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Microlepidogaster arachas, a new species of hypoptopomatine catfish (Siluriformes: Loricariidae) from the upper rio Paraná basin, Brazil

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Abstract

Microlepidogaster arachas Martins, Calegari & Langeani, **sp. nov.**, a new Hypoptopomatinae, is described from the upper rio Paraná basin. The new species is distinguished from *M. longicolla* and *M. dimorpha* by having the anterior portion of the compound supraneural plus first dorsal-fin proximal radial contacting the neural spine of the ninth vertebra. The new species differs from *M. perforatus* by having 18–29 dentary teeth; median series of lateral plates complete, reaching caudal-peduncle end, and continuous lateral line; and 20–24 mid-dorsal plates. *Microlepidogaster arachas* is further distinguished from its congeners by several other osteological features.

Key words: Hypoptopomatinae, Teleostei, Cascudinhos, neotropical, taxonomy, biodiversity

Resumo

Microlepidogaster arachas Martins, Calegari & Langeani, **sp. nov.**, um novo Hypoptopomatinae, é descrito para a bacia do alto rio Paraná. A nova espécie é distinguida de *M. longicolla e M. dimorpha* por apresentar a porção anterior do complexo supraneural mais o primeiro radial proximal da nadadeira dorsal contatando o espinho neural da nona vértebra. A nova espécie se diferencia de *M. perforatus* por ter 18–29 dentes no dentário; série mediana de placas laterais completa, atingindo o fim do pedúnculo caudal, e linha lateral completa; e 20–24 placas médio-dorsais. Adicionalmente, *Microlepidogaster arachas* se distingue de seus congêneres por diversas outras características osteológicas.

Palavras-chaves: Hypoptopomatinae, Teleostei, Cascudinhos, neotropical, taxonomia, biodiversidade

Introduction

Until recently, only *Microlepidogaster perforatus*, from the rio Carandaí in the upper rio Paraná basin, was the only known species in the genus. The type-species of *Microlepidogaster* was described by Eigenmann & Eigenmann (1889), who distinguished the new taxon based on the possession of the ventral surface covered with minute granular plates, dorsal fin inserted far posterior to the pelvic fins, and the temporal plate perforated. With exception of the posterior dorsal-fin insertion, that effectively distinguishes *Microlepidogaster* from most other genera, the other features are uninformative and do not diagnose it from the remaining members of the Hypoptopomatinae. Nevertheless, additional diagnostic features of *Microlepidogaster*, as well as its relationships with the remaining Hypoptopomatinae, are not clear and a revisionary study seeking to establish the taxonomic limits of *Microlepidogaster* is lacking.

The number of new species of Hypoptopomatinae described from the upper rio Paraná basin has been growing steadily in the last decade (Britski & Garavello 2003; Ribeiro *et al*. 2005; Ferreira & Ribeiro 2007; Calegari & Reis

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2010; Martins & Langeani 2011a,b; Martins & Langeani 2012). Recent studies demonstrated that the diversity within *Microlepidogaster* is also greater than previously recognized (Calegari & Reis 2010; Martins & Langeani 2011). Currently, three species are valid, *M. perforatus*, *M. longicolla* Calegari & Reis, 2010, and *M. dimorpha* Martins & Langeani, 2011, all from the upper Paraná basin. In the present paper we describe an additional new species from tributaries of the rio Araguari, rio Perdizes, and rio Dourados, all belonging to the upper rio Paraná basin, and discuss its relationships within the genus.

Material and methods

Measurements were made with digital calipers, point-to-point, on the left side of the specimens and to the nearest 0.1 mm, following Martins & Langeani (2011), with addition of the following measurements: caudal-peduncle depth (minimum height of caudal peduncle); caudal-peduncle width (caudal-peduncle width near to the end of adpressed anal fin); dorsal-fin unbranched ray length (from the base to the tip of the ray); anal-fin unbranched ray length (from the base to the tip of the ray); and nostril length (from the anterior to the posterior edge of the nostril). Morphometric data were expressed as percents of standard length (SL), except for measurements of the head, which were given as percents of head length (HL). Plate counts and nomenclature followed Schaefer (1997). Procurrent rays and vertebrae were counted only for cleared and stained (c&s) specimens, prepared according to Taylor & Van Dyke (1985). Vertebrae count included the five centra from the Weberian apparatus, and the compound caudal centrum counted as a single element. Dorsal-fin rays count included the spinelet as first unbranched ray. The mode of each count is given between parentheses after its respective count.

Institutional abbreviations are: AMNH (American Museum of Natural History, New York), DZSJRP (Coleção de Peixes do Departamento de Zoologia e Botânica do Instituto de Biociências, Letras e Ciências Exatas, UNESP, São José do Rio Preto), LBP (Laboratório de Biologia de Peixes, UNESP, Botucatu), MCP (Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre), MNRJ (Museu Nacional, Rio de Janeiro), MZUSP (Museu de Zoologia da Universidade de São Paulo, São Paulo).

Microlepidogaster arachas Martins, Calegari & Langeani, sp. nov.

(Figs. 1–4; Tables 1–2)

Type material. Holotype. DZSJRP 2999, male, 36.7 mm SL, Brazil, Minas Gerais State, stream at Sacramento Municipality, tributary to rio Araguari at road from Sacramento to Araxá, rio Paranaíba drainage, upper rio Paraná basin, 19°49’11”S 47°16’0”W, 13 Aug 1998, F. Langeani & J. I. Montoya-Burgos.

Paratypes. All from Brazil, rio Paranaíba drainage, upper rio Paraná basin. AMNH 256352, 3, 20.6–36.2 mm SL; DZSJRP 15808, 31 (3 c&s), 15.9–38.4 mm SL; LBP 10882, 3, 22.8–35.3 mm SL; MNRJ 39917, 3, 22.5–35.6 mm SL; MZUSP 110976, 3, 22.0–35.7 mm SL, collected with holotype. DZSJRP 5548, 11 (2 c&s), 15.6–36.3 mm SL, Minas Gerais State, Perdizes Municipality, unnamed stream at dirt road, near BR-262 road, tributary to rio Araguari, 19°36’49”S 47°26’45”W, 20 May 2003, F. Langeani *et al*. DZSJRP 8683, 6, 26–36.1 mm SL, Minas Gerais State, Monte Carmelo Municipality, córrego Rancharia at Castelhana farm 1, tributary to rio Perdizes, dirt road near BR-262 road, 18°52’14”S 47°23’47”W, 5 Sep 2006, F. Langeani *et al*. DZSJRP 8743, 9, 23.1–33.4 mm SL, Minas Gerais State, Araxá Municipality, córrego Santo Antônio, affluent to rio Capivara, tributary to rio Araguari, at dirt road, near BR-262 road, from Araxá to Uberaba, 19°34’43”S 47°9’20”W, 7 Sep 2006, F. Langeani *et al*. DZSJRP 9078, 17 (1 c&s), 35.5–43.4 mm SL, Minas Gerais State, Patrocínio Municipality, stream at country road, tributary to rio Dourados, left on Patrocínio-Coromandel road, 18°54’16”S 46°58’4”W, 11 Aug 2006, F. Langeani & F. R. Carvalho. DZSJRP 9082, 5, 24–33.1 mm SL, Minas Gerais State, Perdizes Municipality, unnamed stream, tributary to rio Araguari at dirt road, right on BR-262 road from Araxá to Uberaba, 19°35’30”S 47°25’22”W, 13 Aug 2006, F. Langeani & F. R. Carvalho. MCP 28333, 5 (1 c&s), 24–37.2 mm SL, Minas Gerais State, Ibiá Municipality, unnamed stream affluent to rio Quebra-Anzol, tributary to rio Araguari, at road from Ibiá to Argenita, 19°38’27”S 46°40’33”W, 27 Jan 2001, C. Lucena *et al*. MCP 28330, 16 (1 c&s), 27–40.4 mm SL, Minas Gerais State, Rio Paranaíba Municipality, unnamed stream, five kilometers from Rio Paranaíba Municipality, 19°09’05”S 46°15’47”W, 26 Jan 2001, C. Lucena *et al*. MCP 28319, 19 (3 c&s), 17.4–41 mm SL, Goiás State, Davinópolis Municipality, córrego Grande, at road Davinópolis to Paranaíba ferry, about one

kilometer of Davinópolis, 18°09’21”S 47°33’24”W, 22 Jan 2001, C. Lucena *et al.* MCP 28343, 6, 26–37 mm SL, Minas Gerais State, Argenita Municipality, unnamed stream on Argenita-Pratinha road, at Fazenda Santa Rosa, 19°42’07”S 46°38’56”W, 27 Jan 2001, C. Lucena *et al.* MCP 28359, 30, 23.8–37.7 mm SL, Minas Gerais State, Cruzeiro Fortaleza Municipality, córrego Jacú, at Rio Serra do Salitre-Brejo Bonito road, rio Quebra-Anzol basin, 19°00’23”S 46°39’37”W, 26 Jan 2001, C. Lucena *et al.* MCP 28280, 7, 24.2–35.8 mm SL, Minas Gerais State, Rio Paranaíba Municipality, ribeirão da Cachoeira, at Rio Paranaíba-Serra do Salitre road, rio Quebra-Anzol basin, 19°11’32”S 46°24’44”W, 26 Jan 2001, C. Lucena *et al.* MCP 44879, 11, 13.3–38.2 mm SL, Minas Gerais State, Patrocínio Municipality, unnamed stream, tributary to rio Quebra-Anzol, tributary at UHE Ponte Nova, 19°18’22”S 47°07’15”W, 14 Sep 2009, N. T. Junqueira. MCP 44878, 11, 21.8–35.5 mm SL, Minas Gerais State, Perdizes Municipality, unnamed stream, tributary to rio Quebra-Anzol, tributary at UHE Ponte Nova, 19°14’50”S 47°08’23”W, 15 Sep 2009, N. T. Junqueira. MCP 47026, 28, 25.2–38.1 mm SL, Minas Gerais State, Arax Municipality, córrego Dantas, tributary to rio Araguari, at BR-452 road, between Araxá and Uberaba, 19°31’13”S 47°05’35.3”W, 23 Jan 2012, R. Reis *et al*.

Diagnosis. *Microlepidogaster arachas* can be diagnosed from all congeners (except *M. perforatus*) by having the anterior portion of compound supraneural plus first dorsal-fin proximal radial contacting the neural spine of ninth vertebra (Fig. 2) (*vs*. compound supraneural plus first dorsal-fin proximal radial contacting neural spine of 10th or 11th vertebra in *M. longicolla*, and seventh vertebra in *M. dimorpha*). The new species is distinguished from *M. perforatus* by having 18–29 dentary teeth (*vs*. 11–15); median series of lateral plates complete, reaching caudal-peduncle end, and continuous lateral line (*vs*. median series of lateral plates terminating two plates before the end of the caudal peduncle, with non-perforated and missing plates in the middle of the series); and 20–24 mid-dorsal plates (*vs*. 9–13). Additionally, *M. arachas* can be distinguished from *M. perforatus* and *M. dimorpha* by having anterior portion of rostral plates with small pointed odontodes (*vs*. small rounded leaf-shaped odontodes); pectoral axillary slit present only in juveniles, absent in adults specimens (*vs*. pectoral axillary slit persistent, present in both juveniles and adults); and 21–24 mid-ventral plates (*vs*. 19–20 plates in *M. perforatus*, and 17–20 plates in *M. dimorpha*). Finally, the new species also differs from *M. perforatus* and *M. longicolla* by presenting mid-dorsal series of lateral plates surpassing the vertical through dorsal-fin length (*vs*. mid-dorsal plate series reduced, reaching the vertical through dorsal-fin base, however never surpassing the dorsal-fin length); and first rib attached to seventh vertebra (*vs.* first rib attached to 10th or 11th vertebra).

Description. Morphometric and meristic data in Tables 1 and 2. Dorsal body profile slightly convex from tip of snout to tip of supraoccipital; almost straight to caudal-fin origin. Ventral body profile almost straight from tip of snout to pelvic-fin origin; ascending from pelvic-fin origin to end of anal-fin base; straight to caudal-fin origin. Greatest body depth variable, at supraoccipital tip or at dorsal-fin origin. Greatest body width at opercle opening, gradually tapering towards snout and caudal fin. Caudal peduncle ellipsoid in transverse section, slightly flattened dorsally and ventrally. Head shallow; longitudinal crest and well-developed odontodes absent. Anterior margin of snout rounded in dorsal view; tip of snout with variable coverage, from many small plates to a pair of rostral plates, but frequently with naked area in its most anterior portion, more evident in juveniles; anterior odontodes small and pointed, equal in size to other on remainder head and body. Lateral plate series with enlarged odontodes concentrated along posterior plate margin. Odontodes of head and body not forming conspicuous rows. Eye small, dorsolaterally placed, not visible in ventral view. Iris operculum present. Compound pterotic quadrangular in shape, its posterior extension poor-developed, far from rib of sixth vertebra; pterotic fenestrae most irregular in shape and variable in size, small in dorsal and large in ventral portion of bone. Infraorbital canal entering infraorbital series via sphenotic. Supraoccipital not contributing to dorsal wall of swimbladder capsule.

Body entirely covered by dermal plates, except on ventral part of head, region overlying opening of swimbladder capsule, around pelvic-fin origin and region in front of urogenital opening. Abdomen generally entirely covered by small-sized plates randomly distributed.

Lips roundish, papillose; lower lip larger than upper lip, not reaching pectoral girdle; papillae gradually smaller to lip edge. Maxillary barbel reduced, free from oral disk. Teeth slender and bifid; median cusp larger and rounded, lateral smaller and pointed. Premaxillary teeth 16–30 (20/27). Dentary teeth 18–29 (22). Premaxillary and dentary accessory teeth present only in juveniles, under 23.0 mm SL.

Dorsal-fin rays ii,6–7(7); originating approximately at vertical through middle of pelvic-fin length; tip of adpressed rays surpassing vertical through middle of anal-fin length; spinelet small, somewhat triangular in shape, locking mechanism non-functional. Anterior portion of compound supraneural plus first dorsal-fin proximal radial

contacting neural spine of ninth vertebra. Pectoral-fin rays i,5–6(6); originating immediately behind opercular opening; tip of adpressed rays surpassing vertical through end of pelvic-fin base. Cleithrum and coracoid exposed only laterally, median portion covered by small plates. *Arrector fossae* partially enclosed by ventral lamina of coracoids, opening relatively ample, extending laterally halfway towards pectoral-fin base; opening region of *arrector fossae* frequently covered by small abdominal plates in adults, these plates eventually fused to each other or to pectoral girdle (Fig. 3). Pectoral axillary slit present only in juveniles. Pelvic-fin rays i,5; unbranched ray shorter than branched rays. Anal-fin rays i,5–6(5). Caudal-fin rays i,12–14(14),i; concave; lobes equal in size; 4 dorsal and 3–5(3) ventral procurrent rays. Adipose fin and azygous plates absent. Median lateral plate series 25–28(27); complete from compound pterotic to caudal-fin base. Vertebrae 31.

FIGURE 1. *Microlepidogaster arachas*, DZSJRP 2999, holotype, male, 36.7 mm SL, Brazil, Minas Gerais State, rio Paranaíba drainage.

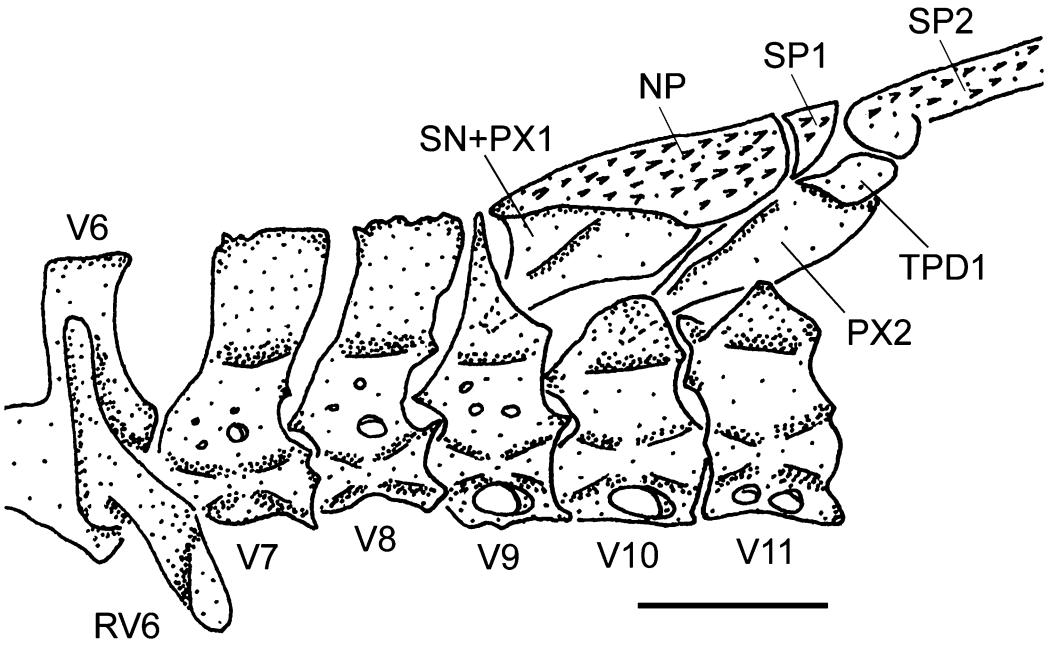

FIGURE 2. Anterior portion of axial skeleton and dorsal-fin supports (left side, lateral view) of *M. arachas*, DZSJRP 5548, 26.7 mm SL. Scale bar = 1mm. Vertebrae count included five from the Weberian apparatus. PX2 = compound proximal and medial radial 2; RV6 = rib of sixth vertebra; SN+PX1 = compound supraneural first dorsal-fin proximal radial; SP1 = dorsal-fin spinelet; SP2 = dorsal-fin spine; TPD1 = transverse process of first dorsal-fin pterigyophore; V6–11 = vertebrae 6–11.

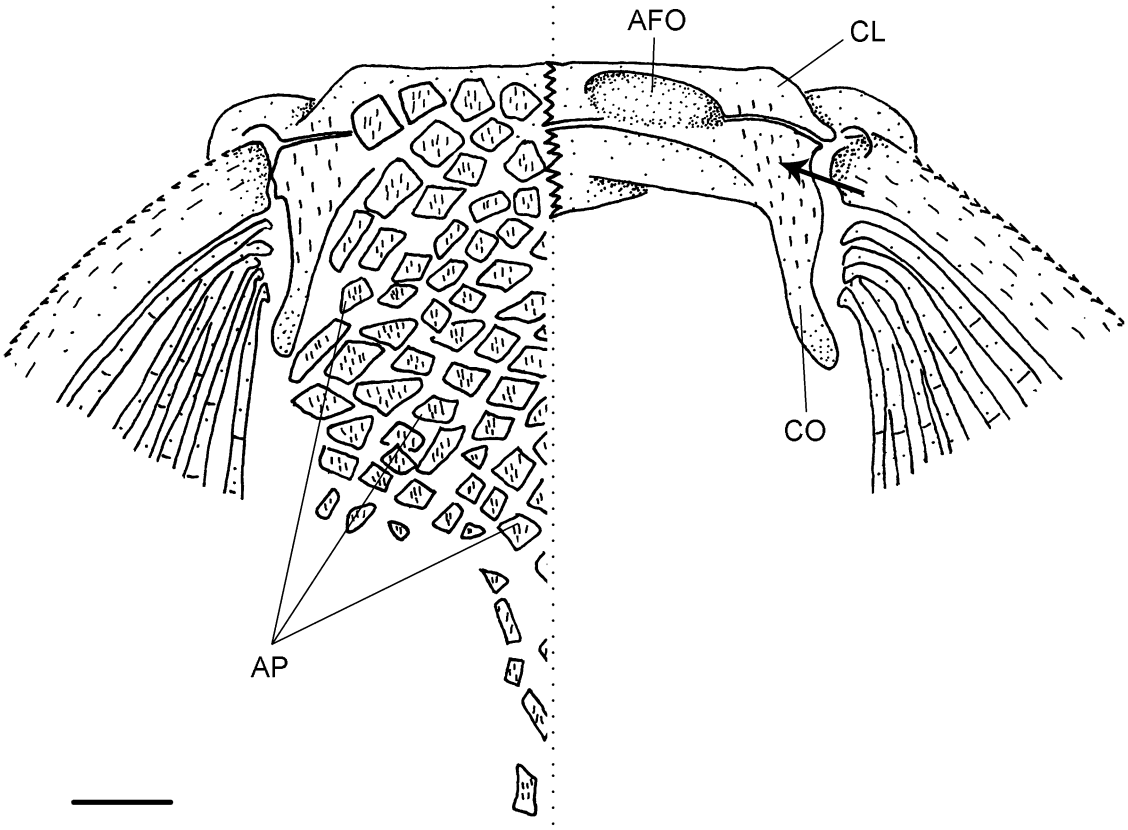

FIGURE 3. Pectoral girdle and abdominal platelets, ventral view, *M. arachas*, DZSJRP 9078, 39.4 mm SL. Anterior to top. Scale bar = 1mm. Platelets removed in left side. Arrow indicates the pectoral girdle exposition. AP = abdominal plates; AFO = *arrector fossa* opening; CL = cleithrum; CO = coracoid.

TABLE 1. Morphometric data for *Microlepidogaster arachas*, holotype (H) and 29 paratypes; range includes holotype. SD = standard deviation. Diagnostic values for *M. longicolla* are in italic, and bold for *M. perforatus*.

Character	H	Minimum	Maximum	Mean	SD
Standard length (mm)	36.7	29.6	43.35		
Percents of standard length					
Predorsal length	47.7	43.7	50.4	47.0	1.6
Preanal length	57.3	55.7	61.6	58.2	1.4
Prepectoral length	25.2	22.6	27.0	24.9	1.1
Prepelvic length	38.2	33.9	40.3	37.4	1.7
Thoracic length	16.8	13.4	18.7	15.8	1.4
Abdominal length	19.8	18.4	24.5	21.5	1.3
Caudal-peduncle depth	*9.5*	*8.1*	*10.3*	*9.4*	*0.6*
Caudal-peduncle length	*35.8*	*32.3*	*36.4*	*35.0*	*1.2*
Caudal-peduncle width	*10.0*	*7.7*	*10.3*	*9.1*	*0.7*
Head length	31.6	29.1	33.4	31.1	1.2
Head depth	15.3	14.0	16.3	15.0	0.7
Cleithral width	23.6	21.1	27.2	23.3	1.4
Base of dorsal fin length	11.5	9.2	13.1	11.4	0.9
Dorsal-fin unbranched ray length	20.3	18.7	23.3	20.2	1.0
Pectoral-fin unbranched ray length	19.7	18.1	23.4	20.5	1.4
Pelvic-fin unbranched ray length	16.1	13.9	20.1	16.5	1.7
Anal-fin unbranched ray length	17.1	14.2	20.3	17.4	1.2
Dorsal to anal fin length	19.3	18.7	22.1	20.3	0.9
Snout-opercle length	25.1	23.1	26.4	24.8	0.9
Percents of head length					
Head width	**71.2**	**71.2**	**79.5**	**75.6**	**2.4**
Head depth	48.4	42.4	52.1	48.3	1.9
Snout length	53.8	51.8	57.1	54.5	1.2
Orbital diameter	12.8	12.2	14.9	13.5	0.9
Interorbital length	36.8	36.3	43.2	39.8	2.0
Maxillary barbel length	4.5	3.0	6.0	4.7	0.8
Prenasal length	32.4	29.5	36.8	33.7	1.5
Internasal length	8.7	7.5	11.7	9.1	1.1
Nostril width	8.7	7.9	11.0	9.2	0.9
Nostril length	13.8	11.3	17.1	14.1	1.6
Suborbital depth	**27.2**	**24.4**	**29.6**	**26.6**	**1.1**

Coloration in alcohol. Ground color of dorsal surface of head and body light to median brown, darker along head; pale-yellow, mostly unpigmented ventrally. Dark brown stripe inconspicuous on lateral surface of head and body, beginning laterally on snout tip and extending to end of caudal peduncle. Four dorsal dark brown saddles, mostly restricted along dorsal midline and barely extending laterally and ventrally, sometimes fused to each other forming dark brown mid-dorsal line from dorsal-fin origin to end of caudal peduncle. First saddle at dorsal-fin origin, second behind dorsal-fin base, third and fourth (most inconspicuous) between dorsal and caudal fins. Head with two light stripes from snout tip to compound pterotic, passing through nares, eyes, and dorsal orbital rim.

Ventrolateral margin of head from snout tip to opercle and pectoral-fin insertion creamy white. All fins with hyaline membranes and light brown rays, slightly darker and more conspicuous on unbranched rays. Caudal fin ranging from almost entirely dark brown with distal border hyaline, in most melanic specimens, to median brown, except for distal tip of rays and small round areas on median portions of dorsal and ventral lobes.

TABLE 2. Frequency distribution of meristic data for *Microlepidogaster arachas*, holotype, 29 paratypes in alcohol, and 4 c&s paratypes. Procurrent rays and vertebrae counts were made only in c&s specimens. Holotype values are marked with an asterisk. Diagnostic values for *M. perforatus* are in bold.

Character	Frequency distribution	Range	Mode
Dorsal plates	25(4), 26(11), 27(15)*	25–27	27
Mid-dorsal plates	20(9), 21(13), 22(7)*, 24(1)	20–24	21
Median plates	25(1), 26(5), 27(16)*, 28(8)	25–28	27
Mid-ventral plates	21(6), 22(12), 23(8), 24(4)*	21–24	22
Ventral plates	20(1), 21(3), 22(9), 23(11), 24(3)*, 25(1), 26(2)	20–26	23
Premaxillary teeth	16(1), 18(1), 20(4), 21(2), 22(2), 23(3), 24(3), 25(3), 26(1), 27(4)*, 28(2), 29(3), 30(1)	16–30	20/27
Dentary teeth	18(3), 19(3), 20(3), 21(4), 22(5)*, 23(2), 24(3), 25(1), 26(1), 27(2), 29(3)	18–29	22
Dorsal-fin branched rays	6(1), 7(29)*	6–7	7
Pectoral-fin branched rays	5(1), 6(29)*	5–6	6
Pelvic-fin branched rays	5(30)*	-	5
Anal-fin branched rays	5(29)*, 6(1)	5–6	5
Caudal-fin branched rays	12(1), 14(28)*	12–14	14
Dorsal procurrent rays	4(4)	-	4
Ventral procurrent rays	3(2), 5(1)	3–5	3
Vertebrae	**31(4)**	-	**31**

Sexual dimorphism. Males with a conspicuous urogenital papillae immediately posterior to anus (*vs*. absent in females); an expanded flap of skin on dorsal surface of first pelvic-fin ray (*vs*. absent in females); and pelvic fin almost reaching anal-fin origin (*vs*. pelvic fin far from anal-fin origin in females).

Distribution. *Microlepidogaster arachas* is known from tributaries to rio Araguari, rio Perdizes, and rio Dourados, all pertaining to the rio Paranaíba drainage, upper rio Paraná basin (Fig. 4).

Remarks. *Microlepidogaster arachas* is widely distributed at rio Paranaíba basin, its extent of occurrence is about 14.016 km^2 (measured by the minimum convex polygon, using GeoCat software – Geospatial Conservation Assessment Tool). The species is common and abundant (known from 15 localities), and we did not recognize any threats that may endanger it. Therefore, following IUCN criteria, we suggest that this species would fit the Least Concern (LC) category.

Etymology. The specific epithet *arachas* is a reference to the native people Arachás who once lived in the area drained by the rio Araguari (rio das Velhas), type-locality of the new species, and were exterminated by the Caiapós in 1750s. In the Tupi language *Araxá* means high place where sun can be seen first, thus Arachás were the ones that inhabited the highlands of southeastern Minas Gerais State. A noun in apposition.

Discussion

Schaefer (1998) suggested five non-exclusive synapomorphies of *Microlepidogaster*, and among these features *M. arachas* shares only the dorsal fin positioned posteriorly in the body (synapomorphy modified by Calegari & Reis 2010), presenting the compound supraneural plus first dorsal-fin proximal radial (SN+PX1) contacting the neural spine of ninth vertebra (char. 26: state 1; Schaefer 1998). This synapomorphy can also be observed in *M. perforatus* and *M. longicolla*, although the contact of SN+PX1 may occur in the eighth or ninth vertebra for the former

species, and in the 10th or 11th for the latter one. This condition is absent only in *M. dimopha*, which presents the SN+PX1 contacting mainly the neural spine of seventh vertebra but with the posterior extension contacting also the eighth centrum. The presence of a pair of rostral plates (char. 34: state 1; Schaefer 1998) is another synapomorphy of the genus and is shared only by *M. perforatus* and *M. dimorpha*. *Microlepidogaster arachas* is polymorphic for this character (ranging from many platelets or just a pair of median rostral plates, frequently with a naked area at anterior portion of snout), whereas *M. longicolla* always presents the anterior portion of snout naked. Among the other three remaining synapomorphies suggested by Schaefer (1998), the presence of a pair of anterior processes in the supraneural (char. 28: state 1; Schaefer 1998), and the median series of lateral plates truncated in the posterior portion, without the last one or two plates, such that the last plates of dorsal and ventral series contact each other in the midline (char. 33: state 1; Schaefer 1998), seem to be autapomorphies of the type-species, *M. perforatus*, as already suggested by Calegari & Reis (2010) and Martins & Langeani (2011b). Additionally, all species of *Microlepidogaster* share the presence of the *levator crest* on the hyomandibula (char. 14, basal state for this character), which Schaefer (1998) considered as absent in *M. perforatus*.

Microlepidogaster arachas also shares the dorsal fin located more posteriorly relative to the supraoccipital with *Rhinolekos* Martins & Langeani, 2011 and *Epactionotus* Reis & Schaefer, 1998, a feature that seems to have had independent origins within the Hypoptopomatinae. The new species can be easily distinguished from *Rhinolekos* by the absence of the lateronasal plate (*vs.* presence of lateronasal plate in all species of the genus. From *Epactionotus*, *M. arachas* differs by presenting the tip of snout with many small plates or a pair of rostral plates not ventrally deflected, bearing small odontodes (*vs*. a single rostral plate ventrally deflected, bearing well-developed odontodes); a fleshy flap on dorsal surface of first pelvic-fin ray in males (*vs.* absent) and by dentary and premaxillary accessory teeth absent in adults (*vs.* presence of accessory teeth in both, juvenile and adult specimens, see Reis & Schaefer 1998).

Furthermore, *M. arachas* is morphologically similar to *M. longicolla* by frequently presenting small plates in the snout, leaving a naked area in its most anterior portion, and pectoral axillary slit and accessory teeth in premaxillary and dentary only in juvenile specimens. According to Martins (2012), these features are observed for the most of Neoplecostominae (such as *Neoplecostomus* Eigenmann & Eigenmann, 1888, and *Pareiorhina* Gosline, 1947), Delturinae (such as *Hemipsilichthys* Eigenmann & Eigenmann, 1889), and some basal members of Hypoptopomatinae (such as *Rhinolekos* and *Pseudotocinclus* Nichols, 1919, and *Parotocinclus jumbo* Britski & Garavello, 2002, the last just for the pectoral axillary slit) which suggest that these characteristics may be plesiomorphic within the subfamily. Thus, *M. longicolla* and *M. arachas* are probably basal members within *Microlepidogaster*, and the genus is likely to be basal within the subfamily.

The occurrence of *M. arachas* and *M. longicolla* in the headwaters of the rio Paranaíba basin, also observed in *Rhinolekos*, could be another indication of the basal position of *Microlepidogaster* within Hypoptopomatinae. The Central Brazilian shield was already suggested by many authors to be an ancestral area for many fish groups (Ribeiro *et al*. 2004; Ribeiro 2006; Menezes *et al*. 2008; Lima & Ribeiro 2011). Additionally, the occurrence of *Plesioptopoma* Reis, Pereira & Lehmann, 2012 in the headwaters of the rio São Francisco, and of *Gymnotocinclus* Carvalho, Lehmann & Reis, 2008 in the headwaters of the rio Tocantins, suggests that the central Brazilian shield shelters the most basal members of Hypoptopomatinae, and likely to be the area where the subfamily originated.

Moreover, Pavanelli & Britski (1999) suggest that the rio Paranaíba basin has high endemism, with an ichthyofauna somewhat distinct from that of the rest of the upper rio Paraná basin. This seems to be the case of some hypoptopomatine species, such as *M. arachas*, *M. longicolla*, *Hisonotus piracanjuba* Martins & Langeani, 2012, and *Rhinolekos* species, all recently described and endemic to this portion of the basin.

Comparative material. *Microlepidogaster dimorpha*, DZSJRP 8750, 19 paratypes (2 c&s), 19.8–37.7 mm SL; DZSJRP 10543, holotype, 37.6 mm SL; DZSJRP 12332, 17 paratypes (2 c&s), 20.3–34.1 mm SL. *M. longicolla*, DZSJRP 12453, 5 paratypes, 40.8–44.8 mm SL; MCP 44877, holotype, 39.8 mm SL; MCP 23323, 13 paratypes (5 c&s), 18.5–42.5 mm SL; MCP 23322, 10 paratypes, 18.1–36.5 mm SL; MCP 23324, 1 partype, 38.3 mm SL; MCP 23325, 12 paratypes, 19.3–41.2 mm SL; AMNH 251432, 5 paratypes, 23.5–35.7 mm SL; LISDEBE 2662, 3 paratypes, 33.3–36.8 mm SL. *M. perforatus*, MCZ 8181, holotype, 32 mm SL; MCP 17717, 4 (1 c&s), 14.7–34.5 mm SL; MNRJ 31886, 13 (2 c&s), 27.6–32.9 mm SL; ANSP 174718, 1 (1 c&s), 28–32.4 mm SL.

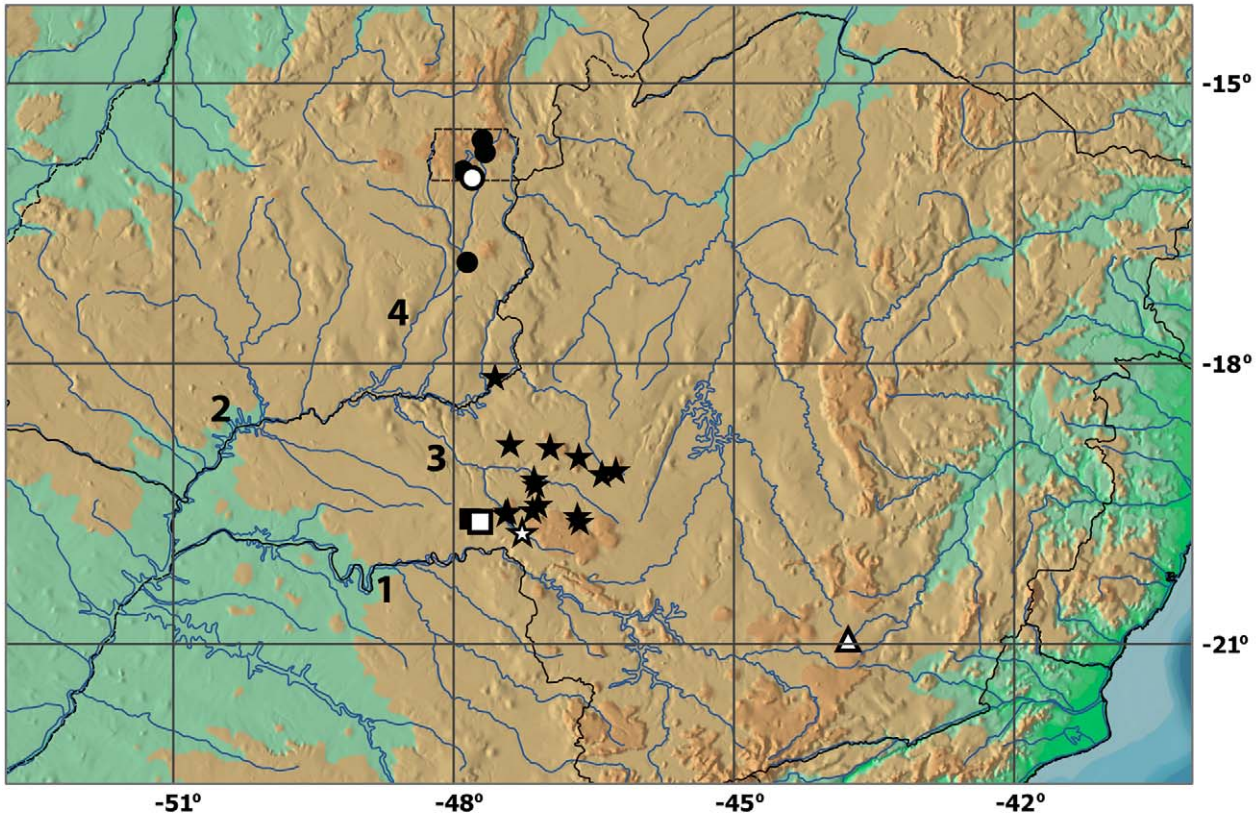

FIGURE 4. Geographic distribution of *Microlepidogaster arachas* (star), *M. dimorpha* (square), *M. longicolla* (circle) and *M. perforatus* (triangle). Open symbols represent type-localities. Some symbols represent more than one lot or locality. 1—rio Grande; 2—rio Paranaíba; 3—rio Araguari; and 4—rio São Bartolomeu.

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