



## Taxonomy and distribution of caecilian amphibians (Gymnophiona) of Brazilian Amazonia, with a key to their identification

ADRIANO O. MACIEL<sup>1</sup> & MARINUS S. HOOGMOED<sup>2</sup>

Museu Paraense Emílio Goeldi, Coordenação de Zoologia, 66077-530 Belém, Pará, Brazil.

E-mail: <sup>1</sup>aombiologo@yahoo.com.br; <sup>2</sup>marinus@museu-goeldi.br

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## Abstract

Based on examination of 622 specimens of Gymnophiona, 15 species are recognized for Brazilian Amazonia. Geographical variation in characters is low and is mainly restricted to the number of annuli. One new species is described, *Microcaecilia rochai* sp. nov. New distribution data and maps for most species are provided. A key to the identification of caecilians of Brazilian Amazonia is presented.

**Key words:** Amazonia, Brazil, caecilians, distribution, taxonomy

## Resumo

A partir da análise de 622 espécimes de Gymnophiona foram reconhecidas 15 espécies para a Amazônia Brasileira. A variação geográfica é baixa, principalmente concentrada na variação de contagem dos anéis corporais. Uma espécie nova descrita, *Microcaecilia rochai* sp. nov. São apresentados novos dados e mapas de distribuição para a maioria das espécies. Uma chave para identificação das cecílias da Amazônia brasileira é apresentada.

**Palavras chave:** Amazônia, Brasil, cecílias, distribuição, taxonomia

## Introduction

Since Dunn (1942) and Taylor (1968) few researchers have worked on the taxonomy of Neotropical caecilians, a task that is hampered by the fact that most species are known from only a few specimens, for example *Caecilia armata* and *Osgaecilia hypereumeces* known from one and two specimens respectively, and without precise provenance. This situation is not exceptional and applies even to species in more actively studied caecilian faunas, such as in India (Giri *et al.*, 2003; Bhatta & Prashanth, 2004; Gower & Wilkinson, 2005; Gower *et al.*, 2007a, 2007b). However, it is known that some caecilian species in at least part of their distribution can be abundant (Moodie, 1978; Wake, 1980; Péfaur *et al.*, 1987; Gorzula & Celsa Señaris, 1998; Oommen *et al.*, 2000; Measey & Di-Bernardo, 2003; Measey, 2004; Lynch & Acosta, 2004; data here presented for some species).

Some Neotropical caecilians are relatively well known, including several species of Typhlonectidae, on which a series of taxonomic studies have been published after Taylor's 1968 monograph (Wilkinson, 1988, 1989, 1991, 1996; Nussbaum & Wilkinson, 1995; Wilkinson & Nussbaum, 1999; Silva *et al.*, 2003). Savage & Wake (1972, 2001) studied the systematics of Central American caecilians and provided a basis for taxonomic revisions for the four genera known from that region, one of which (*Gymnopsis*) is endemic. Lynch (1999) revised the caecilians of Colombia, providing some taxonomic notes, and discussing variation in external morphological characters.

The taxonomic status of *Caecilia*, the most speciose Neotropical genus is problematic. Both it and the nine species of the closely related *Osgaecilia* are of doubtful monophyly (Nussbaum & Wilkinson, 1989). Another unresolved relationship concerns *Microcaecilia*, which might be paraphyletic with respect to *Brasilotyphlus* (Nussbaum pers. comm.; Maciel *et al.*, 2009).

We here attempt to evaluate the taxonomic status of the species of Gymnophiona in Brazilian Amazonia, studying sexual, intra- and interpopulational variation in external morphological characters, using both morphometrics and meristics. We used the vegetation map of (Eva *et al.*, 2002) for the delimitation of Amazonia. Our definition of Amazonia includes areas Ia, IIa and IIb (but not Ib and Ic) as shown in figure 5 of Eva & Huber (2005: 11). Brazilian Amazonia includes all parts of Brazil (independent of type of vegetation) that fall within these areas, which includes the Brazilian part of the Amazon drainage (excepting the head waters of some southern tributaries of the Amazon, which are in the Cerrado Biome) and the southern part of the Guiana Shield that lies within the limits of Brazil. Avila-Pires (1995: fig. 1) provides a schematic drawing of Brazilian Amazonia. The area encompasses the Brazilian States of Acre, Amapá, Amazonas, Pará, Rondônia and Roraima, the western part of Maranhão (W of the Rio Pindaré), a tiny northern triangle of Tocantins and the northern part of Mato Grosso (roughly north of an oblique line that runs from 11° 30' S in the West to 10° S in the east).

Fifteen caecilian species are here recognized for Brazilian Amazonia, of which 13 are diagnosed and described, one *Microcaecilia* is considered *incertae sedis* and one (*Brasilotyphlus* sp.) is not further treated because it is being studied by another researcher. A new species of *Microcaecilia* is described. The few data on geographic variation