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A new subgenus and species of Neotropical *Trichomyia* (Diptera: Psychodidae)

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ABSTRACT. A singular group of 19 species of Neotropical *Trichomyia* Haliday *in* Curtis, 1839 presents four segments in the palpus, the first two partially fused; five of these species were included in the subgenus *Opisthotrichomyia* Bravo, 2001 and seven in the subgenus *Brachiotrichomyia* Bravo & Araújo, 2013. A new species from Brazil is described and a new subgenus proposed for four Neotropical species of this morphological group: *T. biloba* Quate, 1999 from Panama, and *T. onorei* Bravo, 2002, *T. queirozi* Bravo, 2002 and *T. horrida* **sp. nov.** from Brazil. *Syntrichomyia* **subgen. nov.** can be recognized by its fused gonocoxites and gonostyli, and by its bilobed hypoproct. A key to the known species (males) of this new subgenus is presented.

KEY WORDS. Brazil; Neotropics; *Syntrichomyia* subgen. nov.; taxonomy; Trichomyiinae.

Trichomyia Haliday in Curtis, 1839 is a cosmopolitan genus of Psychodidae comprising approximately 146 extant described species. It is the only genus of extant Trichomyiinae species. Eighteen fossil species of Trichomyiinae have been described. According to Wagner & Ibáñez-Bernal (2009), a revision of this group is urgently needed. The first classification of the species of *Trichomyia* was proposed by Duckhouse (1965), who recognized two informal categories: group A, composed of the more 'primitive' and usually larger species with palpus with four segments; and group B, composed of more specialized and usually smaller species with three segments in the palpus. Later, Duckhouse (1978) pointed out a number of problems with his own early classification, particularly because some Neotropical species could not be assigned to either group.

In order to improve the classification of *Trichomyia*, Duckhouse (1978) proposed three subgenera for the species in group B that occur in Australia and New Guinea: *Apotrichomyia* Duckhouse, 1978, *Dactylotrichomyia* Duchouse, 1978, and *Dicrotrichomyia* Duckhouse, 1978. Two years later, he created the subgenus *Gondwanotrichomyia* Duckhouse, 1980 for the species of group A from southern Africa and New Zealand. Bravo (1999, 2001a) and Bravo & Araújo (2013) proposed three subgenera, *Septemtrichomyia* Bravo, 1999, *Opisthotrichomyia* Bravo, 2001 and *Brachiotrichomyia* Bravo & Araújo, 2013 for the Neotropical species.

The Neotropical fauna of *Trichomyia* includes 74 extant species and one *species inquirenda* (Duckhouse 1972, 1973, Wagner 1993, 1999, Wagner & Masteller 1996, Quate 1996, 1999, Bravo 1999, 2000, 2001a, b, c, 2002, Alexander *et al*. 2001, Ibáñez-Bernal 2004, Bejarano *et al*. 2009 a, b, 2010, Pérez-Doria *et al*. 2010, Araújo & Bravo 2012, 2013, Santos & Leite 2012), 12 of which have been included in the three subgenera proposed by Bravo (1999, 2001a) and Bravo & Araújo (2013). Herein we describe a new subgenus and a new species of *Trichomyia* for the Neotropical region.

MATERIAL AND METHODS

We have examined one male specimen of the new species from the Brazilian Amazon, housed in the Invertebrate Collection of the Instituto Nacional de Pesquisas da Amazônia, Manaus, Amazonas, Brazil (INPA), as well as the type specimens of two species of *Trichomyia* (*Opisthotrichomyia*) deposited in the Prof. Johann Becker Entomology Collection of the Zoology Museum of the Universidade Estadual de Feira de Santana, Feira de Santana, Bahia, Brazil (MZFS). The specimen from the Brazilian Amazon (preserved in 70% alcohol) was treated with 10% KOH, dehydrated, and mounted in Canada balsam. The terminology for most morphological characters follows Cumming & Wood (2009) with the following exceptions: the terminology for the antennal segments follows (Ibáñez-Bernal 2004), the terminology for the wing venation follows (Duckhouse 1972), and the terminology for the male terminalia follows Sinclair (2000). Label data are cited in full, with the original spellings, punctuation marks, and dates. Information presented within square brackets is complementary data not included on the labels.

TAXONOMY

Syntrichomyia subgen. nov.

Type species. *Trichomyia queirozi* Bravo, 2002: 60-61, figs 14-21 (type deposited in MZFS).

Diagnosis. Palpus four-segmented, first two segments partly fused. Gonocoxites and hypandrium fused, plate-like, with lateroposterior bristles, some bristles embedded in the lateral arms. Gonostyli fused basally and divergent apically, little sclerotized. Hypoproct bilobed.

Description. Male. Head subcircular, eyes without eye bridge. Antenna. Scape similar in length to pedicel; flagellum with 13 flagellomeres, with pair of simple ascoids, C-shaped; basal flagellomere pyriform, approximately the same length as second; following flagellomeres slightly asymmetrical; apical flagellomeres elongated; terminal flagellomere with apiculus. Palpus four-segmented, first two segments partially fused. Wing. Length 2.00-2.26 times width, with rounded apex; Sc ending at C; sc-r ending at R_1; apex of Sc and base of R thickened; r-m and m-cu absent. Male terminalia. Hypandrium fused with gonocoxites, forming plate-like sclerite (gonocoxal plate) with set of bristles on lateroposterior margin, some embedded in the lateral arms; gonostyli fused basally and divergent apically, unsclerotized; cerci short and compact, wider than long; epandrium wider than long; hypoproct weakly or strongly bilobed.

Female. Only a female specimen of *T. biloba* is available. According to Quate (1999), it is similar to the male. Characteristics of the female genitalia will not be discussed here because we only have one representative of one species.

Etymology. *Syn*, a Greek prefix meaning 'together', alludes to the basal fusion of the gonostyli.

Remarks. Species of *Trichomyia* with a four-segmented palpus, the first two segments separated by a small articular area (partly fused according to Duckhouse 1978), are known only from the Neotropical region, and were not classified in the artificial groups A or B proposed by Duckhouse (1965). According to Bravo (2000), these Neotropical species should be considered an independent lineage of *Trichomyia*, but there are no phylogenetic studies to support this hypothesis. Currently, 18 species have been classified into this Neotropical group (Barreto 1954, Satchell 1956, Duckhouse 1974a, b, Quate 1996, Wagner & Masteller 1996, Bravo 2001a, 2002, Ibáñez-Bernal 2004, Bejarano *et al*. 2009a, b, 2010) and only one subgenus, *Opisthotrichomyia*, was proposed, comprising five species with a four-segmented palpus, the first two segments partly fused (Bravo 2001a).

We propose an additional subgenus, *Syntrichomyia*, for the Neotropical group of species with four-segmented palpi. It can be recognized by the presence of three characters which are not present in other species of *Trichomyia*: gonocoxal plate with a characteristic group of posterolateral bristles; gonostylus unsclerotized, fused basally; hypoproct bilobed. These characteristics are putative synapomorphies of the group, which need to be tested within the context of a broad quantitative phylogenetic analysis.

Species included: *T. biloba* Quate, 1999, *T. onorei* Bravo, 2002, *T. queirozi* Bravo, 2002, and *T. horrida* **sp. nov.**

Key for males of *Syntrichomyia*

1. Gonocoxal plate with short or long lateral arms on posterior margin, crowned with a set of bristles; median surface of gonocoxal plate with bristles (Fig. 5; Quate 1999: fig. 1D)..2

1'. Gonocoxal plate with posterior margin straight, without arms, and a set of bristles on posterolateral margin; surface of gonocoxal plate without bristles (Bravo 2002: figs 11 and 21) 3

2. Gonocoxal plate with short lateral arms, 0.2 times the length of gonostylus, with approximately six bristles; gonostylus (= aedeagus of Quate 1999: fig. 1D) acute apex, without bristles. Distribution: Panama, Barro Colorado Island .... *Trichomyia biloba* Quate, 1999

2'. Gonocoxal plate with long lateral arms, 0.6 times the length of gonostylus, with four bristles; gonostylus rounded at apex, with apical bristles (Fig. 5). Distribution: Brazil, state of Amazonas ..... *Trichomyia horrida* **sp. nov.**

3. Ejaculatory apodeme short, 0.5 times the length of gonostylus (Bravo 2002: fig. 11); cerci joined by sclerotized bridge (Bravo 2002: fig. 12); M_2 incomplete, separated from M_1 (Bravo 2002: fig. 9). Distribution: Brazil, state of Bahia ..... *Trichomyia onorei* Bravo, 2002

3'. Ejaculatory apodeme long, approximately the same length as gonostylus (Bravo 2002: figs 19 and 21); cercus without sclerotized bridge (Bravo 2002: fig. 20); M_2 complete (Bravo 2002: fig. 18). Distribution: Brazil, state of Bahia .... *Trichomyia queirozi* Bravo, 2002

Trichomyia (*Syntrichomyia*) *queirozi* Bravo

Trichomyia queirozi Bravo, 2002: 60-62, figs 14-21.

Remarks. The males of *T. queirozi* can be easily recognized by: 1) M_2 articulated with M_1 (Bravo 2002: fig. 18); 2) gonocoxal plate without lateral arms (Bravo 2002: fig. 21); 3) ejaculatory apodeme ending before anterior margin of gonocoxal plate, curved in lateral view (Bravo 2002: figs 20 and 21); 4) cercus with medial bridge.

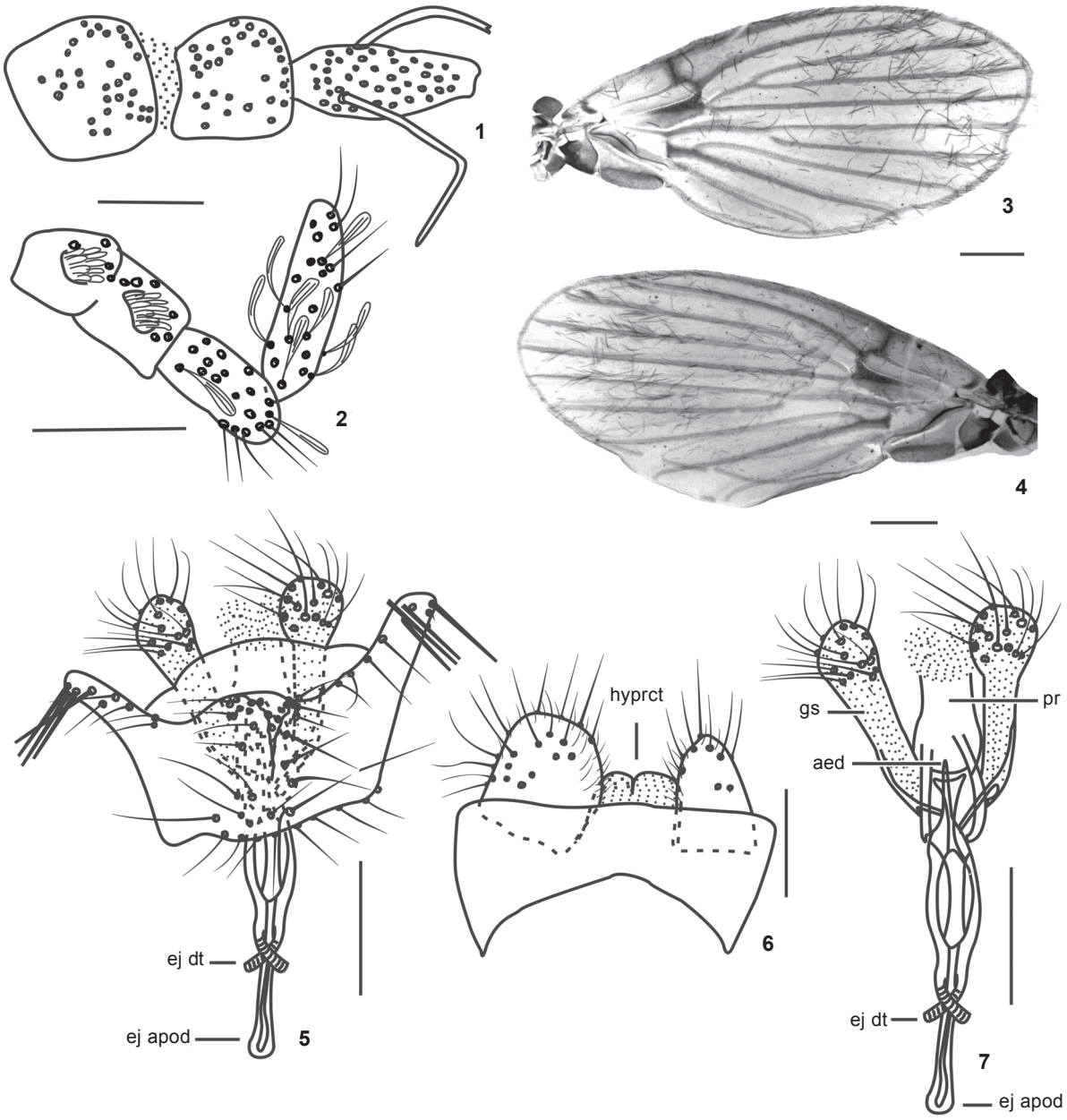
Material examined. Holotype male labeled: "Brasil, BA [Bahia] Serra da Jibóia[,] 01.IV.2001, lg. I. Castro" (MZFS). Holotype condition: mounted in a permanent slide; the head and the male terminalia are turned.

Distribution. Known only from the type locality.

Trichomyia (*Syntrichomyia*) *onorei* Bravo

Trichomyia onorei Bravo, 2002: 59-60, figs 7-13.

Remarks. The males of *T. onorei* can be easily recognized by: 1) M_2 not articulated with M_1 (Bravo 2002: fig. 9); 2)



Figures 1-7. *Trichomyia horrida* **sp. nov.**: (1) scape, pedicel and basal flagellomere with two ascoids, one of them broken; (2) palpus; (3) left wing; (4) right wing; (5) male terminalia, dorsal; (6) cercus, epandrium and hypoproct; (7) aedeagus, ejaculatory apodeme, parameres and gonostylus. (aed) Aedeagus, (ej apod) ejaculatory apodeme, (ej dt) ejaculatory duct, (gs) gonostylus, (hyprct) hypoproct, (pr) fused parameres. Scale bars: 0.12 mm.

gonocoxal plate without lateral arms (Bravo 2002: fig. 11); 3) ejaculatory apodeme ending beyond anterior margin of gonocoxal plate (Bravo 2002: figs 10 and 11); 4) cercus with medial bridge (Bravo 2002: fig. 12).

Material examined. The holotype male is labeled "Brasil, BA[Bahia], Itabuna[,] Reserva Ecológica CEPEC[,] Mata – Light trap[,] 04.VI.1984[,] Paulo S. Terra col." (MZFS). Holotype condition: mounted in a permanent slide; the male terminalia structures are very clear, but the characters can be observed.

Distribution. Known only from the type locality.

Trichomyia (*Syntrichomyia*) *biloba* Quate

Trichomyia biloba Quate, 1999: 413, figs 1A-D.

Remarks. The males of *T. biloba* can be easily recognized by: 1) M_2 not articulated with M_1 (Quate 1999: fig. 1A); 2) gonocoxal plate with short lateral arms (Quate 1999: fig. 1D); 3) ejaculatory apodeme ending beyond anterior margin of gonocoxal plate (Quate 1999: fig. 1D).

The type specimen was not examined.

Distribution. Known only from the type locality in Panama.

Trichomyia (*Syntrichomyia*) *horrida* **sp. nov.**

Figs 1-7

Diagnosis. Gonocoxal plate with long lateral arms, 0.6 times length of gonostylus, crowned with elongated bristles; with bristles on median surface of gonocoxal plate; gonostyli unsclerotized, claviform, with apical bristles.

Description. Male. Antenna incomplete in the specimen studied. First flagellomere pyriform, with paired ascoids, 1.25 times length of flagellomere (Fig. 1). Palpus four-segmented, first two segments with sensorial setae inside pits; palpus formula 1.0:0.8:1.3:2.0 (Fig. 2). Wing (Figs 3 and 4). Right and left wings with wing membrane outside C vein, certainly an anomaly; length 2.2 times width, R_5 complete at base, M_2 unsclerotized at base. Male terminalia. Gonocoxal plate with lateral arms, 0.6 times length of gonostylus, each with four apical bristles; with bristles on median surface of gonocoxal plate (Fig. 5). Gonostyli unsclerotized, claviform, with apical bristles (Figs 5 and 7). Parameres fused, slightly smaller than gonostylus, with sclerotized, U-shaped apical margin (Figs 5 and 7). Aedeagus short, 0.4 times length of gonostylus (Fig. 7). Ejaculatory apodeme 0.5 times length of gonostylus (Figs 5 and 7). Epandrium wider than long (Fig. 6). Hypoproct unsclerotized, slightly bilobed at apex (Fig. 6).

Female. Unknown.

Material examined. The holotype male is labeled "Brasil, AM [Amazonas] Pururu, Est.[Estrada] Nunes de Melo, CDC[light trap,] Km 8-12[,] 26.XI.1998 [without name of collector]" (INPA). Holotype condition: mounted in a permanent slide; some flagellomeres lost.

Etymology. The Latin epithet *horridus* refers to the many bristles present on the male terminalia.

Distribution. Known only from the type locality.

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