

Head. ♂: Pair of large, scaly, multilobed allurement organs arising from ventral surface near apex; frons protuberant, with narrow, dense band of hair scars along anterior margin, without median band. ♀: No allurement organs, frons with broader band of less dense scars on anterior third and sparse, irregular band of 2-4 rows on midline extending to upper eye margin. Vertex height on midline 3X eye bridge. Antenna with 14 flagellomeres. ♂ with large scape, much larger than pedicel, anteroapical margin enlarged and extending beyond base of pedicel. ♀ with scape about 2X length of pedicel, normal shape. Flagellomeres 1-11 spindle-shaped, bearing simple, unbranched ascoids, 12-14 smaller, without ascoids. Labellum bulbous with flattened apex bearing number of bristles.

Pronotum with dense patch of hair scars. Anepisternum with less dense patch on upper half, anterior spiracle near dorsal margin; laterotergite with very dense, oval patch of scars. ♂ with scales on basal part of wing. Radial and medial forks basad of wing center near level of tip of CuA_2 , radial distad of medial, R_5 not pectinate. Origin of R_{2+3} in center of basal cell; R_5 ending in or slightly before tip.

♂ with symmetrical aedeagus; gonocoxal apodemes small, meeting on midline, apparently with small keel joining them to aedeagus; paramere paired; surstylus with multiple tenacula; tergite 9 with paired foramen. ♀ subgenital plate with small apical lobes clearly differentiated from base and with shallow apical concavity; setal sclerite present; lacking genital digit.

♀ genitalia. Inverted V-shaped feature on inner face of subgenital plate, apex of V not extending to margin between lobes; spermatheca with hemispherical lobes; genital digit and setal sclerite lacking.

15. *Syntomoza monteverdica* Quate, n.sp.

Fig. 7a-h

Large species with uniformly black vestiture, except silvery scales on tarsi.

♂. Scape very large, 3.5X length of pedicel, anteroapical margin enlarged lobe-like, extends beyond base of pedicel; flagellomeres small, spindle-shaped, terminal 3 reduced. Tentorial pits large, funnel-shaped; occipital foramen

hourglass-shaped, constricted in center, anterior half narrower than posterior. Frons bare of scars behind narrow anterior band; vertex triangular, ending in sagittate apex, with pair of large, multilobed, scaly allurement organs on posterior surface; median groove from interocular suture to near apex, eyes separated by 3.5 facet diameters, interocular suture well developed, inverted V-shaped, bridge with 4 facet rows.

Wing. Radial fork distad of medial by about cell width, R_{2+3} about 1/2 length of R_2 , medial fork with spur; R_5 ends in acute wing apex.

Aedeagus symmetrical, base rather slender, clavate, ending in 2 pairs of curved points, parameres a pair of short and laterally curved shafts about 1/2 length of aedeagus shafts; left shaft sometimes shorter than right.

Measurements: Antenna 1.36-1.50 mm. Wing length 3.08-3.59 mm., width 1.13-1.25 mm.

♀. Frons with scars more widely distributed over anterior surface and with irregular triple row extending to upper eye margin.

Genitalia with elongate setal sclerite, membranous plate thickened with ridged posterior and lateral margins

Measurements. Antenna 1.24-1.33 mm. Wing length 2.96-3.21 mm., width 1.13-1.18 mm.

Holotype ♂, allotype ♀, COSTA RICA, Puentarenas, Monteverde, 4/II/91, 1500 m +/- moist, shaded bank (INBio). Paratypes, 52 ♂ (slides), 5 ♂ (pinned), 2 ♀, same data (INBio, USNM, LACM, MNH, CAS, BBM, LWQ).

Etymology: Name based on type locality.

Variation is seen in the parameres with the left one often smaller and thicker than the right; these variations are seen in the specimens taken together at Monteverde. A geographical variant was collected at Pitilla, which differs in having both parameres much smaller and the base of the aedeagus somewhat inflated.

Tribe MARUININI

Enderlein, 1937:109, 110; Duckhouse, 1987:234.

While the genus *Maruina* superficially appears to be somewhat aberrant with its very narrow and lanceolate wings and aquatic habitat, Duckhouse has correctly concluded that the genus is the basis

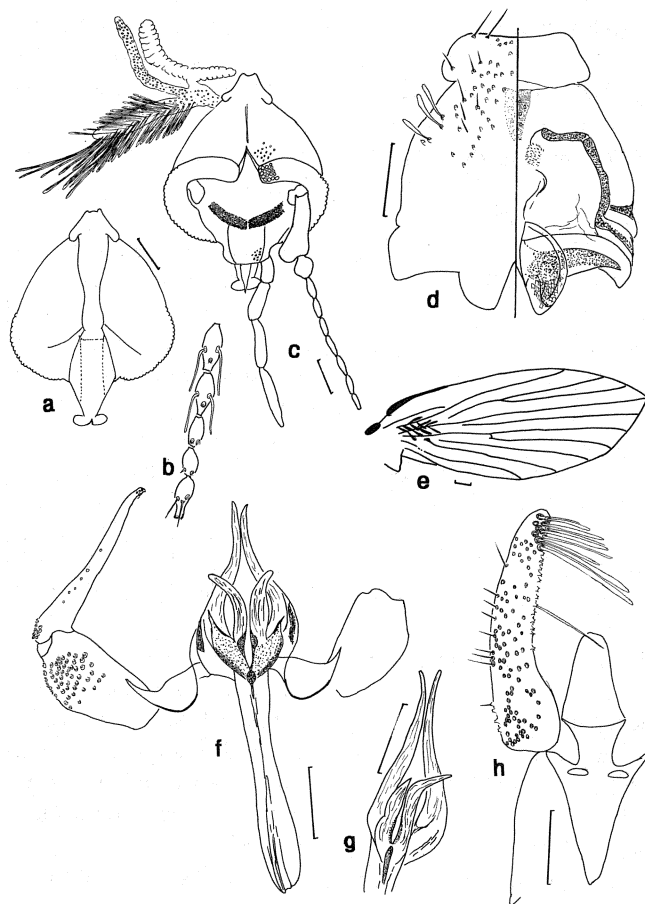


Figure 7. *Syntomoza monteverdica*, n.sp. a. Head, ventral; b. flagellomeres 10-14; c. head, dorsal; d. ♀ genitalia; e. wing; f. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; g. ♂ aedeagus; h. ♂ surstylus, tergite 10 and epandrium. Scale line = 0.1 mm.

of the tribe, which is distinguished by basal flagellomere being fusiform, the radial and medial forks usually basal in position, the possession of the distinctive keel in the male genitalia which connects the gonocoxal apodemes to the broad base of the aedeagus, and the male surstylus bearing a single tenaculum.

This is a large tribe which is well developed in the southern hemisphere and contains the majority of genera endemic to the Neotropics. Much work remains to be done before we will have a clear picture of all the taxa in this tribe.

Genus *Maruina* Müller

Maruina Müller, 1895:480; Quate, 1955:238; Hogue, 1973:7.

Immature stages of *Maruina* are common in Neotropical streams and I have collected hundreds of larvae and pupae in Costa Rica; also, many adults have been taken by netting and trapping. While *Maruina* presents the unique opportunity to study associated immatures and adults, it also is demanding and time-consuming.

The excellent work of Hogue (1972) has laid a solid foundation for the taxonomy of this genus and further studies will be deferred until later.

Costa Rican Species.

16. *Maruina (Aculcina) amadora* Hogue, 1973:14.
 Distribution: Alajuela, Cartago, Puntarenas, San José.
17. *M. (A.) amada* Hogue, 1973:16.
 Distribution: Cartago, San José.
18. *M. (A.) querida* Hogue, 1973:18.
 Distribution: Cartago.
19. *M. (A.) cholita* Hogue, 1973:19.
 Distribution: Puntarenas.
20. *M. (A.) muchaacha* Hogue, 1973:22.
 Distribution: Puntarenas.
21. *M. (Maruina) chamaca* Hogue, 1973:32.
 Distribution: Alajuela, Cartago, Puntarenas, San José.
22. *M. (M.) chamaquita* Hogue, 1973:38.
 Distribution: Guanacaste, San José.
23. *M. (M.) chica* Hogue, 1973:46.
 Distribution: Alajuela, Guanacaste, Puntarenas, San José.
24. *M. (M.) dama* Hogue, 1973:51.
 Distribution: Puntarenas, San José.
25. *M. (M.) vidamia* Hogue, 1973:57.
 Distribution: Puntarenas.
26. *M. (M.) tica* Hogue, 1973:58.
 Distribution: Alajuela, Guanacaste, Puntarenas, San José.
27. *M. (M.) nina* Hogue, 1973:62.
 Distribution: Guanacaste, Puntarenas, San José.

Genus *Alepia* Enderlein

Alepia Enderlein, 1937:94; Quate, 1963:192; Duckhouse, 1968:31; 1974:145.
Chirolepia Enderlein, 1937:103.

Type species: *Alepia scripta* Enderlein, by orig. desig.

Head. Eye bridge with 3 rows of facets, contiguous or separated. Vertex on midline at least 2X width of bridge. Occipital foramen with nearly straight sides, convergent anteriorly. Labellum bulbous. Flagellomeres fusiform, ascoids simple, terminal 3 segments usually unmodified, terminal with apiculis; ascoids simple.

Thorax. Pleuron with hairs on anepisternum and laterotergite. Wing usually patterned; Rs pectinate; radial and medial forks on nearly same level, basad of center of wing; CuA₂ ending beyond level of medial fork; R₅ ending in acute apex.

♂ genitalia. Gonocoxal apodemes large, broadly joined on midline, with median keel connected to aedeagus; aedeagus complex, asymmetrical. Surstylus with or without apical tenaculum, always with cluster of long, sinuous accessory tenacula near base, tips clavate, umbellate or fringed.

♀ genitalia. Inverted V-shaped feature on inner face of subgenital plate formed by flaps of lobes, apex of V extending to or little beyond margin between lobes; spermatheca without hemispherical lobes; genital digit and setal sclerite lacking.

KEY TO SPECIES OF *ALEPIA*

- 1 Interocular suture inverted Y-shaped; ♂ surstylus with single, small tenacula 2
 Interocular suture inverted V-shaped; surstylus without apical tenaculum 28. *alfaroana*
- 2(1) ♂ gonocoxite with apical appendage extending beyond base of gonostylus nearly to tip of gonostylus; ♀ subgenital plate with dark, bell-shaped structure on inner face 29. *valentia*
 Gonocoxite without apical appendage; subgenital plate without bell-shaped structure 30. *relativa*

28. *Alepia alfaroana* (Dyar)
Psychoda alfaroana Dyar, 1926:110.
Alepia alfaroana, Duckhouse, 1974:148
 (descr., illus.)

COSTA RICA. San José, Alajuela.

29. *Alepia valentia* Quate, n.sp.
 Fig. 8 a-d

A large species with patterned wings.
 Male. Antenna with 14 flagellomeres, all subequal in size, terminal with conspicuous

apiculis, ascoids not observed. Eye bridge with only 3 rows of facets, eyes separated by 1 facet diameter; interocular suture prominent, inverted Y-shaped. Hair patch on frons divided in center without dorsal projection. Palpus extends to flagellomere 6 or 7, formula = 10:15:19:21.

Wing infusate except white spots between tips on radial and medial forks, and on tip of CuA₁ and CuA₂; radial and medial forks on same level; R₂ 4-5X length of R₂₊₃.

Gonocoxite with dorsal apodemes narrowly contiguous medially, ventral apodemes broadly contiguous with medial keel extending to aedeagus, with curved posterior extension from apicolateral margin as long as gonostylus, but much more slender. Gonostylus broad, sharply curving outward at apex to a sickle-shaped structure. Aedeagus with broad, dark, rounded base; expanded medially with dark expansions, apex bifurcate. Paramere enclosing base of distal part of aedeagus, apex concave. Surstylus short and stocky, tapers to slender point bearing small atrophied tenaculum; numerous (more than 20) accessory tenacula on dorsal surface of basal half, each consisting of slender stalk bearing clavate or umbellate tips. Epanthrium with single opening. Tergite 10 ending as elongate, triangular lobe.

Measurements: Antenna 1.76-1.81 mm. Wing length 2.63-3.11 mm., width 0.94-1.06 mm.

Female. Eyes separated by 1.5 facet diameters; palpus extends to flagellomere 7 or 8.

Subgenital plate with dark, bell-shaped structure on inner face; spermatheca heavily sclerotized, with bar-shaped expansion on mediobasal margin.

Measurements: Antenna 1.89 mm. Wing length 2.60-2.82 mm., width 0.84-0.99 mm.

Holotype ♂, allotype ♀ COSTA RICA, Heredia, Estación Biol. La Selva, 15/IV/93, 02/V/93 (INBio). Paratypes, 4 ♂, 6 ♀, same but 23/I/93, 12/II/93, 1/IV/93, VII/93, 16/XII/93; 3 ♂, Limon, Puerto Viejo de Talamanca, 20-22/VII/93, sea level (INBio, USNM, LACM, MNH, BBM, LWQ).

30. *Alepia relativa* Quate, n.sp.

Fig. 8 e-g

Wings patterned as *valentia*.

Male. Antenna broken, presumably with 16 segments, all flagellomeres subequal in size, ascoids not observed. Eye bridge with 3 rows of facets, eyes separated by 2-2.5 facet diameters; interocular suture prominent, inverted Y-shaped. Hair patch on frons divided in center, without dorsal projection. Palpus extends to flagellomere 6 or 7, formula 8:14:14:18.

Wing infusate except white spots between tips of longitudinal veins, darker spots at base of R₂₊₃, on radial and medial forks, but fainter on medial, and on tip of CuA₁ and CuA₂; radial and medial forks on same level; R₂ 3.5-4.5X length of R₂₊₃.

Gonocoxite with dorsal apodemes narrowly contiguous medially, ventral apodemes broadly contiguous with median keel extending to aedeagus. Gonostylus moderately broad, tapering to S-shaped apex. Aedeagus with broad, dark, rounded base; apex rounded at apex, not bifurcate, heavily sclerotized; paramere ending in hoof-like appendage near center of distal part of aedeagus. Surstylus short and stocky, tapers to slender point bearing small, atrophied tenaculum; numerous (more than 20) accessory tenacula on dorsal surface of basal half, each consisting of slender stalk bearing clavate tip. Epanthrium with single opening. Tergite 10 ending as elongate, triangular lobe.

Measurements: Antenna broken. Wing length 2.29-2.46 mm., width 0.75-0.89 mm.

Female. Eyes separated by 1.5-2 facet diameters.

Subgenital plate without bell-shaped structure on inner face. Spermatheca darkly sclerotized, with expanded bar on medial margin.

Measurements: Antenna broken. Wing length 2.27-2.58 mm.; width 0.75-0.96 mm.

Holotype ♂, allotype ♀, COSTA RICA, Heredia, Estación Biol. La Selva, 23/I/93 and 12/II/93 (INBio). Paratypes, 3 ♂, 48 ♀, (INBio, LACM, USNM, MNH, CAS, BBM, LWQ).

Arisemus Satchell

Telmatoscopus (Arisemus) Satchell, 1955:88
Arisemus, Botosaneanu & Vaillant, 1970:176;
Duckhouse, 74:149.

Type species: *Psychoda grabhamana* (as *Telmatoscopus (Arisemus) maculosus* Satchell,

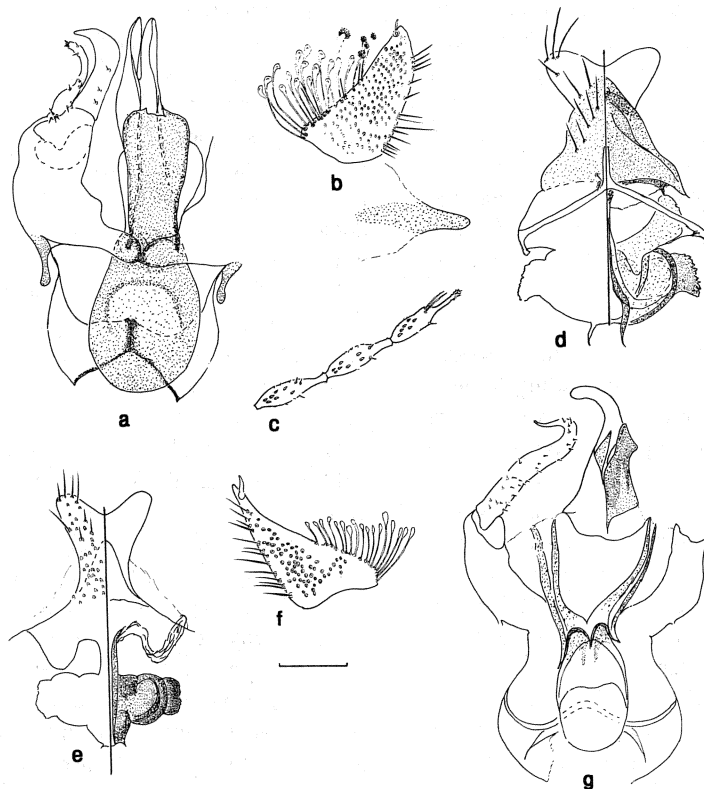


Fig. 8. a-d. *Alepia valentia*: a: ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; b: ♂ surstylus and tergite 10; c: flagellomeres 12-13; d: ♀ genitalia. e-g. *Alepia relativa*. e: ♀ genitalia; f: ♂ surstylus; g: ♂ gonopods and aedeagus, dorsal, right gonostylus not shown. Scale line = 0.1 mm.

by original designation, a synonym of *grabhamana* according to Duckhouse (*l.c.*) (Note: *A. maculosus* Satchell is a junior synonym of *A. maculosus* (Rapp) (1945:309)).

Head Eye bridge with 3 rows of facets, contiguous. Vertex on midline at least 2X width of bridge. Occipital foramen slender, goblet-shaped with constriction anteriorly. Labellum bulbous. Flagellomeres fusiform, ascoids simple, terminal 3 segments reduced, terminal with apiculis.

Thorax Allurement organs absent. Pleuron with hairs on anepisternum and laterotergite. Wing usually patterned; Rs pectinate; radial and medial forks on nearly same level, basad of center of wing; CuA₁ and CuA₂ ending beyond level of medial fork; R₅ ending in acute apex.

♂ genitalia. Gonocoxal apodemes large,

broadly joined on midline, with median keel connected to aedeagus; aedeagus complex, asymmetrical. Surstylus with single tenaculum.

♀ genitalia. Inverted V-shaped feature on inner face of subgenital plate formed by flaps of lobes, apex of V not reaching margin; lacking setal sclerite and genital digit.

Arisemus is similar to *Alepia* but differs in having the terminal 3 flagellomeres reduced; males of the latter are distinguished by the accessory tenacula on the base of the surstylus.

Females are less easily distinguished as most characters appear in both genera. It does appear that *Alepia* females are characterized by the V on the inner face of the subgenital plate reaching the margin of the plate while in *Arisemus* the apex of the V is well basad of the margin. Another distinguishing feature that appears valid is the difference in the labellum; that of *Arisemus* is

Other generic characters to be noted are the goblet-shaped occipital foramen with convex

sides anteriorly, and the normal sized palpus which extends only to flagellomere 2, 3 or 4.

KEY TO SPECIES OF *ARISEMUS*

- 1 Radial and medial forks complete and connected; ♂ with CuA₂ normal, uniform in width along entire vein 2
 Radial and medial forks incomplete, bases of R₃ and M₂ free and disconnected; ♂ with CuA₂ greatly expanded on basal 2/3, at least 2X width of distal part 31. *spilotos*
- 2(1) CuA₂ with marked apical curve; wing broad, length about 2X width; male with scales on basal half of wing 32. *lepidotos*
 CuA₂ straight at apex; wing narrow, length about 3X width; male without scales on wing 33. *salazari*

31. *Arisemus spilotos* Quate, n.sp.
 Fig. 9a-c

Species with spots at tips of veins.

Male. Antenna scape large, about 3X size of pedicel; 14 flagellomeres, 1 and 2 fusiform and larger than following, 3-11 weakly nodiform, nodes progressively enlarged and internode progressively defined more clearly towards apex, 12-14 globular, without internodes, 14 with small, stubby apiculis; ascoids simple, with single branch, confined to flagellomeres 3-11. Eye bridge with 3 facet rows, contiguous on midline. Hair patch on frons confined to anterior half, divided on midline, frons protuberant. Palpus extends to flagellomere 3, formula = 7:9:7:12.

Thorax with patch of scales on anepisternum posterior of anterior spiracle and similar patch on dorsal part of laterotergite ventrad of wing base. Wing with brown spots at tips of all longitudinal veins and on radial and medial forks, expanded in anal area to produce eccentric appearance; radial and medial forks incomplete because bases of R₃ and M₂ lacking and not connected at fork, forks on same level; R₂₊₃ very short, reduced to short stump anterior of fork, base lacking and hence disconnected; CuA₂ expanded on basal 2/3, suddenly constricted and apical part of vein normal, with short spur at apex.

Aedeagus with pair of large, basal expansions, apical part and paramere membranous, tapering to sharp points, paramere extends beyond aedeagus. Surstylus with single tenaculum; tergite

10 triangular.

Measurements: Antenna 1.30-1.46 mm. Wing length 2.60-2.87 mm., width 1.04-1.20 mm.

Female. Similar to ♂. Antenna smaller. Anepisternum without patch of scales. Wing with CuA₂ normal, spur more conspicuous. Subgenital plate with apex of inverted V on inner face clearly basad of plate margin, pair of membranous, bulb-like expansions on distal arms of spermathecae.

Measurements: Antenna 1.13 mm. Wing length 2.51-2.92 mm., width 0.92-1.06 mm.

Holotype ♂, allotype ♀, COSTA RICA, Heredia, Rio Santo Domingo near San Rafael de Vara Blanca, 18,26/VII/93, 1700 m. (INBio). Paratypes, 27 ♂, 7 ♀, same data (INBio, USNM, LACM, MNH, CAS, BBM, LWQ).

Etymology: 'spilotos' Gr, spotted; referring to spots on wings.

A. spilotos appears similar to *A. grabhamana* (Dyar) (Duckhouse, 1974:149), but differs in the shape of the paramere, which has a rounded apex in *grabhamana* and the base of the aedeagus, which is a single, broad plate in *grabhamana* and lacks the pair of basal lobes as in *spilotos*.

32. *Arisemus lepidotos* Quate, n.sp.
 Fig. 9 d-g

Species with spots at tips of veins and ♂ with scales on base of wing; body and legs pale in color.

Male. Scales on head and appendages. An-

tenna with dense scales from scape to flagellomere 7; scape large, about 3X size of pedicel; 14 flagellomeres, 1, 2 and 3 fusiform and larger than following, 4 nodiform with short internode, nodes progressively enlarged and internode progressively defined more clearly towards apex, 1-11 with dense hair covering on nodes, 12-14

globular, without internodes, 14 with small, apiculis; ascoids simple, with single branch, confined to flagellomeres 8-11, those segments lacking scales. Eye bridge with 3 facet rows, contiguous on midline. Hair patch on frons confined to anterior, divided on midline, frons protuberant. Palpus extends to flagellomere 4,

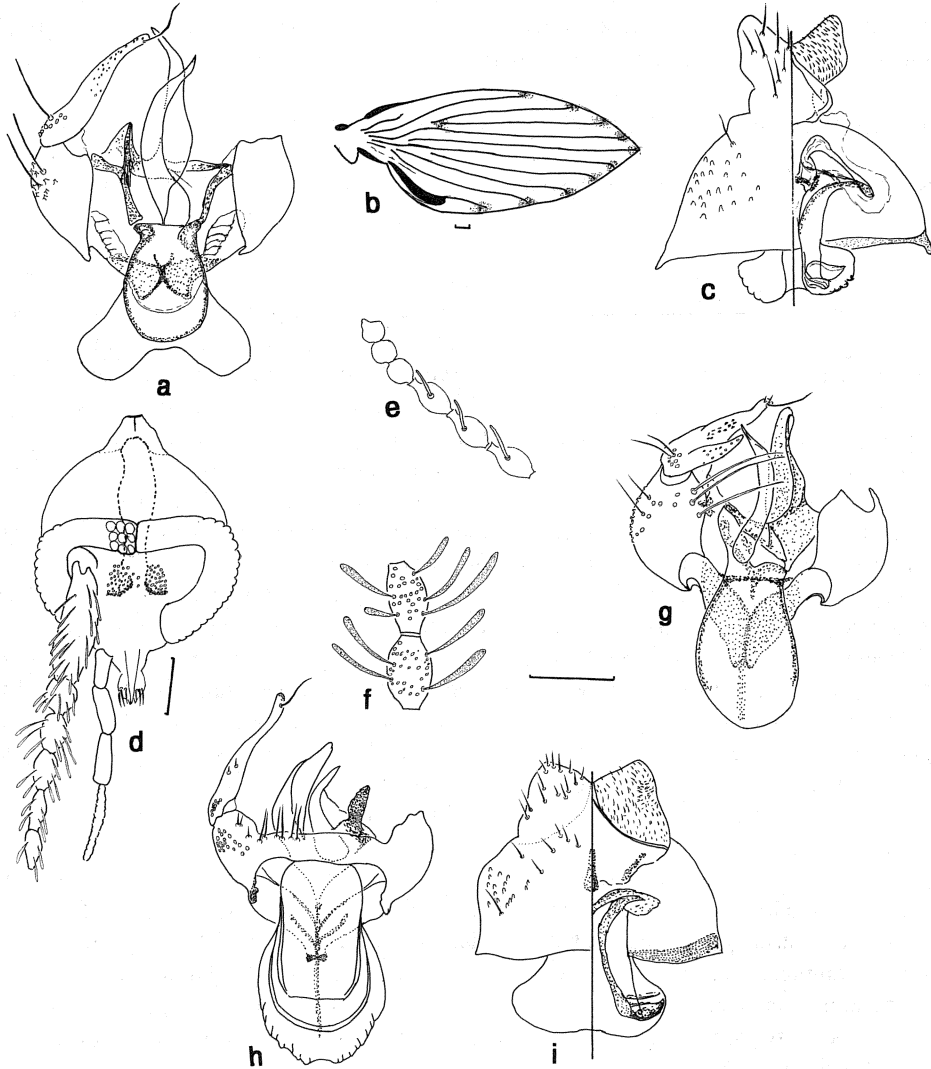


Fig. 9. a-c. *Arisemus spilotos*. a. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; b. wing; c. ♀ genitalia. d-g. *A. lepidotos*. d. head; e. flagellomeres 9-14; f. flagellomeres 1-2; g. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown. h-i. *A. salazari*. h. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; ♀ genitalia. Scale lines - 0.1 mm.

Wing with dense scales on basal half, brown spots at tips of all longitudinal veins and on radial and medial forks; radial and medial forks complete, on same level; R_{2+3} very short; CuA_2 normal. All femora with large, subapical hair scars.

Gonostylus with elongate, cone-shaped projection near base, constricted subapically and ending in thumb-like projection; aedeagus with large basal, paddle-shaped enlargement, apical part membranous with sharp apex; paramere dark, broad at base and tapering to rounded apex, paramere extends beyond aedeagus. Surstylus with single tenaculum; tergite 10 triangular.

Measurements: Antenna 1.36-1.45 mm. Wing length 2.27-2.36 mm., width 1.04-1.06 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Heredia, Estación Biol. La Selva, 22/VII/93, fluorescent light (INBio). Paratypes, 2♂, same; 4♂, same but 19/VII/93 (INBio, USNM, LACM, LWQ).

Etymology: 'lepidotos, Gr, scaly; referring to the scales on the wing of the male.

33. *Arisemus salazari* Quate, n.sp.

Fig. 9 h-i

Species with spots at tips of veins.

Male. Antenna with scape normal, about 1.5X size of pedicel; 14 flagellomeres, 1-11 nodiform with short internode, 12-14 globular, without internodes, 14 with small, stubby apiculis; ascoids simple, with single branch, on flagellomeres 1-11. Eye bridge with 3 facet rows, contiguous on midline. Hair patch on frons extends to within facet diameter of eye bridge, barely divided on midline. Palpus extends to flagellomere 6, formula = 7:8:10:18.

Thorax without scales. Wing narrow, with brown spots at tips of all longitudinal veins and on radial and medial forks; radial and medial forks complete, nearly on same level; R_{2+3} very short; CuA_2 straight at apex, not reaching wing margin.

Gonocoxites connected by rigid band with black, thumb-like projection only on one side, 6 stiff bristles on other side; gonostylus slender, apical half slightly sinuous; aedeagus with large paddle-shaped, basal enlargement; distal part of

aedeagus and paramere membranous, with pointed apices, paramere extends beyond aedeagus. Surstylus with single tenaculum; tergite 10 triangular.

Measurements: Antenna 0.94-1.04 mm. Wing length 1.81-2.12 mm., width 0.58-0.72 mm.

Female. Similar to ♂, but little larger. Subgenital plate compact, apical lobes with shallow apical concavity, apex of inverted V reaches margin.

Measurements: Antenna 0.92-1.07 mm. Wing length 1.76-2.46 mm., width 0.58-0.72 mm.

Holotype ♂, allotype ♀, COSTA RICA, Limón, Puerto Viejo de Talamanca, 22/VII/93 (INBio). Paratypes, 4♂, 18♀, same (INBio, USNM, LACM, MNH, BBM, LWQ).

Etymology: Named to honor Mauricio Salazar, a naturalist, conservationist and owner of the Chimuri Lodge, Puerto Viejo de Talamanca, for his attempts to demonstrate that cash crops can be cultivated with minimal impact on a lowland rain forest.

Caenobrunettia Wagner

Wagner, 1981:218.

Type species: *Caenobrunettia echinoflagellata* Wagner, by orig. desig.

Large species with unpatterned wings, eye bridge short and tapered, each flagellomere with 2 patches of sensory rods and lacking ascoids, palpus very long.

Male. Eyes widely separated, eye bridge short and tapered, with no more than 3 rows of facets. Antennal foramen with thick rim extending anteriorly at edge of eye to tentorium. Antenna with scape and pedicel normal; 14 flagellomeres, asymmetrically fusiform, without ascoids but with many, very long hairs originating in pair of patches of sensory rods; terminal with long apiculis. Palpus long, extends to flagellomere 12, palpomere 1 short, less than 1/3X palpomere 2. Labellum bulbous. Occipital foramen with straight sides, converging anteriorly, with pair of patch of hairs in central part; rest of pleural areas small hook-like projections near posterior margin. Without allurement organs.

Thorax. Anepisternum and laterotergite with patch of hairs in center, rest of pleural area bare;

lacking allurement organs. Wing unpatterned; Rs pectinate, radial and medial forks near wing base; medial fork little distad of radial; origin of R_{2+3} beyond basal cell; R_5 ends in acute apex; tip of CuA_2 well beyond medial cell.

Genitalia. Gonostylus reduced and modified. Gonocoxal apodemes joined on midline, with large basal expansion, joined to aedeagus with keel; aedeagus asymmetrical, base broad and paddle-shaped. Surstylus with single tenaculum.

Setomima

Eye bridges may be short.

Palpomere 1 with dorsolateral patch of sensory rods; palpomere 2 inserted on ventral side of 1; palpus very long, extends beyond tip of antenna; palpomere 1 much shorter than other palpomeres.

Antennal insertion area with sclerotized rim.

Ascoids very long and massive, sclerotized with annular thickenings; 2 ascoids per segment (except 3 on flagellomere 3), bases separated by about 1/3 diameter of node; several stout sensory setae at base of ascoids; last flagellomere elongate with apiculus naked, except for 2 stout apical setae.

Anepisternite with strong, wing-like lobe posterior of spiracle.

Wing densely covered with scales (scars on membrane of rubbed specimens).

Discrete 2nd costal node above Sc.

Ventral epandrial plate broadly fused with gonocoxal apodeme. Hypandrium often arched backwards strongly and attached to base of coxites and to posthypandrial plate. Tenacula multiple, usually short and clavate or dimorphic. Gonopod simple. Aedeagus complex, symmetrical.

Female. Similar to male, but ascoids simple, V-shaped.

Genitalia with setal sclerite and lacking hemispherical lobes in spermatheca.

The shortened eye bridge, very long palpus and antennal structure are shared by *Setomima* Enderlein and *Caenobrunettia* which appear to be sister genera. The following comparison is largely based on the definition of *Setomima* by Duckhouse (1987:247).

Caenobrunettia

Eye bridges always short.

Palpomere 1 without sensory rods, inserted apically on 2; other features the same.

Same.

Ascoids long and filamentous, multiple and arising from single patch; pair of clusters of numerous sensory rods on each side of ascoid patch; last flagellomere elongate, apiculus with few setae and single, long seta at base.

Anepisternite without lobe.

Wing without scales or scars on membrane.

Discrete 2nd costal node above Sc

Epandrium and hypandrium the same. Tenacula single, of usual shape. Gonopod modified, gonocoxite with apicomesal projection, gonostylus much smaller than gonocoxite.

Aedeagus complex, symmetrical.

KEY TO SPECIES OF *CAENOBRUNETTIA*

- 1 Frons with suture from eye bridge extending medially a short distance and ending before eye margin 2
- Frons with suture from eye bridge curving anteriorly and joining eye margin below antennal foramen 35. *laselva*

- 2(1) ♂ gonocoxite with row of 5-6 very large bristles on ventral surface near distal margin; gonostylus nearly as long as gonocoxite; ♀ subgenital plate with Y-shaped apical lobes 34. *plegas*
 ♂ gonocoxite without large bristles on ventral surface; gonostylus very small, ending in curved, acute apex; ♀ subgenital plate with straight, convergent sides 36. *tropicalis*

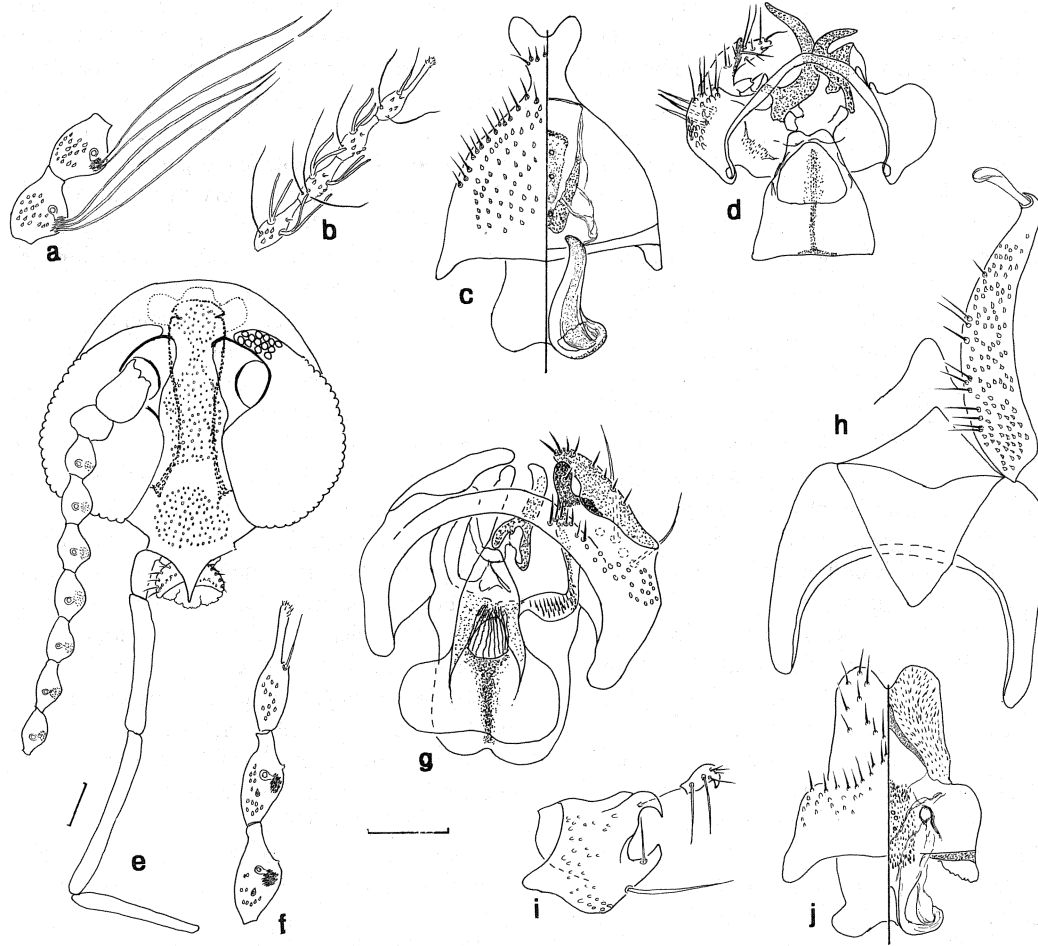


Fig. a-d. *Caenobrunettia plegas*, ♂ flagellomeres 2,3; b. ♀ flagellomeres 1-14. c. ♀ genitalia; d. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown. e-h. *C. laselva*. e. ♂ head. f. ♂ flagellomeres 12-14. g. ♂ gonopods and aedeagus, dorsal. h. ♂ tergites 9,10, surstylus. i-j. *C. tropicalis*. i. ♂ gonocoxite and gonostylus. j. ♀ genitalia. Scale line = 0.1 mm.

34. *Caenobrunettia plegas* Quate, n.sp.
 Fig. 10 a-d

Moderately large species with unpatterned

wings.

Male. Antenna with 14 flagellomeres, asymmetrically fusiform, each with pair of clusters of short, dense sensory rods bearing

very long hairs which probably function as ascoids, deep pit adjacent to each cluster with groove from cluster leading to pit; terminal Antennal foramen with very thick rim which symmetrical with long, slender apiculis and tapered spine at base of and as long as apiculis. extends anteriorly along eye margin to tentorium; suture from inner eye margin extends medially a short distance and ends. Eye bridge small, does not extend to medial margin of antennal foramen, tapers to acute apex. Palpus very long, extends to flagellomere 12, formula = 10:25:28:28.

Gonocoxites joined by rigid, dorsal band; apodemes not extending basally to base of aedeagus; apicomeral projection small, blunt, digitiform; 5-6 large spines on ventral surface near apex. Gonostylus nearly as long as gonocoxite, with ridge projecting laterally as sharp point at distal 1/3, large spine on face of ridge. Aedeagus with large base, apical part sickle-shaped; paramere smaller than apex of aedeagus, ending in acute, sharply curved apex. Surstylus with single tenaculum; tergite 10 very long, extending beyond center of surstylus, ending in attenuate tip.

Measurements: Antenna 1.63-1.75 mm. Wing length 2.19-2.41 mm., width 0.92-0.96 mm.

Female. Flagellomeres smaller than ♂, fusiform, with patches of sensory rods, ascoid simple, V-shaped, extends to basal 1/3 of following segment; terminal flagellomeres not reduced.

Tergite 10 with several ridges in fan shape on apical half. Subgenital plate with small, Y-shaped apical lobes; spermatheca lacking hemispherical lobes; setal sclerite shield-shaped, with 4-5 setae.

Measurements: Antenna 1.12-1.26 mm. Wing length 2.41-2.46 mm., width 0.94-0.99 mm.

Holotype ♂, allotype ♀, COSTA RICA, Heredia, Estación Biol. La Selva, 2/V/93 (INBio). Paratypes, 6 ♂, 1 ♀, same and 23/II/93, 12/II/93, 16,IV/93,1/VII/93, 15/X/93 (INBio, USNM, LACM, MNH, LWQ).

Etymology: 'plegas' Gr, sickle, referring to shape of distal part of aedeagus.

35. *Caenobrunettia laselva* Quate, n.sp.

Fig. 10 e-h

Large species with broad, infusate wings.

Male. Antenna with 14 flagellomeres, all except terminal, asymmetrically fusiform, each with pair of clusters of short, dense sensory rods bearing very long hairs which probably function symmetrical with long, slender apiculis and tapered spine at base of and as long as apiculis. as ascoids, deep pit adjacent to each cluster with groove from cluster leading to pit; terminal Antennal foramen with very thick rim which extends anteriorly along eye margin to tentorium; a suture dorsad and medial of foramen margin curving anteriorly from eye bridge to eye margin below antenna. Eye bridge small, does not extend to medial margin of antennal foramen, tapers to acute apex. Palpus very long, extends to flagellomere 12, formula = 10:35:43:31.

Gonocoxites with dark, apicomeral thumb-like, projection, joined by rigid dorsal band; apodeme very large, extends basad of aedeagus base; gonostylus short, blunt and dark, appears to oppose gonocoxal projection like thumb and forefinger. Aedeagus with large, quadrate base; paramere nearly straight, ending in small, blunt curvature. Surstylus of normal size and shape, with single tenaculum. Tergite 10 triangular.

Measurements: Antenna 1.89 mm. Wing length 2.89 mm., width 1.21 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Heredia, Estación Biol. La Selva, 2/V/93 (INBio).

Etymology: named based on type locality.

36. *Caenobrunettia tropicalis* Quate, n.sp.

Fig. i-j

Male. Smaller than *laselva*.

Antennal foramen with very thick rim which extends anteriorly along eye margin to tentorium; suture dorsad and medial of foramen margin curving anteriorly from eye bridge but ending well before eye margin. Palpal formula = 10:25:27:22.

R₂₊₃ 7X length of R₂.

Gonocoxites joined by rigid, dorsal band; apodemes large, but little narrower than base of aedeagus; apicomeral projection small, with beak-like apex. Gonostylus very small, also ending in beak-like apex. Aedeagus with large, fan-shaped base; paramere not evident. Surstylus and tergite 10 as *laselva*.

Measurements: Antenna 1.41 mm. Wing length 2.05 mm., width 0.82 mm.

Female. Similar to *laselva*, but smaller.

Flagellomeres smaller than ♂, fusiform, with patches of sensory rods, ascoid simple, V-shaped, extends to basal 1/3 of following segment; terminal 3 flagellomeres reduced, 1/3 smaller than preceding, without ascoid. Tergite 10 without wrinkled ridges. Subgenital plate with large lobes having straight, slightly convergent sides; setal sclerite somewhat shield-shaped with anteriomedian projection, with 4-5 setae.

Measurements: Antenna 1.15-1.27 mm. Wing length 2.12-2.19 mm., width 0.8 - 0.89 mm.

Holotype ♂, allotype ♀, Heredia, Estación Biol. La Selva, 1/VII/93 (INBio). 1 ♀ same (LWQ).

Etymology: 'tropikos' Gr., tropical; based on its tropical habitat.

Armillipora Quate, new genus

Type species: *Armillipora selvica* Quate, n.sp., by present designation.

Large species with patterned wings.

Male. Vertex on midline about 2X width of eye bridge; occipital foramen slightly convex near center. Eye bridge with 4 rows of facets, separated. Antenna: scape and pedicel of normal size; 14 flagellomeres, nodiform, all subequal, terminal node reduced, with slender apiculus; each node with double circle of compact, teardrop-shaped pores near center; ascoid single, multiple and filamentous, very long. Palpus very short, extends only to flagellomere 4, palpomeres 1-3 subequal, 4 longest. Labellum a little expanded, but not bulbous.

Thorax with hair scars on dorsal part of anepisternum and center of anepimeron. Posterior spiracle covered with dense patch of short hairs. Wing with Sc very short, extends only to base of R₅, radial and medial fork basad of center of wing, R₂₊₃ very short, base distad of basal cell, not connected to R₄; R₅ ending in acute wing apex; CuA₂ tip beyond medial fork.

Genitalia highly unusual; gonocoxites and gonostyli adhere closely to aedeagus and difficult to discern, gonocoxal apodemes joined on midline, with median keel connected to aedeagus; paramere lacking. Surstylus very short, lacking apical tenaculum, with many, long clavate accessory tenacula arising from dorsum of expanded base and about 6 short, rod-like structures just basad of filamentous accessory tenacula. Tergite 9 with single, large foramen.

Female. Similar to ♂. Genitalia without genital digit or setal sclerite; spermatheca lacking hemispherical lobes.

Etymology: 'armilla' L, bracelet; 'porus' L, pore; referring to circle (or bracelet) of pores around each node of flagellar segments.

The assignment of *Armillipora* to the tribe Maruinini is based on the pectinate radial sector, the basal positions of the radial and medial forks and the male genitalic characters in which a keel connects the gonocoxal apodemes and the broad base of the aedeagus. The erection of the genus is based on the unusual double circle of sensory pores around the nodes of the flagellum in both sexes and the unusual and distinctive features of the male genitalia as described and illustrated.

37. *Armillipora selvica* Quate, n.sp.

Fig. 11

Large species with patterned wing.

Male. Frons with pair of quadrate hair patches, no median extension. Eyes separated by less than 1 facet diameter. Antenna with 14 flagellomeres, each node with double circle of compact, teardrop-shaped pores near center, apex of each pore extends as small point above surface of node; ascoids single and filamentous, very long, arranged as another, sparse circle,

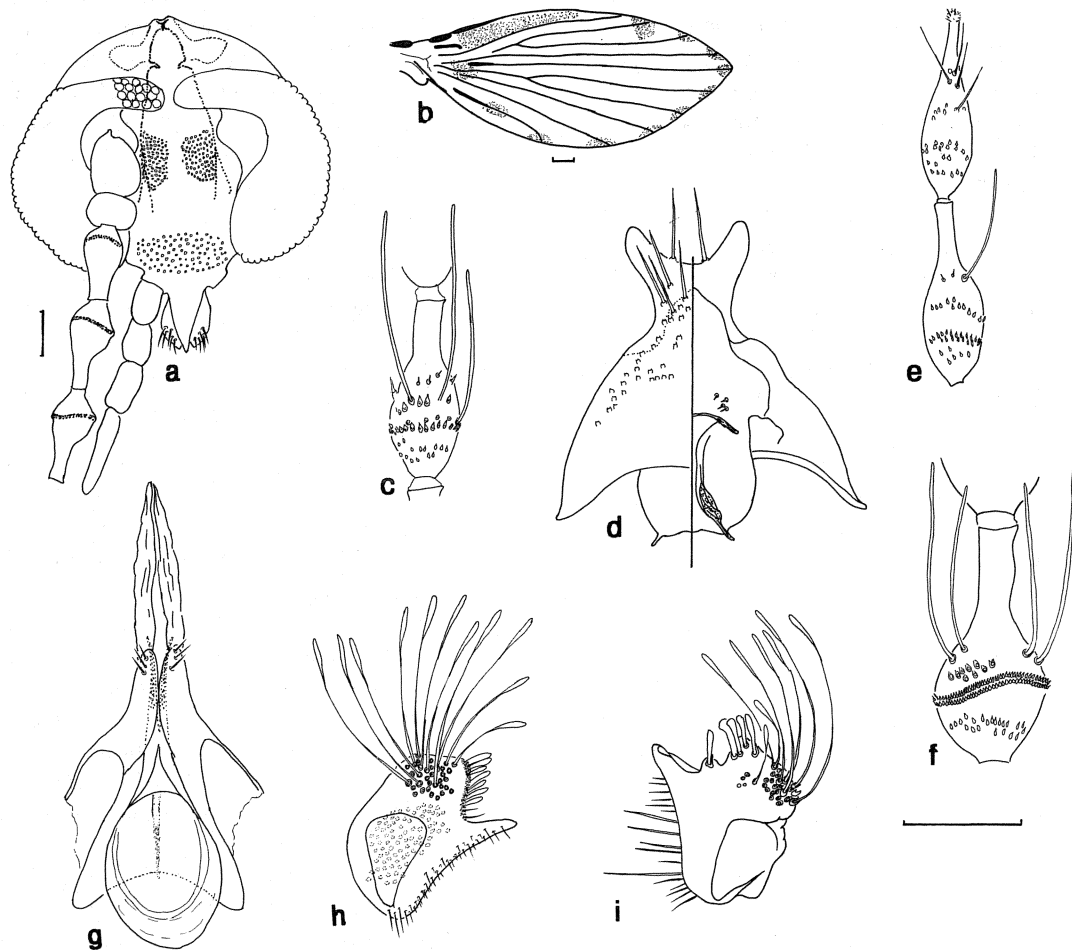


Fig. 11. *Armillipora selvica*. a. ♂ head; b. wing; c. ♀ flagellomere 5; d. ♀ genitalia; e. ♂ flagellomeres 13, 14; f. ♂ flagellomere 5; g. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; h. ♂ surstylus; i. ♂ surstylus, variation. Scale line = 0.1 mm.

separated from and distad of other 2 circles; terminal segment with long, slender apiculis. Palpus short, extends only to flagellomere 3, formula = 9:10:10:19.

Wing with infuscation in costal and basal cells, at vein tips and center of CuA_2 , white spots between vein tips; R_{2+3} very short, not connected to R_4 at base. CuA_2 reaches margin, with small subapical curvature.

Genitalia flattened laterally. Gonocoxite long and narrow, apodemes somewhat Y-shaped. Gonostyli also long and narrow, sword-shaped, closely adhering to each other. Aedeagus

simple, bifid, extends little beyond tip of gonostylus, without paramere, base broad and paddle-shaped. Surstylus highly modified, hemispherical in dorsal view with apicomedial projection lacking tenaculum; many long, capitate accessory tenacula dorsally at base, distad of which are about six, stout rods.

Measurements: Antenna 2.67 mm. Wing length 2.84-3.16 mm., width 1.18-1.25 mm.

Female. Little larger than ♂, flagellomeres smaller, double circle of pores smaller and less compact.

Apical lobes of subgenital plate slender,

separated by broad concavity, pair of long spines on apical margin in concavity in addition to usual scattered spines on exterior surface; spermatheca somewhat quadrate.

Measurements: Antenna 2.37 mm. Wing length 2.72-3.30 mm., width 1.21-1.37 mm.

Holotype ♂, allotype ♀, COSTA RICA, Heredia, Estación Biol. La Selva, 1/VII/93 (INBio). Paratypes, 18♂, 19 ♀, same and 23/I/93, 19/II/93, 5/IV/93, 2,3/V/93, 1/VI/93, 1-23/VII/93, 1-6/XII/93 (INBio, USNM, LACM, MNH, CAS, BBM, LWQ).

Etymology: name based on type locality.

Balbagathis Quate, new genus

Type species: *Balbagathis sylvatica* Quate, n.sp., by present designation.

Species with small, spherical flagellomere 1; unpatterned wings.

Male. Eye bridge with 3 facet rows, narrowly separated on midline; interocular suture present; vertex about 2X width of eye bridge on midline; occipital foramen narrow, hourglass-shaped with anterior concavity before succeeding convexity; lacking allurement organs. Antenna: scape and pedicel of normal size, with 14 flagellomeres, 1 smaller than pedicel and following flagellomeres, spherical; flagellomeres 2-14 strongly nodiform, terminal not reduced, with long apiculis; ascoids unidigitate, long and sinuous. Labellum inflated, but not bulbous, without teeth. Palpus very short, extends only to flagellomere 4.

Anepisternum and laterotergite with band of hair scars. Wing unpatterned, slender; Rs pec-

tinate, radial fork basad of medial, medial near wing center; R₅ ends in acute apex; CuA₂ tip beyond medial fork.

Gonocoxal apodeme large, joined on midline, with median keel extending dorsally to aedeagus; aedeagus asymmetrical, base broad; parameres paired or single; surstylus with single tenaculum.

Female. Vertex about 3X width of eye bridge on midline.

Apical lobes well defined; inner flaps not forming V, confined to slender lobes; genital digit lacking; spermatheca with hemispherical lobes, membranous plate with setal sclerite.

Etymology: 'balbis' Gr, starting point and 'agathis' Gr, ball (of thread); referring to first segment of flagellum small and spherical (like a ball); gender feminine.

Balbagathis possesses the tribal features of Maruinini, namely the pectinate radial sector, basal position of the radial and medial forks and the keel between the gonocoxal apodemes and base of aedeagus. It is distinctive in possession of flagellomeres which are all nodiform except the first which is globular and without an internode, the three facet rows in the eye bridge which occupies a large part of the frontal area of the head, complex, asymmetrical male aedeagus, and male surstylus with a single tenaculum. The antenna does resemble that of *Paratelmatoscopus*, which also has nodiform flagellum except for the reduced, spherical first segment. However, the eye bridges and male and female genitalia are quite different in the two genera.

KEY TO SPECIES OF *BALBAGATHIS*

- 1 Parabasal process a plain band without any projections; ♀ without large spines between apical lobes of subgenital plate 38. *sylvatica*
- Parabasal process of ♂ genitalia with pair of large, pointed, shafts near gonocoxite; ♀ with 2 pairs of large spines between apical lobes of subgenital plate, as large as major spines on lobes. 39. *talamanca*

Although both sexes of the following two species are not described, there are associated

specimens which lead me to believe the above key will prove valid with additional data.

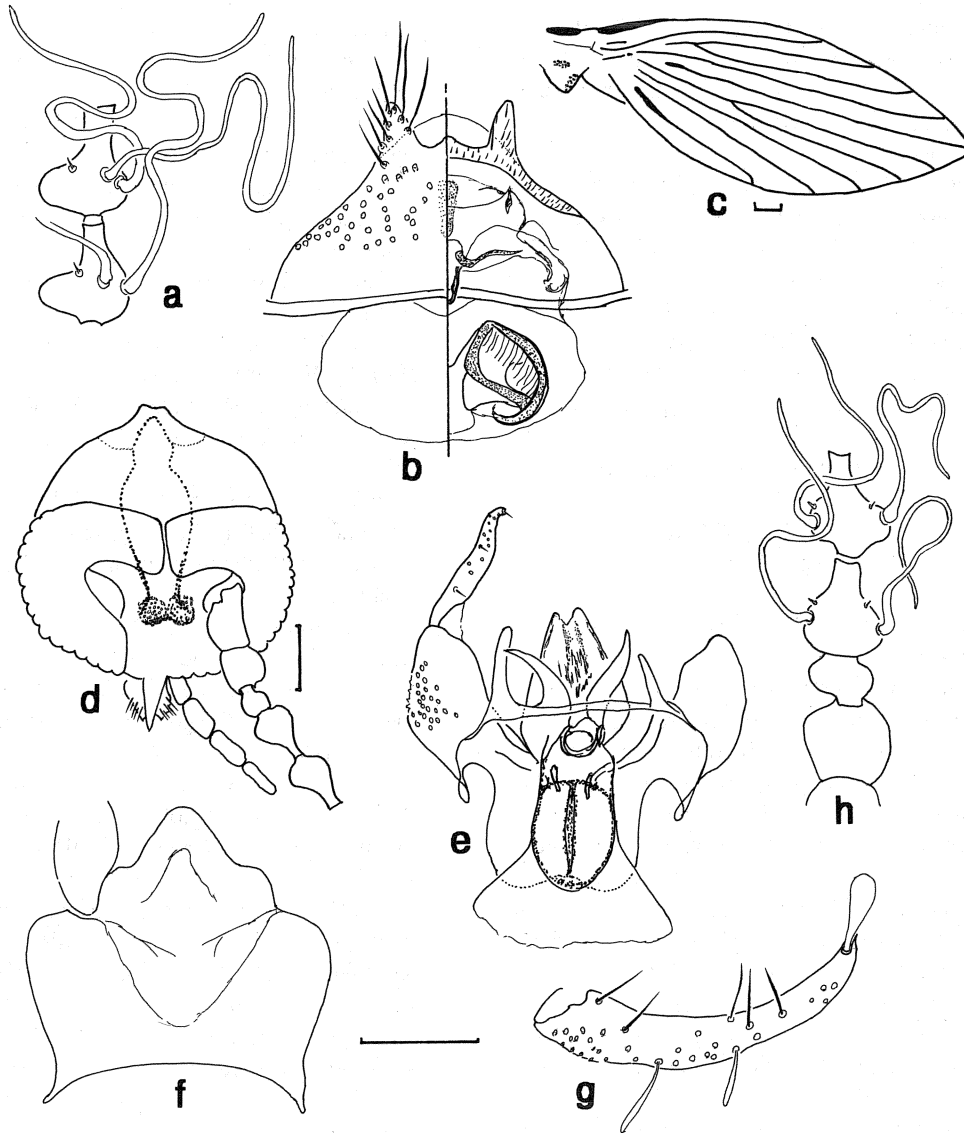


Fig. 12. a-c. *Balbagathis sylvatica*. a. Flagellomeres 5, 6; b. ♀ genitalia; c. wing. d-h. *B. talamanca*. d. head; e. ♂ gonopods and aedeagus, dorsal, right gonostylus not shown; f. ♂ tergites 9, 10; g. ♂ surstylus; h. pedicel and flagellomeres 1-3. Scale line = 0.1 mm.

38. *Balbagathis sylvatica* Quate, n.sp.
Fig 12 a-c

Rather small species with slender, un-patterned wings.

Female. Antenna with 14 flagellomeres, 1 small and spherical, remaining strongly nodiform,

terminal with slender apiculis, not reduced; ascoids undigitate, long and sinuous, extending beyond 2 following segments. Eye bridges with only 3 facet rows, narrowly separated by less than 1/2 facet diameter, inner margin quadrate; interocular suture strong, without median spur. Hair patch on frons undivided but concave in

center. Palpus short, extends to flagellomere 3, formula = 5:7:7:7.

Wing unpatterned; Sc extends to base of R_5 , R_{2+3} 1/4-1/6X length of R_2 ; radial fork basad of medial by about 2-3 cell widths.

Apical lobes of subgenital plate slender, inner flaps confined to lobes, lacking 2 pairs of spines between lobes; spermatheca large, ventral surface lightly wrinkled; setal sclerite shield-shaped, slender, small and obscure.

Measurements: antenna 1.09-1.12 mm. Wing length 1.93-2.27; width 0.72-0.82 mm.

Male. Unknown.

Holotype ♀, COSTA RICA, Heredia, Estación Biol. La Selva, 1/IV/93 (INBio). Paratypes, 8 ♀, same and 12, 17, 19/II/93; 2/V/93, 1, 12/VII/93 (INBio, USNM, LACM, MNH, BBM, LWQ).

Etymology: 'silvaticus' L, of woods; referring to its forest habitat.

At least one other species is present in La Selva and the females are quite different from *sylvatica*. I also have a single male, but I cannot be certain with which female it is associated, so it is left undescribed.

39. *Balbagathis talamanca* Quate, n.sp.

Fig. 12 d-h

Rather small species with slender, unpatterned wings.

Male. Antenna with 14 segments, flagellomere 1 small and spherical, remaining strongly nodiform, terminal with slender apiculis, not reduced; ascoids undigitate, long and sinuous, extending beyond 2 following segments. Eye bridges with only 3 facet rows, narrowly separated by less than 1/2 facet diameter, inner margin quadrate; interocular suture strong, without median spur. Hair patch on frons undivided but concave in center. Palpus short, extends to flagellomere 3, formula = 5:5:6:7.

Wing unpatterned; Sc extends to base of R_5 , R_{2+3} 1/4-1/6X length of R_2 ; radial fork basad of medial by about 2-3 cell widths.

Gonocoxal apodemes large, bilobed; parabasal process forming bridge above aedeagus, bearing pair of lateral shafts as large as parameres. Aedeagus base large, flared anteriorly, apical part with upturned edges forming a scoop; pair of large parameres.

Measurements: Antenna 1.36 mm. Wing length 1.71-2.05 mm.; width 0.65-0.72 mm.

Female. Unknown.

Holotype ♂, COSTA RICA, Limon, Puerto Viejo de Talamanca, 20-22/VII/93, (INBio). Paratypes: 2 ♂, same as holotype; 1 ♂, Limon, Cahuita, 16/II/92; 1 ♂, Limon, Siquirres, 16/II/92, under bridge (USNM, LACM, LWQ).

Tonnoira Enderlein

Tonnoira Enderlein, 1937:87; Quate, 1963:189.

Type species: *Tonnoira pelliticornis* Enderlein, by original designation.

Head. Eye bridges with 4 facet rows, separated on midline; vertex only 1.5X width of eye bridge; labellum flattened, not bulbous, without teeth; occipital foramen with sides straight and parallel, except for anterior convergence, with pair of posterior pockets. Palpomere 1 less than 1/2 length of others. Antenna with 14 flagellomeres; very long, scape and pedicel normal, flagellomeres cylindrical or basal flagellomeres weakly nodiform, node progressively decreasing in size so distal segments cylindrical or subcylindrical, terminal segments not reduced; ascoids simple, undigitate, may be absent.

Thorax without allurement organs; anterior 1/2 of anepisternum covered with hair scars. Wing with forks basad of center; R_s pectinate; radial fork basad of medial; R_5 ends in wing apex; CuA_2 tip about 2 cell widths distad of medial fork.

♂ genitalia with gonopods normal; gonocoxal apodemes expanded and joined on midline; surstylus with 1 apical and 1 subapical tenacula.