

Trichomyia (*Brachiotrichomyia* subgen. nov.) *plumata* sp. nov.
from the Neotropical Region
(Diptera: Psychodidae: Trichomyiinae)

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Abstract. A new subgenus of *Trichomyia* Haliday, 1839 is proposed based on the following characters: palpus four-segmented; the first two segments partially fused and with long posterior gonocoxal arms that each has bristles on the inner margin. *Brachiotrichomyia* subgen. nov. includes seven Neotropical species: *Trichomyia armata* Barretto, 1954, *T. brasiliensis* Satchell, 1956, *T. inermis* Barretto, 1954, *T. pseudodactylis* Quate, 1996, *T. quatei* Bravo, 2001, *T. risaraldensis* Bejarano, Pérez-Doria & Sierra, 2009, and *T. plumata* sp. nov., described and illustrated herein. New illustrations of the male terminalia of *T. inermis* are provided, and new records for Bahia and Amazonas are given. A key to the males of all described species of the new subgenus is included.

Key words. Diptera, Psychodidae, new subgenus, new species, taxonomy, Brazil, Neotropical Region

Introduction

The genus *Trichomyia* Haliday, 1839 in CURTIS (1839) includes 146 extant species distributed globally; the Neotropical fauna of *Trichomyia* is the richest in terms of the number of species (74 with 38 from Brazil), followed by the Australasian/Oceanian (46), Palaearctic (9), Oriental (7) Afrotropical (5) and Nearctic (5) Regions. Eighteen fossil species of *Trichomyia* have been described (DUCKHOUSE 1972, 1973; HENNIG 1972; JEŽEK 1990; WAGNER 1990, 1993, 1999, 2001; QUATE 1965, 1996, 1999; WAGNER & MASTELLER 1996; BRAVO 1999, 2000, 2001a,b,c, 2002; ALEXANDER et al. 2001; WITHERS 2003; IBÁÑEZ-BERNAL 2004; DUCKHOUSE & LEWIS 2007; LAK et al. 2008; BEJARANO et al. 2009a,b, 2010; BERAN et al. 2010; CURLER & MOULTON 2010; PÉREZ-DORIA et al. 2010; ARAÚJO & BRAVO 2012; KVIFFTE 2012; OMELKOVÁ & JEŽEK 2012; SANTOS & LEITE 2012; ARAÚJO & BRAVO, in press).

An informal classification of *Trichomyia* was proposed by DUCKHOUSE (1965, 1978) dividing the species into “group A” (large species with maxillary palpi composed of four clearly differentiated segments) and “group B” (small species with maxillary palpi usually composed of three segments while some Neotropical species have four segments with the first two partially fused). See also comments in the introduction in OMELKOVÁ & JEŽEK (2012). Six subgenera were subsequently proposed for the genus, one for “group A” (*Gondwanotrichomyia* Duckhouse, 1980) and five for “group B” (*Apotrichomyia* Duckhouse, 1978, *Dactylotrichomyia* Duckhouse, 1978, *Dicrotrichomyia* Duckhouse, 1978, *Septemtrichomyia* Bravo, 1999 and *Opisthotrichomyia* Bravo, 2001), the last two subgenera being distributed only in the Neotropical Region (DUCKHOUSE 1978, 1980; BRAVO 1999, 2001a). Another new subgenus of Neotropical *Trichomyia* will be proposed by ARAÚJO & BRAVO (in press).

In the present paper, a new species and a new subgenus of *Trichomyia* are proposed, and *Trichomyia inermis* Barretto, 1954 is redescribed. A key to the males of all described species of this new subgenus is provided.

Material and methods

The specimens examined in this study were mounted on slides and deposited in the following collections:

- INPA Coleção de Invertebrados do Instituto Nacional de Pesquisa da Amazônia, Amazonas, Brazil;
 MZFS Coleção Entomológica Prof. Johann Becker do Museu de Zoologia da Universidade Estadual de Feira de Santana, Bahia, Brazil.

The specimens from Bahia were collected using a CDC light trap. All specimens were cleared with 10% KOH, dehydrated, and mounted using Canada balsam. The general morphological terminology follows CUMMING & WOOD (2009) and the specific terminology of Psychodidae follows WAGNER & IBÁÑEZ-BERNAL (2009).

Taxonomy

Brachiotrichomyia subgen. nov.

Type species. *Trichomyia quatei* Bravo, 2001, here designated.

Diagnosis. Palpus four-segmented, the first two segments partially fused; presence of sensilla in depressed pits on inner side of segments 1 and 2 or, in one species, with sensilla on segment 2 only. Gonocoxites projected dorsally, fused basally, each with a long posterior arm, 1.0–3.5 times the length of ejaculatory apodeme; presence of bristles along half or the entire inner margin of the arm of gonocoxite. Gonostylus unsclerotized, articulated ventrally to the gonocoxite, C-shaped, absent in some species. Aedeagal complex curved and joined at apex.

Description. Male. Head subcircular, eyes without ocular bridge. Antenna: scape similar in length to pedicel; flagellum with 13 flagellomeres with pair of simple ascoids, straight, longer than flagellomere; flagellomeres pyriform; terminal flagellomeres shorter than basal flagellomeres; apical flagellomere with apiculus separate for a suture. Palpus four-segmented, first two palpomeres partially fused, with sensilla in depressed pits on inner side of segments

1 and 2 or, in *Trichomyia pseudodactylis* Quate, 1996, with sensilla in depressed pits only on segment 2. Radial fork distal to medial fork. Male terminalia: Gonocoxites projected dorsally, fused basally, each one with long posterior arm, 1.0–2.0 times the length of ejaculatory apodeme; presence of bristles, filiform or feathered, along half or the entire inner margin of the arm of gonocoxite. Gonostylus unsclerotized, articulated ventrally to gonocoxite, the same length as gonocoxite arm or longer, C-shaped, absent in two species (*Trichomyia armata* Barretto, 1954 and *Trichomyia brasiliensis* Satchell, 1956). Cercus long, longer than arm of gonocoxite. Aedeagal complex curved and joined at apex.

Female. Only one female specimen of *T. armata* was described and, according to BARRETTO (1954), it was similar to the male. The characteristics of the female genitalia will not be discussed here because we only have one representative of one species.

Etymology. The name is composed of the Greek word *brachion*, meaning arm, and the genus name *Trichomyia*; it refers to the presence of a long and wide posterior arm of gonocoxite.

Species included. *Trichomyia armata* Barretto, 1954, *T. brasiliensis* Satchell, 1956, *T. inermis* Barretto, 1954, *T. plumata* sp. nov., *T. pseudodactylis* Quate, 1996, *T. quatei* Bravo, 2001, *T. risaraldensis* Bejarano, Pérez-Doria & Sierra, 2009.

Remarks. BRAVO (2001c) proposed an unnamed group of three Neotropical species with gonocoxites with long posterior arms and long bristles on their inner margins including *T. armata*, *T. brasiliensis*, and *T. quatei*. BEJARANO et al. (2009a) added *T. risaraldensis* and *T. pseudodactylis* to this unnamed group. This taxon is here assigned the name *Brachiotrichomyia* subgen. nov. and classified as a subgenus.

Brachiotrichomyia subgen. nov. is a natural group with at least one exclusive character: ovoid aedeagal complex, fused apically. Two diagnostic characters of the new subgenus show variations: the first character refers to the presence of sensilla in depressed pits on palpal segments 1 and 2 that are observed in all species (except *T. pseudodactylis*, with sensilla only on segment 2, which is assumed to be a secondary modification in that species); the second character refers to the presence of an elongated, unsclerotized gonostylus, although this structure would be secondarily absent in *T. armata* and *T. brasiliensis* according to BRAVO (2001c).

Trichomyia (Brachiotrichomyia) armata Barretto, 1954

Trichomyia armata Barretto, 1954: 127–129, Figs 1–12 (original description); BRAVO (2001c): Fig. 3.

Type material examined. HOLOTYPE: ♂ (MZFS), labelled: '[BRAZIL] SÃO PAULO, SP / Horto Florestal / Cantareira / Barretto & Coutinho / col. 04.XI.1940 [white label, printed]'; PARATYPES: 10 ♂♂ 1 ♀ (MZFS), same locality, data and collector as holotype; 7 ♂♂ 1 ♀ (MZFS), labelled: 'Mogi das Cruzes, SP / Km 67, Estrada / Rio-São Paulo / Barretto & Coutinho / col. 01.XII.1940 [white label, printed]'.

Additional material examined. 1 ♀ (MZFS), labelled: 'BRASIL, PR, Guarapuava / Aguas de Santa Clara / Malaise trap / 01.IX.1986 / PROFAUPAR [white label, printed] // *Trichomyia armata* / Barretto, 1954 / Freddy Bravo det. - 94 [white label, printed]'; 1 ♂ (MZFS), labelled: 'BRASIL, PR, Jundiá do Sul / Fazenda Monte Verde / Malaise trap / 08.XII.1986 / PROFAUPAR [white label, printed] // *Trichomyia armata* / Barretto, 1954 / Freddy Bravo det. - 94 [white label, printed]'; 1 ♀ (MZFS), labelled: 'BRASIL, PR, Jundiá do Sul / Fazenda Monte Verde / Malaise trap / 15.XII.1986 / PROFAUPAR [white label, printed] // *Trichomyia armata* / Barretto, 1954 / Det. Freddy Bravo, 1995 PROFAUPAR [white label, printed]'.

Diagnosis. Male. Palpus with sensilla in depressed pits on segments 1 and 2; segment 4 of palpus 1.3 times the length of third segment; radial fork apical to medial fork; CuA₂ ending

after medial fork; posterior arm of gonocoxite subtriangular in dorsal view, ending in pointed apex, with simple bristles on apical half; gonostylus absent; presence of small ventral tubercle on gonocoxite, with pair of apical bristles; cercus trapezoidal in ventral view with distal margin 0.8 times the length of ventral margin; cercus long and subrectangular in ventral view; ejaculatory apodeme short, 0.4 times the length of gonocoxal arm. **Female** similar to male, cercus short, 3.0 times the length of lobe on sternite 8, and wide, 1.2 times its length.

Distribution. Brazil, states of São Paulo and Paraná.

Trichomyia (Brachiotrichomyia) brasiliensis Satchell, 1956

Trichomyia brasiliensis Satchell, 1956: 152–153, Figs 6A–E (original description).

Material examined. The holotype was not examined; however, the description and figures of Satchell (1956) were sufficient for the species diagnosis.

Diagnosis. Male. Palpus with sensilla in depressed pits on segments 1 and 2; segment 4 of palpus 0.8 times the length of third segment; radial fork apical to medial fork; CuA_2 ending before medial fork; posterior arms of gonocoxite subtriangular in dorsal view, ending in pointed apex, with simple bristles on apical quarter; gonostylus absent; presence of small ventral tubercle on the gonocoxite, with pair of apical bristles; cercus trapezoidal in ventral view; distal margin of cercus the same length as ventral margin; ejaculatory apodeme short, 0.2 times the length of gonocoxite. **Female** unknown.

Distribution. Known only from the type locality in Brazil, state of Santa Catarina.

Trichomyia (Brachiotrichomyia) inermis Barretto, 1954

(Figs 1–7)

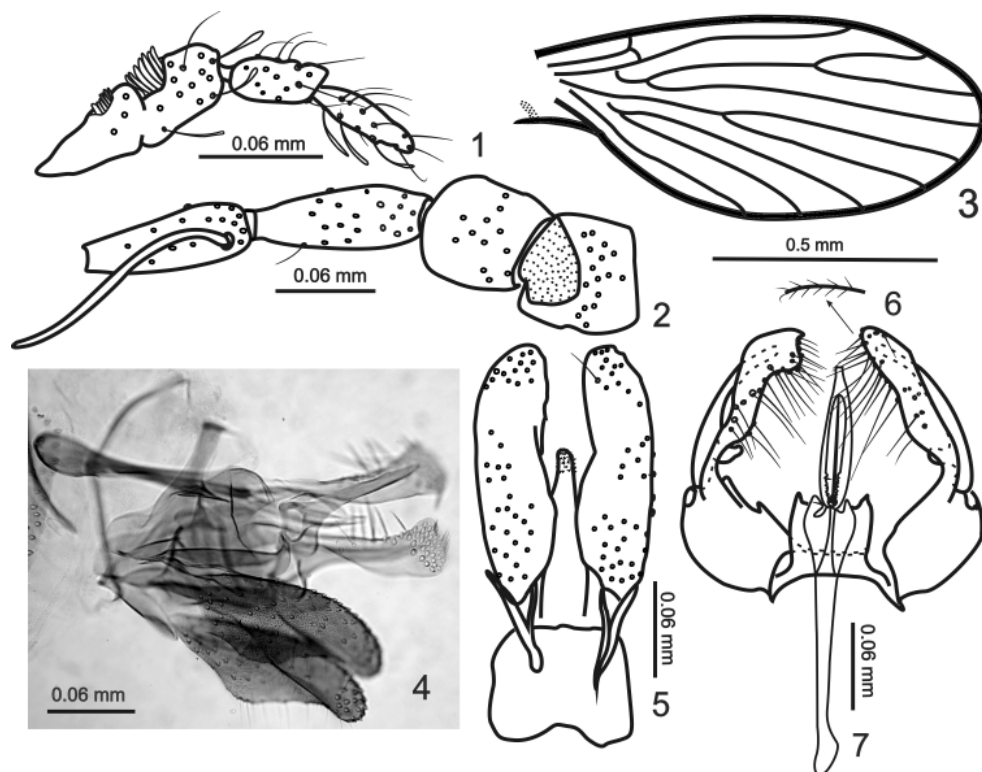
Trichomyia inermis Barretto, 1954: 129–130, Figs 13–17 (original description).

Type material examined. HOLOTYPE: ♂ (MZFS), labelled: 'SÃO PAULO, SP / Horto Florestal / Cantareira / Barretto e Coutinho / col. 04.X.1940 [white label, printed]'.

Additional material examined. 3♂♂ (MZFS), labelled: 'BRAZIL, BAHIA / Cachoeira, Fazenda Vila / Rial, 24.X.2004 / Lg. F. Bravo [white label, printed] // *Trichomyia inermis* Barretto / Det. Freddy Bravo, 2004 [white label, printed]'; 1♂ (MZFS), labelled: 'BRAZIL, AM / Manacapuru / Cajatuba, Km 69/3/ CDC copa Lote 011 / 20.IV.1998 / Col. RQ, RN, PE [white label, printed]'; 1♂ (MZFS), labelled: 'BRAZIL, AM / Manacapuru, Lotes 0122A+0125, Est. Do / Cajatuba, Sítio do Sr. / Simplício CDC (copa) / 24–25.IV.1999 [white label, printed]'.

Diagnosis. Male. Palpus with sensilla in depressed pits on segments 1 and 2 (Fig. 1); segment 4 of palpus 1.2 times the length of third segment (Fig. 1); ascoids 1 and 2 of the same length, ascoid longer than flagellomere (Fig. 2); radial fork apical to medial fork; CuA_2 ending after medial fork (Fig. 3); posterior arms of gonocoxite with lateral margins sinuous in dorsal view, with feathered bristles on the entire surface of inner margin (Figs 4, 6); gonostylus present, blade-shaped, straight, approximately the same length as gonocoxal arm (Figs 4, 7); without ventral tubercle on gonocoxite; cercus trapezoidal in ventral view; distal margin of cercus of the same length as ventral margin (Barretto 1954: Fig. 14); cercus subrectangular in ventral view (Fig. 5); ejaculatory apodeme long, as long as arm of gonocoxite (Fig. 7). **Female** unknown.

Distribution. Brazil, states of São Paulo, Bahia (new record) and Amazonas (new record).



Figs 1–7. *Trichomyia inermis* Barretto, 1954, male. 1 – palpus; 2 – scape, pedicel and basal flagellomeres; 3 – right wing; 4 – male terminalia, lateral view; 5 – cercus, epandrium, hypoproct; 6 – bristle of arm of gonocoxite; 7 – male terminalia, dorsal view.

Remarks. The initial description of the male terminalia of *T. inermis* given by BARRETTO (1954) provided only a lateral view, which made the identification of the species more difficult. The holotype is on a permanent slide and was not remounted; therefore, the redescription was based on new material.

Trichomyia (Brachiotrichomyia) pseudodactylis Quate, 1996

Trichomyia pseudodactylis Quate, 1996: 7–8, Figs 1D–F (original description).

Material examined. The type specimen was not examined; however, the description and figures of QUATE (1996) allowed the diagnosis of the species.

Diagnosis. Male. Palpus with sensilla in depressed pit on segment 2, absent in segment 1; segment 4 of palpus slightly longer than third segment (QUATE 1996); posterior arms of gonocoxite subtriangular in dorsal view, ending in pointed apices, with simple bristles on apical half; gonostylus C-shaped, longer than arm of gonocoxite; presence of small ventral

tubercle on gonocoxite, with pair of apical bristles; cercus trapezoidal in ventral view; distal margin of cercus 1.1 times the length of ventral margin; ejaculatory apodeme short, 0.3 times the length of gonocoxal arm. **Female** unknown.

Distribution. Known only from the type locality, Costa Rica, Guanacaste.

Trichomyia (Brachiotrichomyia) quatei Bravo, 2001

Trichomyia quatei Bravo, 2001: 32–36, Figs 1–3, 5–8 (original description).

Material examined: HOLOTYPE: ♂ (MZFS), labelled: 'BRASIL, BA, Itabuna /Res. Ecol., CEPEC / Mata- light trap / 10.X.1985 / Paulo S. Terra col. [white label, printed] // Holótipo [red label]'.

Diagnosis. Male. Palpus with sensilla in depressed pits on segments 1 and 2; segment 4 of palpus of the same length as third segment; radial fork apical to medial fork; CuA_2 ending after medial fork; posterior arms of gonocoxite subtriangular in dorsal view, ending in rounded apex, with simple bristles along the entire inner margin; gonostylus present, C-shaped, longer than gonocoxal arm; without ventral tubercle on gonocoxite; cercus trapezoidal in ventral view, with tuft of bristles apically; distal margin of cercus of the same length as ventral margin; ejaculatory apodeme short, 0.5 times the length of gonocoxal arm. **Female** unknown.

Distribution: Known only from the type locality, Brazil, state of Bahia.

Trichomyia (Brachiotrichomyia) risaraldensis Bejarano, Pérez-Doria & Sierra, 2009

Trichomyia risaraldensis Bejarano, Pérez-Doria & Sierra, 2009: 296–299, Figs 1–9 (original description).

Material examined. The type specimens were not examined; however, the description and figures of BEJARANO et al. (2009a) allowed the diagnosis of the species.

Diagnosis. Male. Palpus with sensilla in depressed pits on segments 1 and 2; segment 4 of palpus 1.4 times the length of third segment; radial fork apical to medial fork; CuA_2 ending after medial fork; posterior arms of gonocoxite subtriangular in dorsal view, ending in pointed apex, with simple bristles on apical half; gonostylus C-shaped, longer than gonocoxite; presence of small ventral tubercle on gonocoxite, with pair of apical bristles; cercus trapezoidal in ventral view; distal margin of cercus of the same length as ventral margin; ejaculatory apodeme short, 0.2 times the length of gonocoxal arm. **Female** unknown.

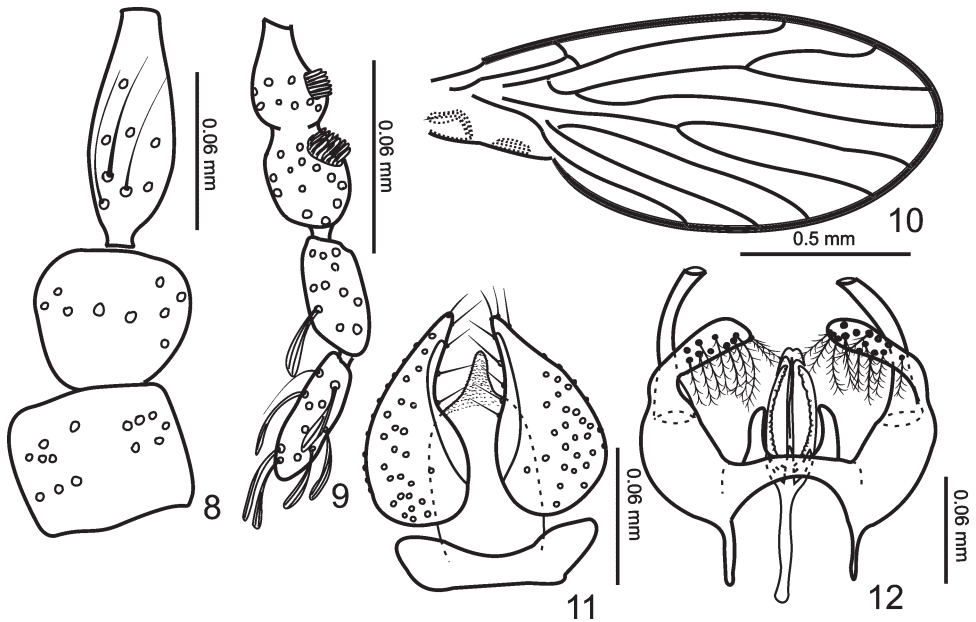
Distribution. Known only from the type locality, Colombia, Risaralda.

Trichomyia (Brachiotrichomyia) plumata sp. nov.

(Figs 8–12)

Type material examined. HOLOTYPE: ♂ (MZFS), labelled: 'Manacapuru (AM) / Cajatuba, Km 69/3/ 3CDC copa / 9.X.1998 [white label]'; PARATYPES: 1 ♂ (MZFS), labelled: 'BRASIL, AM / Manacapuru / Cajatuba, Km 69/3/ CDC copa Lote 011 / 20.IV.1998 / Col. RQ, RN, PE [white label, printed]'; 1 ♂ (MZFS), labelled: 'BRASIL, AM / Manacapuru / Cajatuba, Km 69/3/ CDC / 08.XI.1999 [white label, printed]'; 1 ♂ (MZFS), labelled: 'BRASIL, AM / Purupuru, Est. / Nunes de Melo / Km 4 (base de árvore) / 24.XI.1998 [white label, printed]'.

Diagnosis. Palpus with segment 4 of palpus 1.2 times the length of third segment; radial fork apical to medial fork; CuA_2 ending approximately at the same point as medial fork; posterior arms of gonocoxite subrectangular in dorsal view with acute apex, convergent, with



Figs 8–12. *Trichomyia plumata* sp. nov. 8 – scape, pedicel and basal flagellomere; 9 – palpus; 10 – left wing; 11 – cercus, epandrium, hypoproct; 12 – male terminalia, dorsal view.

feathered bristles on entire surface; gonostylus present, blade-shaped, with truncate apex; cercus teardrop-shaped in ventral view; ejaculatory apodeme long, 0.9 times the length of gonocoxal arm.

Description. Male. Palpus four segmented with sensilla in depressed pits on segments 1 and 2; palpus formula 1.0 : 0.9 : 1.1 : 1.3 (Fig. 9). Antenna incomplete in the specimens studied; scape subcylindrical and pedicel subspherical; basal flagellomeres pyriform, not eccentric (Fig. 8); ascoids lost. Wing (Fig. 10): Sc complete; sc-r complete; R_5 complete at base; r-m and m-cu absent, radial fork apical to medial fork; CuA_2 ending approximately at the same point as medial fork. Male terminalia (Figs 11–12): hypandrium and gonocoxites fused dorsally; posterior arms of gonocoxite subrectangular in dorsal view with acute apex, 8.8 times the length of gonostylus, convergent, with feathered bristles on entire surface; gonostylus present, blade-shaped, with truncate apex; cercus teardrop-shaped in ventral view; epandrium narrow; cercus teardrop-shaped; apex of hypoproct triangular, with microtrichia; pair of lobes half the length of aedeagal complex; ejaculatory apodeme long, 0.9 times the length of gonocoxal arm.

Etymology. The Latin epithet *plumatus* (= feathered), refers to the presence of evident branched bristles on the posterior arm of gonocoxite.

Distribution. Brazil, state of Amazonas: Manacapuru, Purupuru.

Key to the males of Neotropical *Brachiotrichomyia* subgen. nov.

1. Sensilla in depressed pit on palpal segment 2 and absent in segment 1; ejaculatory apodeme short, 0.3 times the length of the gonocoxal arm. *T. (B.) pseudodactylis* Quate, 1996 (Costa Rica)
- Sensilla in depressed pits on segments 1 and 2 (Figs 1, 9); ejaculatory apodeme short or long, 0.2–1.0 times the length of the gonocoxal arm. 2
2. Bristles of inner margin of gonocoxal arm simple, not feathered. 3
- Bristles of inner margin of gonocoxal arm feathered (Figs 6, 12). 6
3. Gonostylus absent. 4
- Gonostylus present. 5
4. Fourth segment of palpus 1.3 times the length of third segment; CuA₂ ending apically to medial fork. *T. (B.) armata* Barretto, 1954 (Brazil: São Paulo, Paraná)
- Fourth segment of palpus 0.8 times the length of third segment; CuA₂ ending before medial fork. *T. (B.) brasiliensis* Satchell, 1956 (Brazil: Santa Catarina)
5. Ejaculatory apodeme 0.2 times the length of gonocoxal arm; bristles on apical half of gonocoxal arm. *T. (B.) risaraldensis* Bejarano, Pérez-Doria & Sierra, 2009 (Colombia: Risaralda)
- Ejaculatory apodeme 0.4 times the length of gonocoxal arm; bristles on entire inner margin of gonocoxal arm. *T. (B.) quatei* Bravo, 2001 (Brazil: Bahia)
6. Cercus long, subrectangular in ventral view; arm of gonocoxite sub-parallel (Figs 5, 7). *T. (B.) inermis* Barretto, 1954 (Brazil: São Paulo, Bahia, Amazonas)
- Cercus teardrop-shaped in ventral view; arm of gonocoxite convergent to midline (Figs 11, 12). *T. (B.) plumata* sp. nov. (Brazil: Amazonas)

Discussion

The unique exclusive character of this new subgenus is the ovoid shape of their apically fused aedeagal complex. Other morphological characteristics show variations in some species: the trapezoidal form of the cercus (teardrop-shaped only in the new species described here); the presence of depressed pits in palpal segment 1 and 2 (except in *T. pseudodactylis*, where they are absent and the sensilla scattered along segment 2); gonocoxite expanded dorsoventrally, with a ventrally articulated gonostylus (except in *T. armata* and *T. brasiliensis*, with no gonostylus). The presence of a posterior gonocoxal arm is not a characteristic unique to the species of this subgenus; it is found in many tropical species of *Trichomyia* – but the presence of bristles on the inner margin of this arm is probably the second exclusive character of this subgenus. Only two species have long ejaculatory apodeme – the new species *Trichomyia (Brachiotrichomyia) plumata* sp. nov. and *T. inermis*; the other species all have short ejaculatory apodeme. *Trichomyia armata* and *T. brasiliensis* are morphologically similar species, in both species the gonostylus is absent and has a trapezoidal cercus; certain morphological differences, however, allow them to be accepted as independent species. These morphological differences are: the relative sizes of the fourth palpal segment and the ejaculatory apodeme and cercus, and the distributions of the bristles on the inner margin of the gonocoxal arm.

It will be necessary to collect more specimens and examine the holotype of *T. brasiliensis* to better determine if the size differences mentioned above constitute a continuous spectrum in a polymorphic species, or according to this last hypothesis, if they represent discrete characters and the two species should be regarded as distinct.

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