*Zootaxa* 3947 (1): 109–121
www.mapress.com/zootaxa/


**Article**

ISSN 1175-5326 (print edition)
**ZOOTAXA**
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3947.1.7
http://zoobank.org/urn:lsid:zoobank.org:pub:54A83A1C-7F6E-416C-88C3-E4D3916E1698

# Revision of the genus *Macrostomus* Wiedemann (Diptera, Empididae, Empidinae). IV. The *amazonensis* species-group

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## Abstract

Six new species of *Macrostomus* Wiedemann are described, namely *M. acreanus* **sp. nov.** from Brazil (Acre state), *M. amazonensis* **sp. nov.** from Guyana and Brazil (Roraima, Amazonas, Pará, Rondônia, and Mato Grosso states), *M. albicaudatus* **sp. nov.** from Brazil (Roraima, Amazonas, and Pará states), *M. paraiba* **sp. nov.** from Brazil (Paraíba state), *M. trombetensis* **sp. nov.** from Brazil (Pará state) and *M. xavieri* **sp. nov.** from Guyana and Brazil (Amazonas state). The six species are all treated in the *M. amazonensis* species-group, which is defined on the basis of one pair of ocellar setae and no supra-alar postsutural setae in combination with characters of the male and female terminalia. A key to the included species is presented and the geographical distributions of the species are mapped.

**Key words**: Neotropics, Amazon Basin, Atlantic Forest, Empididae, *Macrostomus*, taxonomy

## Introduction

This paper is the fourth in a series by the authors that treats each of the species-groups of *Macrostomus* Wiedemann. Previous papers in this series were published by Rafael & Cumming (2009, 2010, 2012). Here we describe six new species that comprise the new *M. amazonensis* species-group, diagnosed herein. The *M. amazonensis* species-group appears to be a monophyletic lineage based on a single pair of ocellar setae and no supra-alar postsutural setae (both features also found in the *M. ferrugineus* species-group), male terminalia with short tergite 8 without a narrow posteriorly projected apex, anterior and posterior cercus flanking setose membranous median cercus, ejaculatory apodeme with dorsal lamella reduced to almost absent, and female terminalia with small or basally widened genital fork (sometimes bearing elongate or inwardly curved lateral arms). The species-group is distributed in the Amazon Basin, except for one species found in the Atlantic Forest of northeastern Brazil as defined by Amorim & Pires (1996) and Amorim (2009).

In addition, there are still several new species of *Macrostomus* that do not apparently belong to any of the four species-groups treated by us in this series of papers. These species will be described in the next final paper in the series. In our final paper on *Macrostomus*, a phylogenetic analysis of the entire genus will attempt to place these species within the named species-groups, or if required, additional yet to be named species-groups. This last paper will also provide a key to all the species-groups and a discussion of biogeographic patterns displayed within *Macrostomus*.

## Material and methods

This study is based on the examination of specimens housed in the following institutions: The Natural History Museum (BMNH), London, UK; Canadian National Collection of Insects (CNC), Ottawa, Canada; Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Brazil; and Museu Paraense Emílio Goeldi (MPEG), Belém,

*Accepted by B. Sinclair: 18 Mar. 2015; published: 14 Apr. 2015*

known only from Acre state, in Southwest Amazonia, seems to be more distantly related to the other species in the *Macrostomus amazonensis* species-group. Nevertheless, testing of possible biogeographic patterns must await an analysis of phylogenetic relationships within and between all the species groups of *Macrostomus*.


## Acknowledgements

We thank the following curators for the loan of specimens: Dr. John Chainey (BMNH) and Dr. Inocêncio Gorayeb (MPEG). Field collections were financed by the Instituto Nacional de Pesquisas da Amazônia (INPA) and the Programa de Apoio a Núcleos de Excelência of the Fundação de Amparo à Pesquisa do Estado do Amazonas (PRONEX–CNPq–FAPEAM Edital 016/2006, Proc. 1437/2007). The first author is financially supported by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), grant 300305/2007-9.


## References


Amorim, D.S. (2009) Neotropical diptera diversity: richness, patterns, and perspectives. *In*: Pape, T., Bickel, D. & Meier, R. (Eds.), *Diptera Diversity: Status*, *Challenges and Tools*. Brill, Leiden, pp. 71–97.

Amorim, D.S. & Pires, M.R.S. (1996) Neotropical biogeography and a method for maximum biodiversity estimation. *In*: Bicudo, C.E.M. & Menezes, N.A. (Eds.), *Biodiversity in Brazil, a first approach*. CNPq, São Paulo, pp. 183–219.

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*. *Vol. 1*. NRC Research Press, Ottawa, Ontario, Canada, pp. 9–50.

Rafael, J.A. & Cumming, J.M. (2009) Revision of the genus *Macrostomus* Wiedemann (Diptera: Empididae: Empidinae). I. The *ferrugineus* species-group. *Zootaxa*, 2064, 39–56.

Rafael, J.A. & Cumming, J.M. (2010) Revision of the genus *Macrostomus* Wiedemann (Diptera: Empididae: Empidinae). II. The *pictipennis* species-group. *Acta Amazonica*, 40, 613–624. http://dx.doi.org/10.1590/S0044-59672010000300023

Rafael, J.A. & Cumming, J.M. (2012) Revision of the genus *Macrostomus* Wiedemann (Diptera, Empididae, Empidinae). III. The *limbipennis* species-group. *Zootaxa*, 3361, 45–55.