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Revision of Neotropical Setomimini (Diptera: Psychodidae: Psychodinae)

Laurence W. Quate and Brian V. Brown

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Natural History Museum of Los Angeles County
900 Exposition Boulevard
Los Angeles, California 90007

Printed at Allen Press, Inc., Lawrence, Kansas
ISSN 0459-8113

Revision of Neotropical Setomimini (Diptera: Psychodidae: Psychodinae)

Laurence W. Quate[1] and Brian V. Brown[2]

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ABSTRACT. The 145 Neotropical species of Psychodinae with expanded anterior gonocoxal apodemes are revised and classified in the tribe Setomimini sensu Vaillant (1990). Three new genera, *Didimioza, Micrommatos,* and *Valerianna,* are described, as well as 84 species that are new to science: *Didicrum deceptrix, D. remulum, D. pyramidon, Thrysocanthus deformitas, Didimioza venezuelica, Didimioza chachapoya, Tonnoira protuberata, T. psacadoptera, T. castanea, T. sicilis, T. bifurcata, T. didyma, T. rapiformis, T. cavernicola, T. fusiformis, Alepia amputonis, A. azulita, A. unicinota, A. lanceolata, A. condylaria, A. digitula, A. litotes, A. absona, A. ferruginea, A. piscicauda, A. labyrinthica, A. caceresi, A. scolomeris, A. diocula, A. longinoi, A. fruticosa, A. imitata, A. falcata, A. ancylis, Balbagathis sinuosa, B. trispica, B. confraga, B. discuspis, B. barva, B. dissimilis, B. manuensis, B. agrestis, Platyplastinx culmosus, P. tango, P. crossomiscos, P. apodastos, Arisemus maesi, Ar. triatrapars, Ar. aenigmaticus, Ar. woodi, Ar. rhamphos, Ar. grandilobus, Ar. caceresi, Ar. pigmentatus, Ar. ampliscapus, Ar. barbarus, Ar. amydrus, Ar. sesquipedalis, Ar. confertus, Australopericoma abnormalis, Aus. exilis, Aus. pontilis, Aus. sagitta, Aus. multifida, Aus. bulbula, Aus. cesticella, Aus. trinidadensis, Aus. curvata, Aus. bhati, Aus. falcata, Micrommatos simplex, M. stephaniae, M. anconatum, M. serratum, M. sylvaticum, Caenobrunettia subditicia, C. pollicaris, C. thele, C. fraudulenta, C. barretti, Valerianna manuensis, V. bullata, Nemoneura confraga,* and *N. liparotes.* New synonyms are *Bazara* Vaillant (= *Arisemus* Satchell), *Alepia bulbula* Quate, *A. sectilis* Quate (both = *Alepia valentia* Quate), *Arisemus lepidotos* Quate, *Ar. stylofurcatus* Collantes and Martínez-Ortega (both = *Arisemus atrasetus* (Rapp)), and *Pericoma wirthi* Quate (= *Australopericoma caudata* (Satchell)). Newly recognized combinations are *Didicrum fenestratum* (Tonnoir), *Desmioza speciosa* (Tonnoir), *Didimioza symphylia* (Quate), *Australopericoma roessleri* (Wagner and Joost), *Aus. caudata* (Satchell), *Aus. pallidula* (Tonnoir), and *Caenobrunettia stylappendiculata* (Wagner). The life history of most species is unknown, although one species is newly recorded from *Azteca* ant (Hymenoptera: Formicidae) nests, one from an oil bird (*Steatornis caripensis*) cave, and one from a bromeliad. Adult males of one species were observed "dancing" on undergrowth leaves in an apparent male mating swarm.

INTRODUCTION

The Psychodidae (or moth flies) is a large, worldwide group of small (1–5 mm) Diptera with approximately 2600 described species. They are distinctive in appearance (e.g., Fig. 1; Quate and Vockeroth, 1981: fig. 17.1), with their densely setose ("hairy") body and their setose, paddle-shaped wings with linear wing veins. The most commonly seen species are harmless, and their larvae are often found in household drains and other moist environments high in organic matter, but species of the Phlebotominae are medically important because adults feed on blood and can transmit diseases to humans and animals. There are six generally recognized subfamilies (Bruchomyiinae, Horaiellinae, Phlebotominae, Psychodinae, Sycoracinae, and Trichomyiinae; Wagner, 1990), but the classification of the group is still strongly contested, and no consensus agreeable to all researchers is as yet apparent (Wagner, 1997).

Psychodid flies are extremely diverse in the Neotropical Region, yet relatively little work has been done on this fauna. Prior to the 1970s, there had been few systematic studies of Neotropical Psychodidae other than of the bloodsucking Phlebotominae and the Bruchomyiinae, which are often collected together with Phlebotominae. Duckhouse (1972) provided the first systematic study of Neotropical Sycoracinae and Trichomyiinae, followed by a catalog of Neotropical Psychodidae (Duck-

Figure 1 *Alepia* spp. **Left.** Male, habitus. **Right.** Female, habitus (scanning electron micrograph)

house, 1973) and redescriptions of poorly defined species of Knab, Dyar and Coquillett (Duckhouse, 1974a) and Rapp and Curran (Duckhouse, 1974b). Bravo and Amorim (1995) and Bravo (1999) also produced careful studies of *Brunettia* Annandale and Trichomyiinae. The first general revision of Neotropical psychodids with keys, descriptions, illustrations, and tribal assignments was that of Quate (1996).

The tribal classification within the largest subfamily, the Psychodinae, is still being vigorously debated (e.g., Duckhouse, 1987; Vaillant, 1990). Most recently for the Neotropical taxa, Quate (1996, 1999) recognized Pericomini Enderlein, Maruinini Enderlein, Paramormiini Enderlein, Mormiini Enderlein, and Psychodini Enderlein. Within Maruinini, he classified the species that we herein place in a separate group, the Setomimini.

The objective of this study was to provide descriptions, illustrations, and keys to all known species of the Setomimini. This tribe was selected for revision because of its richness in the Neotropical Region and to lay the groundwork for future studies on the phylogeny and zoogeography of the group and its Old World relatives. Although a large number of specimens were examined, they represent only a small part of the total Setomimini fauna that we estimate is still largely unknown.

METHODS AND MATERIALS

This revision is the result of the scientific investigations of the senior author before his death in 2002. In 2001, an earlier version of the manuscript was submitted by Quate, but it needed extensive revision that he was unable to complete. The junior author was responsible for thoroughly revising, organizing, and preparing the work for final publication. Thanks to his wife, Valerie, Quate's collection and field notes have been deposited in the Entomology Section of the Natural History Museum of Los Angeles County, and further details of his remarkable life have been recorded (Brown, 2003).

COLLECTING METHODS

Most specimens of Setomimini were obtained with Malaise traps, which generally capture a wider variety of species than other methods. Specimens of Setomimini are the

predominant psychodids caught by Malaise traps. Fewer specimens were obtained in light traps, as most psychodine specimens collected by that method are of the tribe Psychodini.

SPECIMENS

Most of the specimens examined for this work were from personally funded field collections made by the senior author, specifically to Argentina and Chile (1994), the Bahamas (1997), Bolivia (1990), Brazil (1998, 1999), Costa Rica (1992, 1993, 1995, 1997, 1999), French Guiana (1994), Nicaragua (2000), Peru (1997, 1999), Puerto Rico (1998), Surinam (1994, 1996), and Venezuela (1993, 1995, 2001). Some specimens were sent to him by the Arthropods of La Selva (ALAS) project (Longino, 1994) or were borrowed from other institutions.

Some specimens from Costa Rica have separate barcoded labels. In holotype specimens, the data from these labels are given in square brackets.

Descriptions are based on slide-mounted specimens. Specimens were cleared with lactic acid (Cumming, 1992) or potassium hydroxide. Great care was taken with potassium hydroxide, as overcleared specimens often result from treatment with this chemical. Cleared specimens were then dehydrated and dissected in a thin solution of Canada balsam on the underside of a cover slip, with various body parts arranged for the best viewing. After the balsam dried thoroughly, the cover slip was inverted on a slide with a further drop of Canada balsam and dried upside down.

Keys to species are generally based on male specimens only. Female specimens possess too few diagnostic characters at the species level to allow ready identification.

Species recognition in Neotropical psychodids is still in its relative infancy. In some instances, there are variants of species (e.g., *Didimioza symphylia* (Quate)) whose characters are described separately. More specimens or collections from intervening areas are necessary to resolve these situations, but for this monograph, we used our best judgment on whether species status is warranted.

All scale lines in illustrations are 0.1 mm.

MORPHOLOGICAL TERMS

Morphological terms are those of McAlpine (1981), except as noted below. Bravo and Amorim (1995) suggested an alternate interpretation of the mesothoracic sclerites, but we continue to use the definition given by McAlpine, recognizing the anepisternite as the sclerite bearing the anterior spiracle. The alveolar (hair scar) patterns of the anepisternite sometimes offer diagnostic characters.

The second costal node of the wing may be hard to distinguish, because there is almost always an enlargement of the costa beyond the costal node. However, we define the node as present when the apex is clearly demarcated and ends abruptly (see Fig. 284). If the apex tapers into the costa, we then define the second costal node as absent. Relative positions of the radial and medial forks are often referenced by "cell widths." The cell width is the width of the wing cell immediately posterior to the first fork stated in the description.

The terminalia of male psychodids are complex and rich in characters of taxonomic importance. An illustration showing the relationships of the major components was given by Quate and Vockeroth (1981: fig. 17.18). In slide mounts of specimens, the dorsal part of the terminalia (including the hypandrium and gonopods, e.g., Fig. 20) is usually separated from the ventral part (epandrium and surstyli, e.g., Fig. 22).

The hypandrium is sternite 9 (Fig. 20), which in Psychodidae is usually seen as a narrow sclerite that is attached to the base of the epandrium (tergite 9) and/or the bases of the gonocoxites. It was termed the "parabasal process" in an earlier paper (Quate, 1996:33), a use of the term that was incorrect as defined by Duckhouse (1987: 233). The hypandrium is highly modified in the genus *Alepia* Enderlein, in which it is a broad plate that may extend from the base of the gonocoxites to their tips and often is setose. This sclerite is rarely absent, although for the sake of clarity, it frequently has not been included in illustrations of the male genitalia. The gonopods consist of a basal gonocoxite and a distal gonostylus (Fig. 20).

The two parts of the aedeagus, the basiphallus (= the phallapodeme of Vaillant, 1986:333) and distiphallus, as described by McAlpine (1981), are useful terms for the psychodines, since the basal and distal parts are quite different in structure and the distiphallus is usually more useful for species definitions (Fig. 43). The paramere is closely associated with the distiphallus and often appears as a bifurcation of that structure (Fig. 43). These terms are used in this paper to make the descriptions more precise. Other authors have referred to the distiphallus as the "intromittent organ."

The ventral epandrial sclerite was defined by Duckhouse (1987:233, 1990:723) as that sclerite on the dorsal face of the epandrium that extends diagonally from the center of the base to the lateral margin of the apex (Fig. 62). It apparently serves to reinforce the epandrium during movements of the surstyli.

The surstylus (Fig. 22) is an appendage that is attached to the posterolateral margins of the male epandrium. Almost always it bears 1 or more tenacula at or near the tip (Fig. 22). These are flared at the tip or are straight and rodlike. Males of the genera *Alepia* and *Platyplastinx* Enderlein also possess accessory tenacula (e.g., Fig. 83), which are long, filamentous structures with modified tips; in these taxa, typical tenacula are often absent.

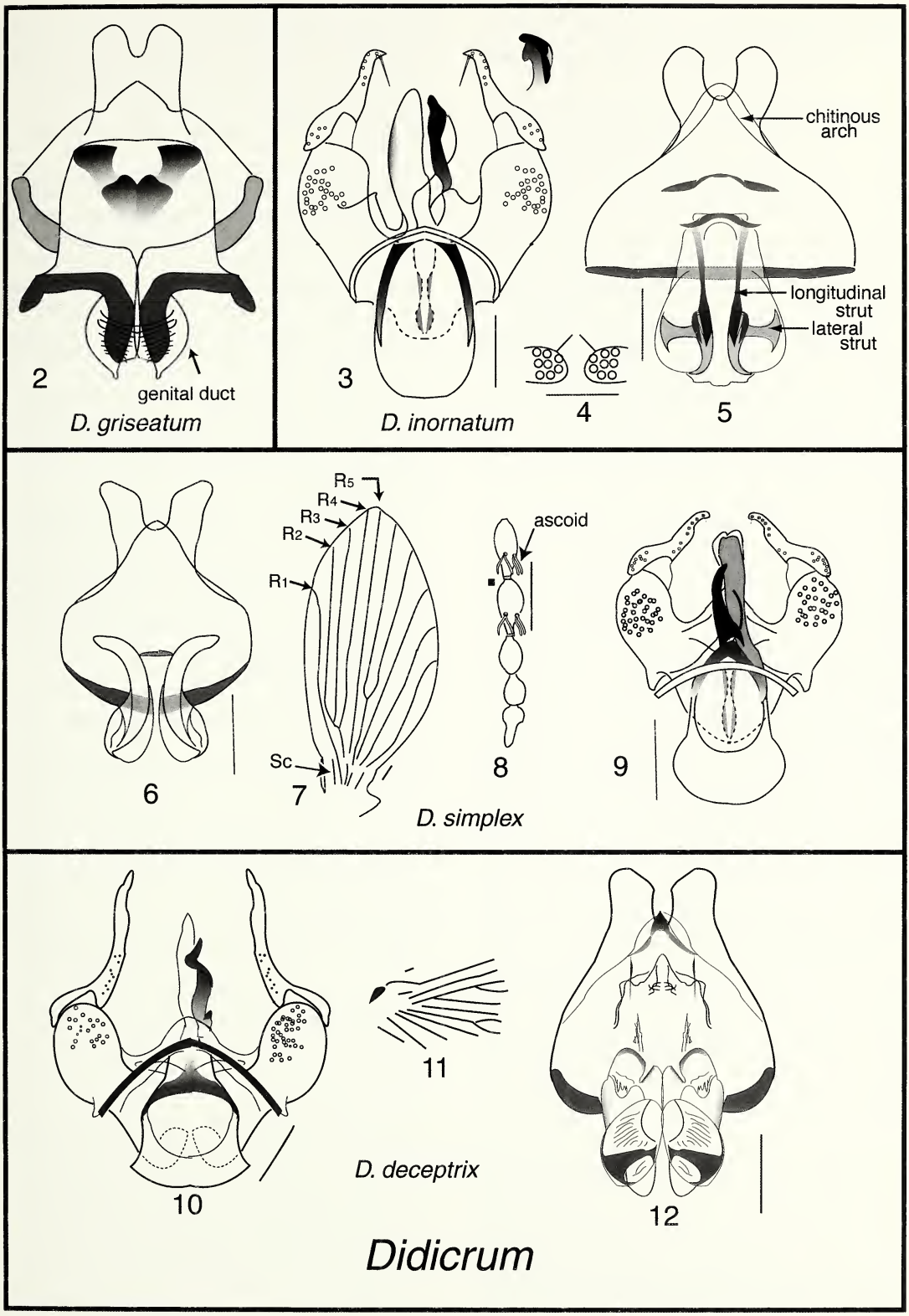
In Psychodidae, the abdominal segments posterior to the eighth are rotated 180°. This rotation, which can occur in either direction (Just, 1973), has not been studied in great detail in many taxa. All references to the dorsal and ventral aspects are in reference to position after this rotation has taken place.

Parts of the female genitalia have been defined by earlier authors (Vaillant, 1971; Quate, 1996, 1999). The chitinous arch (Fig. 5) is the membranous arch which usually extends to or little beyond the apical margin of the subgenital plate between base of its lobes. Longitudinal struts and lateral struts (Fig. 5) are the sclerotized bars that extend longitudinally and laterally from near the center of the hemispherical lobes of the "spermathecae" or genital ducts (true spermathecae are lacking in psychodids; Burrini and Dallai, 1975). The membranous plate is the flat dorsal portion of the spermathecal complex and contains various sclerotized structures; the margins of the plate may be lightly sclerotized and difficult to differentiate, but the shape often provides diagnostic features of the females.

MUSEUM ABBREVIATIONS

Material was borrowed from or deposited in the following collections (most abbreviations from Arnett et al., 1993).

AMNH American Museum of Natural History, New York, USA



Figures 2–12 *Didicrum* spp. 2. *D. griseatum,* female genitalia. 3–5. *D. inornatum:* 3. male genitalia, dorsal; 4. eye bridge; 5. female genitalia. 6–9. *D. simplex:* 6. female genitalia; 7. wing; 8. flagellomeres 10–14; 9. male genitalia, dorsal. 10–12. *D. deceptrix:* 10. male genitalia, dorsal; 11. base of wing; 12. female genitalia. All scale lines = 0.1 mm

BMNH	Natural History Museum, London, UK
CNFV	Centro Nacional de Referencia de Flebótomos, BIOMED, Universidad de Carabobo, Maracay, Venezuela
EMUS	Utah State University, Logan, USA
INBC	Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Costa Rica
INPA	Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil
IZAV	Universidad Central de Venezuela, Maracay, Venezuela
LACM	Natural History Museum of Los Angeles County, Los Angeles, USA
MLPA	Museo de La Plata, La Plata, Argentina
MUSM	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru
RW	Collection of Rüdiger Wagner, Limnologische Flußstation, Schlitz, Germany
ULMG	University of Leipzig, Leipzig, Germany
USNM	National Museum of Natural History, Washington, DC, USA
ZMHB	Zoologisches Museum, Berlin, Germany
ZSMC	Zoologische Staatssammlung, München, Germany

SYSTEMATICS

Tribe Setomimini Vaillant

Setomimini Vaillant, 1982:191–192; 1986:339; 1990:161.
Mormiini Enderlein, 1937:96–107 (in part).
Arisemini Vaillant, 1982:190–191.
Maruinini Enderlein; Duckhouse 1987:234; 1990: 724–725; Quate, 1996:18–19 (in part).

DESCRIPTION. Head with eyes contiguous or separated, if separated, interocular suture nearly always present, almost always with 3 facet rows; terminal 3 flagellomeres may be reduced; labellum flattened or bulbous, apex with spines, but without apical rods ("teeth").

Thorax usually without sensory organs on anepisternite. Wing plain or patterned; radial fork on same level as or basad of medial, both at center or basad of center; R_5 ends in or beyond wing apex.

Anterior gonocoxal apodemes expanded platelike and connected to basiphallus with median keel (Fig. 44).

NOTES ON SYNONYMY. The classification of psychodid flies is highly unstable, as reflected in the complex synonymy, above. Vaillant (1982) first proposed tribe Setomimini but attributed it to Enderlein, in spite of Enderlein's placement of *Setomima* Enderlein in Mormiini. Vaillant (1982) also proposed the tribe Arisemini for the genus *Arisemus* Satchell, but in a later classification (1990), he rejected this taxon. Vaillant (1990) placed *Arisemus,* as well as *Alepia*, *Neoarisemus* Botosaneanu and Vaillant, *Neurosystasis* Satchell, *Bazara* Vaillant, *Paratelmatoscopus* Satchell, *Parasetomima* Duckhouse, and *Tonnoiriella* Vaillant, in the tribe Setomimini.

At this time, we do not have strong evidence that Setomimini is a monophyletic tribe, and at our present level of knowledge, relationships of the various taxa are unclear. It is treated as a group of convenience for those distinctive Neotropical genera that are characterized by the expanded anterior gonocoxal apodeme (Fig. 44). Other Setomimini are found in other parts of the world, but their relationships to the Neotropical species are not considered herein.

Duckhouse (1987) placed psychodine genera with expanded gonocoxal apodemes into the tribe Maruinini. We, however, regard Maruinini as a separate tribe containing only the genus *Maruina* (as did Vaillant, 1990). It differs from Setomimini in possession of an aedeagal sheath (described by Hogue, 1973:6), the structure that encloses the elements of the distiphallus. Also, the aquatic habitat of the immature stages of Maruinini is distinct from most Setomimini.

NATURAL HISTORY. The lifestyle of most Setomimini is unknown. Like that of most small, inconspicuous Diptera, psychodid natural history has generally been discovered accidentally by workers on other projects.

Adult behavior is particularly poorly studied. As noted, Setomimini are less attracted to lights than some other psychodids, possibly indicating that they are less nocturnal in their activities. Males of one species, *Caenobrunettia sarculosa* Quate, were collected as they swarmed on leaves of an undergrowth plant, exhibiting a "dancing" behavior that might serve to attract females.

Like most other psychodids, larvae of Setomimini are probably detritivorous scavengers. Some, such as *Tonnoira cavernicola* n. sp., are found in caves, associated with organic debris from colonies of oil birds and bats. One species, *Alepia longinoi* n. sp., was collected in colonies of ants of the genus *Azteca.* Duckhouse (1974a) noted that many species of Neotropical psychodines (including *Alepia*) are container breeders whose larvae are found in small pockets of moisture held by bromeliads, leaves, seeds, etc.; in this paper, we report on such a habitat for *Neurosystasis amplipenna* (Knab).

KEY TO GENERA OF SETOMIMINI OF THE NEOTROPICAL REGION

Males only.

1 R_5 ends beyond (posterior to) wing apex (e.g., Figs. 7, 30, 34) 2
– R_5 ends in wing apex (e.g., Fig. 104) 4
2 Ascoids consist of a single branch (Fig. 47); terminal 2 flagellomeres may be reduced, but usually none reduced 3
– Ascoids with 2–5 branches (Fig. 8), rarely with 1; terminal 3 flagellomeres reduced (as in Fig. 206) . . . . . *Didicrum* Enderlein
3 Eye bridge with 3 facet rows (Fig. 40) . . . . . *Desmioza* Enderlein
– Eye bridge with 4 facet rows (Fig. 46) . . . . . ***Didimioza* new genus**

– Eye bridge with more than 4 facet rows (Fig. 28) ..... *Thrysocanthus* Enderlein
4 Sc short, does not extend beyond the base of R_5 (Fig. 7) 5
– Sc long, extends beyond the radial fork (Fig. 297) ..... *Nemoneura* Tonnoir
5 Head with same coloration above and below eyes 6
– Head bicolored, vertex darker than the frontal area; eye bridge slender, narrowing to single facet on inner margin (Fig. 281); interocular suture straight; wing plain, without infuscations (Fig. 284) ..... *Valerianna* **new genus**
6 Antenna usually shorter than the wing, at most little longer than the wing 7
– Antenna much longer than wing 12
7 Eyes separated 8
– Eyes contiguous 11
8 Ascoids long, at least 3 times the length of the segment bearing them 9
– Ascoids absent or indistinguishable from hairs 10
– Ascoids short, at most a little longer than the segment bearing them ..... *Australopericoma* Vaillant
9 Eye bridge normal, extends to or close to midline (Fig. 148); flagellomere 1 spherical, much smaller than following segments (Fig. 148) ..... *Balbagathis* Quate
– Eye bridge short (Fig. 273); flagellomere 1 similar to following segments ..... *Caenobrunettia* Wagner
10 Gonopod composed of gonocoxite and articulated gonostylus (Fig. 82); surstylus not bifurcate ..... *Alepia* Enderlein
– Elongate gonostylus fused to gonocoxite; surstylus apically bifurcate ..... *Neurosystasis* Satchell
11 Terminal 3 flagellomeres not reduced, terminal 1 may be reduced but not all 3; palpomere 4 subequal to or shorter than palpomere 3 (Fig. 260); antepronotum with band of dense pores over most of sclerite ..... *Micrommatos* **new genus**
– Terminal 3 flagellomeres reduced and smaller than preceding flagellomeres (Fig. 206); palpomere 4 longer than palpomere 3 (Fig. 200); antepronotum without band of pores ..... *Arisemus* Satchell
12 Ascoids long, at least 3 times the width of segment bearing them (Fig. 166); wing with infuscate patterns (Fig. 167) ..... *Platyplastinx* Enderlein
– Ascoids absent or indistinguishable from hairs; wing without infuscate patterns ..... *Tonnoira* Enderlein

Didicrum Enderlein

Didicrum Enderlein, 1937:105; Quate, 1963:184; Duckhouse, 1990:734–735.

Podolepria Enderlein, 1937:105. Type species: *Pericoma inornata* Tonnoir, by original designation.
Mecysmia Enderlein, 1937:106. Type species: *Pericoma schoenemanni* Enderlein, by original designation.

TYPE SPECIES. *Pericoma griseata* Tonnoir, by original designation.

DESCRIPTION. Male and Female. Eyes separated, interocular suture present but may be interrupted in the center; bridge with 3 (rarely 4) facet rows; frons hair patch quadrate, not separated in center; if dorsal projection present, alveoli sparse and separated; antenna shorter than wing width, scape and pedicel of normal length; with 14 fusiform flagellomeres (but see *Didicrum pyramidon* n. sp., below), terminal 3 reduced, terminal with clavate apiculis, ascoids usually composed of 2–5 anterior branches, occasionally with 1; labellum bulbous; palpus extends to about center of antenna, palpomere 1 about one-half length of 2 and 4 longer than 3.

Thorax usually without sensory organ but rarely with organ on base of forecoxa; anepisternite with alveoli evenly distributed and occupying dorsal two-thirds of sclerite; midcoxa with patch of hairs on anteroapical margin. Wing lacking second costal node; base of R_{2+3} attached to R_4; radial fork basad of medial; R_5 ending beyond wing apex.

Hypandrium a narrow band between bases of gonocoxites; aedeagus asymmetrical; distiphallus consisting of dorsal and ventral processes; basiphallus broad; paramere present; surstylus with 1 tenaculum.

REMARKS. *Didicrum* is distinguished by the branched ascoids, fusiform flagellomeres with terminal 3 reduced, radial and medial forks basad of the wing center, R_5 ending beyond the wing tip, and usually 1 tenaculum. Superficially, it resembles *Pericoma* (tribe Pericomini), and many of its species were originally placed in that genus. However, the expanded anterior gonocoxal apodemes place *Didicrum* and *Pericoma* in different tribes under the present classification.

DISTRIBUTION. This genus is common in temperate South America, Australia, New Zealand, and New Guinea (Duckhouse, 1990). It is a major component of these psychodid faunas.

Didicrum griseatum (Tonnoir)

Fig. 2

Pericoma griseata Tonnoir, 1929:22, pl. III, figs. 42–45.
Didicrum griseatum; Enderlein, 1937:105; Quate, 1963:184–185.

DESCRIPTION. Male. Unknown.

Female. Eyes separated by 2.5–3 facet diameters; bridge with 3 facet rows; interocular suture elongate, inverted V-shaped, slightly interrupted in center; frons hair patch undivided, without median band; ascoids with 5 anterior branches.

Anepisternite sparsely covered with alveoli on dorsal half. Wing generally infuscate over entire surface, darker anterior of R_4 and posterior of M_3; Rs pectinate; base of R_{2+3} attached to R_4; radial fork distad of base of R_{2+3} by about 1 cell width; base of Rs distad of base of M_3; without crossveins (as illustrated by Tonnoir); R_5 ends beyond wing apex.

Apical lobes of subgenital plate rounded and moderately short; chitinous arch faint, does not reach apical margin; membranous plate with U-shaped ornamentation in center; lateral strut very large, longitudinal strut slender; lobes of genital ducts overlaid with striations.

DISTRIBUTION. Chile.

HOLOTYPE. ♀, CHILE, Chiloe I., Ancud, 17–19.xii.1926, F. and M. Edwards (BMNH; examined).

Didicrum inornatum (Tonnoir)

Figs. 3–5

Pericoma inornata Tonnoir, 1929:23–24, pl. III, figs. 40–50.
Podolepria inornata; Enderlein, 1937:105.
Didicrum inornatum; Quate, 1963:185.

DESCRIPTION. Male. Eye bridge with 3 facet rows; interocular suture interrupted in center and represented by only small suture from dorsal eye margin; eyes separated by 1.5–2 facet diameters; dorsal projection of frons hair patch absent or sparse with only few alveoli on midline; ascoids with 2–5 anterior branches.

Sensory organ attached to base of forecoxa, elongate, little larger than spiracle. Anepisternite with sparse alveoli over most of surface. Base of R_{2+3} attached to R_4; radial fork basad of medial, distad of base of R_{2+3} by about 1 cell width; base of R_5 distad of base of M_3.

Gonostylus nearly straight, with slight undulation before apex; dorsal process of distiphallus black, single, bare, without setae, as long as or nearly as long as ventral process, inflated and tapering to apex; ventral process a single shaft with apex undivided; tergite 10 triangular or dome-shaped.

Measurements. Antenna 1.35–1.55 mm ($\bar{x}$ = 1.43; n = 8). Wing length 3.33–3.75 mm, width 1.40–1.63 mm ($\bar{x}$ = 3.53, 1.51; n = 7).

Female. Apical lobes of subgenital plate symmetrical; genital ducts with well-defined longitudinal and lateral struts, lateral broad, inner face plain with only 2 slightly sinuous bars.

Measurements. Antenna 1.23–1.35 mm (n = 3). Wing length 3.45–3.60 mm, width 1.43–1.45 (n = 3).

DISTRIBUTION. Argentina, Chile.

HOLOTYPE. ♂, ARGENTINA, Rio Negro, Puerto Blest, Lake Nahuel Huapi, 2–3.xii.1926, F. and M. Edwards (BMNH; examined).

OTHER SPECIMENS STUDIED. ARGENTINA, Neuquén, Arroyo Quechaquina, N side Lago Lacar, 1♂, 16.xi.1994, L. Quate, H. Bhat, sweeping sedges, 610 m (LACM), N San Martin de los Andes, N shore Lake Huechulafquen, 3♂, 1♀, 17–19.xi.1994, L. Quate, H. Bhat, 920 m (LACM), 11 km W San Martin de los Andes, 5♂, 4♀, 17.xi.1994, L. Quate, H. Bhat, sweeping, bog, 890 m (LACM); Rio Negro, Nahuel Huapi NP, Lago Mascardi, 3♂, 14–16.xii.1994, L. Quate, H. Bhat, Malaise trap, 800 m (LACM). CHILE, Llanquihue, Yerbas Buenas, 3♂, 3.xii.1994, L. Quate, H. Bhat, sweeping, 150 m (LACM).

Didicrum simplex (Tonnoir)

Figs. 6–9

Pericoma simplex Tonnoir, 1929:25–26, pl. III, figs. 54–57.
Didicrum simplex; Quate, 1963:185, figs. 3a–g.

DESCRIPTION. Male. Eye bridge with 3 facet rows; interocular suture interrupted in center and represented by only small suture extending from dorsal eye margin, sometimes totally absent; eyes separated by 1–1.5 facet diameters; dorsal projection of frons hair patch absent or sparse with only few alveoli on midline; ascoids with 2–5 anterior branches.

Sensory organ attached to base of forecoxa, lobular, about same size as spiracle. Base of R_{2+3} attached to R_4; radial fork basad of medial, distad of base of R_{2+3} by about 1 cell width; base of R_5 distad of base of M_3.

Gonostylus nearly straight, with slight undulation before apex; dorsal process of distiphallus black, single, bare, without setae, much shorter than ventral process, with acute apex, slightly curved, ventral process of distiphallus a single shaft, apex split or divided; tergite 10 parallel-sided on basal half and tapering to blunt apex.

Measurements. Antenna 1.23–1.48 mm ($\bar{x}$ = 1.35; n = 10). Wing length 3.08–3.43 mm, width 1.20–1.43 mm ($\bar{x}$ = 3.26, 1.35; n = 10).

Female. Little larger than male; eyes separated by 1.5–2 facet diameters. Subgenital plate with well defined, asymmetrical lobes; chitinous arch barely penetrates posterior margin between lobes; genital ducts simple, reticulate on anterior part; longitudinal strut prominent, lateral strut absent.

Measurements. Antenna 1.20–1.35 mm ($\bar{x}$ = 1.30; n = 10). Wing length 3.03–3.55 mm, width 1.13–1.50 mm ($\bar{x}$ = 3.29, 1.33; n = 10).

DISTRIBUTION. Argentina, Chile.

HOLOTYPE. ♀, ARGENTINA, Bariloche, 28.xi.1926 (BMNH; examined).

OTHER SPECIMENS STUDIED. ARGENTINA, Chubut, Lago Puelo, 4♂, 12.xii.1994, L. Quate, H. Bhat, willows by pond (LACM); Neuquén, 17 km W Aluminé, 1♂, 14.xi.1994, L. Quate, H. Bhat, sedges in stagnant pool, 900 m (LACM), 23 km NW Volcan La Angostura, 1♂, 23–25.xi.1994, L. Quate, Malaise trap, 980 m (LACM), San Martin de los Andes, 7♂, 5♀, 19.xi.1994, L. Quate, H. Bhat, bog, 790 m (LACM), 7 km W San Martin de

los Andes, 5♂, 3♀, 17.xi.1994, L. Quate, H. Bhat, streamside, 660 m (LACM), 11 km W San Martin de los Andes, 1♀, 17.xi.1994, L. Quate, H. Bhat, sweeping bog, 890 m (LACM), 81 km NW San Martin de los Andes, 2♂, 20.xi.1994, L. Quate, H. Bhat, 850 m (LACM), N shore Lake Huechulafquen, N San Martin de los Andes, 1♂, 2♀, 17–19.xi.1994, L. Quate, H. Bhat, 920 m (LACM), Volcan Llanquin, 20 km S Confluencia, 1♀, 25.xi.1994, L. Quate, H. Bhat, sweeping reeds (LACM); Rio Negro, Nahuel Huapi NP, Lago Mascardi, 1♂, 14–16.xii.1994, L. Quate, H. Bhat, Malaise trap (LACM). CHILE, Llanquihue, Yerbas Buenas, 11♂, 9♀, 3.xii.1994, L. Quate, H. Bhat, sweeping, 150 m (LACM).

Didicrum deceptrix new species

Figs. 10–12

DESCRIPTION. Male. Eye bridge with 3 facet rows; interocular suture interrupted in center; eyes separated by 1–1.5 facet diameters; dorsal projection of frons hair patch absent or sparse with only few alveoli on midline; ascoids with 2–5 anterior branches.

Base of R_{2+3} attached to R_4; radial fork on same level as medial, distad of base of R_{2+3} by at least 4 cell widths; base of R_5 distad of base of M_3.

Gonostylus nearly straight, with slight undulation before apex; dorsal process of distiphallus single, bare, without setae, recurved near apex, same diameter throughout length; ventral process of distiphallus a single shaft with apex entire, undivided; tergite 10 parallel-sided on basal half.

Measurements. Antenna 1.40–1.45 mm (n = 2). Wing length 3.75–3.85 mm, width 1.52–1.55 (n = 2).

Female. Eyes separated by 1.5–2 facet diameters; subgenital plate elongate, apical lobes symmetrical; chitinous arch extends beyond posterior border; genital ducts without reticulations; longitudinal strut weakly developed; lateral strut well developed; posterior part of membranous plate with small sclerotized lobe.

Measurements. Antenna 1.38–1.43 mm (n = 4). Wing length 3.60–3.83, width 1.45–1.55 mm (n = 4).

DISTRIBUTION. Chile.

HOLOTYPE. ♂, CHILE, Llanquihue, Yerbas Buenas, 6.xii.1994, L. Quate, H. Bhat, Malaise trap, 150 m (LACM).

PARATYPES. 1♂, 3♀, same data as holotype (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *deceptrix,* for deceiver, referring to its similarity to *D. simplex* and *D. inornatum.*

Didicrum contiguum (Tonnoir)

Figs. 13–14

Pericoma contigua Tonnoir, 1929:24–25, pl. III, figs. 51–53.

Didicrum contiguum; Enderlein, 1937:24; Quate, 1963:185.

DESCRIPTION. Male. Eyes separated by 2–3 facet diameters; interocular suture interrupted in center leaving 2 convergent bars; frons hair patch undivided, without median band; flagellomeres fusiform (4–14 missing), ascoids with 3–4 anterior branches.

Anepisternite sparsely covered with alveoli over most of surface. Base of R_{2+3} not attached to R_4, without crossveins; base of R_5 distad of base of M_3, radial fork basad of medial.

Hypandrium a narrow band; gonostylus strongly curved over apical one-quarter; distiphallus dark, curved; parameres paired, symmetrical, with feathery tips; surstylus with 1 tenaculum; tergite 10 dome-shaped.

Female. Eye separation as in male; interocular suture similar to male, except inverted Y-shaped with center and stem very faint. Subgenital plate with sides of apical lobes slightly divergent; chitinous arch not reaching apical margin; lateral and longitudinal struts slender; genital ducts with striations over lobes.

DISTRIBUTION. Argentina.

HOLOTYPE. ♂, ARGENTINA, Rio Negro, Lake Nahuel Huapi, Puerto Blest, 2–3.xii.1926, and eastern end of lake, 17.xi.1926, F. and M. Edwards (BMNH; examined).

OTHER SPECIMENS STUDIED. 1♂, 1♀ paratype, same data as holotype.

REMARKS. The feathery apex of the male parameres is unique for the genus *Didicrum.*

Based on the branched ascoids and ending of R_5 beyond the wing apex, *D. contiguum* is tentatively placed in *Didicrum.* Unfortunately, the male genitalia are missing from the holotype and the gonocoxal apodemes are missing from the paratype. Since the structure of the anterior gonocoxal apodemes cannot be examined, this placement is problematic.

Didicrum remulum new species

Figs. 15–17

DESCRIPTION. Male. Eye bridge with 3 facet rows; interocular suture inverted V-shaped; eyes separated by 1–1.5 facet diameters; dorsal projection of frons hair patch extends dorsally to center of eye bridge; ascoids unidigitate, with single anterior branch.

Wing with base of R_{2+3} directed toward, but not attached to, R_4; radial fork distad of base of R_{2+3} by at least 4 cell widths; base of R_5 distad of base of M_3; radial fork slightly basad of medial fork.

Gonostylus nearly straight, with slight undulation before apex, dorsal process of distiphallus single, bare, without setae, much longer than ventral process, straight; ventral process of distiphallus a single shaft, with apex entire, undivided; parameres asymmetrical; tergite 10 parallel-sided on basal half.

Measurements. Antenna 0.83–0.90 mm (n = 2). Wing length 2.43–2.70 mm, width 0.98–1.1 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Argentina.

HOLOTYPE. ♂, ARGENTINA, Rio Negro, Lago Morena, 14–16.xii.1994, L. Quate, H. Bhat, Malaise trap, 800 m (MLPA).

PARATYPES. 1♂, same data as holotype; Lago Mascardi, 1♂, 14–16.xii.1994, L. Quate, H. Bhat, 800 m (LACM).

ETYMOLOGY. From Latin *remulum* for oar, referring to the shape of one of the processes of the distiphallus.

REMARKS. The 2 black parts of the distiphallus are distinctive and unlike any other species of *Didicrum*. The single branch of the ascoids differs from most other *Didicrum*, but such other characters as the shape of the flagellomeres, the position of the wing forks, and R_5 ending beyond the wing tip, are characteristics of the genus. We therefore place *D. remulum* in *Didicrum*, although it necessitates enlarging the generic definition.

Didicrum pyramidon new species

Figs. 18–22

DESCRIPTION. Male. Eye bridge with 4 facet rows; interocular suture inverted Y-shaped; eyes separated by 1–1.5 facet diameters; dorsal projection of frons hair patch absent or sparse with only few alveoli on midline; flagellomere 1 larger than following (in two specimens flagellomeres 1 and 2 fused producing only 13 flagellomeres), terminal 3 reduced; ascoids unidigitate, with single anterior branch.

Wing with base of R_{2+3} attached to R_4; radial fork distad of base of R_{2+3} by at least 4 cell widths; base of R_5 on same level as M_3.

Secondary connection between gonocoxites bearing 4–5 setae on small protuberance on each side of midline; gonostylus nearly straight, with slight undulation before apex; posterior gonocoxal apodemes a pair of elongated triangular projections; dorsal process of distiphallus elongate, asymmetrical, little longer than ventral processes, ventral processes paired, 2 triangular shafts, basiphallus short; epandrium with 2 foramina; surstylus long and slender; tergite 10 triangular, with enlarged thickening on lateral margin at base.

Measurements. Antenna 0.93–1.03 mm (n = 2). Wing length 2.55–2.80 mm, width 0.95–1.10 mm ($\bar{x}$ = 2.62, 1.03; n = 6).

Female. Unknown.

DISTRIBUTION. Argentina.

HOLOTYPE. ♂, ARGENTINA, Neuquén, 81 km NW San Martin de los Andes, 850 m, 20.xi.1994 (MLPA).

PARATYPES. 5♂, same data as holotype (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *pyramidos*, for pyramidal, referring to the shape of tergite 10.

REMARKS. The single branch of the ascoids, 4 facet rows of the eye bridge and the elongate male surstylus of *D. pyramidon* resembles species of *Satchellomyia* Duckhouse (1990:737); however, *D. pyramidon* differs from *Satchellomyia* species in having the 3 terminal flagellomeres reduced and lacking the dorsal projection of the frons hair patch.

Didicrum fenestratum (Tonnoir) new combination

Figs. 23–24

Pericoma fenestrata Tonnoir, 1929:20, pl. II, figs. 37–39 (labeled *Pericoma fenestralis*, lapsus).
Synseodais fenestrata; Enderlein, 1937:92.

DESCRIPTION. Male. Unknown.

Female. Eyes separated by 2.5 facet diameters; frons hair patch undivided, short median band of few alveoli extending posteriorly to lower eye margin; ascoids with 2–5 anterior branches.

Wing strongly infuscated on anterior border and on apical two-fifths, lighter infuscation along CuA_2 and at base, circular clear area in center of wing; radial fork basad of medial, about 2 cell widths distad of base of R_{2+3}; base of R_5 distad of base of M_3.

Subgenital plate concave apically between lobes; membranous plate with delicate, striated arch on each side; lateral strut well developed; genital ducts with striations over lobe; membranous lobe elongate, extends anteriorly from lateral strut as rounded lobe.

Measurements. Antenna 0.80–0.97 mm (n = 5). Wing length 2.40–2.67 mm, width 0.85–1.07 mm ($\bar{x}$ = 2.41, 0.99; n = 7).

DISTRIBUTION. Chile.

HOLOTYPE. ♀, CHILE, Llanquihue, Casa Pangue, 4–10.xii.1926, F. and M. Edwards (BMNH; examined).

OTHER SPECIMENS STUDIED. CHILE, Llanquihue, Yerbas Buenas, 2♀, 3.xii.1994, L. Quate, H. Bhat, sweeping (LACM), 5♀, 4–6.xii.1994, L. Quate, H. Bhat, Malaise trap, 150 m (LACM).

Didicrum viduatum (Tonnoir)

Fig. 25

Pericoma viduata Tonnoir, 1929:26, pl. IV, figs. 58–60.
Didicrum viduatum; Enderlein, 1937:105; Quate, 1963:185.

DESCRIPTION. Male. Unknown.

Female. Eyes separated by 2.5–3 facet diameters; eye bridge with 4 facet rows in second and third columns; interocular suture inverted Y-shaped but center and stem very faint; frons hair patch undivided, with sparse, irregular 2 rows of alveoli extending posteriorly to upper eye margin; ascoids with 2 anterior branches.

Anepisternite with sparse alveoli over dorsal two-thirds. Rs pectinate; radial fork slightly basad

of medial; base of R_5 distad of base of M_3; without crossveins.

Subgenital plate with apical lobes rounded; chitinous arch extends beyond apical margin; longitudinal and lateral struts well developed; genital ducts with striations over lobes.

DISTRIBUTION. Chile.

HOLOTYPE. ♀, CHILE, Chiloe I. Ancud, 17–19.xii.1926, F. and M. Edwards (BMNH; examined).

KEY TO MALES OF *DIDICRUM*

The males of *D. griseatum, D. fenestratum,* and *D. viduatum* are unknown.

1 Interocular suture incomplete, interrupted in center (Fig. 4) 2
– Interocular suture complete, inverted V- or Y-shaped (Figs. 16, 21) 5
2 Radial fork distad of base of R_{2+3} by about 1 cell width (Fig. 7); distiphallus consists of 2 shafts, 1 dark and 1 pale 3
– Radial fork distad of base of R_{2+3} by more than 1 cell width (Fig. 11); distiphallus consists of single shaft 4
3 Dark shaft of distiphallus nearly as long as pale shaft (Fig. 3) ..... *D. inornatum* (Tonnoir)
– Dark shaft of distiphallus shorter than pale shaft (Fig. 9) ..... *D. simplex* (Tonnoir)
4 Base of R_{2+3} connected to R_4 (Fig. 11); radial fork on same level as medial; paramere single or absent ..... ***D. deceptrix*** **n. sp.**
– Base of R_{2+3} not connected to R_4; radial fork basad of medial fork; paramere paired and with feathery patch of setae at apex (Fig. 13) .... *D. contiguum* (Tonnoir)
5 Eye bridge with 3 facet rows (Fig. 16); base of R_{2+3} not connected to R_4 (Fig. 17); radial fork basad of medial fork ..... ***D. remulum*** **n. sp.**
– Eye bridge with 4 facet rows (Fig. 21); base of R_{2+3} connected to R_4; radial fork on same level as medial ..... ***D. pyramidon*** **n. sp.**

Thrysocanthus Enderlein

Thrysocanthus Enderlein, 1937:103; Quate, 1963: 189; Duckhouse, 1973:15.

TYPE SPECIES. *Psychoda stellulata* Loew, by original designation.

DESCRIPTION. Male. Head with same coloration above and below eyes; eyes separated; interocular suture present; eye bridge extends to or close to midline; eye bridge with 4–5 facet rows; antenna shorter than wing width; scape elongate; flagellomere 1 similar to following segments; flagellomeres fusiform or barrel-shaped; only terminal 2 flagellomeres sometimes reduced, terminal 1 with long apiculis; ascoids shorter than segment bearing them, unidigitate; palpus shorter than antenna, often highly modified; palpomere 4 shorter to slightly longer than 3; labellum unusually large.

Antepronotum without band of pores; sensory organs of thorax present. Wing irregular in outline, darkly infuscate, but without patterns; Sc short, does not extend beyond base of R_5. Rs not pectinate; base of R_{2+3} attached to R_4; radial fork basad of wing center, distad or basad of medial fork, without spur; R_5 ends beyond wing apex.

Hypandrium a curved band connecting gonocoxites; gonopod composed of gonocoxite and articulated gonostylus; paramere present as shaft parallel to and dorsal of distiphallus with one side attached to gonocoxite; aedeagus asymmetrical; epandrium with 2 foramina; surstylus with 1 tenaculum, without accessory tenacula.

Female. Eye bridge with 4–5 facet rows. Subgenital plate bilobed; female genital ducts with smooth lateral margin.

REMARKS. The 4–5 facet rows in the eye bridge, modified palpus (with segment 2 lobed and segment 3 curved and elongate), and dark, irregular wing makes *Thrysocanthus* readily recognizable.

Thrysocanthus stellulatus (Loew)

Psychoda stellulata Loew, 1854:1.
Thrysocanthus stellulatus; Enderlein, 1937:103; Quate, 1963:189–190.

DESCRIPTION. Male. Eyes separated by 3–4 facet diameters; interocular suture inverted V-shaped; frons hair patch with dense band of alveoli extending posteriorly nearly to interocular suture; palpomeres 2 and 3 enlarged.

Gonostylus with hook-shaped protrusion in center of medial surface; distiphallus with enlargement at center; paramere longer than distiphallus.

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, [no other data] (ZMHB; not examined).

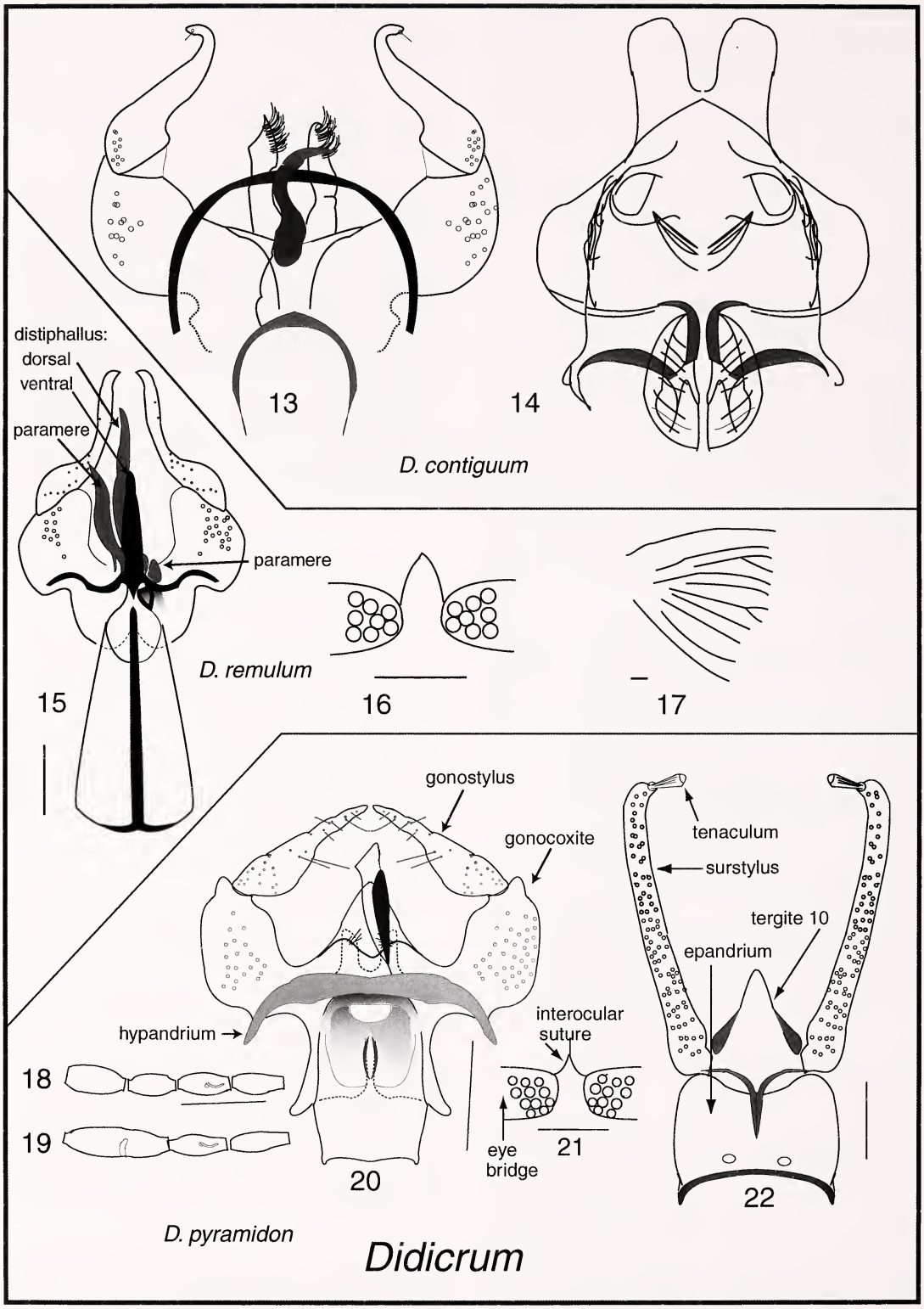
Thrysocanthus rubiginosus Quate
Figs. 26–31

Thrysocanthus rubiginosus Quate, 1963:191, figs. 8a–g.

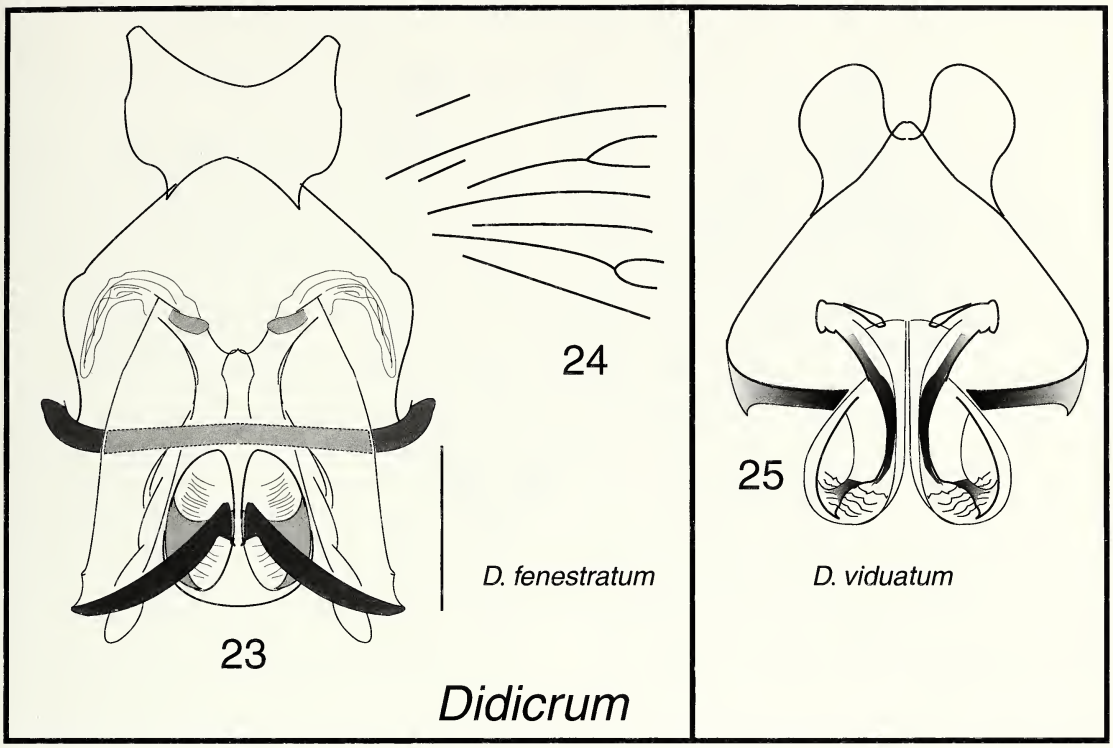
DESCRIPTION. Male. Eyes separated by 4–5 facet diameters; interocular suture inverted V-shaped; frons hair patch with irregular double row of alveoli extending posteriorly to upper eye margin; terminal flagellomeres not reduced; palpomere 2 protruding from apicomedial margin, 3 articulated preapically, curved, 4 normal, ratio of palpomeres 10:20:25:30.

Anepisternite bare of alveoli, except slender, longitudinal strip on posterior one-third with compact alveoli; laterotergite with alveoli only on ventral half. R_1 with enlargement basad of radial fork bearing cluster of long hairs.

Hypandrium a well-developed band bearing rounded lobe on each side of midline, each with 8–10 bristles; gonocoxite with 1 large bristle near apex; distiphallus small, dark, and slender; para-



Figures 13–22 *Didicrum* spp. 13–14. *D. contiguum:* 13. male genitalia, dorsal; 14. female genitalia. 15–17. *D. remulum:* 15. male genitalia, dorsal; 16. eye bridge; 17. base of wing. 18–22. *D. pyramidon:* 18. flagellomeres 1–4; 19. flagellomeres 1–4 of variant; 20. male genitalia, dorsal; 21. eye bridge and interocular suture; 22. male epandrium and surstyli. All scale lines = 0.1 mm



Figures 23–25 *Didicrum* spp. 23–24. *D. fenestratum*: 23. female genitalia; 24. base of wing. 25. *D. viduatum* female genitalia

mere larger and longer than distiphallus; tergite 10 elongate, triangular.

Measurements. Antenna 1.08–1.30 mm ($\bar{x}$ = 1.22; n = 9). Wing length 2.60–2.75 mm ($\bar{x}$ = 2.67; n = 5), width 0.95–1.03 ($\bar{x}$ = 1.00; n = 5).

Female. Eyes separated by 4.5–5 facet diameters; eye bridge with 4 facet rows; palpus normal. Anepisternite without ridges, sparsely covered with alveoli; R_1 without enlargement. Subgenital plate with sides of apical lobes parallel; genital ducts elongate, longitudinal and lateral struts well developed.

Measurements. Antenna 1.20–1.30 mm ($\bar{x}$ = 1.23; n = 5). Wing length 2.63–2.75 mm ($\bar{x}$ = 2.68; n = 5), width 1.00–1.03 mm ($\bar{x}$ = 1.01; n = 5).

DISTRIBUTION. Brazil, Paraguay.

HOLOTYPE. ♂, PARAGUAY, [no locality], 4.v.[no year], Fiebrig (ZMHB; examined).

OTHER SPECIMENS STUDIED. BRAZIL, Rondônia, Cacaulândia, 200 km SSE Porto Velho, 10°18′S, 62°52.1′W, 8♂, 4♀, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (LACM).

REMARKS. In the illustration of the male genitalia by Quate (1963:191, fig. 8f), there appears to be an appendage from the apex of the gonocoxite; in reality, this is a large, articulated spine (as shown in Fig. 26).

Thrysocanthus deformitas new species

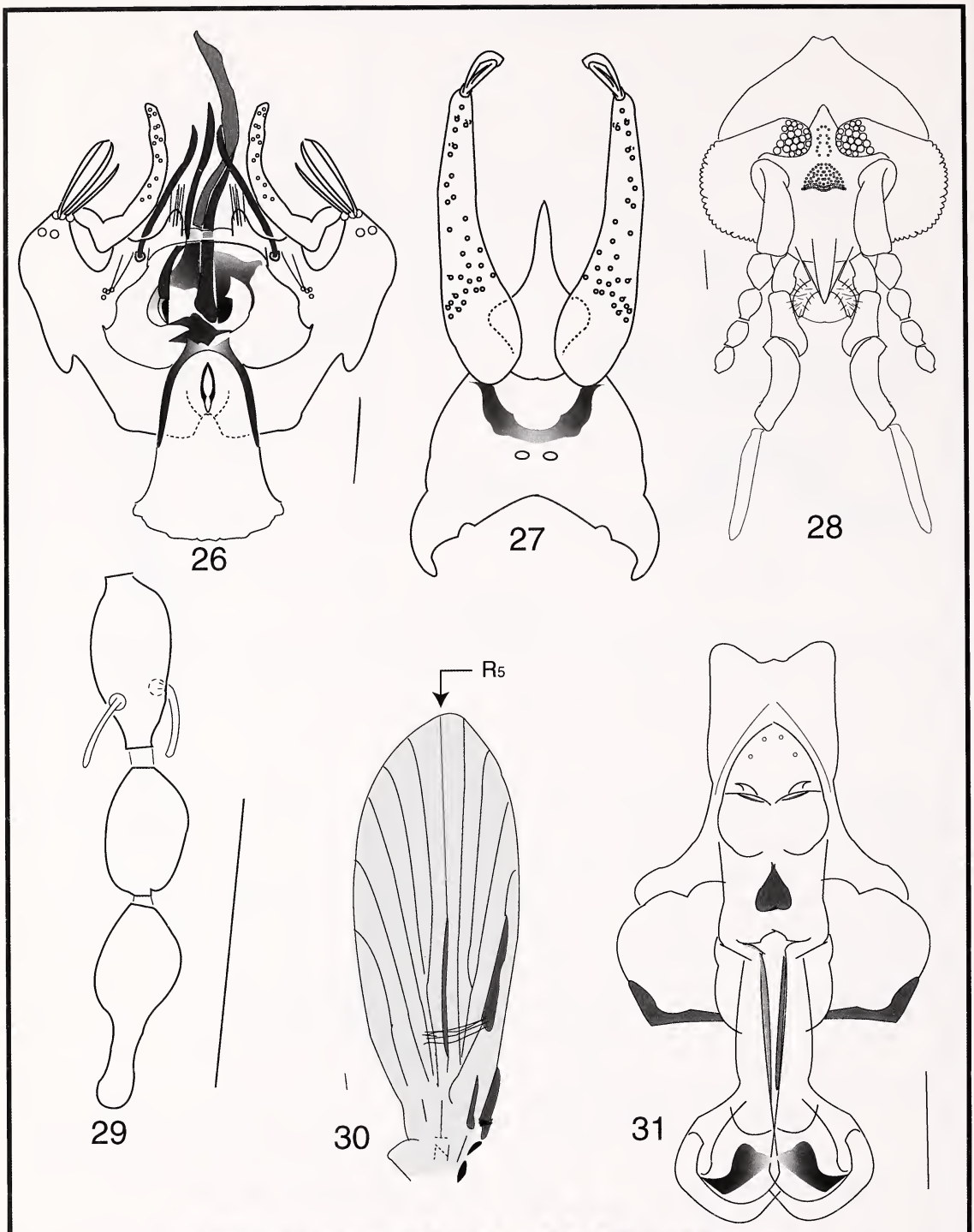
Figs. 32–35

DESCRIPTION. Male. Eyes separated by 3.5–4 facet diameters; interocular suture dome-shaped; frons hair patch with sparse, irregular band extending posteriorly to upper eye margin; terminal 2 flagellomeres reduced; palpus highly modified, palpomere 2 medially with large, rounded lobe, 3 enlarged, curved, with patch of hairs on base of lateral margin, 4 normal, ratio of palpomeres 10:10:30:30.

Anepisternite largely bare of alveoli but with narrow fold on dorsal margin from anterior to posterior densely packed with protuberant alveoli, another fold along posterior margin also with alveoli but not protuberant; laterotergite with alveoli only on ventral portion.

Hypandrium a wide band with elongate protrusion on each side of midline, knob in center bearing cluster of 8–10 bristles; gonocoxite with 6 large bristles on apicomedial margin; anterior gonocoxal apodeme larger than normal; gonostylus slender; distiphallus funnel-shaped; paramere with sclerotized margin on left and membranous area apparently enclosing distiphallus; tergite 10 elongate triangular.

Measurements. Antenna 1.18–1.28 mm ($\bar{x}$ =



Figures 26–31 *Thrysocanthus rubiginosus:* 26. male genitalia, dorsal; 27. male epandrium and surstyli; 28. male head; 29. male flagellomeres 12–14; 30. male wing; 31. female genitalia. **All scale lines = 0.1 mm**

1.24; n = 12). Wing length 3.20–3.50 mm, width 1.28–1.53 ($\bar{x}$ = 3.35, 1.43; n = 13).

Female. Eyes separated by 4.5–5 facet diameters; eye bridge with 4 facet rows; palpus normal. Anepisternite without ridges, sparsely covered with alveoli; R_1 without enlargement. Subgenital plate with sides of apical lobes slightly divergent, apical concavity weak; genital ducts hemispherical with well-developed longitudinal and lateral struts.

Measurements. Antenna 1.18–1.28 mm ($\bar{x}$ = 1.21; n = 13). Wing length 2.97–3.22 mm, width 1.12–1.33 ($\bar{x}$ = 3.07, 1.18; n = 15).

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Rondônia, Cacaulándia, 200 km SSE Porto Velho, 10°18′S, 62°52.1′W, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (INPA).

PARATYPES. 16♂, 18♀, same data as holotype (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *deformis* for misshapen, referring to the unusual male palpus.

KEY TO MALES OF *THRYSOCANTHUS*

1 Gonostylus without protuberance near center; gonocoxite with 1 or more large bristles on apicomedial margin (Fig. 26) 2
– Gonostylus with hooklike protuberance near center of mesal margin; gonocoxite without large bristles . . . . . *T. stellulatus* (Loew)
2 Distiphallus small and slender (Fig. 26); hypandrium with knobs on each side of midline with 6–8 bristles at apex; palpal segment 2 slightly modified, segment 3 slightly curved (Fig. 28) . . . . . *T. rubiginosus* Quate
– Distiphallus funnel-shaped with broad, flattened apex; knobs on hypandrium with bristles on knob in center of protuberance; palpal segments 2 and 3 enlarged and shape strongly modified (Fig. 33) . . . . . *T. deformitas* **n. sp.**

Desmioza Enderlein

Desmioza Enderlein, 1937:99; Quate, 1963:183.

TYPE SPECIES. *Pericoma edwardsi* Tonnoir, by original designation.

DESCRIPTION. Male. Head with same coloration above and below eyes; eyes separated; interocular suture present; eye bridge extends to or close to midline, with 3 facet rows; antenna shorter than wing width; flagellomeres fusiform or barrel-shaped; terminal 3 flagellomeres not reduced, terminal 1 with apiculis; ascoids short, unidigitate; palpus about three-quarters length of antenna, palpomere 4 longer than palpomere 3.

Antepronotum without band of pores; sensory organ of thorax absent, anepisternum sparsely covered with alveoli except posterolateral one-third; laterotergite with sparse alveoli on ventral half. Wing with infuscate patterns; costa without second costal node; Rs not pectinate; R_{2+3} not attached to R_4; radial fork near wing center, on same level as medial fork, with spur; medial fork sometimes with small spur; R_5 ends beyond wing apex.

Anterior gonocoxal apodemes form pair of anterior, expanded lobes; hypandrium a bar connecting gonocoxites, adhering to base of gonocoxites; paramere absent; aedeagus asymmetrical; epandrium with single large foramen; surstylus with 1 tenaculum, without accessory tenacula.

Female. Subgenital plate bilobed; genital ducts with smooth lateral margin.

REMARKS. *Desmioza* is separable from all other Setomimini genera, except *Didimioza,* by the spur on the radial fork; also, the combination of the simple, unbranched ascoids, fusiform flagellomeres, and R_5 ending beyond the wing tip help define this genus.

Desmioza edwardsi (Tonnoir)
Figs. 36–40

Pericoma edwardsi Tonnoir, 1929:12–14; Quate, 1963:183, figs. 2a–g; Duckhouse, 1973:9.
Desmioza edwardsi; Enderlein, 1937:99.

DESCRIPTION. Male. Eyes separated by 2 facet diameters; interocular suture inverted V-shaped; frons hair patch with sparse median band extending dorsally to facet row 1; scape about 3 times length of pedicel; simple, unbranched ascoids on flagellomeres 2–4, paired on 5–13; ratio of palpomeres 10:11:14:25.

Wing with small, faint spots at vein tips, base of R_{2+3} and R_5 and radial and medial forks; radial fork slightly distad of medial; base of R_5 well distad of base of M_3.

Hypandrium fused to bases of gonocoxites; gonocoxites contiguous on midline; gonostylus strongly curved, with subapical protrusion bearing 5–6 bristles; distiphallus composed of 2 black parts, 1 firmly attached to basiphallus, 1 detached, thicker and extends beyond tip of other; surstylus thick and rather short; tergite 10 triangular.

Measurements. Antenna 0.81–0.91 mm (n = 4). Wing length 1.85–2.35 mm, width 0.75–0.95 mm ($\bar{x}$ = 2.21, 0.86; n = 9).

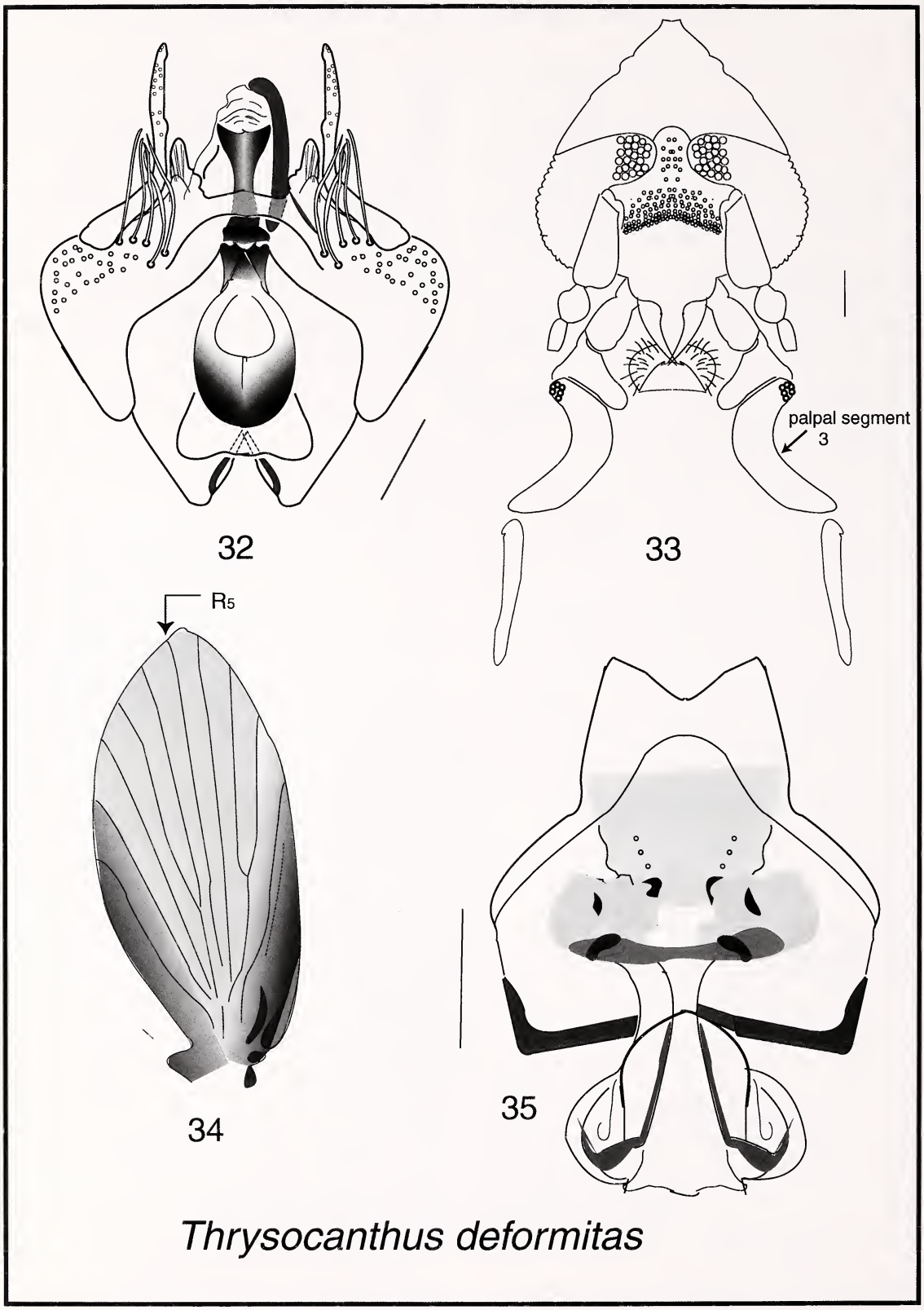
Female. Eyes separated by 2.5 facet diameters. Subgenital plate with sides of apical lobes slightly divergent; chitinous arch extends slightly beyond apical margin; membranous plate largely covered with black particles, central band extends from apex of genital ducts to chitinous arch, sides of band heavily sclerotized, arrow-shaped structure at apex of genital ducts; genital ducts with longitudinal and lateral struts well developed.

Measurements. Antenna 0.78–0.98 mm ($\bar{x}$ = 0.85; n = 10). Wing length 2.45–3.05 mm, width 0.93–1.29 mm ($\bar{x}$ = 2.64, 1.02; n = 10).

DISTRIBUTION. Argentina, Chile.

HOLOTYPE. ♂, ARGENTINA, Rio Negro, Bariloche, 25–28.x.1926 (BMNH; not examined).

SPECIMENS STUDIED. ARGENTINA, Chubut, Los Alerces NP, Lago Rivadavia, 4♀, 9–12.xii.1994, L. Quate, H. Bhat, Malaise trap, 800



Figures 32–35 *Thrysocanthus deformitas:* 32. male genitalia, dorsal; 33. male head; 34. male wing; 35. female genitalia. All scale lines = 0.1 mm

m (LACM); Neuquén, 23 km S of Lago Aluminé, 9♂, 1♀, 13.xi.1994, L. Quate, H. Bhat, sweeping grass (e.g.,1470 m) (LACM), N shore Lago Lacar, 1♂, 16.xi.1994, L. Quate, H. Bhat, sweeping sedges, 610 m (LACM), San Martin de los Andes, 850 m, 1♂, 4♀, 15–20.xi.1994, L. Quate, H. Bhat, Malaise trap in forest of *Nothofagus antarctica,* 850 m (LACM), 7 km W San Martin de los Andes, 3♀, 17.xi.1994, L. Quate, H. Bhat, streamside, 660 m (LACM), 11 km W San Martin de los Andes, 1♀, 17.xi.1994, L. Quate, H. Bhat, sweeping, 800 m (LACM), 12 km S San Martin de los Andes, 10♀, 17–19.xi.1994, L. Quate, H. Bhat, Malaise trap, 815 m (LACM); Rio Negro, Rio Villegas, 57 km S Bariloche, 9♀, 8–13.xi.1994, L. Quate, H. Bhat, 800 m (LACM). CHILE, Llanquihue, Yerbas Buenas, 1♀, 6.xii.1994, L. Quate, H. Bhat, Malaise trap (LACM).

REMARKS. Association of the sexes was made on the basis of common occurrence in the same locality.

Tonnoir (1929:pl. I, fig. 16) shows a crossvein at the radial fork that is not present in any of the specimens we studied. Apparently, the dark spot on the radial fork gave the impression of a crossvein in the dry, pinned specimens that he examined.

Desmioza speciosa (Tonnoir) new combination

Figs. 41–42

Pericoma speciosa Tonnoir, 1929:11–12, pl. 3, fig. 13.

DESCRIPTION. Male. Eyes separated by little more than 2 facet diameters; interocular suture V-shaped, eye bridge with 3 facet rows; frons hair patch with sparse median band extending dorsally to facet row 2; scape about 3 times length of pedicel; simple, unbranched ascoids paired on all flagellomeres, except absent on 1 and 2; ratio of palpomeres 10:12:15:24.

Wing with small, faint spots at vein tips, base of R_{2+3} and R_5, and radial and medial forks; radial fork slightly distad of medial; base of R_5 well distad of base of M_3.

Hypandrium fused to bases of gonocoxites; gonocoxites slightly separated on midline; posterior gonocoxal apodemes bulbous, posterior surface reticulate; gonostylus bifurcate, ventral appendage short and strongly curved, with subapical protrusion bearing 5–6 bristles, dorsal appendage black, similar shape as ventral, with spur at distal one-third without bristles; distiphallus composed of 2 black, straight shafts, ventral much longer than dorsal, tergite 10 triangular.

Measurements. Antenna 0.85–0.99 mm ($\bar{x}$ = 0.93; n = 9). Wing length 2.33–3.00 mm, width 0.98–1.10 mm ($\bar{x}$ = 2.67, 1.07; n = 10).

Female. Eyes separated by 2.5 facet diameters. Subgenital plate with sides of apical lobes parallel or nearly so; chitinous arch extends beyond apical margin; membranous plate largely covered with black particles, central band extends from apex of genital ducts to chitinous arch, sides of band heavily sclerotized, simple, black bar in center between genital ducts; genital ducts with longitudinal and lateral struts well developed.

Measurements. Antenna 0.74–0.85 mm ($\bar{x}$ = 0.81; n = 6). Wing length 2.05–2.60 mm, width 0.75–0.88 mm ($\bar{x}$ = 2.35, 0.84; n = 6).

DISTRIBUTION. Argentina, Chile.

HOLOTYPE. ♀, CHILE, Llanquihue, Casa Pangue, 4–10.xii.1926, F. and M. Edwards (BMNH; examined).

OTHER SPECIMENS STUDIED. ARGENTINA, Neuquén, 17 km W Aluminé, 2♂, 14.xi.1994, L. Quate, H. Bhat, sedges in standing water, 900 m (LACM), 23 km S Lago Aluminé, 5♂, 1♀, 13.xi.1994, L. Quate, H. Bhat, sweeping grass, 1470 m (LACM), 27 km NW Aluminé, Rio Norquinco, 1♂, 14.xi.1994, L. Quate, 980 m (LACM), N San Martin de los Andes, N shore Lago Huechulafquen, 1♀, 17–19.xi.1994, L. Quate, H. Bhat, 920 m (LACM), San Martin de los Andes, 1♂, 1♀, 15–20.xi.1994, L. Quate, H. Bhat, Malaise trap, *Nothofagus antarctica* forest, 850 m (LACM), 7 km W San Martin de los Andes, 1♂, 17.xi.1994, L. Quate, H. Bhat, streamside, 660 m (LACM), 11 km W San Martin de los Andes, 2♂, 17.xi.1994, L. Quate, H. Bhat, sweeping, bog, 890 m (LACM), 12 km S San Martin de los Andes, 7♂, 17–19.xi.1994, L. Quate, H. Bhat, Malaise trap, 815 m (LACM), 81 km NW San Martin de los Andes, 1♀, 20.xi.1994, L. Quate, H. Bhat, Malaise trap, 850 m (LACM); Rio Negro, Rio Villegas, 57 km S Bariloche, 2♀, 8–13.xii.1994, L. Quate, H. Bhat, Malaise trap, 800 m (LACM).

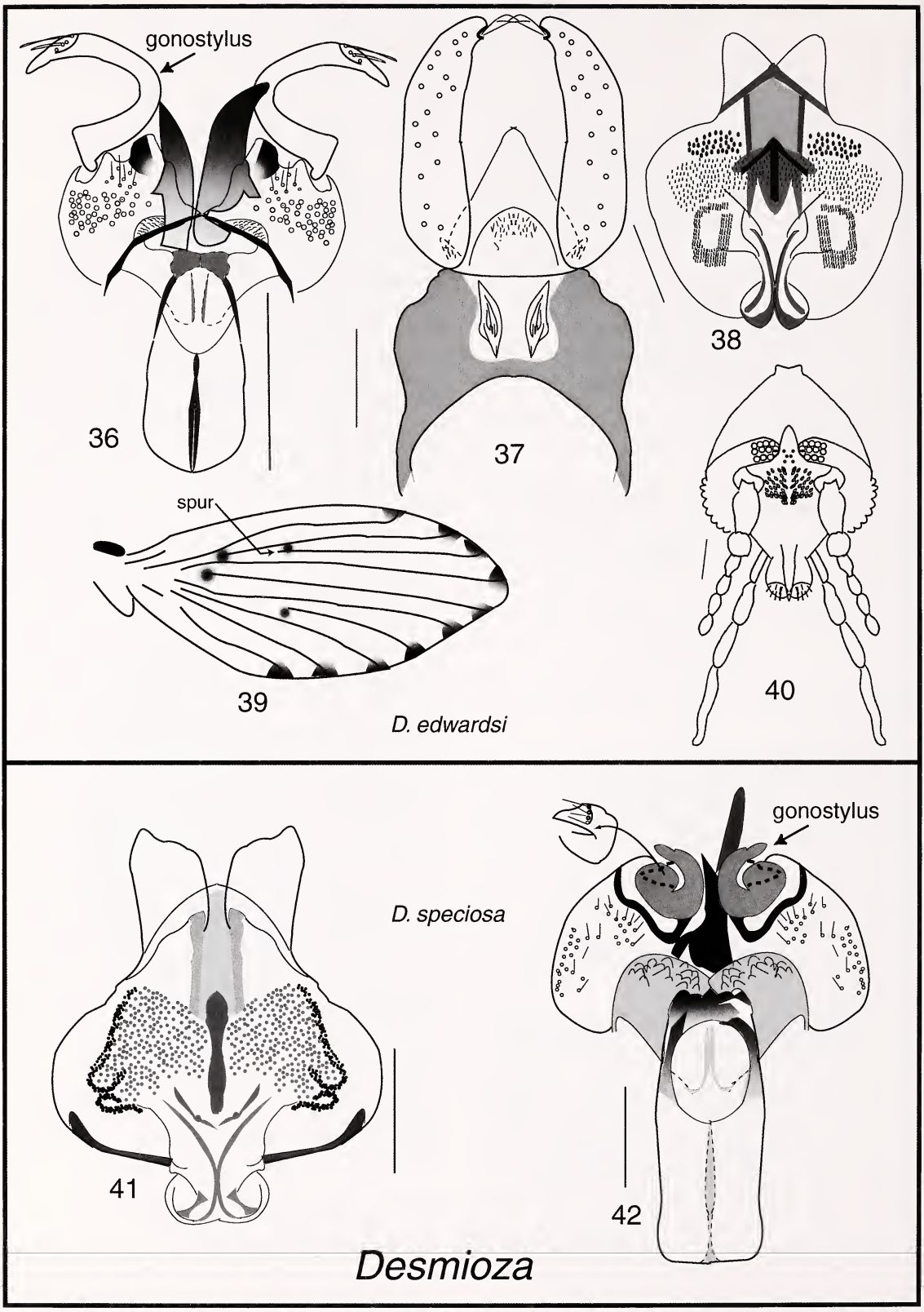
REMARKS. The males of *D. edwardsi* and *D. speciosa* are easily separated by characters of the genitalia. The surstylus of *D. edwardsi* is longer than the gonostylus and single, whereas it is short, circular, and bifurcate in *D. speciosa.* In addition, the distiphallus of *D. edwardsi* consists of 2 shafts ending at about the same level, whereas 1 shaft of *D. speciosa* is much longer than the other. Females of the two species are also similar but are readily separated by the arrow-shaped bar in the center of the membranous plate of *D. edwardsi,* which is replaced by a straight, simple bar in *D. speciosa.* The two species have overlapping distributions.

This is the first description of the males of *D. speciosa,* which were associated with the females by collecting in the same area and by their relative abundance compared with *D. edwardsi.*

KEY TO SPECIES OF *DESMIOZA*

1 Male with gonostylus single, longer than gonocoxite and C-shaped (Fig. 36); female with dark, arrow shape in center of membranous plate (Fig. 38) ..... *D. edwardsi* (Tonnoir)

– Male with gonostylus bifurcate, pair of small, curled appendages on top of each other, shorter than gonocoxite (Fig. 42); female with dark bar



Figures 36–42 *Desmioza* spp. **36–40.** *D. edwardsi:* **36.** male genitalia, dorsal; **37.** male epandrium and surstyli; **38.** female genitalia; **39.** wing; **40.** male, head. **41–42.** *D. speciosa:* **41.** female genitalia; **42.** male genitalia (inset, tip of ventral appendage of gonostylus). **All scale lines = 0.1 mm**

between genital ducts (Fig. 41) .....
..... *D. speciosa* (Tonnoir)

Didimioza new genus

TYPE SPECIES. *Desmioza symphylia* Quate, by present designation.

DESCRIPTION. Male. Head with same coloration above and below eyes; eyes separated; interocular suture present; eye bridge extends to or close to midline, with 4 facet rows; antenna longer than wing width, with 13 flagellomeres, 1 enlarged, 2–11 pyriform with poorly defined internodes, basal internodes short but progressively elongating, flagellomere 12 without internode, flagellomere 13 globular with apiculis as long as base; ascoids paired on flagellomeres 1–12, unidigitate, longer than segment bearing them; palpus about three-quarters length of antenna, palpomere 4 longer than palpomere 3.

Antepronotum without band of pores; sensory organs of thorax absent, anepisternum sparsely covered with alveoli; laterotergite with sparse alveoli on ventral half. Wing without infuscate patterns, except small, faint brown spots at vein tips and forks; costa without second costal node; Rs not pectinate; R_{2+3} weakly joined to R_4; radial fork near wing center at same level as medial fork, with spur; medial fork with small spur; R_5 ends beyond wing apex.

Anterior gonocoxal apodemes form pair of anterior, expanded lobes; hypandrium a thin bar connecting gonocoxites, adhering to base of gonocoxites over part of length; aedeagus asymmetrical; paramere present; epandrium with single large foramen; surstylus with 1 tenaculum, without accessory tenacula.

Female. Eye bridge with 3 facet rows; antenna with 14 flagellomeres, 1 not enlarged but otherwise like male. Subgenital plate bilobed; genital ducts with smooth lateral margin.

ETYMOLOGY. Arbitrary combination of parts of *Didicrum* and *Desmioza* to indicate similarity to the genera bearing those names.

REMARKS. *Didimioza* is most closely related to *Desmioza,* as indicated by the apomorphic spur on the radial fork and R_5 ending beyond the wing tip. The position of the forks and position of the R_5 tip is similar to *Didicrum,* to which it bears a general resemblance. The genus is unique in having 4 facet rows and 13 flagellomeres in the male and only 3 facet rows and 14 flagellomeres in the female. These features, along with the longer antenna and aedeagus with a paramere, indicate the distinctness of the group. Additionally, the 3 genera differ in geographical distribution: Neotropical *Didicrum* and *Desmioza* are only found south of the Tropic of Capricorn, while *Didimioza* is only found north of that latitude.

The reduction in the male flagellomeres is formed by the fusion of the first 2 flagellomeres, as shown by the enlarged segment with a constriction in the center; in the female, there are the normal 14 flagellomeres.

Didimioza symphylia (Quate) new combination

Figs. 43–53

Desmioza symphylia Quate, 1999:418, figs. 2F–J.

DESCRIPTION. Male. Eyes separated by less than 1 facet diameter; interocular suture small, inverted Y-shaped; frons hair patch with broad median band extending dorsally to facet row 2; scape about 2 times length of pedicel; ratio of palpomeres 10:15:17:19.

Wing with small, faint spots at vein tips, base of R_{2+3} and R_5, and radial fork; radial fork on same level as medial; base of R_5 well distad of base of M_3.

Gonocoxite with 2–3 large spines on apicomedial margin; posterior gonocoxal apodemes without spines on posterior border; distiphallus composed of single straight shaft; paramere similar in shape and length to distiphallus, may be little longer than distiphallus, base with lateral expansion ending in dark, sharp point; surstylus thick and of moderate length; tergite 10 dome-shaped.

Measurements. See Table 1.

Female. Eyes separated by 2–2.5 facet diameters. Subgenital plate with apical lobes ovoid; chitinous arch extends little beyond apical margin; membranous plate with T-shaped structure posterior of genital ducts; genital ducts with longitudinal and lateral struts well developed.

Measurements. See Table 1.

DISTRIBUTION. Costa Rica, Panama.

HOLOTYPE. ♂, PANAMA, Barro Colorado I., xii.1993, J. Pickering, Malaise trap (USNM; examined).

OTHER SPECIMENS STUDIED. COSTA RICA, Cartago, 4 km NE Cañon, 3♂, 21♀, iv.1995, P. Hanson, Malaise trap, 2350 m (LACM); Guanacaste, Maritza Biological Station, 6♂, 9♀, 25–28.iv.1997, L. Quate, Malaise trap, 560 m (LACM); Puntarenas, Monteverde, 1♀, 28.iv–1.v.1997, L. Quate, Malaise trap, 1550 m (LACM), Pittier Biological Station, 30 km N San Vito, 6♂, 11–14.vi.1995, L. Quate, Malaise trap (LACM); San José, 19 km S, 3 km W Empalme, 1♂, i–iii.1993, 1♂, i.1995, P. Hanson, Malaise trap, 2600 m (LACM).

REMARKS. *Didimioza symphylia* appears to be a variable species or possibly a species complex. More specimens are needed from further localities to determine whether the following populations warrant species status.

1. The Barro Colorado Island population has the distiphallus nearly as long as the paramere, and the basal expansion of the paramere terminates in a rounded point laterally.
2. The Guanacaste populations have the distiphallus nearly as long as the paramere, the basal ex-

Table 1. Comparison of *Didimioza symphylia* (Quate) populations.

Structure	Panama Canal Zone BCI	Costa Rica Guanacaste Maritza	Costa Rica Cartago Cañon	Costa Rica Puntarenas Monteverde, Pittier
Distiphallus length (versus paramere)	Similar	Similar	Shorter	Shorter
Basal expansion of paramere	Dark, acute	Dark, acute	Brown, blunt	Brown, blunt
Saclike object on female genitalia	Absent	Absent	Present	Absent

		Antenna, mm			Wing, mm Length		Wing, mm Width		
Locality	Sex	Range	$\bar{x}$	n	Range	$\bar{x}$	Range	$\bar{x}$	n
BCI	♀♀	1.05–1.10	1.08	3	1.95–2.33	2.18	0.78–0.95	0.83	5
Maritza	♂♂	1.35–1.45	1.40	3	2.10–2.35	2.20	0.83–0.95	0.89	5
	♀♀	1.00–1.23	1.07	5	2.10–2.43	2.29	0.85–0.95	0.90	6
Cañon	♂♂	1.61–1.67	1.64	2	3.05–3.33	3.23	1.13–1.29	1.23	4
	♀♀	1.28–1.50	1.40	13	3.13–3.54	3.31	1.13–1.40	1.27	13
Pittier	♂♂	1.35–1.40	1.38	2	2.15–2.45	2.28	0.80-0.95	0.89	5
Monteverde	♀♀	1.10–1.23	1.17	16	2.40–2.80	2.68	0.85–1.15	1.05	16

pansion of the paramere ends in a dark, recurved hook on the lateral margin (Fig. 43), and their size is similar to those from Barro Colorado.

3. The Cartago and Puntarenas populations have a smaller distiphallus (Fig. 51), which is clearly shorter than the paramere, and the basal expansion of the paramere ends in a blunt apex laterally. There is considerable size difference in these populations (Table 1). Females of the Cartago populations differ markedly in possessing a black, saclike structure attached to the lateral margin of the membranous plate (Fig. 52). Possibly, these two populations represent a separate species.

The specimen from Empalme may also be a separate species. It has a short, thick distiphallus and a curved paramere.

Didimioza venezuelica new species

Figs. 54–56

DESCRIPTION. Male. Eyes separated by 1 facet diameter; interocular suture small, inverted Y-shaped, stem shorter than arms; frons hair patch with sparse median band extending dorsally to bottom of eye bridge; scape about 2 times length of pedicel; flagellomere 1 elongate and constricted in center; ratio of palpomeres 10:15:17:19.

Wing with small, faint spots at vein tips, base of R_{2+3} and R_5, and radial fork; radial fork on same level as medial; base of R_{2+3} not joined to R_4, no crossvein, although dark spot gives appearance of crossvein; base of R_5 well distad of base of M_3.

Hypandrium a narrow band; gonocoxite with 2 large spines on apicomedial margin; posterior gonocoxal apodemes with cluster of spines on posterior margin of each lobe; distiphallus composed of single straight shaft; paramere similar in shape and length to distiphallus, may be little shorter than distiphallus, base with lateral expansion ending in broad, flat apex; surstylus thick and of moderate length; tergite 10 dome-shaped.

Measurements. Antenna 1.30–1.78 mm ($\bar{x}$ = 1.50; n = 10). Wing length 2.68–3.13 mm, width 0.98–1.15 mm ($\bar{x}$ = 2.83, 1.10; n = 10).

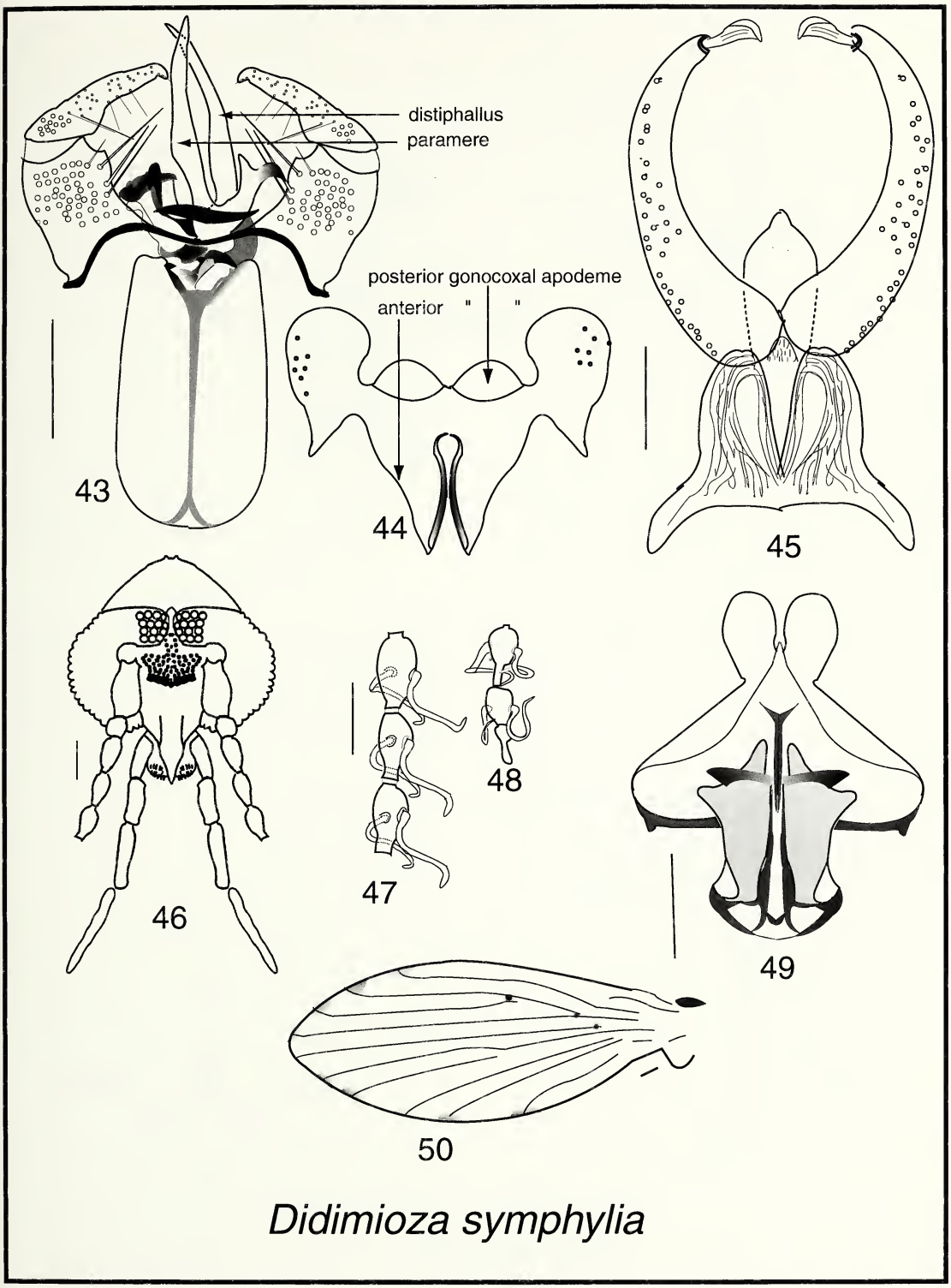
Female. Apical lobes of subgenital plate rounded; chitinous arch reaches apical margin between lobes but does not break margin; membranous plate with straight bar posterior of genital ducts; longitudinal and lateral struts well developed.

Measurements. Antenna 1.10–1.35 mm ($\bar{x}$ = 1.23; n = 18). Wing length 2.43–3.13 mm, width 0.98–1.25 mm ($\bar{x}$ = 2.84, 1.12; n = 18).

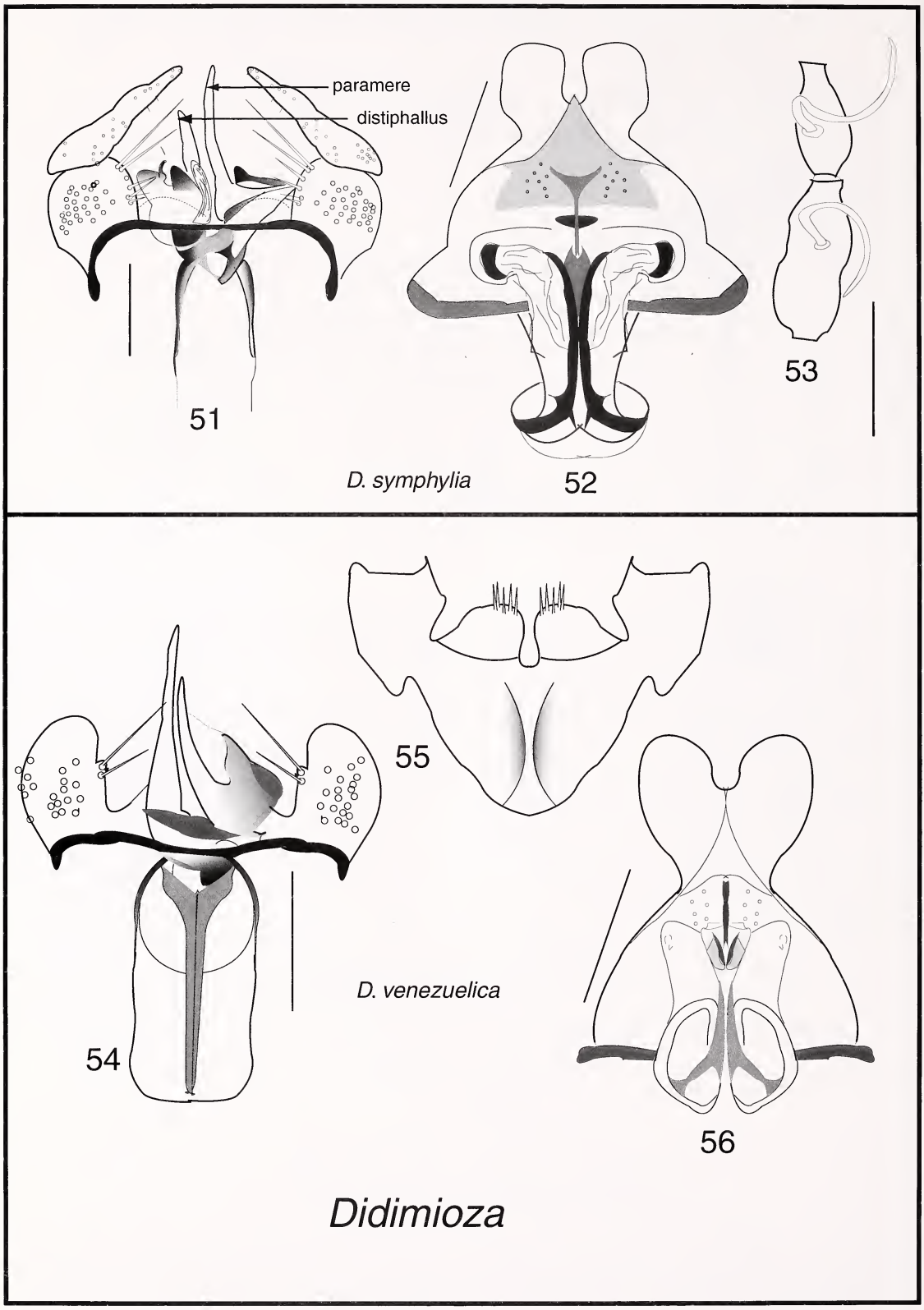
DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Merida, Jají, 8°36′N, 71°21′W, 14.ix.1995, L. Quate, Malaise trap, 2100 m (IZAV).

PARATYPES. 4♂, 14♀, same data as holotype (BMNH, LACM, USNM), La Azulita, 8°42′N, 71°28′W, 1♂, 14.ix.1995, L. Quate, light trap, 1350 m (LACM), 8°27.6′N, 71°20.8′W, 2♂, 13–15.ix.1995, L. Quate, Malaise trap, 2300 m (LACM, USNM), 1♀, La Mesa, W Merida, 8°34′N, 71°19′W, 1♀, 20.ix.1995, L. Quate, Malaise trap, 1650 m (LACM), Merida, 8°41′N, 71°6′W, 1♀, 11.ix.1995, 1♂, 4♀, 12.ix.1995, 3♀, 11–13.ix.1995, L. Quate, Malaise trap, 2100 m (LACM), 3♀, 22.ix.1995, L. Quate, Malaise trap, 1650 m (LACM), Merida, La Hechicera, 8°38′N,



Figures 43–50 *Didimioza symphylia:* 43. male genitalia, dorsal (specimen from Maritza, Costa Rica); 44. male gonopods (Maritza); 45. male epandrium and surstyli (Maritza); 46. male head (Maritza); 47. male flagellomeres 1–4 (Maritza); 48. male flagellomeres 13–14 (Maritza); 49. female genitalia (Panama); 50. wing (Maritza). All scale lines = 0.1 mm



Figures 51–56 *Didimioza* spp. 51–53. *D. symphylia:* 51. male genitalia, dorsal (specimen from Cartago, Costa Rica); 52. female genitalia (Cartago); 53. flagellomeres 1–2. 54–56. *D. venezuelica:* 54. male genitalia, dorsal; 55. gonopods with anterior and posterior gonocoxal apodemes; 56. female genitalia. All scale lines = 0.1 mm

71°9′W, 2♀, 22.ix.1995, L. Quate, Malaise trap, 1800 m, secondary forest (LACM).

ETYMOLOGY. Named for the country in which specimens were collected.

REMARKS. *Didimioza venezuelica* is similar to *D. symphylia* in most respects but differs in that the lateral expansion of the paramere of *D. venezuelica* is broad with a flat apex, whereas that of *D. symphylia* ends in a sharp, lateral projection. Additionally, the lengths of the distiphallus and paramere are nearly equal in *D. venezuelica* (Fig. 54), similar to the Panama populations of *D. symphylia*. A more conspicuous difference is the presence of a cluster of spines on the posterior gonocoxal apodemes of *D. venezuelica* which is lacking in all populations of *D. symphylia*. The female genitalia of *D. venezuelica* are quite different from those of *D. symphylia*, with rounded apical lobes of the subgenital plate, different ornamentation, and a lack of black sacs on the membranous plate; and the bar on the membranous plate being straight and not T-shaped (Fig. 56).

Didimioza chachapoya new species

Figs. 57–58

DESCRIPTION. Male. Eyes separated by little less than 1 facet diameter; interocular suture small, interrupted in center; frons hair patch with median band extending dorsally to facet row 1; scape about 2 times length of pedicel; flagellomere 1 elongate and constricted in center; ratio of palpomeres 10:15:17:19.

Wing with small, faint spots at vein tips, base of R_{2+3} and R_5, and radial fork; radial fork on same level as medial; base of R_{2+3} not joined to R_4, no crossvein, although dark spot gives appearance of crossvein; base of R_5 well distad of base of M_3.

Hypandrium a narrow band; gonocoxite with 3 large spines on apicomedial margin; posterior gonocoxal apodemes without spines; distiphallus composed of single straight shaft; paramere similar in shape and length to distiphallus, base with lateral expansion ending in broad, rounded apex; surstylus of moderate length; tergite 10 not discernible.

Measurements. Antenna 1.83 mm (n = 1). Wing length 3.03 mm, width 1.20 mm (n = 1).

Female. Subgenital plate with apical lobes somewhat quadrate; membranous plate with lightly sclerotized bar in center, curved band across bar, and sclerotized arch on each side of bar; genital ducts with longitudinal and lateral struts.

Measurements. Antenna 1.30 mm (n = 1). Wing length 3.05 mm, width 1.13 mm (n = 1).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Amazonas, Chachapoyas, 6°15′S 77°53′W, 12.viii.1997, L. Quate, 2150 m, shrubs at edge of small stream flowing through pasture at edge of town (MUSM).

PARATYPE. ♀, same data as holotype (MUSM).

ETYMOLOGY. Named for the collecting locality.

KEY TO MALES OF *DIDIMIOZA*

1 Posterior gonocoxal apodemes without spines on posterior margin 2
– Posterior gonocoxal apodemes with cluster of spines on posterior margin of each lobe (Fig. 55) . . . . . ***D. venezuelica* n. sp.**
2 Lateral expansion at base of paramere ending in acute apex . . . . . *D. symphylia* (Quate)
– Lateral expansion at base of paramere rounded . . . . . ***D. chachapoya* n. sp.**

Tonnoira Enderlein

Tonnoira Enderlein, 1937:106; Quate, 1963:189.

TYPE SPECIES. *Tonnoira pelliticornis* Enderlein, by original designation.

DESCRIPTION. Eye bridges fully developed and narrowly separated, with 5 facet rows, connected by interocular suture; frons hair patch quadrate and not divided in center. Antenna very long, longer than wing (except female *T. rectilata*), scape and pedicel short, with 14 flagellomeres; flagellomeres fusiform, unusually long, terminal segments not reduced, apical with long, slender apiculis; ascoids lacking. Palpus extends to flagellomere 4, palpomere 1 much shorter than other palpomeres, ratio of segments 10:30:40:42.

Midcoxa with patch of hairs on anteroapical margin. Rs not pectinate; base of R_{2+3} not attached to R_4, radial and medial forks basad of wing center, radial usually basad of medial, R_5 ends in wing apex.

Hypandrium present; aedeagus asymmetrical (rarely symmetrical), surstylus with 1–3 tenacula; ventral epandrial sclerite (Duckhouse, 1987:233, 1990:723) paired, diagonal, and striated.

Tonnoira protuberata new species

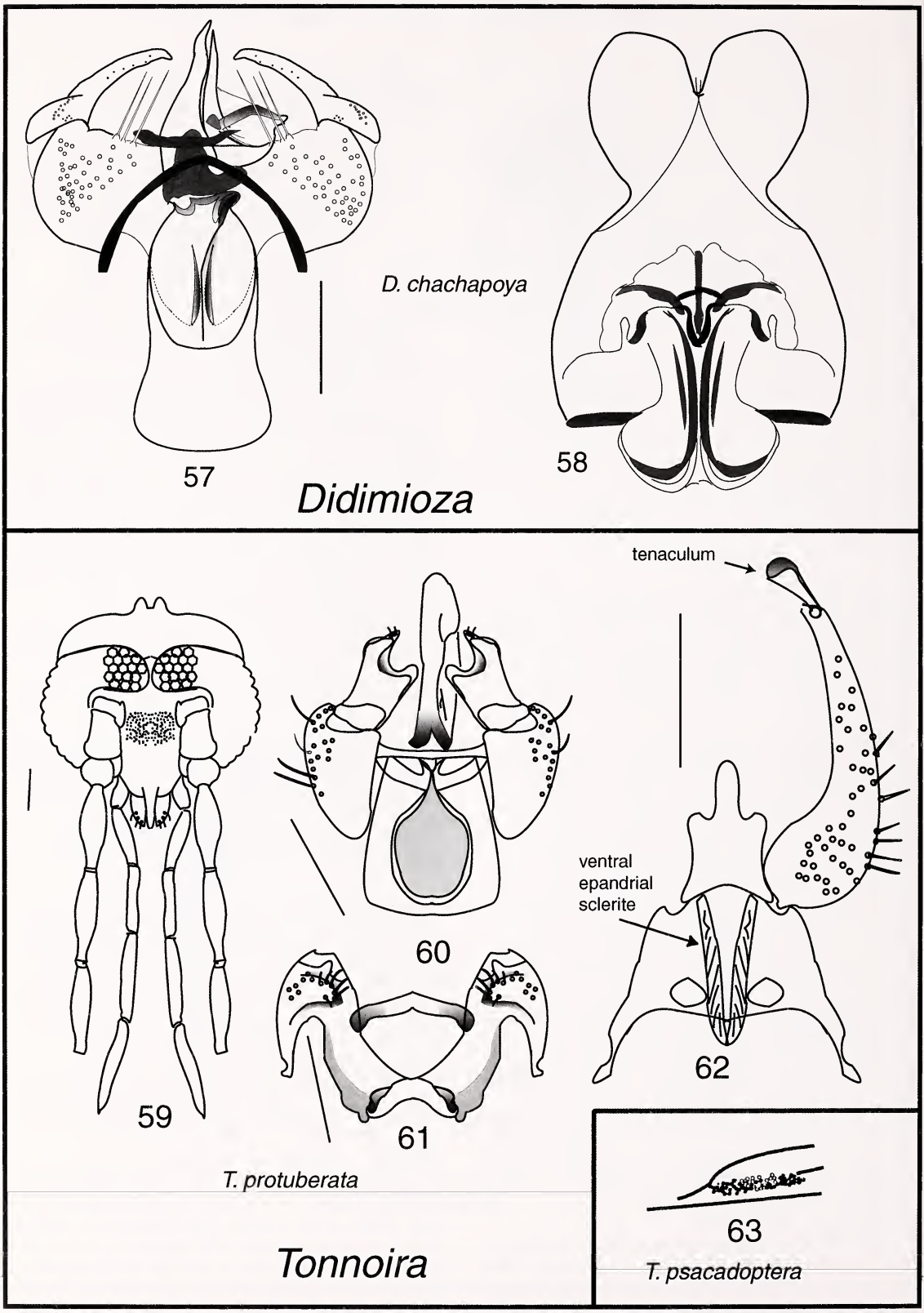
Figs. 59–62

DESCRIPTION. Male. Eye bridge wide, with 5 facet rows, vertex height on midline nearly equal to width of eye bridge; apex of vertex protuberant; eyes separated by less than 1 facet diameter; interocular suture a single suture without stem; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum with band of hairs in center, well separated from anterior margin. Wing without second costal node, membrane clear, uncolored; base of R_3 normal; medial fork distad of radial by more than 3 cell widths.

Hypandrium a straight band connecting gonocoxites, without setose lobe in center; gonostylus very short, much shorter than gonocoxite, ending in 2–4 blunt projections with concavity at apex between lobes; distiphallus a straight shaft extending beyond tip of gonostylus; paramere absent; surstylus with 1 tenaculum; tergite 10 somewhat cruciate with 2 lateral arms before apex.

Measurements. Wing length 2.35–2.68 mm; width 0.90–1.05 mm ($\bar{x}$ = 2.50, 0.97; n = 6).



Figures 57–63 *Didimioza* and *Tonnoira*. 57–58. *D. chachapoya:* 57. male genitalia, dorsal; 58. female genitalia. 59–63. *T. protuberata:* 59. male, head; 60. male genitalia, dorsal; 61. gonopods, ventral; 62. epandrium, surstylus, tergite 10; 63. *T. psacadoptera,* base of radial sector and R_4. All scale lines = 0.1 mm

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 12 km NW El Limon, 19.ix.1993, L. Quate, light trap, 1020 m (IZAV).

PARATYPES. 5♂, same data as holotype (BMNH, LACM), Henri Pittier National Park, Rancho Grande, 10°20′N, 67°41′W, 7♂, 13–18.vi.2001, Malaise trap, 9♂, 16–18.vi.2001, L. Quate, H. Bhat, CDC trap, 1100 m (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *protubero,* meaning to swell out; referring to the apex of the vertex.

Tonnoira psacadoptera new species

Figs. 63–64

DESCRIPTION. Male. Vertex height on midline nearly 2 times width of eye bridge; apex of vertex protuberant; eyes separated by less than 1 facet diameter; interocular suture a single suture without stem; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum with band of hairs in center, well separated from anterior margin. Wing without second costal node; membrane clear, uncolored; base of R_3 with cluster of black granules; medial fork distad of radial by more than 3 cell widths.

Hypandrium a band connecting gonocoxites; pair of lobes, possibly the posterior gonocoxal apodemes, extend posteriorly from bases of gonocoxite, left lobe with additional slender protrusions near apex, right lobe with additional mesal lobe bearing cluster of spines on apex and acute projection laterad of spinose lobe; gonostyli dimorphic, left with prominent protrusion at distal one-third, right without protrusion, more slender than left; surstylus with 1 tenaculum; tergite 10 somewhat cruciate with 2 lateral arms before apex.

Measurements. Antenna 2.60 mm. Wing length 2.25 mm, width 0.98 mm (n = 1).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, 10 km NE of Maracay, 19.ix.1993, L. Quate (IZAV).

ETYMOLOGY. From Greek *psac-* for grain and *pteron* wing, referring to granules on wing.

REMARKS. Unfortunately, the basiphallus and anterior gonocoxal apodemes of the holotype were distorted during slide preparation.

Tonnoira mirabilis Wagner

Figs. 65–66

Tonnoira mirabilis Wagner, 1981:217–218, figs. 1–4.

DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex protuberant; eyes separated by less than 1 facet diameter; interocular suture a single suture without stem; flagellomere 1 longer and thinner than following flagellomeres, length at least 5 times width.

Wing with distinct second costal node, wing membrane infuscate or brownish; medial fork distad of radial by more than 3 cell widths.

Hypandrium a distinct band connecting gonocoxites, rounded or archlike; gonocoxite with slender, attenuate base anterior to hypandrium, posterior of hypandrium nearly quadrate; gonostylus longer than gonocoxite, broad over most of length and narrowing at about distal one-quarter; distiphallus bipartite, apex of longest branch faint, curved at tip, shorter branch straight; paramere with perpendicular expansion at apex, shorter than distiphallus; surstylus with 3 tenacula, dorsal margin with 3 short projections and 3–4 bristles near base; tergite 10 triangular, about as wide as long, evenly tapering to apex.

Measurements. Wing length 2.25 mm, width 0.93 mm (n = 1).

Female. Unknown.

DISTRIBUTION. Surinam, Brazil.

HOLOTYPE. ♂, BRAZIL, Amazonas, Estirao do Equador, Rio do Equador, ix.1979, M. Alvarenga (ZSMC; not examined).

SPECIMEN STUDIED. SURINAM, Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 1♂, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (LACM).

REMARKS. Identification of the specimen was confirmed by Dr. Wagner.

Tonnoira castanea new species

Figs. 67a–b

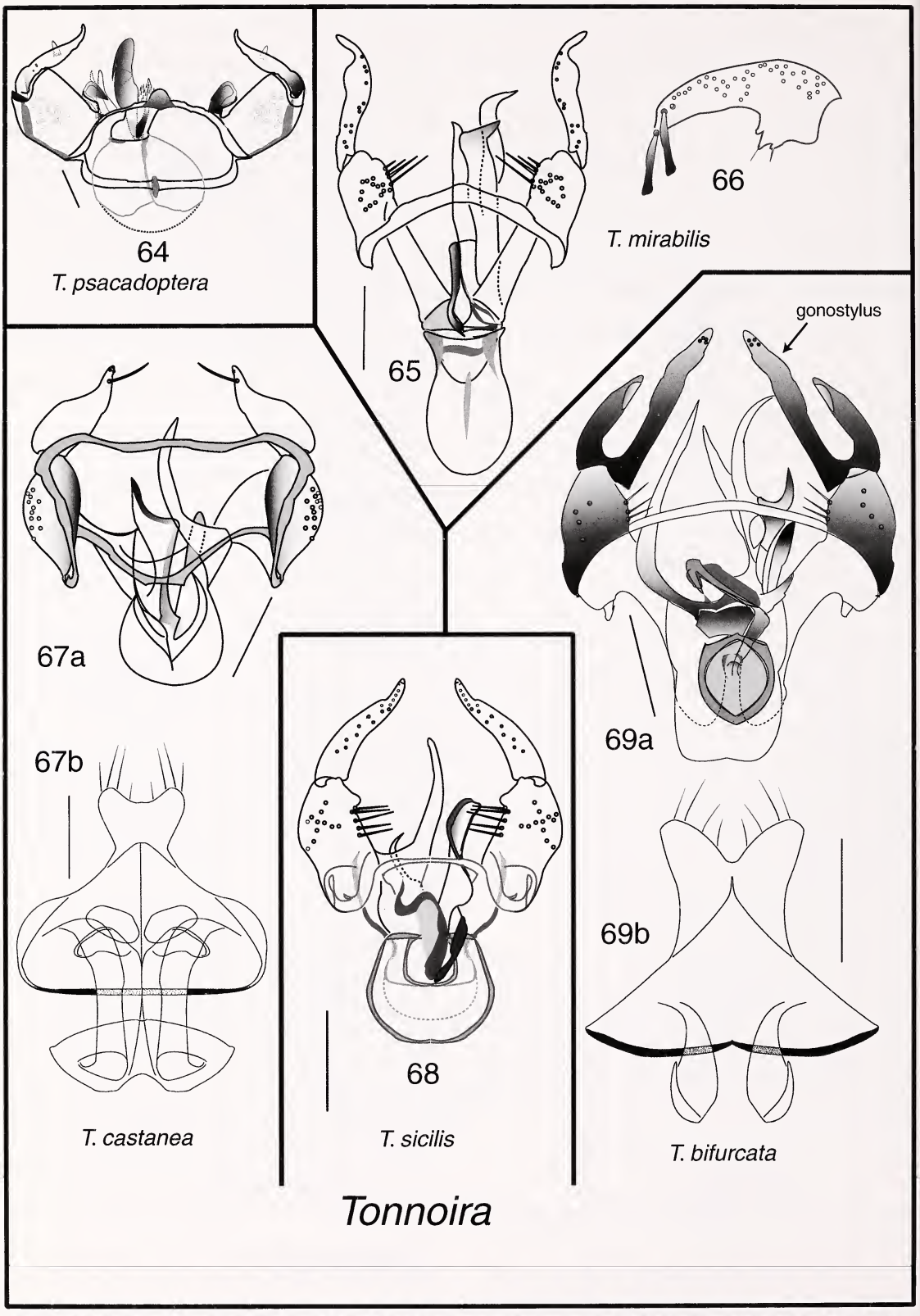
DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex protuberant; eyes separated by 1 facet diameter; interocular suture Y-shaped; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum without hairs in center, narrow band near posterior margin, and cluster on ventral part. Wing with distinct second costal node, membrane infuscate or brownish; medial fork distad of radial by more than 3 cell widths.

Hypandrium a distinct band connecting gonocoxites, of uniform width, rounded or archlike; gonostylus about as long as gonocoxite, broad over most of length, narrowing at about distal one-quarter; distiphallus bipartite, larger shaft with basal three-quarters broad, asymmetrically narrowing at distal one-quarter, smaller shaft small, blunt, about one-half as long as other shaft; paramere longer than distiphallus, sickle-shaped; surstylus with 1 tenaculum; tergite 10 triangular, elongate, longer than wide.

Measurements. Antenna 2.15–2.53 mm (n = 3). Wing length 1.85–2.30 mm, width 0.88–1.05 mm (n = 4).

Female. Anterior margin of tergite 8 with thin, sclerotized rim, alveoli on posterior border much denser than on other tergites; lateral margin of tergite 9 expanded or inflated; apical lobes somewhat



Figures 64–69 *Tonnoira* spp. **64.** *T. psacadoptera,* gonopods and aedeagus, ventral. **65–66.** *T. mirabilis:* **65.** male genitalia, dorsal; **66.** male surstylus. **67a–b.** *T. castanea:* **a.** male genitalia, dorsal; **b.** female genitalia. **68.** *T. sicilis,* male genitalia, dorsal. **69a–b.** *T. bifurcata:* **a.** male genitalia, dorsal; **b.** female genitalia. **All scale lines = 0.1 mm**

heart-shaped, chitinous arch shallow; genital ducts and associated sclerites lightly sclerotized.

Measurements. Antenna 2.53–2.98 mm. Wing length 2.03–2.40 mm, width 0.90–1.08 mm ($\bar{x}$ = 2.31, 1.02; n = 6).

DISTRIBUTION. Brazil, Surinam.

HOLOTYPE. ♂, BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, 100 m, primary forest (INPA).

PARATYPES. 4♂, 6♀, same data as holotype (BMNH, INPA, LACM, USNM).

OTHER SPECIMENS STUDIED. SURINAM, Raleighvallen, 170 km SW of Paramaribo, 4°43′N, 56°12′W, 2♂, 17–25.ix.1994, L. Quate, Malaise trap, 70 m, primary forest (LACM).

ETYMOLOGY. From Latin *castaneus* for brown, referring to the infuscation of the wing.

REMARKS. A distinctive feature of *T. castanea* is the distribution of the alveoli on the anepisternum in which the center is bare and the alveoli are confined to the posterior border and the ventral area. The closely related *T. sicilis* n. sp. has a similar alveolar pattern, but in the male the shape of the distiphallus differs, particularly in the shape of the smaller shaft; in *T. castanea* the smaller shaft is dark and blunt, whereas in *T. sicilis* that shaft is curved and acutely pointed.

Tonnoira sicilis new species

Fig. 68

DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex protuberant; eyes separated by less than 1 facet diameter; interocular suture Y-shaped; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum lacking alveoli in center, narrow band along posterior margin and triangular cluster on ventral part. Wing with distinct second costal node; membrane infuscate or brownish; medial fork distad of radial by more than 3 cell widths.

Hypandrium a distinct band connecting gonocoxites, of uniform width; gonostylus about as long as gonocoxite, broad over basal half and tapering to apex over distal half; distiphallus tripartite, with short basal spur, a sickle-shaped lateral shaft, and broad, paddle-shaped central part twisted in center; paramere slender, tapering to acute apex, longer than longest shaft of distiphallus; surstylus with 1 tenaculum; tergite 10 triangular, elongate, longer than wide.

Measurements. Antenna 2.53 mm. Wing length 1.80 mm, width 0.75 mm (n = 1).

Female. Unknown.

DISTRIBUTION. French Guiana.

HOLOTYPE. ♂, FRENCH GUIANA, Maripasoula, 17–22.iii.1994, L. Quate, light trap, streamside (LACM).

ETYMOLOGY. From Latin *sicilis* for sickle, referring to the sickle-shaped shaft of the distiphallus.

Tonnoira bifurcata new species

Figs. 69a–b

DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex protuberant; eyes separated by less than 1 facet diameter; interocular suture Y-shaped; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum with band of hairs in center, well separated from anterior margin. Wing with distinct second costal node, membrane infuscate or brownish, medial fork distad of radial by about 10 cell widths.

Gonostylus bifurcate, shaped like fishhook, lateral bifurcation of gonostylus more than one-half length of median; distiphallus U-shaped with 1 branch little longer than other; paramere in shape of claw with short, sharp point at base; surstylus with 2 tenacula separated by distance equal to about one-half length of tenaculum or less; tergite 10 triangular, about as wide as long, evenly tapering to apex.

Measurements. Antenna 2.53–2.63 mm (n = 2). Wing length 2.13–2.45, width 0.88–1.03 mm ($\bar{x}$ = 2.24, 0.94; n = 8).

Female. Anterior margin of tergite 8 sclerotized and forming heavy rim, alveoli on posterior border no more dense than on other tergites; lateral margin of tergite 9 expanded or inflated; subgenital plate with straight, slightly divergent sides; chitinous arch prolonged posteriorly, does not reach apical border of plate.

Measurements. Wing length 1.80–1.95 mm, width 0.75–0.78 mm (n = 2).

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Rondônia, Cacaulândia, 200 km SSE Porto Velho, 10°18′S, 62°52.1′W, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (INPA).

PARATYPES. 7♂, 2♀, same data as holotype (BMNH, INPA, LACM, USNM).

ETYMOLOGY. From Latin *bi-* for two and *furca* for fork, referring to the bifurcate shape of the gonostylus.

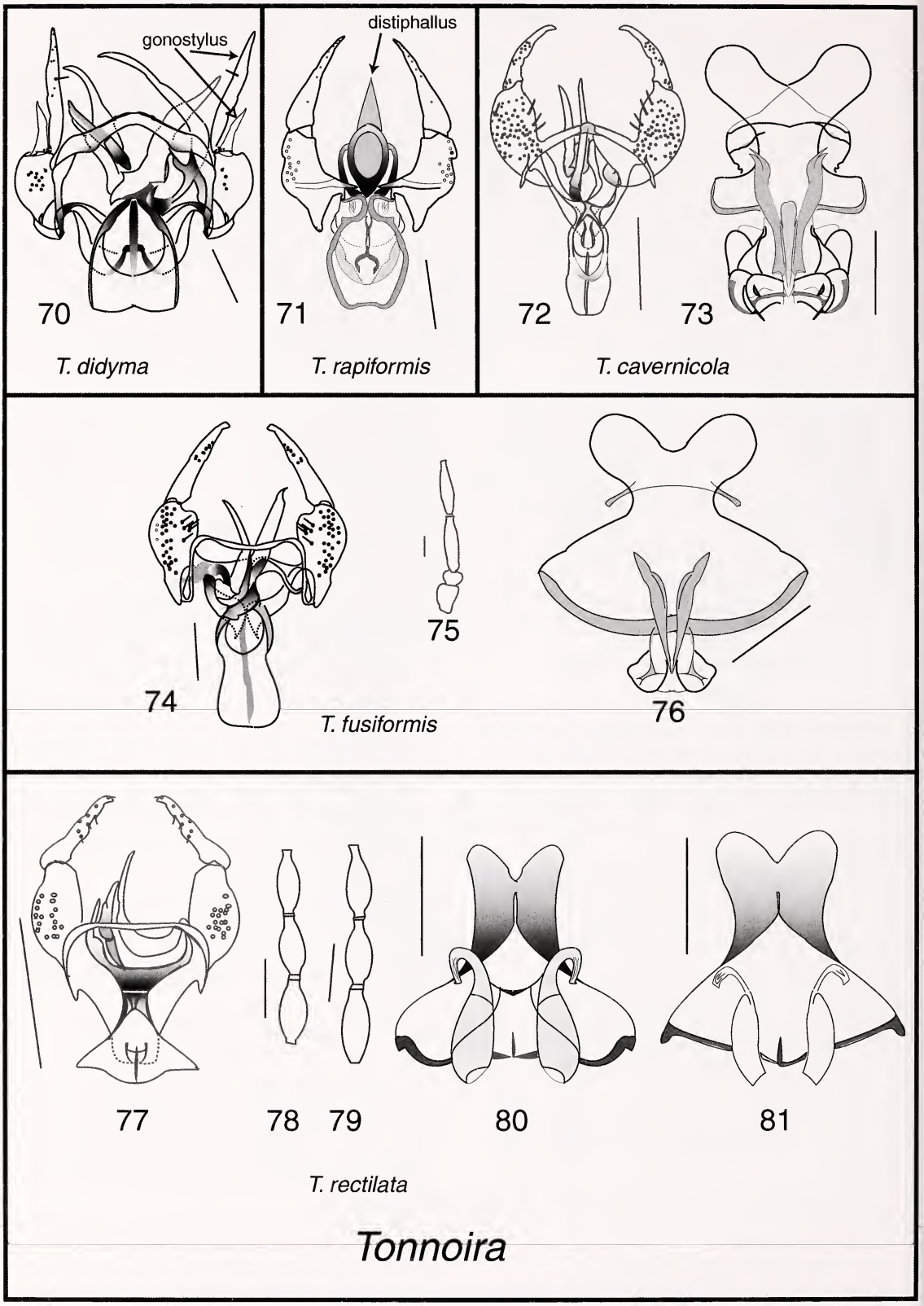
Tonnoira didyma new species

Fig. 70

DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex protuberant; eyes separated by less than 1 facet diameter; interocular suture Y-shaped; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum with band of hairs in center, well separated from anterior margin. Wing with distinct second costal node; membrane infuscate or brownish, base of R_3 normal; medial fork distad of radial by more than 3 cell widths.

Hypandrium little thinner in center; gonostylus bifurcate, lateral bifurcation of gonostylus less than one-half length of median; distiphallus bipartite,



Figures 70–81 *Tonnoira* spp. **70.** *T. didyma,* male genitalia, dorsal. **71.** *T. rapiformis,* male genitalia, dorsal. **72–73.** *T. cavernicola:* **72.** male genitalia, dorsal; **73.** female genitalia. **74–76.** *T. fusiformis:* **74.** male genitalia, dorsal; **75.** base of male antenna; **76.** female genitalia. **77–81.** *T. rectilata:* **77.** male genitalia, dorsal; **78.** flagellomeres 4–6, female; **79.** flagellomeres 4–6, male; **80.** female genitalia (Brazil); **81.** female genitalia (Panama). **All scale lines = 0.1 mm**

lateral branch curved medially, very long, extends beyond tip of gonostylus, median branch curved laterally so crosses other branch, shorter, does not extend beyond gonostylus; paramere bipartite, longer branch slightly sinuous, shorter branch darker, blunt; surstylus with 2 tenacula separated by distance equal to length of tenaculum; tergite 10 triangular, about as wide as long, evenly tapering to apex.

Measurements. Antenna 2.18–2.5 mm (n = 2). Wing length 1.95–2.25, width 0.90–1.00 mm (n = 3).

Female. Unknown.

DISTRIBUTION. French Guiana, Surinam.

HOLOTYPE. ♂, FRENCH GUIANA, Maripasoula, 17.23.iii.1994, L. Quate, Malaise trap, dry forest (LACM).

PARATYPES. 1♂, same data as holotype (LACM); SURINAM, Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 1♂, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (LACM).

ETYMOLOGY. From Greek *didymos* for double, referring to the bipartite structures of the male genitalia.

Tonnoira rapiformis new species

Fig. 71

DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex protuberant, with vertical suture from apex to center of vertex, eyes separated by less than 1 facet diameter; interocular suture Y-shaped; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum with band of hairs in center, well separated from anterior margin. Wing with distinct second costal node; wing membrane infuscate or brownish; medial fork on same level as radial.

Hypandrium vestigial, small band only from gonocoxite to distiphallus and lacking in center; gonostylus elongate, about as long as gonocoxite, tapering from base to single apex without abrupt change; distiphallus turnip-shaped, bulbous at base and tapering to small apex; paramere absent; surstylus with 2 tenacula, separated by distance equal to about one-half length of tenaculum or less; tergite 10 triangular, about as wide as long, evenly tapering to apex.

Measurements. Wing length 2.05–2.18 mm, width 0.85–0.90 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Brazil, Surinam.

HOLOTYPE. ♂, BRAZIL, Estrada do Caripi, km 4, 15 km SW Belém, 22.x.1997, CDC light trap (INPA).

PARATYPE. SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 1♂, 28–30.ix.1996, L. Quate, Malaise trap, 300–450 m, primary forest (LACM).

ETYMOLOGY. From Latin *rapum* for turnip and *forma* for shape, referring to the turnip-shaped male aedeagus.

REMARKS. The distinctive, turnip-shaped distiphallus is unlike any other species of *Tonnoira*. Also, this is the only known species in the genus that has the radial and medial wing vein forks on the same level.

Tonnoira cavernicola new species

Figs. 72–73

DESCRIPTION. Male. Vertex height on midline nearly equal to width of eye bridge; apex of vertex smooth, not protuberant; eyes separated by less than 1 facet diameter; interocular suture Y-shaped; flagellomere 1 longer and thinner than following flagellomeres, length at least 5 times width.

Anepisternum with 2 patches of alveoli, 1 in dorsoposterior corner and smaller in ventral area. Wing with distinct second costal node, membrane lightly infuscated, medial fork distad of radial by more than 3 cell widths.

Hypandrium enlarged in center with knoblike protrusion; rounded or archlike; gonostylus about as long as gonocoxite, tapering from base to apex without abrupt change; distiphallus with 1 straight shaft extending little beyond tip of gonocoxite; paramere also a straight shaft, about as long as distiphallus; surstylus with 2 tenacula separated by distance equal to length of tenaculum; tergite 10 triangular, about as wide as long, evenly tapering to apex.

Measurements. Wing length 2.38–2.68 mm, width 1.00–1.13 mm (n = 4).

Female. Anterior margin of tergite 8 sclerotized and forming thin rim; alveoli on posterior border no denser than on other tergites; female with lateral margin of tergite 9 unmodified; subgenital plate largely composed of apical lobes, base membranous and margins not heavily sclerotized, chitinous arch absent; genital ducts with well-developed anterolateral margins.

Measurements. Wing length 2.60–3.00 mm, width 1.08–1.25 mm ($\bar{x}$ = 2.70, 1.13; n = 5).

DISTRIBUTION. Bolivia, French Guiana.

HOLOTYPE. ♂, BOLIVIA, Chapare, 15 km W Villa Tunari, 160 km E Cochabamba, 26.viii.1990, L. Quate, 400 m, cave (LACM).

PARATYPES. 4♂, 6♀, same data as holotype (BMNH, LACM, USNM).

OTHER SPECIMENS STUDIED. FRENCH GUIANA, 23 km S St. Laurent de Maroni, 2♂, 24–30.viii.1994, L. Quate, Malaise trap, sea level (LACM).

ETYMOLOGY. From Latin *caverna* for cave and *colus* for dwelling, referring to the habitat where most specimens were collected.

REMARKS. Specimens from French Guiana are indistinguishable from those from Bolivia, but not included in the type series because of their geographical separation.

Type specimens were collected in a cave inhab-

ited by a colony of oil birds, *Steatornis caripenis* (Steatornithidae). Adults were on a moist, rock wall within 10 cm of the ground and close to the cave entrance. A moist layer of decomposed manure covered the ground and a shallow, slow-moving stream flowed past the wall harboring the adults. Since other specimens were collected in a forested area, the presence in the cave was probably related to breeding in the moist, organic soil on the cave floor.

Tonnoira fusiformis new species
Figs. 74–76

DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex protuberant; eyes separated by less than 1 facet diameter; interocular suture Y-shaped; flagellomere 1 longer and thinner than following flagellomeres, length at least 5 times width.

Anepisternum with band of hairs in center, well separated from anterior margin. Wing with distinct second costal node; membrane infuscate or brownish; medial fork distad of radial by more than 3 cell widths.

Hypandrium a distinct band connecting gonocoxites, of uniform width, with quadrate or angulate lateral margins; posterior gonocoxal apodeme well developed; gonostylus elongate, about as long as gonocoxite, tapering from base to apex without abrupt change; distiphallus a straight, broad shaft extending beyond apex of gonocoxite with apex abruptly narrowing to acute apex; paramere curved away from distiphallus, shorter and thinner than distiphallus; surstylus with 2 tenacula separated by distance equal to about one-half length of tenaculum or less; tergite 10 triangular, elongate, longer than wide.

Measurements. Antenna 3.93–4.33 mm (n = 2). Wing length 2.50–2.98 mm, width 1.10–1.38 mm ($\bar{x}$ = 2.72, 1.24; n = 10).

Female. Anterior margin of tergite 8 unmodified, alveoli on posterior border no denser than on other tergites; lateral margin of tergite 9 expanded or inflated.

Measurements. Antenna 2.90 mm. Wing length 2.70 mm, width 1.05 mm (n = 1).

DISTRIBUTION. Costa Rica, Ecuador.

HOLOTYPE. ♂, ECUADOR, E Santo Domingo, 8–14.v.1988, Hanson and Bohart (LACM).

PARATYPES. 3♂, 2♀, same data as holotype (EMUS, LACM). COSTA RICA, Cartago, Turrialba, 1♂, 26–29.vi.1986, Bohart and Hanson (LACM); Guanacaste, 5 km SE Rio Naranjo, 1♂, 24–31.x.1992, F. D. Parker (LACM), 3♂, 4–8.viii.1993, F. D. Parker (EMUS, LACM); Heredia, Est. Biol. La Selva, 3♂, 11–17.vi.1986, Hanson and Bohart (EMUS, INBC).

ETYMOLOGY. From latin *fusus* for spindle and *formis* for shape, referring to the spindle shaped appearance of flagellomere one.

REMARKS. Most of the males from Ecuador and Costa Rica are indistinguishable, but some males from Costa Rica have larger posterior gonocoxal apodemes, and tergite 10 is slightly shorter. Although widely separated geographically, these slight differences in some specimens does not preclude their inclusion in the type series.

Tonnoira rectilata Quate
Figs. 77–81

Tonnoira rectilata Quate, 1999:429–430, figs. 10H–I.

DESCRIPTION. Male. Vertex height on midline at least 2 times width of eye bridge; apex of vertex smooth, not protuberant; eyes separated by less than 1 facet diameter; interocular suture Y-shaped; flagellomere 1 slightly longer than following flagellomeres, length 2–4 times width.

Anepisternum with band of hairs in center, well separated from anterior margin. Wing with distinct second costal node, membrane clear, uncolored; medial fork distad of radial by more than 3 cell widths.

Hypandrium of uniform width, without setose lobe in center; gonostylus elongate, about as long as gonocoxite, ending in single apex, tapering from base to apex without abrupt change; distiphallus unipartite, nearly straight beyond rodlike thickening at base; paramere sickle-shaped, longer than distiphallus; surstylus with 2 tenacula, separated by distance equal to about one-half length of tenaculum or less; tergite 10 triangular, about as wide as long, evenly tapering to apex.

Measurements. Antenna 1.53–2.03 mm ($\bar{x}$ = 1.71; n = 10). Wing length 1.40–1.68 mm, width 0.58–0.65 mm ($\bar{x}$ = 1.49, 0.62; n = 10).

Female. Anterior margin of tergite 8 sclerotized and forming heavy rim; lateral margin of tergite 9 expanded or inflated.

Measurements. Antenna 1.50–1.88 mm ($\bar{x}$ = 1.71; n = 10). Wing length 1.65–1.95 mm, width 0.65–0.83 mm ($\bar{x}$ = 1.81, 0.75; n = 10).

DISTRIBUTION. Nicaragua, Panama, Surinam, Brazil.

HOLOTYPE. ♀, PANAMA, Nusagandi, i.1994, J. Pickering, Malaise trap (USNM; examined).

NEW SPECIMENS STUDIED. BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 10♂, 63♀, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, 100 m, primary forest (INPA, LACM), 1♂, same data as previous specimens except CDC light trap (LACM), Manacapura, 74 km WSW Manaus, 3°17.8′S, 60°37.63′W, 14♂, 18.iv.1998, CDC light trap, INPA lot 0107 (INPA, LACM), Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 1♂, 1♀, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise traps, 50 m, disturbed forest (LACM), 1♂, 1♀, same data as previous specimens except CDC light trap, T. Barrett (INPA), Pitinga, 258 km N Manaus, 0°45′S, 60°4′W, 1♂, 16.xii.1997, Bica, CDC light trap (LACM); Rondônia, Cacaulândia, 200 km SSE

Porto Velho, 10°18′S, 62°52.1′W, 2♂, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (LACM). NICARAGUA, Rio San Juan, Refugio Bartola, SE San Carlos, 10°58′N, 84°20′W, 3♂, 9♀, 6–10.ii.2000, L. Quate, Malaise trap, 30 m, lowland rain forest (LACM), 1♂, same data as previous specimens except light trap (LACM).

REMARKS. This is the first description of males, which were associated with females by the large numbers in sympatric distribution and by the unusually small size of the species. Both the male and female genitalia are distinctive and should not be confused with other species of *Tonnoira* presently known.

Females from Brazil show some differences from those in other areas in that the posterior extension of the genital ducts is larger and extends well beyond the apical margin of the subgenital plate (Fig. 80).

Tonnoira pelliticornis Enderlein

Tonnoira pelliticornis Enderlein, 1937:106; Quate, 1963:189, figs. 7a–d.

DESCRIPTION. Female. Vertex height on midline at least 2 times width of eye bridge; apex of vertex smooth, not protuberant; eyes separated by less than 1 facet diameter; interocular suture a single suture without stem; flagellomere 1 longer and thinner than following flagellomeres and length at least 5 times width.

Male. Unknown.

DISTRIBUTION. Peru.

HOLOTYPE. ♀, PERU, Callanga, Staudinger, [no other data] (ZMHB; examined).

REMARKS. As the type species of the genus, it is unfortunate that this species is known only from the female. At present, females do not offer distinguishing features and unless associated with males, are difficult to identify. While there are many specimens from Peru, none resemble the holotype of *T. pelliticornis*. However, the very distinct antenna of the genus *Tonnoira* is present in this female and clearly identifies the genus.

KEY TO MALES OF *TONNOIRA*

The male of *T. pelliticornis* is unknown.

1 Surstylus with 1 tenaculum (Fig. 62) 2
– Surstylus with 2 tenacula 5
– Surstylus with 3 tenacula (only 2 of which are visible in Fig. 66) ..... *T. mirabilis* Wagner
2 Gonostylus elongate, about as long as gonocoxite, ending in single apex; paramere present (e.g., Fig. 68) 3
– Gonostylus short, much shorter than gonocoxite, ending in 2–4 blunt projections, apex concave (Fig. 60); paramere absent ..... ***T. protuberata* n. sp.**
3 Tergite 10 triangular; wing with distinct second costal node; base of R_3 without black granules; hypandrium of uniform width (Figs. 67–68) 4
– Tergite 10 somewhat cruciate with 2 lateral arms before apex; wing without second costal node; base of R_3 with cluster of black granules (Fig. 63); hypandrium enlarged in center (Fig. 64) .. .. ***T. psacadoptera* n. sp.**
4 Gonostylus broad over most of length, narrowing at about distal one-quarter (Fig. 67); distiphallus unipartite; anepisternum with band of hairs in center, well separated from anterior margin ..... ***T. castanea* n. sp.**
– Gonostylus tapering from base to apex without abrupt change (Fig. 68); distiphallus bipartite; anepisternum lacking alveoli in center, narrow band along posterior margin .. ***T. sicilis* n. sp.**
5 Gonostylus bifurcate (Figs. 69–70) 6
– Gonostylus single (e.g., Fig. 71) 7
6 Lateral bifurcation of gonostylus more than one-half length of median (Fig. 69); distiphallus bipartite; paramere about as long as distiphallus; tenacula separated by distance equal to about one-half length of tenaculum or less .... ***T. bifurcata* n. sp.**
– Lateral bifurcation of gonostylus less than one-half length of median (Fig. 70); distiphallus tripartite; paramere longer than distiphallus; tenacula separated by distance equal to length of tenaculum ..... ***T. didyma* n. sp.**
7 Distiphallus various, but not turnip-shaped; paramere present; medial fork distad of radial by more than 3 cell widths; hypandrium a distinct band connecting gonocoxites 8
– Distiphallus turnip-shaped, bulbous at base and tapering to small apex (Fig. 71); paramere absent; medial fork on same level as radial; hypandrium vestigial, small band only from gonocoxite to distiphallus and lacking in center .... ***T. rapiformis* n. sp.**
8 Hypandrium of uniform width (Figs. 74, 77); distiphallus single; paramere shorter than distiphallus; tenacula separated by distance equal to about one-half length of tenaculum or less .. 9
– Hypandrium enlarged in center (Fig. 72); distiphallus bipartite; paramere about as long as distiphallus; tenacula separated by distance equal to length of tenaculum .... ***T. cavernicola* n. sp.**
9 Flagellomere 1 slightly longer than following flagellomeres and length 2–4 times width (Figs. 78–79); tergite 10 about as wide as long; wing membrane clear, uncolored ..... *T. rectilata* Quate
– Flagellomere 1 longer and thinner than following flagellomeres and length at least 5 times width (Fig. 75); tergite 10 elongate, longer than wide; wing membrane infuscate .... ***T. fusiformis* n. sp.**

Alepia Enderlein

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

TYPE SPECIES. *Alepia scripta* Enderlein, by original designation.

DESCRIPTION. Head without sensory organ;

eye bridge with 3 or 4 facet rows, well developed, median margin angulate or tapered to 1 facet; eyes separated; interocular suture present, often inverse Y-shaped, frons hair patch undivided; antenna longer than wing width, but shorter (rarely longer) than wing length, flagellomeres fusiform, lacking distinct ascoids, terminal flagellomeres not reduced; palpus about as long as head, palpomere 4 usually longer than 2 or 3.

Thorax without sensory organs; midcoxa with tuft of long hairs arising from elevated knob of anteroventral margin. Wing with or without infuscate patterns; base of R_{2+3} sometimes attached to R_4; radial and medial forks basad of wing center and usually both complete, radial fork basad of medial or on same level; R_5 ends in wing apex.

Abdomen with alveoli in single or double bands on tergite 2–7.

Male. Hypandrium a broad, lightly sclerotized, fan-shaped plate above distiphallus, rarely a band; gonocoxite with anterior apodeme expanded medially and joined on midline, with vertical keel connected to aedeagus, apodemes often divergent and widely separated; aedeagus asymmetrical; surstylus sometimes with 1 or 2 normal tenacula at or near apex, with many long, slender accessory tenacula on basal half with umbellate, capitate, or clavate tips, often confined to black pad; epandrium with single foramen.

Female. Subgenital plate bilobed; genital ducts with enlargement on lateral border bearing fringed ornamentation on outer surface.

REMARKS. In addition to the large, fusiform flagellomeres and distinctly patterned wings found in both sexes, males are easily distinguished by the multiple accessory tenacula bearing modified tips, which are often confined to a basal, black pad on the surstylus; a small, rodlike apical tenaculum may also be present. Females of *Alepia* are characterized by the expansion on the lateral margin of the genital ducts with a fringed or serrate margin. Only one anomalous species, *A. amputonis* n. sp., lacks this feature of the female, but the males of that species have the characteristic surstylus with accessory tenacula. The fringed genital ducts are not reported in other genera, except in two species of *Balbagathis*.

The genus appears to fall into two subgroups. The first is characterized by the male surstylus having a cluster of accessory tenacula confined to a dark area near the base and the inner margin of the eye bridge tapers to 1 facet on the median margin. The species of the second subgroup have the accessory tenacula dispersed and there is no dark pad; the inner margin of the eye bridge is blunt and the 3 rows of facets extend to the median margin. However, we do not recognize these subgroups as separate subgenera because other divergent characters indicate paraphyly. As with many other taxonomic decisions on Neotropical psychodines, delineations of subgenera are deferred pending further study.

Ascoids are difficult to differentiate from hairs in this genus, because they are about the same size and shape as the antennal hairs. Viewed with phase contrast, however, they appear slightly more translucent and to arise from a round, flat socket, whereas hairs arise from teardrop-shaped sockets. Because it is difficult to differentiate ascoids and hairs, and none seem characteristic, the ascoids have not been described except in a few instances where they are clearly evident.

The hypandrium of the male genitalia of *Alepia* is constructed differently than in other genera. It is usually a broad band between the gonocoxites that is membranous and so weakly sclerotized it is often invisible under ordinary light and is revealed only with phase contrast. A few species have a well-defined hypandrium, which appears as a fan-shaped plate above the distiphallus. In only one species, *A. amputonis*, is the hypandrium a small band as found in other genera.

This genus is a major component of the Neotropical psychodid fauna. It contains a bewildering array of species with the most complicated and diverse male genitalia in the entire family. In addition to the species described below, there are at least 30 more species too poorly represented by only one or two specimens to be named and described.

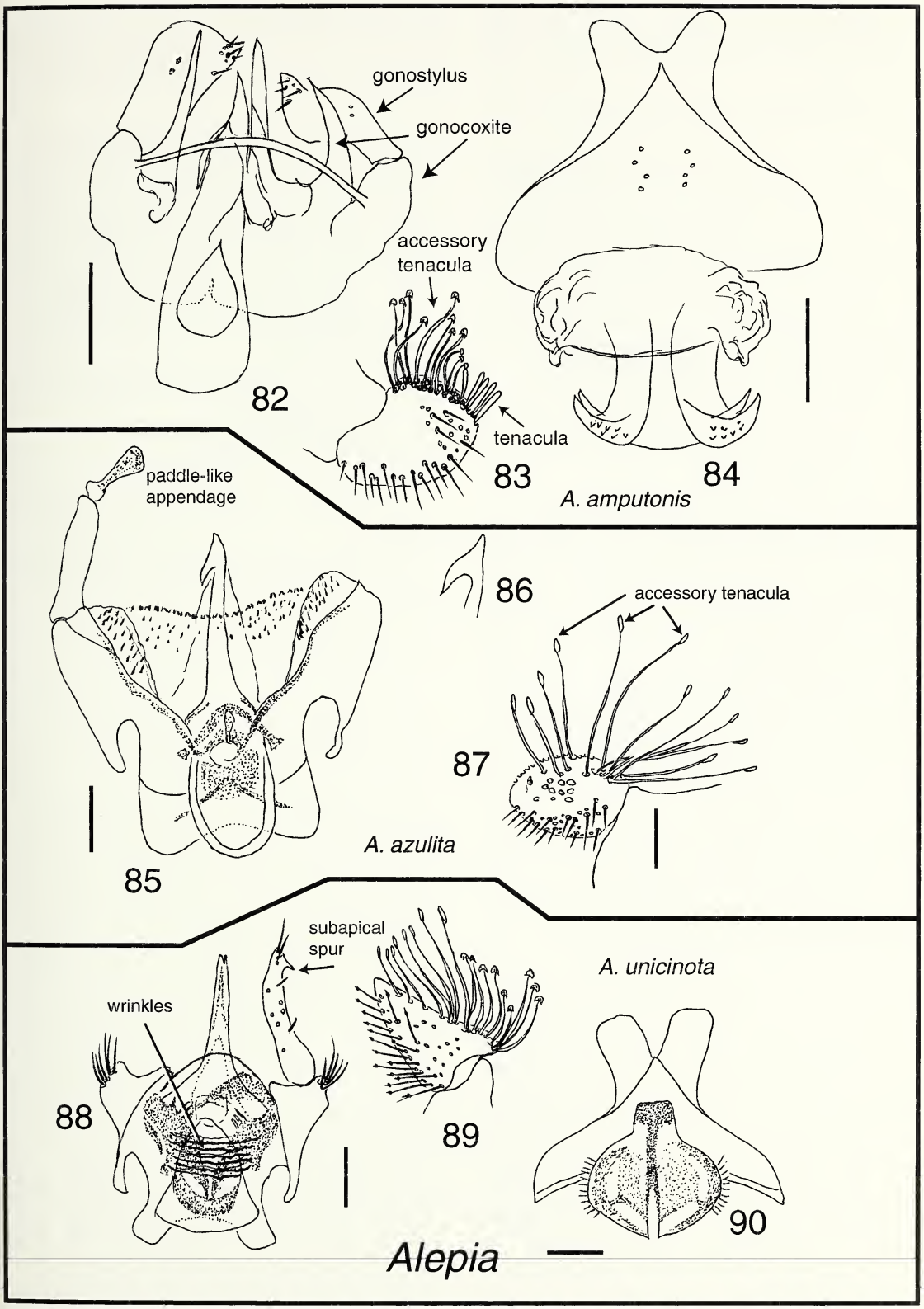
Alepia amputonis new species

Figs. 82–84

DESCRIPTION. Male. Vertex protuberant with median concavity on apex; eyes separated by 1 facet diameter, inner margin usually rounded with 3 facet rows on innermost row, interocular suture absent; frons hair patch quadrate, longer than wide, anterior margin with median concavity, posterior margin with few alveoli producing small posterior projection; antenna very long, longer than wing; flagellomere 1 as wide as pedicel, fusiform with small internode; following flagellomeres progressively more slender and developing short internodes; 14 with slender apiculis; flagellomeres with band of teardrop-shaped sockets, covering basal two-thirds, hairs largely deciduous, palpus extends to flagellomere 5, palpomere 4 shorter than 3, ratio of palpomeres 10:18:18:15.

Anepisternite with alveoli on posterior half and small band extending anteriorly below spiracle. Wing plain, without infuscations except in costal cell; second costal node absent; Sc short; radial fork usually on same level as medial, but in some specimens slightly distad, and distad of base of R_4 by several cell widths; base of R_{2+3} attached; medial fork complete.

Hypandrium a bar connecting gonocoxites; gonocoxites bifurcate, upper appendage slender, acute, with few setae at apex; lower broader, with bulbous apex ending in small projection; distiphallus consisting of single, acutely pointed shaft broadly attached to basiphallus; paramere blunt at apex, straight beyond basal curve, longer than distiphal-



Figures 82–90 *Alepia* spp. 82–84. *A. amputonis:* 82. male genitalia, dorsal; 83. male surstylus, lateral; 84. female genitalia. 85–87. *A. azulita:* 85. male genitalia, dorsal; 86. tip of distiphallus, variant; 87. male surstylus, lateral. 88–90. *A. unicinota:* 88. male genitalia, dorsal; 89. male surstylus, lateral; 90. female genitalia. All scale lines = 0.1 mm

lus; surstylus ovoid, with many umbellate accessory tenacula confined to dorsal margin and 6–8 subapical tenacula with fringed tips; tergite 10 small and pointed.

Measurements. Antenna 2.41–3.10 mm ($\bar{x}$ = 2.77; n = 7). Wing length 2.17–2.80 mm, width 0.80–1.04 mm ($\bar{x}$ = 2.51, 0.92; n = 10).

Female. Antenna shorter than wing, flagellomeres smaller than those of male. Genitalia with chitinous arch variable, may or may not extend to apical margin; setal sclerite with 4 setae on each side of midline; genital ducts without lateral fringe; scattered granules on basal margin.

Measurements. Antenna 1.72–1.89 mm ($\bar{x}$ = 1.84; n = 7). Wing length 2.1–2.82 mm, width 0.82–1.18 mm ($\bar{x}$ = 2.56, 0.97; n = 10).

DISTRIBUTION. Surinam, Brazil.

HOLOTYPE. ♂, SURINAM, Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (LACM).

PARATYPES. 10♂, 20♀, same data as holotype (BMNH, LACM, USNM). Brazil, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 2♂, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, 100 m, primary forest (INPA, LACM).

ETYMOLOGY. From Latin *amputo* for cut away, referring to the tip of the gonostylus, which appears to be cut off.

REMARKS. This species possesses characters of *Alepia* and *Arisemus*. The *Alepia* characters are the accessory tenacula of the male surstylus and large flagellomeres, while the *Arisemus* character is the female genital ducts without a lateral fringe. This is the only *Alepia* known without an interocular suture or markings on the wings, but many *Arisemus* lack wing patterns. Another character not shared by other *Alepia* is the multiple tenacula. The assignment of the species to *Alepia* is tentative, and later studies may show another placement is more appropriate.

Alepia azulita new species

Figs. 85–87

DESCRIPTION. Male. Large species. Vertex protuberant, with concavity and suture on midline; eyes narrowly separated by less than 1 facet diameter; inner margin blunt, interocular suture inverted Y-shaped, stem long, extends about halfway to vertex; frons hair patch divided in center; flagellomere 1 fusiform with small internode, narrower than pedicel, following flagellomeres progressively becoming smaller and thinner and internodes lengthening, flagellomere 14 with elongate apiculis; palpus extends to flagellomere 6, ratio of palpomeres 10:15:19:22.

Anepisternum with alveoli on posterior two-thirds, anterior margin of patch area concave and alveoli fewer posterior of concavity. Wing infuscate, with brown spots at vein tips, on forks and at base of R_5, quadrate spots at tips of R_1, R_2, CuA_1, and CuA_2; second costal node large, quadrate; Sc short, ends between bases of R_4 and R_5, radial fork on same level as medial, distad of base of R_4 by more than 2 cell widths.

Abdomen with small patch of scales on each side of midline between sternites 5 and 6 and 6 and 7. Hypandrium a wide, membranous plate covered with setae; gonocoxite with membranous, setose bar on median margin; gonostylus with articulated, paddle-shaped appendage at tip; distiphallus linear with straight sides, tip ending in hook; surstylus ovoid, accessory tenacula with umbellate tips, scattered and not confined to black spot, without apical tenaculum; tergite 10 triangular, short, basal width greater than length.

Measurements. Antenna 3.49 mm (n = 1). Wing length 5.54 mm, width 1.98 mm (n = 1).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Merida, La Azulita, 13–15.ix.1995, L. Quate (IZAV).

ETYMOLOGY. The name is based on the type locality.

REMARKS. This is the only psychodine known to have an articulated appendage attached to the gonostylus.

Alepia unicinota new species

Figs. 88–90

DESCRIPTION. Male. Vertex moderately protuberant, concavity and suture on midline; eyes separated by less than 3 facet diameters, inner margin of eye bridge rounded; interocular suture broadly inverted V-shaped with very short stem; frons hair patch undivided, anterior border concave; flagellomere 1 bulbous, following flagellomeres progressively smaller and developing short internodes, flagellomere 14 with slender apiculis; palpus large, extends to flagellomere 6, palpomeres 1–3 as wide as flagellomeres, ratio of palpomeres 10:19:17:21.

Anepisternum with kidney- or bean-shaped, brown spot on upper third of posterior margin, with evenly distributed alveoli on posterior two-thirds, anterior margin of alveolar area concave. Wing with infuscate patterns at tips of veins and on veins, spot at tip of CuA_2 large and quadrate; pale spots between vein tips; second costal node present; Sc short, does not extend to base of R_5; radial and medial forks on same level, radial distad of base of R_4 by more than 2 cell widths.

Abdominal tergites 5 and 6 with round lobes on apicolateral margin, lobes densely covered with alveoli. Hypandrium an asymmetrical plate with arched posterior border, center with transverse wrinkles; gonocoxite with cluster of hairs on apex of lateral margin; gonostylus with subapical spur; distiphallus tapering to bifid apex; surstylus elongate triangular, tapering to rounded point; dorsal surface of surstylus with capitate and umbellate accessory tenacula scattered and not confined to dark

plate, mesal surface with many shorter accessory tenacula, apex without tenaculum; tergite 10 small lobe fused to epandrium.

Measurements. Antenna 1.70 mm (n = 1). Wing length 2.12–2.41 mm, width 0.89–0.96 mm (n = 3).

Female. Flagellomeres smaller. Thorax also with spot on anepisternum. Abdominal tergites 5 and 6 without lateral lobes. Apical lobes of subgenital plate somewhat quadrate; chitinous arch reaches apical border between lobes; lateral fringe of genital ducts small and obscure, dorsal surface setose; median bar between genital ducts ending in broad band giving bar a T-shaped appearance.

Measurements. Antenna 1.37–1.48 mm (n = 2). Wing length 1.37–1.48 mm, width 2.46–2.63 mm (n = 2).

DISTRIBUTION. Surinam.

HOLOTYPE. ♂, SURINAM, Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (LACM).

PARATYPES. 2♂, 2♀, same data as holotype (LACM).

ETYMOLOGY. From Latin *unicus* for sole and *nota* for mark, referring to the spot on thorax.

REMARKS. *Alepia unicinota* is the only species of *Alepia* known with a brown spot on the posterior part of the anepisternite, except *Alepia condylaria* n. sp., which has a trifurcate gonostylus; the compact flagellomeres and harpoon-shaped gonostylus are also distinctive of *A. unicinota.*

Alepia lanceolata new species

Figs. 91–93

DESCRIPTION. Male. Vertex protuberant, with concavity and suture on midline; eyes separated by less than 1 facet diameter; eye bridge with 4 facet diameters; interocular suture inverted Y-shaped, stem very long, extends to apex of vertex; frons hair patch divided in center; flagellomere 1 large, as wide as pedicel, fusiform, following flagellomeres progressively becoming smaller and thinner and internodes lengthening, flagellomere 14 with elongate apiculis; palpus extends to flagellomere 5, ratio of palpomeres 10:25:25:25.

Anepisternum with evenly distributed alveoli on posterior two-thirds, anterior margin of alveolar area straight. Wing lightly infuscate with darker areas at vein tips and base of R_5, pale areas between vein tips, second costal node present; costa with tuft of long hair just beyond second costal node; Sc short, ends between bases of R_4 and R_5; radial fork basad of medial by 3 cell widths, distad of base of R_4 by more than 2 cell widths; R_{2+3} not attached; medial fork complete.

Hypandrium a broad, membranous, setose plate between gonocoxites; gonostylus subequal in length to gonocoxite, dark, long, curved, and bifurcate with sharp projection near center; distiphallus simple, long, and tapering; surstylus ovoid, accessory tenacula with clavate tips scattered and not confined to black spot, without apical tenaculum; tergite 10 elongate, triangular, length little longer than basal width.

Measurements. Antenna incomplete. Wing length 3.30–3.74 mm, width 1.13–1.40 mm ($\bar{x}$ = 3.50, 1.25; n = 7).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 10 km N Maracay, 19.ix.1993 (IZAV).

PARATYPES. VENEZUELA, 12 km NW El Limon, 6♂, 19.ix.1993, L. Quate, light trap, 1020 m (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *lancea* for spear, referring to the sharp projection from gonostylus.

REMARKS. The presence of 4 rows of eye facets in *A. lanceolata* is unusual, as other species of *Alepia* have only 3 rows.

Alepia condylaria new species

Figs. 94–96

DESCRIPTION. Male. Vertex not protuberant, with small median concavity and suture on midline; eyes separated by 1 facet diameter; inner margin of eye bridge blunt with 3 facet rows on median margin only; interocular suture inverted V-shaped; frons hair patch divided in center, trapezoidal with median concavity on anterior margin; flagellomere 1 fusiform without internode, nearly as wide as pedicel; following flagellomeres progressively becoming smaller and thinner and internodes lengthening, flagellomere 14 with elongate apiculis; palpus extends to flagellomere 6, ratio of palpomeres 10:15:18:24.

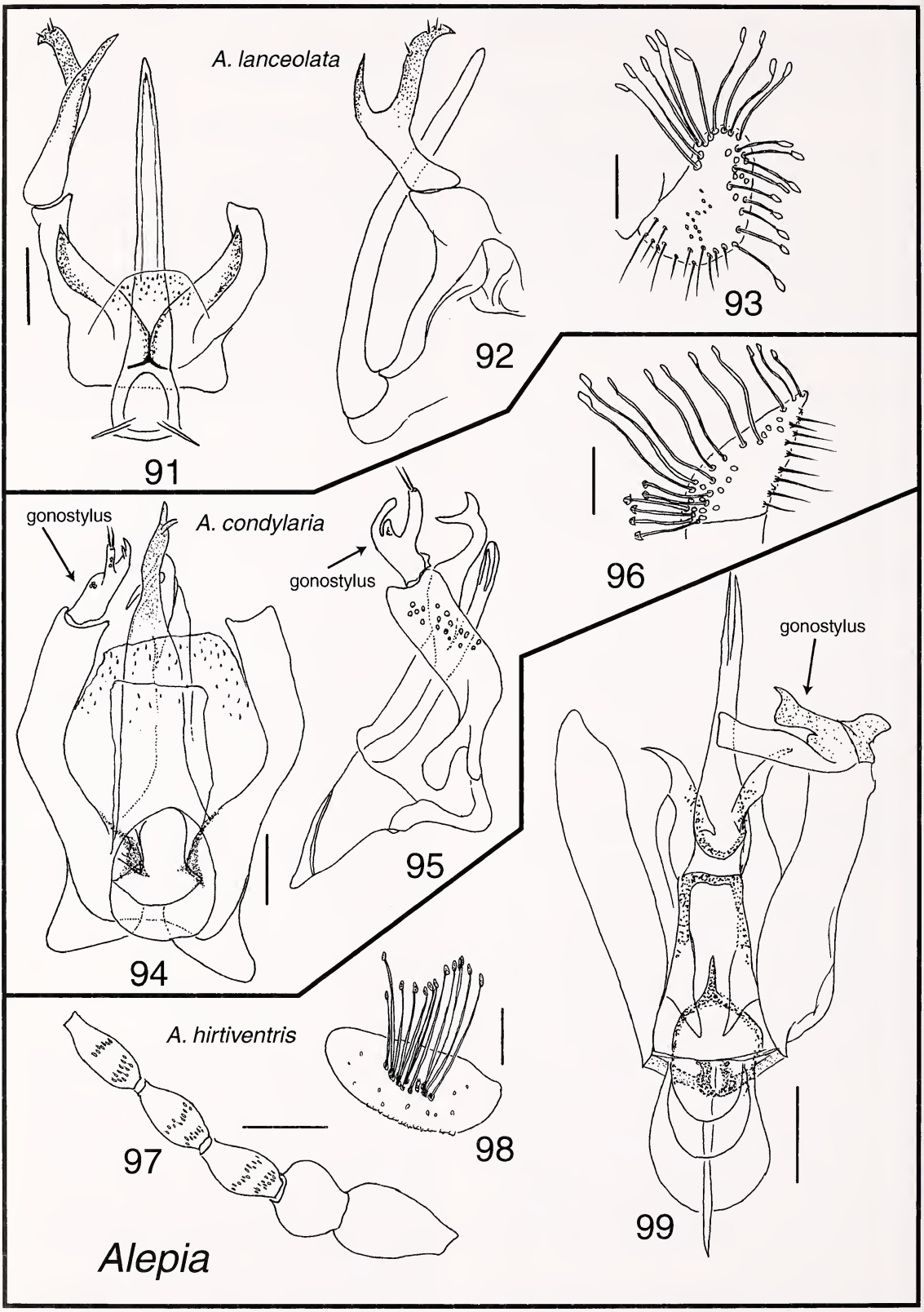
Anepisternum evenly covered with alveoli, except anterior one-quarter, with kidney- or bean-shaped, brown spot on upper third of posterior margin. Wing with infuscations, brown spots at vein tips, on forks and at base of R_5, rest of membrane lightly infuscate; second costal node present; Sc short, ends between bases of R_4 and R_5; radial and medial forks on same level, radial distad of base of R_4 by more than 2 cell widths.

Hypandrium a faint, membranous, setose plate between gonocoxites; gonocoxite linear, longer than wide; gonostylus trifurcate, longest branch with several setae at apex, shortest branch between 2 longer and much shorter than others; distiphallus in shape of shepherd's staff; paramere in form of fishtail in lateral view (Fig. 95); surstylus with numerous, scattered accessory tenacula not confined to black pad, basal ones umbellate and distal ones capitate, without apical tenaculum; tergite 10 slender, triangular, length 2 times basal width.

Measurements. Antenna 1.74–1.86 mm ($\bar{x}$ = 1.81; n = 5). Wing length 2.46–2.94 mm, width 1.01–1.18 mm ($\bar{x}$ = 2.66, 1.09; n = 7).

Female. Unknown.

HOLOTYPE. ♂, VENEZUELA, Aragua El Play-



Figures 91–99 *Alepia* spp. 91–93. *A. lanceolata:* 91. male genitalia, dorsal; 92. male gonopods and aedeagus, lateral; 93. male surstylus, lateral. 94–96. *A. condylaria:* 94. male genitalia, dorsal; 95. male gonopods and aedeagus, lateral; 96. male surstylus, lateral. 97–99. *A. hirtiventris:* 97. base of antenna; 98. male surstylus, lateral; 99. male genitalia, dorsal. All scale lines = 0.1 mm

on, near Ocumari, 11.ix.1993, L. Quate, light trap, sea level (IZAV).

PARATYPES. 6♂, same data as holotype (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *condylus* for knob or prominence, referring to the protuberances on the gonostylus.

Alepia martinicana Wagner

Alepia martinicana Wagner, 1993:114, figs. 17–23.

DESCRIPTION. Vertex with distinct suture on midline, apex with V-shaped notch; eyes separated by less than 3 facet diameters; inner margin of eye bridge rounded; eye bridge with 3 facet rows; interocular suture absent or very faint; frons hair patch divided in center; flagellomeres large, as wide as pedicel; palpomere 2 normal, no wider than other palpomeres.

Wing with irregular infuscate patterns; infuscation over most of wing but lighter in center, spots on forks darker, large rectangular spot between tip of CuA_1 and CuA_2, clear spots between vein tips; second costal node absent; Sc short, ends at or before base of R_4; radial fork on same level as medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork complete.

Gonocoxite without tubercle at base, vestiture normal, not unusually dense; gonostylus short, about one-fifth length of gonocoxite, without appendage at apex, bifurcate near center of segment, without protuberance at base, blunt or pointed at apex; surstylus elongate triangular, with accessory tenacula scattered and not confined to black subbasal area, without tenaculum.

DISTRIBUTION. Martinique.

HOLOTYPE. ♂, MARTINIQUE, Ravin, L'Abbé, Marne Vert, 3.iii.1989, L. Botosaneanu, light trap (RW; not examined).

Alepia hirtiventris (Tonnoir)
Figs. 97–99

Psychoda hirtiventris Tonnoir, 1920:151–154, fig. 3.
Alepia hirtiventris; Duckhouse, 1973:6.

DESCRIPTION. Male. Eye bridge with 3 facet rows; eyes separated by about 2 facet diameters; interocular suture with short spur; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3; palpus does not extend beyond flagellomere 5 or 6.

Wing marked only with spots at vein tips, base of R_5, and at forks; without second costal node; radial fork basad of medial by about 1.5 cell widths.

Gonocoxite without tubercle at base, vestiture normal, not unusually dense; gonostylus short, about one-half length of gonocoxite, without appendage at apex, bifurcate at base, without protuberance at base; distiphallus ending in pair of small, sharp, short points; surstylus globular or ovoid, without apical prolongation; surstylus with accessory tenacula scattered and not confined to black area; without tenaculum.

Measurements. Antenna length 0.68 mm. Wing length 2.63 mm, width 1.15 mm.

Female. Unknown.

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Amazonia, Garupa, 24.i.1896, E. Austen (BMNH; examined).

Alepia valentia Quate

Alepia valentia Quate, 1996:20–21, figs. 8a–d.
Alepia bulbula Quate, 1999:425, fig. 4H. **New synonymy.**
Alepia sectilis Quate, 1999:426, fig. 4I. **New synonymy.**

DESCRIPTION. Male. Vertex flattened, may have slight indentation, without suture on midline; eyes separated by 1 facet diameter, inner margin of eye bridge variable, usually angulate, but may be tapered to width of only 1 facet on inner margin, bridge with 3 facet rows; interocular suture with very short spur, spur shorter than width of 1 facet, angulate, forming acute angle in center; frons hair patch divided in center; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3; palpus does not extend beyond flagellomere 5 or 6.

Anepisternum with alveoli forming single cluster, unevenly distributed, sparser in center, cover most of sclerite. Wing with infuscate patterns, infuscation uniform over most of wing, spots on wing tips and forks may be darker; second costal node present; Sc short; radial and medial forks on same level; base of R_{2+3} attached; medial fork complete.

Hypandrium a faint, membranous, setose band; gonocoxite with elongate tubercle at apex of median margin, vestiture normal, not unusually dense; gonostylus as long as gonocoxite, bifurcate at base, outer bifurcation much smaller than inner, ending in straight, blunt tip; inner strongly curved to sharp point; distiphallus ending in pair of bladelike points; surstylus elongate triangular, with accessory tenacula scattered and not confined to black subbasal area, without tenaculum.

DISTRIBUTION. Costa Rica, Panama.

HOLOTYPE. ♂, COSTA RICA, Heredia, La Selva Biological Station, 15.iv.1993, ALAS project (INBC).

OTHER SPECIMENS STUDIED. COSTA RICA, Heredia, La Selva Biological Station, 1♂, 15.iv.1993, ALAS, Malaise trap (INBC; holotype of *A. valentia*). PANAMA, San Blas, Nusagandi, 2♂, i.1993, 3♂, i.1994, J. Pickering (LACM, USNM; holotypes and paratypes of *A. bulbula* and *A. sectilis*).

REMARKS. A restudy of *A. bulbula* and *A. sectilis* showed that they are not distinct species, but simply specimens of *A. valentia*. The drawing of *A. sectilis* (Quate, 1999: fig. 4I) does not show the tu-

bercle on the gonocoxite, but a reexamination of the types revealed its presence.

Alepia fissura Quate

Alepia fissura Quate, 1999:423, figs. 4E–G.

DESCRIPTION. Male. Vertex without suture on midline and flattened; eyes separated by 2+ facet diameters; eye bridge with 3 facet rows; inner margin of eye bridge angulate with anterior and posterior corner nearly a right angle; interocular suture present, angulate, forming acute angle in center, usually without stem on midline, but if stem present, shorter than width of 1 facet; frons hair patch divided in center; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3; palpus does not extend beyond flagellomere 5 or 6.

Anepisternum without spot, alveoli forming single cluster, unevenly distributed, denser in some areas than in others, cover most of sclerite. Wing with infuscate patterns, infuscation uniform over most of wing, spots on wing tips and forks may be darker; second costal node absent; Sc short, ends at or before base of R_4; radial fork on same level as medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork complete.

Hypandrium a membranous, setose plate; gonocoxite without tubercle at base; vestiture normal, not unusually dense; gonostylus long, as long as gonocoxite, bifurcate at base, outer bifurcation much smaller than inner, ending in straight, blunt tip, inner branch strongly curved to sharp point; distiphallus ending in pair of small, sharp, short points; surstylus with accessory tenacula scattered and not confined to black subbasal area, without tenaculum.

Female. Unknown.

DISTRIBUTION. Costa Rica, Panama.

HOLOTYPE. ♂, PANAMA, Barro Colorado I. (USNM) [holotype data were inadvertently omitted from the original description].

SPECIMENS STUDIED. Holotype and paratypes.

Alepia digitula new species

Figs. 100–101

DESCRIPTION. Male. Vertex with distinct suture on midline, may join suture from interocular suture, apex with V-shaped notch; eyes separated by 5 facet diameters; inner margin of eye bridge rounded; eye bridge with 3 facet rows; interocular suture present, without spur on midline, rounded at center; frons hair patch undivided; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3; palpus does not extend beyond flagellomere 5 or 6.

Anepisternum without spot, alveoli forming single cluster, unevenly distributed, denser in some areas than in others, cover most of sclerite. Wing with infuscate patterns, infuscation uniform over most of wing, spots on wing tips and forks darker; second costal node absent; Sc short, ends at or before base of R_4; radial fork on same level as medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork complete.

Hypandrium membranous, very lightly setose, angulate at apex; little wider than distiphallus; gonocoxite without tubercle at base, vestiture normal; gonostylus longer than gonocoxite, ending in digitate process, enlarged subapically before terminal process; surstylus elongate triangular, accessory tenacula scattered and not confined to black subbasal area, without tenaculum; tergite 10 triangular, clearly differentiated from epandrium, with quadrate setose patch in center.

Female. Unknown.

DISTRIBUTION. Surinam.

HOLOTYPE. ♂, SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 28–30.ix.1996, L. Quate, Malaise trap, primary forest (LACM).

ETYMOLOGY. From Latin *digitulus* meaning "of the finger," referring to the small projection from the tip of the male surstylus.

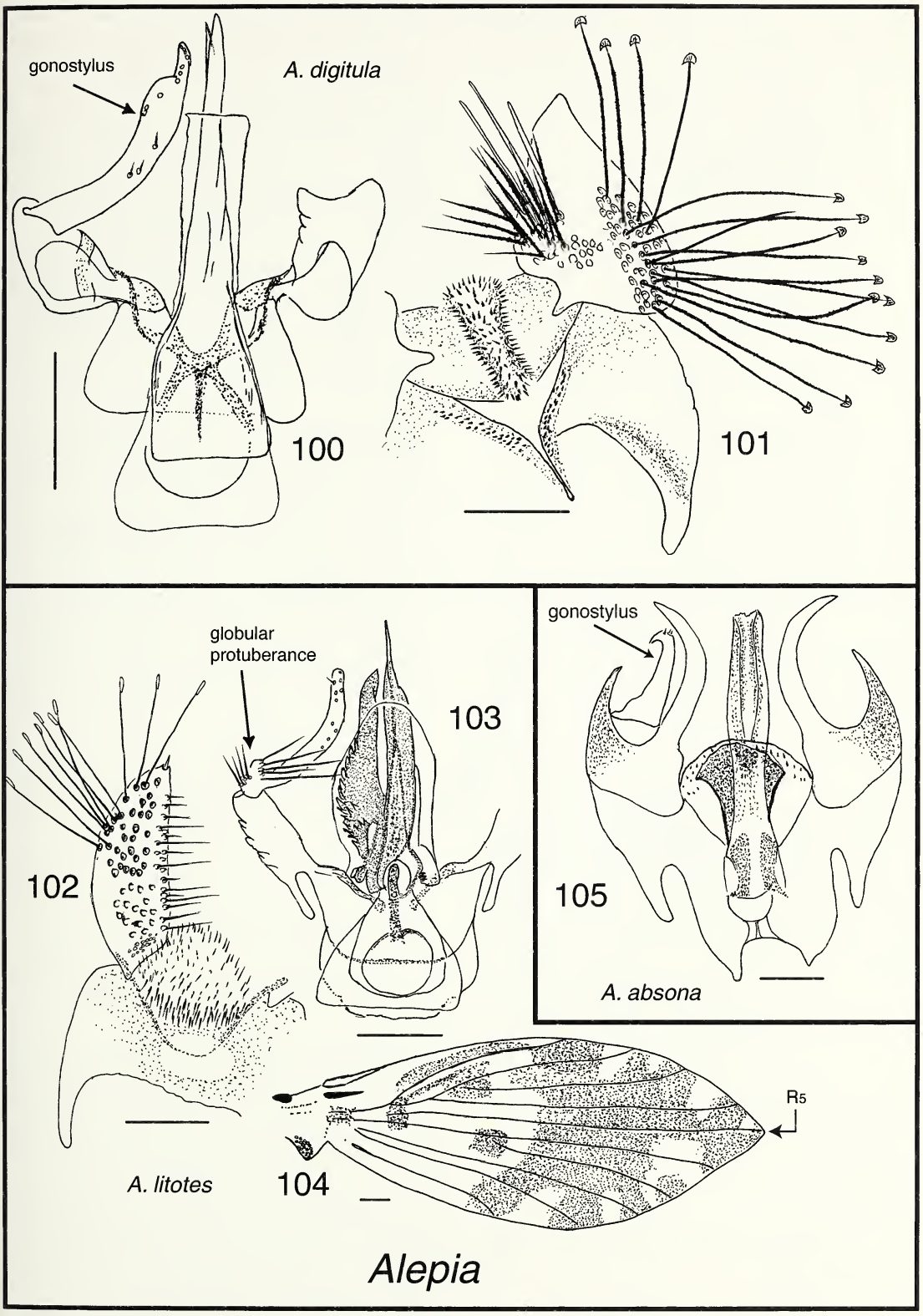
Alepia litotes new species

Figs. 102–104

DESCRIPTION. Male. Vertex slightly protuberant, without suture on midline; eyes separated by 1.5–2 facet diameters, inner margin of eye bridge rounded, not tapered; interocular suture a small arch with flattened apex; bridge with 3 facet rows; frons hair patch undivided, anterior border indented on midline; flagellomere 1 nodiform with short internode, following flagellomeres with progressively narrower nodes and longer internodes, flagellomere 14 broken and lacking; palpus extends to flagellomere 6, ratio of palpomeres 10:17:17:22.

Anepisternum without spot; alveoli form dorsal and ventral clusters with bare spot in center. Wing with infuscate patterns, infuscation largely on distal half, basal half clear except infuscate spots on forks and along R_1; second costal node absent; Sc short, ends at or before base of R_5; radial fork basad of medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork complete.

Abdominal tergites 2–7 with band of alveoli on apical margin. Hypandrium with rounded apex, little wider than distiphallus; gonocoxite cylindrical; gonostylus sickle-shaped with blunt apex, basal lobe of tubercle with 5–6 long spines distally and 2–3 shorter ones basally in addition to several small setae; paramere asymmetrical, right side darker and with several rows of short, dark spines on lateral border; distiphallus flattened laterally and broad dorsoventrally, with indentation before apex and giving appearance of bifid in lateral view; surstylus tapering to rounded point, ventral surface with cap-



Figures 100–105 *Alepia* spp. 100–101. *A. digitula:* 100. male genitalia, dorsal; 101. male epandrium and surstylus. 102–104. *A. litotes:* 102. male epandrium and surstylus; 103. male genitalia, dorsal; 104. wing. 105. *A. absona,* male genitalia, dorsal. All scale lines = 0.1 mm

itate, accessory tenacula; single, very small apical tenaculum; epandrium small, with single, faint foramen; tergite 10 setose dome-shaped lobe.

Measurements. Wing length 2.31–2.80 mm, width 0.87–1.06 mm ($\bar{x}$ = 2.49, 0.95; n = 5).

Female. Unknown.

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Rondônia, Cacaulándia, 200 km SSE Porto Velho, 10°18′S, 62°52.1′W, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (INPA).

PARATYPES. 4♂, same data as holotype (LACM).

ETYMOLOGY. From Greek *litotes* for plainness, referring to the simple male genitalia.

Alepia absona new species

Fig. 105

DESCRIPTION. Male. Vertex slightly protuberant, with suture on midline; eyes separated by 1 facet diameter; interocular suture inverted Y-shaped, stem about same length as arms; frons hair patch divided in center, rounded on anteromedian margin; flagellomere 1 fusiform with small internode, following flagellomeres progressively becoming smaller and thinner and internodes longer, flagellomere 14 with elongate apiculis; palpus extends to flagellomere 6, ratio of palpomeres 10:15:19:23.

Anepisternum with alveoli in center less dense than above and below. Wing with brown spots at vein tips, on forks, and at base of R_5; second costal node absent; Sc short, ends between bases of R_4 and R_5; radial and medial forks on same level, radial fork distad of base of R_4 by more than 2 cell widths.

Hypandrium a faint, membranous setose plate with rounded apical margin; gonocoxite with 2 projections, 1 long, curved projection from apicomedial margin extending beyond apex of gonostylus, and shorter, straight projection from apicolateral margin; gonostylus ending in small hook; distiphallus scoop-shaped on distal part; surstylus elongate triangular, accessory tenacula scattered and not confined to dark plate, apex bifid, ending in pair of small knobs, tenaculum absent; tergite 10 elongate triangular, length about 1.5 basal width.

Measurements. Antenna 2.16 mm. Wing length 3.13 mm, length 1.8 mm (n = 1).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 10 km N Maracay, 19.ix.1993, L. Quate, light trap (IZAV).

ETYMOLOGY. From Latin *absonus* for inharmonious, referring to the unusual structure of the male gonocoxite.

Alepia ferruginea new species

Figs. 106–108

DESCRIPTION. Male. Dark species with dark brown antenna and wing; vertex strongly protuberant, with median concavity, with distinct suture on midline; eyes separated 3.5–4 facet diameters, inner margin of eye bridge rounded; interocular suture inverted V-shaped; frons hair patch divided on midline, anterior margin curved; antenna dark brown, flagellomere 1 with short internode, larger than pedicel, following flagellomeres progressively smaller and internodes lengthening, flagellomere 14 with slender apiculis; palpus extends to flagellomere 7, ratio of palpomeres 10:18:15:18.

Anepisternum covered with evenly distributed alveoli except oval area in lower half of anterior part. Wing darkly infuscated with pale areas between vein tips; second costal node absent; Sc short, extends to base of R_5; radial and medial forks on same level or medial slightly distad of radial, radial fork distad of base of R_4 by more than 2 cell widths.

Hypandrium a membranous, setose plate between gonocoxites; gonocoxite with cluster of hairs in center of lateral margin; gonostylus constricted near apical one-quarter, ends in hook; distiphallus bipartite, 1 shaft sinuous, dark, nearly reaching level of apex of gonostylus, other shaft short, evenly tapered to sharp point, about one-half length of large shaft; surstylus evenly tapering to tip, accessory tenacula with capitate tips, scattered over dorsal and lateral surface, not confined to dark plate; tenaculum absent; tergite 10 elongate triangular.

Measurements. Antenna 2.30 mm (n = 1). Wing length 3.08–3.35 mm, width 1.08–1.33 mm (n = 3).

Female. Unknown.

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, 26 km W Pilcopata, 13;°3.3′S, 71°32.8′W, 24.vii–2.viii.1997, L. Quate, Malaise trap, 1500 m, cloud forest, riverside (MUSM).

PARATYPES. 2♂, same data as holotype (LACM).

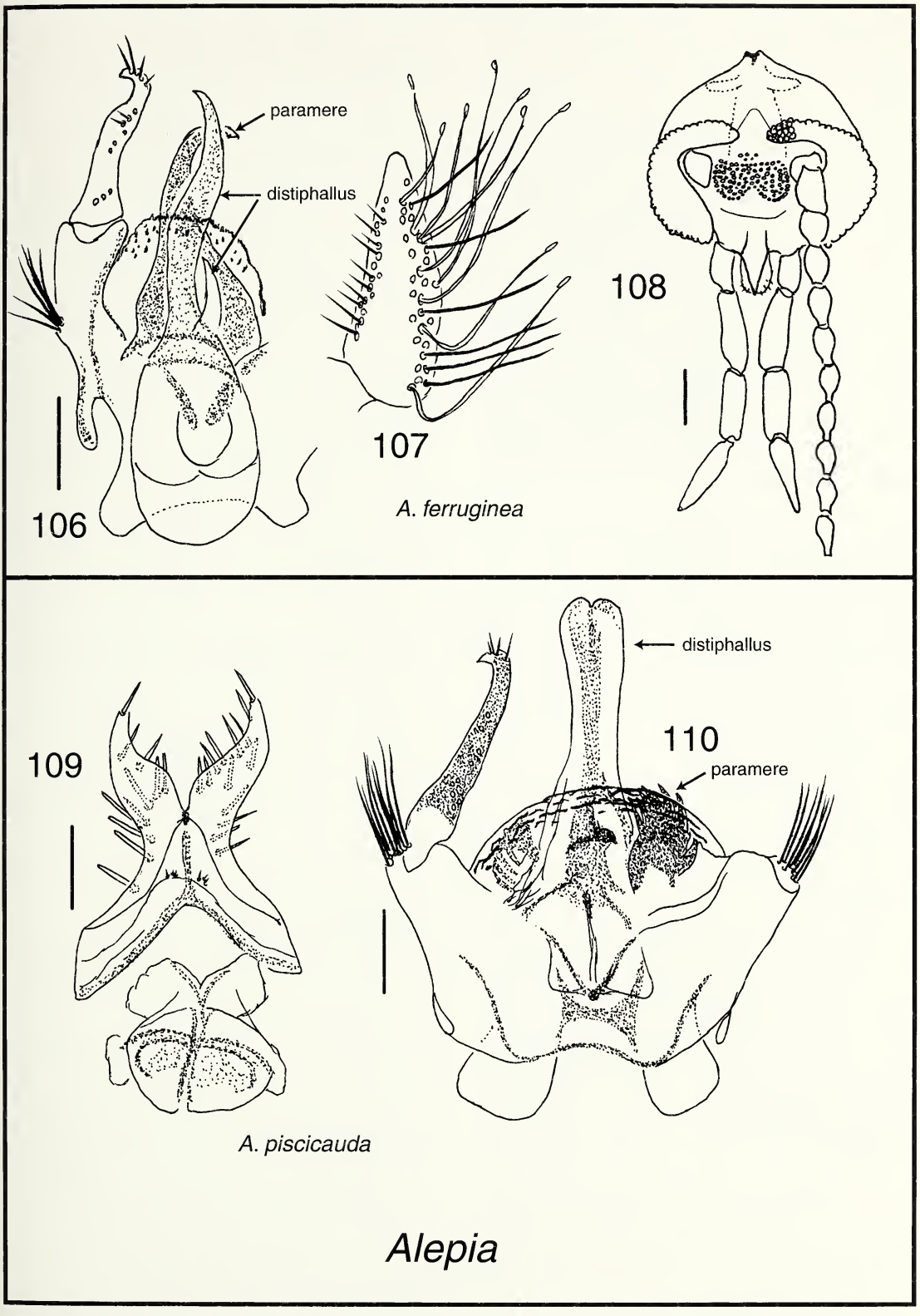
ETYMOLOGY. From Latin *ferruginos* for rust-colored, referring to the dark brown body color.

Alepia piscicauda new species

Figs. 109–110

DESCRIPTION. Male. Vertex protuberant, concave on midline, distinct suture on midline; eyes separated by 2.5–3 facet diameters, inner margin rounded, with single facet in inner row; interocular suture inverted Y-shaped, stem shorter than width of a facet, angulate; frons hair patch undivided, few alveoli extend posteriorly above posterior margin; broad, V-shaped concavity on anterior margin; flagellomere 1 globular, following flagellomeres progressively more slender and internodes lengthening, 14 small and with slender apiculis; palpus very large, palpomeres wider than flagellomeres, extends to flagellomere 8, ratio of palpomeres 10:22:20:24.

Anepisternum evenly covered with alveoli except on anterior border, anterior margin of alveolar patch concave. Wing infuscate with darker infus-



Figures 106–110 *Alepia* spp. 106–108. *A. ferruginea:* 106. male genitalia, dorsal; 107. male surstylus, lateral; 108. male head. 109–110. *A. piscicauda:* 109. female genitalia; 110. male genitalia, dorsal. **All scale lines = 0.1 mm**

cations on vein tips and forks, clear areas between vein tips; second costal node present; Sc short, nearly extends to base of R_1; medial and radial forks on same level, radial fork distad of base of R_4 by more than 2 cell widths.

Abdominal tergites with rounded lobes on lateroposterior margins, lobes darkened by dense alveoli. Hypandrium dome-shaped, with wrinkles along posterior border; gonocoxite with dense cluster of about 15 hairs on apicolateral margin; gonostylus nearly straight, dark, ending in beaklike hook, about 12 spines scattered along dorsal margin and 5 more on apical margin, about two-thirds length of gonocoxite; distiphallus straight, slightly enlarged apically, ending in pair of blunt apices divided by small concavity; right paramere heavily sclerotized, in form of cock's comb, left rounded with riblike structure; surstylus elongate, accessory tenacula scattered along dorsal margin, ending in clavate and umbellate tips, not confined to dark plate, tenaculum absent; tergite 10 rounded, longer than wide.

Measurements. Antenna 1.58–1.72 mm ($\bar{x}$ = 1.64; n = 5). Wing length 2.22–2.89 mm, width 0.94–1.23 mm ($\bar{x}$ = 2.44, 1.05; n = 10).

Female. Eyes separated by 2 facet diameters; flagellomeres and palpomeres smaller than those of male. Abdominal tergites without lateral lobes. Subgenital plate in form of fishtail, few large spines on ventral surface; chitinous arch usually reaches apical border; setal sclerite with 3 small setae on each side of midline on anterior margin; lateral fringe of genital ducts small.

Measurements. Antenna 1.32–1.56 mm ($\bar{x}$ = 1.47; n = 6). Wing length 2.29–2.51 mm width 0.77–0.92 mm ($\bar{x}$ = 2.38, 0.84; n = 10).

DISTRIBUTION. French Guiana, Surinam.

HOLOTYPE. ♂, FRENCH GUIANA, Maripasoula, 17–22.iii.1994, L. Quate, Malaise trap, dry forest (LACM).

PARATYPES. 3♂, 6♀, same data as holotype (BMNH, LACM, USNM). SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 3♂, 2♀, 28–30.ix.1996, L. Quate, Malaise trap, 300–450 m, primary forest (LACM), Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 5♂, 4♀, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *piscis* for fish and *cauda* for tail, referring to the shape of the female subgenital plate.

REMARKS. The cock's comb structure at the side of the distiphallus in males is interpreted as the paramere, but there is some uncertainty about this interpretation because parameres are rarely present in species of *Alepia*.

Alepia labyrinthica new species

Figs. 111–112

DESCRIPTION. Male. Eyes separated by about 2 facet diameters; inner margin of eye bridge angulate with anterior and posterior corner nearly a right angle, with 3 facet rows; interocular suture present, without spur on midline, forming acute angle in center; frons hair patch undivided; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3; palpus extends to flagellomere 5.

Anepisternum without spot; alveoli forming single cluster, evenly distributed over most of sclerite. Wing with infuscate patterns, infuscation uniform over most of wing, spots on wing tips and forks may be darker; second costal node absent; Sc short, ends at or before base of R_4; radial fork on same level as medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} unattached; medial fork complete.

Hypandrium a faint, membranous, setose plate between distal part of gonocoxites; gonocoxite without tubercle at base; gonostylus very short, less than one-third length of gonocoxite, without appendage at apex, unidigitate, triangular, blunt or pointed at apex; distiphallus complex, consists of 2 long shafts, 1 dark and 1 light; paramere similar to and as long as distiphallus, light in color and with hooked expansion at base; surstylus elongate triangular; surstylus with accessory tenacula scattered and not confined to black subbasal area; without tenaculum.

Measurements. Antenna 1.46–1.49 mm (n = 4). Wing length 1.83–2.03 mm, width 0.68–0.80 mm ($\bar{x}$ = 1.95, 0.73; n = 6).

Female. Apical lobes of subgenital plate quadrate; chitinous arch extends little beyond apical border between lobes; triangular setal sclerite bears 6–8 small setae; horizontal and lateral struts of genital ducts heavily sclerotized; serrated fringe well developed.

Measurements. Antenna 1.05–1.24 mm ($\bar{x}$ = 1.11; n = 11). Wing length 1.83–2.13 mm, width 0.65–0.83 mm ($\bar{x}$ = 1.90, 0.71; n = 11).

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, 100 m, primary forest (INPA).

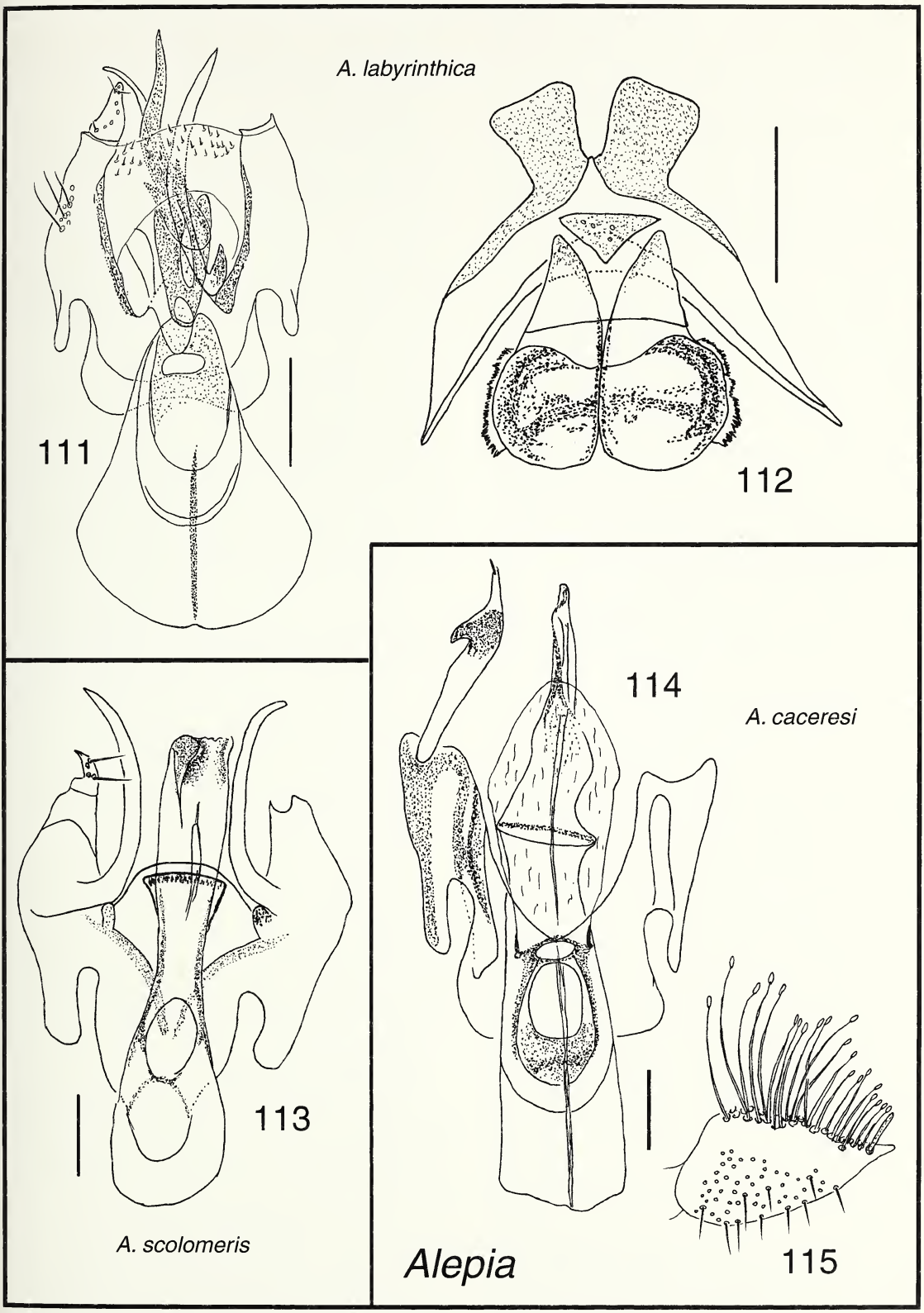
PARATYPES. 4♂, 15♀, same data as holotype (BMNH, INPA, LACM, USNM), Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 3♀, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, 50 m, disturbed forest (LACM), 1♀, same data as previous specimen except CDC light trap (LACM).

ETYMOLOGY. From Latin *labyrinthus* for "structure with many winding passages," referring to the complex spikes of the male genitalia.

Alepia tricolor (Knab)

Psychoda tricolor Knab, 1914:105.
Alepia tricolor; Duckhouse, 1974a:145, figs. 11–13.

DESCRIPTION. Male. (based on Duckhouse, 1974a). Eyes separated by less than 3 facet diam-



Figures 111–115 *Alepia* spp. 111–112. *A. labyrinthica*: 111. male genitalia, dorsal; 112. female genitalia. 113. *A. scolomeris*, male genitalia, dorsal. 114–115. *A. caceresi:* 114. male genitalia, dorsal; 115. male surstylus, lateral. All scale lines = 0.1 mm

eters; eye bridge with 3 facet rows; interocular suture present, without spur on midline, forming acute angle in center; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3, palpus does not extend beyond flagellomere 5 or 6.

Wing with infuscate patterns, infuscation uniform over most of wing, spots on wing tips and forks may be darker; second costal node present; Sc short, ends at or before base of R_4; radial fork basad of medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork complete.

Gonocoxite without tubercle at base, vestiture normal, not unusually dense; gonostylus bifurcate, inner branch sharply bent and much longer than outer branch, without protuberance at base; hypandrium a large projection above distiphallus and heavily setose; gonostylus bifurcate, lateral branch short, elongate triangular, with hook at base, lateral branch much longer, strongly bent at center and tapering to elongate, acute tip; surstylus globular or ovoid, without apical prolongation; accessory tenacula scattered and not confined to black area, with 1 apical tenaculum.

DISTRIBUTION. Panama.

LECTOTYPE. ♂, PANAMA, Coscajar River, ii.1909, reared from larvae in water at base of epiphytic bromeliad, A. H. Jennings (USNM; not examined).

Alepia caceresi new species

Figs. 114–115

DESCRIPTION. Male. Very large species. Vertex protuberant, small concavity on midline, without suture; eyes separated by 2 facet diameters, inner margin of bridge rounded; interocular suture arched with flattened apex; frons hair patch trapezoidal, scarcely divided in center, anterior margin concave; flagellomere fusiform and without internode, following flagellomeres more slender and with internodes well defined, flagellomere 14 with slender apiculis; palpus extends to flagellomere 6, ratio of palpomeres 10:20:20:24.

Anepisternum bare of alveoli in center, alveoli confined to upper margin and posterior half of posterior margin. Wing patterned, with brown spots at vein tips and on forks, uniform over most of wing, spots on wing tips and forks darker; second costal node large and somewhat quadrate; Sc short, extends little beyond second costal node; radial fork basad of medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} unattached; medial fork complete.

Hypandrium roughly diamond-shaped with blunt apex and many longitudinal wrinkles; gonostylus with subapical barb having appearance of harpoon point; distiphallus straight and tapering beyond median expansion with central yokelike structure; surstylus with attenuate apex and small, subapical tenaculum, accessory tenacula with capitate tips scattered over dorsal surface; tergite 10 indiscernible.

Measurements. Antenna 3.35 mm. Wing length 4.77 mm, width 1.98 mm (n = 1).

Female. Unknown.

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Amazonas, 20 km N Pedro Ruiz (MUSM).

ETYMOLOGY. Named in recognition of the generous assistance offered by Dr. Abraham Cáceres.

REMARKS. *Alepia caceresi* is the only species in this genus of such a large size, with a large, quadrate second costal node, and with harpoon-shaped gonostyli.

Alepia alcobregma Quate

Alepia alcobregma Quate, 1999:423, figs. 4E–G.

DESCRIPTION. Male. Vertex with distinct suture on midline; eyes separated by about 1 facet diameter, inner margin of eye bridge angulate with anterior and posterior corner nearly a right angle; eye bridge with 3 facet rows; interocular suture inverted Y-shaped, stem long, joins suture on vertex; frons hair patch undivided; flagellomeres narrower than pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3; palpus does not extend beyond flagellomere 5 or 6.

Anepisternum with alveoli forming single cluster, evenly distributed over most of surface, covering most of sclerite. Wing with infuscate patterns, infuscation uniform over most of wing, spots on wing tips and forks darker; second costal node absent; Sc short, ends at or before base of R_4; radial fork basad of medial, very close to base of R_4, separated by about 1 cell width; medial fork complete.

Hypandrium small, dome-shaped, does not extend beyond tip of gonocoxite; gonocoxite without tubercle at base, vestiture normal, not unusually dense; gonostylus as long as gonocoxite, without appendage at apex, apex a small, curved point; distiphallus a straight shaft; surstylus ovoid, with accessory tenacula scattered and not confined to black subbasal area, with 2–4 subapical, clavate tenacula arising from large sockets.

Female. Unknown.

DISTRIBUTION. Panama.

HOLOTYPE. ♂, PANAMA, Barro Colorado I., viii.1993, J. Pickering, Malaise trap (USNM; examined).

REMARKS. This is one of the few species of *Alepia* with a small, distinct hypandrium.

Alepia relativa Quate

Alepia relativa Quate, 1996:21, figs. 8e–g.

DESCRIPTION. Male. Eyes separated by less than 3 facet diameters; inner margin of eye bridge angulate with anterior and posterior corner nearly perpendicular; eye bridge with 3 facet rows; interocular suture with short spur on midline, not ex-

tending to vertex, angulate, forming acute angle in center; frons hair patch divided in center; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3; palpus does not extend beyond flagellomere 5 or 6.

Anepisternum without spot, alveoli forming single cluster, denser in some areas than in others, cover most of sclerite. Wing with infuscate patterns; infuscation uniform over most of wing, spots on wing tips and forks may be darker; second costal node absent; Sc short, ends at or before base of R_4; radial fork on same level as medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork complete.

Hypandrium a faint, membranous plate without setae and difficult to discern; gonocoxite without tubercle at base; vestiture normal, not unusually dense; gonostylus little longer than gonocoxite, ending in S-shaped curve; distiphallus bifurcate with 2 short, dark shafts, 1 with angulate subapical projection; paramere longer than distiphallus and gonostylus, pale, gently curved at apex, apex blunt; surstylus elongate triangular; surstylus with accessory tenacula scattered, not confined to dark plate, with 1 subapical tenaculum.

Female. Unknown.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Heredia, La Selva Biological Station, 23.i.1993, ALAS project (INBC; examined).

Alepia scolomeris new species

Fig. 113

DESCRIPTION. Male. Vertex slightly protuberant at apex, with distinct suture on midline; eyes separated by less than 1 facet diameter; inner margin of bridge blunt; interocular suture inverted Y-shape, with short stem; frons hair patch trapezoidal with large median concavity on anterior margin, undivided; flagellomere 1 not as wide as pedicel, fusiform without internode, following flagellomeres becoming progressively smaller and thinner and internodes lengthening, flagellomere 14 with elongate apiculis; palpus extends to flagellomere 5, ratio of palpomeres 10:19:23:25.

Anepisternum evenly covered with alveoli, except anterior one-third, anterior border of alveolar pattern concave on anterior border. Wing with infuscate patterns, infuscation uniform over most of wing, with brown spots at vein tips, on forks, and at base of R_5; second costal node absent; Sc short, ends between bases of R_4 and R_5; radial and medial forks on same level, radial distad of base of R_4 by more than 2 cell widths; base of R_{2+3} unattached; medial fork complete.

Hypandrium a dome-shaped plate between gonocoxites without setae; gonocoxite with large, sickle-shaped projection extending beyond tip of distiphallus; gonostylus very small, ending in small, blunt tip; distiphallus terminating in form of scoop, setose arch near center; surstylus elongate oval, accessory tenacula scattered and not confined to black pad; 1 subapical tenaculum; tergite 10 small, triangular, length about equal to basal width.

Measurements. Antenna 2.23–2.60 mm. Wing length 3.01–3.42 mm, width 1.11–1.13 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 10 km N El Limon, 19.ix.1993, L. Quate, light trap (IZAV).

PARATYPE. ♂, same data as holotype (LACM).

ETYMOLOGY. From Greek *skolos* for anything pointed and *-mere* for part, referring to the small, pointed gonostylus.

Alepia diocula new species

Figs. 116–117

DESCRIPTION. Male. Vertex slightly protuberant with shallow concavity and suture on midline; eyes widely separated by 10 facet diameters, inner margin tapered and pointed so columns 1 and 2 with only 1 facet, 2 and 4 with 2 rows, others with 3 rows; interocular suture slightly arched, widened and lighter in center; frons hair patch trapezoidal, not divided; flagellomere 1 fusiform, not as wide as pedicel, flagellomeres progressively becoming longer, more slender and with internodes, so distal flagellomeres slender nodiform; terminal flagellomere with long, slender apiculis; ratio of palpomeres 10: 18:20:20.

Anepisternum with dorsal band of alveoli extending anteriorly to spiracle, patch of alveoli on lower half of posterior part and bare in center. Wing infuscate, with clear spots between most vein tips; second costal node present; Sc very short, ending before base of R_5; radial fork basad of medial by about 2 cell widths, distad of base of R_4 by more than 2 cell widths.

Abdominal tergites with thin band of alveoli on posterior margin. Hypandrium a dome-shaped plate above distal one-third of distiphallus; gonostylus slightly curved, ending in blunt hook; distiphallus broad, apparently scoop-shaped with membranous apex; surstylus with cluster of subbasal accessory tenacula arising from black base, apex attenuate, with subapical seta, but lacking tenaculum.

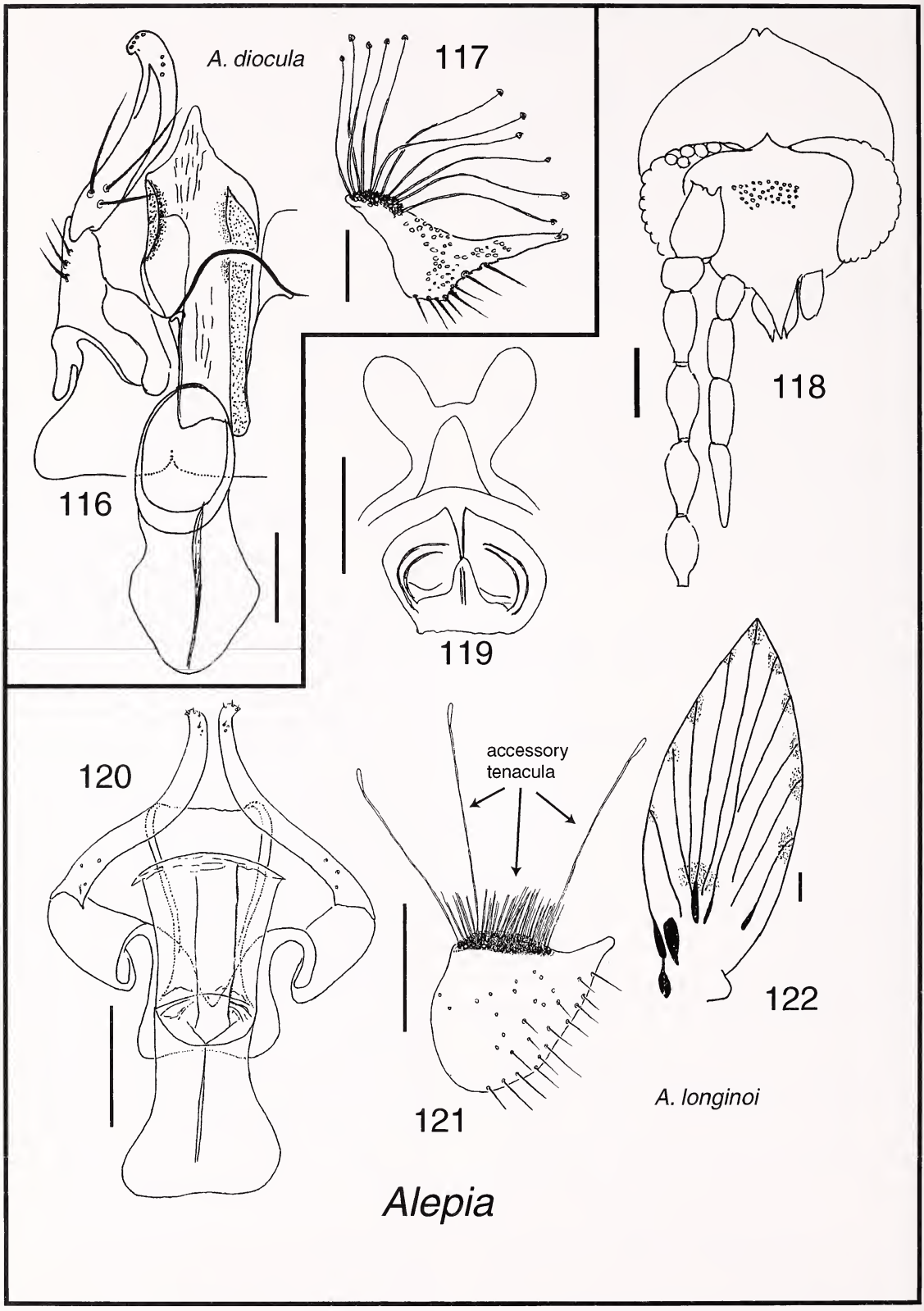
Measurements. Antenna 1.66 mm. Wing length 2.10 mm, width 0.84 mm (n = 1).

Female. Unknown.

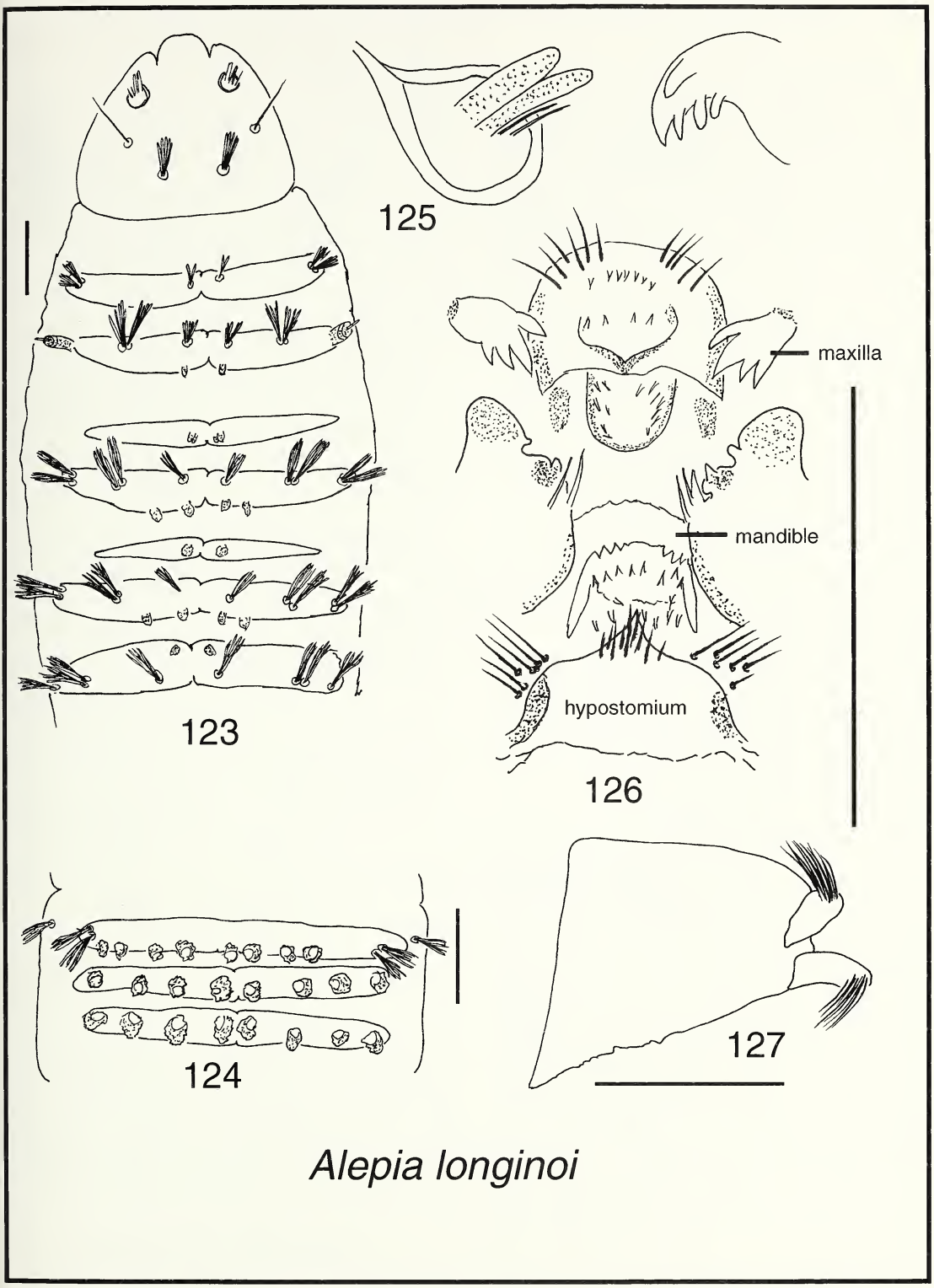
DISTRIBUTION. French Guiana.

HOLOTYPE. ♂, FRENCH GUIANA, Maripasoula, 17–22.iii.1994, L. Quate, Malaise trap, dry forest (LACM).

ETYMOLOGY. From Latin *di* for separate and *oculus* for eye, referring to the widely separated eyes.



Figures 116–122 *Alepia* spp. 116–117. *A. diocula:* 116. male genitalia, dorsal; 117. male surstylus, lateral. 118–122. *A. longinoi:* 118. head; 119. female genitalia; 120. male genitalia, dorsal; 121. male surstylus, lateral (only 3 accessory tenacula drawn to full length); 122. wing. All scale lines = 0.1 mm



Figures 123–127 *Alepia longinoi*, larva: 123. head and thorax; 124. abdominal tergite 3; 125. antenna; 126. oral opening; 127. siphon, lateral. All scale lines = 0.1 mm

Alepia longinoi new species

Figs. 118–127

DESCRIPTION. Male. Vertex flattened, without suture on midline; eyes separated by about 3 facet diameters; inner margin of eye bridge tapered to width of only 1 facet on inner margin; interocular suture present, without spur on midline, forming acute angle in center; frons hair patch undivided; flagellomeres large, as wide as pedicel; palpomere 2 normal, no wider than other 4 as long as or longer than 3; palpus short, only extends to flagellomere 4.

Anepisternum without spot; alveoli forming single cluster, evenly distributed over most of surface. Wing with brown spots on wing tips and forks only (specimens may be faded after having been stored in alcohol for several years); second costal node very large; Sc short, ends at or before base of R_4; radial fork basad of medial, very close to base of R_4; base of R_{2+3} attached; basal part of radial sector enlarged; medial fork incomplete.

Hypandrium a fan-shaped plate above distiphallus; gonocoxite without tubercle at base; vestiture normal; gonostylus longer than gonocoxite, slender, curved, ending in hook; distiphallus large, apically broadened; surstylus with black subbasal area bearing accessory tenacula, without tenaculum.

Measurements. Antenna 1.45–1.53 mm ($\bar{x}$ = 1.52; n = 5). Wing length 1.50 = 1.75 mm, wing width 0.50–0.63 mm ($\bar{x}$ = 1.63, 0.59; n = 7).

Female. Subgenital plate with V-shaped apical lobes arising from slender basal band; chitinous arch not reaching apical margin.

Measurements. 1.45–1.53 mm (n = 2). Wing length 1.65–1.75 mm, width 0.68–0.73 mm (n = 4).

Larva. Antenna consists of pair of rods and 2 setae; mandible with 3 sharp teeth and rounded lateral knob; maxilla with 4 teeth; hypostoma with 3 pairs of small teeth; each of anterior pair of plates of prothorax with single pinnate seta near center and pair near border, single dark lobe on posterior margin near center; each of posterior plates with 1 pinnate seta near midline, pair near center and 1 at margin of plate, 2 pairs of lobes on posterior border, 1 near center and 1 about one-third distance from center to margin; spiracle short, little longer than wide; other plates of thorax with similar adornments. Abdominal protergal and mesotergal plates with median and lateral pair of circular spots with sculptured margins; metatergal plates with pinnate setae, 1 near center, pair at lateral three-quarters and 1 near lateral margin. Siphon very short.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Heredia, Est. Biol. La Selva, 10°26′N, 84°0′W, 5.iii.1989, J. Longino, #2420 (INBC).

PARATYPES. 1♂, 1♀, same data as holotype (INBC, LACM); Puntarenas, Monteverde, 10°18′N, 84°49′W, 6♀, 16 larvae, 27.iv.1989, J. Longino, #2478, #2546, 1190 m, *Cecropia obtusifolia* with *Azteca* ants (LACM), 5♂, 5♀, same data as previous specimens but 25.v.1989, 1190 m (INBC, LACM).

ETYMOLOGY. Named to honor the collector, Dr. John T. Longino.

NATURAL HISTORY. This interesting species was collected by Dr. Longino in nests of *Azteca* ants in stems of *Cecropia* trees. His careful collecting identified not only a new habitat for the family but also yielded the material for the first larval description of *Alepia* and is an important contribution to our knowledge of this family. Details are from the following field notes provided by Longino.

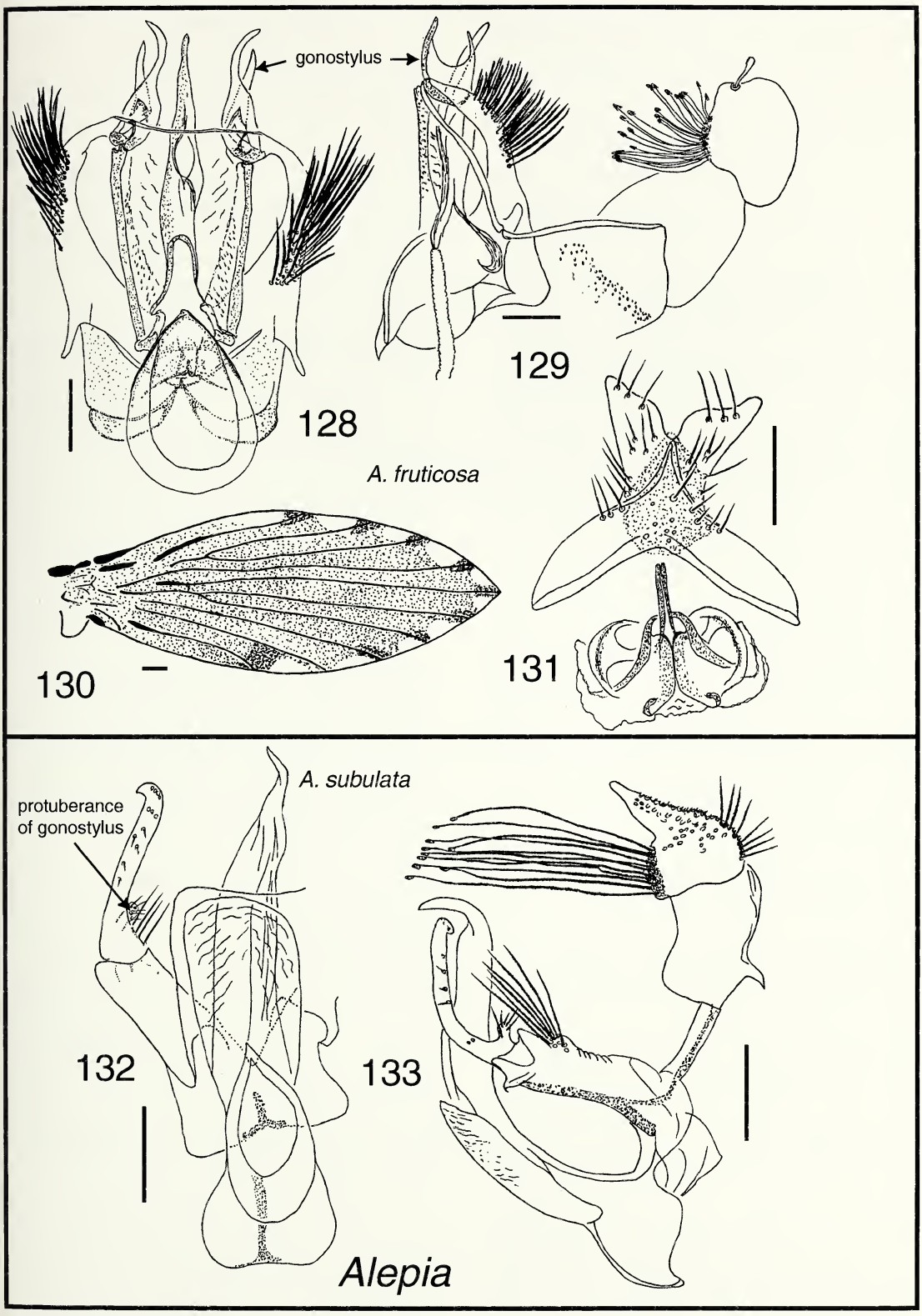
From collection #2420: "These specimens were in a branch sample from a *Cecropia obtusifolia* tree. The tree was inhabited by an active colony of *Azteca xanthochroa.* All the branch internodes were connected, with perforated septa. However, most of the branch interior appeared inactive, with smooth walls and scattered pastelike lumps of moist matter ('knollen' of Mueller). The interior walls were like wet-walled sewer pipes. I found adult dipterans inside the branch [collection contains two male Psychodidae, Psychodinae]. The only exit holes were the ant-maintained holes in the branch tree."

From collection #2478: "This collection is from a branch sample from a *Cecropia* tree: The tree was occupied by an active colony of *Azteca constructor.* I examined the 1–2 m of leafless branch proximal to leafy shoot tip. The septa dividing the internodes had been completely removed, and scattered workers occurred deep in the branch. There were regularly spaced knollen. The knollen were in a line on one side of the branch, 2–3 per internode. From the curvature of the branch (I do not remember its orientation on the tree, but it was probably curving upward) the knollen were probably suspended from the 'ceiling' of the internodes. The knollen were circular, 5–10 mm diameter. The knollen were sticky masses (similar to that found in colonies with queens) of brown particulate matter (like soggy bran cereal). The piles were crawling with mites and full of glistening, writhing nematodes. I also saw what were probably dipteran larvae. By the next morning the knollen were drying out in the split branch. Large number of fly(?) larvae had crawled from each one and were surrounding the pile on the internode wall. I collected a number of larvae in alcohol, and gathered some of the debris pile material in the bottom of a plastic vial, with larvae, in hopes of rearing them."

Alepia fruticosa new species

Figs. 128–131

DESCRIPTION. Male. Vertex protuberant, with suture on midline; eyes separated by 2–3 facet diameters, bridge with 3 facet rows, inner margin obtusely rounded, interocular suture inverted Y-shaped; frons hair patch undivided, hemispherical



Figures 128–133 *Alepia* spp. 128–131. *A. fruticosa:* 128. male genitalia, dorsal; 129. male genitalia, lateral; 130. wing; 131. female genitalia. 132–133. *A. bisubulata:* 132. male genitalia, dorsal; 133. male genitalia, lateral. All scale lines = 0.1 mm

with median concavity on anterior margin; flagellomere 1 nearly as wide as pedicel, ovoid without internode, following flagellomeres progressively becoming smaller and thinner and internodes lengthening, flagellomere 14 with elongate apiculis; palpomere 2 normal, 4 little longer than 3, ratio of palpomeres 10:16:18:20.

Anepisternum largely covered with alveoli except around spiracle and anterior oval area below spiracle. Wing lightly infuscated with darker areas at vein tips and on forks with pale areas between vein tips; second costal node absent; Sc short, ends between bases of R_4 and R_5; radial and medial forks on same level, radial fork distad of base of R_4 by more than 2 cell widths; medial fork complete.

Hypandrium a broad, membranous plate between gonocoxites, lightly setose, gonocoxites linear, longer than wide, completely clothed in dense vestiture giving genitalia shaggy appearance (only part of vestiture shown in Fig. 128); gonostylus trifurcate with 2 pointed projections and short blunt projection; distiphallus tapering to slender point, bifurcate in lateral view; surstylus ovoid, devoid of vestiture except patch of umbellate accessory tenacula arising from black pad near base and clavate tenaculum near center.

Measurements. Antenna 1.38–1.67 mm ($\bar{x}$ = 1.57; n = 6). Wing length 1.95–2.65 mm, width 0.72–0.94 mm ($\bar{x}$ = 2.31, 0.87; n = 9).

Female. Flagellomeres smaller and more slender than those of male. Genitalia with apical lobes in form of fishtail; chitinous arch extends to plate margin; setal sclerite with pair of rows of 3 setae each flanking midline near center; genital ducts with small serrated fringe on border, distinctive archlike sclerotized structure above genital ducts as figured.

Measurements. Antenna 1.28–1.41 mm ($\bar{x}$ = 1.35; n = 5). Wing length 1.95–2.53 mm, width 0.77–0.99 mm ($\bar{x}$ = 2.23, 0.87; n = 6).

DISTRIBUTION. Surinam, French Guiana, Brazil.

HOLOTYPE. ♂, SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 28–30.ix.1996, L. Quate, Malaise trap, 300–450 m, primary forest (LACM).

PARATYPES. BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 2♂, 2♀, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, 100 m, primary forest (INPA, LACM), Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 1♂, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, 50 m, disturbed forest (LACM). FRENCH GUIANA, Maripasoula, 1♂, 17–22.iii.1994, L. Quate, Malaise trap (LACM). SURINAM, 2♂, same data as holotype (LACM), Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 3♂, 3♀, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (BMNH, LACM, USNM).

ETYMOLOGY. From Latin *fruticosus* for bushy, referring to the appearance of the male gonocoxite.

Alepia busckana (Dyar)

Psychoda busckana Dyar, 1926:109.
Pericoma busckana; Rosario, 1936:145.
Alepia busckana; Duckhouse, 1974a:146–148, figs. 17–22.

DESCRIPTION. Male. Vertex flattened, without suture on midline; eyes separated by little more than 3 facet diameters; inner margin of eye bridge rounded; eye bridge with 3 facet rows; interocular suture present, without spur on midline, angulate; frons hair patch undivided; palpomere 2 enlarged, wider than other palpomeres, 4 as long as or longer than 3.

Wing with infuscate patterns; infuscation uniform over most of wing, spots on wing tips and forks darker; second costal node absent; Sc short, ends at or before base of R_4; radial fork distad of medial and distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork complete.

Hypandrium a band between gonocoxites with rounded apex; gonocoxite with setose tubercle at apex, vestiture not unusually dense; gonostylus as long as gonocoxite, slightly curved, apex blunt; distiphallus very dark, trifid at tip; surstylus with cluster of subbasal accessory tenacula arising from black base, apex rounded, apical tenacula lacking.

Female. Unknown.

DISTRIBUTION. Martinique, Trinidad.

HOLOTYPE. ♂, MARTINIQUE, vii.1905, A. Busck (USNM; not examined).

REMARKS. Duckhouse (1974a) states that the thorax has an "epitergal organ hairbrush-like, each with pile of long spines, as in *Paratelmatoscopus*." He also states that ascoids are fine, digitate, and in 2 whorls, but these are here interpreted as hairs.

Alepia apachis Quate

Alepia apachis Quate, 1999:420; figs. 3A–D.

DESCRIPTION. Male. Vertex slightly protuberant, with concavity and lacking median suture; eyes separated by about 1.5 facet diameters; eye bridge with 3 facet rows, inner margin of eye bridge rounded and tapered; interocular suture with spur on midline, forming acute angle in center; frons hair patch undivided; flagellomeres large, as wide as pedicel, each flagellomere with double row of alveoli around node; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3, palpus does not extend beyond flagellomere 5 or 6.

Anepisternite with alveoli forming dorsal and ventral clusters with bare spot in center. Wing with infuscate patterns uniform over most of wing, spots on vein tips and forks darker and with clear spots between vein tips; second costal node absent; Sc short, ends at or before base of R_4; radial fork basad of medial by about 5 cell widths, very close to base of R_4, separated by about 1 cell width; radial sector enlarged basally; medial fork complete.

Hypandrium a large, fan-shaped plate above distiphallus; gonocoxite cylindrical; gonostylus slender, longer than gonocoxite, ending in sharp point; distiphallus ending in dark tip with membranous base; surstylus with cluster of subbasal accessory tenacula arising from black base, apex attenuate, tenaculum lacking.

Female. Unknown.

DISTRIBUTION. Panama.

HOLOTYPE. ♂, PANAMA, Nusagandi, i.1994, J. Pickering, Malaise trap (USNM; examined).

Alepia alfaroana (Dyar)

Psychoda alfaroana Dyar, 1926:110.
Pericoma alfaroana; Rosario, 1936:145.
Alepia alfaroana; Duckhouse, 1974a:148–149, figs. 23–25.

DESCRIPTION. Male. (based on Duckhouse, 1974a). Vertex with distinct suture on midline, apex with V-shaped notch; eyes separated by 1+ facet diameters; inner margin of eye bridge rounded; eye bridge with 3 facet rows; interocular suture present, without spur on midline, forming acute angle in center; frons hair patch undivided; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3, palpus does not extend beyond flagellomere 5 or 6.

Wing with infuscate patterns, infuscation uniform over most of wing, spots on wing tips and forks darker; Sc short, ends at or before base of R_4; radial fork slightly distad of medial; base of R_{2+3} attached; medial fork incomplete.

Hypandrium a quadrate plate between gonocoxites; gonocoxite with setose patch on distal half; gonostylus about one-half length of gonocoxite, without appendage at apex, unidigitate, without protuberance at base; structure of distiphallus not clear in Duckhouse's illustration, but described as "tip of aedeagus laterally flattened, double hook-shaped in lateral view, ventral surface rounded"; surstylus irregular in shape, apex without prolongation; surstylus with black subbasal area bearing accessory tenacula, without tenaculum.

Female. Unknown.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Alajuela, viii.1921, reared from larva in water in bamboo joint, A. Alfaro (USNM; not examined).

REMARKS. Duckhouse (1974a) states the flagellomeres bear "two whorls of fine digitate ascoids," but because of their distribution, these are here interpreted as hairs.

Alepia bisubulata Duckhouse
Figs. 132–133

Alepia bisubulata Duckhouse, 1968:31–33, figs. 9–16.

DESCRIPTION. Male. Vertex protuberant, with small concavity and suture on midline; eyes separated by 4–6 facet diameters; interocular suture arched in center, no stem, separated in center; inner margin of bridge tapered so median margin with only 1 facet row; frons hair patch trapezoidal, undivided in center, anterior margin with small median concavity; antenna with scape and pedicel normal; basal flagellomeres with very short internode, internodes progressively become longer; terminal flagellomere with elongate apiculis; palpus extends to flagellomere 5, ratio of palpomeres 10:19:19:25.

Anepisternite with dorsal and ventral alveolar patches and bare in center. Wing infuscate with clear spots between vein tips, darker spots on vein tips and on forks; second costal node absent; Sc short, does not extend to base of R_1; base of R_{2+3} does not attach to R_4; radial fork complete, basad of medial by about 4 cell widths; medial fork incomplete.

Abdominal tergite with thin band of hair alveoli subapically, except 8 with broader band. Hypandrium a large, semiquadrate plate above distiphallus with wrinkled surface; gonocoxite with subapical, ventral tubercles bearing cluster of 10 or more hairs; gonostylus with longer knoblike, ventral tubercle at base bearing 5 spines; gonostylus ending in small hook; distiphallus ending in sharp, upturned apex; surstylus with cluster of subbasal accessory tenacula with clavate tips arising from black base, apex attenuate, without tenaculum.

Measurements. Antenna 1.70–2.34 mm ($\bar{x}$ = 2.02; n = 6). Wing length 2.05–2.46 mm, width 0.75–0.92 mm ($\bar{x}$ = 2.30, 0.82; n = 9).

Female. Flagellomeres more slender and shorter than those of male. Genitalia typical; lateral fringe of genital ducts covering most of lateral margin; chitinous arch does not reach apical margin; pair of cluster of spines on basal margin of flap anterior to chitinous arch, each cluster contains 4 spines.

Measurements. Antenna 1.69 mm (n = 1). Wing length 2.39–2.41 mm, width 0.80–0.89 mm (n = 2).

DISTRIBUTION. Trinidad, Surinam, French Guiana, Brazil.

HOLOTYPE. ♂, BRAZIL, Santa Catarina, Nova Teutonia, 16.ix.1938, F. Plaumann (BMNH; examined).

OTHER SPECIMENS STUDIED. BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 1♂, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, 100 m, primary forest (LACM); Rondônia, Cacaulândia, 200 km SSE Porto Velho, 10°18′S, 62°52.1′W, 2♂, 22–31.x.1997, W. Hanson, 140 m (EMUS, LACM). FRENCH GUIANA, Maripasoula, 3♂, 17–22.iii.1994, L. Quate, Malaise trap (LACM). SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 1♀, 28–30.ix.1996, L. Quate, Malaise trap, 300–450 m, primary forest (LACM), Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 7♂, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (LACM), 1♂, 1♀, same data as previous specimens except light

trap (LACM). TRINIDAD, Asa Wright Nature Center, 1♂, 15.i.1981, G. Bohart (LACM).

REMARKS. The small tubercle with several hairs at the base of the gonostylus is not found in any other species of *Alepia.*

Alepia eburna (Rapp)
Figs. 134–135

Psychoda eburna Rapp, 1945:309.
Alepia eburna; Duckhouse, 1974b:55–57, figs. 1–6.

DESCRIPTION. Male. Vertex without suture on midline and flattened; eyes separated by about 4 facet diameters; inner margin of eye bridge tapered to width of only 1 facet on inner margin, bridge with 2 facet rows; interocular suture present, without spur on midline, flattened at center; frons hair patch undivided; flagellomeres not as wide as pedicel; palpomere 2 normal, no wider than other palpomeres; 4 as long as or longer than 3.

Wing with infuscate pattern consisting largely of broad, arched band across wing near center; second costal node absent; Sc short, ends at or before base of R_4; radial fork basad of medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} attached; medial fork incomplete, M_2 not attached to M_1.

Hypandrium a dome-shaped bar between gonocoxites; gonocoxite without tubercle at base, vestiture normal; gonostylus sickle-shaped, ending in small hook; distiphallus straight, bifurcate, sides convergent; surstylus with cluster of subbasal accessory tenacula arising from dark pad, with single rodlike tenaculum.

Female. Unknown.

DISTRIBUTION. Nicaragua, Panama.

HOLOTYPE. ♂, PANAMA, Canal Zone, Barro Colorado I., 10.i.1929, C. Curran (AMNH; not examined).

SPECIMEN STUDIED. 1♂, NICARAGUA, Jinotego, Cerro Muri, 7–10.x.1997, Maes and Hernandez, Malaise trap (LACM).

Alepia imitata new species
Figs. 136–138

DESCRIPTION. Male. Vertex protuberant, with suture on midline; eyes separated by 2–3 facet diameters, bridge with 3 facet rows, inner margin obtusely rounded; interocular suture inverted Y-shaped; frons hair patch undivided, hemispherical with median concavity on anterior margin; flagellomere 1 nearly as wide as pedicel, ovoid without internode, following flagellomeres progressively becoming smaller and thinner and internodes lengthening, flagellomere 14 with elongate apiculis; palpomere 2 normal, 4 little longer than 3, ratio of palpomeres 10:16:18:20.

Anepisternum largely covered with alveoli except around spiracle and anterior oval area below spiracle. Wing lightly infuscated with darker areas at vein tips and on forks with pale areas between vein tips; second costal node absent; Sc short, ends between bases of R_4 and R_5; radial and medial forks on same level, radial fork distad of base of R_4 by more than 2 cell widths; medial fork complete.

Hypandrium a delicate, membranous plate between gonocoxites with slightly concave apex; gonocoxites clothed in dense vestiture giving genitalia shaggy appearance, with straight, slender shaft originating near center and extending well beyond tip of distiphallus; gonostylus shorter than gonocoxite, ending in sharp, curved point, with small lobe near center of median margin; distiphallus dark with central shaft flanked by 2 curved bars at base giving appearance of fleur-de-lis; epandrium with well-developed ventral epandrial sclerite (which may appear as part of basiphallus); surstylus ovoid, devoid of vestiture except patch of umbellate accessory tenacula arising from black pad near base and clavate tenaculum near center.

Measurements. Antenna 1.25–1.32 mm (n = 4). Wing length 1.88–1.95 mm, width 0.68–0.75 mm ($\bar{x}$ = 1.90, 0.70; n = 10).

Female. Flagellomeres smaller and more slender than those of male. Genitalia with apical lobes in form of fishtail; few large spines on ventral surface; chitinous arch penetrates apical margin; setal sclerite with pair of rows of 3 setae each flanking midline near center; genital ducts with small fringe on border, basal margin of plate extends posteriorly as dark, median bar.

Measurements. Antenna 1.23–1.30 mm ($\bar{x}$ = 1.26; n = 5). Wing length 1.88–2.08 mm ($\bar{x}$ = 2.00; n = 9), width 0.64–0.72 mm ($\bar{x}$ = 0.68; n = 6).

DISTRIBUTION. Brazil.

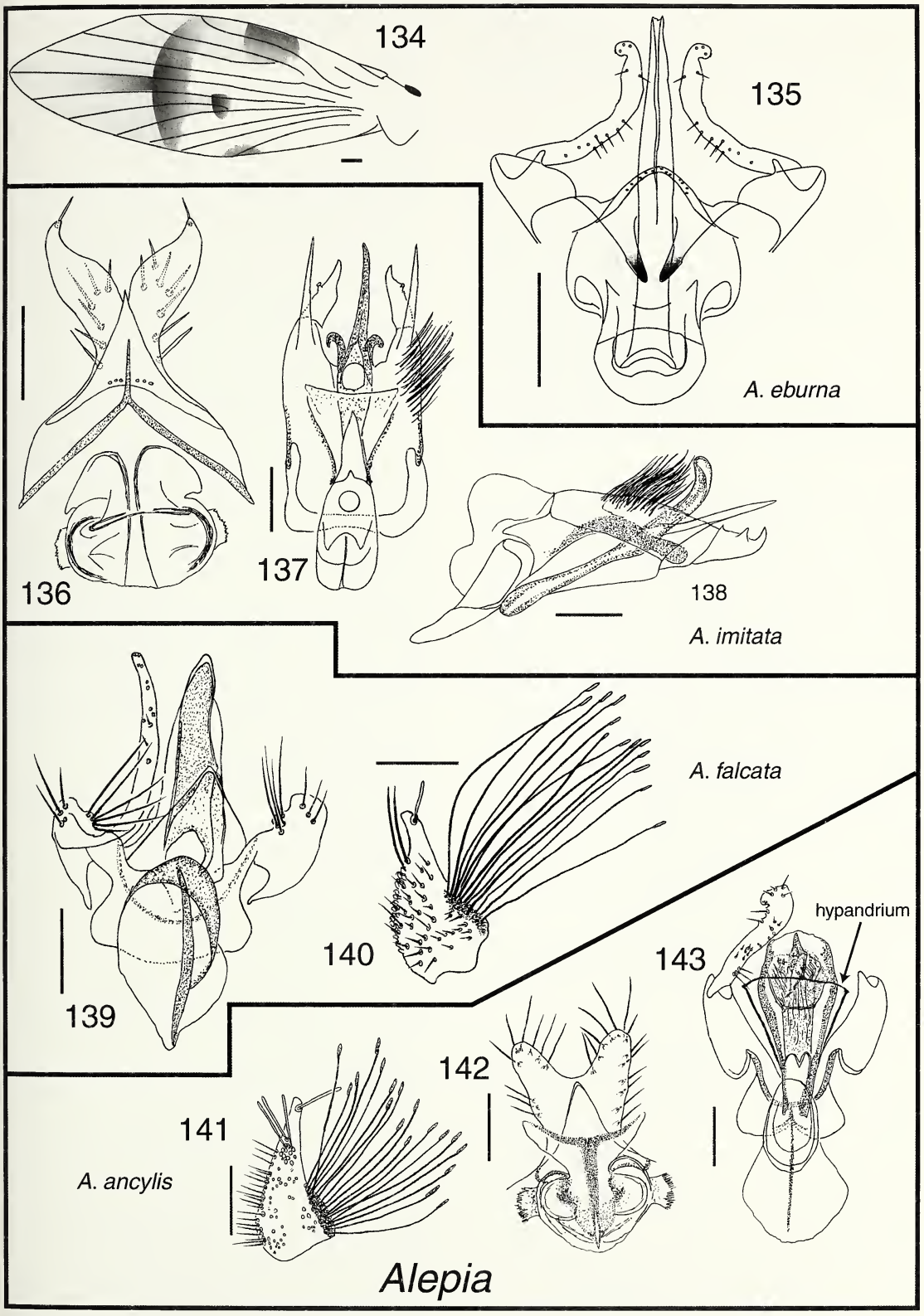
HOLOTYPE. ♂, BRAZIL, Amazonas, Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, 50 m, disturbed forest (INPA).

PARATYPES. 9♂, 3♀, same data as holotype (BMNH, LACM, USNM), Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 5♀, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, 100 m, primary forest (BMNH, INPA, LACM, USNM).

ETYMOLOGY. From Latin *imitatus* for copy, referring to the close similarity to *A. fruticosa.*

REMARKS. The two species, *A. fruticosa* and *A. imitata,* are similar and differ only in details of the genitalia of both sexes. The distinctive fleur-de-lis shape of the distiphallus and the structure of the gonostylus distinguishes *A. imitata.* Females differ in the structure of the genital ducts; the apical lobes also are slightly different.

The subgenital plate of females of *A. fruticosa* and *A. imitata* resembles that of *A. piscicauda,* which also has lobes in the shape of a fishtail. However, those of *A. piscicauda* are longer and more attenuate than in *A. fruticosa.* Also, *A. fruticosa* and *A. imitata* have a pair of irregular rows of small setae in the center of the setal sclerite, whereas *A. piscicauda* has a pair of similar setae in a cluster flanking the midline near the basal margin



Figures 134–143 *Alepia* spp. 134–135. *A. eburna:* 134. wing; 135. male genitalia, dorsal. 136–138. *A. imitata:* 136. female genitalia; 137. male genitalia, dorsal; 138. male gonopods and aedeagus, lateral. 139–140. *A. falcata:* 139. male genitalia, dorsal; 140. male surstylus, lateral. 141–143. *A. ancylis:* 141. male surstylus, lateral; 142. female genitalia; 143. male genitalia, dorsal. All scale lines = 0.1 mm

of the sclerite. Finally, the spines on the ventral surface of the subgenital plate of *A. piscicauda* are much larger than those in *A. fruticosa*. These differences are difficult to appreciate unless both species are available for comparison.

Alepia falcata new species
Figs. 139–140

DESCRIPTION. Male. Vertex protuberant with small concavity and suture on midline; eyes separated by 3–4 facet diameters, bridge with 3 facet rows; interocular inverted V-shaped, weakened in center; frons hair patch quadrate, not separated in center, slightly extended posteriorly on midline; antenna with dense patch of hairs on apicomedial margin of scape; basal flagellomeres fusiform, progressively become more slender with small internode; terminal flagellomere with elongate apiculis; palpus extends to flagellomere 6, ratio of palpomeres 10:22:22:28.

Anepisternite with alveoli sparser in center. Wing infuscate with clear spots between vein tips, darker spots on vein tips and on forks; second costal node present in addition to pseudonode between first and second; Sc short, but extends beyond base of R_5; radial fork slightly basad of medial, distad of base of R_4 by about 1 cell width; R_{2+3} unattached; medial fork complete. Foretibia with 3–4 spines on posterior apex; midtibia with double band of spines nearly encircling apex.

Abdominal tergites with thin band of alveoli on posterior margin. Hypandrium membranous, pyramid-shaped; gonocoxite with small tubercle subapically on medial margin bearing about 12 long hairs and additional 5–6 equally long hairs laterad and distad of tubercle; gonostylus slender, sickle-shaped, blunt at apex, longer than gonocoxite; distiphallus simple, tapering to rounded apex; surstylus with cluster of subbasal accessory tenacula arising from black base with clavate tips, apex attenuate, with single apical tenaculum.

Measurements. Antenna 2.05 mm (n = 1). Wing length 2.46–2.65 mm, width 0.99–1.08 mm (n = 3).

Female. Unknown

DISTRIBUTION. Surinam.

HOLOTYPE. ♂, SURINAM, Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 17–25.ix.1996, L. Quate, Malaise trap, 70 m, primary forest (LACM).

PARATYPES. 2♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *falcatus* for curved or sickle-shaped, referring to the shape of the male gonostylus.

Alepia ancylis new species
Figs. 141–143

DESCRIPTION. Male. Vertex slightly protuberant, with small concavity and suture on midline; eyes separated by 5 facet diameters; interocular angulate inverted Y-shaped; frons hair patch quadrate, not separated in center, anterior and posterior margin with small median concavities; antenna with scape and pedicel normal, basal flagellomeres with very short internode, internodes progressively lengthening; terminal flagellomere with elongate apiculis; ratio of palpomeres 10:14:16:19.

Anepisternite with alveoli largely confined to posterior half with small anterior extension dorsally. Wing generally infuscate with darker spots on vein tips and on forks; second costal node absent; Sc short, does not extend to base of R_1; base of R_{2+3} does not attach to R_4; radial fork basad of medial by about 3 cell widths, distad of base of R_4 by more than 2 cell widths; medial fork incomplete.

Hypandrium a fan-shaped plate over basal half of distiphallus; gonocoxite with few hairs only subapically on lateral margin; gonostylus slightly expanded distally, ending in large hook, 4 bristles near base of medial margin; distiphallus forming gobletlike structure; surstylus with cluster of subbasal accessory tenacula with clavate tips arising from black base, apex attenuate, with single apical tenaculum.

Measurements. Antenna 1.85–2.02 mm (n = 2). Wing length 2.41–2.75 mm, width 0.87–0.92 mm (n = 3).

Female. Flagellomeres more slender than those of male. Subgenital plate with sides of apical lobes divergent; chitinous arch does not reach apical margin; lateral fringe of genital ducts small.

Measurements. Wing length 2.60 mm, width 0.89 mm (n = 1).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, Rio Madre de Dios, 28 km ESE Boca Manu, 12°21′S, 70°42′W, 17.vii.1997, L. Quate, Malaise trap, 250 m, forest trail (MUSM).

PARATYPES. 2♂, same data as holotype (LACM).

ETYMOLOGY. From Greek *ankylis* for hook, referring to the tip of the surstylus.

Alepia scripta Enderlein

Alepia scripta Enderlein, 1937:95; Quate, 1963: 192, fig. 9.

DESCRIPTION. Male. Vertex without suture on midline and flattened; eyes separated by about 2 facet diameters; eye bridge with 3 facet rows, inner margin of eye bridge rounded and tapered; interocular suture angulate, without spur; frons hair patch divided in center; flagellomeres large, as wide as pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3, palpus does not extend beyond flagellomere 5 or 6.

Wing with infuscate pattern, infuscation uniform over most of wing, spots on wing tips and forks darker; second costal node absent; Sc short, ends at or before base of R_4; radial fork basad of medial; distad of base of R_4 by more than 2 cell widths; base of R_{2+3} unattached; medial fork complete.

Hypandrium a membranous, dome-shaped plate above distiphallus; gonocoxite vestiture normal, not unusually dense; gonostylus as long as gonocoxite; without appendage at apex, with small tubercle at base bearing 4 long bristles, apex blunt; distiphallus long, extends nearly to apex of gonostylus, expanded at tip; surstylus irregular in shape, apex with prolongation; surstylus with black subbasal area bearing accessory tenacula, with 1 subapical tenaculum.

Female. Unknown.

DISTRIBUTION. Bolivia.

HOLOTYPE. ♂, BOLIVIA, Yungas, Staudinger, [no other data] (ZMHB; examined).

Alepia albicollare (Enderlein)

Chirolepia albicollare Enderlein, 1937:104.
Alepia albicollare; Quate, 1963:193–194, figs. 10a–h.

DESCRIPTION. Male. Vertex without suture on midline, flattened; eyes separated by about 4 facet diameters; eye bridge with 3 facet rows, inner margin tapered to width of only 1 facet on inner margin; interocular suture flattened at center, without spur on midline; frons hair patch divided in center; flagellomeres large, as wide as pedicel; palpomere 2 normal, 4 longer than 3, palpus very long, probably extends to flagellomere 7.

Wing with infuscate patterns, infuscation uniform largely on distal half with basal half mostly clear; second costal node absent; Sc long, extends beyond base of radial sector; radial fork on same level as medial; very close to base of R_4, distad by about 1 cell width; base of R_{2+3} attached; medial fork complete.

Hypandrium membranous, triangular; gonocoxite without tubercle at base, vestiture normal; gonostylus about as long as gonocoxite, sickle-shaped, with cluster of hairs at base, unidigitate, without protuberance at base; distiphallus with 2 long staffs and 1 very short staff; surstylus elongate triangular, with black subbasal area bearing accessory tenacula, with 2 apical tenacula.

Female. Unknown.

DISTRIBUTION. Bolivia, Paraguay.

HOLOTYPE. ♂, BOLIVIA, Sara, xi.1906–iii.1907, J. Steinbach, 600–700 m (ZMHB; examined).

Alepia copelata Quate

Alepia copelata Quate, 1999:422–423, figs. 3E–F.

DESCRIPTION. Male. Vertex with distinct V-shaped notch and suture on midline; eyes separated by 7 facet diameters; eye bridge with 3 facet rows, bridge tapered to width of only 1 facet on inner margin; interocular suture flattened at center, without spur on midline; frons hair patch undivided; flagellomeres narrower than pedicel; palpomere 2 normal, no wider than other palpomeres, 4 as long as or longer than 3.

Wing with infuscate pattern, infuscation uniform over most of wing, spots on wing tips and forks darker; second costal node present; Sc short, ends at or before base of R_4; radial fork basad of medial, distad of base of R_4 by more than 2 cell widths; base of R_{2+3} unattached; medial fork complete.

Hypandrium a membranous plate between gonocoxites with convex apex; gonocoxite without tubercle at base, vestiture normal; gonostylus longer than gonocoxite, without appendage at apex; surstylus slender, ending in small hook; distiphallus bifurcate, in shape of pair of large dark, oarlike appendages; surstylus irregular in shape, apex with prolongation, with black subbasal area bearing accessory tenacula, with 2 tenacula.

Female. Unknown.

DISTRIBUTION. Panama.

HOLOTYPE. ♂, PANAMA, Barro Colorado I., viii.1993, J. Pickering, Malaise trap (USNM; examined).

Alepia incompleta (Knab)

Psychoda incompleta Knab, 1914:105.
Alepia incompleta; Duckhouse, 1974a:145–146, figs. 14–16.

DISTRIBUTION. Panama.

HOLOTYPE. ♀, PANAMA, Canal Zone, Tabernilla, iv.1909, reared from larva in dark fluid held by flower bracts of *Calathea discolor* Meyer, A. H. Jennings (USNM; not examined).

REMARKS. This species is known only from the female. Features that might aid in its recognition, based on Duckhouse's illustrations, are lack of an interocular suture, equal lengths of first 3 palpomeres, unpatterned wing, and radial and medial forks on the same level.

KEY TO MALES OF *ALEPIA*

The male of *A. incompleta* is unknown.

1 Wing with brown infuscations (Fig. 104); surstylus with fewer than 6 tenacula 2
– Wing plain, without infuscations; surstylus with 6–8 subapical tenacula (Fig. 83) . . . . . ***A. amputonis* n. sp.**
2 Accessory tenacula on surstylus scattered and not confined to basal area (Fig. 87) 3
– Accessory tenacula on surstylus confined to subbasal area, area usually black and forming a pad (Figs. 117, 121) 20
3 Surstylus without apical tenaculum (Figs. 87, 89) 4
– Surstylus with 1 or 2 apical or subapical tenacula (Fig. 115) 16
4 Gonostylus without appendage at apex; membranous area between sternites 5 and 6, 6 and 7 without scales 5
– Gonostylus with paddle-like appendage at apex (Fig. 85); membranous area between sternites 5 and 6, 6 and 7 with small patch of scales on each side of midline . . . . . ***A. azulita* n. sp.**

5 Gonostylus without subapical spur; hypandrium membranous and very faint 6
– Gonostylus with subapical spur giving appearance of harpoon tip (Fig. 88); hypandrium sclerotized and visible, with transverse wrinkles ..... ***A. unicinota*** **n. sp.**
6 Eye bridge with 3 facet rows 7
– Eye bridge with 4 facet rows ..... ***A. lanceolata*** **n. sp.**
7 Gonostylus bifurcate (Fig. 99) 8
– Gonostylus unidigitate 11
– Gonostylus trifurcate (Figs. 94–95) ..... ***A. condylaria*** **n. sp.**
8 Gonostylus much shorter than gonocoxite (Fig. 99) 9
– Gonostylus as long as gonocoxite 10
9 Gonostylus very short, about one-fifth length of gonocoxite, bifurcate at apex (Wagner, 1993: fig. 19) ..... *A. martinicana* Wagner
– Gonostylus about one-half length of gonocoxite, bifurcation at base (Fig. 99) ..... *A. hirtiventris* (Tonnoir)
10 Apex of distiphallus 2 broad blades (Quate, 1996:fig. 8a) ..... *A. valentia* Quate
– Apex of distiphallus 2 sharp points (Quate, 1999:fig. 4G) ..... *A. fissura* Quate
11 Gonocoxite without long projection from apex 12
– Gonocoxite with long projections from medial apex and shorter 1 from lateral apex (Fig. 105); surstylus ends in 2 small, blunt knobs ..... ***A. absona*** **n. sp.**
12 Gonostylus not constricted at apex 13
– Gonostylus constricted at apex and ending in small, digitlike tip (Fig. 100) ..... ***A. digitula*** **n. sp.**
13 Radial fork on same level as medial; gonostylus without globular protuberance at apex ... 14
– Radial fork basad of medial (Fig. 104); alveoli of anepisternite form dorsal and ventral clusters; gonostylus with globular protuberance bearing 5–6 long bristles (Fig. 103) ..... ***A. litotes*** **n. sp.**
14 Gonostylus much shorter than gonocoxite (Fig. 111) ..... ***A. labyrinthica*** **n. sp.**
– Gonostylus subequal in length to gonocoxite (Figs. 106, 110) 15
15 Distiphallus broad, straight, ending posterior to gonostyli; right paramere heavily sclerotized, in form of cock's comb (Fig. 110) ..... ***A. piscicauda*** **n. sp.**
– Distiphallus in form of 2 apically narrowed, relatively slender shafts, neither of which extend posterior to apex of gonostyli; paramere slender, elongate (Fig. 106) ..... ***A. ferruginea*** **n. sp.**
16 Gonostylus unidigitate apically, at most with subapical spur (e.g., Fig. 114); hypandrium membranous, faint 17
– Gonostylus deeply bifurcate with long, pointed, larger shaft (Duckhouse, 1974a:fig. 12); hypandrium sclerotized ..... *A. tricolor* (Knab)
17 Gonostylus without subapical spur 18
– Gonostylus with subapical spur giving appearance of harpoon tip (Fig. 114) ..... ***A. caceresi*** **n. sp.**
18 Spur from interocular suture does not extend to vertex; radial fork on same level as medial; surstylus triangular or elongate triangular ... 19
– Spur from interocular suture reaches vertex; radial fork basad of medial; surstylus globular or ovoid, without prolongation ..... *A. alcobregma* Quate
19 Gonocoxite without long projection from apex; gonostylus little longer than gonocoxite, ending in S-shaped curve ..... *A. relativa* Quate
– Gonocoxite with long projection from center of mesal margin; gonostylus short and ending in straight, blunt tip (Fig. 113) ..... ***A. scolomeris*** **n. sp.**
20 Eye bridge with only 1 or 2 facet rows, eyes widely separated by more than 3 facet diameters 21
– Eye bridge with 3 facet rows, eyes separated by less than 3 facet diameters 22
21 Eyes widely separated by 10 facet diameters, short eye bridge with 2 facet rows ..... ***A. diocula*** **n. sp.**
– Eyes separated by 3 facet diameters, bridge reduced, with only 1 facet row (Fig. 118) ..... ***A. longinoi*** **n. sp.**
22 Gonostylus unbranched, unidigitate (Fig. 132) 23
– Gonostylus trifurcate, with 2 pointed and 1 short blunt apices (Figs. 128–129) ..... ***A. fruticosa*** **n. sp.**
23 Surstylus without apical tenaculum 24
– Surstylus with 1 apical or subapical tenaculum (Fig. 140) 27
– Surstylus with 2 apical or subapical tenacula 31
24 Medial fork complete 25
– Medial fork incomplete 26
25 Radial fork distad of medial; frons hair patch divided in center ..... *A. busckana* (Dyar)
– Radial fork basad of medial; frons hair patch undivided ..... *A. apachis* Quate
26 Gonostylus without protuberance at base .... *A. alfaroana* (Dyar)
– Gonostylus with protuberance at base bearing 5–6 long bristles (Fig. 132) ..... *A. bisubulata* Duckhouse
27 Eye bridge with 3 facet rows; medial fork complete; radial fork on same level as medial .. 28
– Eye bridge with 2 facet rows; medial fork incomplete; radial fork basad of medial .... *A. eburna* (Rapp)
28 Hypandrium a membranous, faint band ... 29
– Hypandrium a large fan-shaped plate above distiphallus (Fig. 143) 30
29 Distiphallus in shape of fleur-de-lis with pair of short curved shafts at base (Fig. 137); eyes separated by 2–3 facet diameters ..... ***A. imitata*** **n. sp.**

– Distiphallus a simple, straight shaft (Fig. 139); eyes separated by more than 3 facet diameters ..... *A. falcata* n. sp.

30 Medial fork incomplete; gonostylus hooked at apex (Fig. 143) ..... *A. ancylis* n. sp.
– Medial fork complete; gonostylus straight at apex ..... *A. scripta* Enderlein

31 Distiphallus consists of 3 shafts, 2 long and dissimilar and 1 very short (Quate, 1963:figs. 10f, h) ..... *A. albicollare* Enderlein
– Distiphallus a pair of oarlike shafts of equal size and shape (Quate, 1999:fig. 3E) ..... *A. copelata* Quate

Neurosystasis Satchell

Telmatoscopus (*Neurosystasis*) Satchell, 1955:86.
Neurosystasis; Duckhouse, 1974a:142.

TYPE SPECIES. *Telmatoscopus* (*Neurosystasis*) *terminalis* Satchell, by original designation.

DESCRIPTION. Eye bridge extends to or close to midline, with 3 facet rows; eyes separated; interocular suture present; antenna longer than wing width and shorter than wing length; flagellomeres fusiform or barrel-shaped, without internodes, terminal 3 flagellomeres not reduced, ascoids indistinguishable; palpus normal, extends to about center of antenna, palpomere 4 longer than palpomere 3.

Antepronotum without band of pores; sensory organs of thorax absent; wing without infuscate patterns; Rs pectinate; base of R_{2+3} not attached to R_4; radial fork without spur, very close to base of R_4, basad of medial fork; R_5 ends in wing apex.

Anterior gonocoxal apodemes form pair of anterior, expanded lobes; hypandrium a bar connecting gonocoxites; gonostyli dimorphic; aedeagus asymmetrical; surstylus bifurcate, with 1 tenaculum.

REMARKS. The bifurcate surstylus is the most distinctive feature of this genus.

Neurosystasis terminalis (Satchell)

Telmatoscopus (*Neurosystasis*) *terminalis* Satchell, 1955:86, figs. 1A–F.

DESCRIPTION. Male. Radial and medial forks on same level, basad of wing center; M_1, M_2, and M_3 joined at medial fork to form triad. Gonostyli dimorphic, right trifurcate with 1 short, sharp branch, 1 broad and blunt branch and 1 long and slender with blunt apex; left gonostylus bifurcate, longer than right, 1 branch slightly sinuous with blunt apex, 1 shorter branch slender with acute apex; branches of surstylus nearly equal in length, 1 blunt and 1 acute at apex.

Female. Subgenital plate weakly bilobed; chitinous arch separates lobes.

DISTRIBUTION. Jamaica.

HOLOTYPE. ♂, JAMAICA, Monteague, 12.ii.1905, Walsingham (BMNH; not examined).

REMARKS. This species can be separated from *N. amplipenna* (below) by its unusual wing venation with the 3 medial veins arising from a single point.

Neurosystasis amplipenna (Knab).

Psychoda amplipenna, Knab, 1914:103.
Neurosystasis amplipenna; Duckhouse, 1974a:142, figs. 1–6.

DESCRIPTION. Male. Wing membrane lightly infuscate with clear spots between most vein tips; radial fork basad of medial and very near base of R_4; branches of M normal. Gonocoxite with long, slender protuberance from apicomedial margin, right little longer than left; gonostylus variable, dimorphic, right unbranched, left longer and in some specimens bifurcate with lateral branch much shorter than medial (other specimens with shorter or no bifurcation); surstylus with branches about same length with blunt apices, lateral branch with right-angle bend at apex, cluster of dark hairs at base of bifurcation.

Female. Unknown.

DISTRIBUTION. Cuba, USA.

HOLOTYPE. ♂, CUBA, San Antonio de Los Baños, reared from larva in water at leaf base of epiphytic bromeliad, J. H. Pazos (USNM; not examined).

NEW MATERIAL EXAMINED. USA, Florida, Orange County, Christmas, 3♀, 25.vi.1976, D. Fish, *ex Tillandsia utriculata* (Bromeliaceae) (LACM, USNM).

REMARKS. Larvae of this species are found in the leaf axils of bromeliads and probably are restricted to this habitat.

Balbagathis Quate

Balbagathis Quate, 1996:31.

TYPE SPECIES. *Balbagathis sylvatica* Quate, by original designation.

DESCRIPTION. Eye bridge usually with 3 facet rows, rarely 4, width usually about one-half length of vertex; interocular suture present, without posterior stem; eyes narrowly separated by less than 1 facet diameter, upper and lower margin angulate; frons hair patch moderately dense, not separated in center, posterior margin with concavity; antenna longer than wing width and shorter than wing length; flagellomere 1 smaller than following segments, without internode, other flagellomeres strongly nodiform, sometimes terminal flagellomere reduced, ascoids single, very long and curled, much longer than flagellomeres; labellum expanded but not bulbous; palpus shorter than antenna.

Anepisternum with dense patch of alveoli on posterior one-half, anterior one-half clear. Wing clear, unmarked; radial sector pectinate; radial fork basad of medial by 4–5 cell widths; R_5 ends in wing apex.

Gonocoxite unmodified; hypandrium a band between gonocoxites, often with posterior projections; aedeagus asymmetrical; surstylus with 1 te-

naculum; ventral epandrial sclerite a V-shaped sclerite from foramen to bases of surstyli.

REMARKS. *Balbagathis* is separable from other genera of Setomimini by the reduced first flagellomere. A few other genera of Psychodidae also have this feature, but none occur in the Neotropics. The male genitalia are complex with a multipartite distiphallus and a modified hypandrium with several posterior projections. The female subgenital plate is characteristic with its pair of slender apical lobes, which are often widely separated.

Species of this genus are difficult to distinguish, except through genitalic characters. The head, antenna, thorax, and wing venation are so similar that they do not provide characters for separating the species; the width of the eye bridge varies slightly but not enough to be a distinguishing character.

Because nonsexual distinguishing characters seem to be lacking, females have been associated with males only on the basis of sympatry. Unfortunately, a species known only from female specimens was chosen as the type species of *Balbagathis*. At the time, however, the female seemed to characterize the genus.

Balbagathis sinuosa new species

Figs. 144–145

DESCRIPTION. Male. Eye bridge with 3 facet rows, width about one-half vertex height.

Gonocoxal apodeme with basal margin concave, bilobed; gonostylus sinuous, strongly curved, nearly S-shaped; hypandrium without projections; base of basiphallus expanded; distiphallus with 2 slender shafts, about equal in length, 1 paler than other; paramere slightly curved, shorter than distiphallus; tergite 10 rounded and domelike.

Measurements. Antenna 1.55–1.68 mm ($\bar{x}$ = 1.60; n = 5). Wing length 1.85–2.60 mm, width 0.78–1.05 mm ($\bar{x}$ = 2.24, 0.91; n = 10).

Female. Apical lobes of subgenital plate well separated and moderately broad, membranous chitinous arch extends posteriorly between lobes; setal sclerite with 3 pairs of setae, genital ducts with faint horizontal strut.

Measurements. Antenna 1.30 mm (n = 1). Wing length 2.10–2.25 mm, width 0.80–0.98 mm (n = 2).

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Merida, La Azulita, ix.1995, L. Quate (IZAV).

PARATYPES. VENEZUELA, Merida, Jají, 8°36′N, 71°21′W, 1♂, 14.ix.1995, L. Quate, Malaise trap, 2100 m (LACM), La Azulita, 8°42′N, 71°28′W, 1♂, [day illegible].ix.1995, L. Quate, Malaise trap, 1400 m (LACM), 2♂, 14.ix.1995, light trap, 1350 m (LACM), 1♂, same data as previous specimens except 19.ix.1995, light trap, 1400 m (LACM), 1♂, same data as previous specimen except 20.ix.1995, light trap, 1900 m (LACM), 1♂, same data as previous specimen except 22.ix.1995, L. Quate, Malaise trap, 1650 m (USNM), El Tao, La Azulita, 8°41.7′N, 71°27.8′W, 1♂, 1♀, 15.ix.1995, L. Quate, light trap, 1350 m (LACM), La Hechicera, 8°38′N, 71°9′W, 1♂, 22.ix.1995, L. Quate, Malaise trap, 1800 m, secondary forest (BMNH).

ETYMOLOGY. From Latin *sinuosus* for "full of bendings," referring to the shape of the gonostylus.

Balbagathis trispica new species

Fig. 146

DESCRIPTION. Male. Eye bridge with 3 facet rows, width about one-half vertex height.

Gonocoxal apodeme with basal margin straight, not bilobed; gonostylus sinuous, strongly curved, nearly S-shaped; hypandrium without projections; base of basiphallus slightly expanded; distiphallus composed of 2 shafts, 1 long and straight, extends well beyond apex of gonocoxite, other shorter and closely appressed to other; paramere also of 2 shafts, shorter than distiphallus and each curve away from center; tergite 10 rounded and domelike.

Measurements. Antenna 1.21–1.25 mm (n = 2). Wing length 1.75–2.00 mm, width 0.67–0.75 mm (n = 3).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 10 km NW El Limon, 19.ix.1993, L. Quate, light trap (IZAV).

PARATYPES. 3♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *tri* for three and *spica* for point, referring to the 3 major shafts of the aedeagus: the long shaft of the distiphallus (the shorter shaft is inconspicuous) and those of the parameres.

Balbagathis confraga new species

Figs. 147–151

DESCRIPTION. Male. Eye bridge with 3 facet rows; width about one-half vertex height.

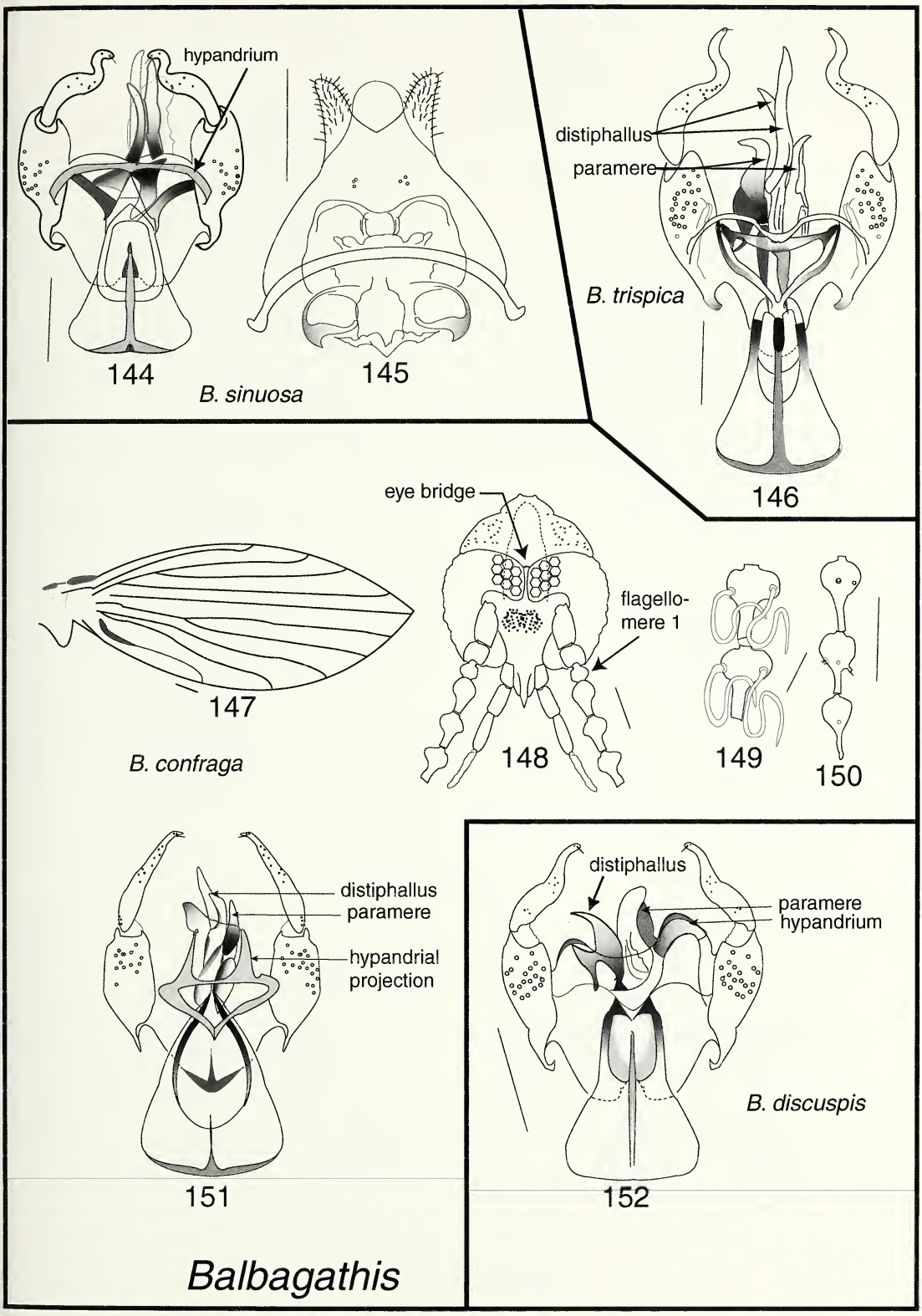
Gonocoxal apodeme with basal margin straight or with concavity, but structure not bilobed; gonostylus nearly straight, with small subapical curvature; hypandrium plate with 2 projections; base of basiphallus scarcely wider than posterior part; distiphallus with central shaft straight, projects well beyond tip of gonocoxite, smaller shaft short, curved to acute apex; paramere slightly curved, little shorter than small shaft of distiphallus, appears to be fractured before fusion with hypandrium; tergite 10 with quadrate or angular apex.

Measurements. Antenna 1.28–1.33 mm (n = 4). Wing length 1.78–2.10 mm, width 0.68–0.75 mm ($\bar{x}$ = 1.95, 0.72; n = 6).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 15 km NW El Limon, 19.ix.1993, L. Quate, light trap (IZAV).



Figures 144–152 *Balbagathis* spp. 144–145. *B. sinuosa:* 144. male genitalia, dorsal; 145. female genitalia. 146. *B. trispica,* male genitalia, dorsal. 147–151. *B. confraga:* 147. wing; 148. male head; 149. male antenna, flagellomeres 5–6; 150. male antenna, terminal flagellomeres; 151. male genitalia, dorsal. 152. *B. discuspis,* male genitalia, dorsal. All scale lines = 0.1 mm

PARATYPES. 4♂, same data as holotype (LACM, USNM), 10 km NW El Limon, 1♂, 19.ix.1993, L. Quate, light trap (LACM).

ETYMOLOGY. From Latin *confragus* for broken, referring to the secondary articulation of the paramere.

Balbagathis discuspis new species
Fig. 152

DESCRIPTION. Male. Eye bridge with 3 facet rows.

Gonocoxal apodeme with basal margin straight or with concavity but not bilobed, widely expanded; gonostylus with slight curvature; hypandrium without posterior projections, concave in center, lateral margin of concavity rounded and prominent; base of basiphallus straight, not bilobed, wider than posterior part; distiphallus a single shaft tapering to acute apex; paramere large, wider than distiphallus, lateral margin in form of dark, pointed bar, median section pale with rounded apex.

Measurements. Antenna 1.30–1.35 mm (n = 3). Wing length 1.53–1.78 mm, width 0.58–0.65 mm ($\bar{x}$ = 1.65, 0.60; n = 5).

Female. Unknown.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Limón, Res. Biol. Hitoy Cerere, 9°48.4′N, 83°1.5′W, 17–26.ii.1999, L. Quate, Malaise trap, 100–200 m, primary forest [barcode INBIOCRI001472817] (INBC).

PARATYPES. 4♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *dis* for without and *cuspis* for point, referring to the hypandrium, which is without projections.

Balbagathis barva new species
Figs. 153–154

DESCRIPTION. Male. Eye bridge with 4 facet rows.

Gonocoxal apodeme with basal margin straight or with concavity but not bilobed; gonostylus with slight curvature; hypandrium with 2 pairs of posterior projections, lateral pair slender and median pair thicker; distiphallus a nearly straight dark shaft, enclosed in membranous film; paramere a single shaft a little longer and thinner than distiphallus; tergite 10 with quadrate or angular apex.

Measurements. Wing length 2.63–2.83 mm, width 0.95–1.05 mm ($\bar{x}$ = 2.72, 1.02; n = 5).

Female. Apical lobes of subgenital plate slender; chitinous arch extends nearly to apex of lobes.

Measurements. Wing length 2.68 mm (n = 1).

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Heredia, Parque Braulio Carrillo, Volcan Barva, vi–viii.1995, L. Quate, Malaise trap, 2800 m [barcode INBIOCRI001471929] (INBC).

PARATYPES. 4♂, same data as holotype (LACM, USNM), 1♂, 1♀, same data as holotype except 9–17.vi.1995, L. Quate, Malaise trap, 2250 m (INBC, LACM).

ETYMOLOGY. Named for Volcan Barva near the type locality.

REMARKS. This is the only known species of *Balbagathis* with 4 facet rows, which readily separates it from other species of the genus.

Balbagathis talamanca Quate
Figs. 155–157

Balbagathis talamanca Quate, 1996:33, figs. 12d–h; Collantes and Martínez-Ortega, 1999b:25.

DESCRIPTION. Male. Eye bridge with 3 facet rows, width about one-half vertex height.

Gonocoxal apodeme prominent and bilobed; gonostylus nearly straight, with small subapical curvature; hypandrium with 2 lateral projections, variable, usually symmetrical, but 1 may be reduced (Fig. 156), large triangular projection between 2 slender projections, ends in blunt tip, striations on dorsal surface, sclerotized bar at one side, extends to tip of distiphallus; base of basiphallus widely expanded; distiphallus a single, broad shaft slightly curving outward from midline; paramere single, with rounded curve at base; tergite 10 rounded and domelike.

Measurements. Antenna 0.95–1.40 mm (n = 3). Wing length 1.30–2.15 mm, width 0.48–0.75 mm ($\bar{x}$ = 1.80, 0.67; n = 10).

Female. Apical lobes of subgenital plate moderately wide; chitinous arch extends posteriorly between lobes well beyond posterior margin; lobes of genital duct well defined with distinct lateral and horizontal struts; membranous plate with dark ellipse at anterolateral and anteromedial areas.

Measurements. Antenna 1.20 mm (n = 1). Wing length 1.95–2.25 mm, width 0.70–0.78 mm (n = 4).

DISTRIBUTION. Nicaragua, Costa Rica.

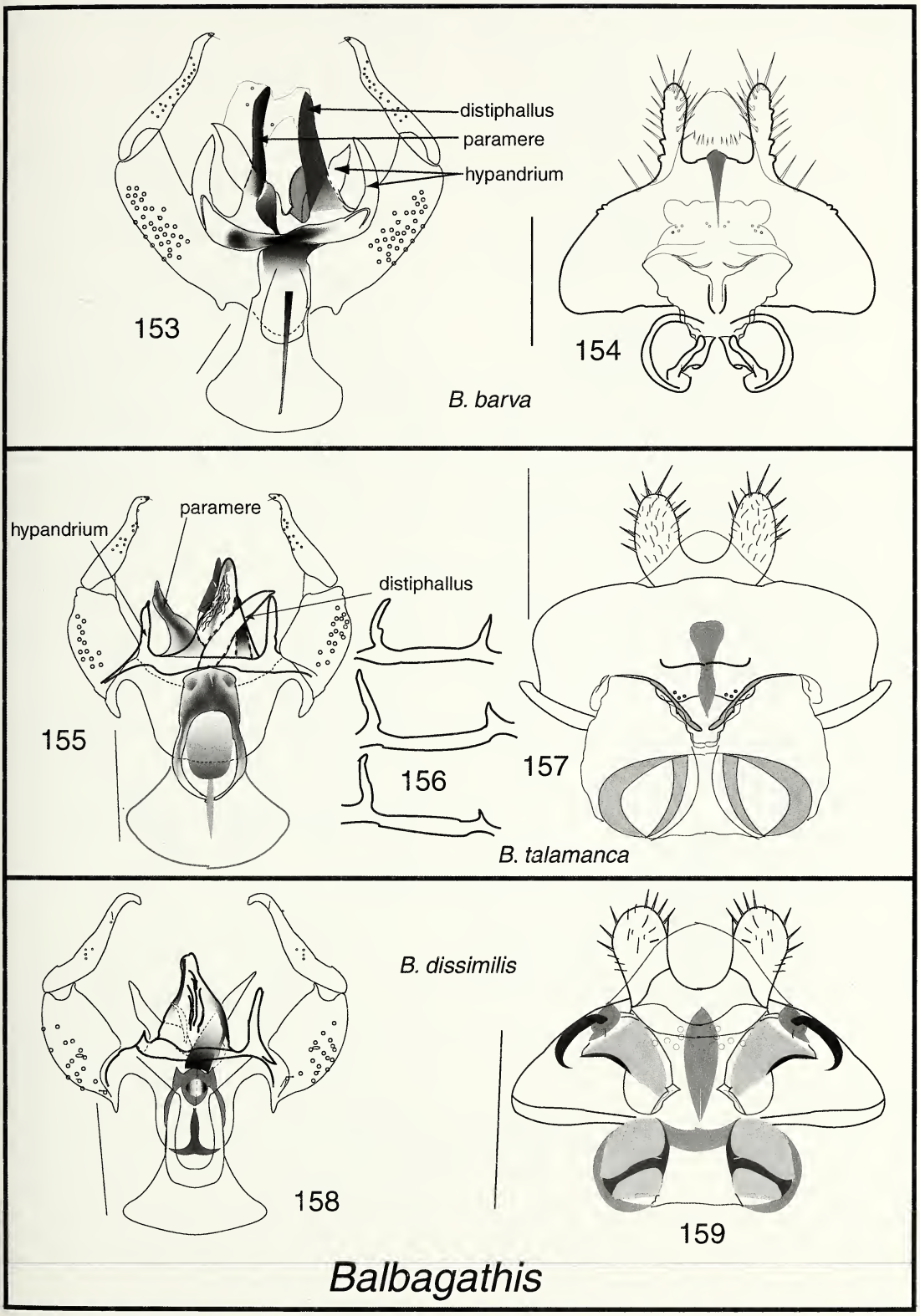
HOLOTYPE. ♂, COSTA RICA, Limón, Puerto Viejo de Talamanca, 20–22.vii.1993, L. Quate (INBC; examined).

NEW SPECIMENS STUDIED. COSTA RICA, Heredia, San Rafael de Vara Blanca, Rio Santo Domingo, 3♂, 18–26.vii.1993, L. Quate, light trap, 1700 m (LACM), La Selva, 1♂, 18.ii.1992, L. Quate, at light (LACM); Puntarenas, Estación Pittier, 22 km N San Vito, 9°1.4′N, 82°57.5′W, 3♂, 11–16.vi.1995, L. Quate, light trap, 1670 m (LACM).

REMARKS. The lateral projections of the hypandrium are variable as shown in Fig. 156.

This species is separable from its nearest relative, *Balbagathis dissimilis* n. sp., in the shape of the triangular projection of the hypandrium, which has a bar at its side in *B. talamanca* but is absent in *B. dissimilis* (for further discussion of the median projection from the hypandrium, see "Remarks" section for *B. dissimilis*). Females have very different ornamentations on the membranous plate of the genitalia.

In addition to the specimens above, there is a



Figures 153–159 *Balbagathis* spp. 153–154. *B. barva:* 153. male genitalia, dorsal; 154. female genitalia. 155–157. *B. talamanca:* 155. male genitalia, dorsal; 156. hypandrium, variants; 157. female genitalia. 158–159. *B. dissimilis:* 158. male genitalia, dorsal; 159. female genitalia. All scale lines = 0.1 mm

large series of specimens from Venezuela and Surinam, in which the males are indistinguishable from *B. talamanca,* but the females are distinctly different. That brings into question the proper association of the sexes. Two males from Estación Pittier were taken with 5 females and this is the basis of the sex association in the northern group. Twenty-four males are associated with 15 females in the southern (Venezuela and Surinam) group. Either there are two species with similar males, or the association of sexes is incorrect in one of the populations. The solution must await additional collections.

Balbagathis dissimilis new species

Figs. 158–159

DESCRIPTION. Male. Eye bridge with 3 facet rows, bridge narrower than other species.

Anterior gonocoxal apodeme with basal margin straight or with concavity but structure not bilobed; gonostylus nearly straight, sometimes with small subapical curvature; hypandrium usually with 1 posterior projection but variable, small second projection may also be present; base of projection from hypandrium undifferentiated, with large triangular projection between 2 smaller projections, ends in blunt tip, striations on dorsal surface, extends to tip of distiphallus; base of basiphallus widely expanded; paramere present; aedeagal complex extends only to apex of gonocoxite; distiphallus a single shaft, tapering in acute apex; paramere similar to shape of distiphallus, but base broader; tergite 10 rounded and domelike.

Measurements. Antenna 1.02–1.14 mm ($\bar{x}$ = 1.08; n = 6). Wing length 1.28–1.70 mm, width 0.50–0.70 mm ($\bar{x}$ = 1.53, 0.64; n = 10).

Female. Apical lobes of subgenital plate relatively wide; chitinous arch extends to beyond center of apical lobes; membranous plate with 5 setae on each side of midline, with sclerotized areas in patterns as illustrated; wedge-shaped structure on midline; genital ducts lightly pigmented, without fringe on lateral margin, horizontal struts well developed, vertical struts slender.

Measurements. Antenna 0.98–1.15 mm ($\bar{x}$ = 1.08; n = 10). Wing length 1.49–1.75 mm; width 0.50–0.75 mm ($\bar{x}$ = 1.66, 0.60; n = 10).

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Limón, Puerto Viejo de Talamanca, 9°39.4′N, 82°45.9′W, 25.ii–1.iii.1999, L. Quate, Malaise trap, secondary forest, sea level (INBC).

PARATYPES. 3♂, 8♀, same data as holotype (BMNH, LACM), Res. Biol. Hitoy Cerere, 9°48.4′N, 83°1.5′W, 1♀, 17–26.ii.1999, L. Quate, Malaise trap, over small stream, 100–200 m (INBC), 2♂, 6♀, same data as previous specimen except Rio Cerere, primary forest (LACM, USNM), 4♂, 1♀, same data as previous specimens except *Heliconia* floodplain (LACM).

ETYMOLOGY. From Latin *dissimilis* for different, referring to differences in projections from the hypandrium.

REMARKS. The differences between *B. dissimilis* and closely related *B. talamanca* are discussed under the latter.

The median projection from the hypandrium may be a precursor to the large, membranous hypandrium seen in *Alepia.* The expansion of this projection, loss of sclerotization, and the lateral projections would result in a hypandrium similar to that seen in *Alepia.*

Balbagathis manuensis new species

Fig. 160

DESCRIPTION. Male. Eye bridge with 3 facet rows; width about one-third vertex height.

Gonocoxal apodeme prominent and bilobed; hypandrium with 2 posterior projections, ending in blunt apex; gonocoxite with small knob on medioapical margin; gonostylus nearly straight, with small central curvature; base of basiphallus moderately expanded; distiphallus with 2 shafts, central shaft straight, short, lateral shaft little longer, curved, apex acute, both extend beyond apex of gonocoxite; paramere curved with right-angle curvature at base; tergite 10 rounded and domelike.

Measurements. Antenna 1.03–1.05 mm ($\bar{x}$ = 1.04; n = 2). Wing length 1.68–1.70 mm, width 0.63–0.64 mm ($\bar{x}$ = 1.69, 0.63; n = 2).

Female. Unknown.

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Rio Madre de Dios, 28 km ESE Boca Manu, 12°21′S, 70°42′W, 13–24.vii.1997, L. Quate, light trap at 36.5 m [on a platform in the forest], 250 m (MUSM).

PARATYPES. 2♂, same data as holotype (LACM).

ETYMOLOGY. The name is based on the type locality.

Balbagathis agrestis new species

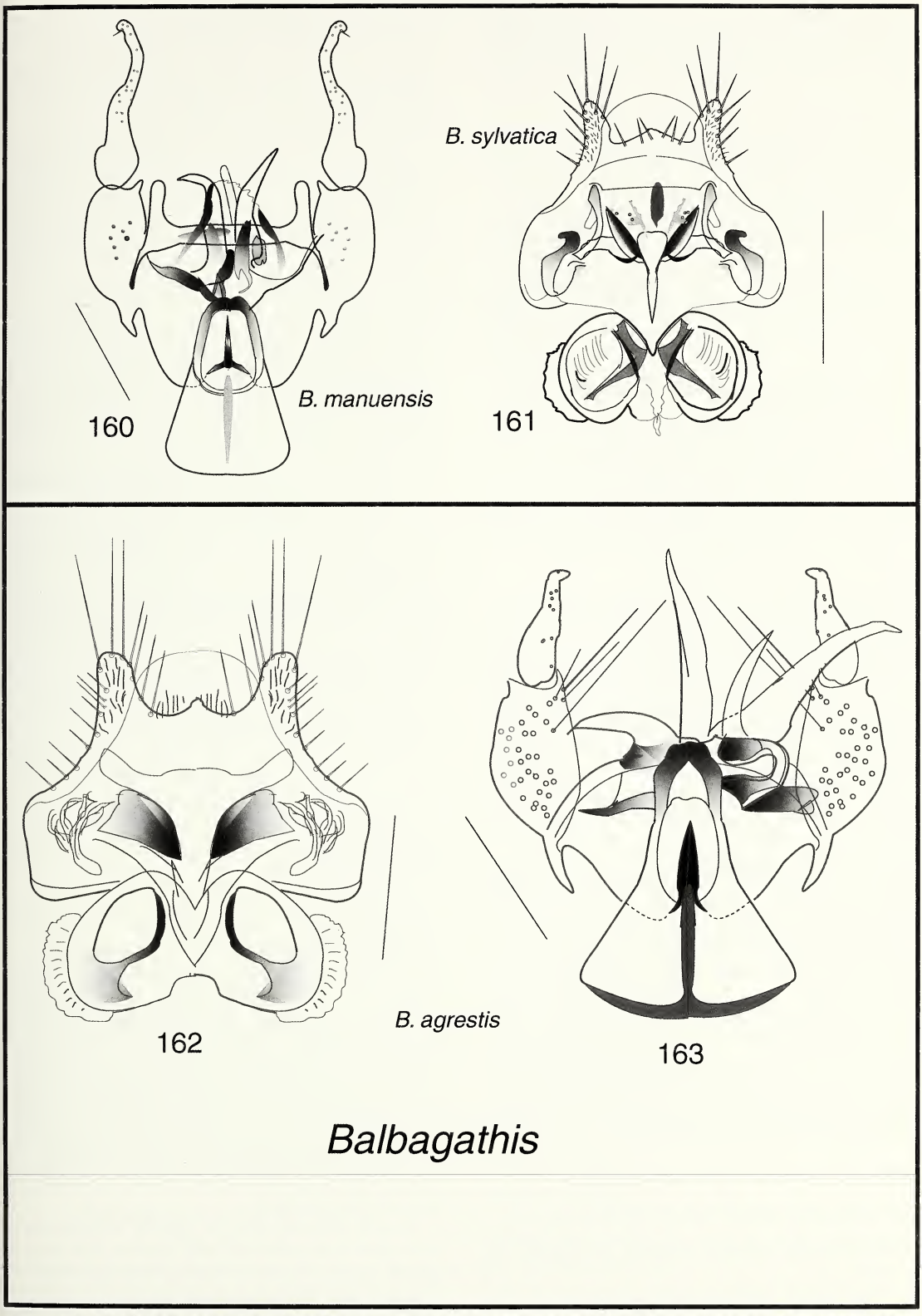
Figs. 162–163

DESCRIPTION. Male. Eye bridge with 3 facet rows; width about one-half vertex height.

Gonocoxal apodeme prominent and bilobed; gonocoxite with several long spines on posteriomedial margin plus usual hairs along lateral area; gonostylus nearly straight, with small subapical curvature; hypandrium with 2 large, hornlike spines arising from sclerotized base; base of basiphallus moderately expanded; distiphallus with a nearly straight shaft tapering to acute apex; paramere large, extends beyond apex of gonocoxite, broad at base, tapering to apex, angled away from central shaft by 45°, about as long as distiphallus; tergite 10 rounded and domelike.

Measurements. Antenna 1.05 mm (n = 2). Wing length 1.58 mm, width 0.60 mm (n = 2).

Female. Apical lobes of subgenital plate small, with many long spines; chitinous arch extends posteriorly beyond apical margin and nearly to apex



Figures 160–163 *Balbagathis* spp. 160. *B. manuensis,* male genitalia, dorsal. 161. *B. sylvatica,* female genitalia. 162–163. *B. agrestis:* 162. female genitalia; 163. male genitalia. All scale lines = 0.1 mm

of lobes; genital ducts well defined, with distinct vertical and horizontal struts, membranous fringe along lateral margins; margins of membranous plate form triangular structure in center of subgenital plate.

Measurements. Antenna 0.83–0.90 mm. Wing length 1.43–1.68 mm, width 0.53–0.63 mm ($\bar{x}$ = 1.54, 0.56; n = 9).

DISTRIBUTION. French Guiana.

HOLOTYPE. ♂, FRENCH GUIANA, Maripasoula, 17–22.iii.1994, L. Quate, light trap, marsh (LACM).

PARATYPES. 1♂, same data as holotype (LACM), 1♀, same data as holotype except light trap, streamside (LACM), 5♀, same data as previous specimen except Malaise trap, dry forest (LACM).

ETYMOLOGY. From Latin *agrestis* for rural or wild, referring to the type locality.

Balbagathis sylvatica Quate

Fig. 161

Balbagathis sylvatica Quate, 1996:32–33, figs. 12a–c; Collantes and Martínez-Ortega, 1999b: 25.

DESCRIPTION. Male. Unknown.

Female. Eye bridge with 3 facet rows, width about one-quarter vertex height.

Apical lobes of subgenital plate slender, chitinous arch extends to center of lobes; genital ducts lightly sclerotized, with well-developed vertical and horizontal struts, fine striations on dorsal surface, membranous fringe along lateral margin; membranous plate with 4–6 setae at lateral margin, pair of lobes flanking midline, lightly sclerotized leaf-shaped spot in center of posterior margin, hooked structure on each lateral margin.

Measurements. Antenna 0.85–1.00 mm ($\bar{x}$ = 0.94; n = 5). Wing length 1.33–2.00 mm, width 0.53–0.75 mm ($\bar{x}$ = 1.65, 0.63; n = 10).

DISTRIBUTION. Nicaragua, Costa Rica.

HOLOTYPE. ♀, COSTA RICA, Heredia, Est. Biol. La Selva, 1.iv.1993 (INBC; examined).

REMARKS. The female of *B. sylvatica* is similar to *B. agrestis*, but differs in distinct differences on the internal face of the subgenital plate. The sclerotized spot and the pair of lobes of *B. sylvatica* are the most evident differences. Both species possess a fringe along the lateral margin of the genital ducts, a similarity with females of *Alepia*.

KEY TO MALES OF *BALBAGATHIS*

The male of *B. sylvatica* is unknown.

1 Hypandrium without posterior projection (Fig. 144) 2
– Hypandrium with posterior projection(s) (Fig. 151) 4
2 Gonostylus sinuous, strongly curved, nearly S-shaped (Figs. 144, 146); distiphallus extends nearly as far posteriorly as gonostyli 3
– Gonostylus with less subapical curvature (Fig. 152); distiphallus relatively short . . . . . ***B. discuspis* n. sp.**
3 Distiphallus with shafts about equal in length (Fig. 144); paramere single; base of basiphallus scarcely wider than posterior part . . . . . ***B. sinuosa* n. sp.**
– Distiphallus with central shaft longer than other shaft (Fig. 146); paramere paired; base of basiphallus widely expanded . . . ***B. trispica* n. sp.**
4 Eye bridge with 3 facet rows; base of basiphallus widely expanded 5
– Eye bridge with 4 facet rows; base of basiphallus scarcely wider than posterior part (Fig. 153) . . . . . ***B. barva* n. sp.**
5 Hypandrium with triangular projection in center between pair of smaller, lateral projections . . . 6
– Hypandrium without triangular projection in center 7
6 Triangular projection from hypandrium with sclerotized bar along one side . . . . . *B. talamanca* Quate
– Triangular projection without sclerotized bar . . . . . ***B. dissimilis* n. sp.**
7 Gonostylus elongate, longer than gonocoxite (Figs. 151, 160) 8
– Gonostylus shorter than gonocoxite; distiphallus extends posteriorly as far as apex of gonostylus (Fig. 163) . . . . . ***B. agrestis* n. sp.**
8 Hypandrial processes apically rounded, ending freely (Fig. 160) . . . . . ***B. manuensis* n. sp.**
– Hypandrial processes apically acute, merging into aedeagal structures (Fig. 151) . . . . . ***B. confraga* n. sp.**

Platyplastinx Enderlein

Platyplastinx Enderlein, 1937:107; Quate, 1963: 195, 1999:433.

TYPE SPECIES. *Platyplastinx solox* Enderlein, by original designation.

DESCRIPTION. Male. Eye bridge with 3 or 4 facet rows, normal, nearly extends to midline, separated or contiguous, interocular suture present when separated; hair patch of frons dense, undivided, extends posteriorly to posterior margin of scape; antenna longer than wing length, flagellomeres fusiform, distal segments gradually become somewhat pyriform with small internodes, terminal 3 segments not reduced, terminal with long apiculis; ascoids simple, digitate, paired on all flagellomeres, very long, more than 3 times the length of segment bearing them.

Thorax without sensory organs; anepisternum with alveoli on posterior half, anterior half free of alveoli except ventral third which has sparse patch of alveoli less dense than on posterior; metapleuron with sparse alveoli except circular patch dorsally; midcoxa with tuft of long hairs arising from elevated knob of anteroventral margin. Wing with infuscate patterns; second costal node present; radial

sector usually pectinate; base of R_{2+3} attached to R_4; forks basad of wing center; R_5 ends in wing tip.

Abdominal tergites with 2 bands of alveoli. Hypandrium a tenuous band between bases of gonocoxites; gonocoxites not fused; gonocoxal apodemes broad and expanded under basiphallus, with median keel; aedeagus asymmetrical; surstylus with 1 or 2 long tenacula and group of short, rodlike accessory tenacula; distiphallus a single shaft, paramere also a single shaft; epandrium with single foramen, articulates with gonocoxite, not with hypandrium, basal margin divided.

Female. Subgenital plate ending in rounded apex and not bilobed; genital ducts small, comma-shaped, not hemispherical; lateral strut present. Cercus short and broad, little longer than wide.

REMARKS. The female subgenital plate without apical lobes is unique for the tribe. Males are distinguished by surstylus bearing normal tenacula in addition to rodlike accessory tenacula.

Platyplastinx culmosus new species

Figs. 164–166

DESCRIPTION. Male. Eyes separated by less than 1 facet diameter, eye bridge with 4 facet diameters; interocular suture slightly arched; antenna broken; palpus extends to flagellomere 6, ratio of palpomeres 10:13:13:17.

Wing lightly infuscated, without patterns; radial and medial forks on same level, both complete.

Hypandrium connects small gonocoxites, expanded in center; gonostylus long with dark tip, extends little beyond tip of distiphallus; distiphallus with pointed apex; basiphallus triangular; paramere shorter than distiphallus, pointed, about same width and closely adhering to distiphallus; epandrium and tergite 10 indiscernible (not dissected); surstylus with about 12–15 long, slender tenacula with fimbriate tips on basal half and about 10 short, rodlike accessory tenacula (only a few of which are visible in Fig. 165).

Measurements. Wing length 2.00–2.18 mm, width 0.78–0.85 mm ($\bar{x}$ = 2.08, 0.83; n = 6).

Female. Unknown.

DISTRIBUTION. Ecuador.

HOLOTYPE. ♂, ECUADOR, Napo, Yasuni Research Station, 76°36′W, 0°38′S, x.1998, W. Hanson, 250 m (LACM).

PARATYPES. 6♂, same data as holotype (EMUS, LACM, QCAZ).

ETYMOLOGY. From Latin *culmosus* for "full of stalks," referring to the multiple tenacula.

Platyplastinx tango new species

Figs. 167–170

DESCRIPTION. Male. Eyes contiguous; bridge with 4 facet rows; antenna as *Platyplastinx apodastos* n. sp.; palpus extends to flagellomere 5, ratio of palpomeres 10:17:24:25.

Wing irregularly infuscated, margins darker on distal half with clear spots between vein tips, dark spots in costal cell, on radial fork, at base of R_5, at medial fork, and at base of CuA_2; radial fork basad of medial by about 2.5 cell widths, both forks incomplete.

Hypandrium a slender band connecting gonocoxites; gonostylus plain, with blunt apex; basiphallus fan-shaped; distiphallus slightly sinuous, tapering to narrow apex; paramere much longer than distiphallus, ending in blunt apex; epandrium and tergite 10 indiscernible, surstylus very short, with 1 long tenaculum and 4 short peglike accessory tenacula arising from heavily sclerotized base.

Measurements. Antenna 2.55 (n = 1). Wing length 2.20–2.33 mm, width 0.95–0.98 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Alajuela, 20 km S Upala, 22.i.1991, F. Parker (INBC).

PARATYPE. 1♂, same data as holotype except 22–30.vi.1991 (LACM).

ETYMOLOGY. From Latin *tango* for touch, referring to the contiguous eyes.

Platyplastinx crossomiscos new species

Figs. 171–172

DESCRIPTION. Male. Eyes separated by about 1.5 facet diameters, eye bridge with 4 facet diameters; interocular suture inverted Y-shaped; antenna as *P. apodastos*; palpus extends to flagellomere 6, ratio of palpomeres 10:13:13:20.

Wing patterns similar to *Platyplastinx moragai* (Quate) (Fig. 174), lightly infuscated with clear spots between vein tips and dark spots on vein tips and base of R_5; radial and medial forks nearly on same level, both complete.

Hypandrium expanded in center, joins gonocoxites; gonostylus long, extends nearly to tip of distiphallus; distiphallus tapering to blunt apex; basiphallus triangular; paramere shorter than distiphallus, tapers to acute apex; surstylus with tenacula on basal half with expanded, fimbriate tips and 20 shorter accessory tenacula on distal half, with striated tips.

Measurements. Wing length 2.15–2.25 mm, width 0.80–0.83 mm ($\bar{x}$ = 2.20, 0.81; n = 2).

Female. Unknown.

DISTRIBUTION. Ecuador.

HOLOTYPE. ♂, ECUADOR, Pichincha, E. Santo Domingo, 8–14.v.1988, W. Hanson and G. Bohart (LACM).

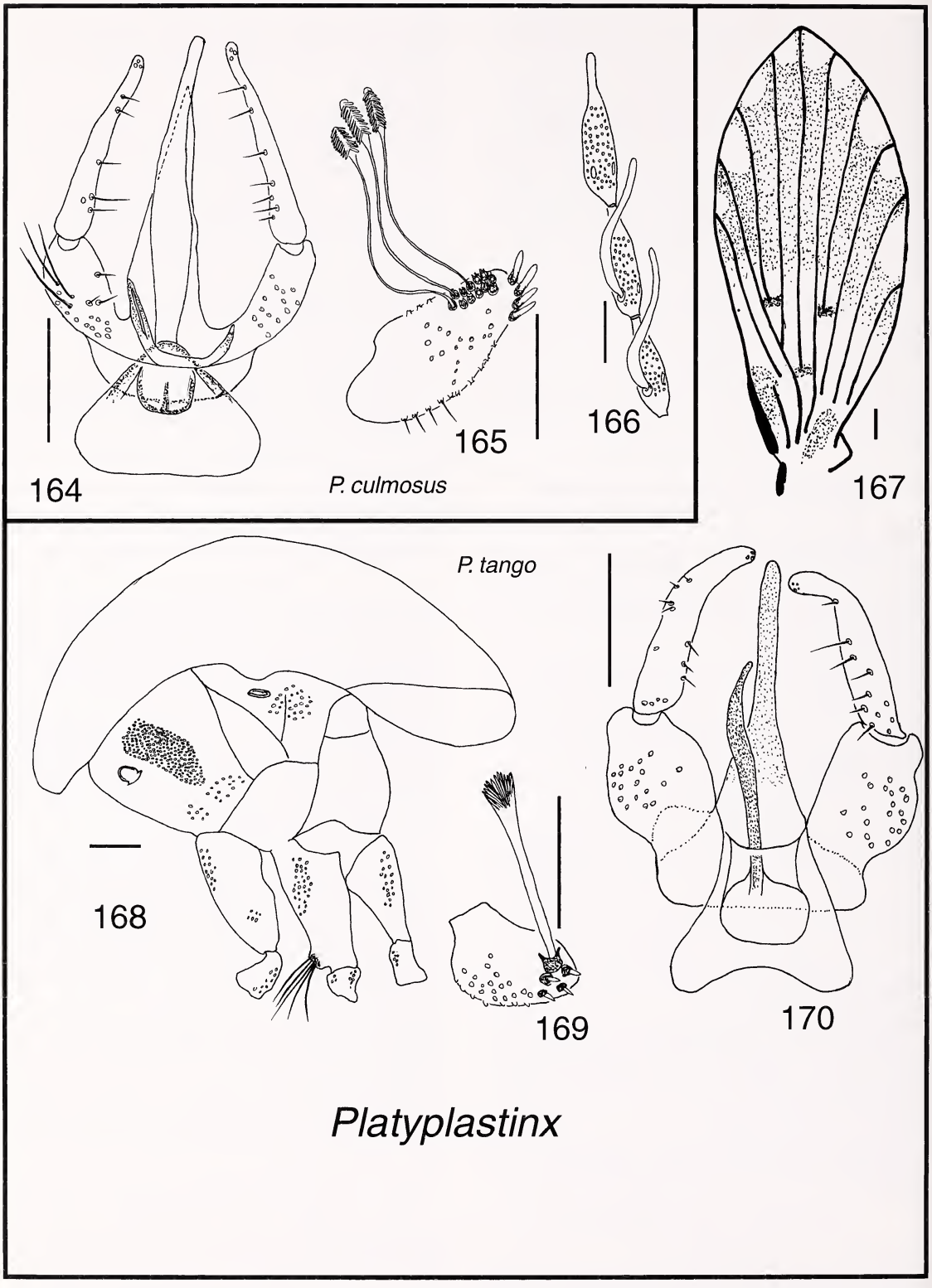
PARATYPES. 2♂, same data as holotype (EMUS, LACM).

ETYMOLOGY. From Greek *krossotos* for fringed and *mischos* for stem or stalk, referring to the fimbriate tenacula.

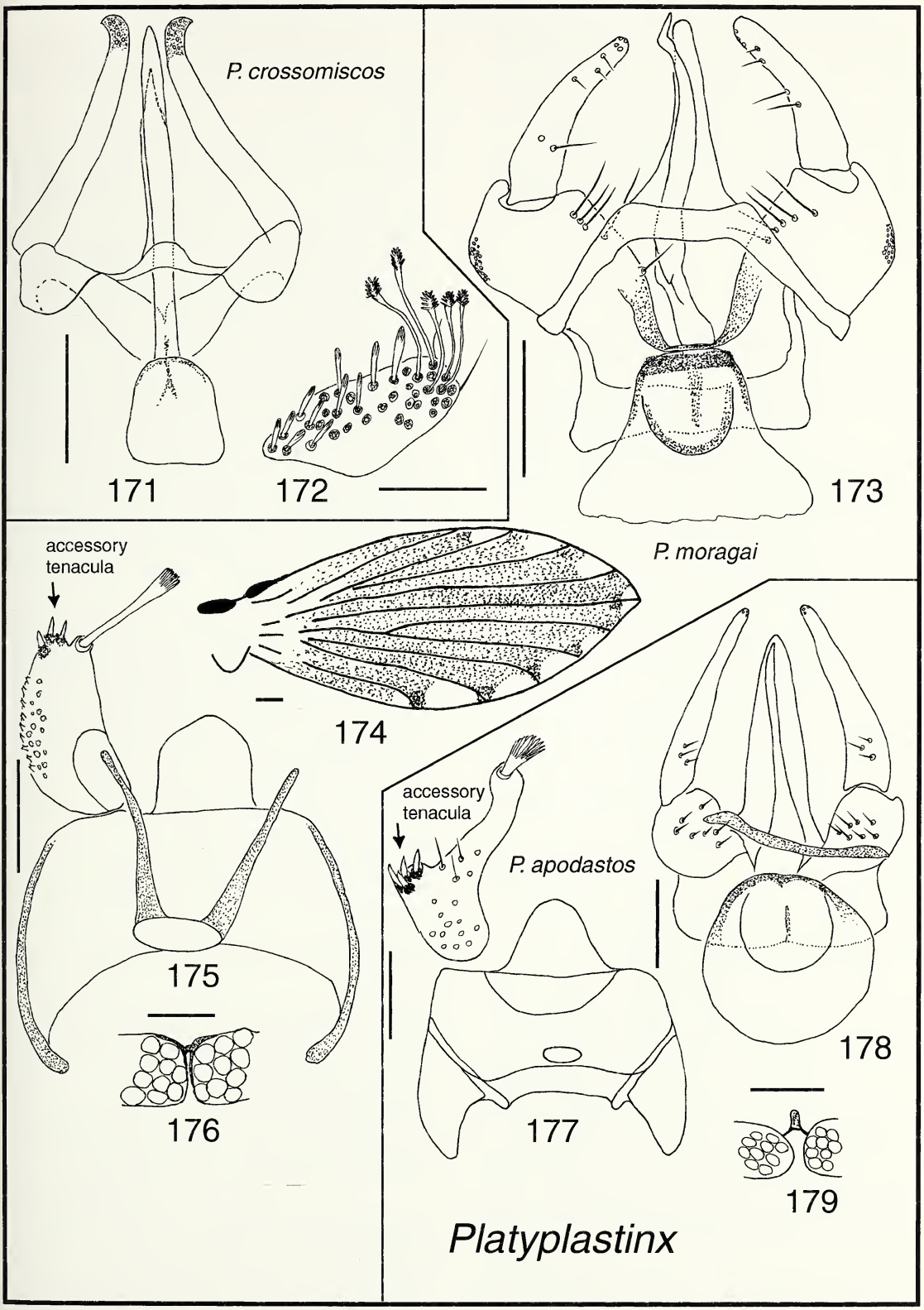
Platyplastinx sycophantos (Quate)

Brunettia sycophanta Quate, 1955:190–191, figs. 56a–f.

Platyplastinx sycophanta; Duckhouse, 1966:187.



Figures 164–170 *Platyplastinx* spp. 164–166. *P. culmosus:* 164. male genitalia, dorsal; 165. male surstylus, lateral; 166. flagellomeres 12–14. 167–170. *P. tango:* 167. wing; 168. thorax, lateral; 169. male surstylus, lateral; 170. male genitalia, dorsal. All scale lines = 0.1 mm



Figures 171–179 *Platyplastinx* spp. 171–172. *P. crossomiscos:* 171. male genitalia, dorsal; 172. male surstylus, lateral. 173–176. *P. moragai:* 173. male genitalia, dorsal; 174. wing; 175. male epandrium, surstylus, tergite 10, dorsal; 176. center of eye bridge. 177–179. *P. apodastos:* 177. male epandrium, surstylus, tergite 10, dorsal; 178. male genitalia, dorsal; 179. center of eye bridge. All scale lines = 0.1 mm

DESCRIPTION. Eyes contiguous; eye bridge with 3 facet rows. Wing with median infuscated band with distal extension to wing tip, no clear areas or spots along margin. Surstylus with 3 tenacula and about 5 accessory tenacula.

DISTRIBUTION. Southern United States.

REMARKS. Although not yet recorded from the Neotropics, *P. sycophantos* belongs to a Neotropical group. It is present in Florida, USA, and nearby states, and may be introduced.

Platyplastinx moragai (Quate)
Figs. 173–176

Tonnoira moragai Quate, 1996:34–36, figs. 13f–j.
Platyplastinx moragai; Quate, 1999:434.

DESCRIPTION. Male. Eyes separated by less than 1 facet diameter; interocular suture strong, without median spur; bridge with 4 facet rows, inner margins quadrate; antenna (broken, presumed 14 flagellomeres); flagellomeres large, nearly as wide as pedicel; palpus extends to flagellomere 5, ratio of palpomeres 10:16:19:23.

Wing lightly infuscated with clear spots between vein tips, darker spots on vein tips and base of R_5; radial fork basad of medial by about 6 cell widths, very close to R_2, R_3 and M_2 weakened at base.

Hypandrium a band connecting gonocoxites; gonostylus plain, with blunt apex; basiphallus fan-shaped; distiphallus slightly curved subapically, tapering at apex; paramere adhering to distiphallus and partly enclosing it, ending in blunt apex; ventral epandrial sclerite slender, extends from oval base to base of surstylus; surstylus very short, length less than epandrium, with 1 long tenaculum and 3 short peglike accessory tenacula; tergite 10 parallel sided with pointed apex.

Measurements. Wing length 2.18–2.50 mm, width 0.85–1.05 mm ($\bar{x}$ = 2.33, 0.97; n = 10).

Female. Flagellomeres smaller than those of male, palpus extends to flagellomere 4. Subgenital plate rounded at apex, not bilobed.

DISTRIBUTION. Costa Rica, Panama, Brazil.

HOLOTYPE. ♂, COSTA RICA, Guanacaste, Estación Pitilla, 9 km S Santa Cecilia, 10–14.vii.1993, L. Quate, light trap (INBC; examined).

NEW SPECIMENS STUDIED. BRAZIL, Rondônia, Cacaulândia, 300 km SSE Porto Velho, 10°18′S, 62°52.1′W, 14♂, 1♀, 22–31.x.1997, W. Hanson, 140 m (EMUS, INPA, LACM).

REMARKS. Other species of *Platyplastinx* are not known to have large ranges such as that of *P. moragai*, but our knowledge of the genus is still in its infancy. There are no apparent differences between the Central American and Brazilian specimens.

Platyplastinx apodastos new species
Figs. 177–179

DESCRIPTION. Male. Eyes separated by about 1 facet diameter; interocular suture strong, with median spur; bridge with 4 facet rows, inner margins rounded; antenna longer than wing; flagellomeres large, nearly as wide as pedicel; apical flagellomere with short apiculis, much shorter than node.

Wing patterns similar to *P. moragai*, lightly infuscated with clear spots between vein tips and dark spots on vein tips and base of R_5; radial and medial forks nearly on same level, medial fork incomplete, i.e., base of M_2 lacking.

Hypandrium a darkened bar connecting gonocoxites; gonostylus very long, extending beyond tip of distiphallus, nearly straight, lightly sclerotized, ending in blunt apex; basiphallus somewhat diamond-shaped; distiphallus slender, nearly parallel-sided until pointed apex; paramere closely adhered to and partly enclosing distiphallus, broader than distiphallus, ending little beyond apex of distiphallus; epandrium broader than long, with lobe on each side of midline at base, ventral epandrial sclerite extends from lobe to apicolateral margin; surstylus with 1 apical tenacula and 9 accessory tenacula at basal one-third; tergite 10 triangular.

Measurements. Antenna 2.40–2.53 mm (n = 2). Wing length 2.45–2.83 mm, width 1.02–1.13 mm ($\bar{x}$ = 2.64, 1.08; n = 5).

Female. Unknown.

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Rondônia, Cacaulândia, 200 km SSE Port Velho, 10°18′W, 62°52.1′W, 7–18.xi.1995, W. Hanson, 140 m (INPA).

PARATYPES. 3♂, same data as holotype (EMUS, LACM), 1♂, same data as holotype except 16–22.iii.1991 (LACM).

ETYMOLOGY. From Greek *apodastos* for separated, referring to the distance between the tenaculum and the accessory tenacula.

REMARKS. The unusual male surstylus with the cluster of accessory tenacula near the base separates *P. apodastos* from other species of *Platyplastinx*.

KEY TO MALES OF *PLATYPLASTINX*

1 Wing patterned with contrasting infuscations and clear areas (Figs. 167, 174) 2
– Wing plain, unpatterned . . . ***P. culmosus* n. sp.**
2 Eyes contiguous 3
– Eyes separated 4
3 Eye bridge with 3 facet rows (southern USA) . . . . . *P. sycophantos* Quate
– Eye bridge with 4 facet rows (Costa Rica) . . . . . ***P. tango* n. sp.**
4 Interocular suture straight or arched, without median spur 5
– Interocular suture inverted Y-shaped, with median spur . . . . . ***P. crossomiscos* n. sp.**
5 Peglike accessory tenacula located at apex of surstylus (Fig. 175) . . . . . *P. moragai* (Quate)
– Accessory tenacula located at base of surstylus (Fig. 177) . . . . . ***P. apodastos* n. sp.**

Arisemus Satchell

Telmatoscopus (*Arisemus*) Satchell, 1955:88.
Arisemus; Botosaneanu and Vaillant, 1970:176; Duckhouse, 1974a:149; Vaillant, 1986:334; Quate, 1996:21–23.
Bazara Vaillant, 1986:337. **New synonymy.** Type species: *Arisemus tetradactylus* Botosaneanu and Vaillant; by original designation.

TYPE SPECIES. *Psychoda grabhamana* Dyar, by synonymy with originally designated type species, *Telmatoscopus* (*Arisemus*) *maculosus* Satchell.

DESCRIPTION. Eye bridge with 3 facet rows, eyes contiguous; labellum flattened; basal flagellomeres usually fusiform, but may be nodiform, if nodiform, internode short or absent on basal flagellomeres and lengthening distally, but never longer than node, terminal 3 flagellomeres reduced (except *A. amydrus* n. sp.) and lacking internodes; ascoids simple, single rods.

Anepisternite sometimes with sensory organs, with central patch of hairs; midcoxa with patch of hairs on anteroapical margin; wing patterned with infuscations or plain; Rs usually pectinate, radial and medial forks close to base, well basad of center (except *A. confertus* n. sp.); R_5 ends in wing apex.

Male. Anterior gonocoxal apodemes broad and joined in center; with keel connected to aedeagus; base of gonocoxites with or without dorsal connection; distiphallus asymmetrical; basiphallus large and spoon- or paddle-shaped; surstylus with 1 tenaculum; epandrium with 2 foramina.

Female. Subgenital plate bilobed at apex; genital ducts hemispherical with indistinct posterior margin; setal sclerite lacking; cercus much longer than wide.

REMARKS. *Arisemus* is distinguished from other genera of Setomimini by the contiguous eyes, reduction of the terminal 3 flagellomeres, termination of R_5 in the wing tip, and the 1 tenaculum on the male surstylus. The female genitalia have a characteristic, simple structure, which is difficult to convey in words; study of the figures will clarify their general form.

Duckhouse (1974a) regards *A. maculosus* (Satchell) a synonym of *A. grabhamana* (Dyar); thus, *A. grabhamana* is the type species. However, *A. maculosus* (Satchell) is a junior homonym of *A. maculosus* (Rapp), and if the synonymy of *A. grabhamana* is proved to be incorrect, *A. maculosus* (Satchell) must be renamed. To avoid adding to the nomenclatorial confusion, no new names are introduced at this time since we agree that the synonymy stated by Duckhouse is correct.

Vaillant (1986) gave a lengthy redefinition of *Arisemus* based largely on these characters: eyes contiguous or separated, bridge with 3–5 facet rows; antenna with 15 or 16 segments; flagellomeres 1–10 fusiform, bulb-shaped with short stem; and aedeagus asymmetrical. We think that this definition is too broad and produces a highly paraphyletic taxon. Therefore, we reject Vaillant's definition and use the one given above, removing *Lobulosa* Szabo as a subgenus of *Arisemus*. It is left to other workers to evaluate the Palearctic species included by Vaillant in *Arisemus*, but it seems doubtful that *Arisemus*, as we define the group, occurs there.

The two species placed in *Bazara* by Vaillant (1986) are distinctive, with the fused gonocoxites and branched gonostylus, but these features do not warrant generic, or even subgeneric, status. Because they share the contiguous eyes, reduced terminal flagellomeres, spotted wings, asymmetrical aedeagus, and 1 tenaculum with many other species of *Arisemus*, *Bazara* is placed into synonymy.

Arisemus hexadactylus Botosaneanu and Vaillant

Arisemus hexadactylus Botosaneanu and Vaillant, 1970:180–181, pl. I, fig. 8 pl. II, figs. 1–13.
Bazara hexadactyla; Vaillant, 1986:337.

DESCRIPTION. Male. (From Botosaneanu and Vaillant, 1970). Scape with ventral projection, with long, clavate bristle with striations at apex; palpomeres 2 and 3 with dark scales on dorsal surface and long, fine bristles ventrally; anepisternum with prominent sensory organ covered with long, black scales; wing with 9 brown spots at tips of all veins except R_5 and on radial fork, spots at tips of R_1, CuA_1, and CuA_2 larger than others; Sc very short; Rs pectinate; CuA_2 does not reach wing margin; gonocoxites broadly fused on dorsal surface, with blunt apical projection from ventral margin; gonostylus dark and trifurcate, with 2 dorsal projections short and sharply pointed, and long ventral projection rounded at tip; tergite 10 quadrate.

Female. Apical lobes of subgenital plate with concave sides; chitinous arch reaches posterior margin of plate between lobes.

DISTRIBUTION. Cuba.

HOLOTYPE. ♂, CUBA, Rio Caburny, 1.v.1969, L. Botosaneanu, 550 m (CNFV; not examined).

Arisemus tetradactylus Botosaneanu and Vaillant

Arisemus tetradactylus Botosaneanu and Vaillant, 1970:181–182, pl. III, figs. 1–4.
Bazara tetradactyla; Vaillant, 1986:337.

DESCRIPTION. Male. (From Botosaneanu and Vaillant, 1970). Scape cylindrical and without long hair; thorax with sensory organ as in *A. hexadactylus*, wing with spots at tips of veins, except R_5, and on radial fork; Sc short; Rs not pectinate, base of R_{2+3} does not join with R_4, CuA_2 does not reach wing margin and with spur; gonocoxites broadly fused at base; gonostylus bifurcate, U-shaped, both branches rounded at apex, lateral branch about two-thirds length of larger; distiphallus and paramere curved and tapering to sharp apices, distiphallus longer than paramere.

Female. Unknown.

DISTRIBUTION. Cuba.

HOLOTYPE. ♂, CUBA, Palenque, 31.iii.1969, L. Botosaneanu, 420 m (CNFV; not examined).

Arisemus boxi (Satchell)
Fig. 186

Telmatoscopus (*Arisemus*) *boxi* Satchell, 1955:89–90, fig. 3.
Arisemus boxi; Botosaneanu and Vaillant, 1970: 178; Vaillant, 1986:336; Wagner, 1993:124.

DESCRIPTION. Male. Eyes contiguous; pedicel with few dark scales on mesal surface; flagellomeres lacking; ratio of palpomeres 10:13:17:25.

Anepisternum with black sensory organ above spiracle, organ composed of densely packed scales or granules arranged in sphere, about 2 times size of spiracle; alveoli confined to lower part of anterior half. Wing with brown spots on vein tips, except R_5 and base of CuA_2; second costal node absent, small pad at base of costa with small tuft of hairs; Sc short, ends at level of base of R_{2+3}; Rs not pectinate, base of R_4 curved anteriorly to lie close to R_{2+3}, with row of long hairs on curved section basad of radial fork; CuA_2 extends to wing margin; alula with large tuft of hairs.

Gonocoxite with small conical process near base, right side bearing tuft of 3 hairs; distiphallus and paramere extend well beyond gonocoxite apex; distiphallus with 2 branches, 1 large and curved away from center, other small and mostly obscured by paramere; paramere as long as major branch of distiphallus, with subapical enlargement.

Measurements. Wing length 1.85 mm, width 0.73 mm.

Female. Unknown.

DISTRIBUTION. St. Lucia, Martinique.

HOLOTYPE. ♂, ST. LUCIA, Bar de l'Isle, 20.x.1935, H. E. Box (BMNH; examined).

REMARKS. The distinguishing features of the males of *A. boxi* are the scales on the pedicel, the alular tuft of hairs, the unusual curvature in R_4, and the genitalic characters, all of which have been illustrated by Satchell (1955: fig. 3) and Wagner (1993: figs. 50–56). However, there are discrepancies in the illustrations of the two authors. Satchell (fig. 3B) shows a row of long hairs on a curved base of R_4, which is not shown by Wagner (fig. 54); the senior author has confirmed that these are present in the holotype. Satchell (fig. 3C) illustrates the distiphallus with a single branch, but Wagner (fig. 56) figures it with 2 branches; the senior author has confirmed that there are 2 branches in the holotype, although the smaller is largely hidden by the paramere. The apical prolongation of the gonocoxite is shown by Satchell to be dark and with 4 setae, while Wagner shows it to be clear and with 7 setae; in the holotype, the senior author found that the prolongation is clear and possesses 3 bristles. The differences in Wagner's illustration are minor and there is no doubt that he properly identified the Martinique specimens.

Arisemus maesi new species
Figs. 180–181

DESCRIPTION. Male. Apex of vertex plain; frons hair patch without median extension, center of frons hair patch divided; dark scales on antenna of male absent; scape normal, ratio of pedicel about 1.5:1; flagellomeres 1 and 2 separated, 1 normal; terminal 3 globular, reduced, smaller than preceding segments.

Thorax with sensory organ on anepisternum, located posterior of spiracle, marked by small, dense cluster of black, spatulate hairs, organ small, no larger than spiracle. Wing normal, length 2–2.5 times width; infuscate patterns limited to vein tips and forks; second costal node absent; costa normal, without concavity; Sc short, ends at or before base of R_{2+3}; Rs pectinate, R_1 normal; radial fork complete, i.e., R_2 and R_3 attached, at about same level as medial; R_4 normal; medial fork complete, M_2 joined to M_1; CuA_2 without enlargement, apex does not reach margin.

Abdominal sternites without black scales. Gonocoxite simple, without processes or large spines; base of gonocoxites on dorsal side not joined; hypandrium inconspicuous; gonostylus without cluster of hairs; distiphallus undivided, apex beaklike, nearly as long as gonocoxite; paramere sausage-shaped, broader than and same length as distiphallus; epandrium width equals or exceeds length; surstylus without spatulate hairs; tergite 10 dome-shaped.

Measurements. Antenna 0.79 mm (n = 2). Wing length 1.75 mm, width 0.63 mm (n = 2).

Female. Subgenital plate quadrangular, with V-shaped apical concavity, chitinous arch varies from extending nearly to apical border to ending some distance from the border, inner face with conspicuous median bar; lateral and longitudinal struts absent.

Measurements. Antenna 0.76–0.83 mm ($\bar{x}$ = 0.78; n = 6). Wing length 1.72–1.94 mm, width 0.55–0.62 mm ($\bar{x}$ = 1.87, 0.60; n = 7).

DISTRIBUTION. Nicaragua.

HOLOTYPE. ♂, NICARAGUA, Granada, Volcan Mombacho, 11°50′N, 85°51′W, 15.xi.1998, J. Maes, Malaise trap, 1100 m (LACM).

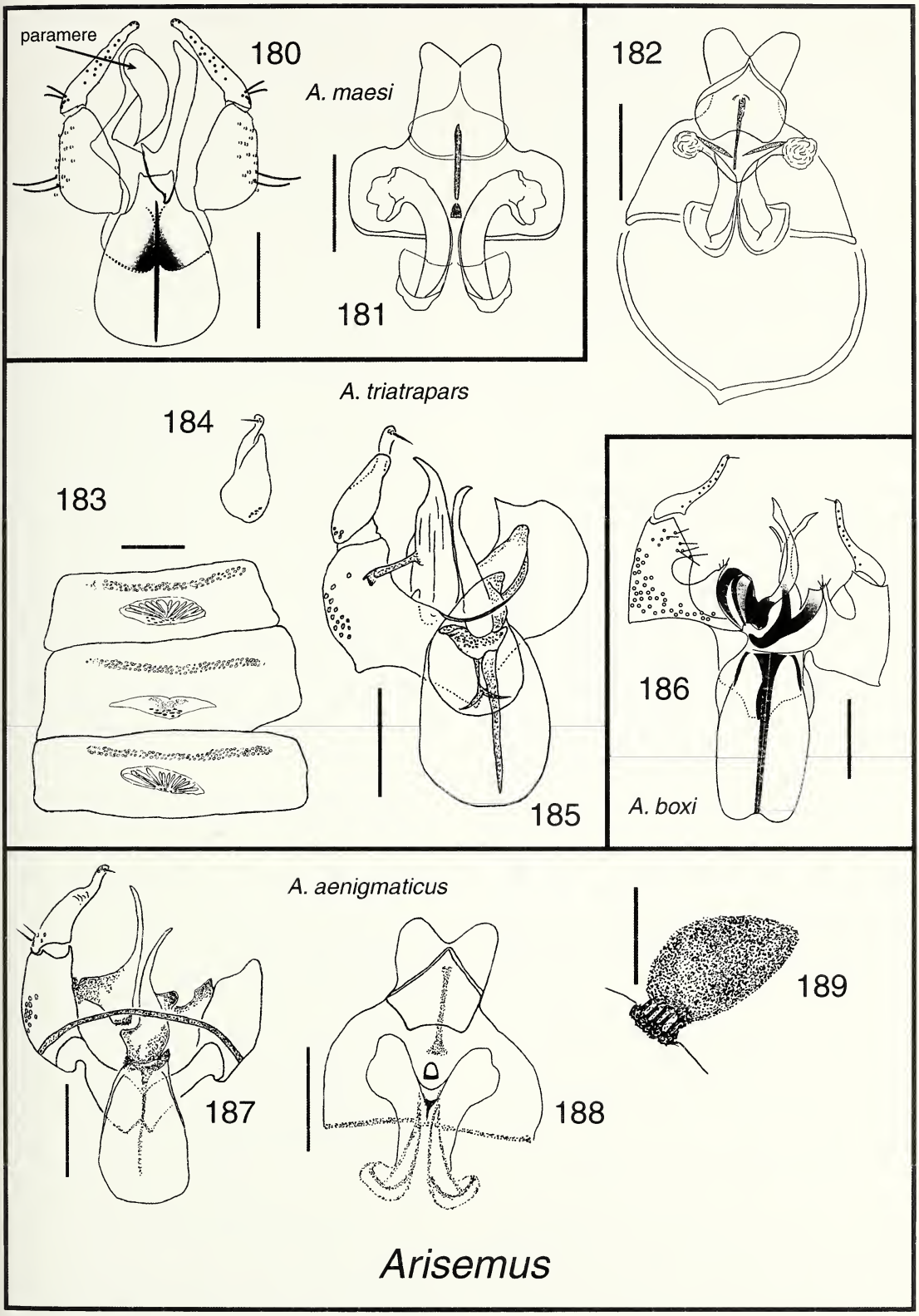
PARATYPES. 1♂, 4♀, same data as holotype (LACM), 1♀, same data as holotype except 30.ix.1998, 1♀, same data as holotype except 30.x.1998, 2♀, same data as holotype except 30.xi.1998 (LACM, Museo Entomologico, Leon, Nicaragua).

ETYMOLOGY. Named to recognize the collector, J. M. Maes, and his important contributions to the entomology of Nicaragua.

Arisemus salazari Quate

Arisemus salazari Quate, 1996:25, figs. 9h–i.

DESCRIPTION. Male. Frons hair patch without median extension, divided in center; flagellomeres



Figures 180–189 *Arisemus* spp. **180–181.** *A. maesi:* **180.** male genitalia, dorsal; **181.** female genitalia. **182–185.** *A. triatrapars:* **182.** female genitalia; **183.** abdominal sternites 5–7; **184.** male gonostylus; **185.** male genitalia, dorsal. **186.** *A. boxi,* male genitalia, dorsal. **187–189.** *A. aenigmaticus:* **187.** male genitalia, dorsal; **188.** female genitalia; **189.** sensory organ on anepisternite. All scale lines = 0.1 mm

1–11 nodiform, terminal 3 globular, reduced, smaller than preceding segments.

Wing infuscate patterns limited to vein tips and forks; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork at same level as medial.

Hypandrium a narrow band connecting paramere to gonocoxite; with digitiform projection on one side halfway between center and lateral margin, without large spines; distiphallus and paramere extend well beyond gonocoxite apex; distiphallus undivided, slender; paramere thicker at base than distiphallus; surstylus without spatulate hairs; tergite 10 triangular.

Female. Tergites 8 and 9 with thin, sclerotized margin as in *A. triatrapars* n. sp.; apical lobes of subgenital plate short and broad.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Limón, Puerto Viejo de Talamanca, 20–22.vii.1993, L. Quate (INBC; examined).

Arisemus guhli Wagner and Joost

Arisemus guhli Wagner and Joost, 1994:76–77, figs. 1–7.

DESCRIPTION. Male. (From Wagner and Joost). Frons hair patch divided in center. Flagellomeres 1–11 nodiform, terminal 3 globular, reduced, smaller than preceding segments.

Wing infuscate patterns limited to vein tips and forks; those at tips of R_1, CuA_1, CuA_2 larger than others; Sc extends to level of base of R_{2+3}; Rs pectinate; radial fork on same level as medial; oval patch at base of M_3 consisting of cluster of cell-like objects.

Hypandrium apparently a narrow band attached to bases of gonocoxites; gonostylus bifurcate, with short, median projection; distiphallus and paramere extend well beyond gonocoxite apex; tergite 10 triangular.

DISTRIBUTION. Colombia.

HOLOTYPE. ♂, COLOMBIA, Rio Magdalena, San Agustin, 15.x.1987, W. Joost (ULMG; not examined).

Arisemus triatrapars new species

Figs. 182–185

DESCRIPTION. Male. Vertex pointed and slightly elongate; frons hair patch divided in center, anteromedial margins concave; scape about 1.5 times pedicel; flagellomeres 1–11 nodiform, most conspicuous in distal segments, terminal 3 globular, reduced, smaller than preceding segments.

Thorax without sensory organs. Wing narrow, length more than 3 times width, with spots at vein tips; Sc short, ends basad of base of R_5; Rs pectinate; radial fork complete, very close to base of R_4, slightly basad of medial fork; CuA_2 without enlargement, ends in wing margin.

Abdominal sternites 3, 4, and 5 with band of black scales in center of anterior margins. Hypandrium a short band between extended dorsal bases of gonocoxites; posterior gonocoxal apodemes form a sclerotized shelf below aedeagus; gonostylus bifurcate, with short, median projection, in dorsal aspect projection rounded, but acute in lateral aspect; distiphallus and paramere extend well beyond tip of gonocoxite; distiphallus slender, ends in curved point; paramere broader and longer than distiphallus; epandrium width equal to or greater than length; surstylus without spatulate hairs; tergite 10 triangular.

Measurements. Antenna 0.61–0.77 mm ($\bar{x}$ = 0.69; n = 10). Wing length 1.48–1.68 mm, width 0.48–0.53 mm ($\bar{x}$ = 1.57, 0.49; n = 10).

Female. Lacking patch of scales on abdominal sternites; anterior margin of tergite 8 a thin, sclerotized band that attaches in pleural area to similar band encircling abdominal segment 9, most clearly seen in lateral view, in flattened dorsal or ventral view, margin of tergite 8 forms semicircular band connected to band of segment 9. Sides of subgenital plate angulate; chitinous arch of subgenital plate reaches margin between apical lobes; rugose sphere at posterolateral margins of membranous plate.

Measurements. Antenna 0.64–0.84 mm ($\bar{x}$ = 0.74; n = 10). Wing length 1.48–1.78 mm; width 0.45–0.60 mm ($\bar{x}$ = 1.66, 0.54; n = 10).

DISTRIBUTION. Costa Rica, Panama, Venezuela.

HOLOTYPE. ♂, COSTA RICA, Limón, Res. Biol. Hitoy Cerere, 9°48.4′N, 83°1.5′W, 17–26.ii.1999, L. Quate, Malaise trap over small stream, 100–200 m [barcode INBIOCRI0014724 39] (INBC).

PARATYPES. 8♂, 3♀, same data as holotype (LACM, USNM), 12♂, 6♀, same data as holotype except Malaise trap, Rio Cerere, shaded stream (BMNH, INBC, LACM, USNM), 1♀, same data as holotype except Malaise trap, primary forest (LACM), 1♀, same data as holotype except *Heliconia* floodplain (LACM).

OTHER SPECIMENS STUDIED. PANAMA, Barro Colorado I., 9°9′N, 79°31′W, 1♂, 4–11.xii.1996, J. Pickering, Malaise trap #7125 (LACM). VENEZUELA, Aragua, Maracay, 6♂, 10–14.ix.1993, L. Quate, light trap (LACM).

ETYMOLOGY. From Latin *tri* for three, *ater* for black, and *pars* for piece, referring to 3 rows of black scales on the sternites.

REMARKS. The males from Panama and Venezuela appear indistinguishable from the types. There are a series of females from the type locality and Venezuela, all associated with males, that differ from the female types in that the chitinous arch does not extend to the apical margin; otherwise, they are similar and have the rugose sphere on the membranous plate. Presumably, this is simply a variation, but since it is a conspicuous difference that may prove to distinguish another species, these females are not included in the type series.

Arisemus aenigmaticus new species
Figs. 187–189

DESCRIPTION. Male. Vertex projecting in small point; interocular suture without spur on midline above eye bridge; frons hair patch without median extension, divided in center; flagellomeres 1–11 nodiform, most conspicuous in distal segments, terminal 3 globular, reduced, smaller than preceding segments; ratio of palpomeres 10:10:12:21.

Antepronotum with fig-shaped sensory organ in front of anterior spiracle (Fig. 189), stem of organ multipartite, surrounded by thin membrane. Wing with spots at vein tips; second costal node absent; Sc short, ends at level of base of R_5; Rs pectinate; radial fork basad of medial by 2 cell widths; CuA_2 does not reach wing margin.

Gonostylus not bifurcate, reduced near apex; distiphallus and paramere extend well beyond gonocoxite apex, distiphallus ending in curved, tapered point; paramere broad at base, but suddenly constricted and also ending in curved tapered point, extends far beyond tip of distiphallus; surstylus with about 30 black, spatulate hairs on dorsal surface near base; tergite 10 triangular.

Measurements. Wing length 1.98–2.05 mm, width 0.65–0.70 mm (n = 2).

Female. Apical lobes of subgenital plate with parallel sides; chitinous arch extends nearly to apical margin; genital ducts small and hemispherical; membranous plate with little sclerotization.

Measurements. Antenna 0.93 mm (n = 1). Wing length 1.81–2.05 mm, width 0.58–0.70 mm ($\bar{x}$ = 1.93, 0.63; n = 5).

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Heredia, La Selva Biol. Sta., 12.ii.1993, ALAS Project, Malaise trap M/00/15 (INBC).

PARATYPES. 2♂, 1♀, same data as holotype (LACM), 1♀, same data as holotype except 1.iv.1993, Malaise trap M/09/56 (LACM), 1♀, same data as holotype except 1.vii.1993, Malaise trap M/14/148 (LACM), 1♀, same data as holotype except 1.xii.1993, Malaise trap M/13/287 (INBC).

ETYMOLOGY. From Latin *aenigmaticus* for perplexing, referring to the unusual location of the male sensory organ.

REMARKS. The location of the male sensory organ on the anterior part of the pronotum in front of spiracle is unusual; thoracic organs are usually located on the anepisternum.

Arisemus woodi new species
Figs. 190–191

DESCRIPTION. Male. Vertex sagittate at apex; frons hair patch divided in center, alveoli dense, denser on anterior and median margins; flagellomeres 1–11 nodiform, most conspicuous in distal segments, terminal 3 globular, reduced, smaller than preceding segments, terminal with small apiculis; ascoids digitiform, extend to apex of segment, paired on flagellomeres 1–11.

Thorax without sensory organ. Wing plain, without infuscations; second costal node absent; Sc short, ends before base of R_{2+3}; Rs pectinate; radial fork little basad of medial, very close to base of R_4, medial fork incomplete, base of M_2 not attached to M_1; CuA_2 extends to wing center.

Gonopods normal; gonocoxal apodemes sclerotized, with rounded lobe on each side of distiphallus; hypandrium an arched band connecting bases of gonocoxites, without projection; distiphallus heavily sclerotized, apex straight and tapered; 2 parameres membranous and inconspicuous, curved, end well before apex of distiphallus; tergite 10 triangular.

Measurements. Antenna 0.84–1.04 mm ($\bar{x}$ = 0.96; n = 10). Wing length 2.17–2.39 mm, width 0.70–0.84 mm ($\bar{x}$ = 2.24, 0.75; n = 10).

Female. Similar to male. Subgenital plate with chitinous arch extending only to center of apical lobes; genital ducts simple, hemispherical, anterior rugose; longitudinal struts end in lobular apex with sclerotized interior and membranous outer margin; T-shaped bar in center of membranous plate.

Measurements. Antenna 0.94 mm (n = 3). Wing length 2.22–2.39 mm, width 0.72–0.84 mm ($\bar{x}$ = 2.35, 0.78; n = 5).

DISTRIBUTION. Costa Rica.

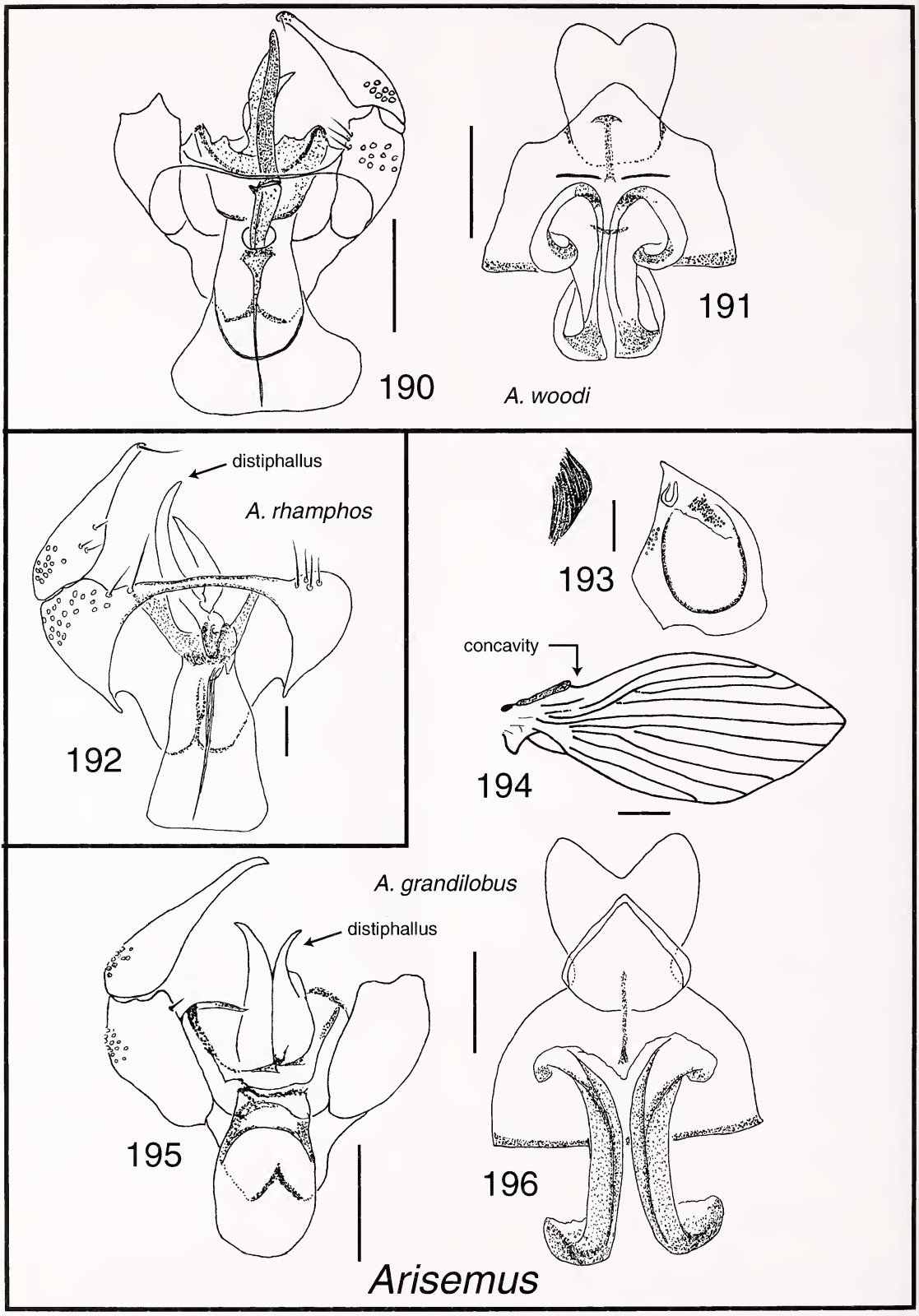
HOLOTYPE. ♂, COSTA RICA, Puntarenas, Monteverde, 28.iv–1.v.1997, L. Quate, Malaise trap, 1550 m (INBC).

PARATYPES. 2♂, same data as holotype (LACM), COSTA RICA, Heredia, San Rafael de Vara Blanca, Rio Santo Domingo, 2♂, 18–26.vii.1993, L. Quate, light trap, 1700 m (LACM), Puntarenas, Estación Biol. Las Alturas, 8°57.23′N, 82°50.22′W, 1♂, 11–16.viii.1995, L. Quate, 1550 m (LACM), Estación Pittier, 20 km N San Vito, 8♂, 3♀, 11–14.vi.1995, L. Quate, Malaise trap, stream, secondary vegetation (INBC, LACM), 2♂, same data as previous specimens except 15.vi.1995, L. Quate, Malaise trap, small stream, 1670 m (LACM).

ETYMOLOGY. Dedicated to Dr. D. M. "Monty" Wood, Agriculture Canada, for generously providing the opportunity for biologists and university students to live in comfortable quarters and work in a marvelous montane tropical forest at Monteverde, Costa Rica.

Arisemus rhamphos new species
Fig. 192

DESCRIPTION. Male. Apex of vertex sagittate; hair patch on frons divided in center, anteromedial margin rounded with dense alveoli; scape and pedicel normal; flagellomeres 1–11 nodiform, terminal 3 globular, without internodes, 14 with small apiculis; ascoids small peglike on flagellomeres 1–3, digitiform and paired on 6–9, not observed on 4, 5, and 10–14; ratio of palpomeres 10:10:11:22.



Figures 190–196 *Arisemus* spp. 190–191. *A. woodi:* 190. male genitalia, dorsal; 191. female genitalia. 192. *A. rhamphos,* male genitalia, dorsal. 193–196. *A. grandilobus:* 193. spiracle and sensory organ on male anepisternite; 194. wing; 195. male genitalia, dorsal; 196. female genitalia. All scale lines = 0.1 mm

Thorax with sensory organ behind anterior spiracle, with scales arising from cluster of 6–8 alveoli, when scales absent, organ recognized by small, compact cluster of berrylike alveoli. Wing plain, without infuscations, with scales at base; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork little basad of medial; CuA_2 extends to wing margin.

Gonocoxites connected by sturdy hypandrium; gonostylus evenly tapering to apex; distiphallus and paramere extend well beyond gonocoxite apex; distiphallus curved, apically tapered, much longer than paramere; paramere curved only at base, tapering to acute apex.

Measurements. Antenna 0.99–1.06 mm ($\bar{x}$ = 1.04; n = 6). Wing length 2.46–2.55 mm, width 0.99–1.06 mm ($\bar{x}$ = 2.50, 1.03; n = 5).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Merida, La Mesa, 8°34′N, 71°19′W, 20.ix.1995, L. Quate, Malaise trap, 1650 m, gorge, secondary vegetation (IZAV).

PARATYPES. 3♂, same data as holotype (LACM), Merida, 8°38′N, 71°9′W, 4♂, 22.ix.1995, L. Quate, Malaise trap (BMNH, LACM, USNM).

ETYMOLOGY. From Greek *rhamphe* for curved knife, referring to the shape of the male distiphallus.

Arisemus grandilobus new species

Figs. 193–196

DESCRIPTION. Male. Vertex sagittate at apex; hair patch on frons divided in center, anterior margin curved, alveoli thicker; scape and pedicel normal; flagellomeres weakly nodiform, 1 larger than following, terminal 3 smaller than preceding, bulbous, without internodes, terminal with short, triangular apiculis; ascoids on flagellomeres 1–11 small, peglike; ratio of palpomeres 10:10:12:22.

Thorax with large sensory organ behind anterior spiracle, consisting of densely packed cluster of spatulate hairs, covering flattened, bare disk occupying nearly all of anepisternum (bare disc visible when hairs removed; Fig. 196). Wing without infuscations; spatulate hairs on basal half; second costal node elongate, vein concave at end of node forming conspicuous indentation on anterior margin; Rs pectinate, but bases of R_{2+3} and R_3 weakened; radial and medial forks on same level; CuA_2 extends to margin.

Gonopods not distinctive; distiphallus and paramere lightly sclerotized, each ending in acute, outwardly curved apex.

Measurements. Antenna 1.12–1.19 mm ($\bar{x}$ = 1.16; n = 6). Wing length 2.46–2.72 mm, width 1.06–1.18 mm ($\bar{x}$ = 2.55, 1.09; n = 10).

Female. Wing with enlargement and small curvature in costa near base, but far less conspicuous than in male. Anterior and lateral margins of tergite 8 with sclerotized rim. Chitinous arch of subgenital plate not reaching apical margin; band at side of longitudinal strut sclerotized, genital ducts hemispherical; small bar in center of membranous plate.

Measurements. Antenna 1.00–1.09 mm ($\bar{x}$ = 1.06; n = 8). Wing length 2.34–2.58 mm, width 0.84–0.96 mm ($\bar{x}$ = 2.40, 0.90; n = 10).

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 20 km S Choroní, 17.ix.1993, L. Quate, light trap, 880 m (IZAV).

PARATYPES. 4♂, 4♀, same data as holotype (BMNH, IZAV, LACM, USNM), 3♂, 7♀, same data as holotype except 14.ix.1993 (BMNH, LACM), 24 km NW El Limon, 1♂, 10.ix.1993, L. Quate, 650 m (LACM).

ETYMOLOGY. From Latin *grandis* for great and *lobus* for lobe, referring to the large sensory organs on the prothorax.

Arisemus buzbyae Wagner and Masteller

Fig. 198

Arisemus buzbyae Wagner and Masteller, 1996: 456–457, figs. 26–31.

DESCRIPTION. Male. Frons hair patch without median extension, divided in center; scape normal, ratio of pedicel about 1.5:1; flagellomeres 1–11 nodiform, terminal 3 globular, reduced, smaller than preceding segments, without internodes; palpomere 4 nearly 2 times length of 3.

Wing narrow, length about 3 times width, spots at tips of veins, rest of wing unpatterned, spots at tips of CuA_1 and CuA_2 larger than other spots; second costal node absent; Rs not pectinate; radial fork basad of medial by about 1 cell width; apical two-thirds of CuA_2 enlarged, does not reach wing margin.

Hypandrium a narrow band connecting bases of gonocoxites; gonostylus bifurcate or with short projection near apex; basiphallus broad, paddle-shaped, distiphallus and paramere short, each ending in sharp, curved point; tergite 10 triangular.

Female. Chitinous arch extends little beyond margin of plate; sclerite laterad of longitudinal strut very long; lobes of genital ducts hemispherical.

DISTRIBUTION. Puerto Rico.

HOLOTYPE. ♂, PUERTO RICO, tributary Mamayes, Bisley stream, Luquillo Experimental Forest, 4.xi.1991, Buzby and Masteller, emergence trap (USNM; not examined).

NEW SPECIMENS STUDIED. PUERTO RICO, Luquillo, Caribbean National Forest, El Verde Experimental Station, 18°19.3′N, 65°49.6′W, 7♀, 2–9.i.1998, L. Quate, Malaise trap, 350 m (LACM), 4♀, same date as previous specimens except La Prieta area (LACM), 1♀, same data as previous specimens except El Yunque section (LACM).

REMARKS. This species was previously known only from the male; the female is described and illustrated here for the first time.

Arisemus mariannae Wagner and Masteller

Arisemus mariannae Wagner and Masteller, 1996: 457–459, figs. 32–37.

DESCRIPTION. Male. Flagellomeres 1–11 nodiform, terminal 3 reduced and globular without internodes; hair patch on frons divided in center, without median extension.

Wing with spots at vein tips; second costal node absent; Sc short, ends before base of R_{2+3}; radial and medial forks on same level; Rs not pectinate; apical two-thirds of CuA_2 enlarged, not ending in wing margin.

Male genitalia with unusual distiphallus with preapical curvature and heavily sclerotized "sclerite" (possibly the gonocoxal apodeme) at base of gonocoxite; tergite 10 dome-shaped.

Female. Unknown.

DISTRIBUTION. Puerto Rico.

HOLOTYPE. ♂, PUERTO RICO, tributary Mamayes, Bisley stream, Luquillo Experimental Forest, 2.ii.1991, E. Masteller, emergence trap (USNM; not examined).

Arisemus martinezi Wagner and Joost

Arisemus martinezi Wagner and Joost, 1994:79–82, figs. 19–23.

DESCRIPTION. Male. Flagellomeres 1–11 fusiform, terminal flagellomeres not reduced, cylindrical, 1–11 with pair of short, sclerotized ascoids.

Wing with small spots at tips of all veins, except CuA_2 has large quadrangular spot at apex and also incrassation on basal third.

Gonocoxite long and slender, gonostylus narrowing near center; hypandrium inconspicuous; distiphallus and paramere much shorter than gonocoxite, both ending in sharp, beaklike tip; tergite 10 triangular.

Female. Unknown.

DISTRIBUTION. Colombia.

HOLOTYPE. ♂, COLOMBIA, Bogota, Quebrada Chico, 8.xi.1987, W. Joost (ULMG; not examined).

Arisemus waidei Wagner and Masteller

Arisemus waidei Wagner and Masteller, 1996:459–461, figs. 38–41.

DESCRIPTION. Male. (From Wagner and Masteller). Scape normal, ratio to pedicel about 1.5:1; flagellomeres fusiform, terminal 3 segments not reduced.

Wing with small spots at vein tips only; second costal node present; Sc extends to level of base of R_{2+3}; Rs pectinate; radial fork at about same level as medial; CuA_2 reaching wing margin.

Genitalia with distiphallus and paramere extending to gonocoxite apex; distiphallus wider than paramere with rounded apex; paramere reverse J-shaped, slender; tergite 10 triangular.

Female. Unknown.

DISTRIBUTION. Puerto Rico.

HOLOTYPE. ♂, PUERTO RICO, El Verde, Quebrada Prieta, 2.iii.1992, Buzby and Masteller, emergence trap (USNM; not examined).

Arisemus spilotos Quate

Arisemus spilotos Quate, 1996:23, figs. 9a–j.

DESCRIPTION. Male. Frons hair patch without median extension, divided in center; scape elongate, ratio to pedicel at least 3:1; flagellomeres 1–11 nodiform, terminal 3 globular, reduced, smaller than preceding segments, without internodes.

Thorax with anepisternal sensory organs located posterior of spiracle, diameter greater than spiracle width. Wing with spots at vein tips; second costal node absent; Rs not pectinate, bases of R_2 and R_3 free and not attached to other veins; CuA_2 greatly enlarged basally and strongly curved in center toward margin.

Hypandrium an arched band connecting bases of gonocoxites, with thick, triangular projection on one side halfway between center and lateral margin; paramere sickle-shaped, apex acute, shorter than distiphallus; distiphallus shaft nearly straight, with 45° curve at apex.

Female. Apical lobes of subgenital plate quadrate, small enlargement at base of lobes; chitinous arch does not reach apical margin.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Heredia, San Rafael de Vara Blanca, Rio Santo Domingo, 18–26.vii.1993, L. Quate, light trap, 1700 m (INBC; examined).

Arisemus atrasetus (Rapp)

Psychoda atraseta Rapp, 1945:310.

Arisemus atrasetus; Duckhouse, 1974b:58–60, figs. 12–17.

Arisemus lepidotos Quate, 1996:23–25, figs. 9d–g. **New synonymy.**

Arisemus stylofurcatus Collantes and Martínez-Ortega, 1999a:216–218. **New synonymy.**

DESCRIPTION. Male. Dark scales on antennae and wings; vertex elongate and pointed; frons hair patch without median extension, divided in center; scape very long, about 3 times length of pedicel; flagellomeres 1–11 nodiform, terminal 3 globular, reduced, smaller than preceding segments; palpomere 4 about 1.5 times palpomere 3.

Wing length about 2.5 times width; brown spots at tips of veins and on forks; Sc short, ends at or before base of R_{2+3}; Rs pectinate; CuA_2 extends to wing margin.

Hypandrium a broad band between gonocoxites, with digitiform projection on one side; male gonostylus bifurcate, bifurcation near base, smaller appendage more than one-half length of main shaft; distiphallus and paramere extend well beyond gonocoxite apex; distiphallus sickle-shaped, shorter

than paramere; paramere slightly curved, apex blunt.

Female. (After Collantes and Martínez-Ortega, 1999a). Subgenital plate with apical lobes somewhat quadrate; chitinous arch reaches apical margin; genital ducts covered with fine striations; longitudinal and lateral struts developed; rod in center of membranous plate.

DISTRIBUTION. Guatemala, Nicaragua, Costa Rica, Panama.

HOLOTYPES. *Arisemus atrisetus,* ♂, PANAMA, Barro Colorado I., 10.i.1929, C. Curran (AMNH; examined). *A. lepidotus,* ♂, COSTA RICA, Heredia, Est. Biol. La Selva, 22.vii.1993, L. Quate, fluorescent light (INBC; examined). *A. stylofurcatus,* ♂, NICARAGUA, Carazo, Biorreserva Chococente, 11°30′N, 86°10′W, 13.ix.1992, J. Maes, light trap (Departamento de Biología Animal, Universidad de Murcia, Spain; not examined).

REMARKS. The illustration of the male gonostylus of *A. atrasetus* by Duckhouse (1974b) appears quite different from that figured for *A. lepidotos* by Quate; the differences, however, are an artifact of the tilted position of the gonostylus, making the bifurcation appear shorter than it actually is. The divergent position of the distiphallus and paramere of *A. atrasetus* probably was caused by the compression of the cover slip during slide preparation.

Collantes and Martínez-Ortega (1999a) state that the "aedeagal complex" of *A. stylofurcatus* differs from that of *A. atrasetus.* However, in the senior author's opinion, the illustration shows a normal variant of the aedeagus and might be partly or entirely due to the position of the aedeagus on the slide.

Arisemus caceresi new species

Figs. 199–201

DESCRIPTION. Male. Antenna of male without dark scales; apex of vertex plain; median extensions dense anteriorly, sparse posteriorly; scape elongate, ratio to pedicel at least 3:1; flagellomeres 1 and 2 sometimes fused, with terminal 3 segments globular, smaller than preceding.

Thorax without sensory organs. Wing length 2–2.5 times width; infuscate patterns limited to vein tips and forks; rectangular infuscation at base of CuA_2 absent; second costal node absent; costa normal, without concavity; Sc ends at or before base of R_{2+3}; Rs pectinate; radial fork complete, i.e., R_2 and R_3 attached at about same level as medial; medial fork incomplete, M_2 not joined to M_1; CuA_2 without enlargement, except basal section sometimes slightly enlarged; apex of CuA_2 extends to wing margin; alula without tuft of hairs.

Abdominal sternites without black scales. Hypandrium an arched band connecting bases of gonocoxites, with pair of triangular projections near midline; gonocoxite simple, without processes, with very long setae from apical border, as long as gonostylus; gonostylus undivided, monomorphic, without cluster of hairs; distiphallus and paramere barely extend beyond apex of gonocoxite; apex of distiphallus straight, acute; paramere a single structure, straight or slightly curved, slender, at most, little longer than distiphallus; epandrium width equal to or greater than length; surstylus without spatulate hairs; tergite 10 triangular.

Measurements. Antenna 0.95–1.12 mm ($\bar{x}$ = 1.06; n = 10). Wing length 2.33–2.68 mm, width 1.00–1.13 mm ($\bar{x}$ = 2.55, 1.08; n = 10).

Female. Scape also elongate; subgenital plate with weak apical concavity; chitinous arch rounded, does not reach posterior margin of plate; membranous plate with irregular, rugose posteriomedial margins; genital ducts elongate, sclerotized, longitudinal struts curved, lyre-shaped.

Measurements. Antenna 0.93–1.10 mm ($\bar{x}$ = 1.02; n = 10). Wing length 2.50–2.95 mm, width 0.95–1.25 mm ($\bar{x}$ = 2.69, 1.08; n = 10).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, Manu Nat. Park, El Mirador to San Pedro, 13°6′S, 71°34′W, 1–9.ix.1999, L. Quate, A. Cáceres, Malaise trap, 1910 m (MUSM).

PARATYPES. 4♂, same data as holotype (BMNH, LACM, USNM), 4♂, 2♀, same data as holotype except 13°4′S, 71°33′W, 1680 m (LACM), 2♂, 4♀, same data as previous specimens except 1780 m (LACM), 3♂, 5♀, same data as previous specimens except 13°6′S, 71°34′W, 1970 m (BMNH, LACM, USNM), 17♂, 4♀, same data as previous specimens except 13°7′S, 71°34′W, 2030 m (LACM, MUSM), 2♂, same data as previous specimens except 13°12′S, 71°36′W, 2120 m (LACM), 9♂, 9♀, same data as previous specimens except 13°8′S, 71°34.8′W, 2150 m (LACM), 4♂, 2♀, same data as previous specimens except 13°9′S, 71°35′W, 2280 m (LACM), 1♀, same data as previous specimens except 13°12′S, 71°36′W, 3350 m (LACM), 26 km W Pilcopata, 13°3′S, 71°32′W, 3♂, 2♀, 1–9.ix.1999, L. Quate, A. Cáceres, Malaise trap, 1480 m (LACM).

ETYMOLOGY. Named for the co-collector, Abraham Cáceres.

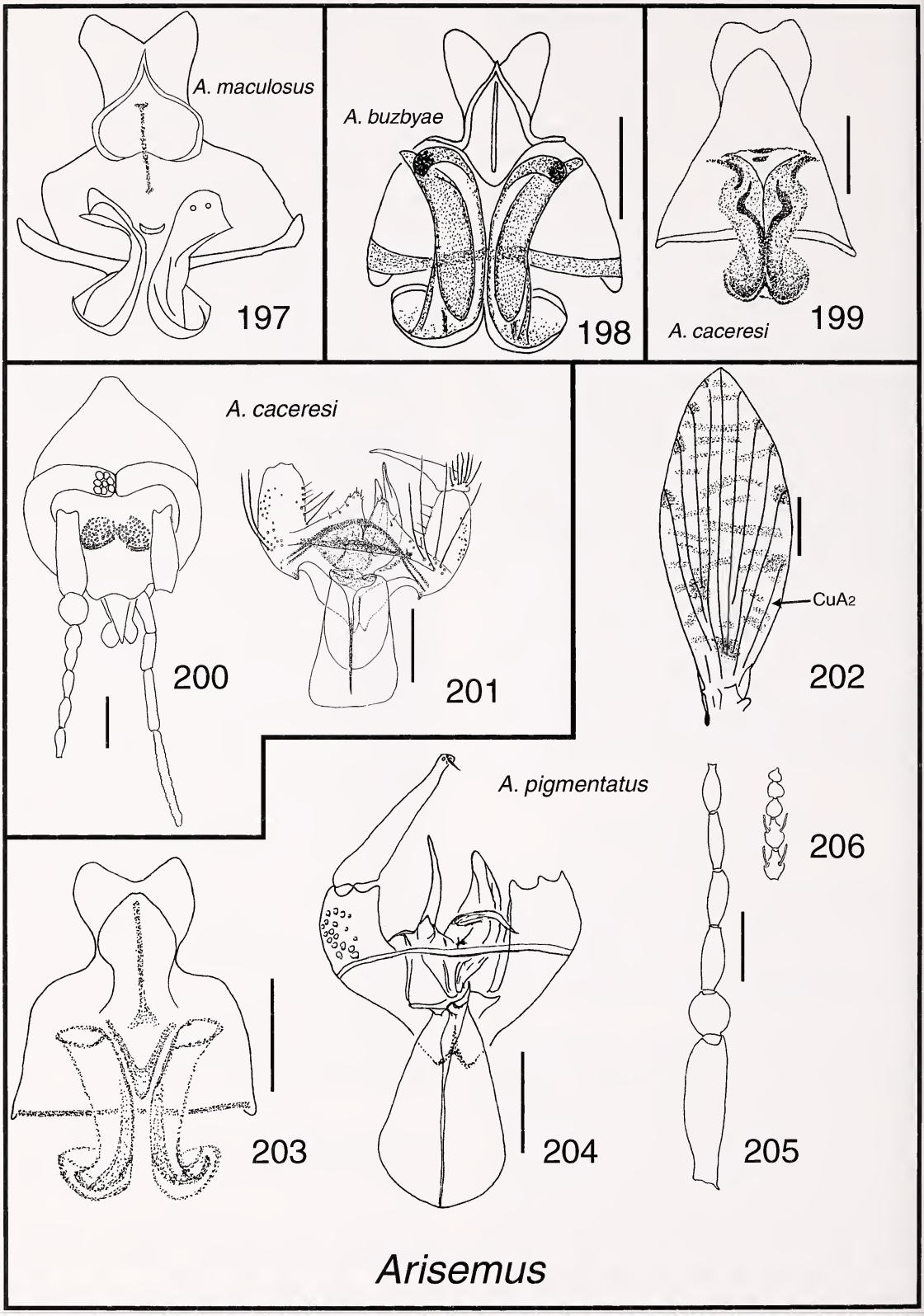
REMARKS. *Arisemus caceresi* was the most common species taken in Malaise traps on an altitudinal transect in the Reserved Zone of Manu National Park from 1480–3350 m.

Arisemus obandoi Wagner and Joost

Arisemus obandoi Wagner and Joost, 1994:79, figs. 14–18.

DESCRIPTION. Male. (From Wagner and Joost). Frons with hair patch U-shaped, lacking from center; scape elongate, 3–4 times length of pedicel; flagellomeres 1–11 fusiform, 1 and 2 much larger than following segments, terminal flagellomeres not reduced.

Thorax with large, hairy sensory organ behind anterior spiracle. Wing uniformly infuscate except clear spots between vein tips; second costal node



Figures 197–206 *Arisemus* spp. 197. *A. maculosus* (Rapp), female genitalia. 198. *A. buzbyae*, female genitalia. 199–201. *A. caceresi:* 199. female genitalia; 200. male head; 201. male genitalia, dorsal. 202–206. *A. pigmentatus:* 202. wing; 203. female genitalia; 204. male genitalia, dorsal; 205. base of male antenna; 206. male flagellomeres 10–14. All scale lines = 0.1 mm

absent; Sc short, ends at or before base of R_{2+3}; Rs not pectinate; crossvein between R_3 and R_4; CuA_2 extends to wing margin.

Hypandrium an arched band connecting bases of gonocoxites; distiphallus and paramere extend well beyond gonocoxite apex, distiphallus bifurcate; paramere shorter than distiphallus.

DISTRIBUTION. Colombia.

HOLOTYPE. ♂, COLOMBIA, San Agustin, Rio Magdalena, 15.xii.1987, W. Joost (ULMG; not examined).

Arisemus grabhamana (Dyar)

Psychoda grabhamana Dyar, 1926:110.
Pericoma grabhamana; Rosario, 1936:145.
Arisemus grabhamana; Duckhouse 1974a:149–150, figs. 26–27.
Telmatoscopus (*Arisemus*) *maculosus* Satchell, 1955:88–89, figs. 2A–G, *nec* Rapp, 1945:309.
Arisemus maculosus; Botosaneanu and Vaillant, 1970:176; Vaillant, 1986:333, figs. 1–7.

DESCRIPTION. Male. Vertex slightly sagittate; frons hair patch sparse and well separated in center; pedicel normal, about one-half length of scape; scape with dense cluster of long, black hairs on median surface; flagellomere 1 cylindrical, larger than following segments, remaining flagellomeres nodiform with very short internodes, terminal 3 globular, reduced, smaller than preceding segment; ascoids not evident; ratio of palpomeres 10:12:17:20.

Thorax with sensory organ on anepisternite in front of anterior spiracle, organ a dense cluster of berrylike granules, patch of long hairs behind anterior spiracle, rest of anepisternum bare of alveoli except small patch of about 15 alveoli on ventral area. Wing with scales on venter near base; length 2–2.5 times width; membrane largely infuscate with clear areas along margin between vein tips; second costal node absent; Rs pectinate; CuA_2 ending in wing margin; radial fork at same level as medial.

Hypandrium a heavy curved bar connecting lateral margins of posterior gonocoxal apodemes; distiphallus and paramere extend beyond apex of gonocoxite; distiphallus slender with acute apex, slightly curved; paramere much broader than distiphallus and longer, ends in blunt apex; tergite 10 triangular.

Measurements. Lectotype, wing length, 2.15 mm, width 0.75 mm. Other specimens, wing length 2.13–2.15 mm, width 0.70–0.75 mm.

Female. Subgenital plate with chitinous arch not reaching apical margin of plate; genital ducts with strong longitudinal strut and no lateral strut; saclike enlargement at anterolateral part of membranous plate.

Measurements. Wing length 2.00 mm, width 0.65 mm.

DISTRIBUTION. Jamaica.

SPECIMENS STUDIED. JAMAICA, Kingston, ♂ (lectotype, designated by Duckhouse, 1974a), 10.viii.1903, M. Grabham, type 2235 (USNM), paratype ♂, same data as holotype, except 11.vii.1903 (USNM), Moneaque, 1♂ (holotype of *T. maculosus* Satchell), 7.i.1905, Wlsm. Eaton Bequest BM 1929–520 (BMNH).

Arisemus maculosus (Rapp)
Fig. 197

Psychoda maculosa Rapp, 1945:309.
Arisemus maculosus; Duckhouse, 1974b:57–58, figs. 7–11.

DESCRIPTION. Male. Unknown.

Female. Frons hair patch without median extension, divided in center; scape normal, ratio to pedicel about 1.5:1; flagellomeres 1–11 nodiform, most conspicuous in distal segments, terminal 3 globular, reduced, smaller than preceding segments.

Wing normal, length 3.3 times width, lightly infuscate with dark spots on vein tips; second costal node present; costa normal, without concavity; Sc extends to base of R_{2+3}; Rs pectinate; radial fork at same level as medial, complete; CuA_2 without medial enlargement; CuA_2 does not extend to wing margin.

Subgenital plate with weak apical concavity; chitinous arch with narrow, prolonged apex not reaching apical margin; genital ducts lightly sclerotized, longitudinal and lateral struts poorly developed, membranous with spike-shaped bar in center arising from pyriform base.

Measurements. Antenna 0.90 mm. Wing length 2.00 mm, width 0.60 mm.

DISTRIBUTION. Panama.

HOLOTYPE. ♀, PANAMA, Barro Colorado I., 7.i.1929, C. Curran (AMNH; examined).

REMARKS. This species is known only from the female and is not included in the key. It resembles other species of *Arisemus* with fusiform flagellomeres and patterned wings. The wing pattern differs from that of *A. grabhamana* in being lightly infuscate with dark spots on the vein tips. This differs from Duckhouse's (1974b) description of the wing pattern.

Arisemus pigmentatus new species
Figs. 202–206

DESCRIPTION. Male. Vertex slightly elongate; hair patch on frons divided in center, anteromedial margins rounded and with denser alveoli; frons hair patch without median extension, divided in center; antenna with scape 3 times length of pedicel; flagellomeres 1–11 elongate fusiform, terminal 3 globular, 12 and 13 with very short internodes; ascoids not found on first 3 flagellomeres nor on last 3; ratio of palpomeres 10:13:14:28.

Thorax with sensory organ behind anterior spiracle, organ covered with spatulate hairs. Wing with many irregular infuscate bands, spots at most vein tips and larger spots at base of R_3 and tips of CuA_1 and CuA_2; second costal node absent; Sc short, ends before base of R_{2+3}; Rs not pectinate;

radial fork incomplete, R_3 not attached; radial fork at about same level as medial; medial fork incomplete, M_2 not connected to M_1; CuA_2 without medial enlargement, does not extend to wing margin.

Hypandrium a straight band connecting bases of gonocoxites; gonostylus simple; distiphallus and paramere extend well beyond gonocoxite apex; distiphallus broad and bluntly rounded, does not extend to tip of paramere; paramere slender and slightly curved; epandrium longer than wide, ventral epandrial sclerite extending from near center of base obliquely to base of surstyli; tergite 10 triangular.

Measurements. Antenna 1.17–1.27 mm ($\bar{x}$ = 1.25; n = 7). Wing length 2.41–2.68 mm, width = 0.89–1.01 mm ($\bar{x}$ = 2.54, 0.96; n = 10).

Female. Larger than male. Scape shorter, about 2.5 times pedicel. No sensory organ on prothorax. Subgenital plate with weak apical concavity; chitinous arch not reaching apical margin; genital ducts slightly sclerotized; longitudinal and lateral struts developed; membranous plate with V-shaped structure and longitudinal bar with expanded base in center.

Measurements. Antenna 0.96–1.18 mm ($\bar{x}$ = 1.05; n = 9). Wing length 2.29–2.92 mm, length 0.84–1.08 mm ($\bar{x}$ = 2.53, 0.95; n = 10).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, 26 km W Pilcopata, 13°3′S, 71°32′W, 1500 m, 25.vii–3.viii.1997, L. Quate, light trap (MUSM).

PARATYPES. 7♂, 4♀, same data as holotype (BMNH, LACM, MUSM), 13♀, same data as holotype except Malaise trap (LACM, USNM), 2♀, same data as holotype except 1.viii.1997, L. Quate, Malaise trap, 1500 m (LACM), 2♀, same data as holotype except 1–9.ix.1999, L. Quate and A. Cáceres, Malaise trap, 1480 m (LACM), 2♂, 13♀, same data as holotype except 13°3.3′S, 71°32.8′W, 24.vii–2.viii.1997, L. Quate, Malaise trap, 1500 m (LACM, USNM).

ETYMOLOGY. From Latin *pigmentum* for color, referring to the extensive infuscation of the wings.

Arisemus ampliscapus new species

Figs. 207–209

DESCRIPTION. Male. Vertex sagittate; frons hair patch sparse, separated except for narrow connection at posterior one-third; antenna with scape extremely enlarged, pedicel normal; short, peglike ascoids on flagellomeres 1–11; flagellomeres 1–11 fusiform, but internodes short distally, terminal 3 flagellomeres globular, reduced, smaller than preceding segments; ratio of palpomeres 10:10:11:17.

Thorax with sensory organ behind anterior spiracle, consisting of dense tuft of long hairs. Wings clear, without infuscations; second costal node absent; Sc short, ends before base of R_{2+3}; Rs pectinate; radial fork little distad of medial; CuA_2 extends to wing margin.

Hypandrium broad, forming solid connection between gonocoxites; gonostylus broad at base, but slender and straight over most of length; distiphallus tapering to apex; paramere very small, does not extend to tip of distiphallus, apex blunt.

Measurements. Antenna 1.24–1.26 mm (n = 2). Wing length 2.14–2.41 mm, width 0.72–0.82 mm ($\bar{x}$ = 2.25, 0.76; n = 7).

Female. Larger than male. Scape not greatly enlarged like that of male. Tergite 8 with anterior margin sclerotized, subgenital plate with shallow, V-shaped notch, chitinous arch does not reach margin of subgenital plate; longitudinal and lateral struts well developed, band at side of longitudinal strut sclerotized; genital ducts hemispherical; membranous with slender bar in center with slightly expanded base.

Measurements. Antenna 0.98–1.17 mm ($\bar{x}$ = 1.05; n = 7). Wing length 2.39–2.65 mm, width 0.84–1.01 mm ($\bar{x}$ = 2.49, 0.92; n = 10).

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 19 km N Maracay, 14–17.ix.1993, L. Quate, Malaise trap, 1280 m (IZAV).

PARATYPES. 4♂, same data as holotype (BMNH, LACM, USNM), 20 km S Choroní, 9♀, 17.ix.1993, L. Quate, light trap, 880 m (IZAV, LACM, USNM), 22 km S Choroní, 1♂, 2♀, 17.ix.1993, L. Quate, Malaise trap, 1000 m (BMNH, LACM).

ETYMOLOGY. From Latin *amplus* for large and *scapus* for stalk, referring to the enlarged scape of the male.

Arisemus barbarus new species

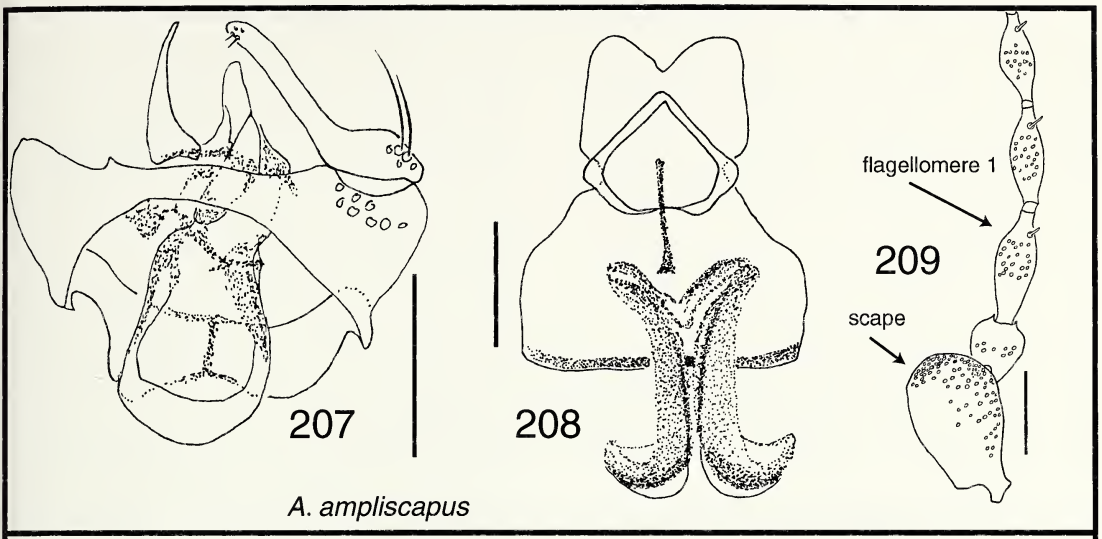
Figs. 210–214

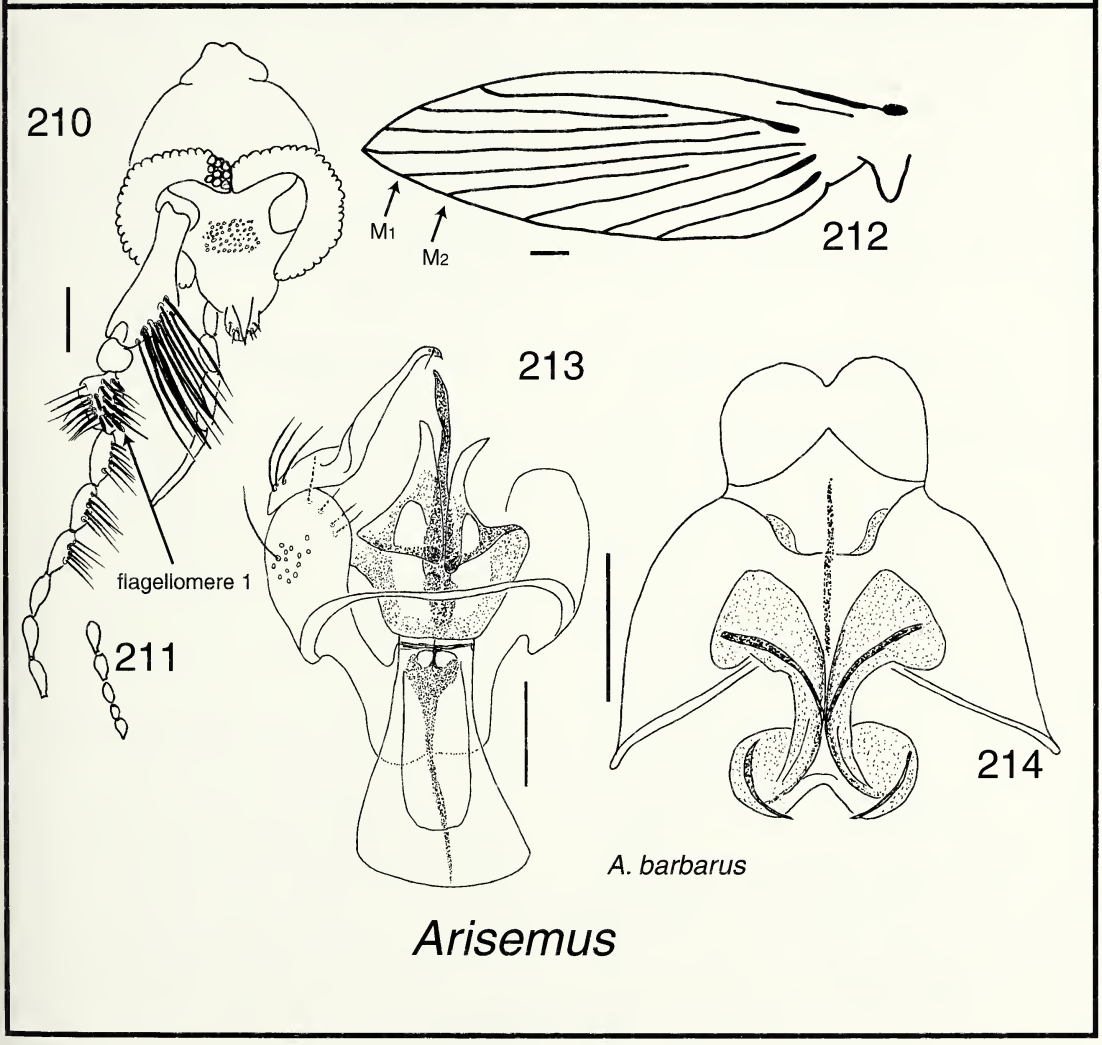
DESCRIPTION. Male. Vertex sagittate at apex; hair patch on frons undivided, quadrangular; base of antenna densely haired, scape enlarged, ratio to pedicel at least 3:1; flagellomere 1 enlarged, much larger than following segments, 2–11 pyriform, most conspicuous in distal segments, terminal 3 globular, reduced, smaller than preceding segments.

Thorax with sensory organ located anterior of spiracle, diameter greater than spiracle width. Wing narrow, length about 3 times width; plain without patterns; second costal node absent; Sc short, ends before base of R_{2+3}; Rs pectinate; radial fork incomplete, at about same level as medial; medial fork usually complete, but incomplete in holotype; CuA_2 extends to wing margin.

Hypandrium an arched band connecting bases of gonocoxites, without projection or spines; distiphallus and parameres extend well beyond gonocoxite apex; distiphallus long, slender, heavily sclerotized; parameres a pair of elongate triangles with outwardly curved apices flanking distiphallus; epandrium width less than length; tergite 10 dome-shaped.

Measurements. Antenna 1.24–1.31 mm ($\bar{x}$ =





Figures 207–214 *Arisemus* spp. 207–209. *A. ampliscapus:* 207. male genitalia, dorsal; 208. female genitalia; 209. base of male antenna. 210–214. *A. barbarus:* 210. male head; 211. flagellomeres 10–14; 212. wing; 213. male genitalia, dorsal; 214. female genitalia. All scale lines = 0.1 mm

1.27; n = 6). Wing length 2.28–2.50 mm, width 0.73–0.83 mm ($\bar{x}$ = 2.41, 0.79; n = 7).

Female. Antenna normal, except flagellomere 1 larger than other flagellomeres. Thorax without sensory organ. Subgenital plate with rounded apical lobes, apical notch V-shaped, shallow, chitinous arch reaches only halfway up lobes; genital ducts ovoid; longitudinal and lateral struts slender, but well developed.

Measurements. Antenna 0.83–1.07 mm ($\bar{x}$ = 0.94; n = 5). Wing length 1.95–2.25 mm, width 0.58–0.73 mm ($\bar{x}$ = 2.10, 0.65; n = 7).

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Limón, Res. Biol. Hitoy Cerere, 9°48.4′N, 83°1.5′W, 17–26.ii.1999, L. Quate, Malaise trap, Rio Cerere streamside, 100–200 m [barcode INBIOCRI001 473081] (INBC).

PARATYPES. 2♂, 4♀, same data as holotype (BMNH, INBC, LACM, USNM), 3♂, 2♀, same data as holotype except Malaise trap, over small stream (LACM, USNM), Puerto Viejo de Talamanca, 9°39.4′N, 82°45.9′W, 1♂, 1♀, 25.ii–1.iii.1999, L. Quate, Malaise trap, secondary forest, sea level (LACM).

ETYMOLOGY. From Latin *barbarus* for foreign or strange, referring to the unusual male antenna.

REMARKS. The hairy, enlarged scape of the male and large first flagellomere in both sexes of *A. barbarus* differ from all other Neotropical *Arisemus*.

Arisemus amydrus new species

Figs. 215–218

DESCRIPTION. Male. Eye bridge with spur on midline longer than width of bridge; frons hair patch without median extension, undivided, a single, quadrate cluster of hairs; scape normal, ratio to pedicel about 1.5:1; flagellomeres 1–11 fusiform, terminal flagellomeres not reduced; ratio of palpal segments 10:11:19:23.

Thorax without sensory organs. Wing narrow, length about 3 times width, infuscate patterns faint, present only on wing tips; second costal node present; costa with concavity, or indentation, at end of second node; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork complete, at about same level as medial; medial fork complete; CuA_2 without enlargement, apex of CuA_2 extends to wing margin.

Abdominal sternites without black scales. Gonocoxite with 25–30 hairs on basal half of mesal surface; distiphallus and paramere extend little beyond gonocoxite apex, curved at apices; paramere slender, little longer than distiphallus; epandrium width less than length; surstylus without spatulate hairs.

Measurements. Antenna 0.50–0.55 mm ($\bar{x}$ = 0.53; n = 3). Wing length 1.03–1.13 mm, width 0.28–0.33 mm ($\bar{x}$ = 1.07, 0.31; n = 3).

Female. Subgenital plate faint and difficult to differentiate from cerci, longer than wide, sides converging posteriorly, apical notch small; chitinous arch slender and pointed posteriorly; pair of rugose lobes above basal margin; genital ducts lobe with incomplete margin; lateral strut absent; cercus very long and very slender as in *A. sesquipedalis* n. sp.

Measurements. Antenna 0.57–0.70 mm ($\bar{x}$ = 0.65; n = 10). Wing length 1.15–1.28 mm, width 0.29–0.37 mm ($\bar{x}$ = 1.22, 0.33; n = 10).

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Limón, Res. Biol. Hitoy Cerere, 9°48.4′N, 83°1.5′W, 17–26.ii.1999, L. Quate, Malaise trap over small stream, 100–200 m [barcode INBIOCRI001473 031] (INBC).

PARATYPES. 5♀, same data as holotype (LACM, USNM), 1♂, 16♀, same data as holotype except Rio Cerere, shaded stream (BMNH, INBC, LACM), Puerto Viejo de Talamanca, 9°39.4′N, 82°45.9′W, 1♂, 25.ii–1.iii.1999, L. Quate, Malaise trap, secondary forest, sea level (LACM).

ETYMOLOGY. From Greek *amydros* for dim, referring to the indistinct female subgenital plate.

REMARKS. Specimens of *A. amydrus* are easily identified by their diminutive size and pale coloration, the distinctive male genitalia and the unusual female genitalia with a long subgenital plate that has a small apical notch, and long, slender cerci.

It is difficult to obtain good slide mounts of individuals of this species due to their fragility and light sclerotization.

Arisemus sesquipedalis new species

Figs. 219–223

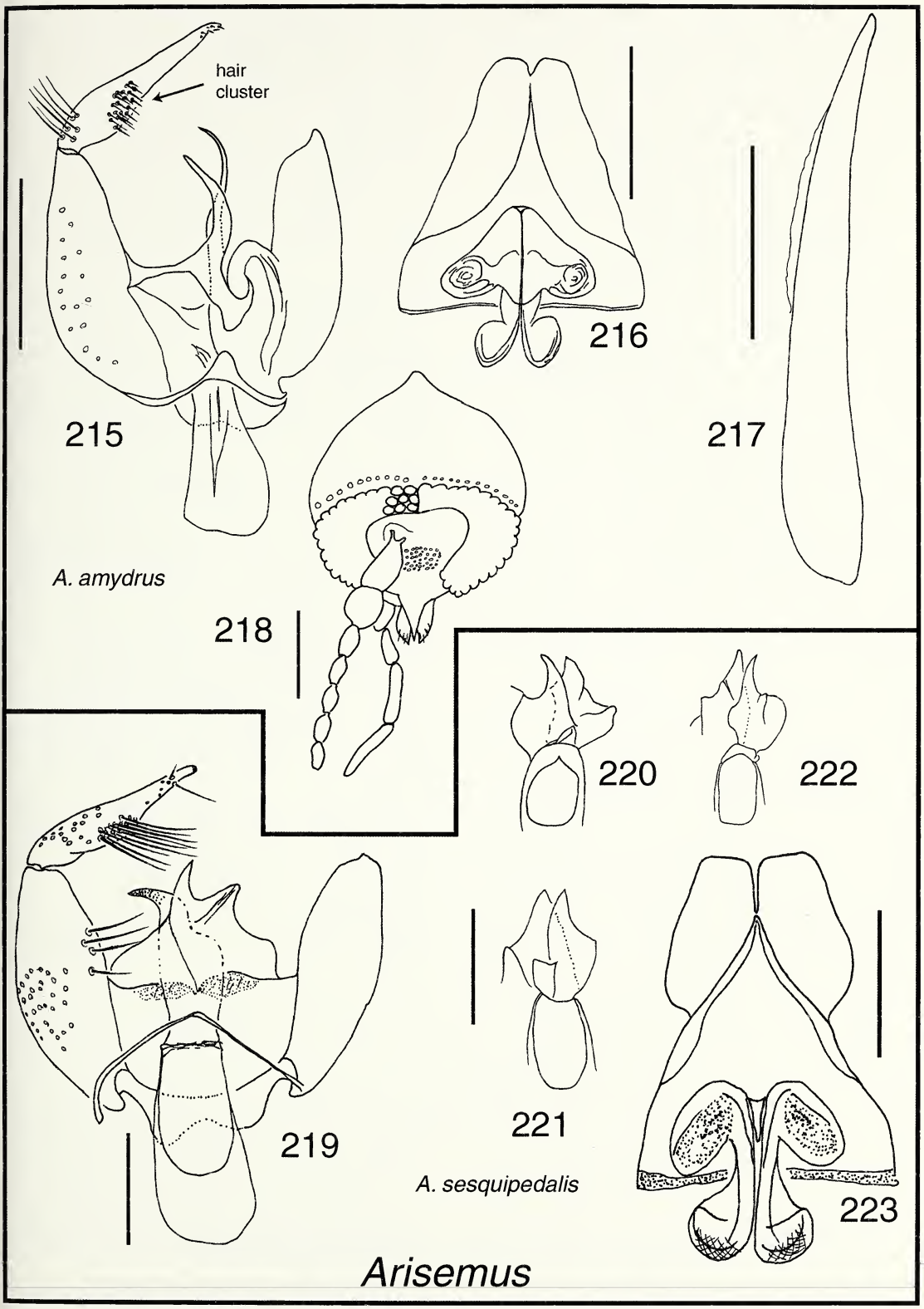
DESCRIPTION. Male. Pale, lightly sclerotized species. Sides of vertex rounded and apex a small rounded protuberance, row of hairs behind eye bridge, vertical suture on midline extending posteriorly about 1.5 facet diameters; hair patch on frons undivided, with small posterior concavity; flagellomeres fusiform, terminal with long apiculis; observed ascoids single on flagellomeres 1–11, base little before center of segment and do not extend to apex of segment.

Wing with faint infuscations at vein tips; second costal node absent; Sc short, costa without concavity; radial fork distad of base of M_3 by several cell widths, on same level as medial.

Gonocoxite elongate; gonostylus undivided, with 25–30 hairs on basal half of mesal surface; distiphallus broad, ending in short, acute, curved point; paramere broad with 2 apical projections, medial one similar to tip of distiphallus, other triangular, projections variable, from long ones broader than tip of distiphallus to short and reduced to small bulge; epandrium width equal to or greater than length.

Measurements. Antenna 1.08–1.32 mm ($\bar{x}$ = 1.20; n = 7). Wing length 2.02–2.46 mm, width 0.60–0.82 mm ($\bar{x}$ = 2.10, 0.71; n = 10).

Female. Subgenital plate with elongate, quadrate



Figures 215–223 *Arisemus* spp. 215–217. *A. amydrus:* 215. male genitalia, dorsal; 216. female genitalia; 217. female cercus; 218. head. 219–223. *A. sesquipedalis:* 219. male genitalia, dorsal; 220. distiphallus and paramere, variant; 221. distiphallus and paramere, variant; 222. distiphallus and paramere, variant; 223. female genitalia. All scale lines = 0.1 mm

lobes, apical notch long and slender; chitinous arch slender apically, extends to margin but does not break margin; genital ducts lightly sclerotized, hemispherical, basal half with granulate surface; pair of lightly sclerotized lobes in apical part of membranous plate; cercus very long and slender, length about 10 times basal width.

Measurements. Antenna 0.90–1.22 mm ($\bar{x}$ = 1.02; n = 10). Wing length 2.05–2.39 mm, width 0.65–0.72 mm ($\bar{x}$ = 2.19, 0.67; n = 10).

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Merida, Merida, 1650–2100 m, 10–22.ix.1995, L. Quate, Malaise trap (IZAV).

PARATYPES. 1♀, same data as holotype (IZAV), Jají, 8°36′N, 71°21′W, 6♀, 14.ix.1995, L. Quate, Malaise trap, 2100 m (LACM), La Azulita, 8°43′N, 71°26′W, 5♂, 10.ix.1995, L. Quate, Malaise trap, 900 m (BMNH, LACM), 3♀, same data as previous specimens except 8°42′N, 71°28′W, 17–18.ix.1995, light trap, 1400 m (LACM), 1♂, same data as previous specimens except 19.ix.1995 (LACM), La Mesa, W Merida, 8°34′N, 17°19′W, 2♂, 2♀, 20.ix.1995, L. Quate, Malaise trap, 1650 m, gorge, secondary vegetation (LACM), Merida, 8°38′N, 71°9′W, 6♀, 22.ix.1995, L. Quate, Malaise trap, 1650 m (BMNH, LACM, USNM), 8♂, 1♀, same data as previous specimens except 8°41′N, 71°6′W, 11.ix.1995, 2100 m (LACM, USNM).

OTHER SPECIMENS STUDIED. VENEZUELA, Aragua, El Vigía, 8°38′N, 71°9′W, 1♂, 22.ix.1995, L. Quate, Malaise trap, 1650 m (LACM), Jají, 8°36′N, 71°21′W, 1♂, 14.ix.1995, L. Quate, Malaise trap, 2100 m (LACM), La Azulita, 8°42′N, 71°28′W, 3♀, 17–18.ix.1995, L. Quate, light trap, Malaise trap, 1400 m (LACM), 2♂, same data as previous specimens except 19.ix.1995, La Mesa, W Merida, 8°34′N, 17°19′W, 4♂, 20.ix.1995, L. Quate, Malaise trap, 1650 m, gorge, secondary vegetation (LACM), Merida, 8°38′N, 71°9′W, 3♂, 22.ix.1995, L. Quate, Malaise trap, 1650 m (LACM), 1♂, same data as previous specimens except 8°41′N, 71°6′W, 11.ix.1995, 2100 m (LACM).

ETYMOLOGY. From Latin *sesquipedalis* for excessively long, referring to the female cerci.

REMARKS. The other specimens studied are those males that have broad parameres differing from the holotype (see Figs. 221–222). In all other respects they appear identical to the holotype, and since they are sympatric, they are treated as belonging to *A. sesquipedalis*. We exclude them from the type series in the event it is shown they belong to a different species.

The infuscations on the wing tips of this very pale species are not always visible on slide mounts, especially if specimens are overcleared.

Arisemus confertus new species

Figs. 224–225

DESCRIPTION. Male. Vertex rounded with small apical protrusion, vertex 3 times width of eye bridge, with row of long hairs behind eye bridge; spur on midline as long as width of bridge; hair patch on frons undivided, sides converging posteriorly, with median anterior and posterior notch; flagellomeres 1–11 fusiform, terminal flagellomeres not reduced; ratio of palpal segments 10:15:20:25.

Wing with small spots at vein tips, no spots on internal surface; second costal node present; costa with concavity, or indentation; Sc extends little beyond base of Rs; Rs pectinate; radial fork distad of medial by about 1 cell width; CuA_2 extends to wing margin.

Hypandrium a small arched band connected to bases of gonocoxites; gonostylus with 25–30 hairs on medial face before center, apex constricted beyond hair patch and tapering to rounded apex; distiphallus and paramere do not extend beyond gonocoxite apex; distiphallus slender, extends little beyond apex of paramere; paramere broad and rounded at apex; tergite 10 dome-shaped.

Measurements. Antenna 0.85–0.99 mm ($\bar{x}$ = 0.89; n = 5). Wing length 1.49–1.81 mm, width 0.51–0.63 mm ($\bar{x}$ = 1.62, 0.55; n = 5).

Female. Similar to male. Apical lobes of subgenital plate nearly straight, sides slightly divergent; chitinous arch extends to and breaks apical margin; genital ducts small, circular.

Measurements. Wing length 1.69–1.83 mm, width 0.51–0.60 mm ($\bar{x}$ = 1.72, 0.54; n = 5).

DISTRIBUTION. Bahamas, Puerto Rico.

HOLOTYPE. ♂, PUERTO RICO, Luquillo, Caribbean National Forest, El Verde Experimental Station, El Verde Section, 18°19.3′N, 65°49.6′W, 2–9.i.1998, L. Quate, Malaise trap, 450 m (LACM).

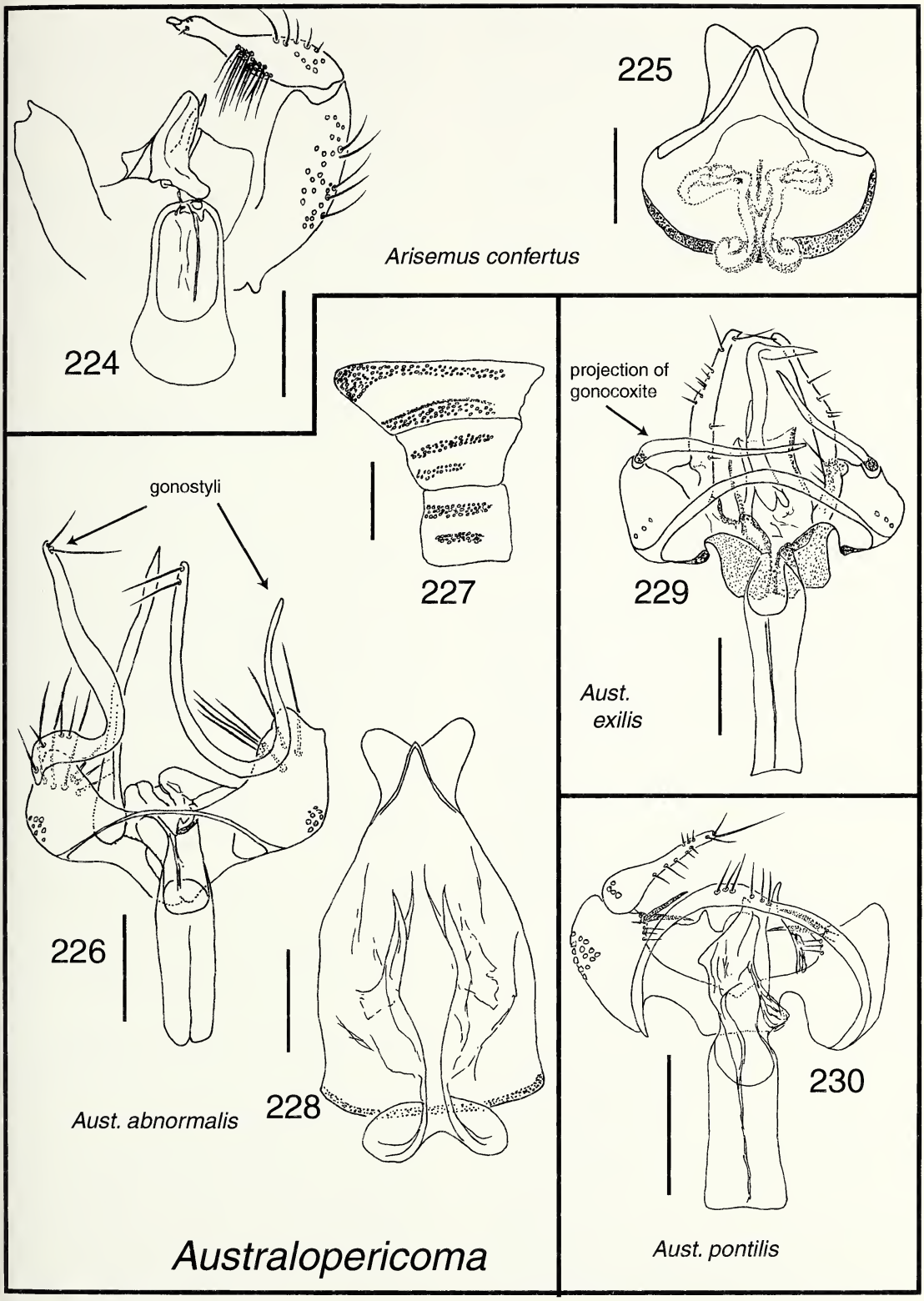
PARATYPES. 1♂, 3♀, same data as holotype except El Yunque Section, 600 m (LACM). BAHAMAS, Abaco I., Treasure Cay, 26°49.8′N, 77°17.3′W, 1♂, 26–31.xii.1997, L. Quate, Malaise trap, sea level (LACM).

ETYMOLOGY. From Latin *confertus* for compressed, referring to the constriction in the male gonostylus.

KEY TO MALES OF *ARISEMUS*

The male of *A. maculosus* is unknown.

1 Gonostylus bifurcate or trifurcate, divided at base and branches widely separated (Botosaneanu and Vaillant, 1970:pl. II, figs. 5–6; pl. III, fig. 4); gonocoxites broadly fused at base . . 2
– Gonostylus usually undivided, if divided, branch occurs near center and narrowly separated from main branch; gonocoxites connected by hypandrium 3
2 Scape bearing long hair on lateral expansion (Botosaneanu and Vaillant, 1970:pl. II, fig. 3); gonostylus trifid . . . . . *A. hexadactylus* Botosaneanu and Vaillant
– Scape normal, gonostylus bifid with 1 short and



Figures 224–230 *Arisemus* and *Australopericoma* spp. 224–225. *Arisemus confertus:* 224. male genitalia, dorsal; 225. female genitalia. 226–228. *Australopericoma abnormalis:* 226. male genitalia, dorsal; 227. female abdomen, tergites 5–7; 228. female genitalia. 229. *Australopericoma exilis,* male genitalia, dorsal. 230. *Australopericoma pontilis,* male genitalia, dorsal. **All scale lines = 0.1 mm**

1 long, slender shafts . . . . . *A. tetradactylus* Botosaneanu and Vaillant

3 Gonostylus without cluster of hairs 4
– Gonostylus with 25–30 hairs on basal half of mesal surface (Fig. 215) 24

4 Scape normal, ratio to pedicel about 1.5–2.0:1 5
– Scape elongate, ratio to pedicel at least 3:1 (Fig. 205), or greatly enlarged (Fig. 209) 18

5 CuA_2 without enlargement 6
– CuA_2 with some part enlarged (Wagner and Masteller, 1996:fig. 28) 15

6 Infuscate patterns on wing present 7
– Wing plain, without infuscate patterns . . . 13

7 Gonostylus undivided 8
– Gonostylus bifurcate or with short, median projection (Fig. 184) 11

8 Apex of CuA_2 extends to wing margin 9
– Apex of CuA_2 does not extend to wing margin 10

9 Infuscate patterns limited to vein tips and forks; gonocoxite with protuberance or projection; paramere as long as or longer than distiphallus; surstylus with about 30 black, spatulate hairs on dorsal margin near base; alula with thick tuft of straight, squamose hairs . . . . . *A. boxi* (Satchell)
– Infuscate patterns more extensive than just at vein tips and forks; gonocoxite simple, without processes; paramere broad, with broadly rounded apex, longer than distiphallus; surstylus without spatulate hairs; alula normal, without tuft of hairs . . . . . *A. grabhamana* (Dyar)

10 Paramere as long as or longer than distiphallus; paramere rounded-elongate, curved (Fig. 180) . . . . . ***A. maesi* n. sp.**
– Paramere shorter than distiphallus; paramere short, dark, and stublike . . *A. salazari* Quate

11 Base of wing vein M_2 without glandular structure 12
– Round cluster of glandular cells at base of M_2 (Wagner and Joost, 1994:fig. 3) . . . . . *A. guhli* Wagner and Joost

12 Surstylus without spatulate hairs; abdominal sternites with band of black scales in center of anterior margins (Fig. 183) . . . . . ***A. triatrapars* n. sp.**
– Surstylus with about 30 black, spatulate hairs on dorsal margin near base; abdominal sternites without black scales . . ***A. aenigmaticus* n. sp.**

13 Medial fork complete, M_2 joined to M_1 . . 14
– Medial fork incomplete, M_2 not joined to M_1 . . . . . ***A. woodi* n. sp.**

14 Anepisternal sensory organs located posterior of spiracle; costa normal, without concavity; apex of distiphallus straighter than that of *A. grandilobus,* not tapering . . . . . ***A. rhamphos* n. sp.**
– Anepisternal sensory organs located anterior of spiracle; costa with concavity, or indentation, at end of second node (Fig. 194); apex of distiphallus slightly curved, tapering . . . . . ***A. grandilobus* n. sp.**

15 Second node of costa absent; distiphallus and paramere extend well beyond gonocoxite apex; flagellomere with terminal 3 segments globular, smaller than preceding segments; apex of CuA_2 does not extend to wing margin 16
– Second node of costa present and often unusually large; distiphallus and paramere short, shorter than gonocoxite or barely extend beyond its apex; flagellomere with terminal 3 fusiform, slightly smaller than preceding flagellomeres, but not globular; apex of CuA_2 extends to wing margin 17

16 Gonostylus with small bifurcation near apex; Rs not pectinate . . . . . *A. buzbyae* Wagner and Masteller
– Gonostylus not bifurcate; Rs pectinate . . . . . *A. mariannae* Wagner and Masteller

17 Base of CuA_2 with large, rectangular spot . . . . . *A. martinezi* Wagner and Joost
– Base of CuA_2 with small, circular spot . . . . . *A. waidei* Wagner and Masteller

18 Wing with infuscate patterns 19
– Wing plain, without infuscate patterns . . . 23

19 CuA_2 not enlarged 20
– CuA_2 with central part enlarged (Quate, 1996: fig. 9b); medial fork complete; hypandrium with digitiform projection on one side halfway between center and lateral margin; infuscate patterns limited to vein tips and forks; radial fork complete, i.e., R_2 and R_3 attached . . . . . *A. spilotos* Quate

20 Apex of CuA_2 extends to wing margin; infuscate patterns do not form bands 21
– Apex of CuA_2 does not extend to wing margin; infuscate patterns forming bands across wing (Fig. 202) . . . . . ***A. pigmentatus* n. sp.**

21 Flagellomere with terminal 3 segments globular, smaller than preceding segments; radial fork basad or at same level as medial; infuscate patterns limited to vein tips and forks; radial fork complete, i.e., R_2 and R_3 attached; Rs pectinate 22
– Flagellomere with terminal 3 fusiform, only slightly smaller than preceding flagellomeres, but not globular; radial fork distad of medial; infuscate patterns more extensive than just at vein tips and forks; radial fork incomplete, R_3 not attached; Rs not pectinate . . . . . *A. obandoi* Wagner and Joost

22 Distiphallus and paramere extend well beyond gonocoxite apex; medial fork complete, M_2 joined to M_1 . . . . . *A. atrasetus* (Rapp)
– Distiphallus and paramere short, shorter than gonocoxite or barely extend beyond its apex (Fig. 201); medial fork incomplete, M_2 not joined to M_1 . . . . . ***A. caceresi* n. sp.**

23 Flagellomere 1 not enlarged (Fig. 209); anepisternal sensory organs posterior of spiracle; tergite 10 triangular; wing normal, length 2–2.5

times the width; medial fork complete, M_2 joined to M_1 ..... *A. ampliscapus* n. sp.
– Flagellomere 1 enlarged, much larger than following segments (Fig. 210); anepisternal sensory organs anterior of spiracle; medial fork incomplete, M_2 not joined to M_1 (Fig. 212) .... *A. barbarus* n. sp.
24 Second costal node present and often unusually large 25
– Second costal node absent .... *A. amydrus* n. sp.
25 Radial fork basad of or at same level as medial; wing normal, length 2–2.5 times width ... . *A. sesquipedalis* n. sp.
– Radial fork distad of medial; wing narrow, length about 3 times width .... *A. confertus* n. sp.

Australopericoma Vaillant

Australopericoma Vaillant, 1975:172–174; Duckhouse, 1990:722.

TYPE SPECIES. *Pericoma wirthi* Quate (= *Pericoma caudata* Satchell) by monotypy.

DESCRIPTION. Eye bridge with 3 facet rows, separated; interocular suture present; labellum flattened, without apical rods ("teeth"); antenna longer than wing width but shorter than wing length, basal flagellomeres fusiform, distal segments may lengthen and form short internode to become pyriform, terminal 3 segments sometimes reduced; ascoids simple, single rods, shorter than segment bearing them.

Anepisternite sometimes with sensory organs, with central patch of hairs; midcoxa with patch of hairs on anteroapical margin; wings plain and unmarked; Rs usually pectinate; radial and medial forks close to base, well basad of center; R_5 ends in wing apex.

Male. Hypandrium a band connecting gonocoxites; anterior gonocoxal apodemes broad and joined in center; with keel connected to aedeagus; base of gonocoxites with or without dorsal connection; distiphallus asymmetrical; basiphallus large and spoon- or paddle-shaped; surstylus with 1 tenaculum; epandrium with 2 foramina; ventral epandrial sclerite T-shaped, only one-half length of epandrium.

Female. Subgenital plate bilobed at apex; apical lobes usually poorly defined and separated by rounded concavity; genital ducts hemispherical with indistinct posterior margin; setal sclerite lacking; cercus much longer than wide.

REMARKS. Named without a description but with a type species designation by virtue of listing only one species in the new genus, Vaillant (1975) created *Australopericoma* for those Neotropical species similar to *Pericoma* with an asymmetrical aedeagus and 1 tenaculum. The type species was not clearly designated, but *Pericoma wirthi* Quate (a synonym of *Pericoma caudata* Satchell) was the only named species assigned to the genus and hence becomes the type species by monotypy. This is an unfortunate selection, because this species is atypical for the genus and so divergent that it may prove to be a genus separate from the other species now assigned to *Australopericoma*. The atypical features of the type species, *A. caudata*, are the paired parameres and distiphallus (nearly symmetrical) and the broad hypandrium with spines in the center, features which are found in no other species of *Australopericoma*. Despite the reservations expressed, the genus *Australopericoma* is the logical taxon for the following group of highly diverse species and is used for the present.

Australopericoma roessleri (Wagner and Joost) new combination

Arisemus roessleri Wagner and Joost, 1994:77–78, figs. 8–13.

DESCRIPTION. Male. Eyes narrowly separated by less than 1 facet diameter; frons hair patch without median extension, undivided; scape elongate, ratio to pedicel at least 3:1; flagellomeres 1 and 2 modified, fusiform and larger than following flagellomeres, 3–14 fusiform, terminal flagellomeres not reduced.

Thorax without sense organ. Wing with basal one-third of wing infuscate, infuscation also in costal cell, along R_5 and CuA_1; Rs pectinate; radial and medial forks on same level; CuA_2 not enlarged, reaches margin.

Genitalia with paramere U-shaped, longer than distiphallus.

DISTRIBUTION. Colombia.

HOLOTYPE. ♂, COLOMBIA, San Agustin, Rio Magdalena, 15.xii.1987, W. Joost (ULMG; not examined).

REMARKS. This species shares some similarities with *Arisemus obandoi*, *Arisemus spilotos*, and *Arisemus pigmentatus*: males have an enlarged scape and modified flagellomeres 1 and 2, but lack thoracic sensory organs.

Australopericoma abnormalis new species

Figs. 226–228

DESCRIPTION. Male. Vertex protuberant at apex; hair patch on frons undivided, with small indentation at center of posterior margin; eyes narrowly separated by less than 1 facet diameter, inner margin of bridge convex; interocular suture without median spur; scape and pedicel normal; flagellomeres elongate fusiform, terminal 3 segments slightly differentiated, terminal with long apiculis; ascoids not observed on flagellomeres 1–3, paired, digitiform on 4–11, arising near center and extend to tip of segment; ratio of palpomeres 10:16:20:27.

Thorax without sensory organ. Wing plain, without infuscations; second costal node present; costa concave beyond that node; Rs pectinate; radial and medial forks on same level; radial fork distad of base of Rs by 3 cell widths; CuA_2 extends to wing margin.

Gonocoxites with 5–6 long bristles on ventral surface beyond center; anterior gonocoxal apodemes small; hypandrium an arched band connecting bases of gonocoxites; gonostylus dimorphic, left gonostylus long, slender and curved at base, with 2 long bristles subapically, right gonostylus bifurcate, each branch equally slender, outer branch variable from inconspicuous to nearly as long as gonostylus, without cluster of hairs; distiphallus and right paramere short and stocky, barely extend beyond gonocoxite apex, left paramere elongate, straight, pointed; tergite 10 triangular.

Measurements. Antenna 1.22–1.35 mm ($\bar{x}$ = 1.27; n = 5). Wing length 2.33–2.65 mm, width 0.82–0.92 mm ($\bar{x}$ = 2.46, 0.87; n = 10).

Female. Tergite 8 grossly enlarged, humped, extends above other tergites, anterior margin heavily sclerotized, thick band of alveoli on anterior and posterior areas; subgenital plate large, with small apical lobes; chitinous arch extends little beyond apical margin; genital ducts hemispherical, lightly sclerotized; horizontal struts curved, form lyrelike structure.

Measurements. Antenna 1.32–1.38 mm (n = 2). Wing length 2.41–2.68 mm, width 0.82–0.89 mm ($\bar{x}$ = 2.59, 0.86; n = 5).

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, Maracay, 10–14.ix.1993, L. Quate, Malaise trap (IZAV).

PARATYPES. 13♂, 4♀, same data as holotype (BMNH, IZAV, LACM, USNM), 2♂, same data as holotype except 14.ix.1993, light trap, wooded hillside (LACM), 10 km N El Limon, 1♀, 19.ix.1993, L. Quate, light trap (LACM).

ETYMOLOGY. From Latin *abnormalis* for abnormal, referring to the unusual asymmetrical male gonostyli and enlarged female tergite 8.

Australopericoma exilis new species

Fig. 229

DESCRIPTION. Male. Apex of vertex sagittate; hair patch on frons undivided, posterior margin with concavity; eyes narrowly separated, interocular suture without median spur; flagellomeres fusiform, terminal 1 globular with long apiculis; ascoids digitiform, originate beyond center and extend to apex of segment, paired on flagellomeres 5–8, single on 9–11; ratio of palpomeres 10:11:16:26.

Thorax without sensory organs. Wing plain, without infuscations; Rs pectinate; radial and medial forks on same level; CuA_2 extends to wing margin.

Gonocoxite with narrow elongation from apical margin extending beyond apex of distiphallus, with apical bristle as usually seen on gonostylus; gonostylus very slender, over entire length, shorter than gonocoxal elongation; hypandrium a strongly sclerotized, arched band connecting bases of gonocoxites; distiphallus very long, extends beyond tip of gonostylus, with right angle curve at apex; paramere quadrate, surrounding distiphallus, and about half length of distiphallus; tergite 10 triangular.

Measurements. Antenna 1.05–1.07 mm (n = 2). Wing length 2.31–2.43 mm, width 0.87–0.99 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, 26 km W Pilcopata, 13°3.3′S, 71°32.8′W, 24.vii–2.viii.1997, L. Quate, Malaise trap, cloud forest, 1500 m (MUSM).

PARATYPE. ♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *exilis* for lean, referring to the shape of the male gonostylus.

Australopericoma pontilis new species

Fig. 230

DESCRIPTION. Male. Vertex prolonged at apex; eyes separated by about 1 facet diameter; interocular suture arched, weakened in center, without median spur; frons hair patch without median extension, undivided; scape normal, ratio to pedicel about 1.5:1; terminal flagellomeres not reduced; ratio of palpomeres 10:12:14:24.

Wing narrow, length about 3 times width, plain without patterns; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork basad of medial by at least 3 cell widths; CuA_2 extends to wing margin.

Gonocoxite with 2 large spines and several setae on apicomedial margin; gonostylus with 1 long and several shorter setae at apex; hypandrium an arched band connecting bases of gonocoxites, with 6 large spines near center; gonostylus undivided; distiphallus membranous, saclike, shorter than parameres; parameres paired, one on each side of distiphallus, with quadrate base ending in incurved, rounded point; tergite 10 triangular.

Measurements. Antenna 0.68–0.75 mm ($\bar{x}$ = 0.72; n = 2). Wing length 1.38–1.50 mm, width 0.48–0.50 mm ($\bar{x}$ = 1.44, 0.48; n = 4).

Female. Unknown.

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Rondônia, Cacaulândia, 200 km SSE Porto Velho, 10°18′S, 62°52.1′W, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (INPA).

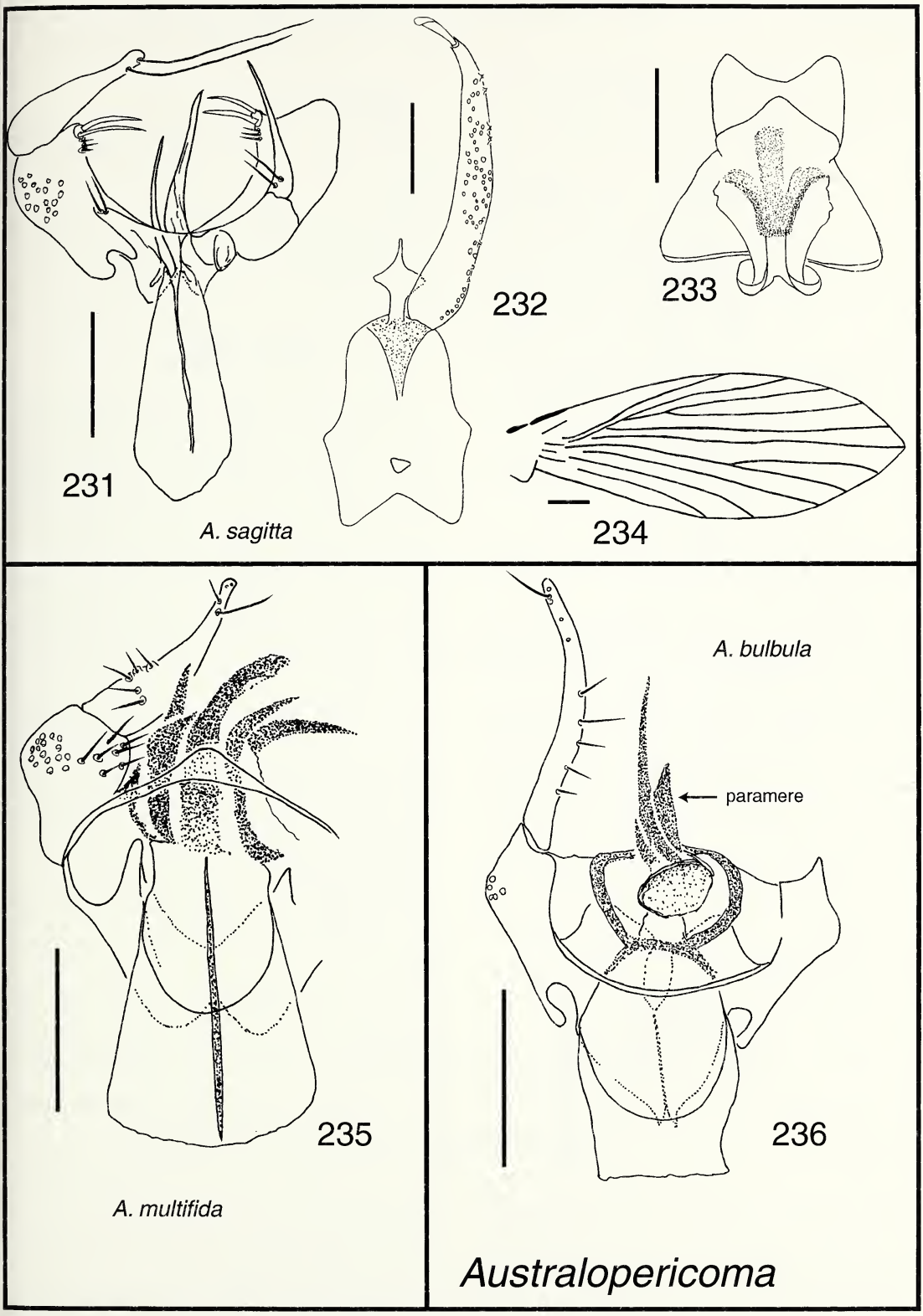
PARATYPES. 3♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *pontis* for bridge, referring to the broad hypandrium that forms a bridge between the gonocoxites.

Australopericoma sagitta new species

Figs. 231–234

DESCRIPTION. Male. Eyes separated by more than 1 facet diameter; interocular suture without median spur; frons hair patch without median extension, undivided; scape normal, ratio to pedicel about 1.5:1; flagellomeres 1–11 fusiform, terminal



Figures 231–236. *Australopericoma* spp. 231–234. *A. sagitta:* 231. male genitalia, dorsal; 232 male epandrium, surstylus, tergite 10; 233 female genitalia; 234. wing. 235. *A. multifida,* male genitalia. 236. *A. bulbula,* male genitalia, dorsal. All scale lines = 0.1 mm

flagellomeres not reduced; ratio of palpomeres 10:12:15:20.

Wing length 2.8–3 times width, plain without patterns; second costal node normal; costa normal, without concavity; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork basad of medial by at least 3 cell widths; CuA_2 extends to wing margin.

Gonocoxite with 2 large and several small spines at apicomedial margin; hypandrium connecting bases of gonocoxites, with 1 or 2 long spines in lateral region and right side prolonged into slender extension which extends beyond tip of paramere; gonostylus with 2 very long bristles at apex; distiphallus and paramere slender, extend well beyond gonocoxite apex; paramere longer and little thicker than distiphallus; tergite 10 arrow-shaped.

Measurements. Antenna 0.58–0.63 mm ($\bar{x}$ = 0.59; n = 4). Wing length 1.30–1.38 mm, width 0.45–0.48 mm ($\bar{x}$ = 1.34, 0.47; n = 4).

Female. Sides of apical lobes parallel, chitinous arch rounded and not attenuate; genital ducts poorly defined.

Measurements. Antenna 0.68–0.77 mm ($\bar{x}$ = 0.73; n = 2). Wing length 1.45–1.58 mm, width 0.48–0.50 mm ($\bar{x}$ = 1.52, 0.48; n = 3).

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Limón, Res. Biol. Hitoy Cerere, Rio Cerere, 9°48.4′N, 83°1.5′W, 17–26.ii.1999, L. Quate, Malaise trap, shaded stream, 100–200 m (INBC).

PARATYPES. 2♀, same data as holotype (LACM), 1♀ same data as holotype except Malaise trap over small stream (INBC), 1♂, same data as holotype except *Heliconia* flood plain (LACM), Puerto Viejo de Talamanca, 9°39.4′N, 82°45.9′W, 2♂, 25.ii–1.iii.1999, L. Quate, Malaise trap, secondary forest, sea level (LACM).

ETYMOLOGY. From Latin *sagitta* for arrow, referring to the arrow shape of tergite 10.

Australopericoma multifida new species

Fig. 235

DESCRIPTION. Male. Vertex prolonged and pointed; eyes narrowly separated by less than 1 facet diameter; interocular suture without median spur; frons hair patch without median extension, undivided; scape normal, ratio to pedicel about 1.5:1; flagellomere 1 normal, 1–11 fusiform, terminal flagellomeres not reduced; ratio of palpomeres 10:12:15:23.

Wing normal, length 2–2.5 times width, plain without patterns; second costal node absent; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork at about same level as medial; CuA_2 extends to wing margin.

Hypandrium an arched band connecting bases of gonocoxites, expanded in center; distiphallus black, bifurcate, 1 shaft with rounded apex; paramere consisting of a complex structure of 4 large, black spines, 2 on each side of distiphallus.

Measurements. Antenna 0.87 mm (n = 1). Wing length 1.65–1.73 mm; width 0.48–0.50 mm (n = 3).

Female. Unknown.

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Rondônia, Cacaulándia, 200 km SE Port Velho, 10°18′S, 62°52.1′W, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (INPA).

PARATYPES. 3♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *multifidus* for many-cleft, referring to the complex paramere.

Australopericoma bulbula new species

Fig. 236

DESCRIPTION. Male. Vertex prolonged, rounded at apex; eyes narrowly separated by less than 1 facet diameter; interocular suture without spur; frons hair patch without median extension, undivided; scape normal, ratio to pedicel about 1.5:1; flagellomeres 1–11 fusiform, terminal flagellomeres not reduced; ratio of palpomeres 10:10:13:21.

Wing normal, length 2.8–2.9 times width, plain without patterns; second costa node present; costa normal, without concavity; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork at about same level as medial; CuA_2 without medial enlargement, extends to wing margin.

Hypandrium an arched band connecting bases of gonocoxites; distiphallus short and stocky, swollen; paramere slender, much longer than distiphallus, darkly sclerotized; tergite 10 triangular.

Measurements. Antenna 0.80–0.81 mm (n = 2). Wing length 1.63–1.78 mm; width 0.58–0.60 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Brazil.

HOLOTYPE. ♂, BRAZIL, Rondônia, Cacaulándia, 200 km SE Port Velho, 10°18′S, 62°52.1′W, 25.v–6.vi.1998, L. Quate, Malaise trap, 140 m (INPA).

PARATYPES. 2♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *bulbus* for swelling, referring to the bulbous shape of the distiphallus.

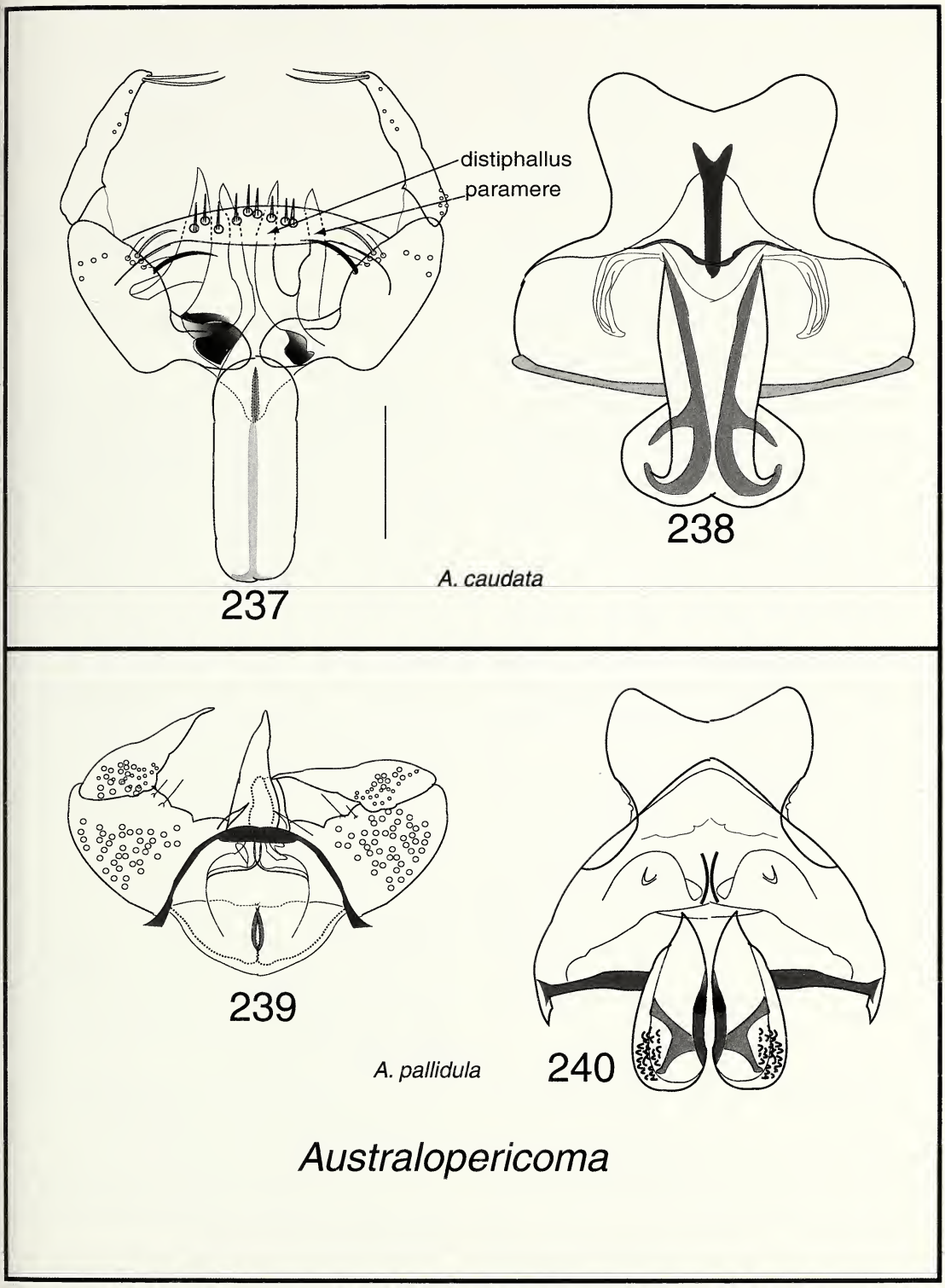
Australopericoma caudata (Satchell) new combination

Figs. 237–238

Pericoma caudata Satchell, 1955(February):90–92, figs. 4A–E.

Pericoma wirthi Quate, 1955(May):154–155, figs. 31a–e. **New synonymy.**

DESCRIPTION. Male. Eyes separated by less than 1 facet diameter; interocular suture arched, without stem; frons hair patch undivided, without median band; scape normal, about same length as pedicel; flagellomere 1 normal, 1–13 elongate fusi-



Figures 237–240 *Australopericoma* spp. 237–238. *A. caudata:* 237. male genitalia, dorsal; 238. female genitalia. 239–240. *A. pallidula:* 239. male genitalia dorsal; 240. female genitalia. Scale line = 0.1 mm

form, terminal 3 reduced, 14 with large apiculis; ratio of palpomeres 10:14:16:24.

Wing normal, length 2–2.5 times width, plain, without patterns; second costal node absent; Sc short; Rs not pectinate; radial fork basad of medial by about 3 cell widths; CuA_2 extends to wing margin.

Hypandrium an arched band, lightly sclerotized, slightly expanded in center, with 9 or 10 spines in center; gonocoxite with 1 or 2 large spines on apicomedial margin; gonostylus with 2 large spines at apex; distiphallus paired, slightly sinuous and with acute apex; parameres paired, larger and longer than distiphallus, also with acute apex; tergite 10 sagittate.

Measurements. Antenna 0.63–0.69 mm. Wing length 1.48–1.65 mm, width 0.53–0.58 mm.

Female. Eyes separated by 1 facet diameter. Subgenital plate with sides of apical lobes divergent; chitinous arch ends well before apical margin; membranous plate with bar and pair of convex crossbars in center at apex of genital ducts; longitudinal strut with projection from basal quarter, lateral strut blended into longitudinal.

Measurements. Antenna 0.63 mm. Wing length 1.68–1.73 mm, width 0.58–0.63 mm.

DISTRIBUTION. Jamaica, Florida, Texas, Arizona.

HOLOTYPES. *Pericoma caudata*: ♂, JAMAICA, Runaway Bay, 15.iii.1905 (BMNH; examined). *P. wirthi*: ♂, USA, Arizona, Wickenburg, Hassayampa River, 29.vi.1953, W. Wirth (USNM; examined).

OTHER MATERIAL EXAMINED. See Quate (1955:154) for a list of the material of this species.

REMARKS. *Australopericoma caudata* is one of the few species of Setomimini that occurs widely in the USA and in the Caribbean. The only difference noted between the mainland and Caribbean populations is that there are 2 large spines on the gonocoxites of the Jamaican specimens and only 1 on those from the USA.

Australopericoma pallidula (Tonnoir) new combination

Figs. 239–240

Pericoma pallidula Tonnoir, 1929:16–18, pl. II, figs. 28–31.

DESCRIPTION. Male. Eyes separated by 1 facet diameter; interocular suture arched, without stem; frons hair patch undivided, without median band; palpomeres long and slender.

Anepisternite with alveoli on dorsal half only (slide slightly distorted, thus alveoli may be distributed differently). Wing without second costal node; Rs not pectinate; radial fork little basad of medial; CuA_2 extends to wing margin.

Hypandrium an arch between gonocoxites, expanded in center; anterior gonocoxal apodemes smaller than normal, with short anterior expansion; gonostylus tapering to acute apex (seta not evident in type slide); basiphallus very small and not expanded at base; distiphallus also tapering to acute apex; paramere short and thick, much shorter than distiphallus, slightly indented at apex.

Female. Apical lobes broadly rounded, narrowing basally; chitinous arch not reaching apical margin; membranous plate with elongate anterolateral projections.

DISTRIBUTION. Argentina.

HOLOTYPE. ♂, ARGENTINA, Rio Negro, Lake Correntosa, 18–25.xi.1926 (BMNH; examined).

Australopericoma cesticella new species

Figs. 241–242

DESCRIPTION. Male. Apex of vertex sagittate; eyes narrowly separated by less than 1 facet diameter; interocular suture without median spur; frons hair patch undivided in center, posterior margin concave; flagellomeres fusiform, terminal segments scarcely smaller than preceding, terminal with long apiculis; ascoids small and peglike on flagellomeres 1–3, digitiform, paired on 4–11, originate beyond center, extend little beyond apex.

Wing plain, without infuscations; Sc short, ends at or before base of R_{2+3}; Rs pectinate, radial and medial forks on same level; CuA_2 extends to wing margin.

Hypandrium a broad band connecting bases of gonocoxites, pair of curved ridges extend from hypandrium to base of distiphallus to form a ring; gonostylus enlarged basally, narrowing at basal third; distiphallus and paramere extend well beyond gonocoxite, distiphallus tubular, apex blunt; paramere appears as central sclerotized ridge on distiphallus; tergite 10 triangular.

Measurements. Antenna 1.13–1.23 mm ($\bar{x}$ = 1.17; n = 5). Wing length 2.41–2.65 mm, width 0.84–0.92 mm ($\bar{x}$ = 2.49, 0.88 mm; n = 6).

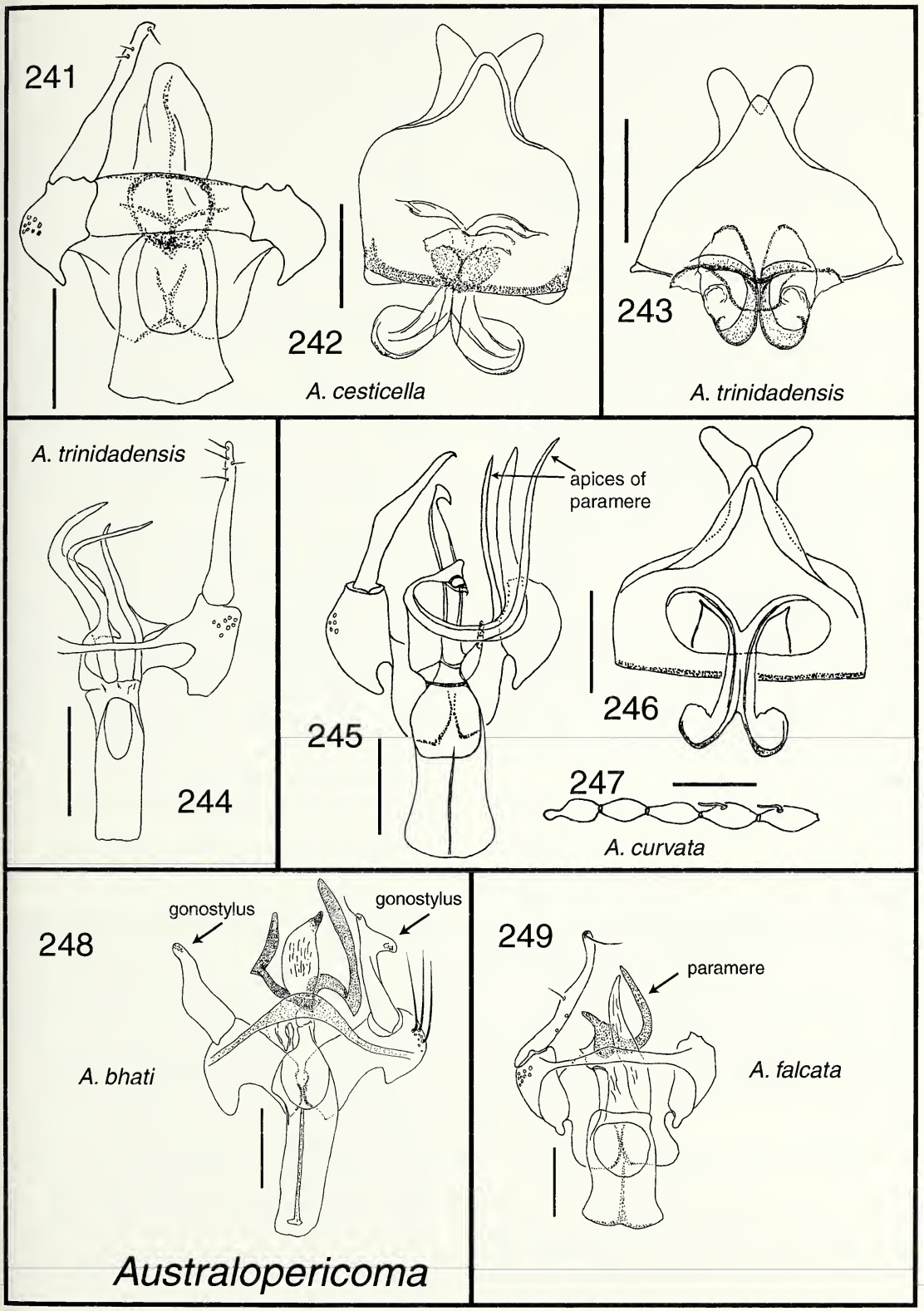
Female. Tergite 8 modified, about one-half length of 7, alveoli over entire surface, somewhat arched and partly separated from 7; chitinous arch extends beyond apical margin; genital ducts lightly sclerotized; cerci long and slender, length about 10 times basal width.

Measurements. Antenna 1.14–1.19 mm ($\bar{x}$ = 1.16; n = 8). Wing length 2.43–2.77 mm, width 0.84–0.94 mm ($\bar{x}$ = 2.58, 0.90; n = 10).

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Puntarenas, 20 km N San Vito, Estación Pittier, 11–14.iv.1995, L. Quate, Malaise trap, streamside, 1800 m [barcode INBIOCRI001471792] (INBC).

PARATYPES. Limón, Res. Biol. Hitoy Cerere, Rio Cerere, 9°48.4′N, 83°1.5′W, 1♂, 17–26.ii.1999, L. Quate, Malaise trap, sidestream, 100–200 m (LACM), 1♂, 2♀, same data as previous specimen except Malaise trap over small stream (LACM); Puntarenas, Las Alturas, 8°57.23′N, 82°50.22′W, 5♂, 5♀, 11–16.viii.1995 (INBC, LACM), 1♂, 3♀, same data as holotype



Figures 241–249 *Australopericoma* spp. 241–242. *A. cesticella:* 241. male genitalia, dorsal; 242. female genitalia. 243–244. *A. trinidadensis:* 243. female genitalia; 244. male genitalia, dorsal. 245–247. *A. curvata:* 245. male genitalia, dorsal; 246. female genitalia; 247. flagellomeres 10–14. 248. *A. bhati,* male genitalia, dorsal. 249. *A. falcata,* male genitalia, dorsal. All scale lines = 0.1 mm

(LACM), same data as holotype except 9°1.4′N, 82°57.5′W, 1♀, 12.vi.1995, 1700 m (LACM), same data as holotype except Rio Gelemas, 1♀, 15.vi.1995, 1670 m (LACM); San José, San Gerardo de Dota, Alberge Sauvegre, 9°33.12′N, 83°48.5′W, 1♂, 7–11.viii.1995, C. Young, 2250 m (Carnegie Museum, Pittsburgh, USA).

ETYMOLOGY. From Latin *cesticillus* for "ring placed on head for support," referring to the ring connecting the hypandrium to the aedeagus.

Australopericoma trinidadensis new species

Figs. 243–244

DESCRIPTION. Male. Very pale species; vertex with small sagittate structure at apex; eyes narrowly separated by less than 1 facet diameter; interocular suture without median spur; frons hair patch without median extension, undivided; scape normal, ratio to pedicel about 1.5:1; flagellomeres 1–14 fusiform, terminal flagellomeres not reduced; ratio of palpomeres 10:20:20:38.

Wing normal, length 2–2.5 times width, plain without patterns; second costal node normal; Sc short, ends at or before base of R_{2+3}; Rs pectinate; radial fork at about same level as medial; CuA_2 extends to wing margin.

Hypandrium a straight band connecting bases of gonocoxites; distiphallus bifurcate, first branch long, S-shaped, broad basally and slender apically, second branch more slender and little longer, strongly curved at apical one-quarter; parameres slender, nearly straight, shorter than distiphallus; epandrium width less than length; tergite 10 triangular.

Measurements. Antenna 0.91 mm (n = 1). Wing length 1.60 mm, width 0.55 mm (n = 1).

Female. Apical lobes of subgenital plate well developed; chitinous arch extends beyond apical margin; genital ducts compact, longitudinal strut well developed; cercus long and slender.

Measurements. Antenna 0.86 mm (n = 1). Wing length 1.50–1.78 mm, width 0.48–0.60 mm (n = 2).

DISTRIBUTION. Trinidad.

HOLOTYPE. ♂, TRINIDAD, Asa Wright Nature Center, 15.i.1981, G. Bohart (LACM).

PARATYPE. ♀, same data as holotype (LACM).

ETYMOLOGY. The name is based on the type locality.

Australopericoma curvata new species

Figs. 245–247

DESCRIPTION. Male. Vertex sagittate at apex; hair patch on frons undivided, rectangular with indentation in posterior margin; eyes very narrowly separated; without spur on midline; scape and pedicel normal; flagellomeres fusiform; terminal segments not modified, terminal with long, clublike apiculis; ascoids digitiform, very small, not observed on flagomeres 1–3, paired on 4–6, single on 7–11, not observed on 12–14; ratio of palpomeres 10:12:13:25.

Thorax without sensory organ. Wing plain, without infuscations; Rs pectinate; radial and medial forks on same level; CuA_2 ends at wing center.

Gonostylus long, with small dorsal incrassation near center; distiphallus ending in hooked apex; paramere bifurcate, each branch curved at base nearly in circle and curves distally to end beyond apex of distiphallus.

Measurements. Antenna 0.99–1.00 mm (n = 2). Wing length 2.12–2.38 mm, width 0.85–0.90 mm (n = 3).

Female. Subgenital plate with apical lobes slender, chitinous arch extends beyond margin of plate; genital ducts and associated structures lightly sclerotized; lateral strut lacking; longitudinal strut prominent, ending in smooth curve; cerci long and slender, length more than 10 times maximum width.

Measurements. Antenna 1.19–1.21 mm (n = 2). Wing length 2.77–2.94 mm, width 1.01–1.11 mm (n = 3).

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Merida, Merida, 11.ix.1995, L. Quate, 2100 m (IZAV).

PARATYPES. VENEZUELA, Merida, Jají, 8°36′N, 71°21′W, 3♀, 14.xi.1995, L. Quate, Malaise trap, 2100 m (IZAV, LACM), Merida, La Hechicera, 8°37′N, 71°9′W, 1♂, 22.ix.1995, L. Quate, Malaise trap, secondary forest, 1800 m (LACM), Merida, 8°41′N, 71°6′W, 1♂, 12.ix.1995, L. Quate, Malaise trap, 2100 m (LACM).

ETYMOLOGY. From Latin *curvatus* for bending, referring to the male paramere.

Australopericoma bhati new species

Fig. 248

DESCRIPTION. Male. Vertex dome-shaped at apex; hair patch on frons undivided, quadrangular with indentation in posterior margin; eyes very narrowly separated; without spur on midline; scape and pedicel normal; flagellomeres fusiform, terminal segments not modified, terminal with long, clublike apiculis; ascoids digitiform, not observed on flagellomeres 1–3, paired on 4–6, single on 7–11, not observed on 12–14; ratio of palpomeres 10:12:15:23.

Thorax without sensory organ. Wing plain, without infuscations; Rs pectinate; radial and medial forks on same level; CuA_2 ends at wing center.

Gonostyli dimorphic, right with large lateral expansion at distal one-quarter, left with small enlargement at distal one-quarter; distiphallus inflated, broad at base and tapering to slender apex, slightly sinuous; paramere bifurcate, both branches dark and strongly curved and twisted at base, 1 longer than other and both longer than distiphallus; tergite 10 triangular.

Measurements. Antenna 1.05–1.12 mm (n = 3).

Wing length 2.33–3.00 mm, width 0.93–1.15 mm (n = 5).

Female. Unknown.

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, Manu Nat. Park, El Mirador to San Pedro road, 13°9′S, 71°35′W, 1–9.ix.1999, L. Quate, A. Cáceres, Malaise trap, 2280 m (MUSM).

PARATYPES. 3♂, same data as holotype (LACM), 1♂, same data as holotype except 1910 m (LACM).

ETYMOLOGY. The senior author took great pleasure in naming this species after his longtime friend and companion on many interesting field trips, Dr. Hari Bhat of Pune, India, who ably assisted him in the altitudinal transect in Manu National Park.

Australopericoma falcata new species

Fig. 249

DESCRIPTION. Male. Vertex with wrinkled, ovoid structure at apex with few alveoli (possibly a sensory organ); frons hairs patch undivided, with posterior margin concave at center; eyes narrowly separated by less than 1 facet diameter, interocular suture present, without median spur; frons hair patch undivided; scape normal, ratio to pedicel about 1.5:1; flagellomeres 1–11 fusiform, terminal with clavate apiculis; ascoids not observed on flagellomeres 1–3, paired on 4–11, digitiform, originating near center of flagellomere and extending little beyond apex; ratio of palpomeres 10:16:16:30.

Thorax without sensory organ. Wing plain, without infuscations; costa slightly concave beyond second costal node; Rs pectinate, but bases of Rs and R_3 weak; radial and medial forks on same level, radial fork distad of base of R_{2+3} by 4 cell widths.

Hypandrium a straight bar connecting gonocoxites; gonostylus slender, tapering to dark, blunt apex, long bristle at apex, slightly incrassate in center; distiphallus broad at base, tapering to slender apex; paramere hook-shaped in form of 'J'; tergite 10 triangular.

Measurements. Antenna 0.90–0.92 mm (n = 2). Wing length 1.98–2.03 mm, width 0.70–0.75 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 19 km N Maracay, 1280 m, 14–17.ix.1993 (IZAV).

PARATYPE. VENEZUELA, Aragua, 22 km S of Choroní, 1♂, 17.ix.1993, L. Quate, Malaise trap, 1000 m (LACM).

ETYMOLOGY. From Latin *falcatus* for hooked, referring to the shape of the paramere.

KEY TO MALES OF *AUSTRALOPERICOMA*

1 Scape normal, no more than 2 times length of pedicel; wing plain, without infuscations 2
– Scape elongate, about 3 times length of pedicel; wing with infuscate patterns . . . . . *A. roessleri* Wagner and Joost
2 Gonostyli similar 3
– Gonostyli dissimilar, 1 J-shaped, other U-shaped (Fig. 226) . . . . . ***A. abnormalis*** **n. sp.**
3 Gonocoxite without large, median projection 4
– Gonocoxite with large, median, nonarticulated projection in addition to slender gonostylus (Fig. 229) . . . . . ***A. exilis*** **n. sp.**
4 Paramere not J-shaped, not strongly curved 5
– Paramere J-shaped, strongly curved (Figs. 245, 249) 12
5 Gonocoxite with 1 or 2 large spines on apicomedial margin (Figs. 231, 237) 6
– Gonocoxite without large spines on margin 8
6 Gonocoxite with 1 large spine (Fig. 237) . . . . . *A. caudata* (Satchell)
– Gonocoxite with 2 large spines 7
7 Hypandrium curved anteriorly, without median setae (Fig. 231) . . . . . ***A. sagitta*** **n. sp.**
– Hypandrium curved posteriorly, with median setae (Fig. 230) . . . . . ***A. pontilis*** **n. sp.**
8 Paramere a single shaft 9
– Paramere consists of 3 pointed, black shafts (Fig. 235) . . . . . ***A. multifida*** **n. sp.**
9 Paramere inflated, shorter than distiphallus (Fig. 236) 10
– Paramere slender, longer than or as long as distiphallus 11
10 Paramere turnip-shaped, much shorter than slender distiphallus (Fig. 236) . . . . . ***A. bulbula*** **n. sp.**
– Paramere with sides nearly parallel, apex with slight indentation . . . . *A. pallidula* (Tonnoir)
11 Distiphallus a single shaft; paramere broad, straight (Fig. 241) . . . . . ***A. cesticella*** **n. sp.**
– Distiphallus a double shaft; paramere slender, sinuous (Fig. 244) . . . ***A. trinidadensis*** **n. sp.**
12 Distiphallus nearly straight, tapering from broad base to straight, acute apex (Figs. 248–249) 13
– Distiphallus curved at base similar to paramere, slender over entire length (Fig. 245) . . . . . ***A. curvata*** **n. sp.**
13 Gonostyli dimorphic, left with large projection at distal one-fourth, right with only slight swelling at distal one-fourth (Fig. 244) . . . . . ***A. bhati*** **n. sp.**
– Gonostyli monomorphic, both similar and slender over entire length . . . . . ***A. falcata*** **n. sp.**

Micrommatos new genus

TYPE SPECIES. *Micrommatos sylvaticum* n. sp., by present designation.

DESCRIPTION. Eyes contiguous; eye bridge with 3 facet rows; frons with single, quadrate hair patch without posterior extension; flagellomeres fusiform, terminal 3 segments not reduced, terminal

flagellomere without apiculis; ascoids absent; palpus short, shorter than head height, palpomere 4 usually shorter than 3.

Antepronotum with band of dense pores along entire dorsal margin of both sexes; midcoxa with tuft of long hairs arising from elevated knob of anteroventral margin. Anepisternum with single hair patch evenly distributed over most of sclerite, but lacking on anteroventral part; midcoxa with patch of long hairs arising from elevated pad on anteroapical margin. Wing plain, without infuscate patterns; second costal node absent; base of R_{2+3} not attached to R_4; radial fork basad of medial; R_5 ends in wing apex.

Male. Anterior gonocoxal apodemes tightly contiguous on midline; hypandrium a bar connecting bases of gonocoxites, usually pair of knobs flanking midline; aedeagus asymmetrical; paramere present; surstylus with 1 tenaculum; epandrium without foramen; tergite 10 small, domelike, scarcely differentiated from epandrium.

Female. Apex of subgenital plate concave; genital ducts with lobe from anterolateral margin.

ETYMOLOGY. From Greek *mikrommatos* for small-eyed, referring to the narrow eye bridge; gender neuter.

REMARKS. The band of pores on the antepronotum, which probably is a male sensory organ, is not known in any other psychodid genus.

Micrommatos simplex new species

Figs. 250–252

DESCRIPTION. Male. Eye bridge separated by 1 facet diameter, with broad interocular suture in center of bridge; palpomere 4 about one-half length of palpomere 3.

Radial fork distad of medial by several cell widths.

Hypandrium without projections, with 3 large spines on each side of midline; distiphallus heart-shaped; paramere tapers from broad base to blunt apex; surstylus without setose lobe at base.

Measurements. Antenna 0.60 mm (n = 1). Wing length 1.23–1.25 mm, width 0.48–0.50 mm (n = 2).

Female. Unknown.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Puntarenas, Est. Biol. Las Alturas, 8°57.23′N, 82°50.22′W, 11–16.viii.1995, L. Quate, Malaise trap, 1550 m [barcode INBIOCRI001471871] (INBC).

PARATYPE. COSTA RICA, Puntarenas, Estación Pittier, 20 km N San Vito, 1♂, 11–14.vi.1995, L. Quate, Malaise trap, stream, secondary vegetation, 1800 m (LACM).

ETYMOLOGY. From Latin *simplex* for simplicity, referring to the relatively simple male genitalia.

REMARKS. The position of the radial fork being distad of the medial is unusual, and *M. simplex* is one of the few species of the Setomimini with this condition.

Micrommatos stephaniae new species

Figs. 253–254

DESCRIPTION. Male. Eye bridge broadly contiguous on midline over 2 facet rows; palpomere 4 little shorter than 3.

Radial fork mesad of medial by about 1 cell width.

Hypandrium with pair of small, sharp projections flanking midline, each bearing 4 setae at apex; distiphallus bipartite, with 1 long, straight and 1 small shaft; paramere broad basally, suddenly tapering to acute point; surstylus with large tumorlike, setose lobe at base, lobe nearly as wide as surstylus.

Measurements. Wing length 1.30 mm, width 0.55 mm (n = 1).

Female. Subgenital plate with shallow concavity between poorly defined lobes; genital ducts with rounded lobe projecting from anterolateral margin; longitudinal and lateral struts lightly developed; setal sclerite with 4 setae on each side in central area.

Measurements. Antenna 0.71–0.79 mm ($\bar{x}$ = 0.74; n = 5). Wing length 1.53–1.80 mm, width 0.55–0.70 mm ($\bar{x}$ = 1.68, 0.62; n = 6).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, Rio Madre de Dios, 28 km ESE Boca Manu, 12°21′S, 70°42′W, 14.vii.1997, L. Quate, Malaise trap, 250 m (MUSM).

PARATYPES. 12♀, same data as holotype (BMNH, LACM, MUSM, USNM), 26 km W Pilcopata, 13° 3′S, 71°32′W, 1♀, 25.vii–3.viii.1997, L. Quate, Malaise trap, quebrada, 1500 m (LACM).

ETYMOLOGY. Named in honor of the senior author's daughter, who accompanied him on the trip during which most of the types were collected.

REMARKS. Association of sexes for *M. stephaniae* has been made based on the short palpomere 4. Another female from the type locality is very similar but possesses heavy struts and V-shaped suture at the apex of the genital ducts. Also, palpomere 4 is as long as 3. Although the differences in the two females are slight, they do seem consistent, and they are not considered conspecific.

Micrommatos anconatum new species

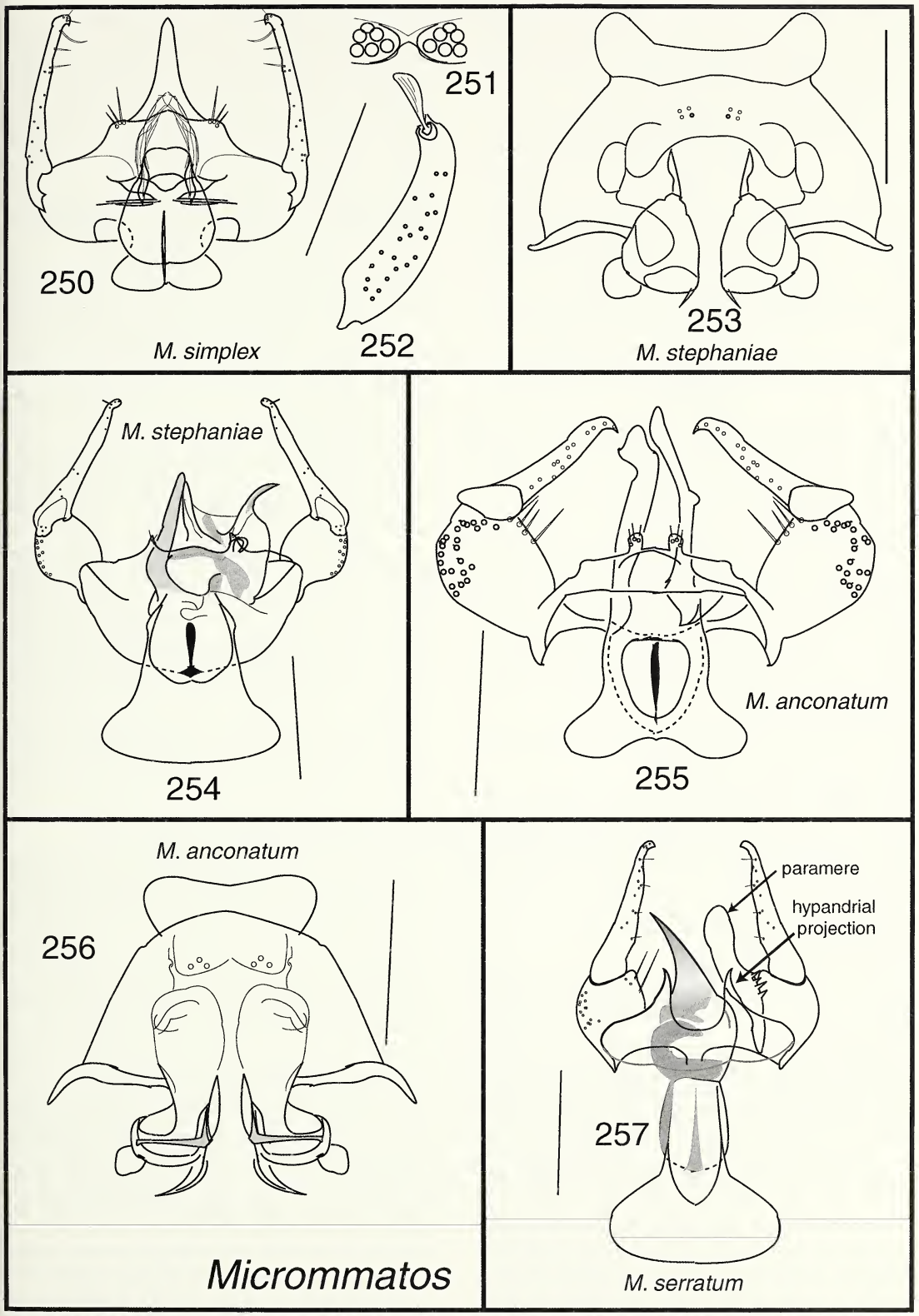
Figs. 255–256

DESCRIPTION. Male. Eyes contiguous, bridge contiguous over 2 facet diameters; palpomeres 3 and 4 subequal in length.

Radial and medial forks on same level.

Hypandrium with pair of small knobs flanking midline, each bearing 4–5 long setae; distiphallus with 45° angle subapical curve, apex expanded and quadrate; paramere with elbowlike curve at distal one-third, apex rounded.

Measurements. Antenna 0.53–0.58 mm ($\bar{x}$ = 0.56; n = 6). Wing length 1.45–1.73 mm, width 0.55–0.65 mm ($\bar{x}$ = 1.56, 0.60; n = 6).



Figures 250–257 *Micrommatos* spp. 250–252. *M. simplex:* 250. male genitalia, dorsal; 251. center of eye bridge; 252. male surstylus, lateral. 253–254. *M. stephaniae:* 253. female genitalia, dorsal; 254. male genitalia, dorsal. 255–256. *M. anconatum:* 255. male genitalia, dorsal; 256. female genitalia, dorsal. 257. *M. serratum,* male genitalia, dorsal. All scale lines = 0.1 mm

Female. Little larger than male; genital ducts with lobelike projection from anterolateral margin.

Measurements. Wing length 1.75–2.13 mm, width 0.70–0.83 mm (n = 4).

DISTRIBUTION. Venezuela.

HOLOTYPE. ♂, VENEZUELA, Aragua, 20 km S Choroní, 14.ix.1993, L. Quate, light trap, 880 m (IZAV).

PARATYPES. 4♂, same data as holotype (BMNH, LACM, USNM), 22 km S Choroní, 3♀, 17.ix.1993, L. Quate, Malaise trap, 1000 m (IZAV, LACM), 10 km N El Limon, 1♂, 19.ix.1993, L. Quate, light trap (LACM).

ETYMOLOGY. From Latin *ancon* for elbow, referring to the elbow shape of the male paramere.

Micrommatos serratum new species

Fig. 257

DESCRIPTION. Male. Eye bridge broadly contiguous on midline over 2 facet rows; palpomere 4 little longer than 3.

Radial fork mesad of medial by about 1 cell width.

Hypandrium with pair of spinelike projections flanking midline, each with single subapical seta; distiphallus straight, broad at base and tapering to acute apex; paramere sausage-shaped, broad with rounded apex, base slender, with 5–6 sharp serrations on lateral margin near base; surstylus long, with oval enlargement at base with setae on apical margin.

Measurements. Antenna 0.62–0.69 mm (n = 4). Wing length 1.58–1.98 mm, width 0.60–0.75 mm ($\bar{x}$ = 1.73, 0.65; n = 6).

Female. Little larger than male; genital ducts with large projection from anterolateral margin; longitudinal strut well developed, lateral strut absent; setal sclerite with 5 setae on each side in basal area.

Measurements. Antenna 0.76 mm (n = 1). Wing length 2.10 mm, width 0.60 mm (n = 1).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, 26 km W Pilcopata, 13°3.3′S, 71°32.8′W, 24.vii–2.viii.1997, L. Quate, Malaise trap, cloud forest, 1500 m (MUSM).

PARATYPES. 4♂, 1♀, same data as holotype (BMNH, LACM, MUSM, USNM).

ETYMOLOGY. From Latin *serra* for saw, referring to the serrate edge of the paramere.

Micrommatos sylvaticum new species

Figs. 258–261

DESCRIPTION. Male. Eye bridge broadly contiguous on midline over 2 facet rows; frons with diagonal suture from anterior of antennal socket nearly to center of eye bridge; hair patch on frons without posterior extension; palpomere 4 same length as or little shorter than 3.

Radial fork mesad of medial by about 1 cell width.

Hypandrium with large, rounded lobe on each side of midline, each lobe with 5 alveoli; distiphallus consists of 2 small shafts, each with 45° angle near distal one-third; paramere a longer shaft than distiphallus, also with 45° angle near distal one-third paralleling those of distiphallus and slightly upturned at apex; surstylus without setose lobe at base or with very small setose lobe.

Measurements. Antenna 0.53–0.64 mm ($\bar{x}$ = 0.59; n = 10). Wing length 1.45–1.93 mm, width 0.53–0.74 mm ($\bar{x}$ = 1.65, 0.65; n = 10).

Female. Apex of female subgenital plate a very shallow concavity; longitudinal and lateral struts of genital ducts slender; setal sclerite with 4 setae on each side of midline in anterior area; domelike structure little anterior of apical margin.

Measurements. Antenna 0.70–0.78 mm (n = 4). Wing length 1.95–2.43 mm, width 0.70–0.90 mm ($\bar{x}$ = 2.20, 0.82; n = 5).

DISTRIBUTION. Costa Rica.

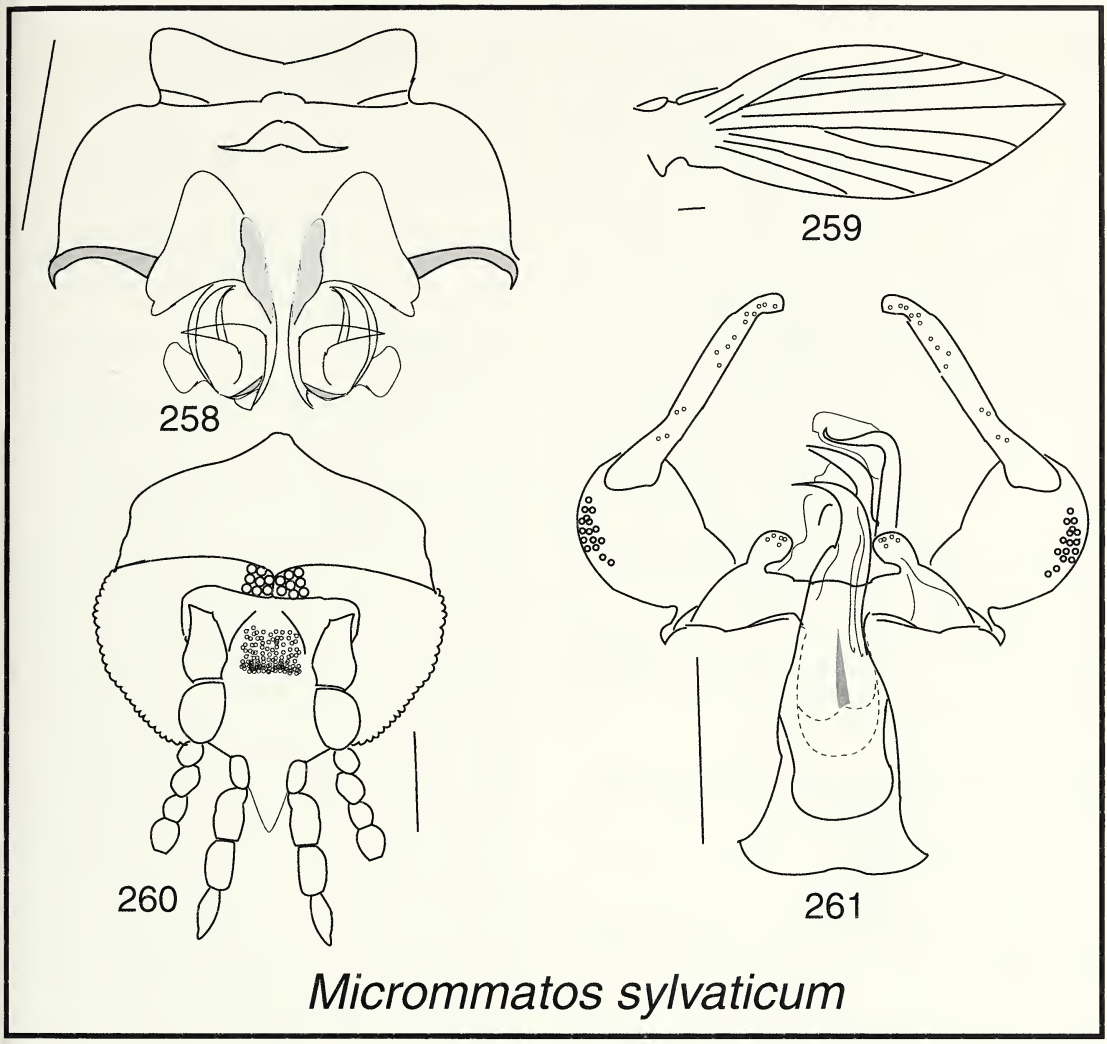
HOLOTYPE. ♂, COSTA RICA, Puntarenas, Est. Biol. Las Alturas, 8°57.23′N, 82°50.22′W, 11–16.viii.1995, L. Quate, 1550 m [barcode INBIOCRI001472387] (INBC).

PARATYPES. 16♂, 4♀, same data as holotype (BMNH, LACM, USNM); Estación Pittier, 20 km N San Vito, 1♀, 11–14.vi.1995, L. Quate, Malaise trap, stream, secondary vegetation, 1800 m (INBC), 1♂, same data as previous specimen except 12.vi.1995, primary forest (LACM), 14 km SW San Isidro, 1♂, 23.vi.1995, L. Quate, light trap, 880 m (LACM).

ETYMOLOGY. From Latin *silvaticus* for "of the woods," referring to the primary moist forest habitat of this species.

KEY TO MALES OF *MICROMMATOS*

1 Radial fork basad of or at same level as medial; palpomere 4 same length as or little shorter than 3; eye bridge broadly contiguous on midline over 2 facet rows 2
– Radial fork distad of medial by several cell widths; palpomere 4 about one-half length of 3; eye bridge separated by 1 facet diameter, with broad interocular suture (Fig. 251) . . . . . ***M. simplex* n. sp.**
2 Surstylus without setose lobe at base or with very small setose lobe; distiphallus unipartite 3
– Surstylus with large globular, setose lobe at base, lobe nearly as wide as surstylus; distiphallus bipartite . . . . . ***M. stephaniae* n. sp.**
3 Hypandrium with rounded lobe on each side of midline; paramere slender, with distinct bend 4
– Hypandrium with pair of large, pointed projections (Fig. 257); paramere sausage-shaped with rounded apex . . . . . ***M. serratum* n. sp.**
4 Distiphallus unipartite; paramere with elbowlike bend near center (Fig. 255) . . . . . ***M. anconatum* n. sp.**
– Distiphallus bipartite; 3 shafts of distiphallus and



Figures 258–261 *Micrommatos sylvaticum*: 258. female genitalia; 259. wing; 260. head; 261. male genitalia, dorsal. All scale lines = 0.1 mm

paramere all with 45° subapical curves (Fig. 261) . . . . . ***M. sylvaticum* n. sp.**

Caenobrunettia Wagner

Caenobrunettia Wagner, 1981:218; Quate, 1996: 25–26.

TYPE SPECIES. *Caenobrunettia echinoflagellata* Wagner, by original designation.

DESCRIPTION. Eye bridge very short and ends in acute point, eyes widely separated; interocular suture absent; flagellomeres fusiform or globular, 1–13 with round patch of rods near center, terminal 3 not reduced; ascoids paired on flagellomeres 1–13, each ascoid consisting of 4 or 5 individual strands, twisted at base and closely appressed to appear as single filament, very long, about length of 3 flagellomeres; palpus very long, extends nearly to end of antenna, palpomere 1 much shorter than other 3.

Anepisternum with anterior part sclerotized and evenly covered with alveoli, posterior part clear and devoid of alveoli, clear area wider than haired; with sensory organs; midcoxa with tuft of hairs on elevated knob and anterior margin. Wing plain, without markings; radial sector pectinate; base of R_{2+3} attached to R_4; radial and medial forks close to base, radial fork distad of Rs base by about 2 cell widths; R_5 ends in wing apex.

Abdominal tergites with 2 bands of alveoli.

Male. Aedeagus usually asymmetrical; surstylus with 1 tenaculum.

REMARKS. *Caenobrunettia* is easily distinguished from other Neotropical genera by the unique ascoids, long palpus, and atrophied eye bridges. It is similar to *Setomima*, which is largely

Afrotropical, but also with one species in North America; Quate (1996) summarizes the differences between the two genera. Additional differences are the structure of the ascoids and tenacula. In *Setomima*, the ascoids consist of a long, single branch and the tenacula are multiple and modified. In *Caenobrunettia*, the ascoids consist of 4 or 5 individual strands, and the tenacula are single and similar in structure to the tenacula of most other psychodids.

Caenobrunettia is almost certainly polyphyletic. The first four species below, *C. stylappendiculata* (Wagner), *C. sarculosa* Quate, *C. subditicia* n. sp., and *C. pollicaris* n. sp., form a monophyletic group with similar male genitalia that clearly represent a single clade. The rest of the species have entirely different genitalia, with only *C. fraudulenta* n. sp. and *C. barretti* n. sp. showing close similarities. The others differ so much in basic structures, both among themselves and from the two recognizable clades, that it is difficult to visualize an ancestor which could give rise to all those species. Thus, distinguishing characters of the head and wing produce a group that is empirically definable, but unjustifiable cladistically. However, given the rudimentary state of knowledge regarding Neotropical psychodines, we use the description above as an empirical basis for the genus.

Caenobrunettia stylappendiculata (Wagner) new combination

Setomima stylappendiculata Wagner, 1993:122–123, figs. 44–49.

DESCRIPTION. Male. (After Wagner). Eyes separated by about 20 facet diameters; basal flagellomeres globular, terminal elongate with long apiculis.

Gonocoxites broadly fused on midline, without protrusions; gonostylus about as long as gonocoxite, expanded in center, with rodlike projection from center of ventral surface with bristle at apex, serrations along lateral border beyond center, apex slender and blunt; distiphallus with 2 shafts, both with acute apices (smaller shown to lie at right angle to larger in Wagner's illustration, but probably distorted in mounting); paramere parallel-sided with blunt apex; tergite 10 bilobed; surstylus with 1 tenaculum.

DISTRIBUTION. Tobago.

HOLOTYPE. ♂, TOBAGO, streamlet cut by Roxborough-Parlatuvier road near highest point, 21.iv.1991, L. Botosaneanu (RW; not examined).

Caenobrunettia sarculosa Quate
Figs. 262–263

Caenobrunettia sarculosa Quate, 1999:426–427, figs. 5A–G.

DESCRIPTION. Male. Eyes separated by more than 10 facet diameters. Basal flagellomeres globular, as wide as long.

Gonocoxites fused on midline, without protrusions; gonostylus with small protrusion with jagged apex at base, Y-shaped, stem longer than bifurcations, lateral bifurcation with blunt apex and other with acute apex; distiphallus a broad, nearly straight stalk with acute apex, extending nearly to tip of gonostylus; basiphallus bell-shaped; paramere bifurcate, lateral branch broader than medial, both with blunt apices, slightly curved, extending little beyond tip of distiphallus; surstylus long and slender, much longer than epandrium; tergite 10 triangular, width and length subequal, with longitudinal ridge in center.

DISTRIBUTION. Brazil, Costa Rica, Panama, Surinam.

HOLOTYPE. ♂, PANAMA, Barro Colorado I., x.1996, J. Pickering, Malaise trap (USNM; examined).

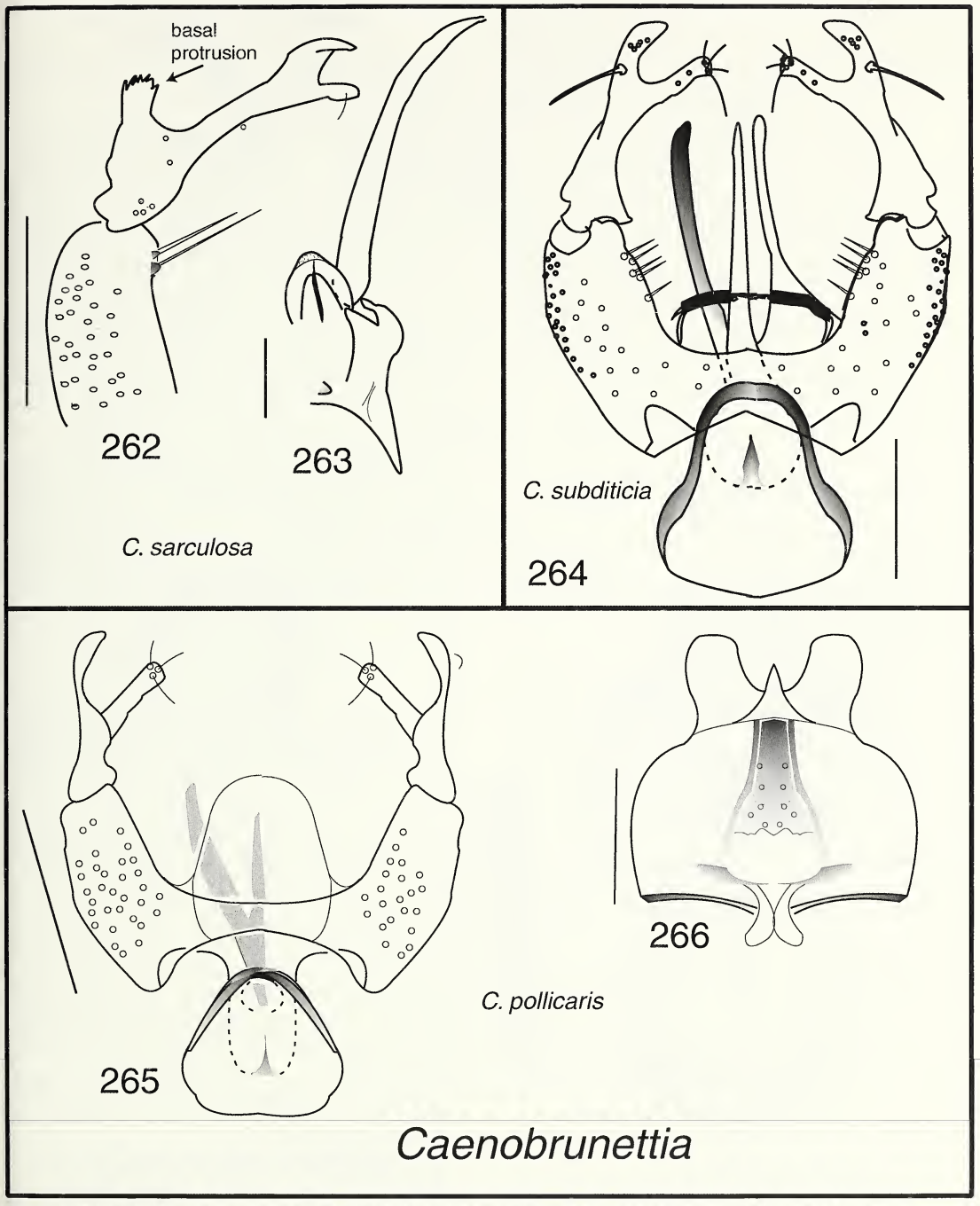
NEW SPECIMENS STUDIED. BRAZIL, Amazonas, Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 1♂, 1♀, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, disturbed forest 50 m, (LACM). COSTA RICA, Guanacaste, 3 km SE Rio Naranjo, 1♂, 4–8.viii.1993, F. Parker (EMUS); Puntarenas, Est. Biol. Las Alturas, 8°57.23′N, 82°50.22′W, 8♂, 11–16.viii.1995, L. Quate, 1550 m (LACM), Monteverde, 1♂, 6.ii.1992, L. Quate, at light, 1500 m (LACM). PERU, Cuzco, Rio Madre de Dios, 28 km ESE Boca Manu, 12°21′S, 70°42′W, 1♂, 14.vii.1997, L. Quate, Malaise trap, forest trail (LACM), 1♂, same data as previous specimen except 19–20.vii.1997, light trap at base of canopy tower, 250 m (LACM). SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 4♂, 28–30.ix.1996, L. Quate, Malaise trap, primary forest 300–450 m, (LACM), Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 2♂, 3♀, 17–25.ix.1996, L. Quate, Malaise trap, primary forest 70 m (LACM).

REMARKS. Males from Las Alturas, Costa Rica, were observed "dancing" on the leaves of a broadleaf plant (possibly of the family Aracaceae). This behavior is probably a type of swarming behavior, serving to aggregate males to increase mating success.

Caenobrunettia subditicia new species
Fig. 264

DESCRIPTION. Male. Eyes separated by 16 facet diameters. Flagellomere 14 unusually long, 2.5 times length of 13; palpus extends little beyond tip of antenna, ratio of palpomeres 10:35:23:24.

Gonocoxites broadly fused dorsally; without projections; dorsal apodeme projecting posteriorly as a rectangular appendage above distiphallus; gonostylus bifurcate and Y-shaped, stem longer than bifurcations, lateral projection of bifurcation bluntly rounded, with large spine near base; distiphallus asymmetrical, consisting of 2 slender stems nearly extending to bifurcation of gonostylus, 1 darker and more acute than other; paramere a straight stalk as long as distiphallus, with blunt apex; epan-



Figures 262–266 *Caenobrunettia* spp. 262–263. *C. sarculosa:* 262. male gonopod, lateral; 263. male epandrium, surstylus, tergite 10. 264. *C. subditicia,* male genitalia, dorsal. 265–266. *C. pollicaris:* 265. male genitalia, dorsal; 266. female genitalia, dorsal. **All scale lines = 0.1 mm**

drium concave at base, with 2 foramina, surstylus long and slender, about 1.7 times long side of epandrium; tergite 10 triangular, width equal to length, with longitudinal ridge in center.

Measurements. Antenna 1.09–1.34 mm ($\bar{x}$ = 1.20; n = 10). Wing length 1.73–2.45 mm, width 0.75–1.00 mm ($\bar{x}$ = 2.15, 0.92; n = 10).

Female. Unknown.

DISTRIBUTION. Surinam, French Guiana, Brazil.

HOLOTYPE. ♂, BRAZIL, Amazonas, Manaca-

puru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, disturbed forest, 50 m (INPA).

PARATYPES. BRAZIL, Amazonas, Manacapura, 74 km WSW Manaus, 3°17.8′S, 60°37.63′W, 1♂, 21.iv.1998, CDC light trap, R. Quieroz (INPA). FRENCH GUIANA, Maripasoula, 1♂, 17–22.iii.1994, L. Quate, Malaise trap, dry forest (LACM). SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 4♂, 28–30.ix.1996, L. Quate, Malaise trap, primary forest, 300–450 m (LACM), Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 10♂, 17–25.ix.1996, L. Quate, Malaise trap, primary forest, 70 m (LACM), 1♂, same data as previous specimens except light trap (LACM).

ETYMOLOGY. From Latin *subditicius* for counterfeit, referring to the unusual male genitalia.

Caenobrunettia pollicaris new species

Figs. 265–266

DESCRIPTION. Male. Eyes separated by about 16 facet diameters; basal flagellomeres globular, as wide as long; terminal apiculis long and slender; ratio of palpomeres 10:44:35:35.

Gonocoxites fused on midline; gonostylus without protrusion at base, Y-shaped, stem of gonostylus shorter than terminal bifurcations, apex of lateral bifurcation blunt, lateral projection bearing large spine; distiphallus asymmetrical, with 1 long stalk extending little beyond tip of gonostylus and 1 very short stalk, both straight and slender; paramere absent (but may be 1 branch of distiphallus); basiphallus small; surstylus long and slender, much longer than epandrium; tergite 10 triangular, width and length subequal, with longitudinal ridge in center.

Measurements. Antenna 1.18–1.22 mm (n = 2). Wing length 2.33–2.35 mm, width 0.90 mm (n = 2).

Female. Subgenital plate with prominent apical lobes; chitinous arch extends well beyond apical margin in sharp projection; genital ducts small, simple, lacking horizontal struts; membranous plate with sclerotized band in center; setal sclerite triangular, bearing 10 setae.

Measurements. Antenna 1.05–1.08 mm (n = 2). Wing length 2.25–2.28 mm, width 0.80–0.85 mm (n = 2).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, 26 km W Pilcopata, 13°3′S, 71°32′W, 24.vii–2.viii.1997, L. Quate, Malaise trap, cloud forest, 1500 m (MUSM).

PARATYPES. 1♂, 2♀, same data as holotype (LACM, MUSM).

ETYMOLOGY. From Latin *pollicaris* for "of the thumb," referring to the shape of the bifurcations of the gonostylus.

Caenobrunettia plegas Quate

Figs. 267–268

Caenobrunettia plegas Quate, 1996:27–28, figs. 10a–d.

DESCRIPTION. Eyes separated by more than 10 facet diameters; basal flagellomeres little longer than wide.

Gonocoxites joined by arched hypandrium, with pincerlike apical projection, median branch acutely pointed and lateral blunt; gonostylus without protrusion at base, with subapical projection, several spines on distal part; distiphallus short and curves to acute apex; paramere scimitar-shaped, acutely pointed, extends beyond tip of gonostylus, lightly sclerotized; surstylus short and stocky, little longer than epandrium; tergite 10 elongate, longer than wide.

DISTRIBUTION. Nicaragua, Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Heredia, La Selva Biological Station, 2.v.1993, ALAS project, Malaise trap (INBC).

NEW SPECIMENS STUDIED. NICARAGUA, Rio San Juan, Refugio Bartola, 10°58′N, 84°20′W, 3♂, 1♀, 6–10.ii.2000, L. Quate, Malaise trap, 30 m lowland rain forest, (LACM).

Caenobrunettia laselva Quate

Fig. 269

Caenobrunettia laselva Quate, 1996:28, figs. 10e–h.

DESCRIPTION. Male. Eyes separated by about 10 facet diameters; ratio of palpomeres 10:30:37:25.

Hypandrium an arched band connecting gonocoxites; gonocoxite with dark, blunt, thumblike apical projection from ventral surface, gonostylus very short, little longer than thumblike projection of gonocoxite, darkly sclerotized; distiphallus broad shaft, slightly curved, with rounded apex; paramere thinner, same length as distiphallus, also bluntly pointed; epandrium with concave base; surstylus stocky, little longer than epandrium; tergite 10 triangular with blunt apex, length about equal to basal width.

Measurements. Antenna 1.45–1.58 mm. Wing length 2.25–2.50 mm, width 0.98–1.05 mm (n = 2).

Female. Unknown.

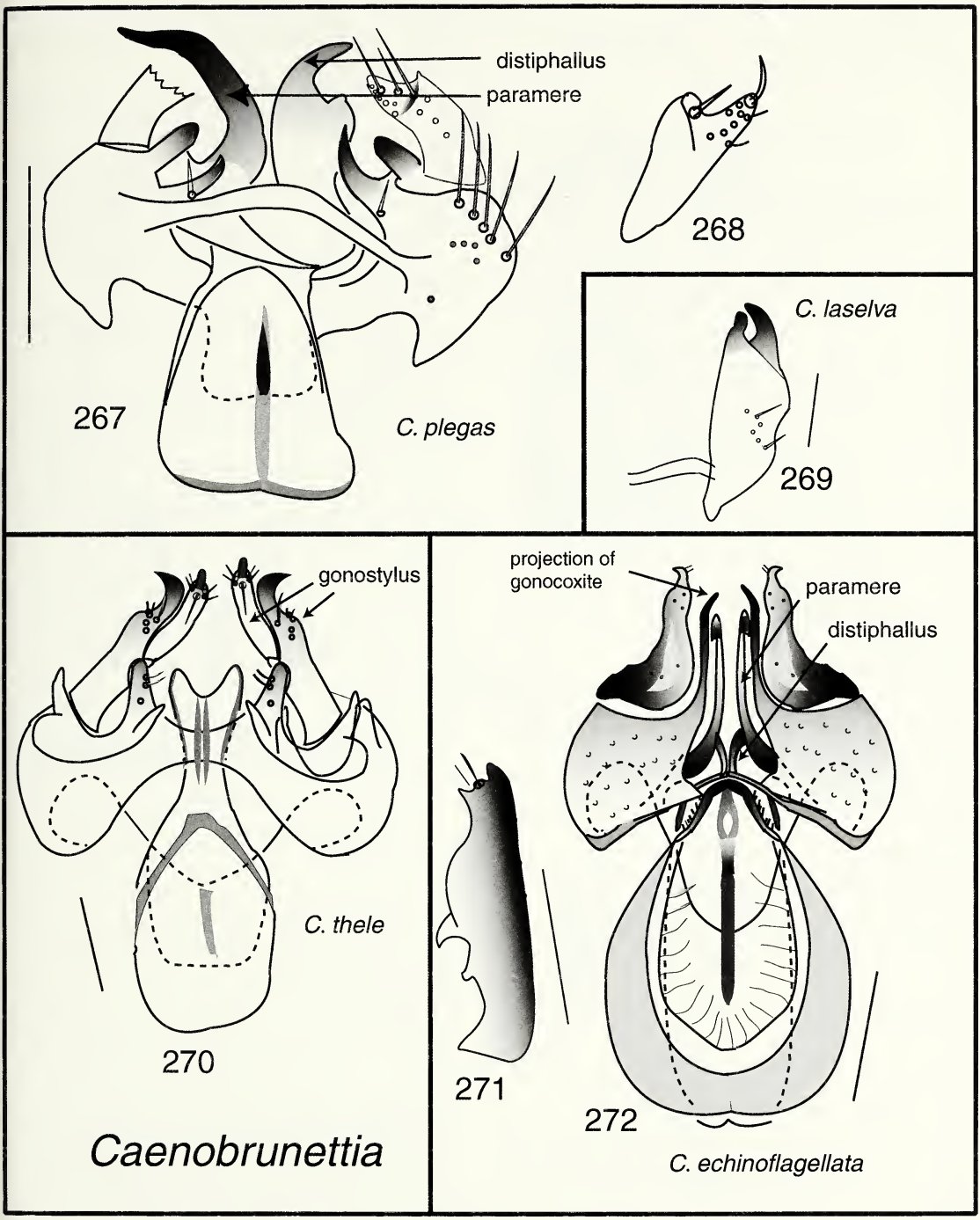
DISTRIBUTION. Costa Rica, French Guiana.

HOLOTYPE. ♂, COSTA RICA, Heredia, La Selva Biological Station, 2.v.1993, ALAS project, Malaise trap (INBC).

NEW SPECIMENS STUDIED. FRENCH GUIANA, 30 km S St. Laurent de Maroni, 1♂, 24–30.iii.1994, L. Quate, light trap, secondary forest, 50–100 m (LACM), 65 km S Cayenne, 1♂, 12–16.iii.1994, L. Quate, light trap, 50–100 m (LACM).

Caenobrunettia tropicalis Quate

Caenobrunettia tropicalis Quate, 1996:28–29, figs. 10i–j.



Figures 267–272 *Caenobrunettia* spp. 267–268. *C. plegas:* 267. male genitalia, lateral; 268. male surstylus, lateral. 269. *C. laselva,* male right gonopod, lateral. 270. *C. thele,* male genitalia, lateral. 271–272. *C. echinoflagellata:* 271. male genitalia, dorsal; 272. male surstylus, lateral. All scale lines = 0.1 mm

DESCRIPTION. Eyes separated by more than 10 facet diameters; basal flagellomeres little longer than wide.

Hypandrium a dorsal band connecting gonocoxites; gonocoxite very short, apex with 2 opposing clawlike projections; gonostylus very small, much shorter than gonocoxite, ending in small hook; surstylus little longer than epandrium; tergite 10 elongate, longer than wide.

Female. Unknown.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Heredia, La Selva Biological Station, 1.vii.1993, ALAS project, Malaise trap (INBC; examined).

Caenobrunettia thele new species

Fig. 270

DESCRIPTION. Male. Eyes separated by about 6 facet diameters; palpus extending to flagellomere 10, ratio of palpomeres 10:25:27:24.

Gonocoxites broadly fused on midline, with bowlike structure at apex, lateral projection pointed with bulbous expansion at base, median blunt with short subapical protrusion; gonostylus bifurcate, longer than gonocoxite, lateral arm with acute, recurved apex forming small hook, median ending as small nipple, with 5 apical setae; basiphallus rather small; distiphallus Y-shaped, ending in pair of blunt points; paramere absent; epandrium with strongly concave base, with 2 foramina; surstylus stocky; tergite 10 triangular with blunt apex, length about 2 times basal width.

Measurements. Antenna 1.47–1.58 mm ($\bar{x}$ = 1.53; n = 4). Wing length 2.03–2.45 mm, width 0.80–1.05 mm ($\bar{x}$ = 2.19, 0.89; n = 9).

Female. Unknown.

DISTRIBUTION. Costa Rica.

HOLOTYPE. ♂, COSTA RICA, Puntarenas, Estación Pittier, 20 km N San Vito, 9°1.4′N, 82°57.5′W, 11–16.vi.1995, L. Quate, Malaise trap, 1670 m (INBC).

PARATYPES. 6♂, same data as holotype except 12.vi.1995, 1700 m (LACM), Est. Biol. Las Alturas, 8°57.23′N, 82°50.22′W, 2♂, 11–16.viii.1995, L. Quate, Malaise trap, 1550 m (LACM).

ETYMOLOGY. From Latin *thele* for nipple, referring to the apex of the gonostylus.

Caenobrunettia echinoflagellata Wagner

Figs. 271–272

Caenobrunettia echinoflagellata Wagner, 1981: 218–220, figs. 5–10.

DESCRIPTION. Male. Eyes separated by 6 facet diameters; basal flagellomeres little longer than wide; ratio of palpomeres 10:30:29:27.

Anepisternum with anterior half covered with alveoli, posterior half unsclerotized and unmarked, 2 areas equal in width. Radial fork distad of Rs base by about 3 cell widths.

Hypandrium very thin band connecting gonocoxites; gonocoxites not touching on midline, with long, slender, acute apical protuberance extending nearly to apex of gonostylus; gonostylus unbranched, without protrusion at base, slightly sinuous, with small hook at apex; basiphallus very large, paddle-shaped, surface of central bulb wrinkled; distiphallus consists of small pair of ducts leading into bases of parameres, paired parameres symmetrical, long, extend nearly to tip of gonocoxite projection, ending in black barb; epandrium concave on anterior margin; surstylus subequal to lateral margin of epandrium; tergite 10 slender, elongate, longer than wide.

Measurements. Antenna 1.18–1.43 mm ($\bar{x}$ = 1.24; n = 10). Wing length 1.85–2.23 mm, width 0.70–0.90 mm ($\bar{x}$ = 1.98, 0.77; n = 10).

Female. Eyes separated by 5 facet diameters. Genital ducts lightly sclerotized, vertical struts well developed; apical lobes small, comma-shaped.

Measurements. Antenna 1.02 mm (n = 1). Wing length 1.93 mm, width 0.73 mm (n = 1).

DISTRIBUTION. French Guiana, Surinam, Ecuador, Brazil, Panama.

HOLOTYPE. ♂, BRAZIL, Amazonas, Estirao do Equador, ix.1979, M. Alvarenga (ZSMC; not examined).

NEW SPECIMENS STUDIED. BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 9♂, 8–15.v.1999, L. Quate, T. Barrett, Malaise trap, primary forest, 100 m (LACM), 1♂, same data as previous specimens except CDC light trap (LACM), Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 1♂, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, disturbed forest, 50 m (LACM), 1♂, same data as previous specimen except CDC light trap, T. Barrett (INPA). ECUADOR, Napo, Yasuni Research Station, 0°38′S, 76°36′W, 1♂, x.1998, W. Hanson, 250 m (EMUS). FRENCH GUIANA, 37 km S Cayenne, 1♂, 1♀, 12–16.iii.1994, L. Quate, light trap, secondary forest, 50–100 m (LACM), 17 km E St. Laurent de Maroni, 1♂ (identification of this specimen confirmed by Dr. R. Wagner), 24–30.iii.1994, L. Quate, light trap, sea level (LACM), Maripasoula, 2♂, 17–22.iii.1994, L. Quate, Malaise trap, dry forest (LACM). PANAMA, Canal Zone, Barro Colorado I., 9°9′N, 79°51′W, 1♂, 26.i–2.ii.1994, J. Pickering, Malaise trap #2409 (LACM). SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 3♂, 28–30.ix.1996, L. Quate, Malaise trap, primary forest, 300–450 m (LACM), Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 1♂, 17–25.ix.1996, L. Quate, Malaise trap, primary forest, 70 m (LACM), 1♂, same data as previous specimen except light trap (LACM).

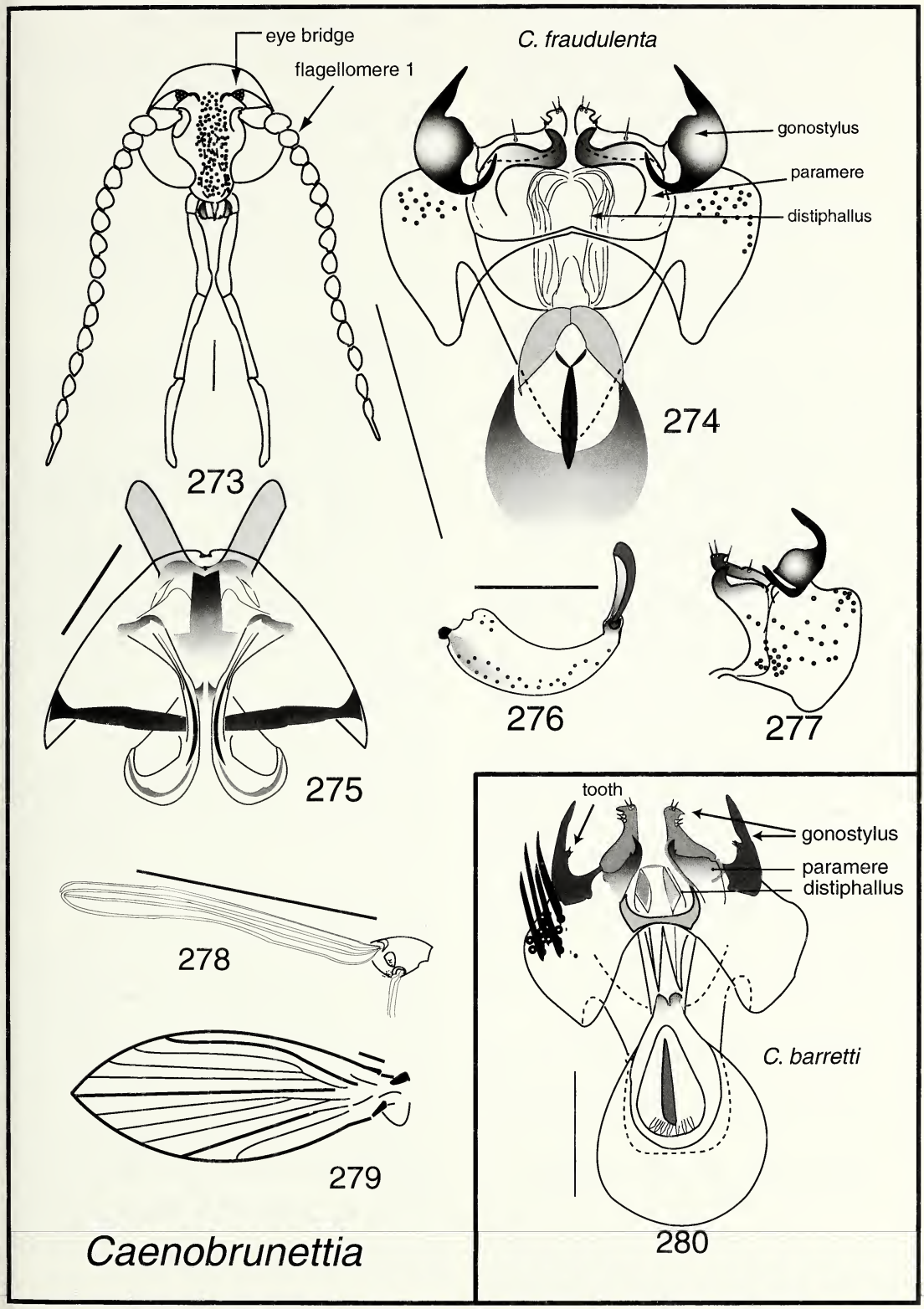
REMARKS. The single female from 27 km S Cayenne, French Guiana, is associated with the male by the locality and the comparatively narrow separation of the eyes. It is the only female *Caenobrunettia* from the localities listed above with this narrow eye separation.

Caenobrunettia fraudulenta new species

Figs. 273–279

DESCRIPTION. Male. Eyes separated by more than 10 facet diameters; basal flagellomeres little longer than wide; palpus extends to flagellomere 13, ratio of palpomeres 10:37:43:29.

Gonocoxites without protrusions, connected by narrow hypandrium; gonostylus complex and un-



Figures 273–280 *Caenobrunettia* spp. 273–279. *C. fraudulenta:* 273. head; 274. male genitalia, dorsal; 275. female genitalia, dorsal; 276. male surstylus, lateral; 277. male gonopod, variant, dorsal; 278. flagellomere 4; 279. wing. 280. *C. barretti,* male genitalia, dorsal. **All scale lines = 0.1 mm**

usual, with black globular body bearing acute posterior prolongation and smaller median projection plus additional median projection with small hook at apex and bearing 2 apical and 2 subapical bristles; distiphallus symmetrical, short, extends little beyond apex of gonocoxite, broad and slightly curved, lightly sclerotized, consisting of 2, separated arms; basiphallus large and paddle-shaped; paramere appressed to median branch of gonostylus, black and hooked; epandrium strongly concave at base, with 2 foramina, lacking diagonal struts; surstylus stocky, little shorter than long side of epandrium; tergite 10 triangular with acute apex, length nearly 2 times basal width.

Measurements. Antenna 1.20–1.33 mm ($\bar{x}$ = 1.24; n = 10). Wing length 1.70–1.98 mm, width 0.63–0.78 mm ($\bar{x}$ = 1.80, 0.70; n = 10).

Female. Antenna shorter than in male. Subgenital plate U-shaped, branches uniform; genital ducts lightly sclerotized, longitudinal and lateral struts slender; membranous plate with dark, quadrate spot near posterior margin.

Measurements. Antenna 1.08–1.30 mm ($\bar{x}$ = 1.20; n = 10). Wing length 1.90–2.23, width 0.75–0.93 mm ($\bar{x}$ = 2.12, 0.84; n = 10).

DISTRIBUTION. French Guiana, Surinam, Brazil.

HOLOTYPE. ♂, BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 23, 3°3′S, 58°43.5′W, 8–15.v.1999, L. Quate, T. Barrett (INPA).

PARATYPES. 32♂, 27♀, same data as holotype (BMNH, EMUS, INPA, LACM, USNM), Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 1♂, 1♀, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, disturbed forest, 50 m (LACM). FRENCH GUIANA, 30 km SE St. Laurent de Maroni, 2♂, 24–30.iii.1994, L. Quate, Malaise trap, secondary forest, sea level (LACM), Maripasoula, 1♂, 17–22.iii.1994, L. Quate, Malaise trap, dry forest (LACM), 1♂, same data as previous specimen except secondary forest, streamside (LACM), 1♂, same data as previous specimen except secondary forest, streamside, light trap (LACM).

ETYMOLOGY. From Latin *fraudulentus* for deceiver, referring to the strange male genitalia.

REMARKS. Females were associated with males on the basis of sympatry and numbers. It is possible that the females of *C. fraudulenta* and *C. barretti* n. sp. are indistinguishable, so this series might contain a mixture of the two.

Caenobrunettia barretti new species

Fig. 280

DESCRIPTION. Male. Eyes separated by more than 10 facet diameters; basal flagellomeres little longer than wide; palpus extends to flagellomere 13, ratio of palpomeres 10:41:49:31.

Gonocoxites without protrusions, connected by short hypandrium; gonostylus branched, 1 lateral, dark projection with tooth at basal one-third and median projection, similar to *C. fraudulenta,* ending in small hook and bearing 2 apical and 2 subapical bristles; paramere also similar to that of *C. fraudulenta,* black with acute, hooked apex; distiphallus symmetrical, short, extends little beyond apex of gonocoxite, broad and slightly curved, lightly sclerotized, consisting of 2 separated arms; basiphallus large and paddle-shaped; epandrium strongly concave at base, with 2 foramina, lacking diagonal struts; surstylus stocky, little shorter than long side of epandrium; tergite 10 triangular with acute apex, length nearly 2 times basal width.

Measurements. Antenna 1.17–1.31 mm (n = 2). Wing length 1.80–2.08 mm, width 0.75–0.80 mm (n = 4).

Female. Unknown.

DISTRIBUTION. Surinam, Brazil.

HOLOTYPE. ♂, BRAZIL, Amazonas, Itacoatiara-Itapiranga Highway, km 20, 3°3′S, 58°43.5′W, 8–15.v.1999, L. Quate, T. Barrett (INPA).

PARATYPES. 6♂, same data as holotype (INPA, LACM, USNM), 8♂, same data as holotype but km 23 (LACM), Manacapuru-Novo Airão, km 46–50, 2°59.3′S, 60°53.6′W, 3♂, 30.iv–6.v.1999, L. Quate, T. Barrett, Malaise trap, disturbed forest, 50 m (LACM). SURINAM, Brownsberg Nature Park, 100 km S Paramaribo, 4°57′N, 55°11′W, 1♂, 28–30.ix.1996, L. Quate, Malaise trap, 300–450 m, primary forest (LACM), Raleighvallen, 170 km SW Paramaribo, 4°43′N, 56°12′W, 2♂, 17–25.ix.1996, L. Quate, Malaise trap, primary forest, 70 m (BMNH, LACM).

ETYMOLOGY. Named in recognition of the generous assistance of Dr. Toby Barrett.

REMARKS. The above two species, *C. fraudulenta* and *C. barretti,* are closely related, but easily distinguished by the gonostylus, which is a black bulb with 2 large projections in *C. fraudulenta* and a simple arm with a tooth on the median margin near the base in *C. barretti.* The structure of the median branch of the gonostylus and the paramere of the two species appear indistinguishable.

The articulation of the paramere with the gonocoxite and aedeagus is difficult to see in most slide preparations of both species and it usually appears as shown in Figs. 274, 277, 280. Some differences are due to the position of the structures on the slide, and relationship of the various parts may seem quite different in different positions, but the structures themselves are constant.

Another related species (left undescribed because of insufficient material) has a median arm of the gonostylus almost identical to the above two species. It also has a black hook, but in this species, it is clearly attached only to the gonocoxite. Probably this structure is also the paramere, which has lost its direct connection to the aedeagus.

KEY TO MALES OF *CAENOBRUNETTIA*

1 Gonostylus with bifurcation beyond center (Figs. 262, 264–265) 2
– Gonostylus usually without bifurcation beyond

center, if bifurcate, branching occurs near base 5

2 Gonostylus Y-shaped, pincerlike bifurcations at end of basal stem (Figs. 262, 264–265) 3

– Gonostylus not Y-shaped, bifurcation formed by rodlike projection from ventral face (Wagner, 1993:fig. 48) . . . . . *C. stylappendiculata* (Wagner)

3 Gonostylus without protrusion at base; lateral projection of gonostylus sometimes bearing large spine 4

– Gonostylus with small finlike protrusion at base with jagged tip (Fig. 262); lateral projection of gonostylus without large spine at base . . . . . *C. sarculosa* Quate

4 Stem of gonostylus longer than terminal bifurcations; gonostylus with large spine on lateral projection (Fig. 264); paramere present . . . . . ***C. subditicia*** **n. sp.**

– Stem of gonostylus shorter than terminal bifurcations; gonostylus without large spine on lateral projection (Fig. 265); paramere absent . . . . . ***C. pollicaris*** **n. sp.**

5 Distiphallus extends well beyond tip of gonocoxite (Fig. 267); paramere single 6

– Distiphallus short and ends at about tip of gonocoxite (Figs. 272, 274, 280); paramere absent or paired 7

6 Distiphallus broad and curved, ending in acute apex (Fig. 267); gonocoxite with thumblike and sharp spikelike projection at apex . . . . . *C. plegas* Quate

– Distiphallus nearly straight and with blunt apex (Fig. 269); gonocoxite only with blunt, thumblike projection at apex . . . . *C. laselva* Quate

7 Gonostylus more than one-half length of gonocoxite 8

– Gonostylus very small, less than one-quarter length of gonocoxite (Quate, 1996:fig. 10i) . . . . . *C. tropicalis* Quate

8 Gonocoxite with long, slender, apical projection extending nearly to apex of gonostylus (Fig. 272); parameres long, slender; gonostylus unipartite . . . . . *C. echinoflagellata* Wagner

– Gonocoxite without long projection; parameres short; gonostylus bipartite (Figs. 270, 274, 280) 9

9 Sclerotized, pointed tip of gonostylus curves outward; pointed and blunt tips of gonostylus close together (Fig. 270) . . . . . ***C. thele*** **n. sp.**

– Sclerotized pointed tip of gonostylus curved inward; tips widely separated (Figs. 274, 280) 10

10 Base of pointed, sclerotized hook of gonostylus with elongate, dark process (Fig. 274); hook without short subbasal tooth . . . . . ***C. fraudulenta*** **n. sp.**

– Base of pointed, sclerotized hook of gonostylus without elongate, dark process (Fig. 280); hook with short subbasal tooth . . ***C. barretti*** **n. sp.**

Valerianna new genus

TYPE SPECIES. *Valerianna manuensis,* by present designation.

DESCRIPTION. Vertex high with bilobed extension at apex, darker in color than frons; eye bridge reduced to narrow point near midline so median margin with only 1 facet diameter; interocular suture present; antenna with 16 segments; flagellomeres small, much more slender than scape and pedicel, fusiform, with pair of simple, unidigitate ascoids on flagellomeres 1–13, terminal flagellomeres not reduced, 14 with slender apiculis; labellum small and only slightly enlarged with bulbous apex; palpus extends to flagellomere 10, ratio of palpomeres 10:24:36:36.

Thorax without sensory organ; antepronotum and anepisternite largely covered with single patch of alveoli; midcoxa with tuft of hairs on elevated knob and anterior margin. Wing clear, unmarked; base of R_{2+3} attached to R_4; radial fork basad of medial by 1–2 cell widths; R_5 ending in wing tip; elongate oval sclerite at base of CuA_2.

Abdominal sternites 4–7 with V-shaped concavity on midline and posterior margin with dense row of alveoli. Hypandrium a band connecting gonocoxites; anterior gonocoxal apodeme circular, located in center of genitalia and attached to gonostylus by slender bar; aedeagus asymmetrical; epandrium with slender bar on midline; surstylus elongate and slender, with 1 tenaculum.

ETYMOLOGY. This name is dedicated by the senior author to his lovely wife, Valerie Ann, for her constant support and encouragement of the field work that resulted in long periods of her being alone. Of course, the gender is feminine.

REMARKS. This distinctive group of species is doubtfully assigned to the tribe Setomimini only on the basis of the enlarged gonocoxal apodeme, which differs from that of other genera in being a single circular structure in the center rather than the usual bipartite structure extending anteriorly from the gonocoxites. The keel connecting the apodeme to the basiphallus is present as in other Setomimini.

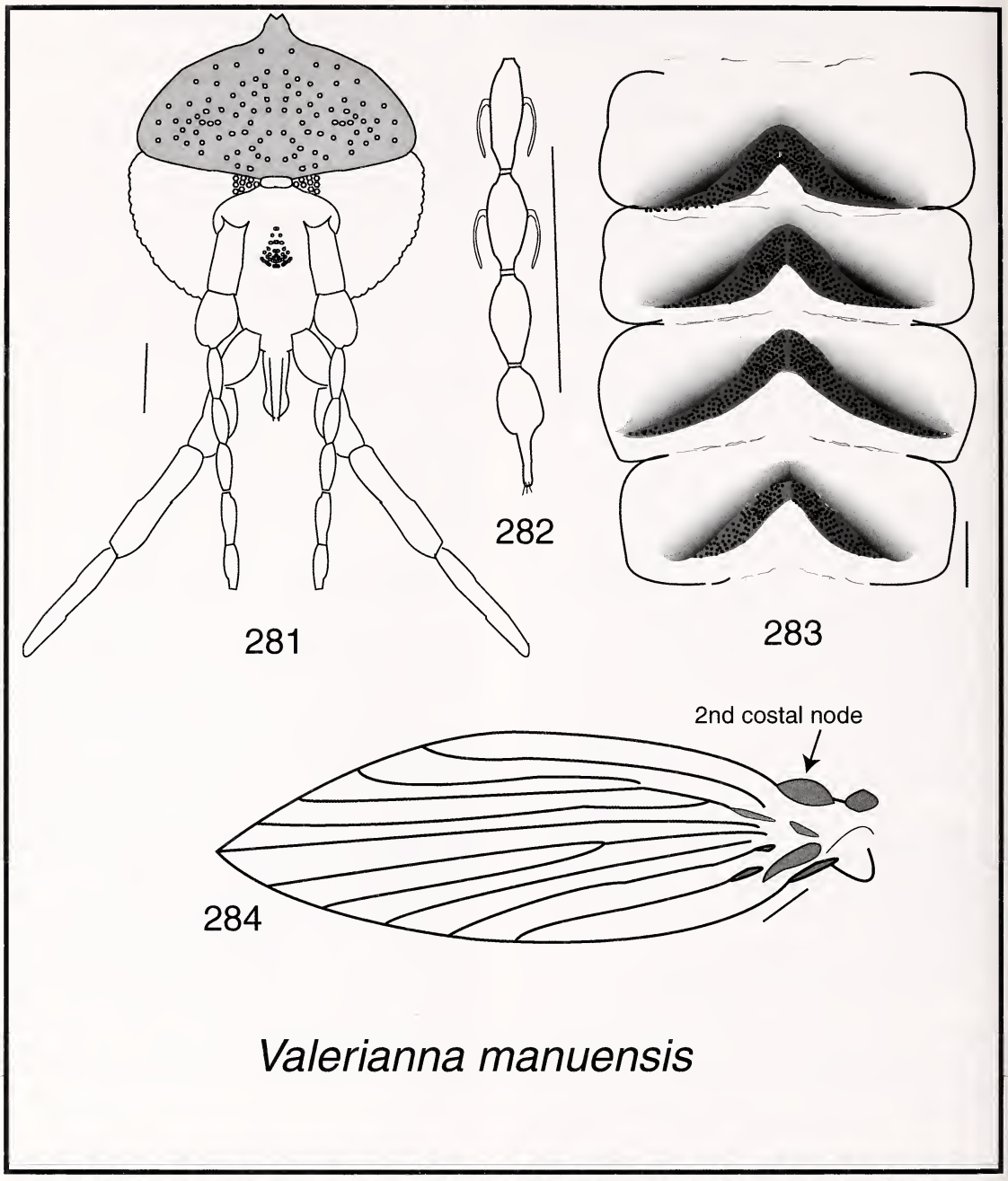
Valerianna manuensis new species

Figs. 281–287

DESCRIPTION. Male. Vertex dark, much darker than frons; interocular suture double; frons with hair patch dense anteriorly and with sparse band extending posteriorly only to base of scape.

Mesonotum very dark, darker than rest of thorax. Costa with second costal node.

Hypandrium a distinct band between bases of gonocoxites; distiphallus consisting of 2 shafts, longer 1 with blunt apex extending to tip of gonocoxite, curved apically, shorter 1 with acute apex nearly straight; basiphallus not expanded anteriorly; paramere much larger than distiphallus and extends well beyond tip of gonocoxite, with oval



Figures 281–284 *Valerianna manuensis:* **281.** male head; **282.** flagellomeres 11–14; **283.** sternites 4–7; **284.** wing. **All scale lines = 0.1 mm**

markings in center; gonostylus blunt and quadrate at apex; with many spines and alveoli.

Measurements. Antenna 0.88–1.00 mm (n = 4). Wing length 1.50–1.70 mm, width 0.55–0.63 mm ($\bar{x}$ = 1.60, 0.57; n = 8).

Female. Unknown.

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, 28 km ESE Boca Manu, 12°21′S, 70°42′W, 1♂, 17.vii.1997, L. Quate, Malaise trap, river trail, 250 m (MUSM).

PARATYPES. 5♂, same data as holotype (LACM), Madre de Dios, 5 km E Puerto Maldon-

ado, 12°36′N, 69°2′W, 3♂, 11–19.ix.1999, L. Quate, Malaise trap, 300 m (BMNH, LACM, USNM).

ETYMOLOGY. The name is based on the locality of the Manu Wildlife Center.

Valerianna bullata new species

Figs. 288–290

DESCRIPTION. Male. Vertex light, same color as frons; interocular suture a single, heavy band; frons with quadrate hair patch less dense than that of *V. manuensis* and without dorsal extension.

Hypandrium an indistinct, narrow band between bases of gonocoxites; distiphallus consisting of 2 shafts, longer 1 with blunt apex extends to tip of gonocoxite with slight basal curve, shorter 1 with acute apex with slight median curve; basiphallus broadly expanded anteriorly; paramere large, sausage-shaped, axis nearly perpendicular to midline; gonostylus tapering to acute apex with small apical hook.

Measurements. Antenna 0.75–0.80 mm (n = 2). Wing length 1.35–1.53 mm, width 0.45–0.50 mm (n = 3).

Female. Apical lobes of subgenital plate prominent and asymmetrical, chitinous arch narrow, extends just to margin between lobes; membranous plate with 4 pairs of setae, with double curved line across center; genital ducts elongate, without fringe or striations; longitudinal and vertical struts moderately sclerotized.

Measurements. Antenna 0.72 mm. Wing length 1.58 mm, width 0.53 mm (n = 1).

DISTRIBUTION. Peru.

HOLOTYPE. ♂, PERU, Cuzco, 28 km ESE Boca Manu, 14–17.vii.1999, L. Quate, Malaise trap (MUSM).

PARATYPES. 2♂, 1♀, same data as holotype (LACM, MUSM).

ETYMOLOGY. From Latin *bullatus* for inflated, referring to the enlarged paramere.

KEY TO MALES OF *VALERIANNA*

1 Tergite 10 quadrate (Fig. 286); paramere a straight shaft with blunt apex (Fig. 285); gonostylus ending in angulate, blunt apex .... ***V. manuensis* n. sp.**

– Tergite 10 oval (Fig. 289); paramere inflated, sausage-shaped (Fig. 288); gonostylus ending in tapered apex ..... ***V. bullata* n. sp.**

Nemoneura Tonnoir

Nemoneura Tonnoir, 1929:27; Satchell, 1953:417–418; Duckhouse, 1973:8.

TYPE SPECIES. *Psychoda punctata* Philippi, by original designation.

DESCRIPTION. Eye bridge with 4 facet rows in male and 3 in female; eyes separated, interocular suture present and angulate; antenna with scape and pedicel normal; flagellomeres pyriform, terminal 3 flagellomeres reduced; ascoids unidigitate, simple, very long, extend to apex of succeeding segment; labellum bulbous; palpomeres normal, ratio 10:11:12.5:16.

Male anepisternum with 3 patches of alveoli: 1 elongate, posterior to and on same level as anterior spiracle; larger 1 on posterior half of sclerite, oval, ventral of spiracle, on separated dark area; 1 smaller than others, between and anterior of other 2. Anterior half of anepisternum with similar dark area, but without alveolus, female with single patch of alveoli covering most of sclerite posterior of spiracle; midcoxa with cluster of alveoli on knoblike enlargement. Wing largely without infuscate patterns (but with faint spots at vein tips); Sc very long, extends to about half distance between radial fork and tip of R_1, base strongly curved toward margin and most of vein very close to C, but does not end in C; base of R_{2+3} not attached to R_4; forks basad of wing center, radial fork basad of medial; R_5 ends in wing apex; CuA_2 curved in center and slightly enlarged at apex; ends in wing margin; R_5 ends in wing apex.

Abdomen without modified sclerites; tergites with 2 bands of alveoli. Male hypandrium a band expanded in center, connected to epandrium; anterior gonocoxal apodemes prominent, bilobed; gonostylus large and clublike, nearly parallel-sided to bluntly rounded apex; basiphallus broad at base, with keel connected to apodemes; distiphallus and paramere single; epandrium with single foramen in center at base; surstylus with 1 tenaculum. Female genitalia with rounded apical lobes and large, hemispherical genital ducts; cercus long and slender, more than 10 times basal width.

Nemoneura punctata (Philippi)

Psychoda punctata Philippi, 1865:631.
Nemoneura punctata; Tonnoir, 1929:27–29, pl. IV, figs. 61–63; Duckhouse, 1973:8.

DESCRIPTION. Male. Unknown.

Female. Eyes separated by 2 facet diameters; interocular suture Y-shaped; frons hair patch divided in center and formed of 2 oval patches; scape and pedicel normal; flagellomeres elongate pyriform; ascoids single on flagellomere 1 and paired on others, ascoid on flagellomere 1 very small, other ascoids larger, but none extend to apex of segment; ratio of palpomeres 10:17:20:22.

Wing with radial fork basad of medial by 6 cell widths; other characters as in genus.

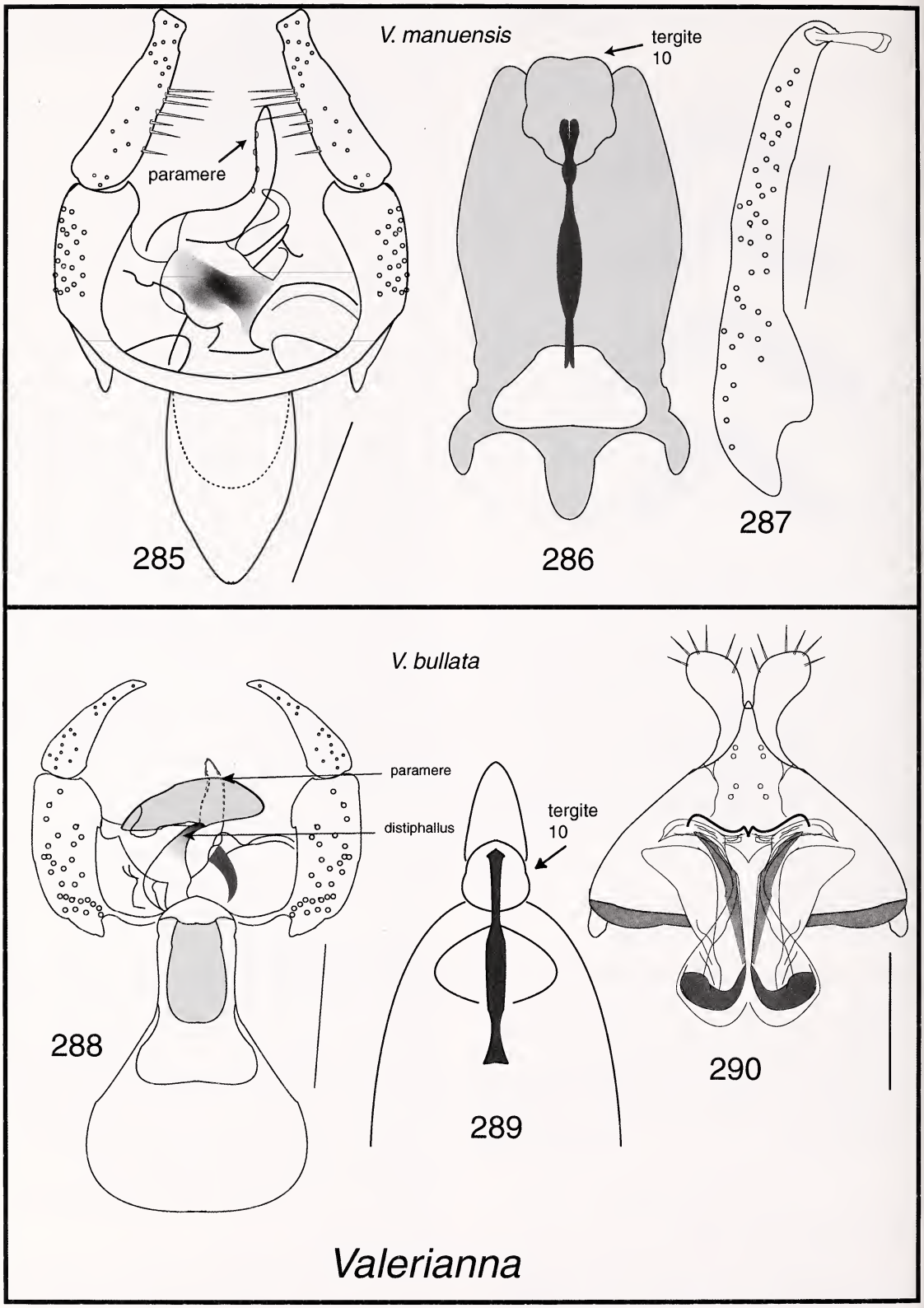
Measurements. Antenna broken; scape, pedicel, flagellomeres 1–9 1.48 mm. Wing length 3.35 mm, width 1.38 mm.

DISTRIBUTION. Chile.

HOLOTYPE. Location unknown; presumed lost.

SPECIMEN STUDIED. CHILE, Llanquihue, Puella, 1♀, 12–13.xii.1926, F. and M. Edwards (BMNH).

REMARKS. There is a single female at the



Figures 285–290 *Valerianna* spp. 285–287. *V. manuensis:* 285. male genitalia, dorsal; 286. male epandrium; 287. male surstylus. 288–290. *V. bullata:* 288. male genitalia, dorsal; 289. epandrium and tergite 10; 290. female genitalia. All scale lines = 0.1 mm

BMNH labeled 'TYPE. *Nemoneura vestita* sp. n. A. Tonnoir det.' Based on consistency with the locality, description, and figures, this undoubtedly is the female described as *N. punctata* (Philippi) by Tonnoir (1929:27). Probably when he first studied the specimen, Tonnoir felt it represented a new species and labeled it as such. Later, he decided it was Philippi's species, but forgot to change the label on the specimen. This would explain the apparent disappearance of *N. punctata* from the BMNH to which Tonnoir (1929) had referred.

Nemoneura dealbata Tonnoir
Figs. 291–292

Nemoneura dealbata Tonnoir, 1929:29, pl. IV, figs. 64–65; Duckhouse, 1973:8.

DESCRIPTION. Male. Eyes separated by 1–1.5 facet diameters; interocular suture interrupted in center; frons hair patch quadrate, partly divided, with sparse, irregular band extending dorsally to upper eye margin, band double to lower eye margin, single dorsally; ascoids paired on basal flagellomeres, but single on distal (second ascoid possibly removed in mounting); ratio of palpomeres 10:10:12:22.

CuA_2 strongly curved preapically and with preapical enlargement.

Anterior gonocoxal apodeme with straight anterior margin and does not appear bilobed; distiphallus with dark, quadrate base, distal part tapering to acute apex; paramere apparently articulates with hypandrium, similar to shape of distiphallus but basal part broader and extends well beyond tip of distiphallus.

Female. Eyes separated by 1.5–2 facet diameters; interocular suture inverted V-shaped. Chitinous arch extends only to base of apical lobes, not reaching apical margin; genital ducts hemispherical, lateral and longitudinal struts well developed; additional longitudinal strut dorsal of genital ducts.

Measurements. Antenna 1.45–1.75 mm ($\bar{x}$ = 1.63; n = 8). Wing length 2.83–3.38 mm, width 1.20–1.35 mm ($\bar{x}$ = 3.16, 1.24; n = 10).

DISTRIBUTION. Chile, Argentina.

HOLOTYPE. ♂, CHILE, Llanquihue, Casa Pangue (date not stated) (BMNH; examined).

OTHER SPECIMENS STUDIED. ARGENTINA, Neuquén, Ar. Quechaquina, N side Lago Lacar, 3♂, 16.xi.1994, L. Quate, H. Bhat, sweeping sedges, 610 m (LACM), N shore Lago Huechulafquen, 2♂, 17–19.xi.1994, L. Quate, H. Bhat, 920 m (LACM), San Martin de los Andes, 1♂, 15–20.xi.1994, L. Quate, H. Bhat, *Nothofagus antarctica* forest, 850 m (LACM), 1♂, same data as previous specimen except 19.xi.1994, bog, 790 m (LACM), 7 km W San Martin de los Andes, 3♂, 17.xi.1994, L. Quate, H. Bhat, streamside (LACM), 11 km W San Martin de los Andes, 13♂, 17.xi.1994, L. Quate, H. Bhat, sweeping bog, 890 m (LACM). CHILE, Llanquihue, Ensenada, 2♂, 1♀, 4–6.xii.1994, L. Quate, H. Bhat, Malaise trap, 180 m (LACM), Volcan Osorno, La Angostura, 1♂, 4–6.xii.1994, L. Quate, H. Bhat, Malaise trap, 980 m (LACM), 2♀, same data as previous specimen except 770 m (LACM), Yerbas Buenas, 4♂, 6♀, 4–6.xii.1994, L. Quate, H. Bhat, Malaise trap, 150 m (LACM).

REMARKS. Only one of the females has a spherical sclerite at the apex of the longitudinal struts. In the illustration (Fig. 292) it is dotted to signify this might not be a consistent character. It might be present on all specimens but destroyed during dissection.

Nemoneura confraga new species
Fig. 293

DESCRIPTION. Male. Eyes separated by 1.5 facet diameters; interocular suture interrupted in center, consists of 2 diagonal bars; vertex with apical notch, small protrusion on each side of notch; frons hair patch undivided, but with deep median notch on anterior border, with sparse, double row of sockets extending dorsally to upper eye margin; ratio of palpomeres 10:12:17:22.

CuA_2 with moderate preapical curve.

Anterior gonocoxal apodemes strongly bilobed; distiphallus appears fractured in 2 places at base, extends well beyond apex of gonostylus, swordlike with small preapical curve; paramere absent; curved transverse bar at base of distiphallus anterior of fracture.

Measurements. Wing length 3.0 mm, width 1.13 mm (n = 1).

Female. Unknown.

DISTRIBUTION. Argentina.

HOLOTYPE. ♂, ARGENTINA, Neuquen, Ar. Quechaquina, N side Lake Lacar, 16.xi.1994, L. Quate, H. Bhat, sweeping sedges, 610 m (MLPA).

PARATYPE. ♂, same data as holotype (LACM).

ETYMOLOGY. From Latin *confragus* for rough, referring to the fractures of the base of the distiphallus.

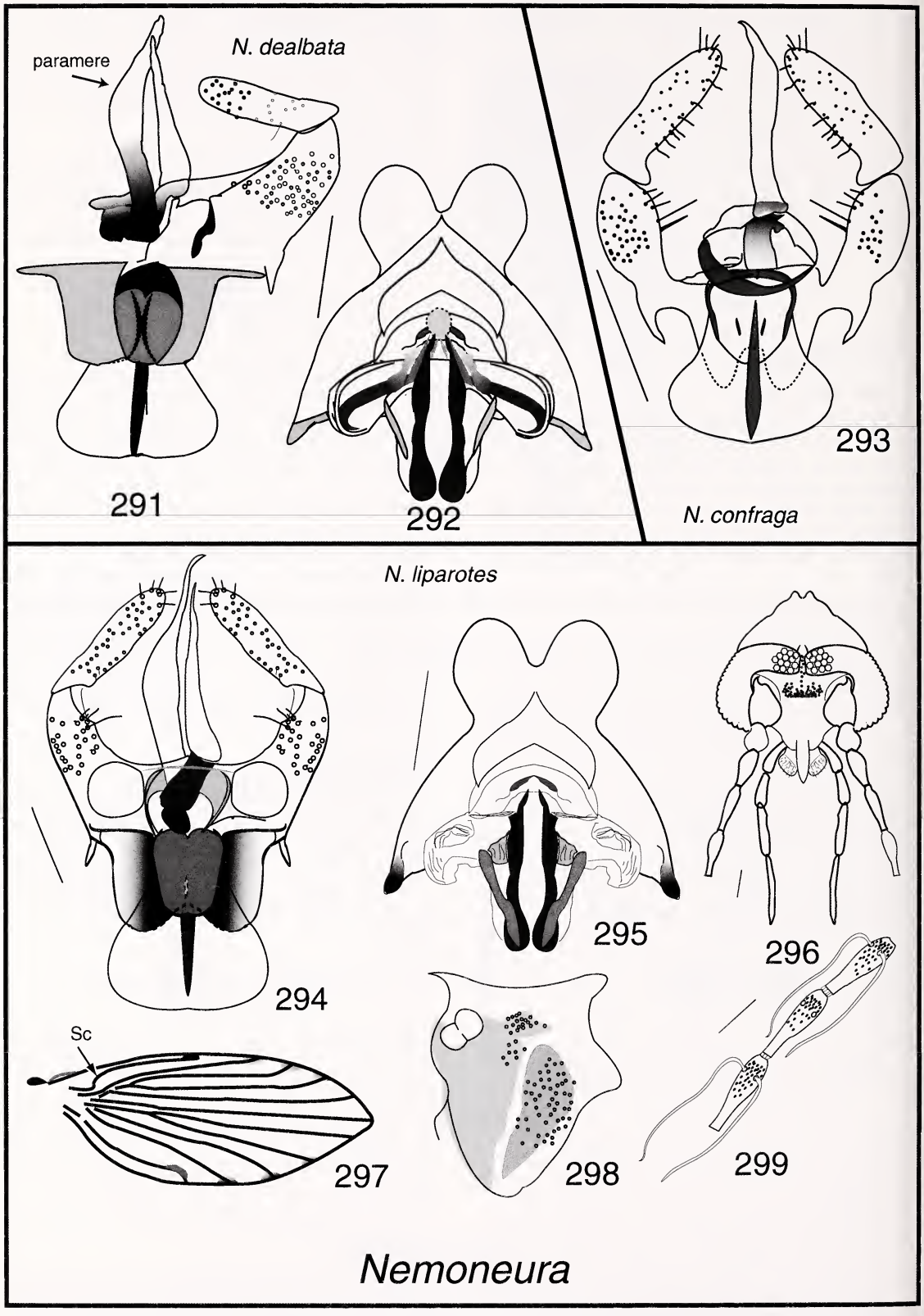
Nemoneura liparotes new species
Figs. 294–299

DESCRIPTION. Male. Eyes separated by less than 1 facet diameter; interocular suture inverted Y-shaped, stem 2 times length of arms; vertex with apical notch, small protrusion on each side of notch; frons hair patch partly divided, but with deep median notch on anterior border, with sparse single row of sockets extending dorsally to center of eye bridge; ratio of palpomeres 10:15:17:22.

CuA_2 with small, preapical curve, not enlarged preapically.

Anterior gonocoxal apodemes with small concavity on midline; distiphallus short, broad, extends little beyond apex of gonocoxite; paramere slender, much thinner and little shorter than distiphallus; curved transverse bar at base of distiphallus.

Measurements. Antenna 2.53 mm (n = 1). Wing



Figures 291–299 *Nemoneura* spp. **291–292.** *N. dealbata:* **291.** male genitalia, dorsal; **292.** female genitalia. **293.** *N. confraga,* male genitalia, dorsal. **294–299.** *N. liparotes:* **294.** male genitalia, dorsal; **295.** female genitalia; **296.** male head; **297.** male wing; **298.** male anepisternum; **299.** male, flagellomeres 6–8. **All scale lines = 0.1 mm**

length 3.15–3.25 mm, width 1.28–1.35 mm (n = 2).

Female. Frons hair patch very sparse, single. Apical lobes of subgenital plate rounded, chitinous arch does not reach apical margin of plate; genital ducts large, with dark lateral and longitudinal struts; above genital ducts an elongate sclerite between genital ducts and longitudinal strut, another small sclerite at side of apex of longitudinal strut; one specimen with spherical sclerite at apices of longitudinal struts (see "Remarks" section for *N. dealbata*).

Measurements. Antenna 2.08 mm (n = 1). Wing length 3.18–3.35 mm, width 1.33–1.45 mm (n = 3).

DISTRIBUTION. Chile.

HOLOTYPE. ♂, CHILE, Llanquihue, Yerbas Buenas, 13 km NE Ensenada, 4–6.xii.1994, L. Quate, H. Bhat, Malaise trap, 150 m (LACM).

PARATYPES. 1♀, same data as holotype (LACM), 3♀, same data as holotype except 3.xii.1994, sweeping, fuchsias and ferns (LACM), 1♀, same data as holotype except 3.xii.1994, shaded seepage bank (LACM).

ETYMOLOGY. From Greek *liparotes* for fat, referring to the short, broad distiphallus.

KEY TO MALES OF *NEMONEURA*

The male of *N. punctata* is unknown.

1 Interocular suture either inverted V-shaped or interrupted in center; CuA_2 with preapical enlargement 2
– Interocular suture inverted Y-shaped with stem longer than arms; CuA_2 without preapical enlargement ..... ***N. liparotes* n. sp.**
2 Paramere present (Fig. 291) ..... *N. dealbata* Tonnoir
– Paramere absent (Fig. 293) . . . ***N. confraga* n. sp.**

Unplaced Species

Syntomolaba Enderlein

Syntomolaba Enderlein, 1937:100; Quate, 1963: 184.

TYPE SPECIES. *Pericoma complicata* Tonnoir, by original designation.

Syntomolaba complicata (Tonnoir)

Pericoma complicata Tonnoir, 1929:15–16, pl. II, figs. 23–27.
Syntomolaba complicata; Enderlein, 1937:100.

DESCRIPTION. Male. Eyes separated by 1 facet diameter; interocular suture inverted Y-shaped with long stem; bridge with 3 facet rows; frons hair patch quadrate with sides parallel, median band extending posteriorly to lower eye bridge margin; scape elongate, 2 times length of pedicel, basal flagellomeres fusiform and progressively developing small internodes; palpus normal, palpomere 4 longer than 3.

Anepisternite with alveoli only behind and below spiracle, mostly bare. Wing as shown by Tonnoir (1929: fig. 25), but without crossveins; R_5 ends in wing apex.

Genitalia missing from type.

DISTRIBUTION. Argentina.

HOLOTYPE. ♂, ARGENTINA, Rio Negro, Puerto Blest, Lake Nahuel Huapi, 2–3.xii.1926, F. and M. Edwards (BMNH; examined).

REMARKS. The missing male genitalia makes placement of *S. complicata* conjectural. The branched ascoids suggests placement in *Didicrum,* but R_5 ending in the wing apex, the bifurcate gonostylus, and peculiar shape of distiphallus are not *Didicrum* characters. Therefore, since it cannot be assigned a genus and does possess some unusual features, we leave this species in *Syntomolaba* for the present. It does not belong to *Pericoma* as suggested earlier (Quate, 1963).

In the LACM collection there is another species that resembles *S. complicata* in the possession of mushroom-shaped ascoids and bifurcate gonostyli on the male genitalia; the position of radial and medial forks and ending of R_5 are also similar. The anterior gonocoxal apodemes of the male genitalia are not expanded anteriorly and thus lack a defining Setomimini character. On this evidence, *Syntomolaba* might belong in another tribe.

Chirolepia Enderlein

Chirolepia Enderlein, 1937:103; Quate, 1963:192.

TYPE SPECIES. *Chirolepia maculipennis* Enderlein, by original designation.

Chirolepia maculipennis Enderlein

Chirolepia maculipennis Enderlein, 1937:103.
Alepia maculipennis; Quate, 1963:192, figs. 10i–l.

DISTRIBUTION. Bolivia.

HOLOTYPE. BOLIVIA (ZMHB).

REMARKS. Only fragments of the type species of this genus, *C. maculipennis,* remains in the Enderlein collection and it appears to be a female. Quate (1963) synonymized the genus *Chirolepia* with *Alepia*; however, its simple, but distinct, ascoids and the ending of R_5 beyond the wing apex are not *Alepia* characters. It is impossible to definitively place *Chirolepia* in a tribe at this time.

ACKNOWLEDGMENTS

Many individuals have generously provided assistance during field trips to Central and South America, offering both logistical support and assistance in obtaining permits. We sincerely thank the following for their support and generous cooperation: Manual Zumbado, INBC, Costa Rica; Jan Michael Maes, Museo Entomologico, Nicaragua; Toby Barrett, INPA, Manaus, Brazil; Abraham Cáceres, Instituto Nacional de Salud, Lima, Peru; Gustavo Spinelli and Javier Muñoz, Museo de La Plata, La Plata, Argentina; Dora Feliciangeli, Universidad Central de Ve-

nezuela, Maracay, Venezuela; Florence Foque, Institut Pasteur, Cayenne, French Guiana; Muriel M. Held, STINASU, Surinam. Tim Van Eldirk, Mil Madeireira Itacoatiara, Ltd, provided living and research space at their lumber camp. Zoe Adams, Natural History Museum, London, Tam Nyugen, American Museum of Natural History, and Nancy Adams, Smithsonian Museum of Natural History, responded to many requests for loans of specimens. Finally, we appreciate the helpful reviews of J. Gelhaus, G. Hendler, S. Ibáñez-Bernal, and R. Wagner.

LITERATURE CITED

Arnett, R. H., G. A. Samuelson, and G. M. Nishida. 1993. *The insect and spider collections of the world.* Gainesville, Florida: Sandhill Crane Press, vi + 310 pp.

Botosaneanu, L., and F. Vaillant. 1970. Trois diptères psychodidae nouveaux de Cuba. *Travaux du Laboratoire d'Hydrobiologie* 61:173–183.

Bravo, F. 1999. *Septemtrichomyia,* subgênero novo de Trichomyiinae Neotropical (Diptera, Psychodidae). *Revista Brasileira de Entomologia* 43:1–7.

Bravo, F., and D. S. Amorim. 1995. First known Neotropical species of *Brunettia* (Diptera Psychodidae) from southeastern Brazil, with description of a new subgenus and systematic comments on the genus. *Iheringia, Série Zoologia* 79:149–158.

Brown, B. V. 2003. In memory of Laurence W. Quate (1925–2002). *Studia Dipterologica* 10:353–356.

Burrini, A. G., and R. Dallai. 1975. Preliminary electronmicroscope studies of fertilisation in *Telmatoscopus albipunctatus* (Williston) (Diptera: Psychodidae). *Monitore Zoologico Italiano* 9:137–152.

Collantes, F., and E. Martínez-Ortega. 1999a. A new species of moth-fly belonging to genus *Arisemus* Satchell, from Nicaragua (Diptera, Psychodidae). *Aquatic Insects* 21:215–219.

———. 1999b. Nuevas citas de especies conocidas de Psychodinae (Diptera: Psychodidae) en Nicaragua. *Revista Nicaraguense de Entomologica* 48:17–27.

Cumming, J. 1992. Lactic acid as an agent for macerating Diptera specimens. *Fly Times* 8:7.

Duckhouse, D. A. 1966. Psychodidae (Diptera, Nematocera) of southern Australia: Subfamily Psychodinae. *Transactions of the Royal Entomological Society of London* 118:153–220.

———. 1968. Psychodidae (Diptera, Nematocera) collected by Mr. Plaumann in southern Brazil. *Proceedings of the Entomological Society of London, Series B* 37:29–40.

———. 1972. Psychodidae (Diptera, Nematocera) of south Chile, subfamilies Sycoracinae and Trichomyiinae. *Transactions of the Royal Entomological Society of London* 124:231–268.

———. 1973. *A catalogue of the Diptera of the Americas south of the United States. 6A. Family Psychodidae, subfamilies Bruchomyiinae, Trichomyiinae, Sycoracinae and Psychodinae.* Museu de Zoologia, Universidade de São Paulo, 29 pp.

———. 1974a. Redescription of the Neotropical Psychodidae (Diptera, Nematocera) described by Knab, Dyar and Coquillett. *Journal of Entomology (B)* 42: 141–152.

———. 1974b. Redescription of the Neotropical Psychodidae (Diptera, Nematocera) described by Rapp and Curran. *Journal of Entomology (B)* 43:55–62.

———. 1987. A revision of Afrotropical *Setomima,* elucidation of their genealogical relationships and descriptions of other Afrotropical Psychodinae (Diptera, Psychodidae). *Annals of the Natal Museum* 28: 231–282.

———. 1990. The Australasian genera of Pericomoid Psychodidae (Diptera) and the status of related Enderlein genera in the Neotropics. *Invertebrate Taxonomy* 3:721–746.

Dyar, F. 1926. Some apparently new American psychodids (Diptera, Psychodidae). *Insecutor Inscitiae Menstruus* 14:107–111.

Enderlein, G. 1937. Klassification der Psychodidae (Dipt.). *Deutsche Entomologische Zeitschrift* 1936:81–112.

Hogue, C. L. 1973. A taxonomic review of the Genus *Maruina* (Diptera, Psychodidae). *Natural History Museum of Los Angeles County, Science Bulletin* 17: 1–69.

Just, J. P. 1973. Die Anatomie der Postabdomina von *Phlebotomus garnhami* Heisch, Guiggsbert und Teesdale, *Pericoma palustris* Meigen und *Liriope lacustris* Meigen (Diptera, Nematocera). *Zoologische Jahrbücher, Abteilung für Anatomie und Ontologie der Tiere* 91:305–388.

Knab, F. 1914. New moth-flies (Psychodidae) bred from Bromeliaceae and other plants. *Proceedings of the United States National Museum* 46:103–106.

Loew, H. 1854. Neue Beiträge zur Kenntniss der Dipteren. Zweiter Beitrag. *Königlichen Realschule zu Meseritz, Programm* 1854:1–24.

Longino, J. T. 1994. How to measure arthropod diversity in a tropical rainforest. *Biology International* 28:3–13.

McAlpine, J. F. 1981. Morphology and terminology—Adults. In *Manual of Nearctic Diptera,* vol. 1, eds. J. F. McAlpine, B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth, and D. M. Wood. Agriculture Canada monograph 27, 2–63. Ottawa: Agriculture Canada.

Philippi, R. A. 1865. Aufzählung der chilenischen Dipteren. *Verhandlungen der Zoologisch-botanischen Gesellschaft in Wien* 15:595–782.

Quate, L. W. 1955. A revision of the Psychodidae (Diptera) in America north of Mexico. *University of California Publications in Entomology* 10:103–273.

———. 1963. Review of G. Enderlein's non-Holarctic genera of Psychodidae and description of a new species (Diptera). *Transactions of the Royal Entomological Society of London* 115:181–196.

———. 1996. Preliminary taxonomy of Costa Rican Psychodidae (Diptera), exclusive of Phlebotominae. *Revista Biologia Tropical, Supplement 1* 44:1–81.

———. 1999. Taxonomy of Neotropical Psychodidae (Diptera). 3. Psychodines of Barro Colorado Island and San Blas. *Memoirs on Entomology International* 14:409–441.

Quate, L. W., and J. R. Vockeroth. 1981. Psychodidae. In *Manual of Nearctic Diptera,* vol 1, eds. J. F. McAlpine, B. V. Peterson, G. E. Shewell, H. J. Teskey, J. R. Vockeroth, and D. M. Wood, 293–300. Agriculture Canada monograph 27. Ottawa: Agriculture Canada.

Rapp, W. F. 1945. New Psychodidae from Barro Colorado Island. *Journal of the New York Entomological Society* 53:309–311.

Rosario, F. del. 1936. The American species of *Psychoda* (Diptera: Psychodidae). *Philippine Journal of Science* 59:85–148.

Satchell, G. H. 1953. The Australian Psychodidae. Part I. *Australian Journal of Zoology* 1:357–418.

———. 1955. Two new subgenera of Psychodidae (Diptera) from Jamaica, with descriptions of five new species. *Annals and Magazine of Natural History* 12: 85–93.

Tonnoir, A. L. 1920. Contribution a l'etude des Psychodidae. *Annales de la Société Entomologique de Belgique* 60:149–157.

———. 1929. *Diptera of Patagonia and South Chile,* pt. 1. Fascicle I—Psychodidae. London: British Museum (Natural History), 32 pp.

Vaillant, F. 1971–1983. Psychodidae-Psychodinae. In *Die Fliegen der palaearktischen Region,* 9d, ed. E. Lindner, 287, 291, 292, 305, 310, 313, 320, 326, 328. Stuttgart: E. Schweitzerbart'sche Verlagsbuchhandlung.

———. 1982. Les tribus de la sous-famille des Psychodidae: Psychodinae (Diptera). *Nouvelle Revue d'Entomologie* 12:189–194.

———. 1986. Le genre *Arisemus* Satchell et quelques genres voisins (Diptera, Psychodidae). *Nouvelle Revue d'Entomologie (N.S.)* 3:333–340.

———. 1990. Propositions pour une révision de la classification des Diptères Psychodidae Psychodinae. *Bulletin de la Société Vaudoise des Sciences Naturelles* 80:141–163.

Wagner, R. 1981. Two new moth-flies (Diptera, Psychodidae) from South America. *Studies on the Neotropical Fauna and Environment* 6:217–220.

———. 1990. Family Psychodidae. In *Catalogue of Palaearctic Diptera,* vol. 2, eds. Á. Soós and L. Papp, 11–65. Budapest: Akadémiai Kiadó.

———. 1993. On a collection of Psychodidae (Diptera) by Dr. L. Botosaneanu from some Caribbean islands. *Aquatic Insects* 15:109–127.

———. 1997. Family Psychodidae. In *Contributions to a manual of Palaearctic Diptera (with special reference to flies of economic importance),* eds. L. Papp and B. Darvas, 205–225. Vol. 2 of *Nematocera and Lower Brachycera.* Budapest: Science Herald.

Wagner, R., and W. Joost. 1994. On a small collection of Psychodidae (Diptera) from Colombia. *Studies on the Neotropical Fauna and Environment* 29:75–86.

Wagner, R., and E. C. Masteller. 1996. New moth flies (Diptera: Psychodidae) and a key to species from Puerto Rico. *Proceedings of the Entomological Society of Washington* 98:450–464.

Received 2 October 2002; accepted 22 October 2003.

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