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REVISION OF THE NEOTROPICAL FAMILY INBIOMYIIDAE (DIPTERA, SCHIZOPHORA)

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REVISION OF THE NEOTROPICAL FAMILY INBIOMYIIDAE (DIPTERA, SCHIZOPHORA)

MATTHIAS BUCK¹ AND S. A. MARSHALL²

ABSTRACT. The Central and South American family Inbiomyiidae with its single genus Inbiomyia Buck is revised, including descriptions of 10 new species: I. acmophallus Buck sp. nov. (Colombia), I. anemosyris Buck sp. nov. (Colombia, Peru), I. matamata Buck sp. nov. (Venezuela, Colombia), I. pterygion Buck sp. nov. (Bolivia), I. regina Buck sp. nov. (French Guiana), I. exul Buck sp. nov. (Costa Rica, Ecuador), I. empheres Buck sp. nov. (Ecuador), I. anodontia Buck sp. nov. (Colombia), I. scoliostylus Buck sp. nov. (Costa Rica), and I. zeugodonta Buck sp. nov. (Colombia, French Guiana). Three species known from single females are briefly diagnosed but not named. A key to the 11 described species of Inbiomyia is provided. The species-level phylogenetic relationships are analyzed on the basis of a matrix of 35 morphological characters. Four species groups are recognized: the I. anemosyris group (I. acmophallus, I. regina, I. pterygion, I. matamata, I. anemosyris), the I. exul group (I. exul, Inbiomyia species 1), the I. mcalpineorum group (I. empheres, I. mcalpineorum, Inbiomyia species 2), and the I. scoliostylus group (I. anodontia, I. scoliostylus, I. zeugodonta, Inbiomyia species 3).

INTRODUCTION

The family Inbiomyiidae, recently erected for the newly described Neotropical acalypterate genus Inbiomyia Buck, 2006, is the fourth family of Cyclorrhapha to be described on the basis of a newly discovered group of flies in the past 50 years (i.e., excluding families erected through taxonomic “splitting”). None of the other 3 families, Xenastaeidae Hardy, 1980, Neminiidae D.K. McAlpine, 1983 (originally as a subfamily of Aulacigastridae), and Marginiidae D.K. McAlpine, 1991, occur in the New World. Inbiomyiidae is in fact the only valid family of Cyclorrhapha that has ever been described from the New World on the basis of a newly discovered genus. Other relatively recently erected families were based on genera described decades earlier, the most recent examples being Teratomyzidae Colless and D.K. McAlpine, 1970 (based on examples being Teratomyza Malloch, 1933), and Syringogastridae do Prado, 1969 (based on Syringogaster Cresson, 1912).

Inbiomyiidae are characterized by several highly unusual and unique morphological features of the head, male and female genitalia, and egg. Buck (2006) placed Inbiomyiidae as the sister group of the monotypic Australasian family Australimyzidae, within the superfamily Carnioidea. The larval biology of Inbiomyia remains unknown, but the unusual egg morphology suggests a specialized biology. So far, species of Inbiomyiidae have been found in 8 Central and South American countries from Guatemala in the north to Bolivia and French Guiana in the south. The actual range probably includes the entire tropical part of the Neotropical region with the apparent exception of the Caribbean. Inbiomyiidae occur in primary tropical forests (rain and cloud forest) from sea level to 2000 m, with the highest number of species found at low elevations.

The morphology, biology, family relationships, and history of discovery of Inbiomyiidae were discussed in detail by Buck (2006). The family was described with the single included species Inbiomyia mcalpineorum Buck, 2006; we here add another 10 new species to the family and consider the distribution and phylogeny of the species.

MATERIALS AND METHODS

MORPHOLOGY AND TERMINOLOGY

The morphological terminology largely follows J.F. McAlpine (1981a). Postabdominal features were examined on specimens cleared in hot 10% KOH and subsequently neutralized in glacial acetic acid. Eggs were obtained by dissection from cleared abdomens of gravid females (museum specimens). Dissected parts are kept in glycerine in a microvial with the specimen.

PHOTOGRAPHY

The habitus photograph (Fig. 1) was taken with a Microptics Digital Lab XLT imaging system using a Canon EOS 1 Ds camera and Microptics ML-1000 flash fiber optic illumination system. Each image was assembled from a series of photographs (with different focal planes) using the computer freeware CombineZ (Hadley, 2005). Wing and egg photographs (Figs. 9, 10, 13) were taken with a Nikon Coolpix 4500 digital camera mounted on a Zeiss compound microscope.

PHYLOGENETIC ANALYSIS

Parsimony analysis of the character matrix was performed with PAUP* 4.0b10 for Windows (Swofford,
2001) using the “branch and bound” algorithm. Branch support was calculated with PAUP* according to Bremer (1994). The Bremer value for a certain branch indicates the minimum number of additional steps (compared to the most parsimonious tree[s]) that is required to generate a tree (or trees) in which the branch in question is unresolved. High Bremer values therefore indicate strong branch support.

ABBREVIATIONS
Costal ratios; e.g., Cs2/Cs3 = length of costal sector 2/ length of costal sector 3. Costal sector 2 is measured between the apices of R1 and R2+3, Cs3 between apices of R2+3 and R4+5, and Cs4 between apices of R4+5 and M (Fig. 10).

SYSTEMATICS
Family Inbiomyiidae

**DESCRIPTION.** A detailed description was provided elsewhere (Buck, 2006). The most important morphological features are summarized below.

Small, mostly dark, acalyptrate flies (Fig. 1); body length 1.3–1.6 mm.

**Head** (Fig. 3). Very short, wider than thorax, with protuberant eyes. Head chaetotaxy reduced, including single long, inclinate orbital bristle, inner and outer vertical bristles, long vibrissa, shorter subvibrissal and several genal bristles, and strong ventral preapical bristle on palpus. Ocellar plate very large and shining, occupying most of frons. Ptilinum extremely reduced. Face with arcuate, ridgelike internal thickening at or above lower margin, here called “lower facial ridge” (Fig. 5: fr); lower margin deeply emarginate. Eye short-pubescent. Antenna short with small scape and pedicel, and hemispherical first flagellomere bearing extremely long, pubescent, dorsoapical arista. Proboscis with small, largely separate labella pointing in nearly opposite directions.

**Thorax.** Strongly arched, humpbacked with the following complement of bristles: 3 dorsocentrales (one presutural), 2 supra-alar (pre- and postsutural), postalar, small postpronotal (sometimes hairlike), 2 notopleurals (posterior one inserted much higher than anterior one), (1–2) scutellars (anterior one usually hairlike, sometimes absent), and dorsoproclinate katepisternal. Acrostichal setulae in 2, often short rows. Pleuron without hairs or bristles except on katepisternum. Legs slender. Forefemur with anteroventral, posteroventral and posterodorsal series of bristles, femora otherwise devoid of bristles. Male foretibia slightly clavate in some species (Fig. 7), usually with row of enlarged, more or less erect ventral bristles on apical half (Fig. 6), tibiae otherwise devoid of bristles (including ventroapical bristle of mid tibia). Wing (Figs. 9, 10) with incomplete subcosta and very short R₁, costa with humeral and subcostal breaks, reaching M (weaker in last sector), with small, well-spaced spinules on second and base of third sector. Cell cup with convex outer margin; anal vein very strong, fading away before wing margin. Halter with darkened knob.

**Preabdomen.** With 4 large tergites (syntergite 1+2, tergites 3 and 4, male syntergite 5+6 or female tergite 5).

**Male Terminalia.** Sternites 5, 6, and 7 fused, separate from short, transverse sternite 8 (Buck, 2006: figs. 4A–C). A small ring-shaped sclerite (nonfunctional remnant of left spiracle 7?) present dorsally between syntergite 5+6 and synternite 5+6+7. Epandrium saddle-shaped, anteroventrally with a pair of slender processes on each side (Fig. 15: vp) which are either fused to or articulated with the epandrium, posteroventrally with a pair of lobes (fused cerci?) behind each surstylus (Fig. 16: vl). Perianal field (Fig. 16: pf) usually closed ventrally by subanal plate (divided medially by suture). Surstylus (Fig. 15: ss) usually with slender basal and dilated distal portion,
usually bearing conspicuous bristles. Hypandrium Y-shaped with slender anterior apodeme (Fig. 15: ha). Postgonites (Fig. 16: pg) well developed (absent in 1 species), with stout bristles. Phallopodeme rodlike, separate from hypandrium (Fig. 16: pa). Phallus clearly divided into basiphallus and distiphallus (Fig. 20: bp, dp). Basiphallus sclerotized, with simple, anchor- or shieldlike epiphallus. Distiphallus short and simple, completely membranous; surface in part striate, in part nonstriate with small spicules and/or microtrichia. Ejaculatory apodeme small and inconspicuous, disklike (Fig. 21).

**Female Terminalia.** Ovipositor broadly truncate, nontelescopic; tergite 7 narrowed or divided medially, sternite 7 comparatively broad and long, laterally almost reaching corresponding tergite (narrowly fused to tergite in some species); all sclerites beyond segment 8 completely reduced, cerci absent. Intersegmental membrane behind

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sternite 7 pouchlike, with a field of conspicuous, posteriorly directed (when invaginated), serrate or crenulate scalelike cuticular outgrowths. Sternite 8 hardly discernable, completely membranous and medially divided. Two moderately sclerotized, tire-shaped, oval, or egg-shaped spermathecae with striate surface. Spermathecal ducts short, joining genital chamber separately; duct insertion lateral to main axis of spermatheca.

Egg (Figs. 11–13). Mature eggs were obtained from 5 species (I. acmophallus sp. nov., I. pterygion sp. nov., I. regina sp. nov., I. exul sp. nov., I. zeugodonta sp. nov.) and are very uniform across the genus. Size large compared to abdomen, shape elliptical (length 0.39–0.48 mm, width 0.21–0.27 mm, length/width ratio 1.67–1.86), strongly flattened dorsoventrally (thickness estimated at ca. 0.05 mm). Ventral surface membranous, unornamented; dorsal surface thicker, coarsely granulose and unpigmented, with polygonal, reticulated pattern. Micropyle on small elevation.

**DIAGNOSIS.** *Inbiomyia* (Inbiomyiidae) can be identified using the key to Neotropical Diptera families by Buck *et al.* (in press). The following characters are diagnostic: small, acalyptate flies

**Figures 9–13**  
*Inbiomyia* wings and eggs.  
9. *I. exul* Buck sp. nov., right wing.  
10. *I. anemosyris* Buck sp. nov., ditto.  
12. *I. zeugodonta* Buck sp. nov., ditto.  
13. *I. exul* Buck sp. nov., ditto. (photograph of cleared and slide-mounted specimen). Scale 0.2 mm (wings), 0.05 mm (eggs).

**Abbreviations:** Cs—costal sector, mp—micropyle. Drawings: A. Cormier (11, 12)
with (1) very shortened head (frons) and protruding eyes, (2) single pair of inclinate orbital bristles, (3) well-developed vibrissae, (4) no ocellar or postvertical bristles, (5) extremely long and nearly apically inserted arista, (6) strongly divergent and largely free labella, (7) aset(ul)ose anepisternum, (8) complete wing venation except for reduced subcosta, and (9) costa with humeral and subcostal breaks. In previously published keys, *Inbiomyia* runs to Aulacigastridae (e.g., J.F. McAlpine, 1981b) or does not key out properly (e.g., Hennig, 1973: conflict at couplet 138).

**BIOLOGY.** There are no direct observations on the biology of *Inbiomyia*. Adults are apparently microbial grazers as can be concluded from the substantial amounts of fungal, algal (including diatoms), and probably bacterial material found in the guts of dissected specimens. Nearly 80% of the currently known material of *Inbiomyia* (ca. 220 specimens in total) was collected in Malaise traps, another 16% in pan traps placed in decaying vegetation (mostly decaying foliage of fallen trees). The junior author observed an adult of an unidentified species on green leaves of a recently fallen tree at Rara Avis (Heredia, Costa Rica). The presence of adults on decaying plant matter suggests a phytosaprophagous larval biology (larvae feeding on the microbial flora of the substrate). However, the comparatively large egg size and low number of mature eggs per female (1–4 in dissected specimens) is unusual for species developing in a nutrient-rich, rapidly decaying, ephemeral food source. Most Diptera that exploit this type of substrates are r-strategists and produce large numbers of relatively small eggs. The unusual egg morphology, which is reminiscent of macrotype Tachinidae eggs, could be indicative of a more specialized, possibly parasitic, lifestyle.

### SPECIES-LEVEL PHYLOGENY OF INBIOMYIA

**Characters Used in Phylogenetic Analysis**

Characters were polarized based on the putative outgroup Australimyzidae (Buck, 2006). No additional outgroups were taken into consideration because the sister group of *Inbiomyiidae* + Australimyzidae is uncertain (Carnidae are the putative sister group of *Inbiomyiidae* + Australimyzidae, but support for this relationship is weak; see Buck, 2006). Inbiomyiidae and Australimyzidae have diverged considerably, especially in male and female postabdominal features. Fourteen of the 35 characters (Table 1), mostly male genital characters, could therefore not be polarized through outgroup comparison. Eleven of these characters could be polarized *a posteriori* (i.e., after the parsimony analysis; see “ancestor” in Table 1) using the “functional ingroup–functional outgroup” (“FIG–FOG”) approach (Watrous and Wheeler, 1981). The polarity of 3 characters (12, 22, 28) remains ambiguous.

In the following list of characters, apomorphic states are coded with “1” or “2” and plesiomorphic states with “0” (except characters 12, 22, 28). Character 21 is ordered. Polarities of characters denoted by asterisks (*) were established *a posteriori*.

**Head, Thorax, and Legs**

1. Facial sclerotization below lower facial ridge: 0—largely absent (Fig. 5); 1—present (Fig. 6)
2. Ocellar hairs: 0—present; 1—absent
3. Inner vertical bristle, length: 0—more than half as long as orbital bristle; 1—at most half as long as orbital bristle

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**Table 1: Character state matrix for described species of *Inbiomyia*.** Australimyzidae, the sister group of Inbiomyiidae, served as outgroup for the analysis. Putative ground-plan character states of Inbiomyiidae (“ancestor”) were in part determined after the analysis using the FIG–FOG method (see text).

<table>
<thead>
<tr>
<th>Species</th>
<th>Character numbers</th>
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<tr>
<td></td>
<td>1234567890</td>
</tr>
<tr>
<td>Australimyzidae</td>
<td>0000000000</td>
</tr>
<tr>
<td>(ancestor)</td>
<td>0000000000</td>
</tr>
<tr>
<td><em>I. anemosyris</em></td>
<td>1111001010</td>
</tr>
<tr>
<td><em>I. matamata</em></td>
<td>1111111010</td>
</tr>
<tr>
<td><em>I. pterygion</em></td>
<td>1111111010</td>
</tr>
<tr>
<td><em>I. acmophallus</em></td>
<td>0010101000</td>
</tr>
<tr>
<td><em>I. regina</em></td>
<td>1011111010</td>
</tr>
<tr>
<td><em>I. exul</em></td>
<td>1111000110</td>
</tr>
<tr>
<td><em>I. mcalpineorum</em></td>
<td>0000100101</td>
</tr>
<tr>
<td><em>I. emperes</em></td>
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<tr>
<td><em>I. anodonta</em></td>
<td>0020000001</td>
</tr>
<tr>
<td><em>I. scoliostylus</em></td>
<td>0000000000</td>
</tr>
<tr>
<td><em>I. zeugodonta</em></td>
<td>0000000000</td>
</tr>
</tbody>
</table>
Male Terminalia

7 Syntergite 5+6, ventral lobe below spiracle 6: 0—absent; 1—present (Fig. 17: tl)
8 Ventral portion of synternite 5+6+7 (= sternite 5), posterior process of right side: 0—absent (Fig. 17); 1—present (Fig. 54; prv)
9 Lateral portion of synternite 5+6+7 (= sternite 6), posterior process: 0—absent (Fig. 17); 1—present (Fig. 27: plr)
10 Epandrium, dorsolateral anterior apodemes: 0—absent (Fig. 15); 1—present (Fig. 62: ap)
11* Perianal field: 0—elliptical (Fig. 41); 1—not elliptical (Fig. 16)
12 Subanal plate: 0—desclerotized or weakly sclerotized; 1—strongly sclerotized (polarity unknown)
13 Articulation of epandrium/hypandrium: 0—broad; 1—narrow (Buck, 2006: fig. 4E)
14 Ventral process of epandrium: 0—fused to epandrium (Fig. 15); 1—articulated with epandrium (Fig. 62)
15* Ventral process of epandrium, apex: 0—slender (Fig. 18); 1—broadly truncate (Fig. 87); 2—bilobate (Fig. 49)
16* Ventral process of epandrium, shape: 0—curved medially (Fig. 18); 1—not curved medially (Fig. 66)
17* Ventral process of epandrium, small point at or near apex: 0—absent (Fig. 66); 1—present (Fig. 18)
18* Ventral process of epandrium, stout blunt bristles on inner surface: 0—absent (Fig. 28); 1—present (Fig. 18)
19* Posteroverentral lobe of epandrium: 0—large (Fig. 16: vl); 1—small (Fig. 76); 2—absent (Fig. 57)
20* Surstylus basal portion: 0—more or less parallel-sided (Fig. 25); 1—widening distally (Fig. 15); 2—tapering distally (Fig. 56)
21 Surstylus apical portion: 0—not expanded (Fig. 56); 1—slightly to moderately expanded (Fig. 62); 2—greatly expanded (Fig. 15)
22 Surstylus apical portion, discal bristles: 0—none or 1 (Fig. 15); 1—several (Fig. 68) (polarity unknown)
23 Surstylus apical portion, peglike bristle(s): 0—absent (Fig. 15); 1—1 (Fig. 57); 2—2 (Fig. 85)
24 Surstylus apical portion, marginal row of hairs: 0—absent (Fig. 75); 1—irregular (Fig. 47); 2—regular (Fig. 25)

RESULTS OF PHYLOGENETIC ANALYSIS

The analysis yielded a single most parsimonious tree (Fig. 2; tree length 71, consistency index = 0.61, retention index = 0.72, rescaled consistency index = 0.44). Four species groups are recognized: the I. anemosyris group (I. acmophallus, I. regina, I. pterygion, I. matamata, I. anemosyris), the I. mcalpineorum group (I. empheres, I. mcalpineorum), the I. exul group (I. exul), and the I. scoliostylus group (I. anodonta, I. scoliostylus, I. zeugodonta). The latter 3 groups each include 1 unnamed species (see species accounts below), which were not included in the analysis because they are known from females only. Most species groups are well defined and show moderate to high Bremer support. The exception is the I. scoliostylus group, which is well supported only if I. anodonta is excluded. The latter shares only 1 synapomorphy with the remainder of the species (character 20, state 1), which occurs convergently in I. acmophallus + I. regina.

Biogeography

The I. anemosyris group is the only species group of Inbiomyia restricted to South America. All other groups are represented in both Central and South America. Because of the still fragmentary knowledge on Inbiomyia (many species still to be discovered, poorly known species distributions), it
is difficult to develop meaningful hypotheses on the phylogeography of the group. Interestingly, all Central American species have their sister species in South America (I. exul, occurring in both South and Central America, and its Central American sister species, Inbiomyia sp. 1, represent a special case). On the basis of current phylogeny, it appears most likely that the stem species of Inbiomyia lived in South America, and its descendants colonized Central America on at least 3 different occasions.

**KEY TO THE SPECIES OF INBIOMYIA BUCK**
(Note: Three unnamed species are known from females only and are not included in the key.)

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Entire katepisternum (and sometimes also ventral margin of anepisternum) white, yellow or brownish yellow, contrasting with medium to dark brown anepisternum (e.g., Fig. 1).</td>
<td>............ 2</td>
</tr>
<tr>
<td></td>
<td>At least dorsal portion of katepisternum medium to dark brown and hardly paler than anepisternum.</td>
<td>............ 5</td>
</tr>
<tr>
<td>2</td>
<td>Upper pleuron (anepisternum, anepimeron, postnotum) uniformly dark brown, sharply contrasting with white to whitish yellow lower pleuron throughout its whole length (Fig. 1). Cs2/Cs3 ≤ 2.0, Cs3/Cs4 &gt; 2.5 (Fig. 9). Surstylus angulate, not expanded apically (Fig. 56). Hypandrium with long, forked ventral process (Fig. 53). Female tergite 7 entire (Fig. 52). Spermatheca tire-shaped (Fig. 52) (Costa Rica, Ecuador).</td>
<td>............ I. exul Buck sp. nov.</td>
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<tr>
<td></td>
<td>Upper pleuron not uniformly colored; at least anepimeron paler than anepisternum, the former not sharply contrasting with yellow lower pleuron. Cs2/Cs3 ≥ 2.8, Cs3/Cs4 ≤ 2.3 (e.g., Fig. 10). Surstylus either greatly expanded apically or not angulate. Hypandrium without forked ventral process. Either female tergite 7 divided or spermatheca asymmetrically egg-shaped.</td>
<td>............ I. zeugodonta Buck sp. nov.</td>
</tr>
<tr>
<td>3</td>
<td>Inner vertical bristle ca. 0.75× as long as orbital bristle. Anterior scutellar bristle 0.3–0.4× as long as posterior one, distinctly longer and more robust than acrostichal hairs. 1–3 dorsocentral setae between postsutural and prescutellar dorsocentral bristles. Apex of surstylus slightly expanded, without fringe of long bristles (Fig. 84). Female tergite 7 narrowly divided medially; spermatheca tire-shaped (Fig. 82) (Colombia, French Guiana).</td>
<td>............ I. zeugodonta Buck sp. nov.</td>
</tr>
<tr>
<td>4</td>
<td>Ocellar plate glossy, without any trace of microtomentum. Male foretibia slightly clavate, with distinctly enlarged, nearly erect ventral bristles (Fig. 7). Slender basal portion of surstylus not extending beyond apex of posteroventral epandrial lobe (Fig. 46). Ventral epandrial process with distinctly bilobate apex; median lobe with several stout apical bristles (Fig. 49). Female sternite 7 partially sclerotized and pale, especially sublaterally (French Guiana).</td>
<td>............ I. regina Buck sp. nov.</td>
</tr>
<tr>
<td>5</td>
<td>Cs2/Cs3 &lt; 2.5. Surstylus with greatly expanded apical portion bearing discal as well as marginal bristles (Figs. 68, 69); marginal bristles few in number and spaced widely. Female unknown. [Face not sclerotized below lower facial ridge. Ventral epandrial process articulated to epandrium.] (Colombia).</td>
<td>............ I. anemosyris Buck sp. nov.</td>
</tr>
<tr>
<td>6</td>
<td>Cs2/Cs3 ≥ 3.0. Surstylus with moderately or greatly expanded apical portion, if greatly expanded then with marginal bristles only (e.g., Fig. 15); marginal bristles, if present, more close-set.</td>
<td>............ I. anodontata Buck sp. nov.</td>
</tr>
<tr>
<td>7</td>
<td>Inner vertical bristle almost as long as orbital bristle. Anterior pair of scutellar bristles longer than acrostichals, ca. one-third as long as posterior scutellars. Ventral epandrial process biangulate in lateral view; surstylus lacking fringe of long bristles, with 2 stout, peglike bristles apically (Fig. 75). Female tergite 8 with long anterior apodeme (Fig. 81: ap); tergite 7 broadly divided medially (Fig. 81) (Costa Rica).</td>
<td>............ I. scoliostylus Buck sp. nov.</td>
</tr>
<tr>
<td>8</td>
<td>Inner vertical bristle &lt; 0.7× as long as orbital bristle (Fig. 3). Anterior pair of scutellar bristles short, hairlike and subequal to acrostichals, or absent. Ventral epandrial process straight in lateral view. Surstylus with fringe of 6–16 long bristles, lacking stout peglike bristles. Female tergite 8 without or with very short anterior apodeme, tergite 7 entire or medially divided.</td>
<td>............ I. scoliostylus Buck sp. nov.</td>
</tr>
<tr>
<td>9</td>
<td>Male perianal area elliptical, sharply delimited ventrally by dark brown, sclerotized subanal plate (e.g., Fig. 63). Surstylus only moderately expanded apically, and with fringe of few long bristles (e.g., Fig. 62). Female tergite 8 without anterior apodeme. Ca. 2 dorsocentral setae.</td>
<td>............ I. scoliostylus Buck sp. nov.</td>
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between postsutural and prescutellar dorso-central bristles .............................. 8

- Male perianal area not elliptical, either poorly delimited ventrally from weakly sclerotized subanal plate (e.g., Fig. 32) or its margins parallel to slightly divergent ventrally (Fig. 16). Surtstylus broadly expanded distally, with fringe of numerous long bristles (e.g., Fig. 15). Either female tergite 8 with short anterior apodeme (Fig. 22) or scutum without setulae between prescutellar and postsutural dorso-central bristles .............................. 9

8 Subanal plate and hind margin of epandrium almost forming a right angle in lateral view; ventral epandrial process with straight posterior margin; postgonite directed anteriorly (Buck, 2006: fig. 6B). Female tergite 7 medially very narrow but not interrupted, laterally fused to sternite (Buck, 2006: fig. 7A) (Costa Rica) ......... I. mcalpineorum Buck

- Angle formed by subanal plate and hind margin of epandrium obtuse (Fig. 62). Ventral epandrial process with a posterior tubercle at base of apical third (Fig. 65). Postgonite directed ventrally (Fig. 63). Female tergite 7 medially interrupted, laterally not fused to sternite (Fig. 80) (Ecuador) .............................. I. empheres Buck sp. nov.

9 Face not sclerotized below lower facial ridge (Fig. 5). Male perianal field angulate ventrolaterally (Fig. 16). Fringe of bristles of distal portion of surstylus extending far onto dorsal margin (Fig. 15). Ventral epandrial process with 2 long apical hairs and several stout, blunt-tipped bristles on medial surface (Fig. 18). Female sternite 7 pigmented darker laterally and medially. Spermatheca tief-shaped (Fig. 22) (Colombia) .............................. I. acmophallus Buck sp. nov.

- Facial sclerotization extending below level of lower facial ridge (Fig. 4). Perianal field elliptical. Fringe of bristles of distal portion of surstylus ending at or near posterior corner (e.g., Fig. 40). Ventral epandrial process without apical hairs, medially with slender fine-tipped bristles only (e.g., Fig. 43). Female sternite 7 often evenly pigmented, if not then darker medially but not laterally. Spermatheca oval (Figs. 37, 38) .................. 10

10 Ocellar plate glossy and lacking microtomentose on each side of ocellar area. Forecoxa brown, at least basal half distinctly darker than remainder of leg. Expanded distal portion of surstylus with angulate anterior corner (Fig. 31). Epiphallus nearly parallel-sided (Fig. 35). Ventral epandrial process tapered, without long hairs in apical fourth (Fig. 34). Female sternite 7 evenly pigmented (Venezuela, Colombia) .............................. I. matamata Buck sp. nov.

- Ocellar plate shining but sparsely microtomentose throughout. Forecoxa yellow, con-colorous with remainder of leg. Expanded distal portion of surstylus broadly rounded anteriorly (Fig. 40). Epiphallus greatly expanded apically, anchor-shaped (Fig. 44). Ventral epandrial process not tapered, with several long hairs on inner surface of apical fourth (Fig. 43). Female sternite 7 darker medially (Bolivia) .................. I. pterygion Buck sp. nov.

SPECIES ACCOUNTS

**Inbiomyia anemosyris** species group

**SPECIES INCLUDED.** I. acmophallus sp. nov., I. anemosyris sp. nov., I. matamata sp. nov., I. pterygion sp. nov., and I. regina sp. nov.

**DIAGNOSIS.** Inner vertical bristle at most half as long as orbital bristle. Facial sclerotization usually extending below lower facial ridge (Fig. 4; except in I. acmophallus). Usually without dorsocentral setae between postsutural and prescutellar dorso-central bristles (except in I. acmophallus). R_{2+3} not shortened, Cs2/Cs3 ≥ 3.0. Male symtergite 5-6 with a pair of ventral lobes below spiracles 6 (Fig. 17: tl). Ventral epandrial process fused to epandrium, not curved medially, at or near apex with a small, usually medially directed toothlike process. Surtstylus with greatly enlarged apical portion, bearing distinct row of long marginal bristles and no discal bristles. Hypan-drium broadly connected to epandrium. Distiphallus spinulose, without microtrichia.

**Inbiomyia acmophallus** Buck sp. nov.

Figs. 5, 11, 14–22; Buck, 2006: fig. 5B

**ADULT.** Wing length 1.41–1.49 mm (♂), 1.44–1.56 mm (♀). Sclerotized portions of head dark brown excluding prementum, which is yellow to brownish yellow. Antenna dark brown, almost concolorous with frons; palpus slightly paler. Frons, besides usual long inclinate orbital bristle, with 2 orbital hairs and a pair of ocellar setulae. Ocellar plate sparsely microtomentose. Face not sclerotized below lower facial ridge (Fig. 5). Thorax including pleuron dark brown, katepisternum slightly and gradually becoming paler ventrally and anteriorly. 1–3 dorsocentral setae between postsutural and prescutellar dorso-central bristles; acrostichal rows of hairs extending posteriorly to at least level of postsutural dorsocentral bristle. Scutellum with posterior pair of bristles only, anterior pair absent. Legs including forecoxa brownish yellow. Both antero- and posteroventral rows of bristles of forefemur stronger and darker in male than in female; bristles of posteroventral row slightly stronger than anteroventral row in both sexes. Distal half of male foretibia with well-developed row of short, semierect, blackish, ventral bristles. Wing slightly infuscate. Cs2/Cs3 = 3.0–3.8, Cs3/Cs4 = 1.6–2.1.
MALE TERMINALIA (Figs. 14–21). Synsternite 5+6+7 without posterior process on ventral or lateral portion (Fig. 17). Ring-shaped sclerite present but faint. Epandrium brown, without pair of anterior apodemes dorsally, ventrally continuous with subanal plate, which is less sclerotized and paler than epandrium. Perianal field ventrally with parallel to slightly divergent lateral margins.
Ventral epandrial process (Fig. 18) brownish yellow, more or less straight and apically narrowed, medially with a single to partially double row of bristles; these bristles becoming shorter, stouter, and blunter distally; a small medial tubercle near apex, one (almost) apical and one subapical bristle. Surstylus (Fig. 15) brownish yellow, marginal fringe of bristles arranged in 1 irregular row. Hypandrium broadly and firmly connected to anteroventral margin of epandrium by a tight suture, posteriorly with a relatively shallow emargination between the 2 arms (as in Buck, 2006: fig. 4E). Postgonite (Fig. 14) short and yellow, directed ventrally (Fig. 16), with 1 long, thin, subapical bristle and numerous shorter bristles, some of which are stout and blunt-tipped (including apical bristle). Epiphallus anvil-shaped, yellow (Fig. 19). Unlike other species, the epiphallus cannot swing out beyond (posterior to) the immobile postgonites. Distiphallus (Fig. 20) moderately long, distally with indistinct, short spicules and no microtrichia.

**FEMALE TERMINALIA** (Fig. 22). Tergite 7 entire, separate from sternite laterally. Sternite 7 unevenly pigmented, darker laterally and medially; extent of pale area highly variable, sometimes including entire midsection. Tergite 8 with short anterior apodeme (Fig. 22: ap), paler than preceding tergites (except its anterior margin); posterior margin slightly angled with shallow emargination between angles. Spermatheca weakly sclerotized, pale brown, tire-shaped with small central invagination and laterally inserted duct.

**EGG** (Fig. 11). The most elongate egg of all examined species (length 0.39 mm, width 0.21 mm). Otherwise as in generic description.


**DIAGNOSIS.** The male of this species is characterized by a peculiar, anvil-shaped epiphallus. It is distinguished from *I. pterygion*, the only other species with an apically expanded epiphallus, by the surstylus, which bears 1–2 bristles on the dorsal margin of the expanded apical portion (absent in *I. pterygion*) and has an irregular fringe of long bristles (regular in *I. pterygion*). The female can be diagnosed by the uniformly dark brown pleuron, entire tergite 7, and pale tergite 8.

**ETYMOLOGY.** The species name is used as a noun in apposition and refers to the anvil-shaped epiphallus (Gr. *akmon*: anvil).
Inbiomyia anemosyris Buck sp. nov.

Figs. 8, 10, 23–29

ADULT. Wing length 1.26–1.41 mm (♂), 1.34–1.44 mm (♀). Sclerotized portions of head dark brown excluding prementum, which is yellow to brownish yellow. Antenna dark brown, almost concolorous with frons; palpus slightly paler. Frontal orbit with 2–3 hairs in addition to strong bristle. Ocellar plate sparsely microtomentose, ocellar setulae absent. Facial sclerotization extending below level of lower facial ridge. Thorax distinctly bicolored. Lower pleuron yellow, proepisternum and anepisternum (excluding posteroventral corner) dark brown (concolorous with scutum); anterior two-thirds of anepimeron and posteroventral corner of anepisternum yellow to brownish yellow; posterior third of anepimeron and postnotum medium brown; area around suture between anepimeron and katatergite somewhat darker. No dorsocentral setulae between postsutural and prescutellar dorsocentral bristles; acrostical rows of hairs extending posteriorly slightly beyond level of transverse suture. Scutellum with a small anterior pair of hairs, subequal in size to acrostical hairs. Legs including forecoxa brownish yellow. Antero- and posteroventral rows of bristles of forefemur slightly stronger and darker in male than in female; bristles of posteroventral row slightly stronger than anteroventral row in both sexes. Ventral row of short, semierect bristles in distal half of male foretibia weaker and not as dark as in some other species (Fig. 8). Wing membrane slightly infuscate. Cs2/Cs3 = 3.0–3.5, Cs3/Cs4 = 1.5–2.0.

MALE TERMINALIA (Figs. 24–29). Synsternite 5+6+7 with a posterior process on its lateral portion (Fig. 27: prl). Ring-shaped sclerite present. Epandrium brown, posteroventral lobes paler; pair of anterodorsal apodemes not developed. Subanal plate continuous with epandrium by a tight suture, posteriorly with broad connection to anteroventral margin of epandrium. Hypandrium narrowly connected to anteroventral margin of epandrium by a tight suture, posteriorly with a relatively small emargination between the 2 arms (as in Buck, 2006: fig. 4E). Postgonite (Fig. 24) short and yellow, directed ventrally (Fig. 26), with ca. 4 stout, blunt-tipped bristles near apex and several longer bristles with fine tips in distal two-fifths. Epiphallus (Fig. 29) yellow, slender, parallel-sided with truncate tip, slightly curved posteriorly in lateral view. Distiphallus (Fig. 29) moderately long, twisted distally, and curved toward right side; its surface in distal half and ventromedially with indistinct short spicules and no microtrichia.

FEMALE TERMINALIA (Fig. 23). Tergite 7 entire, separate from sternite laterally. Sternite 7 evenly sclerotized. Tergite 8 with short anterior apodeme, dark brown and concolorous with preceding tergites; its posterior margin convex without medial emargination. Spermatheca weakly sclerotized, pale brown, asymmetrically egg-shaped with apical invagination and laterally inserted duct.


DIAGNOSIS. The male genitalic characters most closely resemble I. matamata and I. pterygion. From the former it can easily be distinguished by the simple (not apically expanded) epiphallus. From the former it differs by the contrastingly colored pleuron, the twisted distiphallus, and the chaetotaxy of the surstylus (see I. matamata below). The female can be separated from all other species by the peculiar, asymmetrically egg-shaped spermatheca.

ETYMOLOGY. This species is named for the characteristic surstylus, whose regular fringe of long bristles resembles a fan (Gr. anemosyris: a kind of fan). The specific name is a noun in apposition.

Inbiomyia matamata Buck sp. nov.

Figs. 4, 30–36

ADULT. Wing length 1.38–1.44 mm (♂), 1.44–1.49 mm (♀). Sclerotized portions of head dark brown excluding prementum, which is pale yellowish brown. Antenna dark brown, concolor-
ous with frons; palpus slightly paler. Frons beside the strong orbital bristle with 2 orbital hairs and a pair of ocellar setulae. Ocellar plate sparsely microtomentose. Facial sclerotization extending below level of lower facial ridge. Thorax including pleuron dark brown, katepisternum becoming slightly paler anteroventrally. No dorsoentral setulae between poststural and pre-scutellar dorsoentral bristles; acrostichal rows of hairs extending posteriorly to level of poststural dorsoentral bristle. Anterior pair of scutellar setae thin, hairlike, and subequal in length to acrostichals, ca. one-fourth as long as posterior pair of scutellars. Legs brownish yellow, forecoxa dark brown at base and concolorous with anepisternum, becoming gradually paler toward pale brown apex. Antero- and posteroverentral rows of bristles of forefemur moderately strong and brownish in male; bristles of posteroverentral row slightly stronger than anteroventral row. Male foretibia slightly clavate, thickening abruptly in distal half and with a row of well-developed,
dark, semierect bristles. Wing membrane slightly infuscate. Cs2/Cs3 = 3.0–3.9, Cs3/Cs4 = 2.0–2.3.

**MALE TERMINALIA** (Figs. 30–35). Synsternite 5+6+7 with a small, paired, posterior process on its lateral portion (Fig. 33). Ring-shaped sclerite present but very pale and indistinct. Epandrium brown, posteroventral lobes paler, lacking pair of anterodorsal apodemes. Subanal plate continuous with epandrium but poorly sclerotized. Perianal field (Fig. 32) elliptical, ventrally not clearly delimited from subanal plate. Ventral epandrial process (Fig. 34) brownish yellow (darker at base), almost straight; apex with a medially directed point; medial surface with several long bristles from one-half to three-fourths; apical fourth with short sensilla trichodea only. Surstylus very similar to *I. anemosyris*, but marginal bristles more numerous and closer to each other in anterior half (Fig. 31). Hypandrium broadly and firmly connected to anteroventral margin of epandrium by a tight suture, posteriorly

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**Figures 30–35** *Inbiomyia matamata* Buck sp. nov., male terminalia. 30. Left postgonite, anterior. 31. Hypopygium, left lateral. 32. Ditto, posterior. 33. Segments 5–8, ventral. 34. Left ventral epandrial process, anterior. 35. Phallapodeme and phallus, ventral. Scale 0.05 mm (31–33, 35), 0.025 mm (30, 34). **Abbreviation:** eph—epiphallus. Drawings: A. Cormier
with a triangular emargination between the 2 arms. Postgonite (Fig. 30) short and yellow, directed ventrally (Fig. 32), with 4–5 stout, blunt-tipped bristles near apex, and several longer bristles with fine tips in distal half. Epiphallus (Fig. 33) yellow, slender, parallel-sided with truncate tip, slightly curved posteriorly in lateral view. Distiphallus (Fig. 35) moderately long and straight, surface ventromedially and in distal half with indistinct short spicules and no microtrichia.

**FEMALE TERMINALIA** (Fig. 36). Tergite 7 entire, separate from sternite laterally. Sternite 7 evenly pigmented. Tergite 8 with a very small anterior apodeme (Fig. 36: ap), dark brown and concolorous with preceding tergites; its posterior margin convex without medial emargination. Spermatheca weakly sclerotized, pale brown, oval, with lateral invagination and laterally inserted duct.

**TYPE MATERIAL.** Holotype. ♂, AMNH, VENEZUELA: Amazonas, Río Mavaca Camp, 2°2′N, 65°06′W, 150 m, 16–27.iii.1989, D.A. Grimaldi, Phips-FUDECI Expedition.


**DIAGNOSIS.** Closely related to *I. anemosyris*, which has very similar male genitalia, but easily distinguished from it by coloration. In *I. anemosyris* the male foretibia is not clavate; the long bristles on the medial surface of the ventral epandrial process are inserted closer to the apex, the fringe of bristles on the surstylus is less dense in its anterior half, and the distiphallus is twisted apically.

**ETYMOLOGY.** This species is named after the collecting locality in Colombia (where the first specimen examined by the author was collected). The specific name is used as a noun in apposition.

**Inbiomyia pterygion** Buck sp. nov.  

**Figs. 37–44**

**ADULT.** Wing length 1.61 (♂), 1.54 mm (♀). Sclerotized portions of head dark brown excluding prementum, which is brownish yellow. Antenna dark brown, nearly concolorous with frons; palpus slightly paler. Frons beside the strong orbital bristle with only 1 exclinate orbital hair; recline to inclinate orbital hair(s) apparently broken off. Ocellar plate glossy and lacking microomentum on each side of ocellar area; ocellar setulae absent. Facial sclerotization extending below level of lower facial ridge. Thorax mostly brown; mesonotum, proepisternum, and anepisternum dark brown; anepimeron and postnotum medium to dark brown; katepisternum and meron medium brown, becoming much paler (brownish yellow) ventrally. No dorsocentral setulae between postsutural and prescutellar dorsocentral bristles; acrostichal rows of hairs extending posteriorly to level of postsutural dorsocentral bristle. Anterior pair of scutellar setae thin and hairlike, ca. one-fourth as long as posterior pair. Legs yellow to brownish yellow, midcoxa with a medium brown streak on posteroventral surface. Antero- and posteroventral rows of bristles of forefemur strong and black in male; anteroventral row consisting of only 2–3 bristles. Male foretibia slightly clavate, thickening abruptly in distal half and with a row of well-developed, dark, semierect bristles. Wing membrane slightly infuscate. Cs2/Cs3 = 3.1–3.5, Cs3/Cs4 = 2.0–2.2.

**MALE TERMINALIA** (Figs. 39–44). Synsternite 5+6+7 with a posterior process on its lateral portion (Fig. 42). Ring-shaped sclerite present but faint. Epandrium brown, posteroventral lobes paler, without pair of dorsolateral apodemes. Subanal plate continuous with epandrium but poorly sclerotized. Perianal field (Fig. 41) roughly elliptical, ventral margin not clearly delimited from subanal plate. Ventral epandrial process (Fig. 43) brownish yellow (darker at base), very similar to *I. anemosyris*, completely fused to epandrium (Fig. 40), almost straight and apically blunt in lateral view; medial surface with bristles in apical half; apex with a field of *sensilla trichodea* and a small, medially directed point. Surstylus brownish yellow, marginal fringe of bristles arranged in a regular row, bristles of this row broadly spaced anteriorly (Fig. 40). Hypandrium broadly and firmly connected to anteroventral margin of epandrium by a tight suture, posteriorly with a relatively small emargination between the 2 arms (as in Buck, 2006: fig. 4E). Postgonite (Fig. 39) short and yellow, directed ventrally (Fig. 41), with ca. 4 stout, blunt-tipped bristles near apex and several longer bristles with fine tips in distal two-fifths. Basiphallus yellow. Epiphallus (Fig. 44) expanded distally, apical margin with small median emargination. Distiphallus (Fig. 44) moderately long, twisted distally, and curved toward right side, surface in distal half and ventromedially with indistinct short spicules and no microtrichia.

**FEMALE TERMINALIA** (Figs. 37, 38). Tergite 7 not divided, touching sternite laterally but not fused to it. Sternite 7 evenly sclerotized. Tergite 8 without anterior apodeme, dark brown, slightly paler than preceding tergites. Sternite 8 small, very faintly sclerotized and hardly darker than surrounding membrane, medially divided. Spermatheca as in *I. matamata*, weakly sclerotized, pale brown, oval, with lateral invagination and laterally inserted duct (Fig. 38).

**EGG.** Abdomen of paratype contained 2 nearly mature eggs. Eggs larger than in other species (length 0.48 mm, width 0.27 mm), otherwise very similar to *I. acmophallus* (see Fig. 11).

DIAGNOSIS. The male genitalia of this species closely resemble *I. anemosyris* with exception of the distally expanded epiphallus, which is similar to *I. acmophallus*. It can be distinguished from the latter by the elliptical perianal field, the surstylus, which has its fringe of marginal bristles arranged in a regular row, and the ventral epandrial process, which lacks blunt-tipped medial bristles.

ETYMOLOGY. This species is named for the peculiar shape of its epiphallus, which resembles the tail fin of a cetacean (Gr. *pterygion*: fin). The species name is used as a noun in apposition.

*Inbiomyia regina* Buck sp. nov.

Figs. 7, 45–51

ADULT. Wing length 1.54–1.56 mm (♂), 1.61–1.64 mm (♀). Sclerotized portions of head dark brown excluding prementum, which is yellow to brownish yellow. Antenna dark brown, almost concolorous with frons; palpus slightly paler. Frontal orbit with 2–3 hairs in addition to strong bristle. Ocellar plate polished, without microtomentum except between ocelli. Facial sclerotization extending below level of lower facial ridge. Thorax distinctly bicolored. Lower pleuron yellow, proepisternum and anepisternum (excluding posteroventral corner) dark brown (concolorous with scutum); anterior two-thirds of anepimeron and posteroventral corner of anepisternum yellow to brownish yellow; posterior third of anepimeron, postnotum medium brown; area around suture between anepimeron and katatergite somewhat darker. No dorsocentral setae between postsutural and prescutellar dorsocentral bristles; acrostichal rows of hairs extending posteriorly slightly beyond level of transverse suture. Scutellum with a small anterior pair of hairs, subequal in size to acrostichal hairs. Legs including forecoxa brownish yellow. Antero- and posteroventral rows of bristles of forefemur stronger and darker in male than in female; bristles of posteroventral row slightly stronger than anteroventral row in both sexes. Male foretibia slightly clavate, with distinctly enlarged, erect to semierec, dark, ventral bristles (Fig. 7). Wing membrane slightly infuscate. Cs2/Cs3 = 3.1–3.5, Cs3/Cs4 = 1.9–2.3.

MALE TERMINALIA (Figs. 45–50). Synsternite 5+6+7 with large posterior process on lateral portion (Fig. 48: prl). Ring-shaped sclerite present. Epandrium (Fig. 46) dark brown, posteroventral lobes paler; pair of anterodorsal apodemes not developed. Subanal plate continuous with epandrium, weakly sclerotized. Perianal field
ventrally with parallel to slightly divergent lateral margins (Fig. 47). Ventral epandrial process (Fig. 49) brownish yellow (darker at base), completely fused to epandrium, with conspicuously expanded bilobate apex; median apical lobe with a series of stout blunt-tipped bristles becoming gradually shorter laterally and a minute ventral toothlike angle (Fig. 49: tp); lateral apical lobe with a few long hairs on outer surface. Surstylus (Figs. 46, 47) brownish yellow, with a small toothlike apical angle; marginal fringe of bristles arranged in a row that doubles and triples for a short distance posteriorly; anteriormost of these bristles directed medially; bristles conspicuously flattened and slightly expanded in basal half. Hypandrium broadly connected to anteroventral margin of epandrium by a tight suture, posteriorly with a relatively small emargination between the 2 arms (as in Buck, 2006: fig. 4E). Postgonite (Fig. 45) yellow, unusually long and
slender, evenly curved outward, directed ventrally (Fig. 47: pg), with a blunt-tipped apical bristle, a long preapical hair, and several shorter hairs and peglike bristles on posterior and medial surface. Epiphallus (Fig. 50) brown, Y-shaped with slender stem in posterior view, apically flattened with stout base in lateral view. Dis-

tiphallus (Fig. 50) moderately long; its surface in distal half and ventromedially with indistinct short spicules and no microtrichia.

FEMALE TERMINALIA (Fig. 51). Tergite 7 entire, separate from sternite laterally. Sternite 7 unevenly pigmented, dark laterally and medi-

especially anteromedially. Tergite 8 with very...
short anterior apodeme (Fig. 51: ap), dark brown and almost as dark as preceding tergites; its posterior margin convex without medial emargination. Spermatheca weakly sclerotized, pale brown, tire-shaped with small central invagination and laterally inserted duct.

EGG. Length 0.48 mm, width 0.27 mm. Overall shape very similar to I. zeugodonata (Fig. 12) but micropylar elevation less prominent. Upper surface coarsely granulose (microreticulate under high magnification), polygonal (macro)-reticulation moderately developed.

TYPE MATERIAL. Holotype. δ, LACM [LACM ENT 213191], FRENCH GUIANA: Regina, Kaw Mt., Patawa, 4.54°N, 52.15°W, 400 m, iii.2005, Malaise, J.A. Cerda.

Paratypes. 3 δ, 5 ♀. Same data as holotype (1 δ, 2♀, LACM), same except iv.2005 (1 δ, 2♀, LACM; 1 δ, 1 ♀, DEBU).

DIAGNOSIS. The male and female genitalia characters of this species are similar to I. acmophallus, whereas body coloration and facial sclerotization resembles I. anemosyris. The bilobate apex of the ventral epandrial process, the outwardly curved, slender postgonites, and the characteristic surstylus immediately distinguish the male of I. regina from all other species. The female can be recognized by the combination of an unevenly pigmented sternite 7, glossy ocellar plate (devoid of microtomentum), and bicolored pleuron.

ETYMOLOGY. The species name is a noun in apposition and based on the name of the type locality.

Inbiomyia exul species group

SPECIES INCLUDED. Inbiomyia exul sp. nov. and Inbiomyia sp. 1.

DIAGNOSIS. Inner vertical bristle at most half as long as orbital bristle. Facial sclerotization very extensive, extending ventrally more than half way the distance between lower facial ridge and clypeal margin (Fig. 6). No dorsocentral setulae between postsutural and prescutellar dorsocentral bristles. R2,3 shortened, Cs2/Cs3 1.4–1.8.

MALE TERMINALIA (Figs. 53–60). Synsternite 5+6+7 with a long posterior process on its ventral portion (Fig. 54: prv), lateral portion distinctly expanded near base. Ring-shaped sclerite reduced. Epandrium, surstylus, and epiphallus brown. Epandrium lacking pair of dorsolateral apodemes. Posteroventral epandrial lobes absent. Subanal plate absent or its remnants incorporated into medial base of surstylus. Perianal field (Fig. 57) expanding ventrally, extending between posteroverentral margin of epandrium and base of surstylus. Ventral epandrial process separate from epandrium except at anterior corner, which is also the articulation point of the hypandrium (Fig. 56). Ventral epandrial process (Figs. 53, 58) dilated and curved posteriorly in distal half; distal half laterally embraced by surstylus; its medial surface with scattered short bristles. Surstylus (Fig. 56) with broad base, slightly narrowed toward more or less truncate apex, bent posteriorly beyond middle; medially with a small setulose lobe near base (Fig. 59); basal half with ca. 4 long bristles posteriorly; apex with a ventral peglike bristle and several long incurved bristles. Hypandrium (Figs. 53, 56) of most unusual shape; ventrally with a long forked process that arises at the base of the posterolateral arms; apex of the prongs of this fork dilated and with finely crenulate margin (Fig. 55), which comes close to or touches the medial face of the ventral epandrial process; posterolateral arms of hypandrium with broad emargination between them; hypandrium articulated to anteroventral corner of epandrium anteriorly and to medial base of surstylus posteriorly. Postgonite absent. Epiphallus smooth, conical, with blunt apex and fine wrinkles on disk. Distiphallus (Fig. 60) straight and relatively short, ventral surface with long microtrichia at least in basal half and no spicules.
FEMALE TERMINALIA (Fig. 52). Tergite 7 entire, relatively long medially, not fused to sternite laterally. Sternite 7 evenly pigmented. Tergite 8 without anterior apodeme, dark brown and concolorous with preceding tergites; its posterior margin convex with very small and shallow median emargination. Spermatheca moderately sclerotized, pale brown, tire-shaped with small central invagination and laterally inserted duct.

EGG (Fig. 13). Relatively large compared to body size (length 0.45 mm, width 0.27 mm); length/width ratio lower than in other species. Micropylar elevation low, polygonal pattern of upper surface faint, otherwise as in generic description.

Paratypes. 9 ♂, 1 ♀, COSTA RICA: Prov. Puntarenas, Golfito, Corcovado National Park, Los Patos Biological Station, 160 m, 9.ix–9.x.2001, Malaise, K. Caballero (2 ♂, INBC); Corcovado National Park, Cerro Puma, 100–300 m, 19.vi.18.vii.2003, Malaise #3, M. Moraga, A. Azofeifa, and K. Caballero (1 ♂, INBC); Corcovado National Park, Cerro Rincón, La Tigrilla, 600 m, 7.ii–23.iv.2002, Malaise, J. Azofeifa Zuñiga (1 ♀, INBC); Corcovado National Park, 800 m N of Cerro Quebraditos, 782 m,
23.iv–24.vi.2002, Malaise, J. Azofeifa (2♀, INBC); Osa Peninsula, Corcovado National Park, San Pedrillo, 12–14.viii.2001, yellow pans in garden compost, M. Buck (1♂, DEBU); same data except yellow pans in treefall (2♂ [abdomen missing], DEBU); Osa Peninsula, 5 km S Rincon, 8°42’1”N, 83°30’50”W, ~50 m, pans in grassy area at forest margin, 10–11.viii.2001, K.N. Barber (1♂, DEBU); Osa Peninsula, Golfo Dulce Forest Res., 3 km SW Rincón, 10 m, vi.1992, P. Hanson (1♀, DEBU); Osa Peninsula, 23 km N Puerto Jiménez, La Palma, 10 m, xi–xii.1992, P. Hanson (1♀, DEBU); Osa Peninsula, 5 km N Puerto Jiménez, 10 m, vii.1992, P. Hanson (1♀, DEBU); Las Alturas, 8°57’N, 82°58’W, 1500 m, i.1992, P. Hanson (1♂, 1♀, DEBU). Prov. Limón, Cahuita, Reserva Chimuri, trail near cabins, 15 m, 8–9.vi.2000, Malaise, Spinelli, Grogan, Borkent and Picado (1♂, 1♀, INBC); R.B. Hitoy Cerere, V. La Estrella, Sendero

**Figures 55–60** *Inbiomyia exul* Buck sp. nov., male terminalia. 55. Apex of prong of hypandrial fork, lateral. 56. Hypopygium, left lateral. 57. Ditto, posterior. 58. Right ventral epandrial process, inner surface. 59. Right surstylus, inner surface. 60. Phallus, ventral. Scale 0.05 mm (56, 57), 0.025 mm (55, 58–60). **Abbreviations:** eph—epiphallus, hf—hypandrial fork, ph—phallus. Drawings: A. Cormier

**DIAGNOSIS.** This species differs from all other species by the contrastingly bicolored pleuron, the presence of a forked, ventral hypandrial process and the absence of postgonites. One undescribed species from Guatemala is known from 1 female only (see sp. 1 below) shares the distinctive pleural coloration and probably has similar male genitalia.

**ETYMOLOGY.** *Inbiomyia exul* has highly unusual male genitalia that are unique within the genus. The species name, which is used as a noun in apposition, refers to the wide morphological gap between *I. exul* and other species of the genus (*L. exul*: banished person).

**MATERIAL EXAMINED.** GUATEMALA: Departamento Zacapa, 3.5 km SE La Unión, 1500 m, 23–25.vi.1993, flight intercept trap, J. Ashe and R. Brooks (♀, DEBU).

**REMARKS.** Very similar to *I. exul*, wing length 1.65 mm. Differences from *I. exul* include different costal ratios (Cs2/Cs3 = 2.2, Cs3/Cs4 = 2.5), tergite 8 with a small basomedial desclerotized area, and spermatheca with a broader central invagination.

**Inbiomyia sp. 1**

**SPECIES INCLUDED.** *Inbiomyia empheres* sp. nov., *I. mcalpineorum* Buck, and *Inbiomyia* sp. 2.

**DIAGNOSIS.** Inner vertical bristle ca. 0.65× as long as orbital bristle (Fig. 3). Face not sclerotized below lower facial ridge (Fig. 3). 1–3 dorsocentral setulae between postspiracular and prescutellar dorsoventral bristles. R2+3 long, Cs2/Cs3 > 3.0. Epandrium with a pair of anterodorsal apodemes (Fig. 62: ap); ventral epandrial process articulated to epandrium. Subanal plate strongly sclerotized; perianal field elliptical. Distal portion of surstylus tapering ventrally than in *I. mcalpineorum*. Ventral epandrial process (Fig. 65) dark brown (excluding paler apex), articulated to a condyelike process of the epandrium, stouter and more strongly curved inwardly than in *I. mcalpineorum*, and with a posterior projection in distal third. Sertularia (Fig. 62) yellowish brown (excluding darker base), marginal fringe of bristles arranged in a somewhat irregular row, disk with 1 bristle on outer surface. Hypandrium narrowly articulated with anteroventral corner of epandrium, with broad emargination between posterior arms. Postgonite (Fig. 61) similar to *I. mcalpineorum* (with slender stem and dilated apex) but directed ventrally (Fig. 63) and anterior margin less angulate in lateral view; anterior margin of dilated portion bearing row of *ca.* 9 marginal bristles that become gradually stouter and more peglike distally. Epiphallus long and slender, gradually tapering toward apex (Fig. 63: eph), straight in lateral view. Distiphallus without microtrichia ventrally and with fewer spicules than in *I. mcalpineorum*.

**FEMALE TERMINALIA** (Fig. 80). Tergite 7 gradually desclerotized toward midline and becoming very narrow, appearing interrupted, laterally not fused to sternite. Sternite 7 evenly pigmented. Tergite 8 without anterior apodeme, slightly paler than preceding tergites (excluding heavily sclerotized anterior margin), posterior margin convex, without median emargination. Spermatheca as in *I. mcalpineorum*, well-sclerotized, dark brown, tire-shaped with small central invagination and laterally inserted duct.

**INBIOMYIA EMPHERES** Buck sp. nov.

Figs. 61–66, 80

**ADULT.** Wing length 1.71 (♂), 1.94 mm (♀). Sclerotized portions of head dark brown excluding prementum, which is pale brown. Antenna and palpus dark brown, almost concolorous with frons. Frons, besides usual long inclinate orbital bristle, with 2–3 orbital setulae and a pair of ocellar setulae. Ocellar plate sparsely microto-mentose. Thorax including pleuron dark brown, katepisternum slightly and gradually becoming paler ventrally. Acrostichal rows of hairs extending posteriorly to about halfway level between posterior 2 pairs of dorsocentrals. Scutellum with anterior pair of bristles small and subequal to acrostichal hairs. Legs brownish yellow, forecoxa slightly darkened in holotype. Both antero- and posteroventral rows of bristles of forefemur darker and slightly stouter in male than in female; bristles of posteroventral row longer in female. Distal three-fourths of male foretibia with well-developed row of short, semierect, black, ventral bristles. Wing very slightly infuscate. Cs2/Cs3 = 3.8–3.9, Cs3/Cs4 = 1.6–1.7.

**MALE TERMINALIA** (Figs. 61–66). Synsternite 5+6+7 lacking posterior process on its ventral portion, but with a low process on lateral portion (Fig. 64). Ring-shaped sclerite well developed. Epandrium dark brown, ventrally continuous with subanal plate, which is well sclerotized and concolorous with epandrium. Subanal plate forming an obtuse angle with epandrium in lateral view (Fig. 62). Perianal field (Fig. 63) more tapering ventrally than in *I. mcalpineorum*. Ventral epandrial process (Fig. 65) dark brown (excluding paler apex), articulated to a condyelike process of the epandrium, stouter and more strongly curved inwardly than in *I. mcalpineorum*, and with a posterior projection in distal third. Sertularia (Fig. 62) yellowish brown (excluding darker base), marginal fringe of bristles arranged in a somewhat irregular row, disk with 1 bristle on outer surface. Hypandrium narrowly articulated with anteroventral corner of epandrium, with broad emargination between posterior arms. Postgonite (Fig. 61) similar to *I. mcalpineorum* (with slender stem and dilated apex) but directed ventrally (Fig. 63) and anterior margin less angulate in lateral view; anterior margin of dilated portion bearing row of *ca.* 9 marginal bristles that become gradually stouter and more peglike distally. Epiphallus long and slender, gradually tapering toward apex (Fig. 63: eph), straight in lateral view. Distiphallus without microtrichia ventrally and with fewer spicules than in *I. mcalpineorum*.

**TYPE MATERIAL.** Holotype, ♂, CNCI.
Paratype. ♀, same data as holotype.

**DIAGNOSIS.** Closely related to *I. mcalpineorum* but differs from that species by the differently shaped epandrium (less angulate between posterior margin and subanal plate in lateral view), ventral epandrial process (stouter and with tubercle on anterior surface), and the ventrally directed postgonites (directed anteriorly in *I. mcalpineorum*). The female can be recognized by the free tergite 7 (not fused to sternite).

**ETYMOLOGY.** This species is named for its extreme likeness to *I. mcalpineorum* (Gr. *empheres*: resembling, like). The species name is not latinized and therefore indeclinable.

*Inbiomyia mcalpineorum* Buck, 2006


**DIAGNOSIS.** This species is very similar to *I. empheres*, from which it is distinguished mainly by genital characters (see diagnosis of *I. empheres* above). For a detailed description of *I. mcalpineorum*, see Buck (2006).

Figures 61–66 *Inbiomyia empheres* Buck sp. nov., male terminalia. 61. Left postgonite, outer surface. 62. Hypopygium, left lateral. 63. Ditto, posterior. 64. Segments 5–8, ventral. 65. Left ventral epandrial process, lateral. 66. Left ventral epandrial process, anterior. Scale 0.05 mm (62–65), 0.025 mm (61, 66). **Abbreviations:** ap— anterior apodeme of epandrium, dp—distiphallus, eph—epiphallus, pg—postgonite. Drawings: A. Cormier
DISTRIBUTION. Recorded from all Costa Rican provinces between 560 and 1750 m altitude (Buck, 2006).

Inbiomyia sp. 2


REMARKS. Large, wing length 2.02 mm. This specimen agrees with I. empheres morphologically, including the incompletely divided tergite 7 (the terminalia were not dissected). However, the femora and forecoxa are distinctly darker and the katepisternum is unicolorous (not paler ventrally). Based on morphology and the high elevation, where this specimen was collected, it is very likely that it belongs to the I. mcalpineorum species group.

Figures 67–73  Inbiomyia anodonta Buck sp. nov., male terminalia. 67. Left postgonite, anterior. 68. Hypopygium, left lateral. 69. Hypopygium, posterior. 70. Segments 5–8, ventral. 71. Ejaculatory apodeme. 72. Left ventral epandrial process, anterior. 73. Phallus and base of phallapodeme, ventral. Scale 0.05 mm (68–70, 73), 0.025 mm (67, 71, 72).

Abbreviations: ap—anterior apodeme of epandrium, bp—basiphallus, dp—distiphallus, eph—epiphallus, pa—phallapodeme. Drawings: M. Musial
Inbiomyia scoliostylus species group

SPECIES INCLUDED. Inbiomyia anodonta sp. nov., I. scoliostylus sp. nov., I. zengodonta sp. nov., and probably *Inbiomyia* sp. 3.

DIAGNOSIS. Inner vertical bristle 0.75–0.95× as long as orbital bristle (unknown for *I. anodonta*). Face not sclerotized below lower facial ridge. 1–3 dorsocentral setae between poststatural and prescutellar dorsocentral bristles. R2+3 long or short, Cs2/Cs3 = 2.2–3.9. Subanal plate well sclerotized; perianal field elliptical. Ventral epandrial process articulated to epandrium. Expanded apical portion of surstylus with discal bristles. The following characters do not apply to *I. anodonta*: Ventral process of epandrium with truncate apex; apical portion of surstylus with 2 short, blunt, peglike bristles; epiphallus with striate surface.

*Inbiomyia anodonta* Buck sp. nov.

Figs. 67–73

ADULT. Wing length 1.34 mm (♂). Sclerotized portions of head medium brown, prementum brownish yellow. Orbital setae broken off (at least 1 present), ocellar setae present. Ocellar plate sparsely microtomentose. Inner vertical bristle broken off, probably at least half as long as orbital bristle; no postocular setae. Thorax including pleuron medium brown. Acrostichal rows of hairs ending posteriorly at level of poststatural pair of dorsocentrales. Anterior pair of scutellar bristles hairlike, no longer than acrostichal hairs. Legs including forecoxa pale yellowish brown. Bristles of posteroventral row of forefemur slightly stronger than anteroventral row. Male foretibia with a row of relatively short semierect, dark, ventral bristles over most of its length except extreme base. Wing almost clear. Cs2/Cs3 = 2.2–2.4, Cs3/Cs4 = 2.1–2.2. Abdominal tergites medium brown.

MALE TERMINALIA (Figs. 67–73). Ventral portion of synsternite 5+6+7 relatively wide, with more or less straight hind margin (Fig. 70). Ring-shaped sclerite present but faint. Epandrium medium brown, with strong anterodorsal apodemes (Fig. 70: ap), ventrally continuous with subanal plate, which is well sclerotized and concolorous with epandrium. Subanal plate forming an obtuse angle with posterior margin of epandrium in lateral view. Perianal field (Fig. 69) roughly elliptical, rounded below. Ventral epandrial process (Fig. 72) medium brown, shorter than surstylus, nearly straight; inner surface with more or less evenly distributed bristles; apex with a few sensilla trichodea. Surstylus (Figs. 68, 69) brownish, directed posteroventrally, with short stem, greatly expanded distally, with ca. 4 discal bristles plus a marginal fringe of bristles. Hynapandrium narrowly articulated with anteroventral corner of epandrium (anterodorsal to articulation area of ventral epandrial process), with very small emargination between posterior arms. Postgonite (Fig. 67) brown, directed ventrally (Fig. 69), stout, nearly parallel-sided from base to apex; apical margin with 4–5 stout, peglike bristles and several stout hairs; posterior surface with 1 stout, submarginal, peglike bristle. Phallosome as in Fig. 73. Basiphallus brown; epiphallus long, parallel-sided, not striate, slightly curved posteriorly in lateral view. Distiphallus moderately long, ventrally with a few very small and inconspicuous spicules and no microtrichia. Ejaculatory apodeme (Fig. 71) weakly sclerotized.

FEMALE. Unknown.


DIAGNOSIS. *Inbiomyia anodonta* is the only species in the *I. scoliostylus* group that lacks the stout, peglike bristles of the surstylus. It differs from all other species in the genus by the greatly expanded apical portion of the surstylus that bears both an apical row of bristles as well as several discal bristles. The bristles of the apical row are few in number and more widely spaced than usual. A further diagnostic character is the very stout postgonite with its very broad base.

ETYMOLOGY. The species name is a latinized adjective and refers to the lack of toothlike bristles of the surstylus (Gr. odous, odontos: tooth).

*Inbiomyia scoliostylus* Buck sp. nov.

(Figs. 74–79, 81; Buck, 2006: figs. 4D, E)

ADULT. Wing length 1.56–1.59 mm (♂), 1.74 mm (♀). Sclerotized portions of head dark brown, antenna and palpus slightly paler, prementum pale brown. Frons, besides usual long inclinate orbital bristle, with 2–3 orbital hairs and a pair of ocellar setulae. Ocellar plate sparsely microtomentose. Inner vertical bristle unusually long, almost as long as orbital bristle and longer than outer vertical; postocular setulae present. Thorax including pleuron dark brown (paler in faded paratypes), anterior half of katepisternum paler. Acrostichal rows of hairs extending posteriorly about halfway between levels of posterior 2 pairs of dorsocentrales. Anterior pair of scutellar bristles one-third length of posterior pair, longer and than acrostichal hairs. Legs including forecoxa brownish yellow. Both antero- and posteroventral rows of bristles of forefemur stronger and darker in male than in female; bristles of posteroventral row slightly stronger than anteroventral row in female. Male foretibia with a row of relatively short semierect, dark, ventral bristles over most of its length except extreme base. Wing almost clear. Cs2/Cs3 = 3.2–3.9, Cs3/Cs4 = 1.8–2.2. Abdominal tergites dark brown.
MALE TERMINALIA (Figs. 74–79). Ventral portion of synsternite 5+6+7 relatively broad, with more or less straight hind margin (Fig. 77). Ring-shaped sclerite present but faint. Epandrium medium brown, dorsally without pair of apodemes, ventrally continuous with subanal plate (Buck, 2006: fig. 4D), which is well sclerotized and concolorous with epandrium. Subanal plate forming an obtuse angle with posterior margin of epandrium in lateral view. Perianal field (Fig. 76) roughly elliptical, pointed below. Ventral epandrial process (Fig. 78) medium brown, longer than surstylus, biangulate in lateral view, and widest around basal bend; basal bend ventrally with a field of long bristles; distal bend with shorter bristles dorsally, apex with scattered sensilla trichodea. Surstylus (Fig. 75) yellowish, directed posteriorly and with unusually short stem, expanded distally and with 2 stout, peglike bristles, otherwise only with scattered bristles on disk and hind margin but no marginal fringe. Hypandrium narrowly articulated with antero-ventral corner of epandrium (anterodorsal to articulation area of ventral epandrial process),

Figures 74–79  *Inbiomyia scoliostylus* Buck sp. nov., male terminalia. 74. Left postgonite, anterior. 75. Hypopygium, left lateral. 76. Hypopygium, posterior. 77. Segments 5–8, ventral. 78. Left ventral epandrial process, anterior. 79. Phallus, ventral. Scale 0.05 mm (75–77, 79), 0.025 mm (74, 78). Abbreviations: dp—distiphallus, pg—postgonite. Drawings: A. Cormier
with small and shallow emargination between posterior arms (Buck, 2006: fig. 4E). Postgonite (Fig. 74) brown, directed ventrally (Fig. 76), with short stem and dilated apex; apical margin with 4–5 stout, toothlike bristles, otherwise with very short bristles only. Basiphallus brown. Epiphallus (Fig. 79) of moderate length, longitudinally striate, relatively broad with rounded apex, slightly curved posteriorly in lateral view. Distiphallus (Fig. 79) moderately long, ventrally neither with microtrichia nor with spicules.

**FEMALE TERMINALIA** (Fig. 81). Tergite 7 broadly divided medially, laterally closely joined by sternite but not fused to it. Sternite 7 evenly pigmented. Tergite 8 concolorous with preceding tergites (except medially along anterior margin, which is darker brown), with broad and long anterior apodeme (Fig. 81: ap), posterior margin

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**Figures 80–82** *Inbiomyia* spp., female terminalia and spermathecae, dorsal. 80. *I. empheres* Buck sp. nov. 81. *I. scoliostylus* Buck sp. nov. 82. *I. zeugodonta* Buck sp. nov. Scale 0.05 mm. **Abbreviation**: ap—anterior apodeme of tergite 8. Drawings: A. Cormier
evenly convex. Spermatheca moderately sclerotized, medium brown, tire-shaped with small central invagination and laterally inserted duct.


**Paratypes.** 1 ♂, 1 ♀, CNCI, COSTA RICA: Prov. Heredia, Braullo Carrillo National Park, 500 m, 10°10'N, 87°07'W, 10.iv.1985, H. Goullet and L. Masner.

**DIAGNOSIS.** This species is easily recognized by its characteristic biangulate ventral epandrial process and in the female by the combination of a medially divided tergite 7 and a large anterior apodeme to tergite 8. *Inbiomyia zeugodonta*, the only other species with medially divided tergite 7, has a smaller anterior apodeme to tergite 8 and a contrastingly colored pleuron.

**ETYMOLOGY.** The species name is a noun in apposition and refers to the bent ventral epandrium (Gr. σκόλιος: curved, bent).

*Inbiomyia zeugodonta* Buck sp. nov.

**Figs. 12, 82–88**

**ADULT.** Wing length 1.36–1.46 mm (♂), 1.51–1.59 mm (♀). Sclerotized portions of head medium to dark brown excluding medium to pale brown face and brownish yellow prementum. Antenna and palpus yellowish brown, almost concolorous with forecoxa and distinctly paler than frons. Frons beside the strong orbital bristle with 3 orbital hairs (posterior one often larger than frons) and a pair of ocellar setulae. Ocellar plate sparsely microtomentose. Thorax distinctly bicolored. Lower pleuron yellow to brownish yellow, proepisternum, anepisternum, and anterior and posterior third of anepimeron medium to dark brown (concolorous with scutum); middle third of anepimeron and postnotum medium to pale brown. Acrostichal rows of hairs extending posteriorly about halfway between levels of posterior 2 pairs of dorsocentral bristles. Anterior pair of scutellar bristles one-third to two-thirds as long as posterior one, distinctly longer and more robust than acrostichal hairs. Legs including forecoxa brownish yellow. Antero- and posteroverentral rows of bristles of forefemur slightly stronger and darker in male than in female; bristles of posteroverentral row about as strong as those of anteroverentral row in both sexes. Male foretibia with a row of relatively short semierect, dark, ventral bristles over most of its length except at extreme base. Wing membrane hardly infuscate. Cs2/Cs3 = 2.8–3.9, Cs3/Cs4 = 2.0–2.2. Abdominal tergites dark brown.

**MALE TERMINALIA** (Figs. 83–88). Ventral portion of sternum 5+6+7 relatively broad, with more or less straight hind margin (Fig. 86). Ring-shaped sclerite well developed. Epandrium dark brown, dorsally with a pair of anterior apodemes (Fig. 84: ap), ventrally continuous with subanal plate, which is well sclerotized and concolorous with epandrium. Subanal plate forming an obtuse angle with posterior margin of epandrium in lateral view. Perianal field elliptical (Fig. 85). Ventral epandrial process (Fig. 87) pale to medium brown (excluding darker base), longer than surstylus, gently curved posteriorly in lateral view and curved medially in anteroposterior view; apical half (excluding apex) with several bristles of moderate length; apex spatulate with a group of short *sensilla trichodea* on anterior surface and 2–3 bristles on posterior surface. Surstylus (Fig. 84) pale to medium brown, directed posteroventrally; stem gradually becoming wider distally and apical expansion small, with 2 stout, peglike bristles; disk and margin with scattered bristles only, marginal fringe not developed. Hypandrium narrowly articulated with anteroverentral corner of epandrium (anterodorsal to articulation area of ventral epandrial process), with small emargination between posterior arms (as in Buck, 2006: fig. 4E). Postgonite (Fig. 83) brown, long, directed ventrally (Fig. 85), apex slightly dilated; apical margin with ca. 4 stout, peglike bristles and ca. 4 short, more slender, blunt-tipped bristles, otherwise with short setulae only. Basiphallus pale brownish. Epiphallus (Fig. 88) of moderate length, longitudinally striate, relatively broad with rounded apex, slightly curved posteriorly in lateral view. Distiphallus (Fig. 88) moderately long, ventral surface with sparse, short, inconspicuous microtrichia.

**FEMALE TERMINALIA** (Fig. 82). Tergite 7 narrowly divided medially, laterally free from sternite. Sternite 7 evenly pigmented. Tergite 8 paler than dark brown preceding tergites (except medially along anterior margin), with broad but short anterior apodeme, posterior margin truncate medially. Spermatheca moderately sclerotized, medium brown, tire-shaped with small central invagination and laterally inserted duct.

**EGG** (Fig. 12). Almost identical to *I. acmophilus* but slightly wider (length 0.39 mm, width 0.23 mm) and micropylar pole more projecting.


**Paratypes.** 11 ♂, 8 ♀. COLOMBIA: Comisaria Amazonas, Amacayacu National Park, Sector Matamata, 150 m, 27.iii–3.iv.2000, Malaise, A. Parente (2 ♂, 1 ♀, LACM; 2 ♂, DEBU); same data except 3–9.iv.2000, A. Felix (4 ♂, 4 ♀, UNCB; 1 ♂, 1 ♀, LACM; 2 ♂, DEBU); same data except 11–24.iv.2000, A. Felix (2 ♂, UNCB).

**OTHER MATERIAL EXAMINED.** COLOMBIA: Departamento Nariño, Orito, Territorio Kozan, 0’30’N, 77°13’W, 1000 m, 25.i.x.1998, Malaise, E. González (1 ♀, UNCB). FRENCH GUIANA: Regina, Kaw Mt., Patawa, 4.54’N,
52.15°W, 400 m, iv.2005, Malaise, J.A. Cerda (2♀, LACM); same as previous but iii.2005 (1♀, LACM). Note: Females that are not associated with males are tentatively identified as *I. zeugodonta*.

**DIAGNOSIS.** *Inbiomyia zeugodonta* resembles *I. scoliostylus* in possessing a surstylus with 2 stout, peglike bristles. It differs from that species by the curved (not angulate) ventral epandrial process, the contrastingly colored pleuron, and, in the female, the shorter anterior apodeme of tergite 8.

**ETYMOLOGY.** The species name refers to the paired, stout, toothlike bristles of the surstylus (Gr. zeugos: team, pair; Gr. odous, odontos: tooth). The species name represents a latinized adjective.


**REMARKS.** Large, wing length 1.74 mm. This species shares the well-developed chaetotaxy with *I. scoliostylus* and *I. zeugodonta*: Inner vertical bristle longer than outer vertical and almost as long as orbital bristle, ocellar and postocellar setulae present; postpronotal bristle well developed, 3–4 dorsocentral setulae between postsutural and prescutellar dorsocentral bristles; anterior pair of scutellar bristles 0.4× as long as posterior pair. Spermatheca tire-shaped. *Inbiomyia* sp. 3 differs from the species of the *I. scoliostylus* group by the fused tergite and sternite of segment 7.
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