

Programa de Pós-graduação em Diversidade Animal  
Universidade Federal da Bahia

Byanca Sardeiro Bezerra

**Uma nova espécie de *Hypostomus* Lacépède  
(Siluriformes: Loricariidae) da bacia do rio Paraguaçu  
e redescrição de *Hypostomus unae* (Steindachner,  
1878), Estado da Bahia, Brasil**

Salvador

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Orientadora: Angela Maria Zanata  
Co-orientador: Claudio Zawadzki

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## ATA DA SESSÃO PÚBLICA DO COLEGIADO DO PROGRAMA DE PÓS-GRADUAÇÃO EM DIVERSIDADE ANIMAL - INSTITUTO DE BIOLOGIA, UFBA

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De acordo com o regimento geral da UFBA e com o regimento interno deste programa de pós-graduação, foram iniciados os trabalhos da Comissão Examinadora, composta pelos professores Dr. Angela Maria Zanata (presidente), Dr. Osvaldo Oyakawa e Dr. Marcelo Ribeiro Britto às 9:30 horas do dia 12 de Março de 2012.

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Esta Ata será assinada pelos membros da Comissão Examinadora e deste Colegiado, para compor o processo de emissão do diploma.

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## Epígrafe

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*“Um professor é a personificada consciência do aluno; confirma-o nas suas dúvidas; explica-lhes o motivo de sua insatisfação e lhe estimula a vontade de melhorar.”*

*Thomas Mann*

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## Resumo

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O gênero *Hypostomus* inclui 125 espécies atualmente reconhecidas como válidas e distribuídas desde a Costa Rica até a Argentina. Seus integrantes possuem corpo revestido por placas ósseas e boca ventral, sendo conhecidos popularmente principalmente como cascudos, acarís e chupa-pedra. O gênero é um dos mais complexos taxonomicamente na ordem Siluriformes. Particularmente, para as drenagens costeiras do nordeste brasileiro são reconhecidas dez espécies, quatro delas descritas para o Estado da Bahia. A identificação da maioria dos exemplares coletados na Bahia tem sido dificultada pela ausência de localidade-tipo precisa e descrições originais relativamente sucintas de *H. brevicauda*, *H. unae* e *H. wuchereri*. Uma análise taxonômica, com base em dados morfológicos, envolvendo exemplares de *Hypostomus* coletados em todas as drenagens costeiras da Bahia foi realizada no presente estudo. Os resultados permitiram o reconhecimento de uma espécie ainda não descrita para a bacia do rio Paraguaçu, cuja descrição é aqui apresentada. Além disso, exemplares provenientes de três rios incluídos na bacia do Recôncavo Sul foram identificados como *H. unae*, espécie aqui redescrita. A nova espécie, aparentemente endêmica da bacia do rio Paraguaçu, distingue-se das congêneres por ter o corpo coberto de manchas pretas grandes e conspícuas, superfície ventral do corpo nua ou com placas restritas à área entre nadadeiras peitorais, ausência de quilhas na cabeça e corpo, extremidade posterior da nadadeira dorsal geralmente atingindo a placa pré-adiposa, dentes bífidos, em forma de espátula, e com a cúspide lateral não fundida à mesial, sendo 47-86 dentes no premaxilar e 50-81 no dentário. *Hypostomus unae* ocorre nas bacias dos rios Una, das Almas e Jequiçá e distingue-se das congêneres por ter grandes manchas pretas sobre o tronco e nadadeiras (maiores que na cabeça), sendo uma série nas membranas inter-radiais anteriores da nadadeira dorsal, superfície ventral do corpo nua ou com placas usualmente restritas à área entre nadadeiras peitorais, extremidade posterior da nadadeira dorsal não atingindo a placa pré-adiposa ou espinho da adiposa, ausência de quilhas na cabeça e corpo, dentes bífidos, em forma de espátula, e cúspide lateral não fundida à mesial, sendo 29-70 dentes no pré-maxilar e 34-89 no dentário. O presente estudo evidenciou a necessidade de continuidade da análise taxonômica dos espécimes de *Hypostomus* dos rios do Nordeste do Brasil, particularmente daqueles que drenam o

Estado da Bahia, visando redescrever *H. brevicauda* e *H. wuchereri*, além de definir quais espécies descritas para o rio São Francisco ocorrem no estado e descrever novas espécies já diagnosticadas.

## Abstract

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The genus *Hypostomus* includes 125 species currently recognized as valid and distributed from Costa Rica to Argentina. Its members possess body covered with bony plates and mouth ventral, being popularly known mostly as cascudos, acarís, and chupa-pedra. The genus is one of the most complexes taxonomically in the order Siluriformes. Particularly, for coastal drainages of northeastern Brazil ten species are recognized, four of them described for the State of Bahia. The identification of most specimens collected in Bahia has been hampered by imprecise type localities allied to inaccurate original descriptions of *H. brevicauda*, *H. unae*, and *H. wuchereri*. A taxonomic analysis based on morphological data, involving specimens of *Hypostomus* collected in all coastal drainages of Bahia was performed in this study. The results allowed the recognition of a species yet to be described from the rio Paraguaçu basin, whose description is given herein. In addition, specimens from three independent rivers included in the Recôncavo Sul basin were identified as *H. unae*, species redescribed herein. The new species, apparently endemic to the rio Paraguaçu basin, is distinguished from its congeners by having body and head covered by large and conspicuous black spots, ventral surface of body naked or with plates restricted to area between the pectoral fins, absence of ridges over head and body, last ray of dorsal fin usually reaching preadipose plate, teeth bicuspid, spatula-shaped, with lateral cusp not fused to medial one, and 47-86 teeth on premaxilla and 50-81 on dentary. *Hypostomus unae* occurs in the rivers Una, das Almas and Jequiriçá and is distinguished from congeners by having large black spots on the trunk and fins (larger than on head), one series of spots on each interradiial membrane of dorsal fin, ventral body surface comparatively weakly covered by plates restricted to portion between pectoral-fin bases when present, dorsal fin not reaching preadipose plate, absence of keels on head and body, teeth long, bicuspid, spatula-shaped, with lateral cusp not fused to mesial one, and 29 to 70 teeth on premaxilla and 34 to 89 on dentary. The present study revealed a need for continuity of taxonomic analysis *Hypostomus* specimens from northeastern Brazil, particularly those draining the Bahia State, aiming to redescribe *H. brevicauda* and *H. wuchereri*, along with defining which species described from the rio São Francisco basin occur in the state and describe new species already identified.

## Introdução geral

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A ordem Siluriformes contém os peixes morfologicamente mais diversos e amplamente distribuídos do grupo Ostariophysi, sendo representada por 36 famílias, 477 gêneros e 3.088 espécies (FERRARIS, 2007). A família Loricariidae é a mais representativa da ordem com 785 espécies reconhecidas, incluídas em 100 gêneros (ESCHMEYER & FRICKE, 2011) com distribuição em rios da região Neotropical, desde o sudeste da Costa Rica até o nordeste da Argentina (ISBRUCKER, 1980). Loricariidae pertence à superfamília Loricarioidea junto com Astroblepidae, Scoloplacidae, Callichthyidae, Trichomycteridae e Nematogenyidae (BASKIN, 1973; SCHAEFER, 1987; DE PINNA, 1993). Esse agrupamento monofilético é um dos maiores dentro da ordem Siluriformes. É diagnosticado com base, principalmente, na presença de dentes tegumentares (odontódeos) na superfície externa do corpo. Dentre as propostas de agrupamentos, a mais recente é de Armbruster (2004), que propôs cinco subfamílias: Hypoptopomatinae, Hypostominae (que inclui cinco tribos), Lithogeninae, Loricariinae e Neoplecostominae. Posteriormente, Reis *et al.* (2006) descreveram a subfamília Delturinae para incluir os gêneros *Delturus* e *Hemipsilichthys*.

O gênero *Hypostomus* Lacépède, 1803, objetivo desse estudo, é o gênero-tipo da subfamília Hypostominae. Segundo Britski *et al.* (1999) os membros desta subfamília se caracterizam por apresentar pedúnculo caudal alto, não-deprimido e região interopercular pouco móvel, provida de espinhos curtos, não-eréteis. Embora várias modificações na classificação de Hypostominae tenham sido propostas, a mais recente foi a de Armbruster (2004) que alocou as tribos Ancistrini e Hypostomini em Hypostominae, e propôs também as tribos Corymbophanini, Pterygoplichthini e Rhinelepini, reconhecendo a subfamília como uma unidade monofilética. *Hypostomus* inclui 117 espécies listadas por Ferraris (2007) e oito descritas posteriormente (ARMBRUSTER *et al.*, 2007; JEREP *et al.*, 2007; ZAWADZKI *et al.*, 2008a, 2008b; HOLANDA CARVALHO *et al.*, 2010; ZAWADZKI *et al.*, 2010). De modo geral, o elevado número de espécies, aliado ao conhecimento limitado sobre os seus padrões de distribuição, à grande quantidade de descrições incompletas e à considerável variação intra-específica na morfologia e padrão de colorido têm causado uma série de problemas na delimitação e reconhecimento das espécies dentro do gênero, ou mesmo na distinção entre formas de uma mesma localidade (BRITSKI, 1972; BRITSKI *et al.*, 1999; BIRINDELLI

*et al.*, 2007; JEREP *et al.*, 2007). Trabalhos de revisão regionais têm sido uma alternativa utilizada por vários autores para lidar com as questões taxonômicas envolvendo *Hypostomus* (JEREP *et al.*, 2007). Sendo assim, estudos taxonômicos envolvendo o gênero usualmente tratam de trabalhos restritos a algumas bacias hidrográficas (REIS *et al.*, 1990; MAZZONI *et al.*, 1994; OYAKAWA *et al.*, 2005) ou revisões de subunidades monofiléticas do gênero (ARMBRUSTER, 2003; HOLLANDA CARVALHO & WEBER, 2005).

Particularmente, para as drenagens costeiras do nordeste brasileiro são reconhecidas dez espécies, das quais quatro foram descritas para bacias que drenam o Estado da Bahia: *H. brevicauda* (Günther, 1864) e *H. wuchereri* (Günther, 1864) com localidade-tipo definida apenas como "Bahia", *H. unae* (Steindachner, 1878) do rio Una e *H. chrysoptiktos* Birindelli, Lima & Zanata, 2007, descrita recentemente e endêmica da bacia do rio Paraguaçu. A identificação das três primeiras espécies tem sido dificultada pela ausência de localidade tipo precisa e descrições originais relativamente sucintas, em conjunto com uma diversidade de morfotipos de difícil identificação amostradas nas drenagens costeiras da Bahia. Especificamente para o caso de *H. brevicauda* e *H. wuchereri* até o momento não foi possível definir, de modo satisfatório em quais drenagens ocorrem e quais espécimes pertencem a elas. No caso de *H. unae*, embora a localidade-tipo esteja definida como rio Una, há três rios com o mesmo nome no Estado da Bahia. Um deles, afluente do rio Paraguaçu, na Chapada Diamantina, é distante geograficamente das cidades visitadas pelo coletor do material-tipo (Otto Wucherer). Os dois outros são drenagens costeiras, um incluído na bacia do Recôncavo sul, com foz na cidade de Valença e o outro com foz ao sul da cidade de Ilhéus, ambos provenientes de localidades possivelmente visitadas por Otto Wucherer. Tal incerteza quanto ao rio de origem de *H. unae* também contribuiu para dificultar o reconhecimento da espécie.

As outras seis espécies de *Hypostomus* descritas para o Nordeste do Brasil incluem duas do Rio Grande do Norte (*H. papariae* (Fowler, 1941), para o Lago Papari e *H. pusarum* (Starks, 1913) de Ceará-Mirim)) e quatro do Ceará (*H. carvalhoi* (Miranda Ribeiro, 1937) do rio Granjeiro, *H. eptingi* (Fowler, 1941) de Fortaleza, *H. jaguribensis* (Fowler, 1915) do rio Jaguaribe e *H. nudiventris* (Fowler, 1941) do rio Choró). Pesquisa feita com base na literatura e análise de material que eventualmente poderiam ser dessas espécies mostraram não haver ocorrência destas em drenagens do Estado da Bahia. Oito espécies de *Hypostomus* foram descritas para o rio São Francisco (*H. alatus* Castelnau 1855, *H. francisci* (Lütken, 1874), *H. garmani* (Regan, 1904), *H.*

*johnii* (Steindachner, 1877), *H. lima* (Lütken, 1874), *H. macrops* (Eigenmann & Eigenmann, 1888), *H. subcarinatus* Castelnau, 1855, e *H. vaillanti* (Steindachner, 1877)), a maior drenagem das proximidades, sendo que algumas delas também podem ocorrer em outras drenagens do Estado da Bahia. Até o momento não foram encontradas citações destas espécies para drenagens costeiras da Bahia.

Um estudo taxonômico amplo, envolvendo todas as espécies citadas acima e com objetivo de definir quais espécies ocorrem no Estado da Bahia e descrever as espécies possivelmente novas nunca foi realizado. Inicialmente, o presente estudo buscou atingir, ao menos parcialmente, tal objetivo. Entretanto, em vista das dificuldades referentes à identificação das espécies nominais em relação ao material recentemente coletado, a grande quantidade de material a ser analisado e o curto prazo disponível para tal tarefa, este estudo apresenta a redescrição de *Hypostomus unae* e descrição de uma espécie da bacia do rio Paraguaçu até então desconhecida.

## CAPÍTULO

Este capítulo apresenta o manuscrito intitulado “**A new dark-spotted species of *Hypostomus* Lacépède (Siluriformes: Loricariidae) from rio Paraguaçu basin and redescription of *Hypostomus unae* (Steindachner, 1878), Bahia State, Brazil**”, que será submetido para publicação no periódico científico NEOTROPICAL ICHTHYOLOGY. Os critérios de redação e formatação seguem as normas deste periódico, as quais se encontram disponíveis no ANEXO desta dissertação.

**A new dark-spotted species of *Hypostomus* Lacépède (Siluriformes: Loricariidae) from rio Paraguaçu basin and redescription of *Hypostomus unae*, Bahia State, Brazil**

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**Key words:** Hypostominae, taxonomia, drenagens costeiras, Nordeste.

**Abstract.** A new species of the genus *Hypostomus* Lacépède is described from the rio Paraguaçu basin, Bahia State, Brazil. The new species is distinguished from its congeners known to the northeastern Brazilian coastal drainages and to the São Francisco river basin by having large and conspicuous black spots similar in size over yellowish background, on head, trunk, and fins, ventral portion of body naked or plates covering only head and thoracic region; absence of ridges on head and trunk.

*Hypostomus unae* is redescribed based on examination of recently collected specimens from three small coastal drainages located between Paraguaçu and Contas rivers (rio Una, rio das Almas and rio Jequiriçá). *Hypostomus unae* is distinguished from congeners by having trunk covered by large inconspicuous black spots distinctly larger than that over head, ventral surface of body naked or with small areas covered by plates, absence of ridges on body, lower lobe of caudal fin slightly longer than upper, tip of adpressed dorsal-fin rays not reaching adipose plate or spine, relatively low teeth number, and spots on caudal fin aligned forming vertical bands at least in small to middle sized specimens.

**Resumo.** Uma nova espécie do gênero *Hypostomus* Lacépède é descrita da bacia do rio Paraguaçu, Estado da Bahia, Brasil. A nova espécie distingue-se de suas congêneres conhecidas para as drenagens costeiras do nordeste brasileiro e da bacia do rio São Francisco por apresentar corpo com manchas pretas grandes e conspícuas sobre fundo amarelado de tamanho semelhante no tronco, cabeça e nadadeiras, além de ventre nu ou parcialmente coberto por placa na região da cabeça e tórax, ausência de quilhas na



cabeça e corpo. *Hypostomus unae* é redescrita com base no exame de espécimes coletados recentemente em três pequenas drenagens costeiras localizadas entre os rios Paraguaçu e de Contas (rio Una, rio das Almas e rio Jequiariçá). *Hypostomus unae* distingue-se das congêneres por ter tronco coberto por manchas pretas inconspícuas e bem maiores que as da cabeça, ventre nu ou com pequenas áreas cobertas por placa, ausência de cristas nas laterais do corpo, ponta da nadadeira dorsal não atingindo espinho da adiposa e manchas na nadadeira caudal formando faixas transversais ao menos em exemplares de tamanho pequeno a médio.

### Introduction

*Hypostomus* Lacépède is the second most species-rich genus of the order Siluriformes, including 117 species listed by Ferraris (2007), plus eight species described to Brazilian rivers in recent years. Ten species of *Hypostomus* are currently known to Brazilian northeastern coastal drainages and eight to the São Francisco river, the largest drainage nearby. Four species of the former group cited were described to Bahia state: *Hypostomus brevicauda* (Günther, 1864) and *H. wuchereri* (Günther, 1864) both with the vague type-locality “Bahia”, *Hypostomus unae* (Steindachner, 1878) from rio Una, and the recently described *H. chrysoptiktos* Birindelli, Lima & Zanata (2007), endemic for the Paraguaçu river basin. The three first species were described from material sent to the British Museum of Natural History, London, by Otto Wucherer, who very probably collected the specimens in coastal river basins southern from Salvador (the capital of Bahia State), as localities of reptiles collected by him as Canavieiras, Nazaré, and Ilhéus suggest (Günther, 1861, 1863; Wucherer, 1861a, 1861b, 1863a, 1863b). Particularly for *Hypostomus unae*, it could be originally from three distinct small coastal drainages all named rio Una, one that drains to the coastal city of Valença, within the Recôncavo Sul basin, the other that drains to the city of Una, more to the south of Bahia State, and the third possibility represented by a tributary of Paraguaçu river, on the central portion of the state. Thus, the imprecise type locality, allied to the somewhat vague description, and absence of a precise diagnosis to these three species has rendered it difficult to securely identify *Hypostomus* specimens of the coastal Brazilian drainages, particularly those from Bahia state. The remaining six northeastern *Hypostomus* species were described for drainages situated relatively far north of Bahia state. From those, *H. papariae* (Fowler, 1941), was described from Lago

Papari, and *H. pusarum* (Starks, 1913) from Ceará-Mirim, both on Rio Grande do Norte State). This last species has been erroneously attributed to Ceará State in the literature (Carvalho & Bockmann, 2007). The other four northeastern species from Ceará state are *H. carvalhoi* (Miranda Ribeiro, 1937) from rio Granjeiro, *H. eptingi* (Fowler, 1941) from Fortaleza, *H. jaguribensis* (Fowler, 1915) from rio Jaguaribe, and *H. nudiventris* (Fowler, 1941) from rio Choró.

Eight species of *Hypostomus* are known to rio São Francisco basin and could possibly occur in rivers draining northeastern Brazilian coastal drainages. These are *H. alatus* Castelnau 1855, *H. francisci* (Lütken, 1874), *H. garmani* (Regan, 1904), *H. johnii* (Steindachner, 1877), *H. lima* (Lütken, 1874), *H. macrops* (Eigenmann & Eigenmann, 1888), *H. subcarinatus* Castelnau, 1855, and *H. vaillanti* (Steindachner, 1877). The majority of these species were originally described from rio das Velhas, a tributary of upper rio São Francisco and up to date there is no citation of their presence in coastal drainages of Bahia State. In fact, a detailed comparative study is necessary to establish exactly which of these species occurs in the São Francisco river portion or in its tributaries in the domains of the Bahia state. In addition, only one species, *H. scabriceps* (Eigenmann & Eigenmann, 1888), is known to coastal drainages nearby, to the south of Bahia State described to rio São Mateus, Espírito Santo State.

Expeditions carried out in the last six years in all coastal drainages of Bahia, Brazil, gathered a number of specimens of *Hypostomus*. Detailed examination of that material has been allowing for the resolution of some of the alpha-taxonomy problems of the genus in that part of the country. Herein we describe a new species of *Hypostomus* apparently endemic to the rio Paraguaçu basin and provide a redescription of *H. unae*.

## Material and Methods

Methodology and terminology for measurements follow Boeseman (1968), Armbruster & Page (1996), Bockmann & Ribeiro (2003), and Hollanda Carvalho & Weber (2004), with the inclusion of the following measurements: anal-fin spine length; anal-fin base length; body depth at dorsal-fin origin; mouth width, taken at the level of maxillary-barbel insertions; premaxillary-ramus length, measured at the largest portions of the dentary complex *sensu* Addriens *et al.* (2009, fig. 1B, 1C, 3E); and maxillary-barbel length, taken from free outer portion of barbel. Plate counts and nomenclature

follow schemes of serial homology proposed by Schaefer (1997), with modifications by Oyakawa *et al.* (2005). The following new counts were included: paired dorsal plates between end of the dorsal-fin base and adipose-fin base; ventral plates between end of anal-fin base and lower caudal-fin spine, not including plate at base of rays. Standard length (SL) is expressed in mm and all other measurements are expressed as percentage of standard length, except subunits of head, which are expressed as percents of head length (HL). Measurements and counts were taken on the left side of the specimens, whenever possible. Meristic data are given in the description, an asterisk indicates counts of the holotype, and the frequency of each count is given in parentheses. Holotype and syntype countings are identified with asterisks. Counts of branchiostegal rays, vertebrae, and data on position of dorsal and anal fins in relation to vertebral column were examined only in cleared and stained specimens (c&s), prepared according to the procedures of Taylor & Van Dyke (1985). Osteological terminology follows Schaefer (1987). In the material listed, the total number of specimens and its size range comes first, followed by the number and size range of measured specimens (in parentheses), if different. All examined specimens are alcohol preserved, except when noticed with c&s. Institutional abbreviations follow Sabaj Pérez (2010). Specimens utilized for comparative analysis are listed under ‘Comparative material examined’. Comparisons with *H. brevicauda* and *H. wuchereri* were based exclusively on the type material examined.

### ***Hypostomus jaguar*, new species**

Figs. 1-3

**Holotype.** MZUSP 110603, 164.8 mm SL. Brazil, Bahia, Iaçú, rio Paraguaçu in Fazenda Os Touros at 18 km from Iaçú, 12°41'10.6"S 40°07'47"W, 143 m a.s.l., 8 Jun 2005, A. M. Zanata, J. L. O. Birindelli, O. T. Oyakawa, M. P. Geraldés, P. C. A. Cardoso & P. Moura.

**Paratypes.** All from Bahia, rio Paraguaçu basin, same data as holotype, except when noticed. MZUSP 90870, 13, 68.8-175.6 mm SL. UFBA 3177, 1, 139.6 mm SL, 9 Jun 2005. MZUSP 91653, 1, 129.0 mm SL, Itaetê, rio Una, in front of Lapa do Bode, 12°56'8.1"S 41°03'53.9"W, 308 m a.s.l., 4 Dec 2005, A. M. Zanata, P. Camelier & M. P. Geraldés. NUP 4448, 2, 126.8-152.9 mm SL, Itaberaba, Fazenda Santo Antônio at 10

km from Vila São Vicente, out of roadway BA 242, 12°30'54.1''S 39°22'53.9''W, 134 m a.s.l., 7 Jun 2005, A. M. Zanata, P. Camelier, J. O. Birindelli, O. T. Oyakawa, M. P. Geraldés & P. Moura. UFBA 6232, 2, 123.5-138.0 mm SL, 15 May 2010, A. Zanata, R. Burger & C. P. Oliveira. UFBA 6457, 2, 121.7-170.2 mm SL, Itaetê, rio Una, in front of Lapa do Bode, 12°56'8.1''S 41°03'53.9''W, 308 m a.s.l., 4 Dec 2005, A. M. Zanata, P. Camelier & M. P. Geraldés. UFBA 6501, 8, 85.7-175.0 mm SL (1 c&s, 85.7 mm SL), Itaberaba, Fazenda Santo Antônio at 10 km from Vila São Vicente, out of roadway BA 242, 12°30'54.1''S 39°22'53.9''W, 134 m a.s.l., 7 Jun 2005, A. M. Zanata, P. Camelier, J. O. Birindelli, O. T. Oyakawa, M. P. Geraldés & P. Moura.

**Non types.** UFBA 6502, 8 (143.0-195.0) 1 c&s, 159.1 mm SL, Itaberaba, Vila de São Vicente, bought at the market in Vila São Vicente, rio Paraguaçu basin.

**Diagnosis.** *Hypostomus jaguar* can be distinguished from the species of the *H. cochliodon* group, except *H. hemicochliodon*, by having bifid and spatula-shaped teeth and the lateral cusp and mesial not fused (*vs.* spoon-shaped teeth with lateral and mesial usually fused). From *H. alatus*, *H. albopunctatus*, *H. chrysostiktos*, *H. faveolus*, *H. francisci*, *H. lexi*, *H. luteus*, *H. luteofrenatus*, *H. margaritifera*, *H. microstomus*, *H. multidentis*, *H. regani*, *H. roseopunctatus*, *H. scaphiceps*, *H. strigaticeps*, *H. tietensis*, and *H. variipictus* it is distinguished by having conspicuous black spots over body and fins (*vs.* pale or yellowish spots). It is distinguished from the remaining congeners, except *H. agna*, *H. brevicauda*, *H. brevis*, *H. garmani*, *H. heraldoi*, *H. hermanni*, *H. johnii*, *H. lima*, *H. luetkeni*, *H. nigropunctatus*, and *H. wuchereri*, by the absence of ridges on pterotic-supracleithrum, predorsal plates and on lateral series of plates (*vs.* having moderate to developed ridges on pterotic-supracleithrum, predorsal plates, and lateral series of plates). The new species differs further from *H. agna*, *H. brevicauda*, *H. heraldoi*, *H. johnii*, *H. luetkeni*, *H. vermicularis*, and *H. wuchereri* by having head and trunk covered by large and conspicuous dark spots (length of spots ranging from half of to approximately eye diameter) (*vs.* small overall spots, similar in length to pupil diameter or smaller); from *H. garmani*, *H. hermanni*, *H. lima*, and *H. mutuae* by having ventral surface weakly covered by plates, restricted, when present, to portion between pectoral-fin bases (*vs.* ventral surface almost or completely covered by plates, including median area between pelvic fins). In addition, *H. jaguar* can be distinguished from *H. chrysostiktos*, also endemic of rio Paraguaçu basin, by having seven

unbranched dorsal-fin rays (vs. 10-11) and 25 or 26 median plates (vs. 27-29), from *H. brevicauda*, *H. unae*, and *H. wuchereri* by having the trunk and head covered by dark large (length of spots ranging from half of to approximately eye diameter) and conspicuous spots (vs. small overall spots in *H. brevicauda* and *H. wuchereri* (length of spots smaller than pupil), and inconspicuous spots (in alcohol preserved specimens) over lateral of body, much larger than the head ones in *H. unae*). I differs further from *H. brevicauda* and *H. wuchereri* by having ventral surface of body comparatively weakly covered by plates, when present, restricted to portion between pectoral-fin bases (vs. ventral surface almost or completely covered by plates, including central area between pelvic fins) and from *H. unae* by having longer dorsal fin, with tips of the last ray, when adpressed, usually reaching the preadipose plate (adpressed fin 36.6-44.3% vs. 29.6-38.7% and tip of last rays not reaching adipose plate or spine) and higher teeth number 47-86 (mode 70) on premaxilla and 50-81 (mode 75) on dentary (vs. 29-70 (mode 51) on premaxilla and 34-89 (mode 54) on dentary). Additionally, *Hypostomus jaguar* can be distinguished from its congeners from other coastal northeastern rivers (*H. carvalhoi*, *H. eptingi*, *H. jaguribensis*, *H. nudiventris*, *H. papariae*, and *H. pusarum*) by a series of features, including the dark large and conspicuous spotted color pattern of body and fins, comparatively weakly covered ventral surface of belly, and lobes of caudal fin similarly elongated. See 'Remarks' for more details on diagnosis.

**Description.** Standard length of examined specimens 68.8 to 175.6 mm SL.

Measurements of holotype and paratypes in Table 1. Dorsal, lateral, and ventral views Figure 1. Dorsal profile of body convex from snout tip to dorsal-fin origin, straight and posteroventrally inclined from this point to middle of caudal peduncle, and somewhat concave from end of adipose spine and origin of dorsal-most caudal-fin rays. Ventral profile of body straight from snout to opercular aperture, straight to somewhat convex along thoracic and abdominal areas, and straight from urogenital opening to caudal-fin base. Body relatively depressed; greatest body width at cleithral region, progressively tapering posteriorly from cleithrum; width at cleithral region greater than head depth. Greatest body depth at dorsal-fin origin, gradually tapering to caudal peduncle. Caudal peduncle robust, slightly flattened ventrally, in cross-section roughly trapezoidal on its anterior portion and more elliptical posteriorly.

Head somewhat depressed, wide, and rounded anteriorly. Head without ridges. Posterior border of supraoccipital with a small triangular process. Two plates fused to

each other bordering posterior margin of supraoccipital bone. Interorbital region straight to somewhat convex, with lateral margins slightly elevated. Eye dorsolateral, relatively small. Dorsal flap of iris present. Mouth wide; roof and area anterior to dentary teeth covered by relatively small papillae. Lips rounded, of moderate size, occupying approximately two-thirds of ventral surface of head, its posterior border not reaching transverse line between gill openings, and without distinctly fringed edges. Inner surfaces of lips covered by papillae, except for smooth region just behind toothed portions. Antermost papillae of inner surface of lower lip roundish and relatively large, followed by patch of laterally elongated papillae; antermost papillae in inner surface of upper lip roundish and small, followed by patch of larger and closely positioned papillae; distal margins of lips with a band of very small papillae, more evident on upper lip. Papillae of lower lip slightly more spaced than on the upper. Teeth long, bicuspid, and curved inward distally; mesial cusp longer, approximately 2.5 to 3.0 times length the other cusp and curved inward, similar to *Hypostomus auroguttatus* (Muller & Weber, 1992: fig. 2e). Majority of teeth overlap each other laterally. Forty seven to 86 (mode 70, holotype 67) teeth in premaxilla, 50 to 81 (mode 75, holotype 75) teeth in dentary. Contralateral premaxillary teeth forming relatively straight line or slightly concave arch; contralateral dentaries forming concave arch facing mouth cavity in angle of approximately 120°. Maxillary barbels short, usually similar in length to orbital diameter.

Body covered with five rows of moderately spinulose dermal plates. Cheeks, snout, and rostrum completely plated, except for naked area on snout tip that continues ventrally to margin of upper lip, and small areas around nares. Ornamentation of pterotic-supracleithrum usually similar to remaining surface of head, but with odontodes slightly larger and more sparsely distributed. Plates over opercle weakly armed, varying from covered with relatively small odontodes similar in size with those in nearby areas posterior portion of opercle with slightly more elongated odontodes. Posterior portion of preopercle surface with somewhat stronger odontodes. Cheek plates slightly evertible. Dorsal-fin base naked. Median series of plates bearing the lateral-line canal. Dorsal series of plates starting posteriorly, at vertical through dorsal-fin origin. Ventral series of plates usually starting at origin or slightly posterior to origin of pelvic-fin base. Plates between end of dorsal-fin base and adipose-fin spine flattened. Dorsalmost plates between end of dorsal-fin base and adipose-fin spine flattened. Twenty one (26)\* or 22(1) dorsal plates, 24(25)\* or 25\*(2) mid-dorsal plates, 25(7)\* or 26(20) median

plates, 25(3)\* or 26(24) mid-ventral plates, 21(19)\* or 22(8) ventral plates, 13 (13) or 14\* (14) plates between anal to caudal fin. Three predorsal plates (two specimens with a small central plate between first two plates), 7 (12)\* or 8 (15) plates below dorsal fin, 5(17) or 6(10)\* paired plates between dorsal and adipose fin. One (20)\*, 2(6) or 3(1) preadipose plates. Odontodes over plates covering most of lateral body portions aligned, forming parallel rows usually more conspicuous on posterior half of body; odontodes somewhat stronger on borders of plates of midventral and ventral series. Plates without ridges, except for the first four of the mid-ventral series and on plates of the dorsal series along dorsal-fin base to adipose fin (specimen of 68.8 mm SL without ridge on dorsal series of plates). Odontodes over head usually smaller and not forming organized rows.

Ventral surface of head and body with variation on plated and naked areas; head usually with rounded patches of plates on each side, positioned close to opercle aperture and separated by naked central area on the rear of lower lip; some specimens with those lateral patches reduced to a few small platelets; one specimen, on the contrary, with plates completely covering ventral surface of head, except area close to lower lip border. Covering of thoracic ventral surface varying from almost completely naked, with a few small plates on the central portion between pectoral fins, to having relatively large areas covered by plates, over coracoids, central, and lateral portions close to pectoral-fins base and extending shortly posterior to it; when covered, form of central plated area on thorax rounded or rough triangular, pointed posteriorly. Variation on thoracic ventral covering is apparently ontogenetic, with area almost completely naked in specimens around 110.0 mm SL or smaller, but similarly, naked surface also occurs in large specimen of 170.0 mm SL. Abdominal area naked; rarely with a few sparse platelets on central area between pelvic fins base. Preanal plate naked in specimens around 100.0 mm SL or larger (smaller specimens with a few odontodes on the area or plate completely covered with skin).

Dorsal-fin I7, its origin situated on vertical anterior to pelvic-fin origin and approximately on midlength of pectoral-fin spine. Tips of first and last basal radials of dorsal fin lying above neural spines of vertebrae seven and 16, respectively. Dorsal fin higher than the length of its base; tips of adpressed last rays varying from reaching the anterior border of the preadipose plate to, more rarely, the anterior border of adipose spine. Posterior margin of dorsal fin slightly convex. Adipose-fin spine narrow, usually straight or slightly curved ventrally. Pectoral fin I6, its posterior margin slightly

concave; pectoral-fin spine not distinctly strong. Degree of overlapping of posterior tip of adpressed pectoral fin over pelvic fin ontogenetically variable, with tip of fin reaching midlength of pelvic-fin unbranched ray in smaller and median-sized specimens to reaching posterior third of pelvic-fin spine in largest individuals. Pectoral fin inserted about same plane as pelvic fins (slightly superior) and pectoral-fin spine resting on top of pelvic-fin when adpressed. Pelvic fin i5, its posterior margin somewhat rounded to straight. Tip of pelvic fin usually reaching  $\frac{1}{4}$  to anterior half of anal-fin unbranched ray. Anal fin i3(1) or i4 (27)\*, its border straight to slightly rounded and reaching fifth or sixth plate after its origin. Tips of first and last basal radials of anal fin lying below hemal spines of vertebrae 14 and 17, respectively. Caudal fin i,14,i (25)\* or i,15,i(2), its posterior margin varying from somewhat concave to straight; lower unbranched ray somewhat longer than upper. All fin rays covered by odontodes, somewhat stronger on unbranched ones. Distal portion of unbranched pectoral-fin ray with odontodes somewhat longer and slightly curved, more conspicuous on larger individuals. Twenty nine vertebrae, three branchiostegal rays.

**Color in alcohol.** Overall ground color of dorsal and lateral surface of body yellowish. Dorsal and lateral surface of body covered with large black, round, conspicuous, and equally distributed black spots. Spots over trunk usually varying from half of to approximately eye diameter, decreasing gradually in size towards head. Head spots usually around half of eye diameter, slightly smaller on snout. Fins covered with similar spots, slightly smaller than the ones of trunk and slightly larger than the majority of head spots. Interradial membranes of anteriormost dorsal-fin rays with one series of spots and posteriormost interradianal membranes with two series; a few specimens with two or three spots elongated and merged to each other forming short longitudinal or inclined bands; membrane between longest rays with seven to nine spots and membrane between last two rays with a vertical line of four or five spots in specimens around 80.0 mm SL or larger; number of spots on membranes may be lower in smaller specimens. Pectoral and pelvic fin similarly spotted, spots not fused or forming bands; spines usually with seven or more spots in specimens around 80.0 mm SL or larger, and four or five on smaller. Adipose spine with three spots; adipose membrane spotted or not. Caudal fin with spots over rays and membranes, usually not forming vertical stripes, but in some specimens (usually smallest) spots somewhat merged to each other forming weakly defined vertical stripes; appearance of vertical stripes observed also in some



specimens when caudal fin is somewhat folded. Around 10 spots over unbranched caudal-fin rays and eight or more over longest branched rays. Anal fin spotted. All fins with posterior margins darkened. Overall ground color of ventral body surface yellowish to light brown; presence of black round spots variable, usually completely absent but in some specimens concentrated on head area, others over plated portion, and others sparsely distributed over belly. Spots on belly, when present, less conspicuous than on lateral portion of body. Ventral surface of caudal peduncle yellowish, usually without conspicuous spots, with darkened median longitudinal stripe or a few sparse darkened roundish areas. Largest specimen examined darker overall, with somewhat grayish background and spots slightly less visible, although in the same pattern described above.

**Color in life.** Description based on field observations of several specimens and on pictures of living specimens (Fig. 2). Ground color yellowish with somewhat golden hue. Black, round, and conspicuous spots over body and fins rays and interradial membranes similar to the coloration in alcohol. Ventral surface yellowish or light brown, with or without spots.

**Distribution.** Only known from rio Paraguaçu basin, an independent coastal drainage in northeastern Brazil (Fig. 3).

**Common name.** Acari, acari-preto, acari-pintado.

**Etymology.** From *îagûara* in the indigenous language tupi-guarani, which means panther, in allusion to the black spotted color pattern over a yellowish background. A noun in apposition.

**Ecological notes.** *Hypostomus jaguar* was captured in dark water stretches of the rio Paraguaçu and its tributaries (up 60 m wide and 1,5 m deep), with rocky bottom, dark colored water, mild to fast water current, at altitudes ranging from 143 to 350 meters above sea level. The new species apparently occurs along the river course, from its tributaries on the oriental slopes of Chapada Diamantina mountains to at least the middle portion of rio Paraguaçu. The surrounding vegetation along the Paraguaçu river is highly variable, crossing domains of Campo rupestre, Caatinga, Cerrado, (Brazilian

savannas) and semi-deciduous seasonal to evergreen riparian forests. Most areas sampled were anthropized mainly due to cattle ranches. The species occurs sympatrically with *H. chrysostiktos*.

**Remarks.** In addition to the overall large and defined spotted color pattern of *Hypostomus jaguar*, contrasting with the small to moderate and usually faded spots on body and fins coloration of the northeastern congeners (*H. carvalhoi*, *H. eptingi*, *H. jaguribensis*, *H. nudiventris*, *H. papariae*, *H. pusarum*), it differs also by having ventral surface of body naked or weakly plated, always without plated area on abdomen (*vs.* thorax completely covered by small plates forming a broad rectangular area on thorax continuing posteriorly through a narrow median longitudinal band and followed by a somewhat broad plated area situated posterior to pelvic fin base in *H. carvalhoi*, *H. jaguribensis*, and *H. papariae*, and broad plated area on thorax and abdomen of *H. eptingi*). The new species differs further from these three species by absence of ridges on trunk (*vs.* presence of ridges). Absence of dark bands on caudal fin also distinguishes *H. jaguar* from *H. eptingi*, *H. papariae*, and *nudiventris*, with five or six obscure transverse dark bands on former two species and seven dark bands on latter. *Hypostomus jaguar* differs also from *H. papariae* and *H. pusarum* by its comparatively shorter dorsal fin, rarely reaching the adipose-fin spine (*vs.* dorsal fin clearly reaching or trespassing base of adipose-fin spine) and from *H. nudiventris* by the absence of brown median vertical short lines or streaks parallel with rays of dorsal fin (*vs.* presence). The new species differs further from *H. eptingi* by having lobes of caudal fin comparatively similar in length (*vs.* lower lobe distinctly longer than upper).

Eight species are recognized to the rio São Francisco basin (*H. alatus*, *H. francisci*, *H. garmani*, *H. johnii*, *H. lima*, *H. macrops*, *H. subcarinatus*, and *H. vaillanti*). As previously cited elsewhere, none of these species were registered up to date to coastal rivers draining the Bahia state and in the present study none of them was observed in the Paraguaçu river basin. All the *Hypostomus* species described for São Francisco basin possess ventral surface of head and body almost or completely covered by plates, distinctly of the new species with naked or comparatively weakly covered ventral surface of belly. In addition, *H. jaguar* is readily distinguished from *H. alatus* and *H. francisci* by having dark spots over yellowish or clear brown background (*vs.* clear spots over dark background), from *H. johnii* and *H. vaillanti* by having caudal-fin lobes relatively similar in length (*vs.* lower lobe distinctly longer than upper), from *H.*

*subcarinatus* by having body robust and no predorsal ridges (vs. elongate body and at least three predorsal ridges), from *H. macrops* by having pectoral spine weakly armed with odontodes (vs. pectoral spine with large and curved odontodes on most of its extension), and from *H. lima* by having similarly sized spots over body and head (vs. spots over body of double size compared to head ones). From *H. scabriceps*, the unique species known to coastal drainages nearby, to the south of Bahia State, the new species can be further distinguished by its large spotted coloration, one or two spots partially reaching each plate (vs. comparatively small spotted, up to four spots per plate) and dorsal fin reaching or almost reaching adipose fin (vs. dorsal fin distant at least two plates from adipose fin).

*Hypostomus jaguar* is the second species of the genus endemic to Paraguaçu river basin. Its sympatric congener, *H. chrysostiktos* has higher number of branched dorsal-fin rays (10-11), a remarkable and unique characteristic within the Hypostomini, together with an inverted pattern of coloration. Thus, *H. jaguar* has external morphological features apparently more similar to other congeners (e.g., *H. unae*, known to rio Unae, rio Jequiriçá and rio das Almas basins) than with the sympatric *H. chrysostiktos*. Although a study of relationships was not performed, we suggest that the closest relatives of *H. jaguar* possibly are congeners from outside Paraguaçu river basin. The endemic nature of the Paraguaçu basin ichthyofauna was previously highlighted by various authors (Lima & Gerhard, 2001; Santos & Zanata, 2006; Santos & Caramaschi, 2007; Birindelli *et al.*, 2007) and up to date a total of 16 species are known to be endemic to the basin. *Hypostomus jaguar* represents the eleventh siluriform species apparently endemic to the Paraguaçu basin.

Weber (2003) mentioned the possibility of *H. wuchereri*, a species with the vague type-locality “Bahia”, as occurring in the rio Paraguaçu, a information cited posteriorly by Bitencourt *et al.* (2011). Nonetheless, the examination of type material of *H. wuchereri* revealed it as a species very distinct from *H. chrysostiktos* and *H. jaguar*, the two species known up to date to occur in the Paraguaçu river basin (see diagnosis of *H. jaguar* in this paper and of *H. chrysostiktos* in Birindelli *et al.*, 2007). Extensive collections have been performed in the rio Paraguaçu in the last 12 years by ichthyologists of Bahia State and the occurrence of a yet not sampled *H. wuchereri* in this river basin seems unlikely. A taxonomic study aiming to redescribe *H. wuchereri* and define its distribution is under way by the authors.

## *Hypostomus unae*

Figs. 4-7

*Plecostomus unae* Steindachner, 1878: 383. (type locality: rio Una, Bahia, Brazil).

Regan 1904:215 (description; Bahia)

*Plecostomus robinii* (not Cuvier & Valenciennes, 1840) Günther, 1864: 236

(description). Steindachner, 1877: 676 (description; rio Una, südlich von Bahia, Brasil).

Eigenmann & Eigenmann, 1888:170-171 (identification key; catalog; rio Una).

Eigenmann & Eigenmann, 1890: 412 (description; rio Una).

**Diagnosis.** *Hypostomus unae* can be distinguished from the species of the *H. cochliodon* group, except *H. hemicochliodon*, by having bifid non spoon-shaped teeth and the lateral cusp not fused to the mesial one (vs. spoon-shaped teeth with lateral cusp usually fused to the mesial). From *H. alatus*, *H. albopunctatus*, *H. chrysoptiktos*, *H. faveolus*, *H. francisci*, *H. lexi*, *H. luteus*, *H. luteofrenatus*, *H. margaritififer*, *H. microstomus*, *H. multidens*, *H. regani*, *H. roseopunctatus*, *H. scaphiceps*, *H. strigaticeps*, *H. tietensis*, and *H. variipictus* it is distinguished by having dark spots over body and fins (vs. pale spots). It is distinguished from the remaining congeners, except *H. agna*, *H. brevicauda*, *H. brevis*, *H. garmani*, *H. heraldoi*, *H. hermanni*, *H. johnii*, *H. lima*, *H. luetkeni*, *H. nigropunctatus*, and *H. wuchereri*, by the absence of ridges on pterotic-supracleithrum, predorsal plates and on lateral series of plates (vs. presence of moderate to developed ridges on pterotic-supracleithrum, predorsal plates, and lateral series of plates); from *H. agna*, *H. brevicauda*, *H. brevis*, *H. garmani*, *H. heraldoi*, *H. hermanni*, *H. johnii*, *H. lima*, *H. luetkeni*, *H. nigropunctatus*, and *H. wuchereri* by having ventral surface comparatively weakly covered by plates, restricted, when present, to portion between pectoral-fin bases (vs. ventral surface almost or completely covered by plates, including median area between pelvic fins). *Hypostomus unae* is additionally distinguished from *H. chrysoptiktos* mainly by having seven unbranched dorsal-fin rays (vs. 10-11) and 25-26 (rarely 27) median plates (vs. 27-29), from *H. brevicauda* and *H. wuchereri* by having body covered by dark large (length of spots ranging from approximately equal to 1.5 the eye diameter) and comparatively inconspicuous blotches (mainly observed in medium to large sized or alcohol preserved specimens) (vs. spots conspicuous and smaller than pupil), and one series of spots on each interradiial membrane of dorsal fin (vs. two or three series of spots). *Hypostomus*

*unae* differs further from *H. brevicauda* and *H. wuchereri* by having belly surface naked or, more rarely, weakly covered by plates (*vs.* ventral surface almost or completely covered by plates). It can be distinguished from *H. jaguar* by having comparatively inconspicuous black spots over trunk (mainly in medium to large sized or alcohol preserved specimens), much larger than the head ones (*vs.* body and head covered by black large and conspicuous spots, relatively similar in size), shorter dorsal fin with tip of last rays not reaching adipose plate or spine (adpressed fin 29.6-38.7% *vs.* 36.6-44.3% and tips of adpressed rays usually reaching preadipose plate or adipose spine), and lower teeth number (29-70 [mode 51] on premaxilla and 34-89[mode 54] on dentary (*vs.* 47-86 [mode 70] on premaxilla and 50-81[mode 75] on dentary).

*Hypostomus unae* can be distinguished from its congeners of other coastal northeastern rivers (*H. carvalhoi*, *H. eptingi*, *H. jaguribensis*, *H. nudiventris*, *H. papariae*, and *H. pusarum*) and from rio São Francisco basin (*H. alatus*, *H. francisci*, *H. garmani*, *H. johnii*, *H. lima*, *H. macrops*, *H. subcarinatus*, and *H. vaillanti*) by a series of features, including weakly plated ventral surface of belly (*vs.* partially or completely plated belly) and lobes of caudal fin similarly elongated (*vs.* lower lobe clearly longer than upper). See 'Remarks' for more details on diagnosis.

**Description.** Standard length of examined specimens 41.2 to 183.0 mm. Measurements of syntype and other specimens in Table 2. Dorsal, lateral, and ventral views of head and body in Figure 4-5. Dorsal profile of body convex from snout tip to occipital process, slightly convex to somewhat straight from this point to dorsal-fin origin, straight and posteroventrally inclined from this point to middle of caudal peduncle, and somewhat concave from end of adipose spine and origin of dorsalmost caudal-fin rays. Ventral profile of body straight from snout to opercular aperture, straight to somewhat convex along thoracic and abdominal areas, and straight and posterodorsally inclined from urogenital opening to caudal-fin base. Body relatively depressed; greatest body width at cleithral region, progressively tapering posteriorly from cleithrum; width at cleithral region greater than head depth. Greatest body depth at dorsal-fin origin, gradually tapering towards caudal peduncle. Caudal peduncle robust, in cross-section from trapezoidal on its anterior portion to elliptical posteriorly, slightly flattened ventrally.

Head somewhat depressed, wide, and rounded anteriorly. Head without ridges, except for larger specimens with slightly developed ridge posterior to orbits. Posterior

border of supraoccipital with a small triangular posterior process. One or two plates (fused to each other) bordering posterior margin of supraoccipital bone. Interorbital region straight to somewhat convex, with lateral margins slightly elevated. Eyes dorsolateral; relatively small. Dorsal flap of iris present. Mouth distinctly wide; roof and area anterior to dentary teeth covered by relatively small papillae. Lips rounded, without distinctly fringed edges; lower lip large, its posterior border not reaching transverse line between gill openings in larger specimens. Inner surfaces of lips covered by papillae, except for smooth region just behind toothed portions. Antermost papillae of lower lip inner surface roundish and relatively large, followed by gradually smaller papillae, usually similarly rounded (some larger specimens with somewhat laterally elongated papillae on posterior half of lower lip); antermost papillae in inner surface of upper lip roundish and small, followed by patch of larger and closely positioned papillae; distal margins of upper lip with a band of very small papillae. Twenty nine to 70 (mode 51; syntype with more than 42, some teeth missing) teeth in premaxilla and 34 to 89 (mode 54; syntype with more than 50, some teeth missing) teeth in dentary. Teeth long, bicuspid, and curved distally inward, mesial cusp longer similar to *Hypostomus auroguttatus* (Muller & Weber, 1992: fig. 2e), longer cusp approximately 1.75 to 2.0 times length the other (Fig. 6A). Some specimens possess comparatively stronger and lower number of teeth, bearing cusps shorter and similar in length (longer cusp equal to 1.3 times the shorter Fig. 6B) (see also 'Remarks'). Teeth partially overlapping each other, except in specimens with of lower number of strong teeth. Contralateral premaxillary teeth forming relatively straight line or slightly concave arch; contralateral dentaries forming concave arch facing mouth cavity, in approximately 120°. Maxillary barbells short, shorter than orbital diameter.

Body covered with five lateral rows of moderately spinulose dermal plates. Cheeks, snout, and rostrum completely plated, except for naked area on snout tip that usually continues ventrally to margin of upper lip (except larger specimens with patch of plates between snout tip and border of upper lip), and small areas around nares. Outer edge of upper lips without platelets. Ornamentation of pterotic-supracleithrum usually similar to remaining surface of head, but with odontodes slightly larger and more sparsely distributed. Plates over opercle weakly armed, covered with relatively small odontodes similar in size with those in nearby areas and somewhat stronger odontodes on its posterior border. Posterior portion of preopercle surface with somewhat stronger odontodes. Cheek plates slightly evertible. Dorsal-fin base naked. Median series of

plates bearing a complete lateral-line. Dorsal series of plates starting posteriorly, at vertical through dorsal-fin origin. Ventral series of plates usually starting posterior to origin of pelvic-fin base. Dorsalmost plates between end of dorsal-fin base and adipose-fin spine flattened. Twenty (1), 21\* (48), or 22(2) dorsal plates, 23 (1), 24 (43), or 25\* (7) mid-dorsal plates, 25(9), 26\*(36), or 27(4) median plates, 25(29), 26\*(19), or 27(1) mid-ventral plates, 20 (5), 21(42), or 22\*(4) ventral plates. Thirteen (8), 14\* (34), or 15(5) plates between end of anal-fin base and lower caudal-fin ray. Three predorsal plates, 7 (31) or 8\*(20) plates below dorsal fin, 4(1), 5(18), or 6\*(30) paired plates between dorsal fin and adipose fin, and 1\*(33) or 2(17) preadipose plates. Odontodes on plates covering most of lateral body portions not forming parallel rows, except on mid-ventral series where rows of odontodes can be present; odontodes somewhat stronger on borders of plates of midventral and ventral series. Plates of the body without ridges, except for the first four of the mid-ventral series and, on plates of the dorsal series along dorsal-fin base to adipose fin (specimens larger than 100.0 mm SL); larger specimen with weakly developed ridges along mid-dorsal and mid-ventral series of plates. Odontodes over head usually smaller.

Ventral surface of head varying from naked to with lateral patches of plates, close to opercular aperture; plates on ventral surface of head already present in specimens around 80.0 mm SL and, on the other hand, specimens of 140.0 mm SL almost naked. Ventral surface of body usually naked, except by a few plates on lateral portions, close to pectoral-fin base; small specimens up to 80.0 mm SL completely naked; a few large specimens (around 133.0 and 175.0 mm SL) with coracoid almost completely covered by plates, followed by a large triangular patch of plates covering the central thoracic portion and narrowing posteriorly to end on area between pelvic fins. Preanal plate exposed in specimens around 75.0 mm SL or larger.

Dorsal-fin I7 (51), its origin situated on vertical anterior to pelvic-fin origin and on vertical from midlength to posterior third of pectoral-fin spine. Tips of first and last basal radials of dorsal fin lying above neural spines of vertebrae seven and 16, respectively. Dorsal fin slightly higher than the length of its base; tips of adpressed last rays varying from relatively distant of preadipose plate (up to two dorsal plates) to reaching the anterior border of the preadipose plate. Posterior margin of dorsal fin slightly convex. Adipose-fin spine narrow, usually straight or slightly curved ventrally. Pectoral fin I6 (51), its posterior margin slightly concave; pectoral-fin spine slightly curved inward, stronger in specimens larger than 140.0 mm SL; posterior tip of

addressed pectoral fin reaching anterior third of pelvic-fin spine length, varying from slightly anterior in smaller specimens to posterior in larger specimens. Pectoral fins inserted about the same plane as pelvic fins (slightly superior) and pectoral-fin spine resting on top of pelvic-fin when addressed. Pelvic fin i5 (51), its posterior margin somewhat rounded; degree of overlapping of tip of pelvic fin ontogenetically variable, varying from up to half of anal-fin unbranched ray in smallest specimens to not reaching the fin in some larger specimens. Anal fin i4 (51), its border straight to slightly round and tip reaching fifth or sixth plate after its origin. Tips of first and last basal radials of anal fin lying below hemal spines of vertebrae 15-18, respectively. Caudal fin i,13,i (1) or i,14,i,\* (50), its margin varying from somewhat concave to straight; lower spine similar in size or slightly longer than upper. All fin rays covered by odontodes, somewhat stronger on unbranched rays. Posterior half of unbranched pectoral-fin rays in specimens around 150.0 mm SL or larger with distinctly longer, stronger and curved odontodes (larger odontodes of larger specimens with 3.1 mm). Vertebrae, 29 branchiostergal rays, -4.

**Color in alcohol.** Overall ground color of dorsal and lateral surface of body grayish or light brown to yellowish in smaller specimens (Figures 4-5). Dark spotted pattern over body ontogenetically variable; middle to small sized specimens (around 120.0 mm SL or smaller) with dark spots clearly visible over trunk and head, distinct from larger specimens somewhat homogeneously grayish colored. Trunk of middle to small sized specimens covered with medium to large black, roundish spots; spots varying from approximately equal to 1.5 the eye diameter; some specimens with largest spots concentrated over median series of plates. Spots over head much smaller than those over trunk and dorsal fin, varying from 0.2 (specimen of 115.6 mm SL) to 0.6 times length the eye diameter (specimen of 56.0 mm SL) and more closely distributed. Larger specimens with poorly visible or complete absence of spots over trunk and head, usually with very closely positioned small spots limited by clear lines of the background and resulting in a somewhat reticulated pattern; trunk of some large specimens completely without spots. Fins covered with relatively large black, roundish and conspicuous spots, smaller than the trunk ones (when present) and considerably larger than head spots. Dorsal fin with spots somewhat larger than on other fins, distributed in one series on each interradiial membrane; four to seven on first membrane and two to four on last one; unbranched dorsal-fin ray with three or four spots on smallest specimens, six or seven



on specimens around 135.0 mm SL, and completely gray in larger specimens. Distribution of spots on dorsal fin somewhat variable, aligned horizontally or not; in some specimens spots merged to each other forming longitudinal stripes (more common in specimens up to 115.0 mm SL). Pectoral and pelvic fin similarly spotted, although spots somewhat smaller. Pectoral-fin spots usually aligned in transversal lines in smaller specimens and not aligned in larger ones; spots usually not fused or forming bands; spines with three to five spots on smallest and without conspicuous spots on largest specimen. Pelvic-fin spots aligned only on smallest specimens, with three to five spots over pelvic spine; larger specimen with pelvic-spine spots barely visible and restricted to its anterior portion. Anal fin completely yellowish on smaller specimens, spotted on middle sized and homogeneously darkened on larger. Adipose spine and membrane with one or two spots or completely darkened on larger specimens. Caudal fin with spots similar to pectoral and pelvic fins, over rays and membranes, forming vertical stripes or not; three to six stripes observed on various specimens from 28.7-147.0 mm SL. Overall ground color of ventral body surface yellow or pale in smaller specimens to grayish on larger, usually not spotted; dark spots, if present, barely visible or restricted to a few inconspicuous ones on caudal peduncle.

**Color in life.** Description based on field observations of several specimens and on pictures of living specimens (Fig. 7). Ground color yellowish to light brown. Black roundish spots over body and fins in pattern similar to observed on specimens in alcohol. In some specimens three broad inconspicuous dark bands trespasses dorsal and lateral portions of body, the first through origin of dorsal-fin, second at the end of the fin and the third through adipose-fin base. Ventral surface yellow- to whitish.

**Distribution.** *Hypostomus unae* occurs in three relatively small independent drainages (rio das Almas, rio Jequiriçá, rio Una) that are included in the Recôncavo Sul basin situated on central portion of coastal region of Bahia, Brazil (Fig. 3).

**Common name.** Acari, cari, chupa-pedra.

**Habitat and ecological notes.** *Hypostomus unae* was captured in relatively small coastal drainages and their tributaries (0.8-25 m wide and up to 1.5 m deep), in stretches characterized by mild to fast water current and clear to relatively turbid water, at

altitudes ranging from 56 to 375 meters above sea level. Substrates at all locations were rocky, with pebbles and sand. The dominant riparian vegetation is usually represented by grass and a few marginal trees, except in the rio das Almas basin, with a more preserved riparian vegetation. All localities where *H. unae* was captured were originally surrounded by the Atlantic Forest. However, the Recôncavo Sul basin, where rio Una, rio das Almas, and rio Jequiçá are included is one of the regions first colonized in Brazil (started in the XVI century) and most of the areas were first converted to cocoa plantations and more recently to cattle ranches with resultant major changes to riparian habitats and most likely in water conditions and quality. Nowadays, the hydric resources of the region are highly disturbed mainly by deforestation, contamination by pesticides, siltation and remotion of the river beds, effluents discharge, dams construction, introduction of alloctone species (*Astronotus ocellatus*, *Clarias gariepinus*, *Cichla pinima*), and intensification of touristic activity (Fischer, 2007; Burger *et al.* 2012). According to Burger *et al.* (2012), the rio das Almas have better conserved riparian vegetation mainly derived by the cocoa plantation called “cabruca”(i.e., native trees partially shading cacao plantation) and ichthyofauna apparently best preserved in comparison to remaining drainages of Recôncavo Sul basin. On the other hand, apparently the rio Una, type locality of *H. unae*, is one of the most disturbed coastal drainages of the Recôncavo Sul basin, with high degree of water contamination according to Fischer (2007).

**Material examined. Syntype.** BMNH 1862.11.23.12, 1, 104.7 mm SL, Brazil, Bahia.

**Nontypes: All from Brazil, state of Bahia: rio Jequiçá basin:** UFBA 5823, 11, 21.1-115.3 mm SL (3, 41.4-115.3 mm SL), Amargosa, rio Jequiçá Mirim, 13°03'32"S 39°38'05"W, 300 m a.s.l., 4 Oct 2009, A. M. Zanata, R. Burger, P. Camelier & A. B. A. Góes. UFBA 5890, 3, 31.4-64.6 mm SL(2, 41.2-64.6 mm SL), Ubaíra, rio do Mucuri, tributary of rio Jequiçá, between Jenipapo village and Ubaíra, 13°14'57"S 39°40'14"W, 329 m. a.s.l., 4 Oct 2009, A. M. Zanata, R. Burger, P. Camelier & A. B. A. Góes. UFBA 6027, 3, 100.0-136.0 mm SL, Amargosa, córrego Timbó, tributary of rio Jequiçá Mirim, 13°04'20"S 39°38'13"W, 375 m a.s.l., 4 Oct 2009, A. M. Zanata, R. Burger, P. Camelier & A. B. A. Góes. **Rio Una basin:** UFBA 5881, 4, 29.0-50.1 mm SL (2, 43.1-50.1 mm SL), Presidente Tancredo Neves, rio Rolo under bridge of roadway BR 101, tributary of rio Piau, 13°28'57"S 39°25'22"W, 180 m a.s.l., 5 Oct 2009, A. M. Zanata, R. Burger, P. Camelier & A. B. A. Góes. UFBA 6993, 1, 135.5 mm

SL, Valença, rio Una, 13°22'S 39°04'W, 12 Feb 2012, collected by a fisherman. **Rio das Almas basin:** UFBA 4529, 4 150.0-190 mm SL (1 c&s, 161.7 mm SL), Nilo Peçanha, bought from a fisherman at Sítio Pantaneiro, between Gandu and Nilo Peçanha, 13°36'28"S 39°08'38"W, 56 m a.s.l. UFBA 5257, 10, 113.0-183.0 mm SL (6, 112.0-183.0 mm SL), Nilo Peçanha, 13°39'17.5"S 39°12'59.1"W, 92 m a.s.l., 3 Dez 2008, R. Burger & J. A. Reis. UFBA 5718, 7, 77.5-102.0 mm SL, Teolândia, rio Preto at Pedra do Sino, 13°32'19"S 39°39'59"W, 10 Nov 2009, R. Burger & J. A. Reis. UFBA 5722, 13, 27.8-96.2 mm SL (7, 52.1-96.2 mm SL), Piraí do Norte, córrego between Piraí do Norte and Gandú, 13°43'59"S 39°24'20"W, 157 m a.s.l., 8 Oct 2009, A. M. Zanata, R. Burger, P. Camelier & A. B. A. Góes. UFBA 5731, 25, 39.5-112.0 mm SL (8, 54.6-112.0 mm SL), Wenceslau Guimarães, riacho on road between Teolândia and Cocão village, 13°33'59"S 39°36'54"W, 172 m a.s.l., 5 Oct 2009, A. M. Zanata, R. Burger, P. Camelier & A. B. A. Góes. UFBA 6460, 12, 59.7-123.0 mm SL (8, 59.7-123.0 mm SL), Wenceslau Guimarães, Nova Esperança village, riacho Serra Grande, tributary of riacho Campo, 13°36'06"S 39°41'59"W, 300 m a.s.l., 8 Oct 2010, bought from fisherman. UFBA 6486, 7, 29.6-101.9 mm SL (5, 49.6-101.9 mm SL), Wenceslau Guimarães, rio Samambaia on the limit between Wenceslau Guimarães and Cravolândia, tributary of rio Piabanha, tributary of rio Preto, 13°31'51.2"S 39°42'37.5"W, 338 m a.s.l., 9 Oct 2010, A. M. Zanata *et al.* UFBA 6487, 2, 89.3-108.1 mm SL, Wenceslau Guimarães, riacho Serra Grande, tributary of riacho Campo, 13°35'59.8"S 39°42'37.5"W, 307 m a.s.l., 8 Oct 2010, A. M. Zanata *et al.* UFBA 6488, 7, 55.4-110.0 mm SL (6, 60.6-110.0 mm SL), Wenceslau Guimarães, rio Preto at Pedra do Sino, 13°32'29.2"S 39°39'46.7"W, 218 m a.s.l., 9 Oct 2010, A. M. Zanata *et al.*

**Remarks.** *Hypostomus unae* can be more detailed diagnosed from congeners inhabiting coastal drainages to the north of Bahia state (*H. carvalhoi*, *H. eptingi*, *H. jaguribensis*, *H. nudiventris*, *H. papariae*, *puserum*) by its overall large spotted color pattern over trunk and spots comparatively abruptly smaller over head (*vs.* relatively small spotted overall or with faded body coloration). It is also distinguished from *H. carvalhoi*, *H. eptingi*, and *H. papariae* by having ventral surface of body comparatively naked or with a few areas covered by plates (*vs.* thorax completely covered by small plates forming a broad rectangular area continuing posteriorly through a narrow median longitudinal band and followed by a somewhat broad plated area situated posterior to pelvic-fin base in *H. carvalhoi*, *H. jaguribensis*, and *H. papariae*, and broad plated area on thorax and

abdomen of *H. eptingi*). *Hypostomus unae* differs further from these three species by the absence of ridges on trunk (vs. presence of ridges) and from *H. nudiventris* by absence of brown median vertical short lines or streak parallel with rays of dorsal fin (vs. presence) and adpressed dorsal fin comparatively short, barely reaching preadipose-fin plate (vs. dorsal fin long reaching dorsal-fin spine). It differs also from *H. eptingi*, *H. papariae*, and *H. pusarum* by having one series of black spots on each interradiial membrane of dorsal fin (vs. two series).

From the species recognized to the São Francisco river basin, *H. unae* can be additionally diagnosed by its naked or weakly covered ventral surface of belly (vs. ventral surface of head and body almost or completely covered by plates). It also differs from *H. alatus* and *H. francisci* by having dark spots over yellowish or clear brown background (vs. clear spots over dark background), from *H. johnii* and *H. vaillanti* by having caudal-fin lobes relatively similar in length (vs. lower lobe distinctly longer than upper), from *H. subcarinatus* by having body robust and no predorsal ridges (vs. elongate body and at least three predorsal ridges), and from *H. macrops* by having pectoral spine weakly armed with odontodes (vs. pectoral spine with large and curved odontodes on most of its extension). From *H. scabriceps*, the unique species known to occur in a nearby coastal river to the south of Bahia State, *H. unae* can be distinguished by its large spotted coloration, usually with one spot per plate (vs. comparatively small spotted, up to four spots per plate) and dorsal fin reaching or almost reaching the adipose fin (vs. dorsal fin distant at least two plates from adipose fin).

A relatively wide variation in number of teeth and two somewhat distinct teeth forms, was observed in *H. unae* populations. In fact, the variation was observed among specimens of the same lot. As given in the species description, the premaxillary teeth number varied from 29-70 and the dentary from 34-89. The majority of the specimens examined have relatively high number of teeth (mode 51 on premaxilla and mode 54 on dentary). In this case, teeth usually overlap each other at least partially and possess one cusp distinctly longer, similar to *Hypostomus auroguttatus* (Muller & Weber, 1992: fig. 2e), with larger cusp approximately 1.75 to 2.0 times length the other (Fig. 6A). In contrast, specimens with lower number of teeth (around 30) have teeth comparatively stronger, not overlapping each other, and with cusps shorter, similar in size (Fig. 6B). Analysis of the material per lot sampled and particularly for each of the tree river basins where the species inhabits revealed that the observed variation occurs within specimens of the same lot and within each basin. Furthermore, no other morphological or

coloration trait allows further distinction of the specimens with distinct teeth countings and, thus, those were considered herein as belonging to the same species.

On a recent cytogenetic study (Bitencourt *et al.*, 2011) of two allopatric populations of *Hypostomus*, one sampled in rio Una at the locality of Valença and the other in the rio de Contas basin around the city of Jequié, the authors tentatively identified these populations as *H. cf. wuchereri*. However, the examination of all specimens collected in rio Una basin, including the vouchers utilized in the cited cytogenetic study from that basin (not from rio de Contas basin), revealed that the material belongs to *H. unae*. Furthermore, ongoing taxonomic study of *Hypostomus* of Contas rivers basin revealed two species of the genus in that basin, none of them identified as *H. unae*. Identification of one of these two species as *H. wuchereri* or not depends on future taxonomic studies.

**Comparative material examined. Brazil:** *Hypostomus brevicauda* BMNH

1864.1.19.16-17, 2 syntypes, 189.0-196.1 mm SL, Bahia. *Hypostomus chrysoptiktos* UFBA 2786, 5 paratypes, 112.3-259.7 mm SL, Bahia, Iaçú, rio Paraguaçu. *Hypostomus garmani* BMNH 1904.1.28.3, holotype, 209.9 mm SL, Minas Gerais, rio das Velhas. *Hypostomus heraldoi* MZUSP 98771, 1 holotype, 217.9 mm SL, Goiás, rio Pirapitinga. *Hypostomus johnii* MCZ 7831, 1 syntype, 94.0 mm SL, Piauí, Teresina, rio Parnaíba basin, rio Poti. MCZ 7864, 2 syntypes, 93.1-95.5 mm SL, Piauí, Teresina, rio Parnaíba basin, rio Poti. *Hypostomus lima* BMNH 1876.1.10, 2 cotypes, 72.9-86.1 mm SL, Minas Gerais, Lagoa Santa. *Hypostomus multidentis* NUP 5340, paratype, 157.0 mm SL, São Paulo, rio Paraná basin, rio Paranapanema. NUP 5340, 1, 157.0 mm SL, São Paulo, Piraju, upper rio Paraná basin, rio Paranapanema, Chavantes reservoir. NUP 6776, 1, 167.0 mm SL, Paraná, Doutor Oliveira Castro, rio Paraná, upper rio Paraná basin. *Hypostomus mutuae* MCP 28669, holotype, 67.7 mm SL, Mato Grosso, Chapada dos Guimarães, rio Paraguai basin, rio Mutuca. MZUSP 27694, 2, 75.0-79.4 mm SL, Mato Grosso, Chapada dos Guimarães, rio Paraguai basin, rio Mutuca. NUP 6641, 13, 52.4-109.2 mm SL, Mato Grosso, Chapada dos Guimarães, rio Paraguai basin, rio Claro. NUP 6642, 4, 62.1-98.1 mm SL, Mato Grosso, Chapada dos Guimarães, rio Paraguai basin, rio Claro. *Hypostomus pusarum* UFBA 3824, 3, 84.2-107.9 mm SL, Rio Grande do Norte, Jardim do Seridó, rio Seridó. *Hypostomus scabriceps* BMNH 1904.1.28.3, 1 cotype, 88.0 mm SL, Espírito Santo, São Matheos. *Hypostomus strigaticeps* BMNH 1907.7.6.1012, 3 syntypes, 75.7-160.0 mm SL, São Paulo, rio Tietê basin, rio

Piracicaba. NUP 4017, 2, 72.8-100.0 mm SL, São Paulo, Ipuã, rio Tietê basin, rio Ipanema. NUP 4538, 11, 82.0-140 mm SL, São Paulo, Piracicaba, rio Tietê basin, rio Corumbataí. *Hypostomus subcarinatus* MNHN A.9575, 1 holotype, 241.8 mm SL, Minas Gerais. *Hypostomus wuchereri* BMNH1863.3.27.15, 1 syntype, 203.8 mm SL, Bahia. BMNH 1852.13.12.8, 1 syntype, 127.3 mm SL, Bahia. *Hypostomus* sp. UFBA 3027, 5, 115.0-123.0 mm SL, Bahia, Rio Real, rio Itapicuru. *Hypostomus* sp. UFBA 4254, 3, 83.5-79.4 mm SL, Bahia, Floresta Azul, rio Salgado, rio Cachoeira basin. *Hypostomus* sp. UFBA 4835, 1, 155.0 mm SL, Bahia, Mascote, rio Pardo. *Hypostomus* sp. UFBA 5862, 2, 22.3-40.0 mm SL, Bahia, Muniz Fereira, rio da Onha, rio Jaguaripe basin. *Hypostomus* sp. UFBA 6335, 4, 60.4-174.0 mm SL, Bahia, Ubaitaba, rio Oricó, tributary of rio de Contas. *Hypostomus* sp. UFBA 6457, 2, 123.0-170.0 mm SL, Bahia, Itaetê, rio Una, tributary of rio Paraguaçu. *Hypostomus* sp. NUP 9813, 13, 51.6-76.8 mm SL, Bahia, Jequié, rio das Pedras, tributary of rio das Contas, 13° 43'40"S 39°05'26"W, 23 Apr 2009, V. H. Miguez.

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## Legends

**Fig. 1.** *Hypostomus jaguar*, holotype, MZUSP 110603, 164.8 mm SL, from the rio Paraguaçu, Bahia State, Brazil.

**Fig. 2.** *Hypostomus jaguar*, paratype, UFBA 6457, 170.2 mm SL. Photographed alive.

**Fig. 3.** Geographic distribution of *Hypostomus jaguar* (dots; open symbol for type locality) and *Hypostomus unae* (squares). Symbols may represent more than one lot.

**Fig. 4.** *Hypostomus unae*, UFBA 5257, 183.0 mm SL, from the rio das Almas, Bahia State, Brazil.

**Fig. 5.** *Hypostomus unae*, syntype, BMNH 1862.11.23.12, 1, 104.7 mm SL, Bahia Brazil. Photo from <https://acsi.acnatsci.org>.

**Fig. 6.** Dentary teeth of *Hypostomus unae* from rio das Almas, Bahia, Brazil **A:** UFBA 6486, 103.2 mm SL; **B:** UFBA 5718, 91.4 mm SL. Left side.

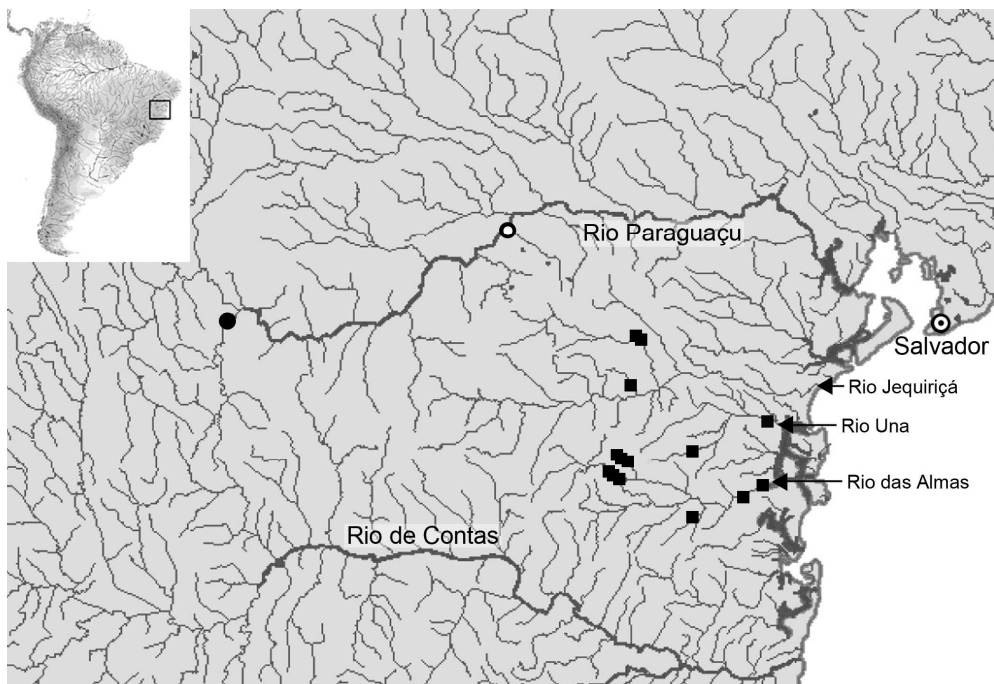
**Fig. 7.** *Hypostomus unae*, UFBA 5731, 112.0 mm SL, from rio das Almas basin, Bahia State, Brazil. Photographed alive.



**Fig. 1.**



**Fig. 2.**



**Fig. 3.**



**Fig. 4.**





**Fig. 5**



**Fig. 6A**





**Fig. 6B**



**Fig. 7**

**Table 1.** Morphometric data for *Hypostomus jaguar* sp. n.

	Holotype	N	Range	Mean	SD
Total length in mm	-	12	95.0-238.5	-	-
Standard length in mm	164.8	27	68.8-175.6	-	-
<b>Percents of standard length</b>					
Predorsal length	40.0	27	38.7-42.9	40.2	1.1
Preanal length	64.0	27	63.4-67.6	65.3	1.2
Head length	31.8	27	31.4-35.9	33.3	1.3
Interdorsal length	16.9	26	13.3-17.6	15.0	1.1
Thoracic length	22.8	27	22.0-25.1	23.4	0.7
Abdominal length	23.1	27	19.7-23.6	22.4	0.9
Caudal peduncle length	33.0	27	29.7-33.4	31.6	1.0
Caudal peduncle depth	10.4	27	9.5-11.0	10.7	0.3
Dorsal-fin spine length	29.7	13	29.5-33.2	31.3	1.3
Adressed dorsal-fin length	38.6	27	36.6-44.3	41.6	1.9
Dorsal-fin base length	22.3	27	22.3-26.6	25.0	1.1
Anal-fin spine length	10.0	25	8.4-11.1	10.0	0.7
Anal-fin base length	3.2	27	2.4-4.2	3.5	0.4
Pectoral-fin spine length	30.8	23	29.5-33.8	31.4	1.3
Pelvic-fin spine length	23.8	26	23.6-27.2	25.7	0.9
Upper caudal-fin ray length	-	5	28.8-33.8	31.4	2.1
Lower caudal-fin ray length	-	12	31.9-42.1	36.9	3.5
Adipose-fin spine length	9.0	27	7.1-10.1	8.7	0.7
Cleithral width	29.4	27	28.9-31.9	30.2	0.7
Body depth	21.1	27	17.7-21.7	19.9	1.0

**Percents of head length**

Head depth	57.3	27	49.7-57.9	54.3	2.5
Snout length	62.6	27	61.4-67.5	63.8	1.6
Snout-opercle distance	73.5	27	70.1-76.8	73.1	1.9
Interorbital width	37.6	27	32.9-39.0	36.6	1.4
Orbital diameter	14.3	27	11.4-15.9	13.4	1.1
Mouth width	56.5	27	50.5-59.6	54.9	2.1
Mandibular ramus length	17.0	27	15.1-20.1	17.7	1.2
Premaxillar ramus length	18.1	27	15.4-19.8	18.0	1.0
Maxillary barbel length	12.2	27	8.5-16.3	11.7	1.8

**Table 2.** Morphometric data for *Hypostomus unae*.

	Syntype	N	Range	Mean	SD
Total length in mm	-	57	50.8-225.0	-	-
Standard length in mm	104.7	58	41.2-183.0	-	-
<b>Percents of standard length</b>					
Predorsal length	41.4	58	37.6-44.1	41.2	1.5
Preanal length	67.7	58	62.5-68.6	65.0	1.2
Head length	33.2	58	30.0-38.4	33.9	1.7
Interdorsal length	16.8	58	15.8-20.6	18.4	1.1
Thoracic length	25.0	58	20.5-25.8	22.8	1.1
Abdominal length	20.8	58	18.9-23.5	21.5	1.0
Caudal peduncle length	30.5	58	28.4-34.7	31.3	1.3
Caudal peduncle depth	12.0	58	9.3-12.0	10.4	0.4
Dorsal-fin spine length	28.7	51	22.1-30.1	25.4	2.0
Adpressed dorsal-fin length	36.3	58	29.6-38.7	34.1	1.9
Dorsal-fin base length	21.4	58	19.6-24.2	22.3	1.2
Anal-fin spine length	8.3	56	7.2-11.4	9.5	0.9
Anal-fin base length	3.5	58	2.2-5.1	3.4	0.5
Pectoral-fin spine length	28.9	55	23.1-29.7	26.7	1.6
Pelvic-fin spine length	25.1	57	19.9-26.3	23.3	1.2
Upper caudal-fin ray length	-	24	19.8-30.7	26.7	2.3
Lower caudal-fin ray length	-	40	24.0-34.1	28.4	2.1
Adipose-fin spine length	7.5	57	6.5-10.3	7.8	0.7
Cleithral width	30.0	58	27.0-30.6	28.8	0.8
Body depth	19.5	58	16.3-24.1	20.2	1.4
<b>Percents of head length</b>					
Head depth	52.3	58	46.3-65.1	56.7	4.1
Snout length	64.7	58	56.3-66.7	62.0	2.1
Snout-opercle distance	74.1	58	65.7-77.8	73.4	2.6
Interorbital width	35.3	58	28.9-36.7	33.7	1.7
Orbital diameter	13.5	58	11.3-21.6	17.2	1.8

Mouth width	56.6	58	46.3-61.9	54.8	4.1
Mandibular ramus length	17.5	58	15.9-22.1	18.8	1.6
Premaxillar ramus length	18.1	58	11.3-22.1	18.1	1.8
Maxillary barbel length	8.0	58	2.9-13.8	8.1	1.9

## Conclusões gerais

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- Esse estudo taxonômico permitiu o reconhecimento de uma espécie ainda não descrita para a bacia do rio Paraguaçu, bem como a identificação de *Hypostomus unae* com base em exemplares provenientes dos rios Una, das Almas e Jequiriçá.
- A nova espécie pode ser diagnosticada de suas congêneres conhecidas para as drenagens costeiras do nordeste brasileiro e da bacia do rio São Francisco por apresentar corpo com manchas pretas grandes e conspícuas sobre fundo claro de tamanho semelhante no tronco, cabeça e nadadeiras, além de ventre nu ou parcialmente coberto por placa na região da cabeça e tórax, ausência de quilhas na cabeça e corpo e lobo inferior da nadadeira caudal não muito mais longo que o superior.
- *Hypostomus unae* é aqui redescrita e distingue-se das congêneres por ter tronco coberto por manchas pretas inconspícuas e bem maiores que as da cabeça, ventre nu ou com pequenas áreas cobertas por placa, ausência de quilhas nas laterais do corpo, lobo inferior da caudal pouco mais longo que o superior, ponta da nadadeira dorsal não atingindo espinho da adiposa e manchas na nadadeira caudal formando faixas transversais ao menos em exemplares de tamanho pequeno a médio.
- O presente estudo evidenciou a necessidade de continuidade da análise taxonômica dos espécimes de *Hypostomus* dos rios do Nordeste do Brasil, particularmente daqueles que drenam o Estado da Bahia, visando redescrever *H. brevicauda* e *H. wuchereri*, além de definir quais espécies descritas para o rio São Francisco ocorrem no estado e descrever novas espécies já diagnosticadas.

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## **ANEXO**

Normas para submissão de artigos a serem publicados no periódico NEOTROPICAL ICHTHYOLOGY, (disponível em: <http://www.ufrgs.br/ni/>, acessado em 11 de outubro de 2011), cujo conceito Qualis/CAPES, em 2010, foi B1 na área de Ciências Biológicas I.

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Acesse o sítio <http://submission.scielo.br/index.php/ni>, registre-se como autor e siga os procedimentos lá descritos de submissão.

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- Figuras compostas devem ser identificadas com as letras **a**, **b**, ..., em minúsculas, no canto esquerdo inferior de cada ilustração. As figuras compostas devem ser preparadas fazendo-se uso apropriado do espaço disponível (largura da página - 175 mm; coluna - 85 mm).
- Ilustrações devem conter escalas de tamanho ou indicação de tamanho na legenda.

## Referências Bibliográficas

- Citar no texto nos seguintes formatos: Eigenmann (1915, 1921) ou (Eigenmann, 1915, 1921; Fowler, 1945, 1948) ou Eigenmann & Norris (1918) ou Eigenmann *et al.* (1910a, 1910b).
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- Referências devem ser listadas em ordem alfabética, nos seguintes formatos:

### Livros:

Campos-da-Paz, R. & J. S. Albert. 1998. The gymnotiform “eels” of Tropical America: a history of classification and phylogeny of the South American electric knifefishes (Teleostei: Ostariophysi: Siluriphysi). Pp. 419-446. In: Malabarba, L. R., R. E. Reis, R. P. Vari, Z. M. S. Lucena & C. A. S. Lucena (Eds.). Phylogeny and Classification of Neotropical Fishes. Porto Alegre, Edipucrs, 603p.

### Dissertações/Teses:

Langeani, F. 1996. Estudo filogenético e revisão taxonômica da família Hemiodontidae Boulenger, 1904 (*sensu* Roberts, 1974) (Ostariophysi, Characiformes). Unpublished Ph.D. Dissertation, Universidade de São Paulo, São Paulo. 171 p.

### Artigo em revistas (listar nome do periódico por extenso):

Lundberg, J. G., F. Mago-Leccia & P. Nass. 1991. *Exallodontus aguanai*, a new genus and species of Pimelodidae (Teleostei: Siluriformes) from deep river channels of South America and delimitation of the subfamily Pimelodinae. Proceedings of the Biological Society of Washington, 104(4): 840-869.

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## NEOTROPICAL ICHTHYOLOGY TAXONOMIC CONTRIBUTION STYLE SHEET

Note: This summary is intended to provide specific information for taxonomic manuscripts only. For general information on the organization and style requirements for NI, consult a recent issue of the journal and the Instructions to Authors that can be found on the inside back cover (as well as on the NI web site).

### **Generic accounts:**

Order of presentation:

Name Author, Year (or new genus [Do not abbreviate.])

[Synonymy]

#### **Type species.**

**Diagnosis.** (see below the CONSIDERATIONS ON HOW TO PREPARE DIAGNOSES)

**Etymology.** (for new species only)

[**Remarks.**]

#### **Key to species.**

Comments on above:

Type species: For newly proposed genera, the original Name of the proposed type species, followed by Author and Year of publication (or new species) is sufficient. For previously proposed generic names, the following additional information is required (in this order): Nature of type designation (e. g., original designation, monotypy, absolute tautonymy. etc). If the type species was not designated in the original publication, the author, year and page of the designation should be cited (e. g., Type by subsequent designation by Jordan, 1919: 45).

Diagnosis: diagnoses should NOT be written in telegraphic style (for clarity purposes). Generic diagnoses preferably should list the unique synapomorphies of the genus, followed by homoplastic derived characters and/or other useful distinguishing characteristics.

Etymology: For new names, state the gender, even though it may be obvious from the construction. Do not give an etymology for preexisting names. If it is necessary to discuss the etymology of an old name (for example, to justify an interpretation of its gender), put that in the Remarks section.

### **Species accounts**

Order of presentation:

Name, Author, Year (or “new species” [Do not abbreviate.])

[Synonymy]

**Holotype.** [for new species only – include full collection data (see details, below)]

[**Paratype(s).**] [for new species only – include full collection data (see details, below)]

[**Non-types .**] [for new species only – include reduced collection data (see details, below) (Justification for separating non types should be provided in Remarks)]

**Diagnosis.** (see below the CONSIDERATIONS ON HOW TO PREPARE SPECIES DIAGNOSES)

#### **Description.**

**Coloration.**

**Size.**

**[Sexual dimorphism.]**

**Distribution.**

**[Ecological notes.]**

**Etymology.** [for new species only]

**[Remarks.]**

**[Material examined.]** (for accounts of previously named species)

Some comments on the above listed categories:

Types: Should be listed separately from other material examined only for new species.

Should include full collection data, in the following order:

Catalog number, # specimens (except for holotype), size range, number and size range of measured specimens, if different – in parentheses, locality, date of collection [in Day, Month (3 letter abbreviation only) and Year format], and collector(s) (e.g., LIRP 5640, 25, 38.5-90.3 mm SL (12, 75.0-90.3 mm SL), Brazil, São Paulo, Município de Marapoama, rio Tietê basin, ribeirão Cubatão at road between Marapoama and Elisiário, 21°11'35"S 49°07'22"W, 10 Feb 2003, A. L. A. Melo).

Diagnosis: diagnoses should NOT be written in telegraphic style (for clarity purposes).

Description: In telegraphic style (i. e., no verbs or articles)

Coloration: In telegraphic style (i. e., no verbs or articles), may be divided in Color in alcohol and Color in life.

Etymology: For new names, state the usage (adjective, noun, patronym, etc.), even though it may be obvious from the construction. Do not provide an etymology for preexisting names, unless the etymology is necessary to justify the spelling. In such cases, this information belongs in the Remarks and not as a separate heading.

Material examined: Provide only locality, catalog number, number of specimens and size range. In addition, indicate any types by: (Holo- Syn-, etc.) type of *Xus yus* Author, date. For Lectotype or Neotype, also provide citation for source of designation (e.g., USNM 123456, 75 mm SL, Amazon River near Manaus, lectotype of *Xus yus*, Author, date, designated by Isbrücker (1971: 85) [or designated herein]). Specimen lots should be arranged by Country, then by State or Territory, then by river basin, if relevant. Country should be written in Bold font and should not be repeated after the first usage in a species account.

Specific issues:

Scientific names must always include the generic name, or at least an abbreviation for the generic name. This applies to tables and figure captions, as well as the text of the manuscript. Typically, the whole generic name should be spelled out in full at the first usage in each paragraph. Thereafter, an abbreviation can be used provided that there is no possibility of confusion with another generic name.

Bilaterally paired structures must be treated in the singular (e. g., pelvic fin short, not pelvic fins short)

Compound adjectives that include a noun should be connected by a hyphen (e. g., pectoral-fin spine, NOT pectoral fin spine).

Fin-ray formulae should be reported with unbranched rays in lower case Roman numerals, spines in upper case Roman, and branched rays in Arabic numerals. Transitions between different types of rays should be indicated by a comma (,) and not a plus sign (+), or dash (–) (e. g, iii,7 or II,9. Not iii–7 or iii+7; no spaces should be inserted after the comma). We treat the catfish spinelet as a spine, so dorsal fin counts that include a spinelet should be reported as II,6 (or whatever the branched ray count is).

Latitude and Longitude: No spaces between numerals and symbols. For degree sign, use Control +@, space (in MS Word) and not superscript O; for seconds, do not use the single quote mark twice, use the double quote mark (Shift quote).

Percents: no space between numeral and % (e. g. 25%).

### **Revisions and reviews**

Species accounts should be in alphabetical order.

### **CONSIDERATIONS ON HOW TO PREPARE SPECIES DIAGNOSES**

A species diagnosis is typically a paragraph constructed of full sentences which list the most important traits that allow the reader to unequivocally identify the species. Ideally, the diagnosis includes one or more features that are unique to the species, preferably autapomorphic characters. If unique features were not discovered, the next best option is a differential diagnosis, within which a series of direct comparisons are made among species and the alternative character states specified by contrasts are stated explicitly (using "vs." followed by the condition found in the species, or group of species, being compared, for each diagnostic feature). Diagnoses that consist only of a combination of characters (i.e., traits listed sequentially which, when considered together, distinguish the species from congeners) in many cases fail to make a convincing case that the species warrants recognition, mostly because too little information is offered in the way of direct comparisons with congeners. For that reason, this form of diagnosis should be avoided.