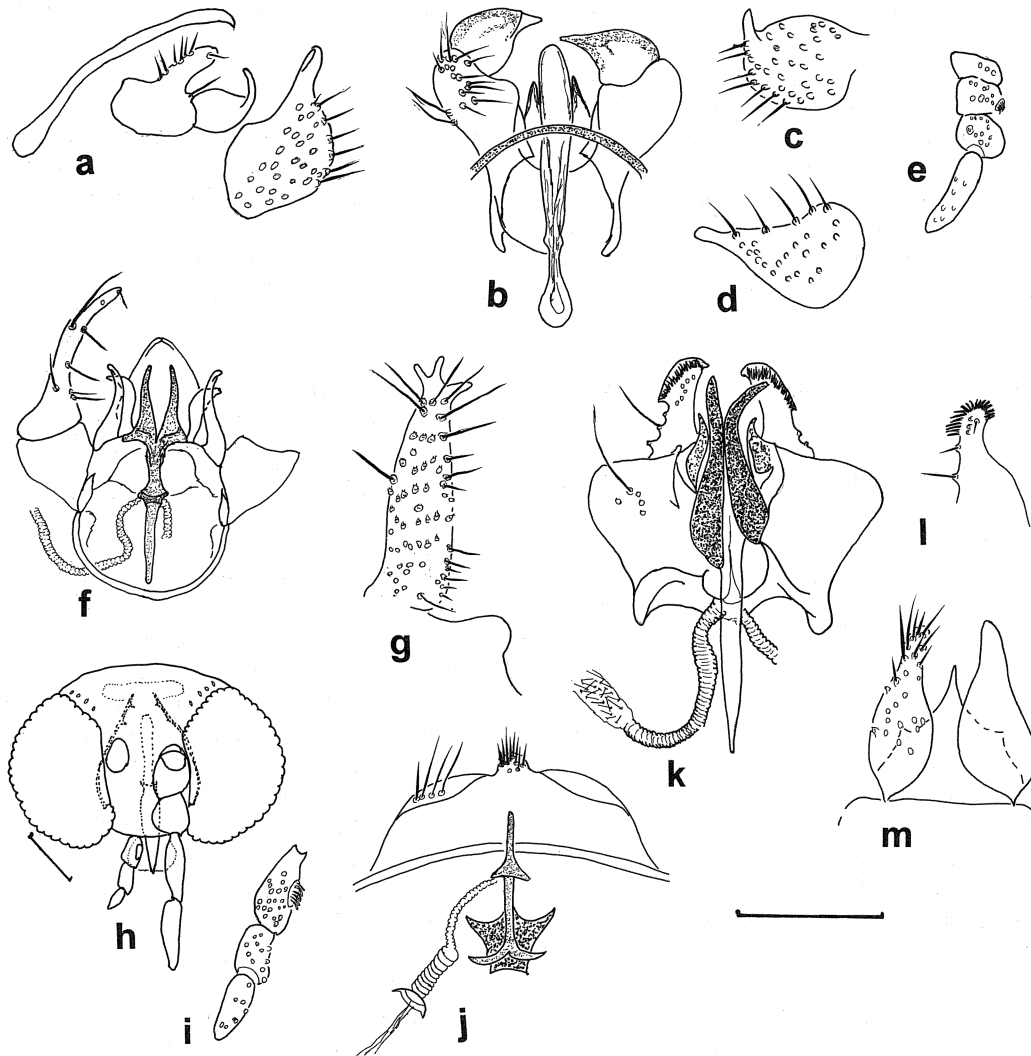


Fig. 2. a-e. *Trichomyia saurotis*, n.sp. a. ♂ aedeagus, lateral, gonopod and surstylus; b. ♂ gonopods and aedeagus, dorsal; c,d. ♂ surstyli, variations; f. ♂ palpus. f-g. *T. tritruncula* n.sp. f. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; g. ♂ surstylus & tergite 10. h-m. *T. xaniostylis*, n.sp. h. ♂ head; i. ♂ palpus; j. ♀ genitalia; k. ♂ gonopods and aedeagus, dorsal; l. ♂ surstylus, lateral; m. ♂ tergite 10 and surstyli. Scale lines = 0.1 mm

start in segment 7.

Measurements: Antenna 1.47 mm. Wing length 1.90 mm., width 0.80 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Guanacaste, Volcán Cacao, E of Santa Rosa, 14-17/VII/94,

1000 m. (INBIO).

Etymology: 'tres' L, three; 'trunculus' L, stem; referring to 3 processes at tip of ♂ surstylus.

6. *Trichomyia xaniostylis* Quate, n.sp.
Fig. 2h-m

Species with 3-segmented palpus, R_{2+3} and R_2 subequal; ♂ gonostylus ending in dark, comb-like row of spines.

Male. Single row of large scars paralleling ocular margin. Palpus with 3 palpomeres, 1 longer, 2 & 3 subequal, 1 with sensilla in depressed pit on inner side. Antenna with flagellomere 1 pyriform, progressively more eccentric beyond flagellomere 1, 16 a small, ovoid apiculus; ascoids extending to center of succeeding segment.

Anepisternum with patch of hair scars on posterior surface. Wing with R_2 subequal to length of R_{2+3} ; medial fork complete, base of M_2 present.

Aedeagus terminating in 4 black, pointed shafts. Gonocoxite without posterior lobe beyond base of gonostylus; gonostylus ending in dark, comb-like row of spines; surstylus without tenaculum; anterior end of sperm duct a membranous sac containing pin-like objects.

Measurements: Antenna 1.77-1.81 mm. Wing length 1.61-1.81 mm., width 0.67-0.75 mm.

Female. Spermathecal ducts slender distally, cylindrical anteriorly.

Measurements: Antenna 1.27-1.59 mm. Wing length 1.61-1.93 mm., width 0.58-0.67 mm.

Holotype ♂, allotype ♀, COSTA RICA, Limon, Puerto Viejo de Talamanca, 20-23/VII/93, sea level (INBIO). Paratypes 7 ♂, 15 ♀ same (INBio, USNM, LACM, MNH, CAS, BBM, LWQ).

Etymology: 'xanio' Gr, comb; 'stylus' Gr, style; referring to comb-like apex of the gonostylus.

7. *Trichomyia intricata* Quate, n.sp.

Fig. 3a

Species with 3-segmented palpus; ♂ gonocoxite with apical process extending beyond tip of gonostylus.

Male. Single row of large scars paralleling ocular margin. Palpus with 3 palpomeres, 1 longest, 2 & 3 subequal, 1 with sensilla in depressed pit on inner side. Antenna with flagellomere 1 pyriform, progressively more eccentric beyond flagellomere 1 (terminal segments lacking); ascoids extending to center of succeeding segment.

Anepisternum with patch of hair scars on

posterior surface. Wing with R_2 subequal to length of R_{2+3} ; medial fork complete, base of M_2 present

Gonocoxite with posterior lobe simple, extending beyond tip of gonostylus; gonostylus short, slightly curved, ending in small apical point, without subapical projection; surstylus without tenaculum.

Measurements: Antenna 1.40 mm. Wing length 1.54 mm., width 0.58 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Limon, Puerto Viejo de Talamanca, 20-23/VII/93, sea level (INBIO). Paratype ♂, same (USNM).

Etymology: 'intricata' L, complex; referring to complex ♂ genitalia.

8. *Trichomyia ptilotis* Quate, n.sp.

Fig. 3b-d

Pale species with 3-segmented palpus, gonocoxite with long, posterior lobe, gonostylus with subapical thumblike projection; aedeagus with pair of feather-like projections near center.

Male. Single row of large scars paralleling ocular margin. Palpus with 3 palpomeres, 1 with sensilla in depressed pit on inner side, ratio = 28:20:25. Antenna with flagellomere 1 pyriform, progressively more eccentric beyond flagellomere 1, 16 a small, clavate apiculus; ascoids extending to center of succeeding segment.

Anepisternum with hairs on posterior half. Wing with R_{2+3} little longer than R_2 ; medial fork complete, base of M_2 present.

Gonocoxite with long posterior lobe, gonostylus with subapical, thumblike projection on posterior margin; aedeagus with pair of feather-like appendages from center of straight shaft; surstylus elongate, tergite 10 elongate triangular, extends beyond apex of surstylus.

Measurements: Antenna 1.42 mm. Wing length 1.57 mm., width 0.63 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Limon, Puerto Viejo de Talamanca, 20-23/VII/93, sea level (INBio).

Etymology: 'ptilon' Gr, feather; referring to unusual shape of ♂ aedeagus which is reminiscent of a feather.

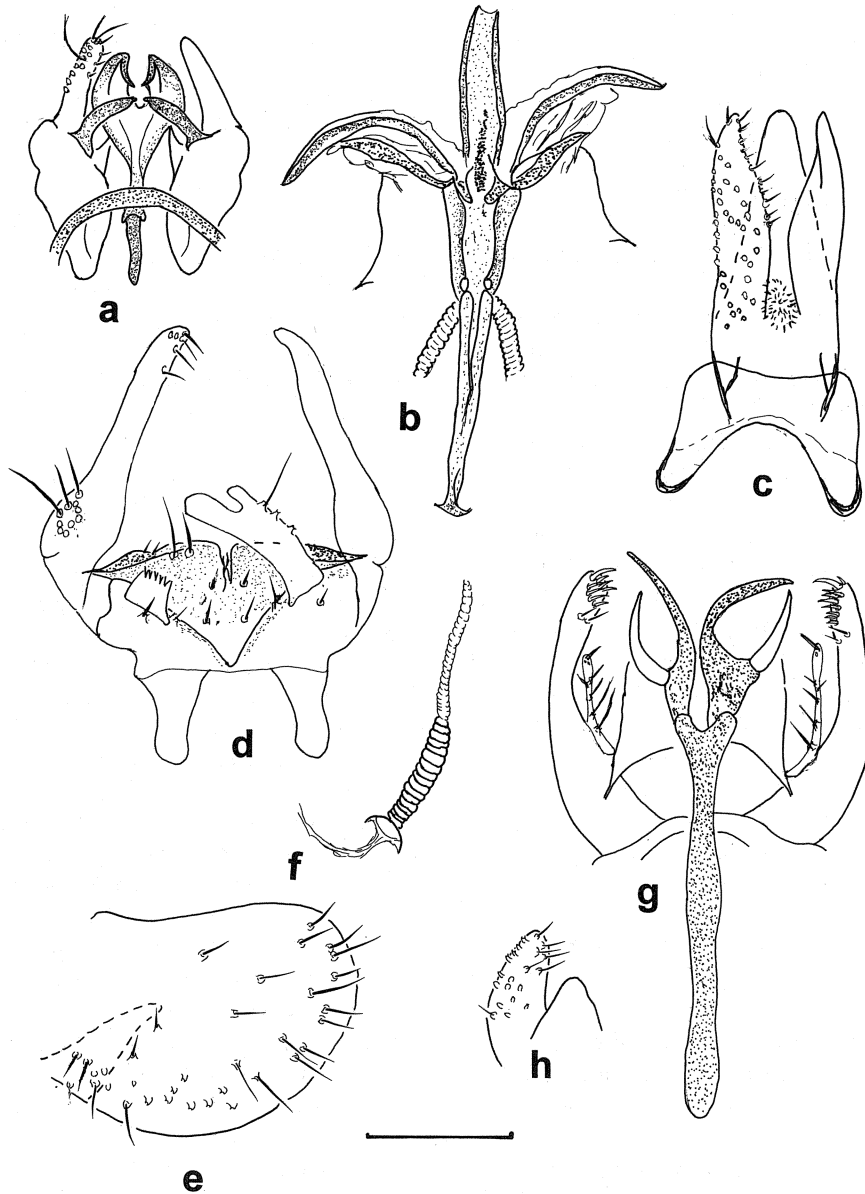


Fig. 3. a. *Trichomyia intricata*, n.sp. ♂ gonopods and aedeagus, dorsal. b-d. *T. ptilotis*, n.sp. b. ♂ aedeagus, dorsal; c. ♂ surstyli, tergite 9 & 10; d. ♂ gonopods and aedeagus, dorsal. e-h. *T. acanthostylis*, n.sp. e. ♀ cercus, lateral; f. ♀ spermatheca and duct; g. ♂ gonopods and aedeagus, dorsal; h. ♂ tergite 10 and surstylus. Scale line = 0.1 mm.

9. *Trichomyia acanthostylis* Quate, n.sp.

Fig. 3e-h

Species with 3-segmented palpus, R_{2+3} clearly longer than R_2 ; ♂ gonocoxite with patch of spines at apex.

Male. Single row of large scars paralleling

ocular margin. Palpus with 3 palpomeres, 1 longest, 2 & 3 subequal, 1 with sensilla in depressed pit on inner side. Antenna with flagellomere 1 pyriform, progressively more eccentric beyond flagellomere 1, 16 a small, ovoid apiculus; ascoids extending to center of

succeeding segment.

Anepisternum with patch of hair scars on posterior surface. Wing with R_{2+3} longer than R_2 ; medial fork complete, base of M_2 present

Gonocoxite tapering to rounded apex armed with many thick spines; gonostylus arises from gonocoxite before center, very slender, slightly clavate at tip, with several strong spines; surstylus without tenaculum.

Measurements: Antenna 1.44-1.70 mm. Wing length 1.40-2.29 mm., width 0.55-0.89 mm.

Female. Spermathecal ducts slender distally, cylindrical beyond collar.

Measurements: Antenna 1.12-1.32 mm. Wing width 1.59-1.83 mm., width 0.58-0.67 mm.

Holotype ♂, COSTA RICA, Heredia, Estación Biol. La Selva, 02/V/93, 50-100 m.; allotype ♀ same, but 3/VII/93 (INBio). Paratypes 7 ♂, 2 ♀ same, but 12/II/93-25/VII/93; 5 ♂, Puntarenas, Estación Pittier, 22 km N of San Vito, 11-14/VII/95, 1670 m. (INBio, USNM, LACM, MNH, CAS, BBM, LWQ).

Etymology: 'akantha' Gr, thorn; 'stylos' Gr, style; referring to the apical spines of the gonostylus.

The specimens from Estación Pittier only differ from the other specimens in being larger.

10. *Trichomyia clavellata* Quate, n.sp.

Fig. 4a-b

Large species with 3-segmented palpus, R_{2+3} longer than R_2 , ♂ gonocoxite with large, clavate posterior lobe, gonostylus small and inconspicuous.

Male. Single row of large scars paralleling ocular margin. Palpus with 3 palpomeres, 1 longest, 2 & 3 subequal, 1 with sensilla in depressed pit on inner side. Antenna with 1 flagellomere 1 pyriform, progressively more eccentric beyond flagellomere 1, 16 a small ovoid apiculus; ascoids extending to center of succeeding segment.

Anepisternum with patch of hair scars on posterior surface. Wing with R_{2+3} longer than R_2 ; medial fork complete, base of M_2 present.

Gonocoxite with large, clavate posterior lobe extending far beyond base of gonostylus; gonostylus small, sac-like, bare; surstylus small,

without tenaculum, but with several long bristles at apex.

Measurements: Antenna 1.55 mm. Wing length 1.98 mm., width 0.80 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Guanacaste, Volcán Cacao, E of Santa Rosa, 14-17/VII/93, 1000 m. (INBio).

Etymology: 'clavellatus' L, club-shaped; referring to posterior lobe of gonocoxite.

11. *Trichomyia dolichakis* Quate, n.sp.

Fig. 4c-f

Small, pale species with 3-segmented palpus; ♂ with pair of large, dark rods extending apicolaterally from tergite 7.

Male. Single row of large scars paralleling ocular margin. Palpus with 3 palpomeres, 1 longest, 2 & 3 subequal, 1 with sensilla in depressed pit on inner side. Antenna with flagellomere 1 pyriform, progressively more eccentric beyond flagellomere 1, 16 a small, ovoid apiculus; ascoids extending to center of succeeding segment.

Anepisternum with patch of hair scars on posterior surface. Wing with R_2 subequal to R_{2+3} ; medial fork complete, base of M_2 present.

Tergite 7 with pair of long, slender, dark rods extending apicolaterally to tip of gonocoxite, tip sharply recurved into slender process lying close to main stem. Gonocoxite with a clavate, curved posterior lobe; gonostylus tapering to rounded apex; surstylus little longer than wide, without tenaculum; sperm ducts very long, extend anteriorly to tergite 7.

Measurements: Antenna 1.50-1.63 mm. Wing length 1.35-1.59 mm., width 0.55-0.67 mm.

Female. Spermathecal duct slender distally, expanded into cylindrical tube beyond collar, cylindrical structure attached to collar, slender, thread-like ducts leading into cylindrical structure.

Measurements: Wing length 1.47 mm., width 0.51 mm.

Holotype ♂, allotype ♀, COSTA RICA, Limon, Puerto Viejo de Talamanca, 20-22/VII/93, sea level (INBio). Paratypes, 10 ♂, same; 1 ♀, same but 7/VII/93. (INBio, USNM, LACM, LWQ).

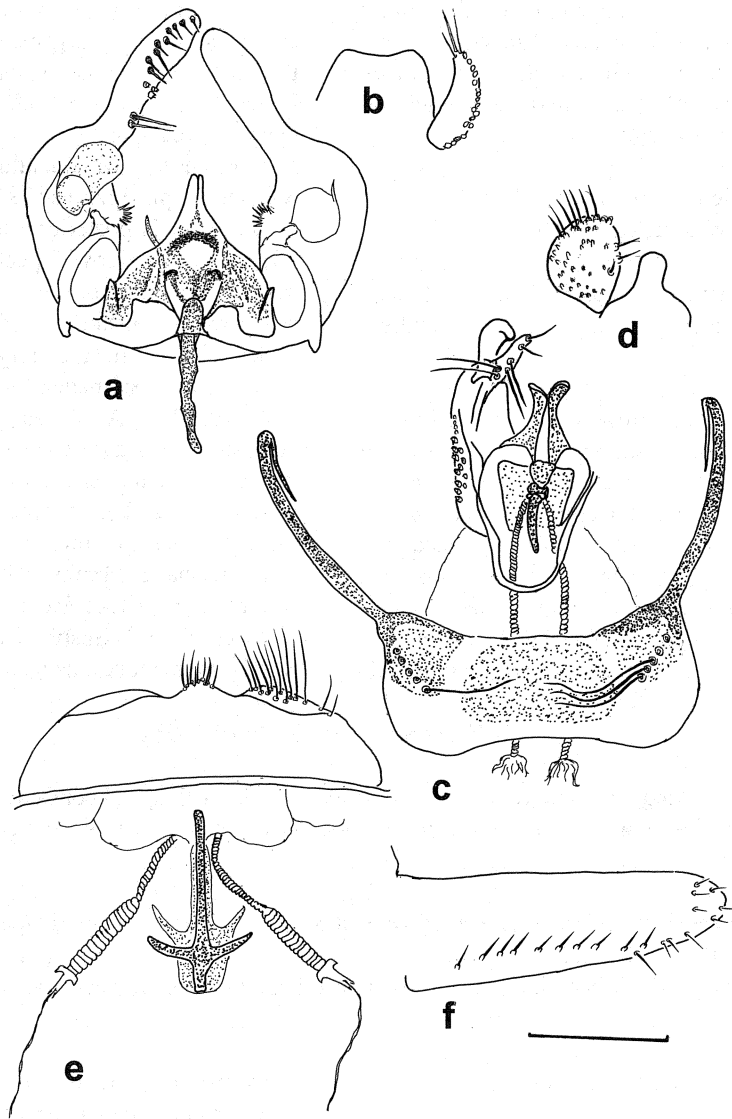


Fig. 4. a-b. *Trichomyia clavellata*, n.sp. a. ♂ gonopods and aedeagus, dorsal; b. ♂ tergite 10 and surstylus. c-f. *T. dolichakis*, n.sp. c. ♂ tergite 8, right gonopod and aedeagus, dorsal; d. ♂ tergite 10 and surstylus; e. ♀ genitalia; f. ♀ cercus. Scale line = 0.1 mm.

Etymology: 'dolichos' Gr, long; 'akis' Gr, point; referring to long projections on 7th tergite of ♂.

The conspicuous rods on the 7th tergite of the ♂ immediately identifies this species. However, there are other undescribed species which share this character as indicated by a few specimens from the western part of Costa Rica which will

require additional specimens for a diagnosis.

Tribe PERICOMINI

Pericomini Enderlein, 1935:246; Duckhouse, 1987:234.

Members of this tribe are characterized by the

fusiform shape of the flagellomeres, the central location of the radial and medial forks, the radial sector not pectinate, and the male genitalia lack the keel between the gonocoxal apodemes and the base of the aedeagus.

Genus *Pericoma* Walker

Pericoma Walker, 1856:256.

Type species: *Trichoptera trifasciata* Meigen; by subsequent designation, Coquillett, 1910:587.

Eye bridge with 4 rows of facets; eye bridges separated, interocular suture present; vertex much higher than width of eye bridge, often extended apically in arrowhead shape; occipital foramen slender, usually in shape of goblet. Antenna with scape little longer than pedicel, 14 fusiform (barrel- or spindle-shaped) flagellomeres; terminal 3 segments slightly reduced and more spherical than preceding, terminal with apiculis; ascoids

paired, digitiform, absent from terminal 3. Occipital allurement organs present or absent. Palpus with 4 palpomeres, long, extend to flagellomere 10 or 11; labellum bulbous, conspicuously inflated apically.

Thorax usually without allurement organs; hair scars on anepisternum and katepisternum; metanotum extends posteriorly into abdominal segment 3. Wing never with pectinate Rs, radial and medial forks near or distad of wing center and radial usually distad of medial; base of R_{2+3} in center of basal cell; R_5 ending beyond apex; apex of CuA_2 distad of medial fork.

♂ genitalia. Aedeagus symmetrical, pair of parameres; aedeagus slender or expanded basally; gonocoxal apodemes narrow, joined on midline, without median keel; tergite 9 with paired foramen; surstylus with multiple tenacula.

♀ genitalia. Subgenital plate without V-shaped feature on inner face; lacking genital digit; spermatheca with hemispherical lobes and setal sclerite in membranous plate.

KEY TO SPECIES OF *PERICOMA*

- 1 Large species, wing length more than 3 mm.; apex of vertex with apical concavity 2
- Smaller species, wing length less than 2 mm; apex of vertex rounded, without concavity
- 14. *hespenheidei*
- 2(1) Eyes separated by 1.5 facet diameters; ♂ without occipital allurement organs; apex of vertex bilobed, but not sagittate 12. *hansoni*
- Eyes separated by 2.5 facet diameters; ♂ with occipital allurement organs; apex of vertex sagittate 13. *zumbadoi*

12. *Pericoma hansoni* Quate, n.sp.
Fig. 5a-b

Very large species; vertex elongate, triangular; wings without pattern, infusate.

Male. Vertex triangular, more than 3-4X width of eye bridge. Antenna with 14 flagellomeres, 1 largest, spindle-shaped with apex a little elongate, following flagellomeres progressively smaller, terminal 3 slightly smaller than preceding, more cylindrical, terminal with well developed apiculis; ascoid extends little beyond tip of flagellomere. Palpus long, extends to flagellomere 11, ratio = 12:25:28:28. Eyes separated by 1.5 facet diameters, with 4 rows of facets. Hair patch on

frons sparse, confined to anterior half except irregular single or double row extending to above upper eye margin, interocular suture inverted V-shaped.

Wing with radial fork distad of medial, both lacking spur; R_2 about .75X R_{2+3} .

Gonostylus broad at base and tapering to slightly curved, rounded apex. Aedeagus Y-shaped, apical arms expanded at base, with lateral projection 2/3 length from fork; paramere unusual, attached near fork and extend mesad at 45° and then extend directly posterior to apex of aedeagus, then bend laterad at 45°, central shaft twisted and wrinkled like a croissant. Sternite 9 slightly expanded at center and setose on expan-

sion. Tergite 10 triangular; surstylus with about 14 tenacula.

Measurements: Antenna length 1.62-1.52 mm. Wing length 4.0-4.1 mm., width 1.4 mm.

Female. Eyes also separated by about 1.5 facet diameters.

Subgenital plate with crescent-shaped apical lobes; setal sclerite faint, somewhat ovoid; membranous plate with pair of dark, elongate ovoid structures posteriorly; spermatheca kidney-shaped, with long lateral bar.

Measurements: Antenna 1.5 mm. Wing length 3.86 mm., width 1.5 mm.

Holotype ♂, allotype ♀, COSTA RICA, Cartago, 4 km NE of Cañon, IV/95, 2350 m., P. Hanson (INBio). Paratypes, 2 ♂, same (INBio, LWQ).

Etymology: Named to recognize the work of Paul Hanson in advancing the knowledge of Costa Rican insects by his studies of Hymenoptera and obtaining and disbursing large collections of Costa Rican insects for other taxonomists.

13. *Pericoma zumbadoi* Quate, n.sp.

Fig. 5c-g

Large species; vertex elongate, triangular; wings without pattern, infusate. Male.

Vertex more than 3X width of eye bridge, apex sagittate, long, bilobed, scaly allurement organs near apex. Antenna with 14 flagellomeres, 1 largest, spindle-shaped with apex a little elongate, following flagellomeres progressively smaller, terminal 3 slightly smaller than preceding, more cylindrical, terminal with well developed apiculus; ascoid extends little beyond tip of flagellomere. Palpus long, extends to flagellomere 11, ratio = 15:20:28:28. Eyes separated by 2.5 facet diameters, with 4 rows of facets. Hair patch on frons sparse, confined to anterior half except irregular single or double row extending to above upper eye margin, interocular suture inverted V- or Y-shaped.

Wing with radial fork distad of medial, both lacking spur; R_2 about .75X R_{2+3} .

Gonostylus broad at base and tapering to slightly curved, rounded apex. Aedeagus ends in 1 long and 1 short branch; parameres asymmetrical, one side broad and blade-like, other about 1/3 smaller. Sternite 9 expanded at center and

setose on expansion. Tergite 10 triangular; surstylus with about 10-14 tenacula.

Measurements: Antenna length 1.32-1.44 mm.

Wing length 3.25-3.52 mm., width 1.16-1.21 mm.

Female. Eyes also separated by about 2.5 facet diameters.

Subgenital plate with crescent-shaped apical lobes; setal sclerite distinct, elongate, clavate, with 8 setae near apex; membranous plate largely sclerotized; spermatheca with reticulate surface.

Measurements: Antenna 1.25-1.31 mm. Wing length 3.25-3.42 mm., width 1.16-1.28 mm.

Holotype ♂, allotype ♀, COSTA RICA, Cartago, 51.5 km S of Cartago, 19-24/VI/95, 2680 m. (INBio). Paratypes, 7 ♂, 10 ♀, same (INBio, USNM, LACM, MNH, CAS, BBM, LWQ).

Etymology: named to recognize Manuel A. Zumbado's contribution to studies of Costa Rican Diptera and his dedication to the realization of INBio's goals.

14. *Pericoma hespenheidei* Quate, n.sp.

Fig. 6a-d

Large species; vertex elongate, triangular; wings without pattern, infusate.

Male. Apex of vertex rounded, more than 2X width of eye bridge. Antenna with 14 flagellomeres, 1 largest, barrel-shaped, following flagellomeres progressively smaller and more elongate, terminal with well developed apiculus; ascoid with single branch, extends little beyond tip of flagellomere. Palpus long, extends to flagellomere 11, ratio = 11:15:16:20. Eyes separated by 2 facet diameters, with 4 rows of facets. Hair patch on frons dense, undivided, with irregular double row extending to above upper eye margin, interocular suture inverted Y-shaped.

Wing with radial fork little distad of medial, medial sometimes incomplete but without spur; R_2 about .7X R_{2+3} .

Gonocoxite with large patch of hairs on lateral margin; gonostylus broad at base, but strongly constricted near base and largely a slender shaft. Aedeagus Y-shaped, but arms beyond fork pressed against parameres and hence obscure; parameres symmetrical, slender, pointed shafts

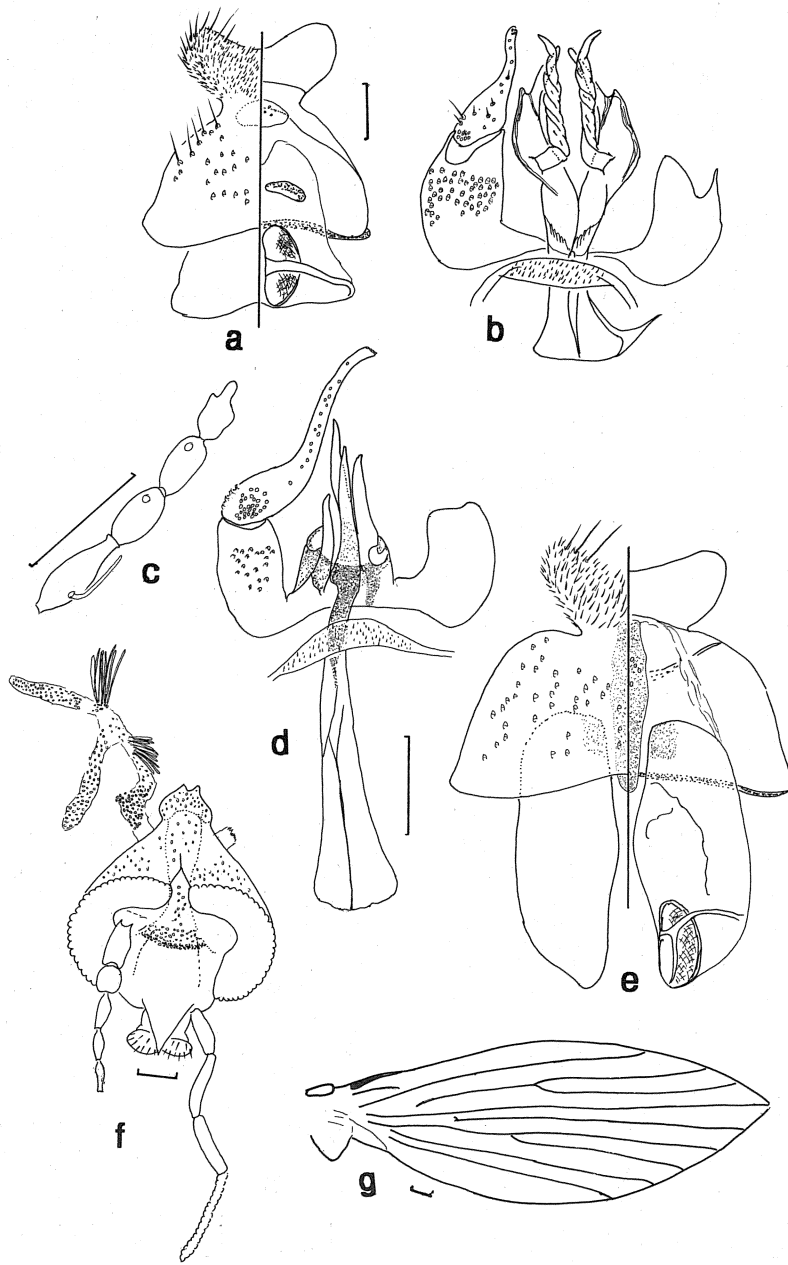


Fig. 5a-b. *Pericoma hansonii*. a. ♀ genitalia; b. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown. c-g. *P. zumbadoi*. c. flagellomeres 10-14; d. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; e. ♀ genitalia; f. head; g. wing. Scale line = 0.1 mm.

curving laterally and extending far beyond tip of aedeagus; anterior gonocoxal apodemes a hemi-

spherical projection below parameres. Surstylus with about 10 tenacula.

Measurements: Antenna length 0.81-0.99 mm. Wing length 2.41-2.55 mm., width 0.8 mm.

Female. Eyes separated by about 2.5 facet diameters.

Subgenital plate with base quadrate, except for setose lobes and laterodistal area; apical lobes well defined, with divergent sides. Setal sclerite elongate and distinctly sclerotized; membranous plate with pair of dark, irregular lobes on each side of midline.

Measurements: Antenna 0.95-1.09 mm. Wing length 2.46-2.82 mm., width 0.8-0.92 mm.

Holotype ♂, COSTA RICA, Heredia, Estación Biol. La Selva, 25/VII/93, H. Hespeneide; allotype ♀, same, except 1/VII/93 (INBio).

Paratypes, 19 ♂, 22 ♀, same except 12/II/93, 1/IV/93, 2/V/93, 1/VII/93, 1/XII/93. (INBio, USNM, LACM, MNH, CAS, BBM, LWQ)

Etymology: Named in honor of Henry A. Hespeneide, U.C.L.A. in recognition to his contributions to the knowledge of the natural history of Costa Rica.

Genus *Syntomoza* Enderlein

Syntomoza Enderlein, 1937:88; Quate, 1963:185.

Type species: *Syntomoza niveitarsis* Enderlein, by original designation.

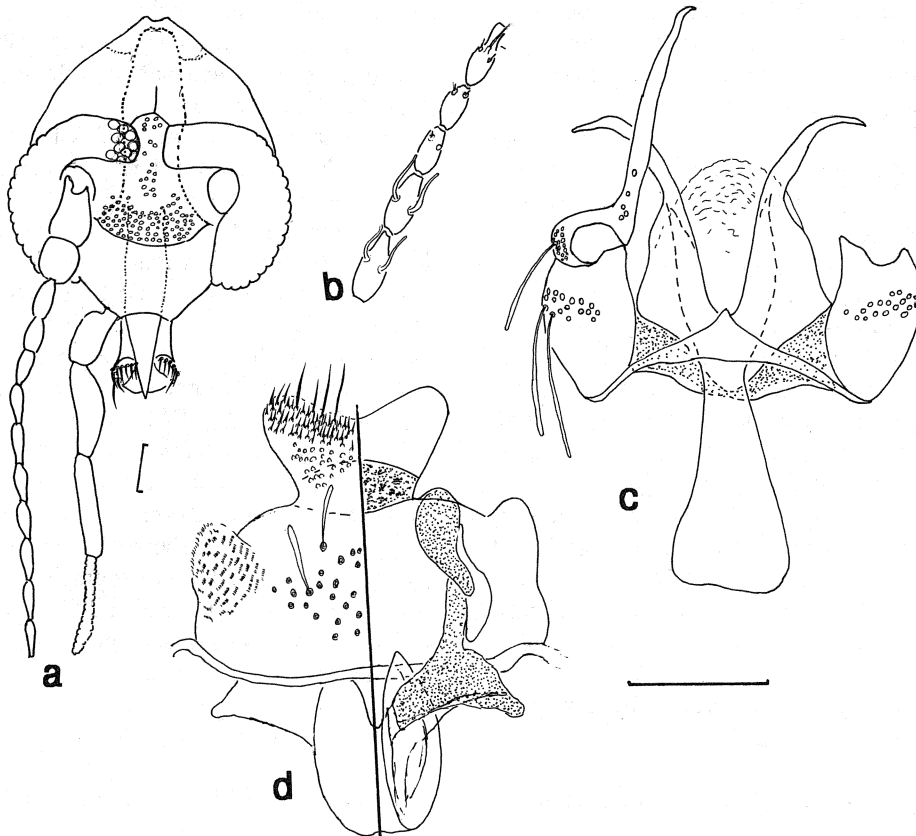


Fig. 6. *Pericoma hespenheidei*, n.sp. a. ♀ head; b. flagellomeres 10-14; c. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; d. ♀ genitalia. Scale line = 0.1 mm.