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A new armored catfish species of the genus *Hypostomus* Lacépède, 1803 (Siluriformes: Loricariidae) from the upper rio Xingu basin, Brazil

Cláudio H. Zawadzki¹, José L. O. Birindelli² and Flávio C. T. Lima³

A new armored catfish species of the genus *Hypostomus* is described from the upper rio Xingu basin, Mato Grosso State, Brazil. The new species is diagnosed from congeners by having high number of teeth (58 to 101, mean 77 on premaxilla, and 58 to 105, mean 80 on dentary), dark spots over body and fins, and abdomen mostly naked. The new species is known from the rapids of the rio Culuene, where it is sympatric with *Hypostomus faveolus*.

Uma espécie nova de cascudo do gênero *Hypostomus* é descrita da bacia do alto rio Xingu, estado de Mato Grosso, Brasil. A espécie nova é diagnosticada de suas congêneres por ter um alto número de dentes (58 a 101, média 77 no pré-maxilar e 58 a 105, média 80 no dentário), manchas escuras sobre o corpo e nadadeiras e abdômen em grande parte nu. A espécie nova é conhecida de corredeiras do rio Culuene, onde ocorre simpatricamente a *Hypostomus faveolus*.

Key words: Amazon basin, Cascudo, Hypostominae, rio Culuene, systematics.

Introduction

Hypostomus Lacépède, 1803 is the largest loricariid genus with 126 valid species (Weber, 2003; Hollanda Carvalho *et al.*, 2010; Zawadzki *et al.*, 2010). The genus *Hypostomus* is considered to be paraphyletic (Armbruster, 2004) and only diagnosable by symplesiomorphies. *Hypostomus* species are morphologically very conservative, and the relatively few diagnostic characters in external morphology and coloration within the genus usually vary intra-specifically in many species (Oyakawa *et al.*, 2005; Zawadzki *et al.*, 2008). This limited morphological variation and the high species richness represent a challenge to efforts aiming to clarify species boundaries among the species. Additionally, estimates based on molecular data (Weber, 2003), suggest that approximately one-third of all *Hypostomus* species are yet to be described.

Species of the genus *Hypostomus* occur in a wide range of habitats, from lowland lakes to fast running mountain streams (Burgess, 1989), and exhibit reproductive strategies as being egg guarders in which the male cares for eggs and larvae within some kind of cavity or nest (Suzuki *et al.*, 2000). In addition, its sucker-like mouth allows them to feed on algae and detritus, an abundant resource in the Neotropics not available for the great majority of fishes.

Although the subfamily Hypostominae is highly diverse in the rio Xingu basin (*e.g.*, Zuanon, 1999; Rapp Py-Daniel & Zuanon, 2005; Rapp Py-Daniel *et al.*, 2011), there are few known species of *Hypostomus* for the basin. Recently, Zawadzki *et al.* (2008) described *Hypostomus faveolus* from the upper stretches of the rio Xingu and rio Tocantins basins. Sympatrically with *Hypostomus faveolus* at the rio Culuene in the upper rio Xingu basin, a second, undescribed *Hypostomus* species occurs which, unlike *H. faveolus*, is restricted to fast-flowing, rocky river stretches. The aim of the present contribution is to describe that species.

Material and Methods

Methodology and terminology for measurements follow Boeseman (1968) modified by Weber (1985) and Zawadzki *et al.* (2008). Plate counts and nomenclature follow Schaefer (1997), with the modifications of Oyakawa *et al.* (2005). Standard length (SL) is expressed in millimeters and all other measurements are expressed as percents of standard length or head length (HL). Institutional abbreviations are: AMNH, American Museum of Natural History; ANSP, Academy of Natural Sciences of Philadelphia; BMNH, British Museum of Natural History; CPUFMT, Coleção de Peixes da Universidade

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Federal do Mato Grosso; INPA, Instituto Nacional de Pesquisas da Amazônia; MCP, Museu de Ciências e Tecnologia da Pontifícia Universidade Católica, Rio Grande do Sul; MCZ, Museum of Comparative Zoology; MNRJ, Museu Nacional, Universidade Federal do Rio de Janeiro; MZUSP, Museu de Zoologia da Universidade de São Paulo; NUP, Núcleo de Pesquisas em Limnologia, Ictiologia e Aquicultura da Universidade Estadual de Maringá; ZUEC, Museu de Zoologia da Universidade Estadual de Campinas.

Results

Hypostomus kuarup, new species

Figs 1-4

Holotype. MZUSP 109765, 157.0 mm SL; Brazil, Mato Grosso, Campinópolis, rio Xingu basin, rio Culuene (at the former rapids, current area of reservoir Paranatinga II), 13°51'03"S 53°15'31"W, 21 Aug 2006, J. L. O. Birindelli, L. M. Sousa & A. Akama.

Paratypes. ANSP 192412, 5, 113.5-139.6 mm SL; INPA 37075, 5, 123.9-158.7 mm SL; MCP 46838, 5, 97.0-112.5 mm SL; MNRJ 39116, 5, 102.6-131.3 mm SL; MZUSP 91970, 29, 22.9-112.9 mm SL; NUP 11269, 5, 88.9-127.8 mm SL; ZUEC 6551, 5, 89.0-150.4 mm SL; collected with the holotype.

Non-type specimens. All from Brazil, Mato Grosso, Campinópolis, rio Xingu basin, rio Culuene. CPUFMT 656, 20, 61.3-140.5 mm SL, rio Culuene, fish ladder of reservoir Paranatinga II, 13°50'58"S 53°15'22"W, 14-16 Jul 2010, F. C. T. Lima, R. Rayla & P. Azevedo. MZUSP 89714, 2, 70.3-78.9 mm; MZUSP 89864, 2, 89.4-98.4 mm SL, rio Culuene (at the former rapids, current area of reservoir Paranatinga II), 13°51'03"S 53°15'31"W, 15 Jan 2006, J. L. O. Birindelli & A. Akama. MZUSP 89804, 5, 50.0-88.8 mm SL; rio Sucuri (tributary of rio Culuene), 13°55'40"S 53°17'10"W, 15 Jan 2006, J. L. O. Birindelli & A. Akama. MZUSP 89831, 9, 19.3-156.4 mm SL, córrego do Corgão, at rapids (tributary of rio Culuene), 13°48'18"S 53°16'04"W, 15 Jan 2006, J. L. O. Birindelli & A. Akama. MZUSP 89859, 12, 15.8-84.5 mm SL; creek on road to rio Maria (tributary of rio Culuene), 13°59'35"S 53°20'28"W, 15 Jan 2006, J. L. O. Birindelli & A. Akama. MZUSP 89745, 62, 46.3-168.9 mm SL; rio Culuene (at the former rapids, current area of reservoir Paranatinga II), 13°51'03"S 53°15'31"W, 15 Jan 2006, J. L. O. Birindelli & A. Akama. MZUSP 89878, 6, 12.2-33.0 mm SL; MZUSP 89898, 2, 33.4-57.6 mm SL; creek tributary of rio Culuene, 13°51'19"S 53°15'15"W, 15 Jan 2006, J. L. O. Birindelli & A. Akama. MZUSP 91766, 10, 16-128.4 mm SL; córrego Corgão, at rapids (tributary of rio Culuene), 13°48'18"S 53°16'04"W, 21 Aug 2006, J. L. O. Birindelli, L. M. Sousa & A. Akama. MZUSP 91803, 1, 46.4 mm SL; rio Culuene, near mouth of rio Maria, 14°00'32"S 53°20'46"W, 21 Aug 2006, J. L. O. Birindelli, L. M. Sousa & A. Akama. MZUSP 94217, 8, 72.4-186.6 mm SL; NUP 9144, 7, 143.9-105.1 mm SL; rio Culuene (at former rapids, current area of reservoir Paranatinga II), 13°51'03"S 53°15'31"W, May 2007, F. C. T. Lima, F. A. Machado, C. A. Figueiredo, J. L. Birindelli, L. Moraes & N. E. Silva. MZUSP 95575, 2, 33.6-41.5 mm SL; rio Couto de Magalhães, near village of São José do Couto, 13°50'17"S 53°3'53"W, 6 Oct 2007, F. C. T. Lima, F. A. Machado, C. A. Figueiredo, J. L. Birindelli, L. Moraes & N. E. Silva. MZUSP 97489, 4, 16.3-46.1 mm SL; Córrego do Corgão, at rapids (tributary

of rio Culuene), 13°48'23"S 53°15'59"W, 4 Oct 2007, F. C. T. Lima, F. A. Machado, C. A. Figueiredo, J. L. Birindelli, L. Moraes & N. E. Silva. MZUSP 98031, 19, 12.9-90.4 mm SL; rio Culuene and mouth of rio Maria, 14°00'31"S 53°20'53"W, 7 Oct 2007, F. C. T. Lima, A. C. Ribeiro, C. R. Moreira & L. Moraes. MZUSP 98138, 97, 15.5-143.9 mm SL; rio Culuene, Cachoeira do Adelino, 13°47'50"S 53°14'46"W, 2 Oct 2007, F. C. T. Lima, F. A. Machado, C. A. Figueiredo, J. L. Birindelli, L. Moraes & N. E. Silva. MZUSP 98213, 8, 30-120.2 mm SL; rio Culuene, at rapids (immediately below reservoir Paranatinga II), 13°51'03"S 53°15'31"W, 2 Oct 2007, F. A. Machado, C. M. C. Leite & M. Carvalho. MZUSP 94864, 1060, 10.5-217.7 mm SL; NUP 9145, 5, 126.8-148.8 mm SL; NUP 9146, 10, 98.0-152.6 mm SL; NUP 9200, 17, 32.0-117.6 mm SL; NUP 9203, 31, 38.4-132.1 mm SL; ZUEC 6366, 10, 50.0-147.4 mm SL; rio Culuene (at former cofferdam of the reservoir Paranatinga II), 13°51'03"S 53°15'31"W, 2 Jul 2007, L. M. Sousa, A. N. Ferreira, C. A. Figueiredo & F. A. Machado.

Diagnosis. *Hypostomus kuarup* is distinguished from all congeners, with the exception of *H. alatus*, *H. denticulatus*, *H. francisci*, *H. johnii*, *H. isbrueckeri*, *H. luteomaculatus*, *H. meleagris*, *H. multidentis*, *H. mutucacae*, *H. regani*, *H. strigaticeps*, and *H. ternetzi* by having high number of teeth (58 to 101, mean 77 on premaxilla, and 58 to 105, mean 80 on dentary) (*vs.* lower number of teeth, rarely more than 50 on both premaxilla and dentary); from *H. alatus*, *H. francisci*, *H. luteomaculatus*, *H. meleagris*, *H. multidentis*, *H. regani*, and *H. strigaticeps* by having dark spots over body and fins (*vs.* pale spots) and additionally from *H. alatus*, *H. francisci*, *H. luteomaculatus*, and *H. regani* by having a large premaxillary ramus, 24.0-29.9% of HL, mean 27.1% and large dentary ramus, 22.2-30.2% of HL, mean 27.0% (*vs.* relatively small premaxillary and dentary ramus, approximately or less than 20% of HL). *Hypostomus kuarup* can be distinguished from *H. denticulatus* by having teeth with asymmetric cusps (*vs.* teeth with symmetrical cusps); from *H. isbrueckeri* by possessing an homogeneous caudal-fin ground color (*vs.* a yellow band on distal caudal-fin margin in mature males); from *H. johnii* by having dark spots over body and fins usually faded (*vs.* dark spots over body and fins always conspicuous), abdomen mostly naked (*vs.* mostly plated), and by having the upper and lower caudal-fin rays almost similar in length (*vs.* lower ray considerably longer than upper); from *H. mutucacae* by having caudal peduncle wide, width approximately equal to depth at adipose-fin origin (*vs.* caudal peduncle compressed, depth approximately twice the width at adipose-fin origin), relatively robust teeth on both jaws (*vs.* slender teeth on both jaws), and body with small dark spots (*vs.* body with large dark blotches, approximately similar to larger than eye diameter, in specimens around 100 mm SL); from *H. ternetzi* by having a roughly flat interorbital and predorsal region (*vs.* interorbital and predorsal region with prominent median keel) and abdomen mostly naked (*vs.* mostly plated).

Description. Morphometric data in Table 1; meristic data in Table 2. Head broad and slightly depressed. Body width in cleithral region considerably greater than head depth and approximately equal to head length. Snout and anterior profile

of head in dorsal view roughly rounded in smaller specimens to roughly square-shaped in larger individuals. Snout rising at approximately 45° from horizontal in lateral profile. Dorsal profile slightly convex and sloped upward from tip of snout to

interorbital region, straight from that point to dorsal-fin origin; sloped downward from dorsal-fin origin to region of dorsal procurrent caudal fin rays, then elevating again to caudal-fin insertion. Caudal peduncle somewhat rectangular in cross-



Fig. 1. *Hypostomus kuarup*, holotype, MZUSP 109765, 157.0 mm SL: Brazil, Mato Grosso, Campinápolis, rio Culuene.

section, dorsally and ventrally flattened. Eye of moderate size (13.2-17.1% of HL), dorsolaterally positioned. Interorbital space slightly concave in transversal section view due to supraorbital arching. Mesethmoid forming inconspicuous median ridge on snout. Low ridge on dorsal surface of head, from nares to upper margins of eyes, and from latter to compound pterotic. Cheek plates with usually small odontodes; some specimens with moderately-sized odontodes (Fig. 2). Parieto-supraoccipital generally flat or with inconspicuous median ridge; with small blunt posterior process bordered by large, symmetrically paired predorsal plates. Dorsal and lateral surface of head and body covered with dermal plates except for small naked patch on tip



Fig. 2. Head and anterior portion of body in lateral view of *Hypostomus kuarup*, MZUSP 94864, 147.0 mm SL. Inset box on upper left corner show detail of odontodes development on cheek plates.

of snout and at dorsal-fin base. Predorsal region with paired, poorly developed ridges. Body lateral surface with five longitudinal series of plates. Dorsal series of plates dorsally flattened from dorsal-fin terminus to adipose-fin base; usually with longitudinal rows of odontodes, larger odontodes clustered at middle and distal portions of plates. Mid-dorsal series with moderately-developed longitudinal rows of odontodes. Median series bearing lateral line without hypertrophied odontodes. Mid-ventral series bearing moderately-developed longitudinal rows of odontodes. Ventral series strongly flattened ventrally, and with well-developed longitudinal rows of odontodes. Lateral line complete.

Mouth wide, occupying almost entire width of head. Lips wide, but moderate in length. Outer edge of upper lips platelets covered with odontodes. Lower lip almost reaching gill opening, its inner surface covered with numerous small papillae. Maxillary barbel moderate in size, shorter than orbital diameter. Teeth slender, with elongate main cusp and small lateral cusp. Intermandibular tooth row angle approximately 150°.

Lower surface of head naked or with small patches of platelets immediately anterior to gill openings. Pectoral bridge usually with some platelets forming narrow transversal row. Abdomen usually with few platelets arranged only on lateralmost border, between pectoral-fin origin and pelvic-fin origin; a few larger specimens also with small patch of platelets on middle of abdomen (Fig. 3).

Dorsal fin II,7; moderate in size; spine flexible; its border strongly rounded; posteriorly reaching preadipose azygous plate when adpressed. Adipose-fin spine well developed, curved inward, with distal tip usually reaching anteriormost dorsal procurrent ray. Pectoral fin I,6; pectoral-fin spine slightly curved with rounded tip, and usually with distally well-developed odontodes, mainly in larger specimens; when adpressed reaching to approximately middle of pelvic-fin spine. Pelvic fin i,5; pelvic-

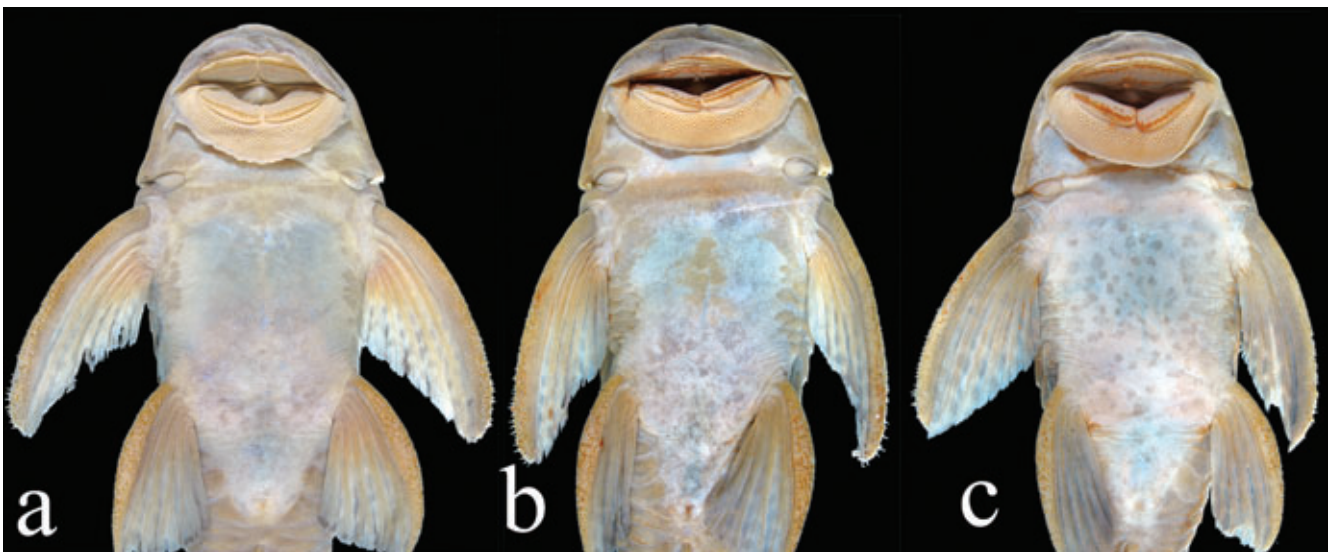


Fig. 3. Head and anterior portion of body in ventral view of *Hypostomus kuarup*, (a) MZUSP 109765, 157.0 mm SL, holotype, (b) MZUSP 94864, 147.0 mm SL, (c) MZUSP 94864, 115.0 mm SL, showing the variation of presence and arrangement of platelets (a, b), and abdominal color pattern (c).



Fig. 4. *Hypostomus kuarup*, MZUSP 94864, 110.0 mm SL, photographed alive. Photo by Leandro Sousa.

fin unbranched ray curved inward; when adpressed just reaching anal-fin insertion; its border almost straight. Anal fin i,4; when adpressed distal tip of posterior rays reaching fourth or fifth plate posterior to its origin. Caudal fin i,7+7,i; emarginate, with ventral lobe similar in length to slightly longer than dorsal lobe.

Color in alcohol. Ground color of dorsal surface of head and body dull brown. Head, dorsum and flanks covered with numerous dark round spots. Spots on head small, increasing gradually in size posteriorly, especially posterior to head. Spots more densely concentrated on snout and head. Some preserved specimens with overall dark coloration, without distinct dark spots. Ventral region of head and abdomen pale brown to grayish, usually without spots; spots only present as few isolated brown patches in few specimens.

Color in life. Live specimens with coloration similar to preserved specimens, except that fins and ventral portion of head and body are yellowish brown (Fig. 4).

Etymology. Kuarup or Quarup, is an origin myth and a festivity shared by most the ethnical groups living in the upper portion of the Xingu Indigenous Park. The myth tells about a mythical hero, Mavutsinim, who wanted to bring the dead back to life. With this purpose in mind, he collected three logs of Kuarup wood and after adorning them, he asked a cane toad and an agouti, as well as his tribal men, to sing and dance by the logs, as they would turn into bodies for the deceased. The ceremony ultimately failed in the last phase, but Mavutsinim declare that from then on the festivities should be carried in honor of the deceased (Villas Boas & Villas Boas, 1986). The Kuarup festivity takes places between July and September, when the different ethnical groups of the upper Xingu gather in one village and for several days dance, sing around tree trunks that represent the dead man, and perform the famous huka-huka wrestling contests. The first Kuarup is said to have taken place at the Saginhenhu, a locality recently

identified by the Indians as being the Cachoeira do Adelino, one of the localities from where *Hypostomus kuarup* is known.

Distribution and habitat. *Hypostomus kuarup* is known from the rio Culuene, upper rio Xingu basin, Mato Grosso, Brazil (Fig. 5). The species is the most abundant loricariid catfish in the area, though, unlike the sympatric congener *Hypostomus faveolus* (Zawadzki *et al.*, 2008: 400), *H. kuarup* is confined to rapid stretches. The type locality was a former rapid that was dried out after the building of the Paranatinga II hydroelectric Dam (Fig. 6). The species still persists at a fish ladder built at the type locality (CPUFMT 656) and certainly also at rapids situated both above (at the mouth of the rio Maria) and below the reservoir (Cachoeira do Adelino).

Remarks. *Hypostomus kuarup* is known from thousands of specimens collected in the rio Culuene in the former rapids,

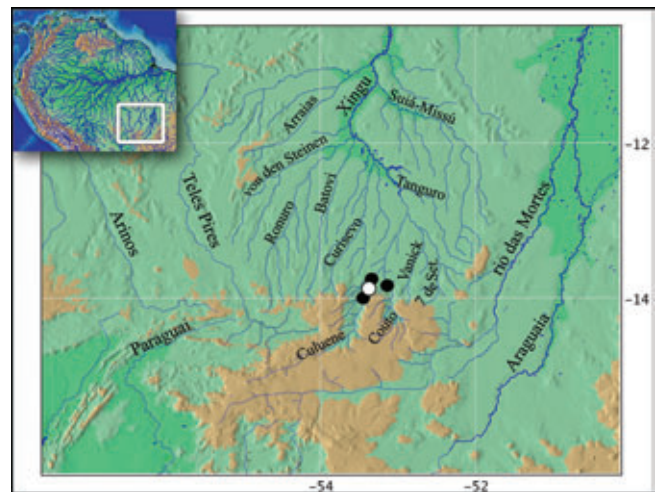


Fig. 5. Distribution of *Hypostomus kuarup*. White symbol represents type locality.



Fig. 6. Type locality of *Hypostomus kuarup*, Brazil, Mato Grosso, rapids at rio Culuene (currently dry by the diversion of the river channel due to the construction of the Paranatinga II hydroelectric dam). Photo taken during the early dry season.

current area of reservoir Paranatinga II (13°51'03"S 53°15'31"W), and tributaries of rio Culuene nearby. As the number of specimens is too large, a sample of 60 specimens from the aforementioned locality was chosen to constitute the type series.

Discussion

The high number of teeth in the upper and lower jaws of *Hypostomus kuarup* (premaxilla 58-101, mean = 77; and dentary

58-105, mean 80) is a key character of the new species. This character readily distinguish it from the species of the *Hypostomus cochliodon* group, *H. plecostomus* and related species from Suriname and Guianas, which have less than 60 teeth on each upper and lower jaw (Boeseman, 1968; Planquette *et al.*, 2000). All aforementioned species also differ from *Hypostomus kuarup* by having abdomen mostly plated (*vs.* abdomen almost completely naked in the new species). Most species of *Hypostomus* with high number of teeth (up to 100) (*H. alatus*, *H. francisci*, *H. multidentis*, *H. regani*, and *H.*

Table 1. Morphometric data of *Hypostomus kuarup*. Letters in parenthesis follow the abbreviations of Boeseman (1968). N = number of examined specimens, SD = standard deviation.

	N	Holotype	Mean	Range	SD
Standard length (mm)	30	157.0	-	114.4-217.7	-
	Percents of standard length				
Predorsal length (D)	30	40.4	39.7	36.0-44.6	1.62
Preanal length	30	66.6	66.1	60.0-67.8	1.50
Head length (E)	30	32.9	32.7	30.0-36.8	1.34
Interdorsal distance (M)	30	16.6	16.5	11.1-26.9	3.20
Thoracic length (N)	30	32.8	32.2	30.9-34.0	0.69
Abdominal length (P)	30	25.7	25.7	23.2-27.5	0.95
Caudal peduncle length (R)	30	30.0	30.0	28.3-31.8	0.85
Caudal peduncle depth (S)	30	11.3	10.8	9.9-11.6	0.51
Dorsal-fin spine length (K)	30	26.9	25.8	20.8-29.7	2.26
Dorsal-fin base length (L)	30	27.9	26.9	24.6-29.1	0.93
Pectoral-fin spine length (O)	29	32.8	31.2	27.1-33.8	1.46
Pelvic-fin unbranched ray length (Q)	30	25.6	23.5	21.7-25.6	0.95
Upper caudal-fin ray length	23	27.0	27.9	21.7-33.6	3.10
Lower caudal-fin ray length	23	31.6	33.1	27.5-38.3	2.50
Adipose-fin spine length	30	8.8	8.4	7.1-9.9	0.64
Cleithral width (F)	30	27.6	27.5	25.7-32.7	1.30
Body depth at dorsal-fin origin	30	21.3	18.3	15.8-21.3	1.23
	Percents of head length				
Head depth (G)	30	55.0	51.9	47.1-55.0	1.85
Snout length (H)	30	69.8	65.7	53.2-69.8	3.47
Snout-opercle distance	30	83.2	83.0	73.9-87.5	2.41
Interorbital width (J)	30	34.7	35.7	32.4-38.0	1.45
Orbital diameter (I)	30	14.3	15.3	13.2-17.1	0.98
Mandibular ramus length	30	25.6	27.0	24.0-29.9	1.30
Premaxillar ramus length	30	26.8	27.1	22.230.2	1.37
Maxillary barbel length	29	11.2	11.1	8.5-15.2	1.69

strigiceps) have pale spots on the body; all these species occur in the rivers from eastern South America (rio Paraná, rio Paraguay, and rio São Francisco basins). The only other nominal species of *Hypostomus* with high number of teeth and dark spots on the body are *H. denticulatus*, *H. johnii*, *H. mutuae*, and *H. ternetzi*. *Hypostomus mutuae* is the most similar species to *H. kuarup*, sharing with it an unusually wide mouth and

snout (Fig. 7). Molecular (P. Holanda-Carvalho, pers. comm.) and cytogenetic (L. Giuliano-Caetano, pers. comm.) evidence shows *Hypostomus mutuae* to be related to an assemblage of *Hypostomus* from the rio Paraguay basin that includes *H. latirostris* and *H. ternetzi*. Although the relationships of *Hypostomus kuarup* are at the moment unknown, we suspect that the species might be related to several undescribed



Fig. 7. *Hypostomus mutuae*, NUP 6641, 109.2 mm SL: Brazil, Mato Grosso, rio Paraguay basin, rio Claro.

Table 2. Meristic data of *Hypostomus kuarup*.

	N	Holotype	Mode	Range
Dorsal series of plates	30	22	22	21-23
Mid-dorsal series of plates	30	24	24	24-25
Median series of plates	30	25	25	24-26
Mid-ventral series of plates	30	25	25	24-26
Ventral series of plates	30	22	22	21-23
Predorsal plates	30	3	3	3-3
Plates below dorsal-fin base	30	9	8	8-9
Plates between dorsal and adipose fins	30	5	5	4-6
Dorsal-fin branched rays	30	7	7	7-7
Pectoral-fin branched rays	29	6	6	6-6
Pelvic-fin branched rays	30	5	5	5-5
Anal-fin branched rays	30	4	4	4-4
Caudal-fin branched rays	30	14	14	13-14
	N	Holotype	Mean	Range
Teeth on premaxilla	30	90	77	58-101
Teeth on dentary	30	92	80	58-105

Hypostomus species occurring at the southern shield tributaries of the Amazon basin.

Hypostomus kuarup is also characterized by having only slightly developed keel-like rows formed by moderately enlarged odontodes on body plates. This feature contrasts with the condition present, on one hand, in *Hypostomus* species as *H. carinatus*, *H. commersoni*, *H. hoplonites*, and *H. plecostomus*, which possess distinct, well-developed keels on the body plates, and, on the other hand, from species as *H. agna*, *H. garmanni*, *H. hermanni*, and *H. pyrinesei*, which have smooth body plates which entirely lack keels. Another interesting feature of the new species, shared with congeners which also exhibit preference for habitats with rocky bottom and fast flowing water, is its naked abdomen (mostly without plates) in specimens from all sizes. As earlier recorded by Gosline (1947) and Boeseman (1968), fully plated ventral areas are usually present in middle to large specimens of most species of *Hypostomus*, but are almost completely lacking throughout the whole life of a few species.

Comparative material examined. All from Brazil. *Hypostomus denticulatus*: Goiás State: MZUSP 98770, holotype, 161.9 mm SL, rio do Peixe, rio Paranaíba basin, Caldas Novas. NUP 4306, 2, 144.3-158.5 mm SL, rio Corumbá, upper rio Paraná basin, Pires do Rio. *Hypostomus johnii*: Piauí State, Teresina: MCZ 7831, syntypes, 1, 94.0 mm SL, rio Poti, rio Parnaíba basin. MCZ 7864, syntypes, 2, 93.1-95.5 mm SL, rio Poti, rio Parnaíba basin. *Hypostomus latirostris*: BMNH 1892.4.20.26-27, syntypes, 2, 137.2-159.3 mm SL, rio Jangada, rio Paraguay basin. Mato Grosso State: NUP 11014, 4, 113.3-153.3 mm SL, rio Cuiabá, rio Paraguay basin, Cuiabá. NUP 12203, 1, 113 mm SL, rio Casca, rio Paraguay basin, Chapada dos Guimarães. *Hypostomus meleagris*: AMNH 12246, holotype, 252.8 mm SL, upper rio Paraná basin. *Hypostomus multidentis*: São Paulo State: NUP 5340, paratype, 157.0 mm SL, rio Paranapanema, rio Paraná basin. NUP 5340, 1, 157.0 mm SL, Chavantes reservoir, rio Paranapanema, upper rio Paraná basin, Piraju. Paraná State: NUP 6776, 1, 167.0 mm SL, rio Paraná, upper rio Paraná basin, Doutor Oliveira Castro. *Hypostomus mutuae*: Mato Grosso State: MCP 28669, holotype, 67.7 mm SL; rio Mutuca, rio Paraguay basin, Chapada dos Guimarães. MZUSP 27694, 2, 75.0-79.4 mm SL, rio Mutuca, rio Paraguay basin, Chapada dos Guimarães. NUP

6641, 13, 52.4-109.2 mm SL, rio Claro, rio Paraguay basin, Chapada dos Guimarães. NUP 6642, 4, 62.1-98.1 mm SL, rio Claro, rio Paraguay basin, Chapada dos Guimarães. *Hypostomus strigaticeps*: São Paulo State: BMNH 1907.7.6.1012, syntypes, 3, 75.7-160.0 mm SL, rio Piracicaba, rio Tietê basin. NUP 4017, 2, 72.8-100.0 mm SL, rio Ipanema, rio Tietê basin, Ipuã. NUP 4538, 11, 82.0-140.0 mm SL, rio Corumbataí, rio Tietê basin, Piracicaba.

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