New species of *Australopericoma* Vaillant (Diptera: Psychodidae) from the Brazilian semiarid region and key to males of the genus

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**ABSTRACT**

A new species of moth fly, *Australopericoma paraibana* sp. n., is described from areas of the Brazilian semiarid region, in the states of Paraíba and Bahia, north-eastern Brazil. A key to males of *Australopericoma* and morphological remarks on *Australopericoma caudata* (Satchell) are also provided.

**ARTICLE HISTORY**

Received 13 October 2014
Accepted 4 August 2015
Online 12 September 2015

**KEYWORDS**

Psychodinae; Setominini; Neotropical Region; moth flies; taxonomy

*Australopericoma* Vaillant, 1975 is a mainly Neotropical genus with 16 described species. Two species occur in the southern Nearctic region, *Australopericoma delta* Curler and Moulton, 2010 and the type species of the genus, *Australopericoma caudata* (Satchell, 1955), with the latter also occurring in Jamaica (Quate 1955; Satchell 1955; Quate and Brown 2004; Curler and Moulton 2010). The other 14 species have been recorded from Costa Rica, Trinidad, Venezuela, Colombia, Peru, Brazil, and Argentina (Tonnoir 1929; Wagner and Joost 1994; Quate and Brown 2004; Bravo 2007). In Brazil, this genus has been recorded from Rondônia State in the Brazilian Amazon (Quate and Brown 2004) and in the semiarid regions of the states of Bahia and Paraíba (Bravo 2007; Bravo and Araújo 2014). We describe here a new species of *Australopericoma* from the states of Paraíba and Bahia, in the semiarid region of Brazil.

**Materials and methods**

Specimens mounted on slides and deposited in the Prof. Johann Becker Entomology Collection at the Zoological Museum of the State University of Bahia at Feira de Santana, Brazil (MZFS) were previously identified as *Australopericoma dissimilis* Bravo, and were recently recognized as a new species by one of the present authors (Maíra Araújo). The morphological descriptions principally follow the terminology of Cumming and Wood (2009). Photos were acquired using a camera Olympus® (Tokyo, Japan) DP25 attached to microscope Olympus® BX51. The program CombineZP® (http://www.hadleyweb.pwp.blueyonder.co.uk/) was used to combine photos of different depths with ‘pyramid weighted average’ parameter.

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**Taxonomy**

*Australopericoma paraibana* Cordeiro and Bravo sp. nov.  
(Figures 1A–G, 2A, B)

**Type material**
Brazil, Paraíba, Santa Teresinha, Fazenda dos Franceses, 7.0159°S, 37.4083°W, 258 m asl, 6 May 2011, holotype male, Lima & Brito leg. [malaise trap]; 11 paratype males same data [malaise trap]; 1 paratype male same data except 25–29 September 2011 [malaise trap]; 2 paratype males same data except 7.0255°S, 37.4113°W, 269 m asl, 27 July 2011 [malaise trap]; 1 paratype male Bahia, Serrinha, Fazenda Pinheiro, 21 April 2005, Vieira & Chagas leg. [light trap].

**Comparative material**
Holotype and paratypes of *Australopericoma dissimilis* Bravo, 2007; paratypes of *Pericoma caudata* Quate, 1955 (as specified below, in the material examined of *A. caudata*).

**Etymology**
The name refers to the state of the type locality.

**Diagnosis**
This species is mainly characterized by its male terminalia: hypandrium of uniform width throughout its length, with a series of 9–16 sparsely distributed short and strong setae on the ventral surface; gonocoxites with stout spine on inner margin; gonostylus with three bristles as long as its length, two of them inserted apically and one basally; lateral margins of aedeagal apodeme slightly divergent.

**Description**
**Adult male.** Eye bridge with 3 facet rows, separated by almost 1 facet diameter (Figure 1A). Interocular suture present, without spur (Figure 1A). Frontal scar patch with lower margin bilobed, without median dorsal projection. 5–6 larger alveoli (base of postocular bristles) on lateroposterior margin of eye (Figure 1B). Antenna shorter than wing; scape cylindrical, 1.4× length of pedicel; pedicel spherical; 14 flagellomeres present (Figure 1A, C); basal flagellomeres fusiform (Figure 1D); 13th flagellomere reduced, 14th with long apiculus (Figure 1C); 1st flagellomere without ascoids, 2nd to 9th with pair of C-shaped ascoids, shorter than the segment bearing them (Figure 1D). Mouthparts extending beyond basal palpmere, labelum with apicolateral bristles and three short internal spines. Palpus formula = 1:1.3:1.3:2.1, last palpomere striated (Figure 1A). Wing (Figure 1E) typical of the genus with short Sc; medial fork apical to radial fork, radial fork arising basal to apex of CuA₂; R₅ ending at wing tip. Male terminalia: epandrium pilose, rectangular, longer than wide, distal margin concave (Figure 1F); presence of two foramina near proximal margin. Cercus long, 1.1× length of epandrium, with 1 apical clavate tenaculum (Figure 1F); internal surface of cercus with 4 long bristles near base (Figure 1F) and ‘papilla-like’ area at base. Epiproct subtriangular micro-setose at apex (Figure 1F). Hypandrium of uniform width throughout its length, with dorsal surface less sclerotized than ventral surface; ventral surface projects ventrally to articulate...
with parameres (Figures 1G, 2A). Dorsal surface microsetose on posterior margin and ventral surface, with a series of 9–16 sparsely distributed short and strong setae (Figure 2A); Gonocoxite pilose, approximately the same length as gonostyle, and with one stout spine on ventral surface (Figures 1G, 2A). Gonostylus pilose, with one long apical bristle, one long
subapical bristle, and one long basal bristle (Figure 2B). Gonostylus with three small setae at base, close to articulation point. Gonocoxal apodeme triangular anteriorly and bilobed posteriorly, with truncate lobes (Figure 2B). Hypoproct with two sclerites, the basal one less sclerotized, Y-shaped, and with a pair of lateral sclerites; apical sclerite with triangular microsetose apex. Aedeagus asymmetric (Figures 1G, 2A). Aedeagal apodeme almost as long as aedeagus, with lateral margins slightly divergent (Figure 2A). Paramere pairs asymmetrical, one with 2 posterior-pointing arms and a semicircular basal portion articulating with aedeagus; the other long, with acute apex, and articulating basally with the lateroventral projection of the hypandrium.

Measurements (n = 5)
Head width 0.33 mm (0.32–0.34), head length 0.31 mm, wing length 1.31 mm (1.27–1.35), wing width 0.46 mm (0.43–0.49).

Distribution
This species is currently known only from Santa Terezinha – Paraíba State, and Serrinha – Bahia State, two localities in the semiarid region of north-eastern Brazil.

Australopericoma caudata (Satchell)
Pericoma caudata Satchell, 1955 (February): 90–92, figs. 4A–E; Collantes and Martinez-Ortega (1999): 25; Quate and Brown (2004): 92–94 (in combination with A. caudata). Pericoma wirthi Quate, 1955 (May): 154–155, figs. 31a–e; Collantes and Martinez-Ortega (1999): 25 (synonymy with P. caudata); Quate and Brown (2004): 92–94 (synonymy with A. caudata).
Australopericoma caudata (Satchell): Quate and Brown (2004): 92–94, figs. 237–238; Wagner and Hribar (2004): 509; Ibáñez-Bernal (2008): 91–92.

**Material examined**
Paratype male of *Pericoma wirthi* Quate US, Arizona, Wickenburg, Hassayampar, 29 June 1953, col. W. W. Wirth (USNM); two female paratypes of *Pericoma wirthi* Quate US, Kerrville, Tx, col. L. J. Bottimer, one 23 October 1953, one 11 August 1953 (USNM); one male US, Alabama, Mobile Co., Grand Bay Sav (site 1), Malaise, 30.39°N, 38.31°W, 20 June 2004, col. W. E. Benton (MZFS).

**Remarks**
Quate and Brown (2004) noted that the gonostylus of *A. caudata* had two large setae at its apex, and presented a drawing (Quate and Brown 2004, fig. 237) showing these setae to be less than half the length of the gonostylus; we observed, however, that the gonostylus of *A. caudata* is much more like that of *A. paraibana* sp. n., with one long seta at the apex, subapex, and base of the gonostylus, the latter being straight apically, not sinuous as the former two.

**Comments**
The new species *Australopericoma paraibana* is very similar to another species of *Australopericoma* from the semiarid region of Brazil, *Australopericoma dissimilis* Bravo, as well as *A. caudata*, which occurs in Jamaica and in southern USA. They can easily be differentiated, however, by the shape of the hypandrium and by the numbers and distributions of the setae on this structure, as follows: in *A. caudata* the hypandrium is expanded medially, with 9–10 setae distributed on this expanded area; in *A. paraibana* the hypandrium is uniform in width throughout its length, with 9–16 sparsely distributed setae not concentrated in the median portion; in *A. dissimilis* the hypandrium is H-shaped in dorsal view, with 7 setae on the apex of each of the two distal ‘lobes’. Additionally, *A. paraibana* sp. n. and *A. caudata* have four long bristles near the base of the cercus, all of approximately the same length, and a stout spine on the inner margin of each gonocoxite; *A. dissimilis* has only three long bristles near the base of the cercus, the middle one being 2× longer than the others, and no stout spine on the gonocoxites. The aedeagal apodeme of *A. caudata* has straight and parallel lateral margins, while the aedeagal apodeme of the new species has slightly divergent lateral margins.

*A. caudata, A. dissimilis, and A. paraibana* sp. n., together with *A. pontilis* Quate & Brown, *A. sagitta* Quate & Brown, and *A. delta*, appear to form a group of closely related species as they share a number of exclusive characters among the *Australopericoma*: radial fork basal to medial fork at a distance greater than the length of R$_{2+3}$; medial fork apical to the apex of CuA$_2$; hypandrium with macrosetae; gonocoxite with one or two stout spines on inner side (this feature absent in *A. delta* and *A. dissimilis*). A key to the males of *Australopericoma* was provided by Quate and Brown (2004). We present here a modified version of this key, including species described after 2004:

Key to males of *Australopericoma*, modified from Quate and Brown, 2004
1 Scape normal, no more than 2 times length of pedicel; wing plain, without infuscations ..................................................................................................................................................... 2
– Scape elongate, about 3 times length of pedicel; wing with infuscate patterns .......................................................... A. roessleri (Wagner and Joost)

2 Gonostyli with similar format ........................................................................................................................................... 3
– Gonostyli dissimilar, one J-shaped, other U-shaped .......... A. abnormalis Quate & Brown

3 Gonocoxite without large, median projection .................................................................................................................. 4
– Gonocoxite with large, median, nonarticulated projection in addition to slender gonostylus .......................................................... A. exilis Quate & Brown

4 Hypandrium without macrosetae; radial on the same level or little basal to medial fork; gonocoxite without stout spine ........................................................................................................................................... 5
– Hypandrium with macrosetae; radial fork clearly basal to medial fork, medial fork apical to level where CuA₂ meets wing margin; gonocoxite may have with one or two stout spines on inner side ........................................................................................................................................... 12

5 Paramere not J-shaped, not strongly curved ........................................................................................................................................... 6
– Paramere J-shaped, strongly curved ........................................................................................................................................... 10

6 Paramere consists of a single shaft ........................................................................................................................................... 7
– Paramere consists of 3 pointed, black shafts.............. A. multifida Quate & Brown

7 Paramere inflated, shorter than distiphallus ........................................................................................................................................... 8
– Paramere slender, longer than or as long as distiphallus ........................................................................................................................................... 9

8 Paramere turnip-shaped with pointing apex............... A. bulbula Quate & Brown
– Paramere with sides nearly parallel, apex with slight indentation ........................................................................................................................................... A. pallidula (Tonnoir)

9 Distiphallus a single shaft; paramere broad, straight .......... A. cesticella Quate & Brown
– Distiphallus a double shaft; paramere slender, sinuous ........................................................................................................................................... A. trinidadensis Quate & Brown

10 Distiphallus nearly straight, tapering from broad base to straight, acute apex ...... 11
– Distiphallus curved at base similar to paramere, slender over entire length ........................................................................................................................................... A. curvata Quate & Brown

11 Gonostyli dimorphic, left with large projection at distal one-fourth, right with only slight swelling at distal one-fourth ........................................................................................................................................... A. bhati Quate & Brown
– Gonostyli monomorphic, both similar and slender over entire length ........................................................................................................................................... A. falcata Quate & Brown

12 Gonocoxites without stout spine on inner margin ........................................................................................................................................... 13
– Gonocoxites with one or two stout spine on inner margin ........................................................................................................................................... 14

13 Apex of gonostylus slightly clavate with two long bristles; macrosetae of hypandrium restricted to apex of distal lobes ........................................................................................................................................... A. dissimilis Bravo
– Apex of gonostylus acute, long setae subapical; macrosetae of hypandrium on the expanded central portion of hypandrium ........................................................................................................................................... A. delta Curler
14 Hypandrium curved anteriorly, with one or two setae on the sides, without setae on median region and with right side prolonged into slender extension ................................................. Hypandrium curved posteriorly, never bare on median region ........................................ 15

15 Hypandrium with 6 macrosetae, near centre; gonocoxite with 2 stout spines on apex of inner margin; gonostylus with 1 long and several shorter setae at apex ................................................................. A. pontilis Quate & Brown
– Hypandrium with at least 9 macrosetae; gonocoxite with 1 or 2 stout spine subapically on inner margin; gonostylus with 2 long and several shorter setae at apex ......................................................... 16

16 Hypandrium slightly expanded medially with 9–10 setae on central expanded area; aedeagal apodeme with straight parallel lateral margins ......................... A. caudata (Satchell)
– Hypandrium uniform in width through its length with 9–16 setae sparsely distributed, not concentrated on the median portion; aedeagal apodeme with slightly divergent lateral margins .................................................................................................................. A. paraibana sp. nov.

Acknowledgements

We are thankful for the referees Jan Ježek and Rüdiger Wagner, who contributed to the final version of the manuscript.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

The authors are grateful to the Ministério de Ciência, Tecnologia e Inovação (MCTI) and the Programa de Pesquisa em Biodiversidade (PPBio) [project MCT/CNPq/504038/2012-5] for financial support. F.B. also received a research grant from CNPq [305055/2012-7] and D.C. had a post-doc fellowship from the agreement Fapesb/CAPES.

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