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A new species of *Aspidoras* Ihering (Siluriformes: Callichthyidae: Corydoradinae) from the Rio Xingu Basin, Pará, Brazil

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Abstract

A new species of *Aspidoras* is described from an unnamed stream in the Rio Xingu Basin, Castelo de Sonhos municipality, Pará State, representing the northernmost record of the genus along the edge of the Brazilian Shield in the Amazon Basin. *Aspidoras marianae* is easily distinguished from all congeners in having minute odontode-bearing platelets scattered over the surface of the snout region, minute platelets between the parieto-supraoccipital process and the nuchal plate, and other shared features related to color pattern, morphometrics, meristics and morphological data. Comments about exclusive and shared features are presented.

Key words: *Aspidoras brunneus*, *A. microgaleus*, Endemism, Rio Iriri, Amazon basin

Introduction

The genus *Aspidoras* Ihering (1907) is currently composed of 21 valid species distributed among several river basins of Central, Northern and Northeastern Brazil (Britto, 2000; Eschmeyer, 2015). The largest taxonomic revision of the genus was presented by Nijssen & Isbrücker (1976), who analyzed the species known at that time, providing redescriptions and describing nine new species. According to Reis (1998) and Britto (2003), the genus is a natural group, based on morphological structures analyzed in a phylogenetic paradigm. Some estimates of alleged relationships between subgroups have been proposed (Britto, 1998; Lima & Britto, 2001; Britto *et al.*, 2005; Wosiacki *et al.*, 2014) based on shared characters, but without a more comprehensive parsimony analysis, and by Alexandrou *et al.* (2011) based on maximum likelihood and bayesian analyses of mitochondrial and nuclear DNA sequences.

Nine species of *Aspidoras* are known from the Amazon Basin, all but one of which [*A. cf. pauciradiatus* (Weitzman & Nijssen)] is restricted to headwater and middle portions of rivers of the Brazilian Shield. A number of recent surveys have revealed an increasing number of new species that have been described in the last two decades (Britto, 1998; Britto *et al.*, 2002; Wosiacki *et al.*, 2014), demonstrating that knowledge about the diversity of the fish fauna in this region remains limited. A collecting trip to the Castelo de Sonhos municipality in the Rio Xingu basin, Pará State, revealed a new species of *Aspidoras* that is described in this paper, constituting the northernmost record of the genus for the Amazon Basin in the Brazilian Shield.

Material and methods

Morphometric and meristic data were taken following Reis (1997), with the addition of the length of the ossified portion of pectoral spine, which was measured from the articulation between the spine and pectoral girdle to its distal tip. Measurements were obtained with calipers to 0.1 mm. Teeth and vertebrae counts were taken from

cleared and stained specimens according to Taylor & Van Dyke (1985). Vertebrae counts included only free centra, with compound caudal centra (pre-ural 1+ ural 1) counted as a single element. The frequency of each count is provided in parentheses after the respective count in the description, below. Counts from the holotype are indicated by an asterisk. Osteological terminology follows Reis (1998), except for the use of parieto-supraoccipital instead of supraoccipital (Arratia & Gayet, 1995) and compound pterotic instead of pterotic-supracleitrum (Aquino & Schaefer, 2002). Nomenclature of latero-sensory canals follows Schaefer & Aquino (2000). Homologies of barbels follow Britto & Lima (2003). Institutional abbreviations are: INPA (Instituto Nacional de Pesquisas da Amazônia, Manaus), MCP (Museu de Ciências e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre), MNRJ (Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro), MPEG (Museu Paraense Emílio Goeldi, Belém), MZUSP (Museu de Zoologia da Universidade de São Paulo, São Paulo).

Aspidoras marianae, new species

(Fig. 1; Table 1)

Holotype. MPEG 26409, 28.5 mm SL, Brazil, Pará, Castelo de Sonhos municipality, unnamed stream tributary to the Rio Curuá, itself a tributary to the Rio Iriri, Rio Xingu basin, 8°26'44.7"S, 55°09'25.0"W, 15 Aug 2012; M. B. Mendonça.

Paratypes. 12 specimens. All collected with the holotype: MPEG 26408, 3 + 3 cs, 17.8–28.5 mm SL. MNRJ 43440, 2, 18.7–21.2 mm SL. MCP 48790, 2, 19.0–19.6 mm SL. INPA 48537, 2, 18.8–21.7 mm SL.

Diagnosis. *Aspidoras marianae* differs from its congeners by the presence of minute odontode-bearing platelets scattered over surface of snout region (Fig. 2; vs. absence). The new species can be distinguished from its congeners, except *A. taurus*, by the presence of infraorbital 1 and 2 covered by thick skin and not visible externally (vs. externally visible); and from *A. taurus* by the possession of minute platelets between parieto-supraoccipital process and nuchal plate (vs. absence).

Additionally, the new species can be distinguished from *Aspidoras microgaleus* and *A. belenos* by the presence of three nasal pores (vs. two); from *A. velites* by presenting ventral laminar expansion of the first infraorbital conspicuously expanded (Fig. 3; vs. very reduced, almost absent in some specimens); by the number of dorsal-fin rays, II,7,i (vs. II,7–II,8); the reduced number of ventrolateral body plates, 22–23 (vs. 24–26); the greater depth of body, 28.0–31.0% SL (vs. 15.0–20.3%); the greater maximum cleithral width, 24.1–28.5% SL (vs. 12.5–17.1%); the greater head depth, 68.2–83.0% HL (vs. 53.2–64.6%); the greater least interorbital distance, 49.9–58.6% HL (vs. 30.3–38.3%); and the greater least internareal distance, 26.9–31.8% HL (vs. 11.1–17.9%). From *A. microgaleus* it is easy to distinguish by the greater head length, 32.5–38.6% SL (vs. 25.4–28.7%); the greater horizontal orbit diameter, 18.9–23.5% HL (vs. 10.1–17.0%); the reduced number of total free vertebrae, 23 (vs. 25); the first infraorbital notoriously expanded ventrally (Fig. 3, vs. not expanded); and the anal fin with a diffuse blotch restricted to the base of the last two rays, and one blotch each over third and fourth branched rays (vs. two series of dots on all rays). From *A. belenos* and *A. brunneus*, it differs by the overall coloration in a roughly marbled pattern (Fig. 1) (vs. characterized by stripes; Britto *et al.*, 2002: figs. 1, 2, and/or solid, uniform coloration; Nijssen & Isbrücker, 1976: fig. 7). Also from *A. belenos* by conical serrations on the pectoral-fin spine (vs. bifid serrations).

Description. Small species, largest specimen 28.5 mm SL. Morphometric data presented in Table 1. Head slightly compressed, with convex dorsal profile. Snout rounded in dorsal view. Dorsal profile of body convex from snout dorsal-fin base; slightly concave from last dorsal-fin ray to caudal peduncle. Ventral profile of body slightly convex from snout to pelvic girdle region; straight from this point to anal-fin origin; markedly concave from first anal-fin ray to caudal-fin base. Body roughly elliptical in cross-section at pectoral girdle, gradually more compressed toward caudal fin.

Eye rounded, dorsolaterally on head. Orbit delimited dorsally by frontal and sphenotic, anteriorly by lateral ethmoid, and ventral and posteriorly by infraorbitals. Anterior and posterior nares very close, separated by thin skin flap. Anterior naris tubular.

Small papillae on surface of snout. Mouth small and subterminal. One pair of maxillary barbels and two pairs of mental barbels. Maxillary barbel not reaching limit of gill opening ventrally. Maxillary barbel slightly longer than outer mental barbel. Inner mental barbel fleshy, nearly one-fourth of outer mental barbel length. Minute

rounded papillae over all barbels and upper and lower lips. Minute odontode-bearing platelets scattered over surface of snout region (Fig. 2).

Gill membranes united to isthmus. Four branchiostegal rays covered by thick layer of skin; distal two rays united at their tips by branchiostegal cartilage. Teeth on upper pharyngeal tooth plate 21(1), 24(1) or 25(1) in two rows, and on fifth ceratobranchial 22(1), 25(1) or 26(1) aligned in one row. Minute vermiculate platelets homogeneously scattered over entire surface between isthmus and pelvic region (Fig. 4).

Nasal, frontal, sphenotic, parieto-supraoccipital and compound pterotic visible externally, all covered by thin layer of skin and bearing minute scattered odontodes. Two cranial fontanels; anterior small, ovoid, delimited by frontal bones, its posterior margin contacting anterior margin of parieto-supraoccipital; posterior rounded and smaller than anterior fontanel, restricted to middle of parieto-supraoccipital.

Nasal slender, slightly curved, inner margin contacting frontal. Frontal quadrangular, anterior extension contacting nasal bone. Posteriorly, frontal contacts sphenotic and parieto-supraoccipital. Sphenotic quadrangular, contacting parieto-supraoccipital dorsally, compound pterotic posteriorly and infraorbital 2 ventrally. Compound pterotic anterior portion contacting sphenotic anteriorly and parieto-supraoccipital dorsally; posterior portion contacting first dorsolateral body plate dorsally and first lateral line ossicle posteriorly. Ventrally, compound pterotic contacting opercle and cleithrum. Parieto-supraoccipital quadrangular, with elongated posterior process separated from nuchal plate by one dorsal body plate. Minute platelets between these elements (Fig. 5). Two infraorbital bones, both covered by thick skin and not visible externally; first infraorbital notoriously expanded (Fig. 3). Opercle exposed, ovoid and roughly elongated. Preopercle externally visible, slender and covered by thin layer of skin. Interopercle quadrangular, covered by thin layer of skin.

TABLE 1. Morphometric data of holotype and 12 paratypes of *Aspidoras marianae*. Ranges include the holotype.

	Holotype	Paratypes	
		Mean	Range
Standard length	28.5	21.8	17.8–28.5
Percents of standard length			
Depth of body	28.5	29.2	28.0–31.0
Predorsal distance	40.0	44.3	40.0–46.7
Prepelvic distance	43.8	47.0	43.8–50.1
Preanal distance	73.1	75.3	73.1–78.3
Preadipose distance	78.4	79.7	74.7–84.5
Length of dorsal spine	14.7	13.7	11.8–15.9
Length of pectoral spine	17.3	16.9	15.9–18.5
Length of adipose-fin spine	9.0	9.7	8.3–11.7
Depth of caudal peduncle	14.4	15.0	14.4–15.9
Dorsal to adipose distance	22.6	21.7	20.2–23.3
Length of dorsal-fin base	17.1	17.0	15.6–19.1
Maximum cleithral width	24.1	27.1	24.1–28.5
Head length	32.5	35.9	32.5–38.6
Length of maxillary barbel	14.7	16.2	14.5–18.7
Percents of head length			
Head depth	83.0	75.4	68.2–83.0
Least interorbital distance	40.5	43.6	38.7–48.3
Horizontal orbit diameter	19.0	20.6	18.9–23.5
Snout length	42.5	44.0	35.4–51.7
Least internareal distance	28.3	29.2	26.9–31.8



FIGURE 1. *Aspidoras marianae*, holotype, MPEG 26409, 28.5 mm SL, Castelo de Sonhos municipality, unnamed stream, Rio Xingu basin, Pará, Brazil. Left lateral, dorsal, and ventral views.

Trunk lateral line composed of one perforated dorsolateral body plate (third) and two laterosensory canals, reduced to small ossicles. Lateral line canal entering neurocranium through compound pterotic, splitting into three branches before entering sphenotic: pterotic, preoperculomandibular, and postero-lateral, each with single pore. Postero-lateral branch open in compound pterotic itself, just above upper margin of opercle. Sensory canal continuing through compound pterotic, entering sphenotic as temporal canal, which splits into two branches: one branch giving rise to infraorbital canal, other branch entering frontal through supraorbital canal. Supraorbital canal

with two branches: epiphyseal, opening near anterior fontanel; and anterior running through nasal bone. Nasal canal with one opening anteriorly and two posteriorly. Infraorbital canal running through entire second infraorbital, extending to infraorbital 1 and opening into two pores. Preoperculomandibular branch giving rise to preoperculomandibular canal, which runs through entire preopercle with three openings, corresponding to pores 3, 4 and 5, respectively.

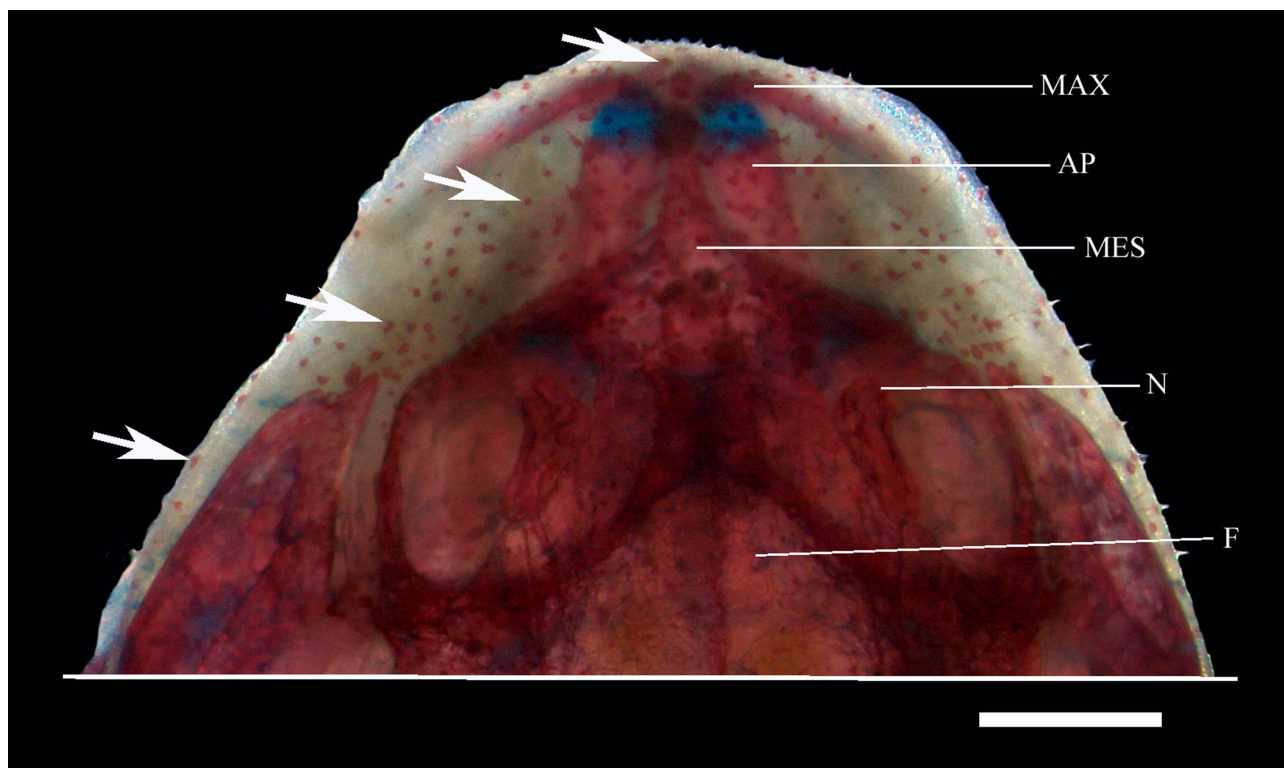


FIGURE 2. Dorsal view of the snout region of *Aspidoras marianae*, MPEG 26408, paratype. Arrows indicate minute odontode-bearing platelets scattered over all surface of the snout. MAX = maxilla, AP = autopalatine, MES = mesethmoid, N = nasal, F = frontal. Scale bar = 1 mm.

Body plates with minute odontodes restricted to posterior margins. Nuchal plate exposed. Dorsolateral body plates 24(9) or 25(4*); ventrolateral plates 22(8) or 23(5*); dorsolateral body plates along dorsal-fin base 6(5*) or 7(8); dorsolateral body plates from adipose-fin to caudal-fin base 8(5) or 9(8*); preadipose platelets 4(4) or 5(9*). Precaudal vertebrae 8(3); caudal vertebrae 15(3); Six pairs of ribs, first pair conspicuously larger than others.

Dorsal fin rectangular; its origin just posterior to third dorsolateral body plate. Dorsal spine shorter than first five dorsal-fin rays and with smooth anterior and posterior margins; dorsal-fin rays II,7,i(13*). Adipose origin just posterior to 16th or 17th dorsolateral body plate; preceded by small curved well-ossified spine. Pectoral fin roughly triangular; origin just posterior to gill opening; ossified portion of pectoral spine shorter than all branched pectoral-fin rays; anterior margin with small, scattered odontodes; posterior border of pectoral spine with 14–19 conical serrations, roughly perpendicularly oriented relative to main axis of spine (Fig.6); pectoral-fin rays I,8(5) or I,8,i(8*). Pelvic fin ovoid; origin just below second ventrolateral body plate; pelvic-fin rays i,5(11*) or i,6(2). Anal fin roughly ellipsoid; origin just posterior to 13th or 14th ventrolateral body plate; anal-fin rays ii,5(13*). Caudal fin bilobed, lobes bluntly pointed and equal in size; principal caudal-fin rays i,6/6,i(13*); procurrent caudal-fin rays 5(4) or 6(9*) and 5(4) or 6(9*) on dorsal and ventral lobes, respectively. All fins with minute odontodes scattered on all rays.

Color in alcohol. Background coloration pale yellow. Presence of four large brown blotches along midline of flank: first located between pectoral and pelvic girdles; second between pelvic girdles and anal fin; third above anal fin; and last on caudal peduncle and caudal-fin base. First, second and third blotches chevron shaped, fourth roughly triangular. Tiny dark brown blotches on dorsal surface of head; more numerous and concentrated on parieto-supraoccipital region. Elongated, oblique, dark brown blotch on antorbital portion. Opercle with few brown saddles. Roughly rounded, brown blotch on base of dorsal fin, from base of spine to interradial membrane after

third branched ray. Small brown patches scattered along dorsal fin, larger until third or fourth branched rays. Dark spot on base of adipose-fin spine and few diffuse chromatophores on medial portion. Pectoral spine with small, diffuse, light brown blotches on proximal and distal portions; with tiny chromatophores; small, light brown patches until fourth or fifth pectoral-fin rays. Pelvic fin hyaline. Anal fin with small, diffuse, light brown blotches restrict to base of last two rays, and one diffuse light brown blotch each over third and fourth branched rays. Three to four irregular, vertical series of small, brown blotches restrict to rays on caudal fin.

Distribution. Known only from its type locality, an unnamed stream tributary of the Rio Curuá, itself a tributary of the Rio Iri, in the Rio Xingu basin (Fig. 7).

Habitat notes. *Aspidoras marianae* was only collected in a slow-flowing stream with clear water and a sandy bottom with mud, leaf litter, submerged logs, and some aquatic macrophytes (Fig. 8).

Etymology. The specific epithet *marianae* is a reference to Mariana P. Wosiacki, daughter of the third author. A genitive noun.

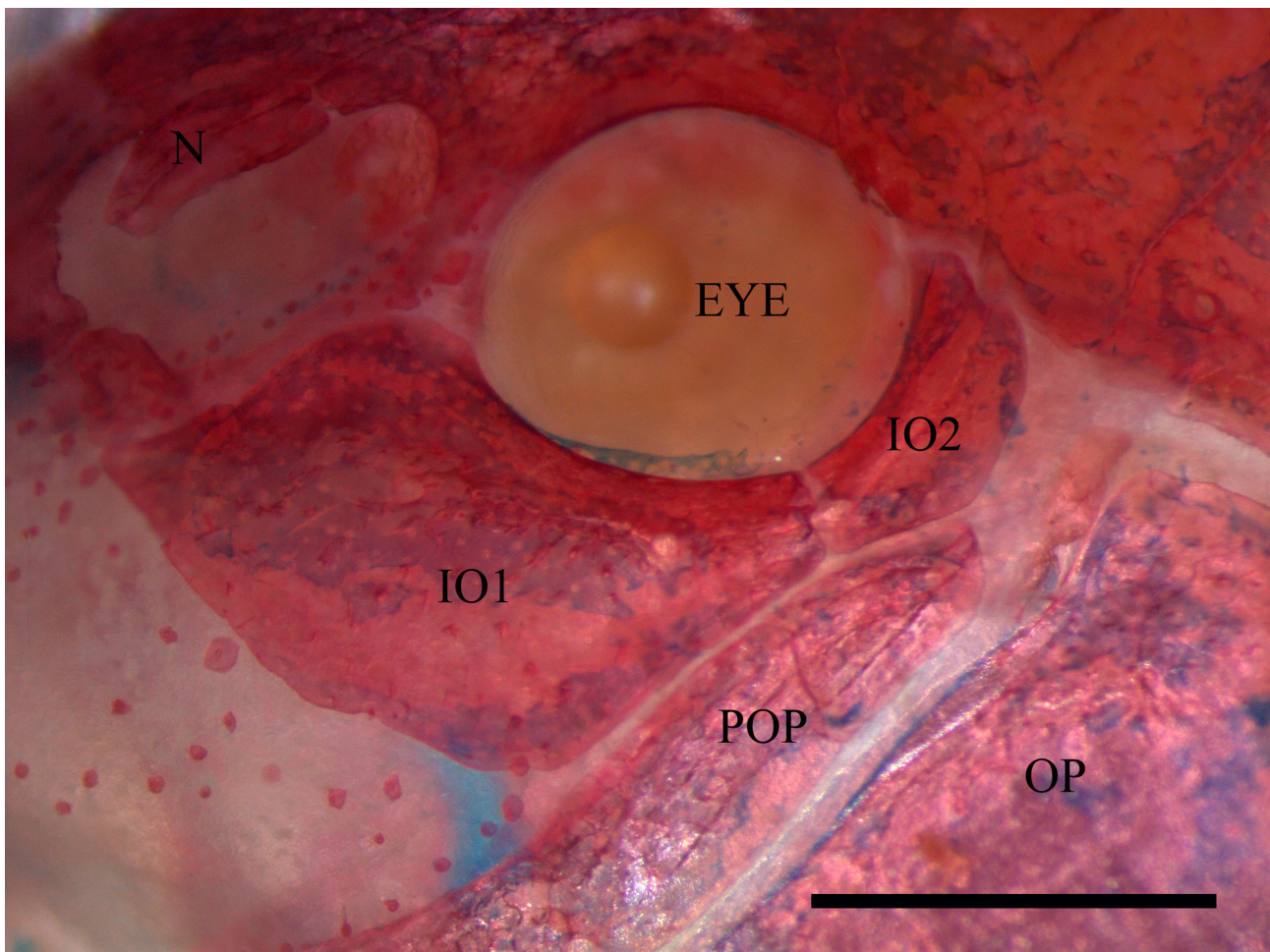


FIGURE 3. Lateral view of the orbital region of *Aspidoras marianae*, MPEG 26408, paratype. N = nasal, IO1, 2 = infraorbitals 1,2, POP = preopercle, OP = opercle. Scale bar = 1 mm.

Discussion

Aspidoras marianae is promptly assigned to *Aspidoras* since it presents all the proposed synapomorphies of the genus (Britto, 2003): posterior portion of mesethmoid wide; frontal fontanel reduced; parieto-supraoccipital fontanel present; opercle compact; ossified portion of pectoral spine strongly reduced, and less than half the length of the first branched pectoral-fin ray. Nevertheless, the new taxon shares with species of *Scleromystax* and *A. fuscoguttatus* (L.F.C. Tencatt, *pers. comm.*) the presence of minute platelets between the parieto-supraoccipital process and the nuchal plate (Fig. 5). According to Britto & Reis (2005), this feature is an apomorphy of

Scleromystax. Considering that *A. marianae* displays all the exclusive features of *Aspidoras*, this condition is hypothesized as a homoplasy.

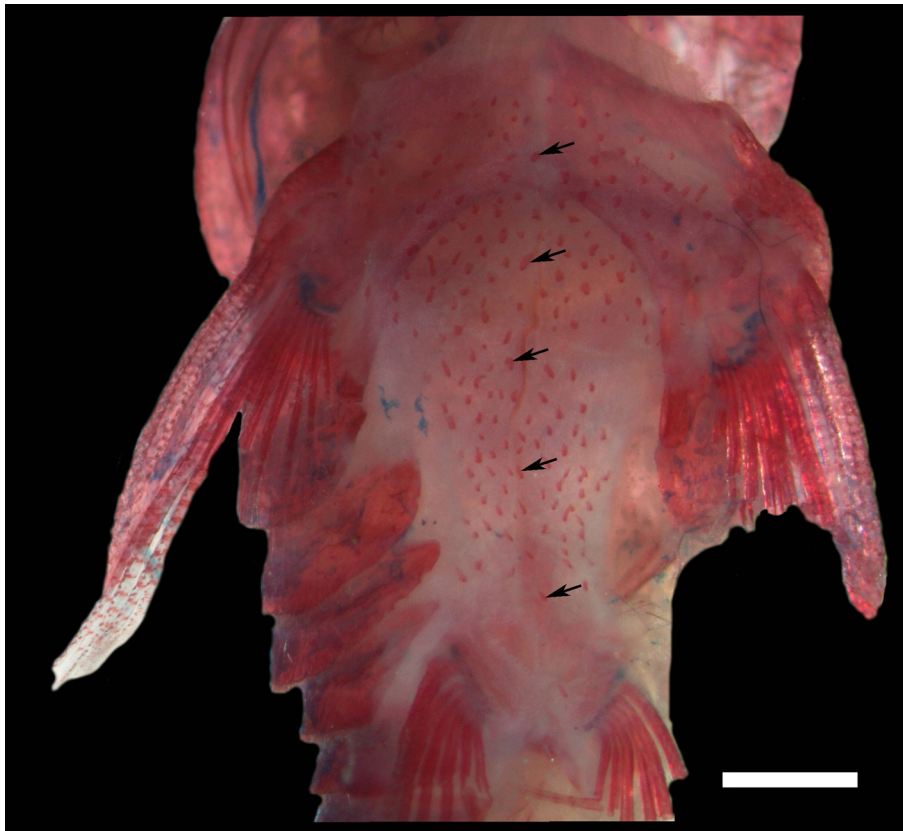


FIGURE 4. Detail of the isthmus region of *Aspidoras marianae*, MPEG 26408, paratype. Arrows indicate minute odontode-bearing platelets. Left ventrolateral plates removed. Scale bar = 2 mm.

Another characteristic that facilitates the identification of *A. marianae* is the presence of minute odontode-bearing platelets scattered over the snout surface (Fig. 2). This feature is shared with some *Corydorax* species (e.g. *C. acutus* Cope, *C. aeneus* (Gill), *C. spectabilis* Knaack, *C. trilineatus* Cope; M.R. Britto, *pers. obs.*), although the odontodes are even smaller than in *A. marianae*, and embedded in a thick layer of skin.

The presence of minute platelets on the skin surface between the isthmus and the pelvic region is shared with *A. microgalaeus*, *A. belenos* and *A. velites*. However, the condition observed in *A. marianae* is most similar to that observed in *A. microgalaeus* and *A. belenos*. In these species there is one odontode per platelet; also, the platelets are somewhat circular, rhombic shaped. In *A. velites* there is two or three odontodes per elongate and vermiculate platelet (Britto *et al.*, 2002: fig.4).

Finally, another helpful feature for identifying *A. marianae* is the first infraorbital bone notoriously expanded (Fig. 3). Although, Britto (2003: character 15) listed a large anterior expansion of infraorbital 1 as a condition present in most of the Corydoradinae, it is possible to perceive a range of variation in shape that is informative at species level (Tencatt *et al.*, 2013). In several *Aspidoras* species, the infraorbital 1 is not so large, showing a slender (e.g. *A. microgalaeus* and *A. albater*, Britto, 1998: fig.5b–c) or much reduced ventral laminar expansion (e.g. Britto *et al.*, 2005: fig. 3).

Concerning the occurrence of *Aspidoras marianae*, it is the fourth species of the genus described from the Rio Xingu basin. Other *Aspidoras* species in the Rio Xingu are *A. poecilus* Nijssen & Isbrücker, *A. brunneus* and *A. microgalaeus*. Only the holotype of *A. poecilus* is recorded from the Rio Xingu drainage. All the paratypes and samples have been from the Rio Araguaia basin, which suggests an error for the type-locality. *Aspidoras brunneus* and *A. microgalaeus* are both assigned from disjunct headwaters of the Rio Culuene basin, Rio Xingu drainage. *Aspidoras marianae* described herein from a tributary of the Rio Iriri, another main affluent of the Rio Xingu, is the northernmost record of the genus for the Amazon system in Brazilian Shield. Finally, the description of yet another new species for the Xingu Basin reinforces the suggested importance of the region as a center of endemism, especially in the headwaters of Rio Xingu.

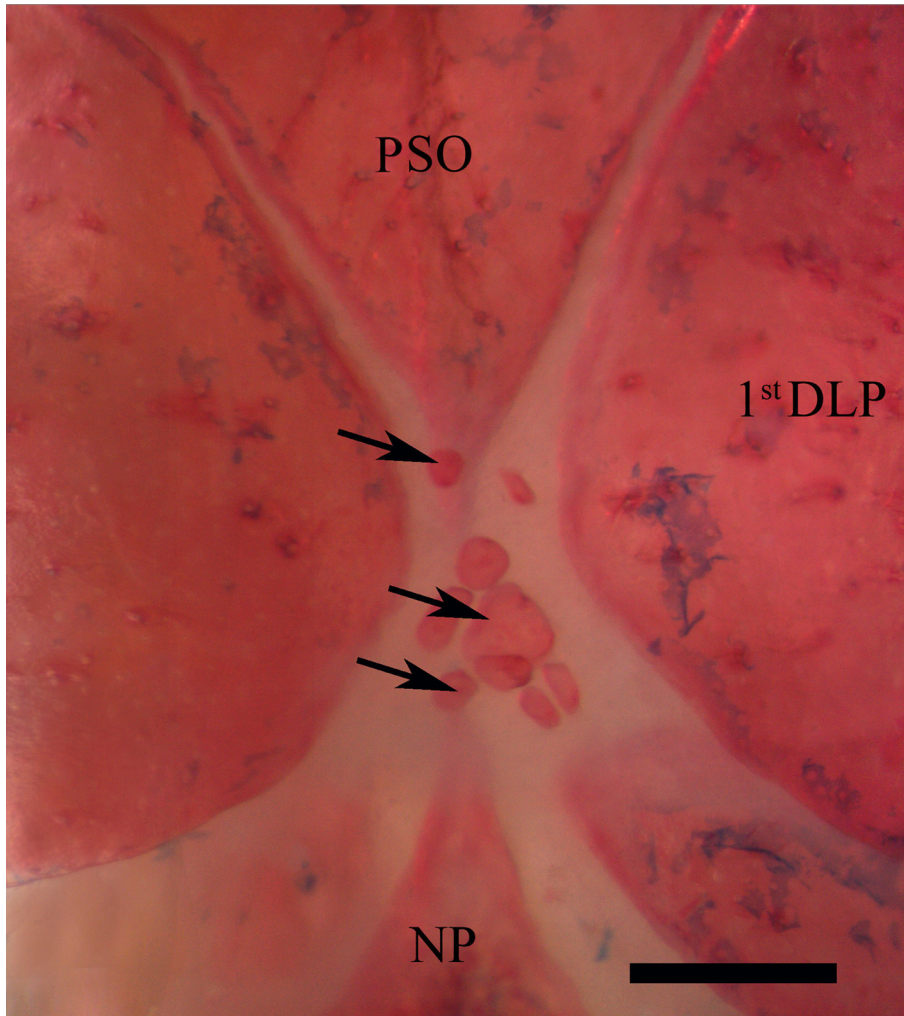


FIGURE 5. Detail of the nuchal region of *Aspidoras marianae*, MPEG 26408, paratype. Arrows indicate minute platelets between parieto-supraoccipital process and nuchal plate. PSO = parieto-supraoccipital, NP = nuchal plates, 1stDLP = 1st dorsolateral plate. Scale bar = 1 mm.



FIGURE 6. Dorsal view of left pectoral-fin spine of *Aspidoras marianae*, MPEG 26408, paratype. Odontodes on anterior margin not depicted. Scale bar = 1 mm.

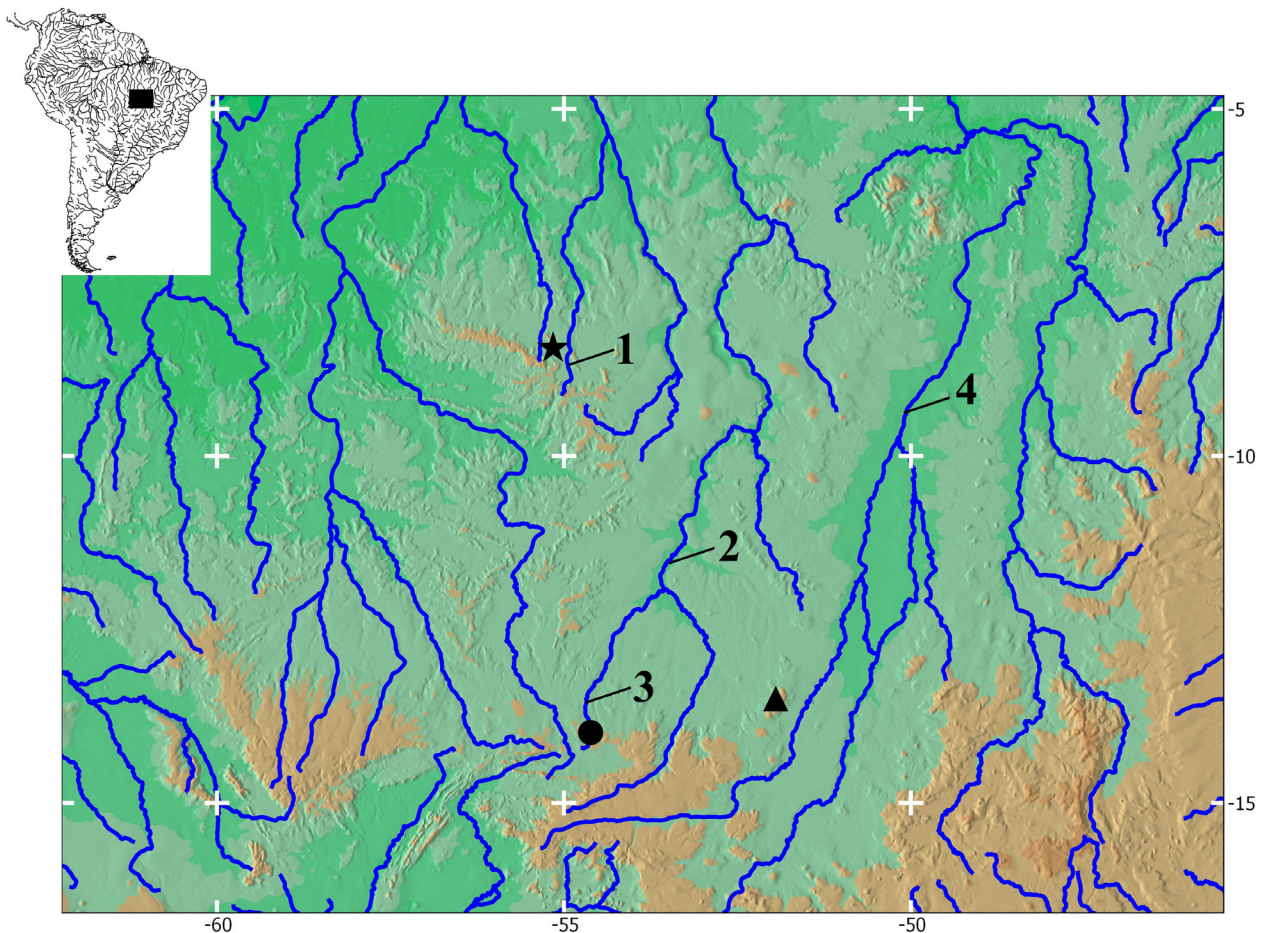


FIGURE 7. Map of part of the upper Rio Xingu showing type localities of *Aspidoras* species. Star = *Aspidoras marianae*, circle = *A. microgaleus*, triangle = *A. brunneus*. 1 = Rio Curuá; 2 = Rio Xingu; 3 = Rio Culuene; 4 = Rio Araguaia.

Comparative material: *Aspidoras belenos*: MNRJ 12433 (holotype, 27.8 mm SL): Brazil, Mato Grosso, creek at road from Primavera do Leste to Paranatinga, 82 km N of Primavera do Leste, Rio das Mortes basin, 15°03'S 52°03'W. *Aspidoras carvalhoi*: MNRJ 5230 (holotype, 25.4 mm SL): Brazil, Ceará, Guaramiranga, Açude Canabrava. *Aspidoras gabrieli*: MPEG 27080 (holotype, 31.3 mm SL): Brazil, Pará, Parauapebas, Serra dos Carajás, unnamed tributary to the left bank of Rio Parauapebas, tributary to the right bank of Rio Itacaiúnas, lower Rio Tocantins basin, 06°05'15.6"S, 50°07'56.9"W (approx. 660 m asl); Paratypes: Same data as for the holotype, except where noted: MPEG 18610, 26, 11.3–31.0 mm SL; MPEG 18611, 5, 25.7–28.7 mm SL. MPEG 18609, 16, 10.8–27.0 mm SL; MPEG 27079, 13, 9.6–28.8 mm SL, 06°06'13.5"S 50°07'58.6"W; MPEG 18612, 18, 16.5–29.0 mm SL, 06°06'02.8"S 50°08'11.9"W; MPEG 17392, 40, 10.4–29.5 mm SL, 06°06'02.8"S, 50°08'11.9"W; MPEG 17393, 51, 19.5–30.5 mm SL; MPEG 17394, 139, 11.3–36.6 mm SL, 5 CS (19.0–25.6 mm SL); INPA 41151, 5, 21.2–26.8 mm; MCP 48100, 20, 20.3–31.8 mm; MNRJ 41447, 5, 20.7–29.4 mm; MZUSP 115044, 5, 19.0–28.6 mm, 06°05'15.6"S, 50°07'56.9"W; MPEG 17389, 14, 10.0–28.8 mm SL and MPEG 17390, 8, 11.8–24.9 mm SL, 06°06'13.5"S 50°07'58.6"W; MZUSP 87674, 12, 12.7–32.9 mm SL, 1 CS 31.4 mm SL, Brazil, Pará, Parauapebas, Igarapé Jacaré, tributary to Rio Parauapebas, 06°08'20.61"S 48°46'45.54"W (approx. 160 m asl). *Aspidoras lakoi*: MNRJ 5292 (holotype, 33.4 mm SL): Brazil, Minas Gerais, Passos, small creek at Floresta do Grotão, Fazenda da Cachoeira, a tributary of Rio Grande, Rio Paraná basin. *Aspidoras microgaleus* MCP 19295 (4 paratypes, 19.8–24.7 mm SL): Brazil: Mato Grosso, small tributary of Rio Culuene, km 86 of road from Paranatinga to Canarana, Rio Xingu basin, 14°00'S 54°38'W. *Aspidoras psammaticides*: MNRJ 28407 (holotype, 25.7 mm SL): Brazil, Bahia, Lençóis, Rio Caldeirão, 12°39'33"S 41°22'12"W; MNRJ 21269 (52 paratypes, 15.4–27.8 mm SL): same data as holotype; MNRJ 21709 (51 paratypes, 2 cs, 15.0–28.4 mm SL): same data as holotype; MNRJ 21270 (26 paratypes, 2 cs, 15.9–30.4 mm SL): Brazil, Bahia, Lençóis, Rio Capivara, 12°37'19"S 41°22'35"W; MNRJ 21708 (7 paratypes, 14.4–21.2 mm SL): Brazil, Bahia, Lençóis, rio Roncador, 12°42'01"S 41°21'26"W; MNRJ 21710 (18

paratypes, 1 cs, 16.7–24.9 mm SL): Brazil, Bahia, Lençóis, Rio Roncador, 12°42'01"S 41°21'26"W; MNRJ 21711 (46 paratypes, 16.5–27.9 mm SL): Brazil, Bahia, Lençóis, Rio Capivara, 12°37'19"S 41°22'35"W; MNRJ 21712 (paratype, 23.2 mm SL): Brazil, Bahia, Lençóis, Rio Ribeirão, 12°35'10"S 41°22'57"W. *Aspidoras spilotus*: MNRJ 8688 (142 paratypes, 17.7–30.0 mm SL): Brazil, Ceará, Ipu, Cachoeira do Gusmão. *Aspidoras taurus* MNRJ 19951 (5 paratypes, 30.9–40.3 mm SL): Brazil, Mato Grosso, Alto Garças, Fazenda Cabeceira do Itiquira, close to highway BR-364, Rio Itiquira, Rio Paraguai basin, 16°56'S 53°32'W. *Aspidoras velites*: MZUSP 73247 (25 paratypes, 15.8–27.9 mm SL): Brazil, Mato Grosso, Alto Araguaia, Córrego Gordura, km 491.4 of the Ferronorte railroad, 17°18'20"S, 53°16'22"W. *Aspidoras virgulatus*: MNRJ 5371 (holotype, 32.7 mm SL): Brazil, Espírito Santo, Linhares, Córrego Chumbado at road from Linhares to São Mateus; MNRJ 10547 (3 paratypes, 21.9–30.2 mm SL): same data as holotype; MNRJ 5143 (5 paratypes, 20.7–36.1 mm SL): Brazil, Espírito Santo, Vale do Itaúna, Ribeirão do Engano; MNRJ 5366 (2 paratypes, 30.6–33.6 mm SL): Brazil, Espírito Santo, Linhares, Rio Cupido, Sooretama; MNRJ 5370 (paratype, 27.7 mm SL): Brazil, Espírito Santo, Linhares, Rio Ouesino at road from Linhares to São Mateus; MNRJ 5409 (2 paratypes, 28.4–33.1 mm SL): Brazil, Espírito Santo, Linhares, Rio Cupido, Sooretama. *Aspidoras* sp.: MPEG 17577 (4, 20.0–35.7 mm SL): Brazil, Pará, Novo Progresso, Jamanxim National Forest (FLONA), 06°55'35"S 49°50'25.6"W. *Scleromystax barbatus* MNRJ 13723 (18, 2 cs): Brazil, Rio de Janeiro, Teresópolis, Córrego Sujo, right tributary of Rio Preto at road BR-492, 22°16'30"S 42°51'53"W.



FIGURE 8. Type locality of *Aspidoras marianae*, in unnamed stream tributary to the Rio Curuá, itself a tributary to the Rio Iriri, Rio Xingu basin, 8°26'44.7"S, 55°09'25.0"W.

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