Zootaxa 1092: 21–30 (2005)
www.mapress.com/zootaxa/

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

1092

Description of a new *Batrochoglanis* species (Siluriformes, Pseudopimelodidae) from the rio Paraguai basin, State of Mato Grosso, Brazil

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Abstract

A new *Batrochoglanis* species, *B. melanurus*, is described from the córrego Cancela, affluent of rio Cuiabá, rio Paraguai basin, State of Mato Grosso, Brazil. The coloration pattern of the caudal fin, completely dark-brown, distinguishes this species from its congeners. Some additional morphometrical characters, such as head depth, pectoral-girdle width, adipose-fin base length and pelvic-fin length also separate this species from the others, except *B. villosus* (Eigenmann).

Key words: Neotropic, Rio Cuiabá, Rio Paraguai, taxonomy, catfishes

Resumo

Uma nova espécie de *Batrochoglanis*, *B. melanurus*, é descrita do córrego Cancela, afluente do rio Cuiabá, bacia do rio Paraguai, Estado do Mato Grosso, Brasil. O padrão de colorido da nadadeira caudal, completamente castanho-escuro, difere essa espécie de suas congêneres. Alguns caracteres morfométricos levantados, tais como a altura da cabeça, a largura da cintura peitoral, o comprimento da base da nadadeira adiposa e o comprimento da nadadeira pélvica também diferem essa espécie das demais, exceto de *B. villosus* (Eigenmann).

Palavras-chave: Região Neotropical, rio Cuiabá, rio Paraguai, taxonomia, bagres

Accepted by L. Page: 30 Sept. 2005; published: 8 Dec. 2005

Introduction

The genus *Batrochoglanis* was proposed by Gill (1858) for *Pimelodus raninus* Valenciennes. However, due to a series of later taxonomic mistakes, such as the lack of designation of a type-species (e.g. Gill, 1861; Bleeker, 1862) and incorrect identifications, this nominal genus was considered a synonym of *Pseudopimelodus* Bleeker, until its revalidation by Shibatta (2003a). According to this author, species of this genus have rounded, wider than deep bodies; large heads, rounded in dorsal view; pelvic fins originating at vertical line through dorsal-fin end; short caudal peduncles, with caudal-fin procurrent rays close to adipose and anal fins; emarginated caudal fins, with rounded lobes, or completely rounded; postcleithral processes surpassing pectoral-fin base, but not reaching vertical through dorsal-fin origin; axillary pore absent; incomplete lateral lines, sometimes surpassing the adipose-fin end, but never reaching caudal fin; premaxillary dentigerous plates with lateral margins posteriorly prolonged.

Currently, four *Batrochoglanis* species are known and distributed throughout the Amazon basin, rivers of the Ecuadorian and Colombian Pacific coast, and the northern region of South America (Shibatta, 2003a). No species has been described or mentioned from the rio Paraguai basin, a region with a different icthyofauna compared to the basins mentioned above. In recent samples from the rio Paraguai basin, five specimens of the genus *Batrochoglanis*, which belong to a new species, were captured. This new species is described herein.

Material and Methods

The following measurements were made on the left sides of the specimens, with a caliper to the nearest 0.05 mm: standard length (SL), eye diameter, interorbital width, snout length, mouth width (greatest distance between the left and right corners of the jaw), head depth at posterior margin of eyes, maxillary barbel length, head length (to the posterior margin of opercle bone), predorsal distance, dorsal-fin base length, adipose-fin base length, prepelvic length, pelvic-fin length, pelvic-fin to anal-fin length, body depth, caudal-peduncle depth, pectoral-girdle width, pectoral-fin spine length, dorsal-fin spine length, and anal-fin base length. Measurements related to the head are presented as percents of head length and those related to the body, including head length, are presented as percents of standard length. Meristic data of the fin rays and gill rakers were also taken.

Institutional abbreviations follow Leviton *et al.* (1985), with the addition of MZUEL (Museu de Zoologia da Universidade Estadual de Londrina), and NUP (Coleção Ictiológica do Núcleo de Pesquisas em Limnologia, Ictiologia e Aqüicultura da Universidade Estadual de Maringá).

Holotype. MZUSP 87240 (136.7 mm SL); córrego Cancela, affluent of rio Cuiabá, rio Paraguai basin; 14º42,501S/56º15,850W; Nobres; State of Mato Grosso; Brazil; 19 April 2000; col. Nupélia.

Paratypes (all from the same locality and collector as the holotype). NUP 3430 (92.8 mm SL); 14 December 2000. MZUEL 3669 (60.8 mm SL); 18 November 20002. MZUEL 3670 (51.7 mm SL); 18 November 20002. MZUEL 3671 (49.1 mm SL); 21 May 2003.

Diagnosis. The new species can be differentiated from all of its congeners by having a homogeneous dark-brown caudal-fin coloration pattern. In addition, it can be distinguished from *B. acanthochiroides* (Güntert) by having a deeper head (39.5 to 46.2 versus 26.0 to 38.7), a wider pectoral girdle (30.7 to 31.9 versus 28.4 to 30.4), and a longer adipose-fin base (16.0 to 21.5 versus 12.5 to 15.5); from *B. raninus* (Valenciennes) by a deeper head (39.5 to 46.2 versus 29.0 to 39.4); and from *B. transmontanus* (Regan) by having a longer adipose-fin base (16.0 to 21.5 versus 11.5 to 14.3), and a longer pelvic-fin length (19.8 to 22.4 versus 14.0 to 16.3).

Description. Morphometric data are presented in Table 1. Body depressed from snout to dorsal-fin origin, and posteriorly compressed. Profile gently convex from snout tip to dorsal-fin origin, slightly inclined upwards. Dorsal-fin base profile more pronouncedly convex, due to well developed musculature. Profile from dorsal-fin end to adipose-fin end almost straight (not considering adipose fin), inclined downwards. Dorsal profile more straight in young specimens (Fig. 2). Ventral profile from tip of lower jaw to anal-fin end slightly convex, almost straight. More straight on isthmus region. Profile pronounced convex in young specimens from pectoral girdle to pelvics, and from this point to anal-fin origin (Fig. 2). Procurrent rays present just after adipose and anal fins. Head large, its length about 3 times in SL; its width greater than its depth. Mouth terminal, with lower jaw a little shorter than superior. Adductor mandibulae muscles and rictal fold at the corners of the mouth well developed, giving thickset appearance to head and lower jaw. Opercular membrane large and well developed. Eye relatively small, in upper lateral position and covered by skin. Tubular anterior nostril over lip. Maxillary barbel surpassing distal opercle edge, sometimes reaching vertical through dorsal-fin origin in young specimens. Outer mental barbel reaching pectoral-fin base. Anterior cranial fontanelle extending slightly beyond posterior orbit border. Dorsal fin trapezoidal, with posterior border rounded and origin situated before midpoint of standard length; not reaching adipose-fin origin when adpressed; first lepidotrichium (“spinelet”) small and rigid, forming dorsal-fin locking mechanism; second ray elongated, forming spine; six branched rays. Adipose fin slightly elongated, with posterior border angular and free. Pectoral fin triangular, not reaching pelvic-fin origin when adpressed; first ray rigid and strongly serrate on both sides; six branched rays. Pelvic fin rounded, originating just after vertical through dorsal-fin end, reaching anal-fin origin when adpressed; one unbranched and five branched rays.

Anal fin rounded, its base length smaller than adipose-fin base; three to five unbranched rays and six or seven branched ones. Caudal fin almost rounded, with rounded lobes, with upper lobe longest in smaller specimens; 13 branched rays. Lateral-line pores present until just beyond adipose-fin end. Eight to eleven total gill rakers. Axillary pore absent.

TABLE 1. Morphometric data of the type-series of *Batrochoglanis melanurus* (n = 5 including the holotype), from "córrego" Cancela, rio Paraguai basin. SD: standard deviation.

Character	Holotype	Low-High	Mean and SD
Standard length (mm)	136.7	49.1–136.7	(78.2±37.01)
Percents of head length			
Eye diameter	8.1	8.1–13.38	(11.11±2.01)
Interorbital width	48.7	37.0–48.71	(41.5±5.38)
Snout length	39.6	35.0–39.55	(37.5±1.98)
Mouth width	71.6	57.3–71.62	(63.6±5.79)
Head depth	45.2	39.5–46.18	(42.7±2.85)
Maxillary-barbel length	91.8	91.8–140.50	(112.9±18.47)
Percents of standard length			
Head length	33.5	31.6–33.47	(32.7±0.92)
Predorsal distance	42.7	40.8–42.68	(42.0±0.68)
Dorsal-fin base length	15.6	15.1–16.33	(15.6±0.47)
Adipose-fin base length	17.8	16.0–21.54	(18.4±2.03)
Prepelvic length	57.1	55.2–57.10	(56.2±0.76)
Pelvic-fin length	19.8	19.8–22.38	(20.8±1.07)
Pelvic-fin to anal-fin length	20.3	18.9–20.95	(20.1±0.81)
Anal-fin base length	13.7	12.2–14.53	(13.4±0.93)
Body depth	25.8	20.5–26.46	(24.2±2.40)
Caudal-peduncle depth	13.4	11.3–13.38	(12.5±0.85)
Pectoral-girdle width	31.6	30.6–31.87	(31.3±0.52)
Pectoral-fin spine length	14.8	14.8–17.92	(17.1±1.31)
Dorsal-fin spine length	9.5	9.5–14.49	(13.3±2.14)

Color in alcohol. Coloration pattern variable with ontogenetic development. Largest specimen, the holotype, dark-brown with blotches light-brown irregularly disposed on dorsal, pectoral, pelvic and anal fins; adipose-fin anterior and posterior borders, nape, adductor mandibulae muscles region, and median region of the flank lighter than other parts of the trunk; caudal fin entirely dark-brown. Smaller specimens (three paratypes) with coloration pattern of body and pectoral and pelvic fins dark-blotched. Regions of head, just after nape, below dorsal and adipose fins, and caudal-fin base darkened by concentration of dark dots. Dorsal and anal fins dark with median hyaline band. Smaller specimens have a dark-colored tail similar to the holotype.

FIGURE 1. *Batrochoglanis melanurus*, MZUSP 87240, holotype, 136.7 mm SL; córrego Cancela, affluent of rio Cuiabá, rio Paraguai basin, State of Mato Grosso. Whitish coloration is due to dense mucus solidified after formalization.

FIGURE 2. *Batrochoglanis melanurus*, paratype, young specimen coloration, MZUEL 3669 (60.8 mm SL).

Distribution. The new species is known only from the type-locality, córrego Cancela, affluent of rio Cuiabá, rio Paraguai basin, State of Mato Grosso, Brazil (Fig. 3).

Etymology. The species name *melanurus*, from Greek *melan*, black, and *ouras*, tail, referring to the dark coloration of the caudal fin. An adjective.

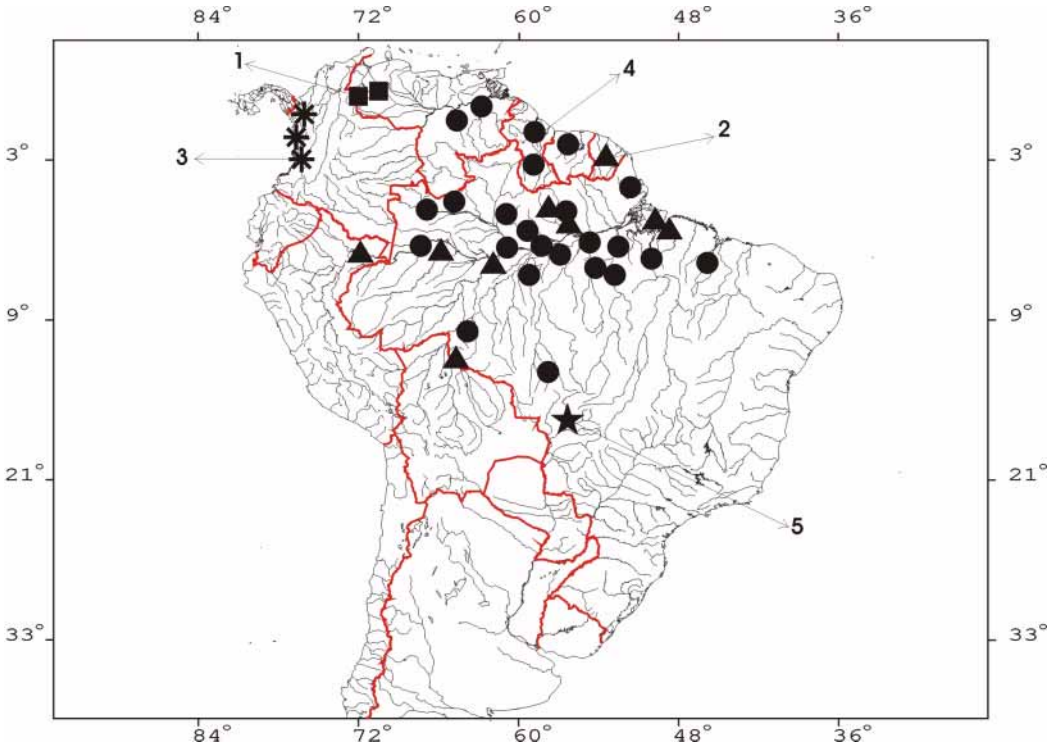

FIGURE 3. Partial map of South America showing geographic distribution (symbols) and type-locality (numbers) of *Batrochoglanis acanthochiroides* (square; 1= Santander); *B. raninus* (triangle; 2= La Mana); *B. trasmontanus* (asterisk; 3= Río San Juan); *B. villosus* (dot; 4= Potaro Landing); and *B. melanurus* (star; 5= córrego Cancela). Each symbol may represent more than one locality or lot.

Discussion

Whereas Lundberg *et al.* (1991) demonstrated the monophyly of the family (subfamily in that paper), and Shibatta (2003b) determined the phylogenetic relationships among the genera, the taxonomy of pseudopimelodid species remains obscure. Three color patterns of the caudal fin in *Batrochoglanis* species are known. The first pattern, in what is henceforth called the "*raninus* Group", containing *B. raninus*, *B. transmontanus* and *B. acanthochiroides*, is a light caudal fin, with a dark band on the posterior third. The second pattern, shown only in *B. villosus*, is a light caudal fin, with dark dots irregularly distributed. The third pattern, found only in *B. melanurus*, has the caudal fin completely dark. The coloration pattern is useful for separating species, but apparently does not allow inferences about phylogenetic relationships to be safely made, since this character is widespread in this family. A light caudal fin with a dark band is also displayed by species of *Pseudopimelodus*, and *Microglanis*, and the completely dark caudal fin probably arose independently in *Batrochoglanis*, *Cephalosilurus*, and *Microglanis*.

Otherwise, the variation in coloration of *B. melanurus*, from on ontogenetic perspective, suggests that the presence of dark blotches on the body is a plesiomorphic condition, and that the homogeneously dark coloration pattern of the body is an apomorphic condition. The same blotches occur in *B. villosus*, but with the formation of a homogeneous spotted pattern. The fact that the pattern with dark blotches is found in species of *Pseudopimelodus*, *Microglanis*, and *Cephalosilurus* reinforces this hypothesis. However, adults of *B. raninus* and *B. transmontanus* present a black body rather than a dark brown one, while in *B. acanthochiroides* it is spotted. The morphometric similarity between *B. melanurus* and *B. villosus* is perhaps the best clue to infer possible phylogenetic relationships. These two species would therefore compose a group, sister group of the "*raninus* Group".

The absence of the axillary pore in *B. melanurus* also occurs in the other species of the genus, as well as in *Microglanis* species. Shibatta (2003a) presumes that this character is synapomorphic for these two genera.

The type locality of *B. melanurus* is situated in the upper rio Paraguai basin, near the rio Arinos one of the headwaters of the rio Tapajós, a large tributary of the Amazon basin. Several specimens of *B. villosus* from the rio Tapajós basin were examined (see appendix); however, none presented a dark caudal fin. Even if there previously occurred an episode of ichthyofaunal transfer by headwater capture, the elapsed time since would be enough for the new population to establish a character that differentiates it from the others (assuming a sister-species relationship between *B. melanurus* and *B. villosus*). It is possible that other new species, sympatric to *B. melanurus* and related with Amazonian forms, will be discovered in the region.

Acknowledgements

We would like to thank Heraldo A. Britski (MZUSP) for being the first to suggest the species was probably new. For critically reading the manuscript, we are indebted to John J. Stanley and Weferson J. Graça (UEM/Nupélia), and for comparative material loans, we thank Osvaldo T. Oyakawa and José L. Figueiredo (MZUSP), Lúcia R. Py-Daniel (INPA), Richard P. Vari and Suzan L. Jewett (USNM), Norma Feinberg (AMNH), Sven O. Kullander (NRM), G. Duhamel (MNHN), Barry Chernoff (formerly at FMNH) and Scott A. Schaefer (formerly at ANSP). Thanks are due to Nupélia (Núcleo de Pesquisas em Limnologia, Ictiologia e Aqüicultura) for collecting the material and giving logistic support. Research associated with this study was supported by Furnas Centrais Elétricas and UEM/Nupélia. This study was partially supported by grants from CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico) to CSP. Both authors are participants of ASCI (All Catfish Species Inventory Project, NSF DEB-0315963).

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Appendix
Comparative material (with range of standard length in millimeters).

Batrochoglanis raninus. **FRENCH GUIANA**. MNHN (A9942), Syntype, Río La Mana (70.4). **BRAZIL**. Amazonas: MZUSP 6333, lago Castro, rio Purus mouth, 78.xi.1967 (50.0); MZUSP 23376, igarapé Manduaçu, paraná de IUPIÁ, NW de Fonte Boa, 8–9.x.1968 (8 ex., 49.2–75.0); MZUSP 23407, igarapé Tucuxi, Ati-Paraná, NW de Fonte Boa, 10.x.1968 (24 ex., 21.7–74.4). Pará: MZUSP 22126, rio Utinga, Belém, no date (7 ex., 27.9–38.5); MZUSP 22263, Paissandu, Oriximiná, x–xi.1959, (31.3); MZUSP 23023, rio Arani, Arari falls, Ilha de Marajó, vii.1965 (33.2); MZUSP 23029, igarapé Apéu, Boa Vista, Castanhal, vii.1965 (39.2); MZUSP 23659, igarapé Jaramacaru, affluent of rio Cuminá, 29.ix–1.x.1969 (13 ex., 16.5–29.4). Rondônia: INPA 9522, rio Guaporé, 5 km upstream Costa Marques, 20.xi.1983 (33.2). **PERU**: Depto Loreto: AMNH 78053, Río Tahuayo, affluent of Rio Amazonas, Huasi village, 8–9.vii.1987 (4 ex., 33.7–42.7).

Batrochoglanis villosus. **GUYANA.** FMNH 53219, Holotype, Potaro Landing, 1908 (118.0). PARATYPES: FMNH 53220, Kumaka, 1908 (61.9); FMNH 53571, Wismar, 1908 (38.0). NON TYPES: Essequibo: AMNH 04419, Río Potaro, Tumatumari, Summer of 1912 (88.6); AMNH 13658, Río Essequibo, Rockstone, x.1936 (102.5). **SURINAME**. Distrito Nickerie: AMNH 55370, stream opposite to camp, about 2 km downstream the Cow falls, 11.ix.1980 (4 ex., 25.8–78.1). **VENEZUELA.** Bolivar: ANSP 135756, Río Urbana (Urbani) at Maripa Las Trincheras road, 7º18N 65º 00W, 20.i.1977 (50.6); ANSP 135903, Río Caura at Jabillal, 6º 57N 64º 50W, 28.i.1977 (91.4); ANSP 139883, small affluent of Río Mato (left bank), 7º0865º10W, 1.ii.1977 (74.3); ANSP 160315, caño (probably caño Curino), affluent of Río Caura, near to confluence of Caura and Orinoco rivers, 7º3748”N 64º 5042”W, 22.xi.1985 (61.3). **Brazil.** Rondônia: INPA 9518, igarapé Jatuarana, about 2 km upstream Samuel dam, 6.ix.1985 (2 ex., 86.8–97.4). Amazonas: INPA 3088, rio Uatumã, Morena fall, 8.x.1987 (163.2); INPA 6589, rio Marauiá, affluent of rio Negro, 3.xii.1991 (119.2); MZUSP 6645, igarapé of the lago Manacapuru, 13.xi.1967 (88.2); MZUSP 7109, igarapé on the left side of the rio Canumã, Canumã, 28.xi.1967 (8 ex., 49.8–90.8); MZUSP 7296, igarapé of the rio Marau, Maués, 03.xii.1967 (2 ex., 61.1–61.6); MZUSP 7356, igarapé Limãozinho, Maués, 04.xii.1967 (26 ex., 44.4–110.1); MZUSP 7416, igarapé of lago Saracá, Silves, 6.xii.1967 (93.4); MZUSP 7445, rio Sanabani, Silves, 7–8.xii.1967 (2 ex., 52.80–85.10); MZUSP 7487, igarapé affluent of Sanabani, Silves, 7.xii.1967 (52.2); MZUSP 23301, rio Jauperi, beach 30 km upstream the mouth, 19.xi.1968 (35.6); MZUSP 23548, igarapé Açu, 7 km downstream Santo Antônio do Içá, left side of rio Solimões, 20.x.1968 (2 ex., 58.7–77.0); MZUSP 24903, lago Janauacá and surroundings, rio Solimões, ix.1976–i.1977 (178.1); MZUSP 30820, rio Tefé, Ipanema de baixa, 7.viii.1979 (6 ex., 34.8–89.0); MZUSP 31092, Rio Negro, São Gabriel da Cachoeira, 18.v.1979 (157.2); rio Negro, Barcelos, island lake, 29.ii.1980 (45.2); MZUSP 31095, rio Negro, São Gabriel falls, iv–v.1980 (145.1); MZUSP 31097,

upper rio Negro, São Pedro, junction of Igarapé do Igará, 23.v.1979 (194.2). Pará: INPA 4188, rio Xingu, Babaquara island, 5.x.1990 (77.5); INPA 5719, rio Trombetas, upstream Porteira fall, 20.iv.1985 (98.6); INPA 6800, rio Jamanxim, affluent of rio Tapajós, Terra Preta island, 20.x.1991 (2 ex., 41.0–42.6); INPA 6994, rio Tapajós, Pimental, 23.x.1991 (3 ex., 59.6–80.6); INPA 7085, rio Tapajós, Pimental, 22.x.1991 (117.2); INPA 9520, rio Tocantins, Tucuruí market, 4.ii.1981 (180.8); lago Jacaré, rio Trombetas, 7–11.x.1969 (49.8); MZUSP 8497, igarapé affluent of the left side of rio Mapiri, Santarém, 25.xii.1967 (51.0); MZUSP 8414, igarapé Jacundá, Alter do Chão, Santarém, 23.xii.1967 (58.3); MZUSP 21840, rio Tapajós, Lombo de Anta fall, near to São Luiz, 6.xi.1970 (108.6); MZUSP 23042, lago Jacaré, rio Trombetas, 29.ix–13.x.1965 (3 ex., 46.4–66.8); MZUSP 24061, rio Tocantins, igarapé Limão, Baião, 9.ix.1970 (39.0); MZUSP 24286, rio Tapajós, São Luiz, 5.xi.1990 (63.8); MZUSP 30823, rio Tapajós, Pederneiras, downstream Itaituba, 24.x.1983 (9 ex., 31.2–48.6); MZUSP 30826, rio Tapajós, São Luiz upstream Itaituba, 22.x.1983 (37.4); MZUSP 30836, rio Tapajós, Alter do Chão, beach north, 25.xi.1983 (138.8). Mato Grosso: MZUSP 37770, igarapé Tarumã, 10 km upstream rio Canumã mouth, Aripuanã, 16.xi.1987 (8 ex., 30.9–108.7); MZUSP 37786, igarapé do Poraquê, downstream Dardanelos, Aripuanã, 9.xi.1976 (6 ex., 36.3–107.2). Amapá: MZUSP 30822, rio Amapá, Cachoeira Grande, i.1984 (7 ex., 38.2–78.6); MZUSP 30825, rio Amapá, Cachoeira Grande, i.1984 (44.6). Maranhão: MZUSP 43596, lago dos Viana, Pindaré-Mearim system, 9.iv.1984 (145.4).

Batrochoglanis acanthochiroides. **VENEZUELA**. USNM 121270, Holotype, Maracaibo Lake basin, Río San Juan, affluent of Rio Motatan, 17–20.iii.1942 (106.00); Paratypes: VENEZUELA. USNM 121271, Río San Pedro, Río Motatan system, 20.iii.1942 (4 ex., 33.6–54.1); USNM 121273, Río San Juan, affluent of Río Motatan, 17.iii.1942 (2 ex., 51.0–80.4); USNM 121276, Maracaibo Lake basin: Río Machango, 21.iii.1942 (2 ex., 41.1–53.2); USNM 121278, Río Jimeles, affluent of Río Motatan, 24.iii.1942 (27.2); USNM 121279, Río Tachira, Río Catatumbo system, 01.iv.1942 (2 ex., 33.1–73.6).

Batrochoglanis transmontanus. **COLÔMBIA**. Antioquia. NRM 15990, Río Atrato drainage, Palo Branco, Caño Ogodó, about 1 km upstream village Palo Branco (6º11´N/76º42´W), 30.i.1989 (191.9); NRM 15992, Río Atrato drainage, Buchadó, river bank along village (6º25´N/76º46´W), 27.i.1989 (138.1). Choco. NRM 15994, Río Baudó drainage, Boca de Pepe, various tributaries and rivers close to village (5º4´N/77º3´W), 22.ii.1990 (58.4).

