

First reliable records of distribution of *Brachyrhamdia meesi* Sands & Black, 1985 (Siluriformes: Heptapteridae)

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Brachyrhamdia meesi was originally described from “Belém, Brazil”, based on material from aquarium-fish trade. Since its description, no voucher specimen of *B. meesi* with reliable locality has been registered in a scientific collection so far. Furthermore, this species has never been encountered in Belém and surrounding areas in Lower Amazon, an ichthyologically well sampled region, which led us to believe its type locality is erroneous. Based on recent fieldwork in Río Ampyiacu tributaries, Peru, and a thorough review of fish collections, we report for the first time the distribution area of *B. meesi* as Upper Amazon of Brazil and Peru and the first case of sympatry between *Brachyrhamdia* species.

Introduction

Brachyrhamdia Myers, 1927 is a genus of Heptapteridae comprising six valid species and distributed throughout Río Orinoco and Rio Amazonas systems (including Rio Tocantins basin) and Guianas region (Bockmann & Guazzelli, 2003; Ferraris, 2007; Slobodian & Bockmann, 2013). Species of *Brachyrhamdia* are popular among aquarium-fish hobbyists, mainly due their striking color patterns, and much of the literature on the genus is addressed to aquarists (e. g. Innes & Myers, 1950; Sands, 1984, 1985a; Sands & Black, 1985). Species belonging to *Brachyrhamdia* are remarkable for their mimicry with some species of *Corydoras* La Cèpède, 1803 (Callichthyidae), *Otocinclus* Cope, 1871 (Loricariidae), and *Pimelodella* Eigenmann

& Eigenmann, 1888 (Heptapteridae), with which they share similar color patterns and body habitus (Innes & Myers, 1950; Sands, 1980, 1985b; Sands & Black, 1985; Lundberg & McDade, 1986; Axelrod & Burgess, in Axelrod, 1987; Hercos et al., 2009; Slobodian & Bockmann, 2013).

Brachyrhamdia meesi was known to aquarists before its formal description (e. g. Sands, 1984), and became even more popular since. The species is relatively common in aquarium shops, in Brazil and abroad, and is usually misidentified as a species of *Pimelodella* (Sands, 1985b; Sands & Black, 1985; pers. obs.). Individuals of *B. meesi* sold throughout the world supposedly originate from ornamental fish trades of Brazilian Amazon and Leticia region in Colombia (J. A. Zuanon and J. I. Mojica, pers. comm.). Despite its wide

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Fig. 1. *Brachyrhamdia meesi*, MZUSP 118426, 45.5 mm SL; Peru: Loreto: Río Ampyiacu basin.

popularity among hobbyists, until recently there was no record of *B. meesi* in scientific collections accompanied by reliable locality data.

After a detailed screening throughout most scientific collections of South and North America in pursuit of *Brachyrhamdia* material, we found some specimens that allowed us to enlighten the distribution area of *B. meesi*. Those were specimens of *Brachyrhamdia* caught during recent fieldwork in the Upper Amazon of Peru, carried out by ichthyology team of the Museu de Zoologia da Universidade de São Paulo (MZUSP), Brazil, and specimens belonging to the Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul (MCP), Brazil.

Material and methods

Identification of specimens follows Slobodian (2013), Slobodian & Bockmann (2013) and Bockmann & Slobodian (2013). Listed specimens were fixed in formalin and preserved in ethanol, except when noticed otherwise. Institutional acronyms follow Sabaj Pérez (2014). Abbreviations: c&s, cleared and stained; SL, standard

length; xr, x-rayed. Map was produced with Quantum GIS® 2.6.0 software.

Results and discussion

Specimens from MZUSP 118426, MZUSP 118427 and MCP 29849 were unambiguously identified as *B. meesi* due the presence of a lateral dark stripe, wider below anal fin, extending from pseudotympanum to caudal-fin base, a dark, rectangular mark near caudal-fin base, unpigmented zones adjacent to the dark lateral stripe, a sub-ocular blotch, a first pectoral-fin ray (unbranched) bearing few (4–6) retrorse (tip of dentations oriented towards the base of pectoral fin) to straight dentations on two-thirds to half of its posterior margin, 36–38 total vertebrae (cf. Slobodian, 2013) (Fig. 1). MZUSP specimens are from Río Ampyiacu tributaries, Upper Amazon river basin of Peru, and MCP specimens are from Mamirauá lake system, Rio Solimões, Upper Amazon river basin of Brazil (Fig. 2), so that those three lots are the first material of *B. meesi* with reliable locality data. Another two specimens (INPA 8047) have a locality record, but since it is near a pisciculture station and due

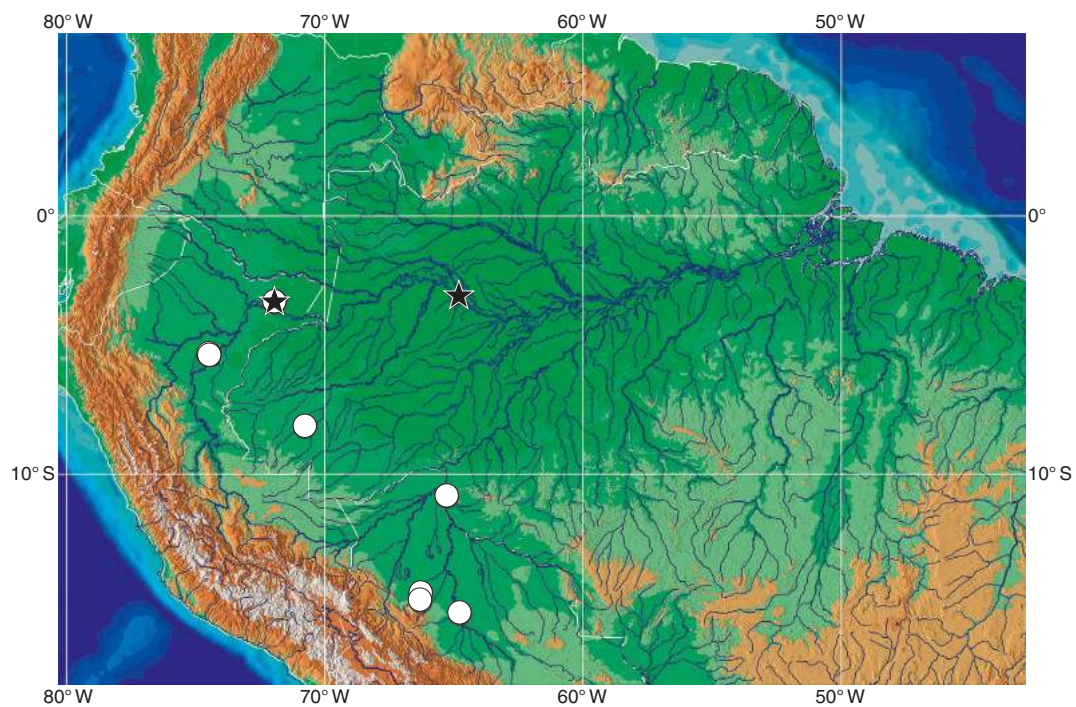


Fig. 2. Northern South America, showing the distribution of *Brachyramdia meesi* (★) and *B. marthae* (○).

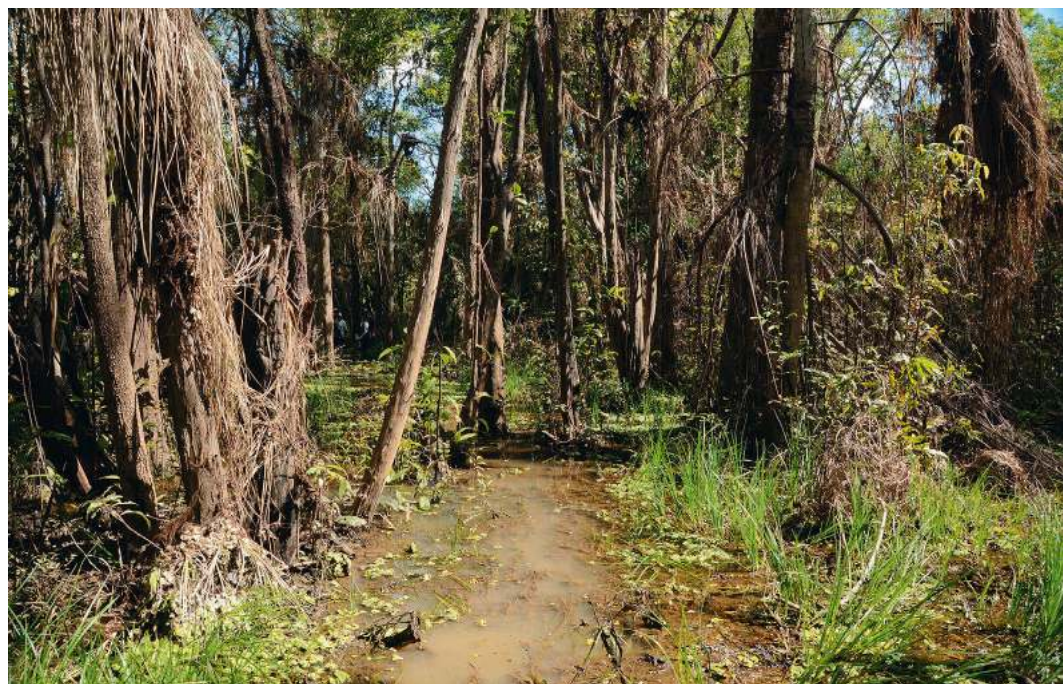


Fig. 3. Peru: Loreto: Laguna Shangay, Río Ampiyacu basin, one of the localities where *Brachyramdia meesi* was collected, together with *B. marthae*. (Photograph by O. T. Oyakawa).

to the absence of other records for the region we suspect they were introduced. All other examined *B. meesi* material are from aquarium-trade.

Brachyrhamdia meesi was described by aquarists based on specimens from ornamental fish trade, in a publication targeted at hobbyists (Sands & Black, in Sands, 1985). The description is brief and the type locality is uncertain. The three type-specimens were reported as “collected near Belem, Brazil”, in March 1985. It is also said the first author received a shipment of fishes from Germany, which included some fishes from Belém, Brazil, but no further detail was provided. Despite Belém and surrounding areas being very well sampled ichthyologically, there are no records of *B. meesi* from there in any collection or publication. In fact, no other species of the genus is recorded from Belém region, which led us to believe that its type-locality corresponds in fact to the origin of shipment. Indeed, Belém, capital of Pará State in Brazil, is known as an important hub for ornamental fish trade.

Brachyrhamdia meesi is the sister species of *B. marthae* Sands & Black, in Sands (1985), from Madeira-Mamoré-Madre de D'ós system of Bolivia, Brazil and Peru, which has a good representation among the main Neotropical fish collections (see Material examined) (Zarske, 2003; Slobodian & Bockmann, 2013; Bockmann & Slobodian, 2013). Species of *Brachyrhamdia* are largely allopatric (Slobodian, 2013; Slobodian & Bockmann, 2013), each exhibiting somewhat patchy distribution throughout the main drainages of northern South America, likely due to peculiar ecological requirements (Slobodian & Bockmann, 2013). In contrast with the distribution pattern of other *Brachyrhamdia* species, the recently found *B. meesi* localities are partly overlapping with the distribution area of its sister species, *B. marthae*, so that specimens of *B. meesi* (MZUSP 118427) were found mixed with *B. marthae* (MZUSP 118428) collected in Laguna Shangay, on right shore of Río Ampiyacu, Upper Amazon river of Peru. This comprises the first reported case of sympatry among *Brachyrhamdia* species (Fig. 2).

The above-mentioned scenario suggests perhaps the type specimens of both *B. meesi* and *B. marthae* species were collected together in this Upper Amazon region. Another possibility is that “Belém”, stated as the type locality of *B. meesi*, is actually Belém do Solimões, a locality considerably further west in Amazonas State, Brazil, adjacent to the border with Colombia and Peru.

This location is relatively close to the region where *B. meesi* was found. Belém do Solimões is a locality sometimes referred to as “Belém” in the literature (e.g. Géry, 1963; Géry, 1965) (M. Marinho, pers. comm.).

Those two localities of the Upper Amazon where *B. meesi* was encountered are very close to each other and are situated at low altitudes (about 80 and 130 m asl). At both sites specimens were found in places with standing water, abundant vegetation (macrophytes, flooded forest, riparian vegetation), and substrate of mud and leaf litter (Fig. 3). Water of Río Yaguasyacu is transparent to white while that of Laguna Shangay is transparent to dark (O. T. Oyawaka, pers. comm.). Specimens of *B. meesi* were found among riparian vegetation, near the shores (O. T. Oyawaka, pers. comm.), broadly similar to the habitat where *B. thayeria* was found (Slobodian & Bockmann, 2013).

Despite *Brachyrhamdia* species being known to mimic other catfishes (Innes & Myers, 1950; Sands, 1980; Slobodian & Bockmann, 2013), no other catfish with similar coloration was observed at the three localities where *B. meesi* was encountered. Therefore, despite the indirect data given by *B. meesi* being found mixed with *Pimelodella* species in aquarium stores (Sands, 1985b; pers. obs.), there is no trustworthy information about *B. meesi* mimicking other catfishes.

Currently, *B. meesi* (together with *B. marthae* and *B. rambarrani* Axelrod & Burgess, in Axelrod, 1987) is on the official list of species whose capture, transport and trade is allowed (MPA, 2012), which is quite surprising when one considers that its geographical range was not known and that its only known locality, which is its type locality, is likely to be a mistake. In the last evaluation of threatened fish fauna from Brazil (MMA, 2014) *B. meesi* was considered Data Deficient (DD) using IUCN criteria (IUCN, 2001). The new data presented here on *B. meesi* add new information to assess more accurately its conservation status, allowing a proper reassessment of the risk of keeping this species in a list that allows its use for commercial purposes.

Material examined. *Brachyrhamdia marthae*: BOLIVIA: AMNH 39747, 1; Beni: Río Itenez, 2 km SE of Costa Marques, in Brazil; 12°28'20"S 64°13'49"W. – AMNH 77576, 4, 22.6–26.8 mm SL; Beni: Río Mamoré, about 5 km southeast of Limoquije; 15°23'60"S 64°45'60"W. – AMNH 225416, 1, 27.2 mm SL; Santa Cruz: Río Ichilo, about 54 km south of Boca Chapare; 16°23'32"S

64°41'11" W. – MZUSP 27823, 2, 30.8–32.1 mm SL; Rio Chapare between Todos os Santos and its mouth; 15°57'09" S 64°45'24" W. – USNM 305631, 15, 2 c&s, 26.5–33.2 mm SL; Beni: Provincia General José Ballivia Seguro, borrow pit by road at 1.5 km W, Río Matos crossing 45 air km E of San Borja; 14°55'60" S 66°16'60" W. – USNM 305864, 40, 2 c&s, 34.1–42.2 mm SL; Beni: E. B. B. Trapiche La Pascana camp, ancient path of Río Maniquí; 14°38'18" S 66°17'04" W. – USNM 305891, 3; Beni: E. B. B., Trapiche La Pascana camp, ancient path of Río Maniquí; 14°38'18" S 66°17'03" W. BRAZIL: MCP 15555, 3; Mato Grosso: Pontes e Lacerda, Rio Guaporé and flooded area in Pontes e Lacerda, Rio Madeira basin; 15°12'00" S 59°20'60" W. – MZUSP 30771, 3, 32.8–45.1 mm SL; Acre: Tarauacá, Rio Tarauacá, Rio Juruá basin; 8°10'00" S 70°46'00" W. – UFRO-I 10982, 128; Rondônia: Corumbiara, unnamed igarapé at Estrada dos Bois, affluent of Rio Corumbiara; 12°59'54" S 61°08'52" W. – UFRO-I 3277, 1; Rondônia: Guarajá-mirim, Rio Pacaás Novos, near confluence with Rio Mamoré; 10°52'07" S 65°15'42" W. PERU: RMNH 29424, holotype, xr, 76 mm SL; Peru, aquarium import. – FLMNH 128932, 1, 24.0 mm SL; Loreto: Caño Yarina, affluent of Río Pacaya, in Pacaya-Samiria National Reserve; 5°21'49" S 74°53'20" W. – FLMNH 128977, 5, 23.3–33.0 mm SL; Loreto: Caño Yarina, affluent of Río Pacaya, in Pacaya-Samiria National Reserve; 5°21'49" S 74°53'20" W. – FLMNH 129036, 2, 29.0–32.5 mm SL; Loreto: Caño Yarina, affluent of Río Pacaya, in Pacaya-Samiria National Reserve; 5°21'49" S 74°53'20" W. – MZUSP 118428, 11, 27.1–36.5 mm SL; Loreto: Laguna Shangay, in lowland rainforest, at right margin of Río Ampiyacu; 3°20'33" S 71°56'01" W. – MZUSP 118425, 12, 27.4–31.3 mm SL; Loreto: small river Agua Negra, left margin of Río Ampiyacu; 3°20'09" S 71°56'34" W.

Brachyrhamdia meesi: BRAZIL: RMNH 29425, holotype, xr, 56.5 mm SL; near Belém. – INPA 8047, 1, xr, 1 c&s, 43.4 mm SL; Amazonas: Manaus, unnamed igarapé near to the road to pisciculture, km 21 of AM-010 highway (doubtful locality). – MCP 29849, 2, 44.2–50.9 mm SL; Amazonas: Alvarães, Ressaça do Vila Alencar, 1 km south of Boca do Mamirauá community, Mamirauá lake system; 3°07'25" S 64°48'02" W. PERU: MZUSP 118426, 11, 36.9–48.2 mm SL; Loreto: creek tributary of the right margin of Río Yaguasyacu, Río Ampiyacu basin; 3°20'51" S 71°59'09" W. – MZUSP 118427, 1, 35.0 mm SL; Loreto: Laguna Shangay, in lowland rainforest, at right margin of Río Ampiyacu; 3°20'32" S 71°56'01" W. NO LOCALITY DATA: LIRP 9079, 1 c&s, 51.8 mm SL; LIRP 10250, 9, 1 c&s, 55.8–74.9 mm SL; MZUSP 87209, 1, xr, 57.7 mm SL; UFRJ 397, 1 c&s, 43.1 mm SL; aquarium fish trade.

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