

Artículo Original
(Original Paper)**DESCRIPTION OF THE MALE OF THE COPROPHAGOUS MOTH FLY *PSYCHODA SERRAOROBONENSIS* BRAVO, CORDEIRO & CHAGAS, 2006 (DIPTERA, PSYCHODIDAE)****DESCRIPCIÓN DEL MACHO DE LA MOSCA COPRÓFAGA *PSYCHODA SERRAOROBONENSIS* BRAVO, CORDEIRO & CHAGAS, 2006 (DIPTERA: PSYCHODIDAE)****JÉSSICA LUNA CAMICO*, DANILO PACHECO CORDEIRO, DAYANA ANDRADE DE LIMA**

Instituto Nacional de Pesquisas da Amazônia, Coordenação de Biodiversidade. Av. André Araújo, N° 2936, caixa postal 478, CEP 69011-970, campus II, Aleixo Manaus, Amazonas, Brasil.

E-mail: <jesyka.luna@gmail.com>, <d.pacheco.c@gmail.com>, <dayanaandrade.91@gmail.com>

*Autor correspondiente: <jesyka.luna@gmail.com>

Recibido: 07/12/2017; aceptado: 06/08/2018; publicado en línea: 22/10/2018

Editor responsable: Magdalena Cruz Rosales

Camico, J. L., Cordeiro D. P., Lima, D. A. (2018) Description of the male of the coprophagous moth fly *Psychoda serraorobonensis* Bravo, Cordeiro & Chagas, 2006 (Diptera, Psychodidae). *Acta Zoológica Mexicana (nueva serie)*, 34: 1–6. DOI: 10.21829/azm.2018.3412101

ABSTRACT. In the diverse genus *Psychoda*, a great number of species are described based only on one sex, mainly for the difficulties of sexual association in this taxon. Immatures of coprophagous moth flies were captured on a sample of cow dung left exposed during five days at Reserva Ducke (Manaus, Brazil), in the Brazilian Amazon. The presence of Psychodidae larvae was confirmed with a stereomicroscope and the material was kept resting at room temperature until the emergence of adults. Male and females of *Psychoda serraorobonensis* Bravo, Cordeiro & Chagas, 2006 were obtained and associated by the morphology of the immatures and adults. The male of *P. serraorobonensis* is herein described and illustrated and the distribution of this species in Brasil is updated. This is the first data about the feeding habits of this species.

Key words: Amazon forest; coprophilous; taxonomy; Psychodinae; Psychodini**Camico, J. L., Cordeiro D. P., Lima, D. A.** (2018) Descripción del macho de la mosca coprófaga *Psychoda serraorobonensis* Bravo, Cordeiro & Chagas, 2006 (Diptera, Psychodidae). *Acta Zoológica Mexicana (nueva serie)*, 34: 1–6. DOI: 10.21829/azm.2018.3412101

RESUMEN. En el diverso género *Psychoda*, se describe un gran número de especies basadas solo en un sexo, principalmente por las dificultades de asociación sexual dentro de este taxón. Se capturaron inmaduros de polillas coprófagas en una muestra de excremento de vaca que quedó expuesta durante cinco días en Reserva Ducke (Manaus, Brasil), en la Amazonía brasileña. La presencia de larvas de Psychodidae se confirmó en un estereomicroscopio y el material se mantuvo en cautiverio a temperatura ambiente hasta la emergencia de los adultos. Se obtuvieron machos y hembras de *Psychoda serraorobonensis* Bravo, Cordeiro y Chagas, 2006 y se asociaron por la morfología de los inmaduros y adultos. El macho de *P.*



serraorobonensis se describe e ilustra y se actualiza la distribución de esta especie en este documento. Este es el primer dato sobre los hábitos alimenticios de esta especie.

Palabras clave: Bosque amazónico; coprófilo; taxonomía; Psychodinae; Psychodini

INTRODUCTION

Psychodidae comprises 533 valid species in Brazil, where *Psychoda* Latreille, 1796 is one of the most diverse genera, with 27 registered species (Shimabukuro *et al.*, 2018), distributed from North to South of the Country. The sexual association in *Psychoda* is difficult due to the high diversity on this genus, the high rate of sympatric species, and the resemblance of closely related species (Cordeiro *et al.*, 2011). For these reasons, several species have been described based on only one sex. In Latin America and the Caribbean region, for example, more than half of the species are known by one sex only (Bravo *et al.*, 2006; Cordeiro *et al.*, 2011). Often the authors have chosen to base their descriptions on females, as they are frequently more abundant in traps and also exhibit conspicuous specific diagnostic characters in the terminalia (Quate, 1996; Cordeiro *et al.*, 2011). The present study provides the description of the male of *Psychoda serraorobonensis*, as well as a map with the known distribution of this species.

MATERIAL AND METHODS

Specimens studied herein were collected at Reserva Ducke, located at km 26 of the Manaus-Itacoatiara road. They were collected with a bovine faeces bait, made of a sample of 1.5cm³ of cow dung, exposed in the field for five days. The material was brought to the laboratory and kept in plastic cups covered with 'saran wrap' at room temperature until the emergence of adults. The adults were preserved in 70% ethanol and identified using a stereomicroscope. Females are preserved in 70% ethanol and the male was mounted on a permanent slide with Canada Balsam, following the procedure of Bravo (1996).

The terminology follows the proposal of Cummig & Wood (2009) with the specific term gonocoxal apodeme proposed by Quate & Brown (2004). A geographic distribution map of the species was created using Websoftware Simple Mappr.

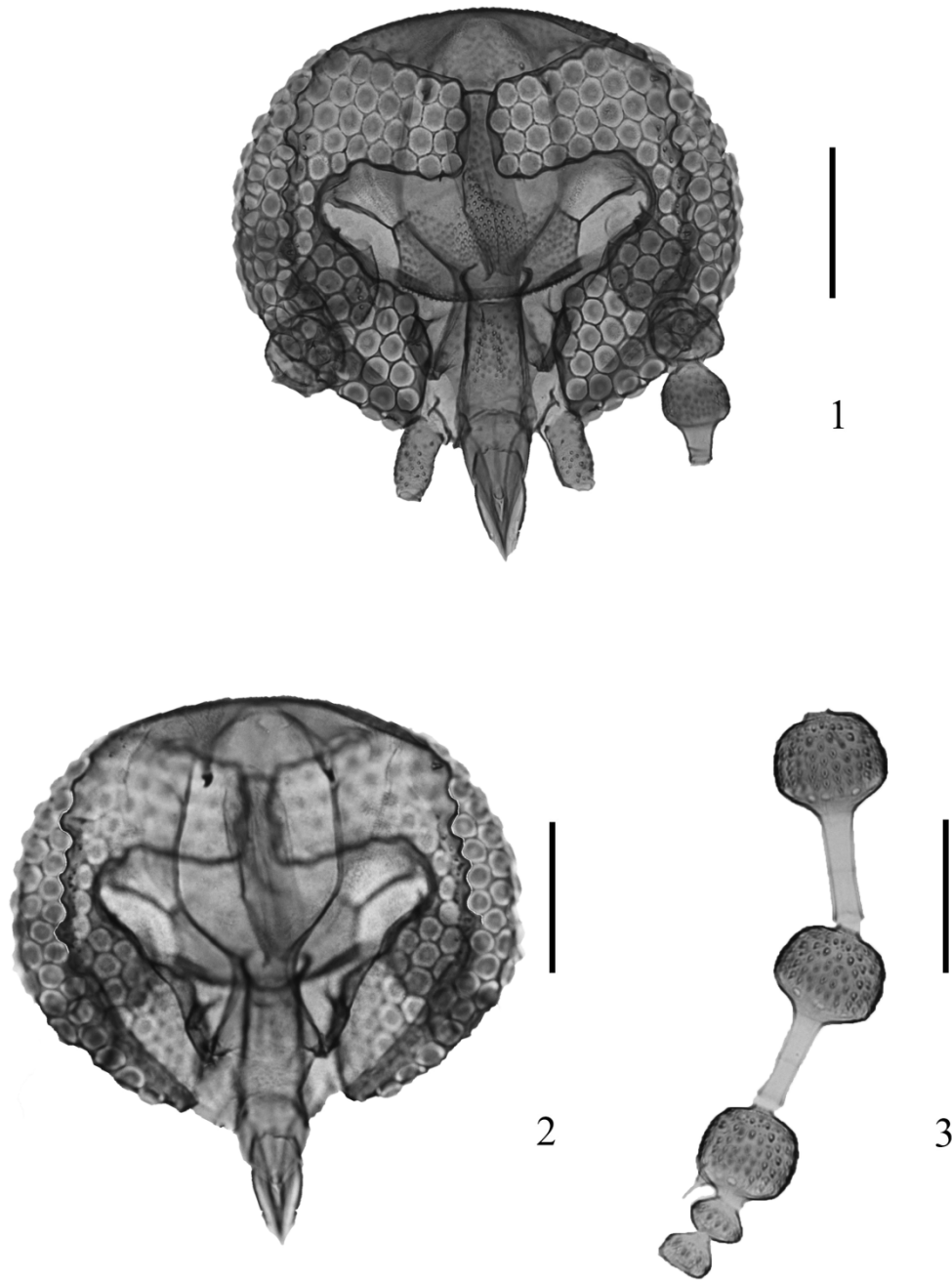
RESULTS

Psychoda serraorobonensis Bravo, Cordeiro & Chagas (Figs. 1-8)

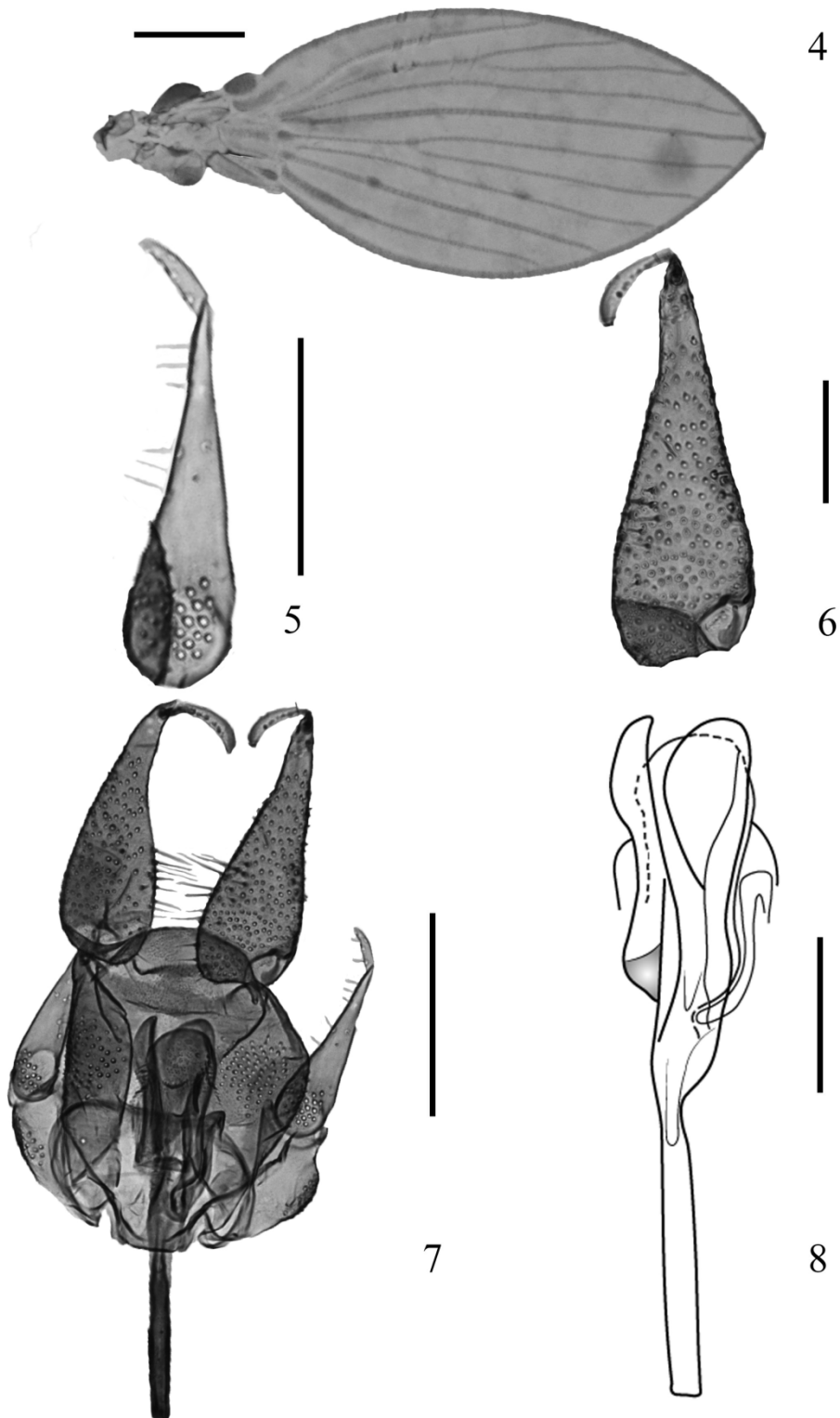
Psychoda serraorobonensis Bravo, Cordeiro & Chagas, 2006: 10. Type-locality: Brazil, Bahia, Serra do Orobó, holotype female (MZUEFS). Add. Ref.: Bravo, 2007:327 (Citation); Cordeiro, Bravo & Carvalho, 2011:15 (Record).

Examined material. 1 ♂, 3 ♀ BRASIL, Amazonas, [Manaus], Reserva Ducke, 2°56'8.84"S; 59°57'43.24"O, xii.2016, fezes bovina, col. D. Andrade (INPA).

Diagnosis. Eyes separated by 1.0 (male) or 1.5–2.0 (female) facet diameters; antenna with 14 flagellomeres, the 3 apical subequal are reduced in size, 11th and 12th fused, 14th separated and spherical; ascoids Y-shaped; wing with medial fork incomplete; female subgenital plate pilose on distal half and with lateral margins convex; male terminalia with gonostyle coniform with a group of alveoli at base and short setae sparsealy distributed, aedeagus asymmetrical, bifid with left branch little longer and wider in



Figures 1–3. *Psychoda serraorobonensis*: ♂ 1. Head in anterior view; 2. Head in posterior view; 3. Flagellomeres 9-13 [Scale 0,1 mm (1,2) 0,05 mm (3)].



Figures 4 – 8. *Psychoda serraarobonensis*: ♂ 4. Wing; 5. Gonostyli; 6. Surstyli; 7. Terminalia in dorsal view; 8. Aedeagus [Scale 0,2 mm (5) 0,1 mm (7) 0,05 mm (5,6,8)].



dorsal view, one short sinuous paramere articulat with aedeagus and a small projection of the hypandrium, gonocoxal apodeme strongly sclerotized, pilose ventrally and with rounded distal margin.

Description. Adult male. Head: Eye bridge with four facet rows (Fig. 1); Eyes separated by a distance of 1.0 facet diameter (Fig. 1); Scape subcylindrical, pedicel spherical, flagellomeres 1–11 nodiform, 11th and 12th fused, 12th–13th reduced (14th lost, antenna broken), ascoids Y-shaped, palpal formula: 1,0:1,1:1,1:- (apical segment lost, palpus broken), labellum with three apical digitiform setae ('teeth').

Wing: radial fork complete, M_2 close but not linked to M_1 (Fig. 4). Terminalia (Figs. 7 and 8): hypandrium stripe-like with a small triangular posterior projection on one side, gonocoxites with a group of alveoli on lateral margin, gonostyli little longer than gonocoxite, coniform, with acute apex, a group of alveoli at base and short sparsely distributed setae on apical 2/3; gonocoxal apodeme strongly sclerotized, pilose ventrally and with rounded distal margin; aedeagus bifid, left branch little longer and wider in dorsal view, one short sinuous paramere articulates with aedeagus and ends on the small projection of the hipandrium; epandrium as long as wide, pilose, surstyli coniform, 1.5X the length of gonostyle, with one tenaculum at apex. Epiproct and hypoproct broadly oval, pilose. Female. Described by Bravo, Cordeiro & Chagas (2006).

Distribution (Fig. 9). Brazil (States of Amazonas, Bahia, São Paulo and Paraná) (Bravo *et al.*, 2006; Cordeiro *et al.*, 2011).



Figure 9. Distribution of *Psychoda serraorobonensis*.

Comments. We are confident of the sexual association as not only the morphology of adults match, but also all adults emerged from a single sample of faeces. The morphology of all larvae and larvae exuviae found on the faeces are also identical, indicating there was a single species on that sample. Description of immatures are in preparation on a paper comprising other immatures of coprophagous Psychodini. *P. serraorobonensis* appears to have a wide distribution in Brazil.

ACKNOWLEDGEMENTS. We thank the National Research Institute of the Amazon, for the support designed the research. We thank the Coordination of Improvement of Higher Education Personnel (CAPES) for the support provided.

REFERENCES CITED

- Bravo, F.** (1996) Análise Filogenética dos Psychodidae (Diptera, Psychodomorpha), com ênfase nos Psychodinae e Trichomyiinae. Tese de Doutorado - Setor de Ciências Biológicas, Universidade Federal do Paraná, Curitiba, 118 pp.
- Bravo, F., Cordeiro, D., Chagas, C.** (2006) Two new species and new records of *Psychoda* Latreille (Diptera, Psychodidae, Psychodinae) from Brazil, with comments on supraspecific classification of the genus and an actualized list of Latin American and Caribbean islands species. *Zootaxa*, 1298, 1–15.
- Cordeiro, D., Bravo, F., de Carvalho, C. J. B.** (2011) Taxonomy of Brazilian *Psychoda* Latreille, 1796 (Diptera, Psychodidae) with the description of thirteen new species. *Zootaxa*, 3101, 1–37.
- Cumming, J. M., Wood, D. M.** (2009) Adult morphology and terminology [Chapter] 2. In: Brown, B. V.; Borkent, A.; Cumming, J. M.; Wood, D. M.; Woodley, N. E., Zumbado, M. A. (Eds.): *Manual of Central American Diptera*, Volume 1, NRC Research Press, Ottawa, Ontario, Canada, p. 9–50.
- Quate, L. W.** (1996) Preliminary taxonomic of Costa Rica: Psychodidae (Diptera), exclusive of Plebotominae. *Revista de Biología Tropical*, 44 (Supplement 1), 1–81.
- Quate, L. W., Brown, B. V.** (2004) Revision of Neotropical Setomimini (Diptera: Psychodidae: Psychodinae). *Publications of the Natural History Museum of Los Angeles County, Contributions in Science*, 500, 1–117.
- Shimabukuro, P. H. F., Andrade, A. J., Galati, E. A. B., Cordeiro, D. P., Bravo, F.** (2018) Psychodidae in Catálogo Taxonômico da Fauna do Brasil. PNUD. Disponível em: <http://fauna.jbrj.gov.br/fauna/faunadobrasil/16799> (acesso em: 31 Jul. 2018).