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Review of the genus *Hypostomus* Lacépède, 1803 from rio Ribeira de Iguape basin, with description of a new species (Pisces, Siluriformes, Loricariidae)

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Abstract

Species of the loricariid genus *Hypostomus* Lacépède, 1803 from rio Ribeira de Iguape drainage (São Paulo and Paraná States, Brazil) are reviewed. Four species were found in the area: *H. agna* (Miranda-Ribeiro, 1907), *H. ancistroides* (Ihering, 1911), *H. interruptus* (Miranda-Ribeiro, 1918), and a new species *H. tapijara*. *Hypostomus tapijara* is distinguished from its congeners inhabiting rio Ribeira de Iguape basin by the presence of well defined large, dark, and roundish spots somewhat homogeneously distributed over body and fins, and by its relatively broad dorsal fin (interradial membranes apparently wider than in examined congeners from coastal Brazilian drainages). A key, descriptions and illustrations are provided for all species.

Keywords: Fish, armored catfishes, *Hypostomus*, Atlantic Forest, taxonomy

Resumo

Espécies de loricariídeos do gênero *Hypostomus* Lacépède, 1803 da bacia do rio Ribeira de Iguape (São Paulo and Paraná States, Brazil) são revisadas. Quatro espécies foram encontradas na área: *H. agna* (Miranda-Ribeiro, 1907), *H. ancistroides* (Ihering, 1911), *H. interruptus* (Miranda-Ribeiro, 1918), e uma nova espécie *H. tapijara*. *Hypostomus tapijara* distingue-se de seus congêneres que ocorrem no rio Ribeira de Iguape pela presença de pontos negros arredondados e bem definidos distribuídos sobre o corpo e as nadadeiras e por possuir a nadadeira dorsal ampla (membranas interradiais aparentemente mais largas que em outras espécies de *Hypostomus* provenientes das drenagens do Leste). São apresentadas uma chave, descrições e ilustrações para todas as espécies.

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Introduction

Hypostomus, the type genus of the subfamily Hypostominae, constitutes an assemblage of bottom-dwelling loricariid fishes widely distributed throughout South America, occurring in a variety of freshwater ecosystems such as small mountain streams and large lowland river areas. Maximum diversity in number of species of *Hypostomus* occurs in rivers of the Paraná-Paraguay system (Weber, 2003). As presently defined the genus consists of more than 130 nominal species (107 species considered valid by Weber, 2003 and expanded by Armbruster, 2004).

Species level taxonomy of *Hypostomus* is still poorly known as well as the phylogenetic relationships within and of the genus. *Hypostomus* was established by Lacépède (1803), who included in the genus only a single species, *H. guacari*. Old descriptions, similar to Lacépède's, and available for various subsequent species added to the genus, are very often scanty, with incomplete or poor characterization of species. This fact, together with a number of *Hypostomus* species yet to be described, makes the recognition of most taxa of the genus difficult. Hypothesis of phylogenetic relationships of *Hypostomus* based on molecular data (Montoya-Burgos *et al*., 1997, 2002) revealed that the genus does not form a natural group. According to these authors, some species currently assigned to *Hypostomus* should be removed from the genus, while the genus *Cochliodon* should be treated as synonym of *Hypostomus*, an action effectuated by Weber & Montoya-Burgos (2002: 265). Morphological based phylogenetic studies presented by Armbruster (2004) reinforce the conclusions above and place *Aphanotorulus* and *Isorineloricaria* in the synonymy of *Hypostomus*. In spite of the cited studies, more detailed phylogenetic analysis of the relationships within *Hypostomus* awaits for future studies.

The elevated number of species currently included in *Hypostomus*, allied to the broad variability in morphology and color pattern of those taxa, poses difficulties for its entire revision. Various authors acquainted with these problems provided regional revisions of the genus, as exemplified by Boeseman (1968) with a study of the Surinam representatives of the genus, Weber (1985, 1986, 1987) that deals with *Hypostomus* from Paraguay, more recently Reis *et al*. (1990) reviews and describes three new species from Southern Brazil, Mazzoni *et al*. (1994) provides a taxonomical revision of *Hypostomus* from Lower rio Paraíba do Sul, State of Rio de Janeiro, Brazil, and finally Hollanda Carvalho & Weber (2004) provided a revision of *Hypostomus cochliodon* group from middle and lower Amazon system.

This paper has a similar approach and provides a review of the nominal species of *Hypostomus* from Ribeira de Iguape river basin, with description of a new species. This hydrographic system is located between the coordinates 23° 45'S / 46° 45'W e 25° 30'S / 49° 55'W, in São Paulo and Paraná States, Brazil (Figs. 3, 5, 8), and is entirely inserted in the greater remnant area of the Atlantic rainforest of South and Southeastern Brazil. This paper is part of ongoing studies of freshwater fishes from rio Ribeira de Iguape basin by the first two authors.

Material and Methods

Counts and measurements follow Boeseman (1968), Weber (1985), Reis *et al*. (1990) and Armbruster (2003). Counts and measurements are presented in tables. Examined 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 percentage of head length. Measurements were taken on the left side of body or on the right side if that was not possible. The oral disc width was measured at point of insertion of maxillary barbel. Body plate counts and nomenclature follow a modification of Schaefer (1997) (see Fig.1). In each 'Material Examined' section, lots are grouped by state, followed by institutional abbreviation, catalogue number, number of specimens in the lot, number of specimens counted and measured (in parentheses), their range of standard lengths and specific collecting data.

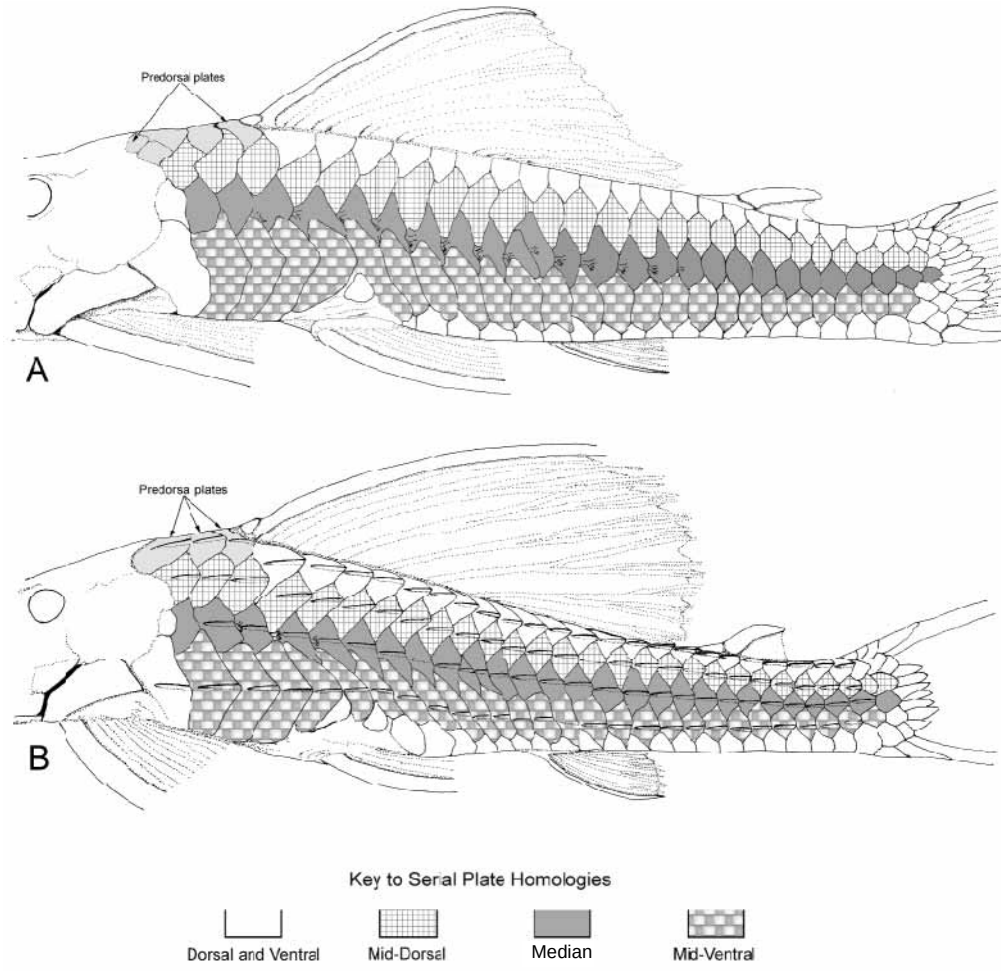

FIGURE 1. Posterior portion of head and lateral surface of body showing the lateral series of plates of (A) *Hypostomus agna*, MZUSP 45167, 186.3 mm SL; and (B) *Hypostomus tapijara*, sp. n., MZUSP 42800, 196.3 mm SL. Left side, anterior to left.

Specimens examined belong to the following institutions: Museu de Zoologia da Universidade de São Paulo, São Paulo (MZUSP); Museu Nacional, Rio de Janeiro (MN); Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre (MCP), and Academy of Natural Sciences of Philadelphia (ANSP).

Key to the species of *Hypostomus* from rio Ribeira de Iguape basin

1. Keels absent or poorly developed; anterior plates of mid-dorsal series longitudinally aligned with those of posterior portion of trunk, not interrupted by the first plate of dorsal series (Fig. 1A); caudal peduncle trapezoid in cross-section; 3 to 5 plates around supraoccipital (Fig. 2) ..... *Hypostomus agna*

1'. Keels well developed; anterior plates of mid-dorsal series not aligned with those of posterior portion of trunk, interrupted by the first plate of dorsal series (Fig. 1B); caudal peduncle ovoid in cross-section; 1 to 2 plates around supraoccipital 2

2. Plates on ventral surface of head absent in adults; spots on posterior half of body less conspicuous and more sparsely distributed than on anterior portion of body; spots on fins usually aligned, sometimes forming dark bands (Fig. 4) . *Hypostomus ancistroides*

2'. Ventral region of head completely covered with dermal ossifications, except for small naked areas; pattern of distribution of spots on body and fins relatively uniform, never forming dark bands 3

3. Presence of oblique inconspicuous dark bands on flanks; small spots over body and fins, smaller over head; dorsal fin comparatively smaller (dorsal-fin spine length 21.6 –28.4% SL) (Fig. 6) .....*Hypostomus interruptus*

3'. Dark bands on flanks absent; well defined large, dark, and roundish spots somewhat homogeneously distributed over body and fins; relatively broad dorsal-fin (dorsal-fin spine length 27.6–34.3% SL) (Fig. 7).....*Hypostomus tapijara*, sp.n.

***Hypostomus agna* (Miranda-Ribeiro)**
(Fig. 1A, 2, 3; Table 1)

Plecostomus ãgnã Miranda-Ribeiro, 1907:188 (type locality: Rio da Ribeira, Iporanga).

Plecostomus agna Miranda-Ribeiro, 1908a:4 [reference, distribution]. Miranda-Ribeiro, 1911:45. Miranda-Ribeiro, 1918:711 [reference]. Gosline, 1945:81 [reference, distribution]. Fowler, 1954:174 [reference, distribution].

Hypostomus agna Isbrücker, 1980:18 [reference, distribution]. Burgess, 1989:430 [reference, distribution]. Isbrücker, 2001:28 [reference]. Weber, 2003:355 [reference, distribution]. Armbruster, 2004:79 [reference].

Material examined: Brazil. *São Paulo*: — MZUSP 40198, 4, 150.2-300.0 mm SL; Barra do Turvo; Sema/Sudelpa, no date. — MZUSP 42587, 3, 158.5-185.3 mm SL; rio Ribeira

de Iguape, Ribeira; Expedição MZUSP, 6-13 March 1991. — MZUSP 42799, 1, 171.3 mm SL; rio Ribeira de Iguape, Ribeira; Expedição MZUSP, 8-27 March 1991. — MZUSP 45190, 1, 139.1 mm SL; rio Ribeira de Iguape, Eldorado; M. Damato, 5 March 1993. — MZUSP 45427, 2, 229.4-289.4 mm SL; rio Ribeira de Iguape, near mouth of rio Pilões and 8 km upstream of rio Batatal, Eldorado; M. Damato, 1 March 1993. — MZUSP 45434, 4, 159.5-223.3 mm SL; rio Ribeira de Iguape, near rio Pilões, Eldorado; M. Damato, 2 March 1993. — MZUSP 53339, 1, 168.5 mm SL; rio Ribeira de Iguape, near Iporanga; S. Buck, 21 September 1996. — MZUSP 45446, 3, 154.8-202.8 mm SL; rio Ribeira de Iguape, close to rio Pilões, Eldorado; M. Damato, 3 March 1993. — MZUSP 45463, 1, 184.9 mm SL; rio Pilões, tributary of rio Ribeira de Iguape, Eldorado; M. Damato, 6 March 1993. — MZUSP 45167, 1, 186.3 mm SL; rio Batatal, tributary of rio Ribeira de Iguape, Eldorado; M. Damato, 3 March 1993. — MZUSP 38583, 5, 174.0-295.0 mm SL; rio Pardo, Iporanga — Barra do Turvo Road, Barra do Turvo; O. T. Oyakawa *et al*., 5-6 February 1988. — MZUSP 55485, 2, 101.3-152.3 mm SL; waterfalls of rio Palmital, 1000 m above mouth into rio Ribeira de Iguape, Apiaí; M. R. Santos & M. Morato, 22 January 1995. — MZUSP 55215, 2, 126.1–257.0 mm SL; rio Pardo, Barra do Turvo; M. R. Santos & M. Morato, 25 January 1995. – MZUSP 55206, 1, 300.0 mm SL; rio Catas Altas, Ribeira; M. R. Santos & C. E. Espírito Santo, 14 October 1995.

Diagnosis. *Hypostomus agna* is distinguished from its congeners inhabiting Ribeira de Iguape river basin by the absence or poorly developed keels (versus keel well developed), mid-dorsal series of plates longitudinally aligned, not interrupted by the first plate of dorsal series (Fig. 1A) (versus mid-dorsal series of plates not aligned, interrupted by the first plate of dorsal series (Fig. 1B)), caudal peduncle trapezoidal in cross-section (versus oval), higher number of plates around supraoccipital (3 to 5 versus 1 to 2), and higher number of teeth in the premaxillary (mode = 51 versus mode =25-39) and dentary (mode around 52 versus mode = 26-42). *Hypostomus agna* can be further distinguished from *H. interruptus* and *H. tapijara* by having the basal lamina of first proximal radial of anal fin covered by skin (versus basal lamina of first proximal radial of anal fin usually uncovered).

Description: Standard length of examined specimens 101.3 to 269.3 mm SL. Counts and proportional measurements in Table 1. Dorsal profile gently rising from snout tip to dorsal-fin origin, and gently descending from this point to the end of caudal peduncle. Caudal peduncle robust and roughly trapezoidal in cross-section; strongly flattened on ventral portion. Dorsal plates between end of dorsal-fin base and adipose-fin spine flattened. One or two, usually one, preadipose plate.

Pre-dorsal region of trunk located between pterotic-supracleithrum and vertical through dorsal-fin origin covered by three horizontal series of plates that extend posteriorly to caudal fin. Median series of plates bearing the lateral-line canal. Mid-dorsal series situated above and mid-ventral series situated below median series. Dorsal series of plates starting at vertical through dorsal-fin origin. Ventral series of plates usually starting at vertical through pelvic-fin origin (starting at midlength of pelvic-fin base in a few examined

specimens). Plates of the mid-dorsal series longitudinally aligned, not interrupted by first plate of dorsal series (Fig. 1A). Abdomen usually covered with minute platelets, leaving large naked areas around the pelvic fin and anterior to anus.

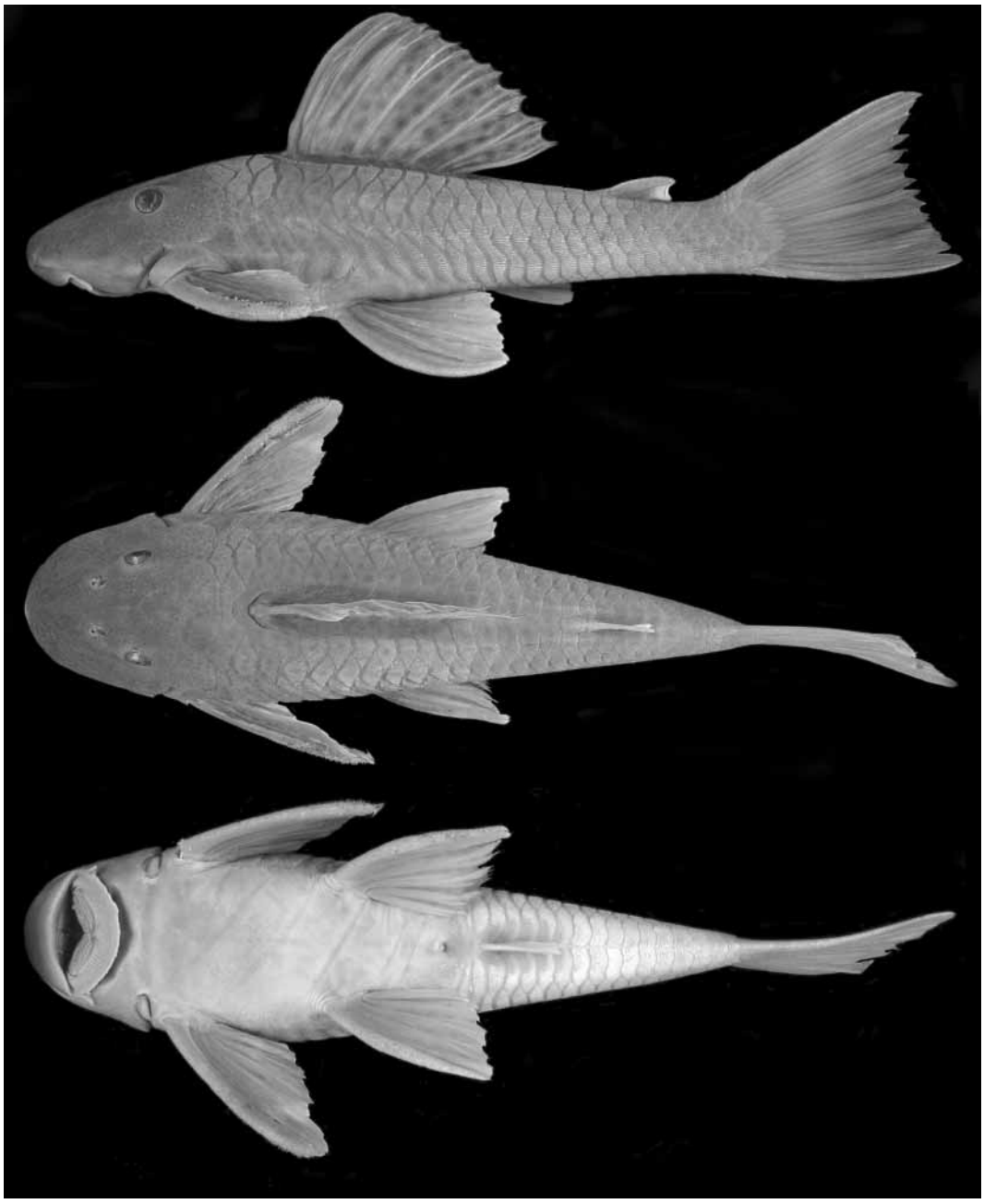

FIGURE 2. Dorsal, lateral, and ventral views of *Hypostomus agna*, MZUSP 42587, 185.3 mm SL.

TABLE 1. Morphometric and meristic data of *Hypostomus agna* and *H. ancistroides.*

	Hypostomus agna			*Hypostomus ancistroides*		
Morphometric data						
	Mean±sd	Range	n	Mean±sd	Range	n
Standard length (SL) (mm)	–	101.3–296.3	25	–	25.9–164	38
% SL						
Predorsal length	38.1±1.5	32.1–39.9	25	44.5±3.4	37.2–51.4	38
Head length (HL)	30.2±0.9	28.2–31.7	23	35.5±3.1	29.1–40.9	37
Thorax length	22.7±1.2	20.2–24.5	23	24.1±1.0	22.3–26.7	38
Pectoral spine length	23.8±1.1	21.5–25.3	23	24.1±2.0	18.5–27.5	38
Abdomen length	22.4±0.7	21.0–23.6	23	20.7±1.4	18.5–25.7	38
Pelvic spine length	28.2±1.6	24.0–30.1	23	26.8±2.2	22.3–30.9	36
Caudal peduncle depth	9.8±0.3	9.0–10.5	23	8.9±0.4	8.1–9.7	38
Caudal peduncle length	33.3±0.8	31.7–35.2	23	30.9±1.7	27.8–36.0	38
Adipose spine length	8.4±0.5	7.5–9.4	22	7.5±1.2	4.6–9.4	38
Interdorsal length	19.2±1.4	17.5–22.7	23	18.5±2.0	15.8–27.0	38
Base of dorsal length	24.9±1.1	22.2–27.4	23	22.2±3.0	18.1–29.3	38
Dorsal spine length	26.5±1.5	22.8–28.7	19	25.7±2.3	21.3–29.8	35
First caudal-fin upper lobe length	27.6±1.6	24.4–30.2	20	32.1±2.2	27.9–37.8	30
First caudal-fin lower lobe length	29.0±2.7	22.7–32.8	16	34.9±2.9	29.6–40.7	35
Cleithral width	27.4±0.7	26.0–28.8	23	27.9±1.3	26.4–33.8	38
% HL						
Orbit length	15.1±1.4	13.2–18.2	23	16.3±1.6	13.1–19.0	37
Snout length	66.9±2.1	60.5–70.9	23	55.0±3.2	48.1–60.5	37
Bony interorbital	38.0±2.1	33.6–40.9	23	34.5±2.6	22.3–37.3	38
Right mandibular ramus	19.3±1.1	17.0–21.1	23	12.3±1.9	7.8–16.4	33
Head depth	48.8±3.0	45.6–59.7	23	52.5±6.5	43.8–66.8	37
Meristic data						
	Mode	Range	n	Mode	Range	n
Lateral plates	27	26–30	23	27	26–28	32
Predorsal plates	3	3–5	23	3	3–4	32
Plates at dorsal-fin base	8	8–9	23	8	7–8	32
Teeth on right premaxila	51	31–75	23	25	20–39	30
Teeth on left premaxila	51	29–74	23	25	21–39	31
Teeth on right dentary	53	36–73	22	27	25–40	30
Teeth on left dentary	52	32–72	21	26	22–38	30
Plates bordering supraoccipital	3	1–5	23	1	1–2	32

TABLE 2. Morphometric and meristic data of *Hypostomus tapijara* sp.n. and *H. interruptus.*

Morphometric data	*Hypostomus tapijara*				*Hypostomus interruptus*			
	Holotype	Mean±sd	Range	n	Holotype	Mean±sd	Range	n
Standard length (SL) (mm)	378.3	–	40.3–378.3	22	120.5	–	75.9–236	39
% SL								
Predorsal length	33.9	36.9±1.5	33.9–40.7	22	38.0	37.3±1.3	34.8–40.3	39
Head length (HL)	26.3	29.9±2.2	26.3–37.0	22	30.5	29.7±1.5	26.8–32.5	39
Thorax length	24.8	24.9±1.6	21.6–28.0	22	24.1	23.7±1.0	21.8–26.3	39
Pectoral spine length	22.4	24.9±1.1	22.4–26.5	19	24.4	22.9±1.3	19.7–26.0	39
Abdomen length	21.9	21.1±1.5	18–24.8	20	20.9	21.4±0.7	20.1–22.9	39
Pelvic spine length	26.7	29.7±1.1	26.7–32.0	22	27.1	25.9±1.7	21.8–30.3	34
Caudal peduncle depth	8.3	8.7±0.3	8.0–9.0	22	8.9	9.1±0.5	8.1–9.9	39
Caudal peduncle legth	30.5	32.2±1.1	30.5–33.9	21	33.5	34.7±1.0	32.7–36.6	39
Adipose spine length	5.4	6.4±0.7	5.4–7.8	22	8.4	7.8±0.8	5.7–9.8	39
Interdorsal length	22.4	20.0±1.4	17.8–22.4	22	19.3	20.8±1.7	16.8–26.1	39
Base of dorsal length	27.2	28.1±1.4	25.0–31.7	22	23.6	24.4±1.0	21.9–27.5	39
Dorsal spine length	27.6	32.0±2.0	27.6–34.3	20	-	25.3±1.6	21.6–28.4	34
First caudal-fin upper lobe length	31.9	35.2±3.0	25.9–39.0	19	-	30.2±1.6	26.8–34.2	33
First caudal-fin lower lobe length	32.8	37.2±2.3	32.6–41.0	20	-	33.1±2.0	30.1–37.2	29
Cleithral width	23.5	25.7±0.9	23.5–27.2	22	26.7	27.3±1.4	24.1–29.5	39
% HL								
Orbit length	10.5	13.3±2.6	10.5–22.1	22	16.1	16.1±1.3	13.5–18.4	38
Snout length	64.5	61.1±2.7	52.0–66.4	22	59.9	59.9±2.3	54.0–65.7	38
Bony interorbital	37.4	40.5±1.6	36.2–42.5	22	36.8	36.5±1.4	33.2–0.2	38
Right mandibular ramus	11.0	11.8±1.0	10.2–13.7	21	13.6	15.0±1.6	11.6–17.5	35
Head depth	65.2	59.4±4.1	47.9–65.6	22	49.6	46.5±3.1	42.7–60.3	38
Meristic data								
	Holotype	Mode	Range	n	Holotype	Mode	Range	n
Lateral plates	29	29	28–31	22	28	29	27–32	37
Predorsal plates	3	3	3–3	22	3	3	3–3	37
Plates at dorsal-fin base	9	10	9–11	22	8	8	7–9	37
Teeth on right premaxila	32	29	19–47	21	-	37	24–52	34
Teeth on left premaxila	32	28	19–40	19	-	39	29–53	32
Teeth on right dentary	33	29	12–48	21	-	42	34–60	31
Teeth on left dentary	35	30	15–46	21	-	40	32–53	29
Plates bordering supraoccipital	1	1	1–2	22	2	2	1–4	37

Plates on dorsal and lateral portion of body relatively smooth in all specimens examined. Weakly developed keels present in dorsal, mid-dorsal, median, and mid-ventral series of plates in larger specimens and no apparent keel, unless for the mid-ventral keel in smaller specimens (approximately 185.0 mm SL). Keel situated on dorsal series of plates, when present, with its origin aligned to vertical through base of second branched dorsal-fin ray. Mid-ventral series with keel more developed on first four plates.

Head wide and rounded anteriorly. Dorsal and ventral regions of head completely covered with dermal ossifications, except for a roughly ovoid naked area on snout tip. Specimens around 175.0 mm SL with naked area extending from snout tip to margin of upper lip. Ornamentation of pterotic-supracleithrum similar to the remaining surface of head and with odontodes densely distributed. Dorsal margin of orbit not distinctly elevated and not continuing in ridge on pterotic-supracleithrum. No ridge on the supraoccipital or on predorsal plates. Usually three, sometimes four or five plates bordering posterior margin of supraoccipital bone. Space between orbits straight or somewhat concave. Eyes large.

Mouth distinctly wide. Anterior-most papillae of inner face of lower lip roundish and small, followed by patch of larger and sparsely distributed papillae and with a more posterior patch of smaller and closely positioned papillae. Teeth long and bicuspid; medial cusp approximately 2.5 times the length of outer cusp and curved inward. Premaxillary teeth inserted in a relatively straight line; dentary teeth inserted in a somewhat concave arch facing mouth cavity; contralateral dentaries forming a relatively wide angle. Maxillary barbels short, approximately half eye diameter, and without papillae.

Dorsal-fin origin situated on vertical anterior to pelvic-fin origin and approximately on posterior third of pectoral-fin spine. Dorsal fin relatively small; tips of adpressed last two dorsal-fin rays ending on the first or second plate before adipose-fin spine. Margin of dorsal fin relatively straight or slightly convex. Adipose-fin spine robust and somewhat curved ventrally. Distal half of pectoral fin spine of specimens 175.0 mm SL or larger covered dorsally with small odontodes slightly curved forward. Tip of adpressed pectoral fin ending slightly beyond origin of pelvic fin. Tip of pelvic fin usually posterior to origin of anal-fin rays. Basal lamina of first proximal radial of anal fin covered by skin in all specimens examined. Caudal-fin margin slightly concave, lower spine somewhat longer than upper.

Color in alcohol. Dorsal and lateral surface of body with light brown ground coloration. Body covered with roundish dark brown spots, decreasing gradually in size and becoming more concentrated towards snout. Ventral surface of body pale or yellowish. Overall ground coloration of all fins pale to light brown, scattered with roundish dark brown spots. Spots on fins slightly larger than those on body.

Distribution and notes. *Hypostomus agna* occurs exclusively in the Ribeira de Iguape river basin (Fig. 3). The species was found to live mainly in the channel of the largest rivers, as exemplified by rio Ribeira de Iguape itself, rio Batatal, rio Pardo, and rio Catas Altas. *Hypostomus agna* is one of the largest species of loricariids of this basin, just smaller than *H. tapijara*.

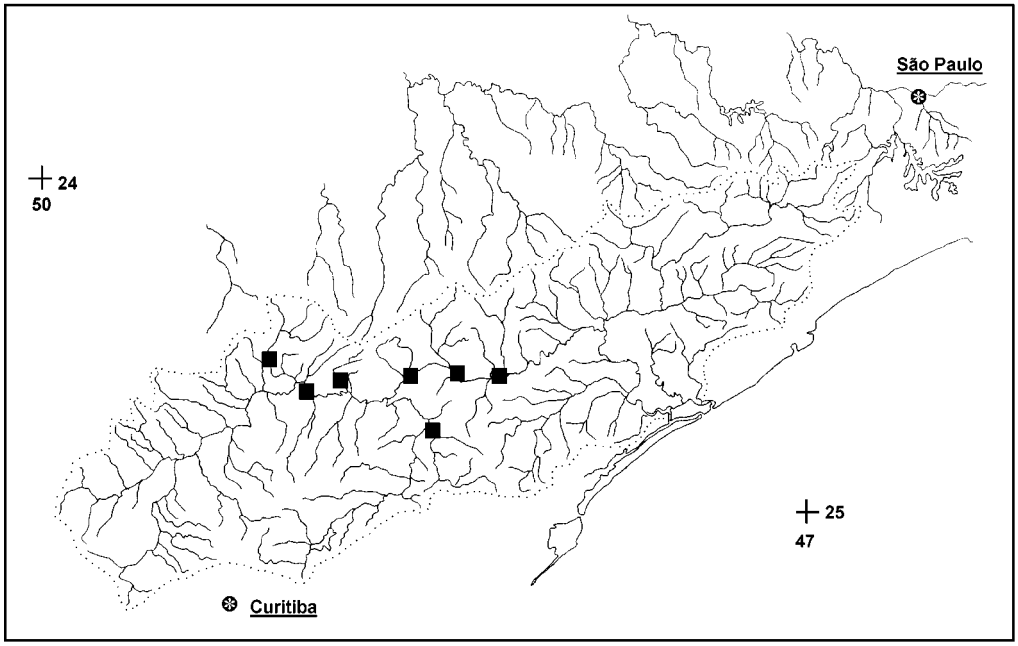

FIGURE 3. Geographic distribution of *Hypostomus agna*. Dotted lines delimit Ribeira de Iguape river basin.

Hypostomus ancistroides **(Ihering, 1911)**
(Fig. 4, 5; Table 1)

Plecostomus ancistroides. Ihering, 1911:396 (type locality: rio Tatuhy, afluente do lado esquerdo do rio Sorocaba; rio Piracicaba, Estado de São Paulo).

Material examined: Brazil. *São Paulo*: — MZUSP 51988, 2, 127.0-154.0 mm SL; rio Juquiá, Cachoeira do França waterfall, Juquitiba; M. D. Domingos; May 1997. — MZUSP 78734, 3, 34.1-52.6 mm SL; ribeirão das Laranjeiras, approx. 23º 50' 39.5"S, 47º 3' 13.5"W, São Lourenço; Projeto Biota/Fapesp Ribeira, 23 October 2001. — MZUSP 78435, 14, 25.9-92.3 mm SL; tributary of rio São Lourenço, near Bairro da Serraria, on the road to São Lourenço, approx. 23º 52' 43.2"S, 46º 59' 42.1"W, Juquitiba, Projeto Biota/ Fapesp Ribeira; 23 October 2001. — MZUSP 78436, 71 (19), 25.9-164.0 mm SL; tributary of Ribeirão das Laranjeiras, on the road to São Lourenço, approx. 23º 50' 45.6"S, 47º 4' 58.7"W, Juquitiba; Projeto Biota/Fapesp Ribeira, 23 October 2001. — MZUSP 79000, 1, 95.2 mm SL; Ribeirão da Barrinha, tributary of rio São Lourenço, approx. 23º 52' 23.3"S, 46º 55' 56.5"W, São Lourenço; Projeto Biota/Fapesp Ribeira, 26 June 2002 — MZUSP 79001, 5, 41.6-112.2 mm SL; tributary of Ribeirão do Chiqueiro, near the Fish Farm Araponga, approx. 23º 48' 11.0"S, 46º 55' 46.8"W, São Lourenço; Projeto Biota/ Fapesp Ribeira; 26 June 2002.

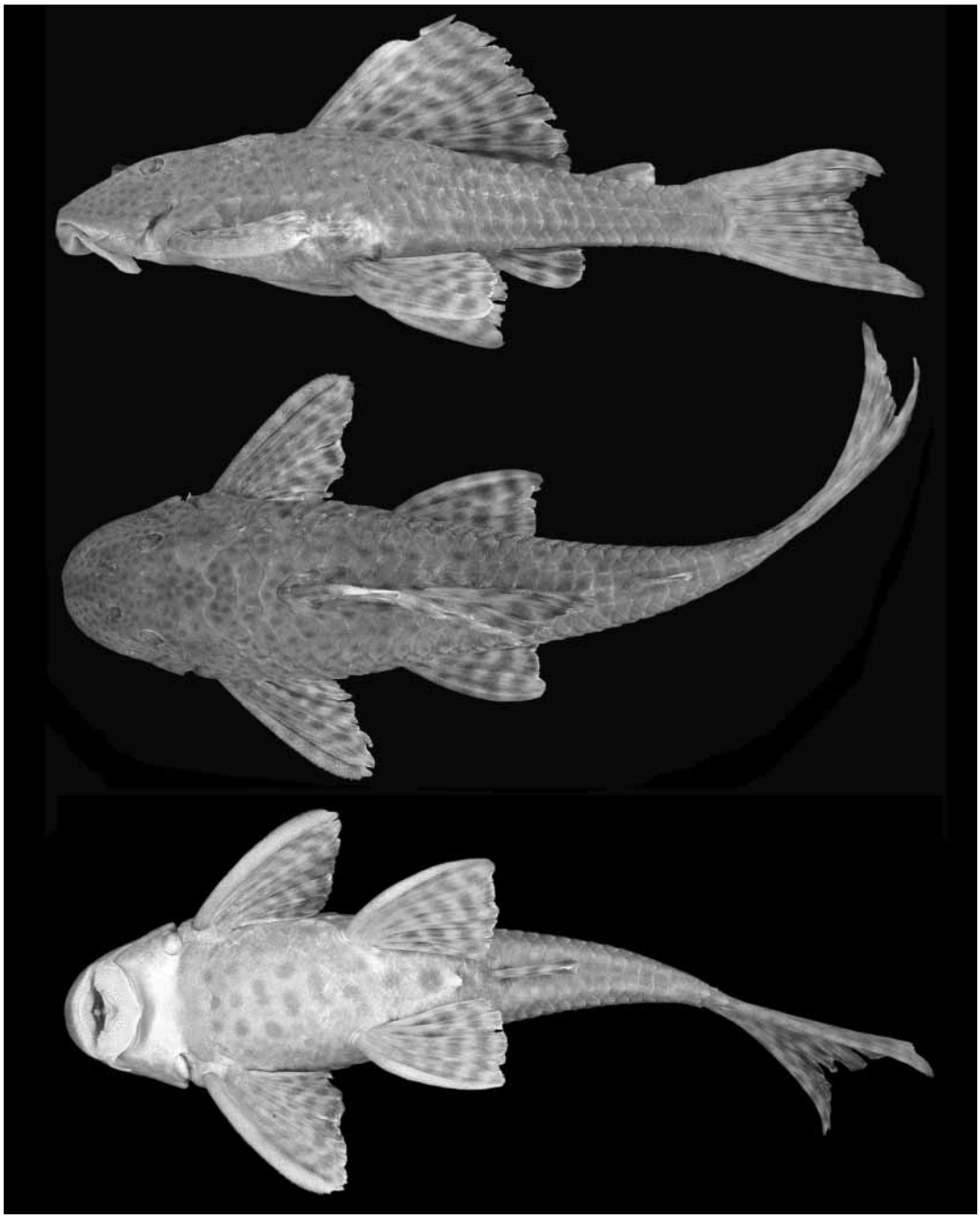

FIGURE 4. Dorsal, lateral, and ventral views of *Hypostomus ancistroides*, MZUSP 78436, 147.0 mm SL.

Diagnosis. *Hypostomus ancistroides* can be distinguished from its congeners inhabiting Ribeira de Iguape river basin by the absence of plates on ventral surface of head (versus ventral region of head completely covered with dermal ossifications), exclusive color pattern represented by spots on posterior half of body less conspicuous and more sparsely

distributed than on anterior portion of body, and exclusive presence of aligned spots on fins, sometimes forming dark bands.

Description: Standard length of examined specimens 25.9 to 164.0 mm SL. Counts and proportional measurements presented in Table 1. Dorsal profile slightly convex, raising somewhat abruptly upward from snout tip to dorsal-fin origin, and gently descending from this point to the end of caudal peduncle. Caudal peduncle roughly ovoid in cross-section; slightly flattened on ventral portion. Dorsal plates between end of dorsal-fin base and adipose-fin spine flattened. One preadipose plate.

Pre-dorsal region of trunk located between pterotic-supracleithrum and vertical through dorsal-fin origin covered by three horizontal series of plates that extends posteriorly to caudal fin. Median series of plates bearing the lateral-line canal. Mid-dorsal series situated above and mid-ventral series situated below median series. Dorsal series of plates starting at dorsal-fin origin. Ventral series of plates starting after the insertion of the posterior-most pelvic-fin ray. Plates of mid-dorsal series not aligned, interrupted by first plate of dorsal series (Fig. 1B). Covering of abdomen ontogenetically variable; completely naked in specimens around 60.0 mm SL or smaller; usually covered with minute platelets, leaving naked areas around the pelvic fin that extends antero- and posterolaterally in larger specimens.

Body with four keels along flanks. Dorsal-most keel situated over dorsal series of plates. Keel on mid-dorsal series of plates interrupted, following the alignment of plates. Anterior portion of this keel somewhat continuous with ridge on pterotic-supracleithrum, crossing the plates of mid-dorsal series of pre-dorsal region of trunk, becoming somewhat posterodorsally oriented and not aligned to keel on plates of posterior portion of mid-dorsal series. Keel on median series of plates poorly developed. Mid-ventral series with keel more developed on anterior-most six plates.

Head somewhat triangular, rounded anteriorly. Dorsal region of head completely covered with dermal ossifications, except for naked area on snout tip that continues ventrally to reach margin of upper lip. Ornamentation of pterotic-supracleithrum distinct from remaining surface of head and with odontodes more sparsely distributed. Ventral area of head completely naked. Dorsal margin of orbit slightly elevated, continuing in a low ridge on pterotic-supracleithrum. Specimens larger than 63.0 mm SL with a prominent ridge on supraoccipital, diverging in two separated ridges on predorsal plates. One or two plates bordering posterior margin of supraoccipital bone. Space between orbits almost straight or slightly convex. Eyes large.

Mouth rounded. Anterior-most row of papillae on inner face of lower lip roundish and sparsely distributed, followed by patch of smaller, closer papillae, decreasing in size posteriorly. Teeth long and bicuspid; medial cusp approximately twice in length of outer cusp and curved inward. Premaxillary teeth inserted in a relatively straight line; contralateral dentary row of teeth inserted in a relatively acute angle. Maxillary barbels long, slightly larger than eye diameter, and without papillae.

Dorsal-fin origin situated on vertical anterior to pelvic-fin origin, approximately on posterior third of pectoral-fin spine. Dorsal fin relatively small; tips of the adpressed last three rays ending at second plate before the adipose-fin spine. Margin of dorsal fin relatively straight or slightly convex. Adipose-fin spine compressed, somewhat straight. Distal half of pectoral-fin spine of specimens larger than 70.0 mm SL covered dorsally with small odontodes slightly curved forward. Tip of adpressed pectoral fin slightly beyond origin of pelvic fin. Tip of pelvic fin beyond origin of last branched anal-fin ray. Basal lamina of first proximal radial of anal fin covered by skin in the majority of specimens examined. Caudal fin margin concave, lower spine longer than upper.

Color in alcohol. Dorsal and lateral surface of body with light brown ground coloration. Body covered with roundish black or dark brown spots. Spots on portion of body anterior to dorsal-fin insertion relatively small, close together and decreasing in size over snout. Spots on portion of body posterior to dorsal-fin insertion sparsely distributed, comparatively larger (sometimes occupying area beyond the limits of one plate). Some plates of this region without spots. Area below mid-ventral keel commonly with spots. Ventral surface of body yellowish, clear in smaller specimens and usually with scattered well defined large dark spots in specimens around 90.0 mm SL or larger. Ventral portion of caudal peduncle with median horizontal dark stripe continuing posteriorly from anal fin, bordered by clear areas. Overall ground coloration of all fins light brown or pale orange with dark brown spots in spines, rays and interradials membranes. Spots over fins usually similar in size to those distributed over trunk. Spots usually distributed in series on all fins. Some specimens have spots over pelvic, caudal, and more often on dorsal fin merged to each other forming well defined bands.

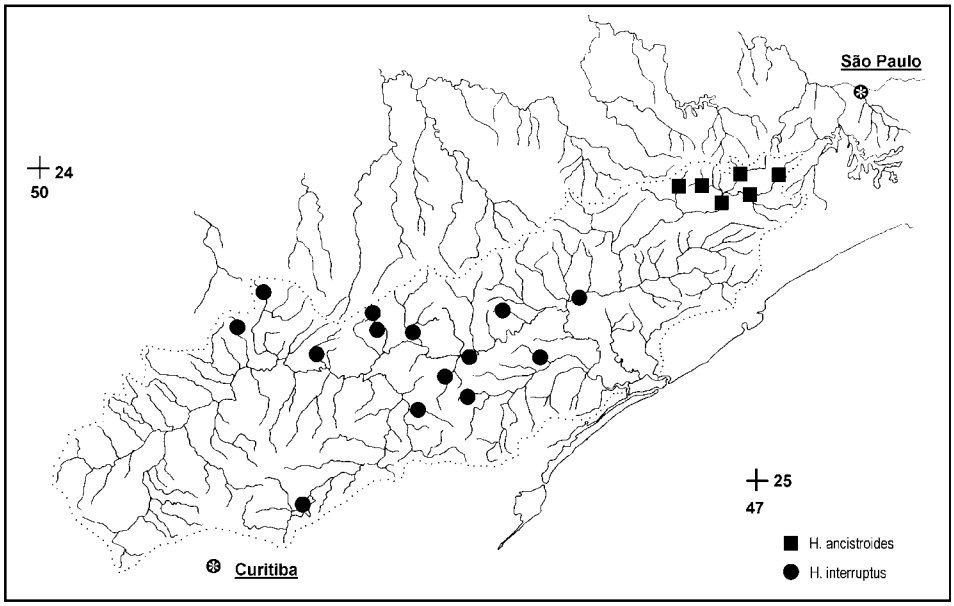

FIGURE 5. Geographic distribution of *Hypostomus ancistroides* and *Hypostomus interruptus*. Dotted lines delimit Ribeira de Iguape river basin.

Distribution and notes. *Hypostomus ancistroides* is herein reported for the first time to occurs in Ribeira de Iguape river basin. Previously, *H. ancistroides* was only known to occur in Upper Paraná river basin. Recent collecting efforts, mainly focused on the ongoing project "Fish Diversity of the Headwaters and Streams of the Ribeira de Iguape River", revealed that the species in the area of interest is restricted to small rivers close to the watershed with the Upper Paraná river basin, at 700 to 800 m above sea level (Fig. 5). *Hypostomus ancistroides* represents the smallest species of *Hypostomus* from Ribeira de Iguape basin.

***Hypostomus interruptus* (Miranda-Ribeiro)**
(Fig. 5, 6; Table 2)

Plecostomus interruptus Miranda-Ribeiro, 1918:632 (type locality: rio Juquiá. Restricted by Britski, 1969:209 to rio Juquiá, Fazenda Poço Grande). Gosline, 1945:81 [reference, distribution]. Fowler, 1954:184 [reference, distribution]. Britski, 1969:209 [catalogue, distribution].
Hypostomus interruptus Isbrücker, 1980:25 [reference, distribution]. Burgess, 1989:431 [reference, distribution]. Isbrücker, 2001:28 [reference]. Weber, 2003:358 [reference, distribution]. Armbruster, 2004:79 [reference].
Hypostomus cf. *affinis* (Steindachner, 1877). Bizerril & Lima, 2000:107 [reference].
Hypostomus sp. 1161 Montoya-Burgos, 2003 [biogeography, molecular phylogeny].

Holotype. Brazil. São Paulo: MZUSP 2110, 121.0 mm SL; rio Juquiá, Fazenda Poço Grande, Juquiá; W. J. Moenkhaus, 1898.

Other material examined. Brazil. *São Paulo*: — MZUSP 68172, 2, 166.0 – 202.8 mm SL; rio do Queimado, tributary of rio Jacupiranguinha, Parque Estadual do Jacupiranga, approx. 24º 48' 2,2"S, 48º 13' 32,0"W, Cajati; Projeto Biota/Fapesp Ribeira, 9 March 2001. — MZUSP 68192, 4, 32.3-46.6 mm SL; MZUSP 68196, 7, 32.4-55.7 mm SL; same data as above. — MZUSP 75463, 7, 41.8 – 140.0 mm SL; ribeirão Braço Bonito, tributary of rio Areado, Parque Estadual da Serra do Mar, Núcleo Pedro de Toledo, approx. 24º 14' 59"S, 47º 10' 46"W, Itariri; Projeto Biota/Fapesp Ribeira, 13 September 2001. - MZUSP 75464, 3, 42.7-77.1 mm SL; Ribeirão Braço Bonito, tributary of rio Areado, Parque Estadual da Serra do Mar, Núcleo Pedro de Toledo, approx. 24º 15' 5,0"S, 47º 10' 35,0"W, Itariri; Projeto Biota/Fapesp Ribeira, 13 September 2001. — MZUSP 78706, 1, 33.5 mm SL; Ribeirão Grande creek, Bairro Ribeirão Grande, Parque Estadual da Serra do Mar, Núcleo Pedro de Toledo, approx. 24º 14' 7;0"S, 47º 13' 58,0"W, Pedro de Toledo; Projeto Biota/Fapesp Ribeira, 11 September 2001. — MZUSP 78707, 1, 54.0 mm SL; tributary of rio Itariri, on the road from Manoel da Nóbrega to Santa Rita, approx. 24º 12' 37,0"S, 47º17' 23,0"W, Pedro de Toledo; Projeto Biota/Fapesp Ribeira, 14 September 2001. — MZUSP 51913, 4 (2), 104.3-108.9 mm SL; rio Saibadela, Saibadela Base Camp of Fazenda Intervales, Sete Barras; S. Buck *et al*., 4-6 March 1994. — MZUSP 70693, 1, 43.5 mm SL; rio das Criminosas, tributary of rio Catas Altas, Itapirapuã Paulista, approx.

24º 34' 16,7"S, 48º 10' 22,4"W; Projeto Biota/Fapesp Ribeira, 09 August 2001. — MZUSP 37992, 1, 149.0 mm SL; rio Pardo, tributary of rio Turvo, Água do Padre district, Barra do Turvo; O. T. Oyakawa *et al*., 22 July 1987. — MZUSP 40003, 4, 83.7-96.5 mm SL; riacho Arataca, tributary of rio Jacupiranga, at road Pariquera - Açu to Iguape, Pariquera-Açu; O. T. Oyakawa *et al*., 28 March 1987. — MZUSP 45410, 1, 117.0 mm SL; rio Pilões, tributary of rio Ribeira de Iguape, Eldorado; M. Damato, 7 March 1993. — MZUSP 45457, 1, 202.3 mm SL; rio Ribeira de Iguape, close to rio Batatal, Eldorado; M. Damato, 5 March 1993. — MZUSP 51981, 21 (5), 75.9-169.4 mm SL; rio Betari, Serra district, Iporanga; R. Pardini, 16 February 1995. — MZUSP 52636, 2, 116.5-180.5 mm SL; rio Betari, bellow rio Águas Quentes, Águas Quentes cave, Serra district, Iporanga; S. Buck *et al*., 26 January 1995. — MZUSP 52639, 3, 141.3-178.0 mm SL; rio Betari, Serra district, Iporanga; S. Buck *et al*., February 1995. — MZUSP 52455, 1, 124.0 mm SL; rio Ribeira de Iguape, close to rio Batatal, Eldorado; M. Damato, 5 March 1993. – MZUSP 46066, 7, 75.9-120.7 mm SL; rio Betari, Iporanga; R. Pardini, 1993. – MZUSP 50715, 3, 118.5-150.0 mm SL; rio Betari, near of rio Ribeira de Iguape, Iporanga; S. Buck, February 1995. — MZUSP 45168, 1, 168.6 mm SL; rio Batatal, tributary of rio Ribeira de Iguape, Eldorado; M. Damato, 3 March 1993. – MZUSP 55486, 1, 192.5 mm SL; rio Pilões, tributary of rio Ribeira de Iguape, Iporanga; M. R. Santos & M. Morato, 19 January 1995. – MZUSP 55217, 3, 206.1-226.8 mm SL; rio Pardo, Barra do Turvo; M. R. Santos & C. E. Espírito Santo, October 1995. – MZUSP 55214, 5, 172.8-197.2 mm SL; rio Catas Altas, Ribeira; M. R. Santos & M. Morato, 23 January 1995. — MZUSP 55487, 2, 156.5-188.8 mm SL; rio Batatal, Eldorado; M. R. Santos & M. Morato, 17 January 1995. — MZUSP 55482, 2, 155.4-189.2 mm SL; rio Pardo, Barra do Turvo; M. R. Santos & M. Morato, 25 January 1995. — MZUSP 55488, 16, 115.1-223.7 mm SL; waterfalls of rio Palmital, 1000 m above mouth into rio Ribeira de Iguape, Apiaí; M. R. Santos & M. Morato, 22 January 1995. *Paraná*: — MZUSP 25010, 10, (5), 125.3-180.8 mm SL; Capivari-Cachoeira Dam, Campina Grande do Sul; L. C. Freitas, 26 August 1977. — MZUSP 54581, 236.0 mm SL; rio Pardo, Bairro Água do Padre on the road Iporanga to Barra do Turvo, Barra do Turvo; O. T. Oyakawa, F. Langeani & V. C. Silva, February 1988. — MZUSP 79558, 49, 21.2-39.1 mm SL, Arroio Taquaral, tributary of rio Açungui, Campo Largo, 25º 24' 50.3" S, 49º 38' 31.8" W; Projeto Biota/Fapesp Ribeira, 19 May 2002. — MZUSP 79559, 9, 30.5-47.5 mm SL; Arroio 3 Barras, tributary of rio Ponta Grossa, 24º 50' 14.8"S, 49º 15' 51.2"W; Cerro Azul; Biota/Fapesp Ribeira, 20 May 2002.

Diagnosis. *Hypostomus interruptus* is distinguished from its congeners inhabiting rio Ribeira de Iguape basin by its oblique dark bands on flanks (versus absence of such bands), comparatively smaller spots over body and fins, more so over anterior portion of head, and spots on region of trunk posterior to dorsal-fin end more conspicuous in smaller specimens (up to 130.0 mm SL), becoming faded or absent in larger specimens (versus color pattern of trunk relatively homogeneous throughout ontogeny).

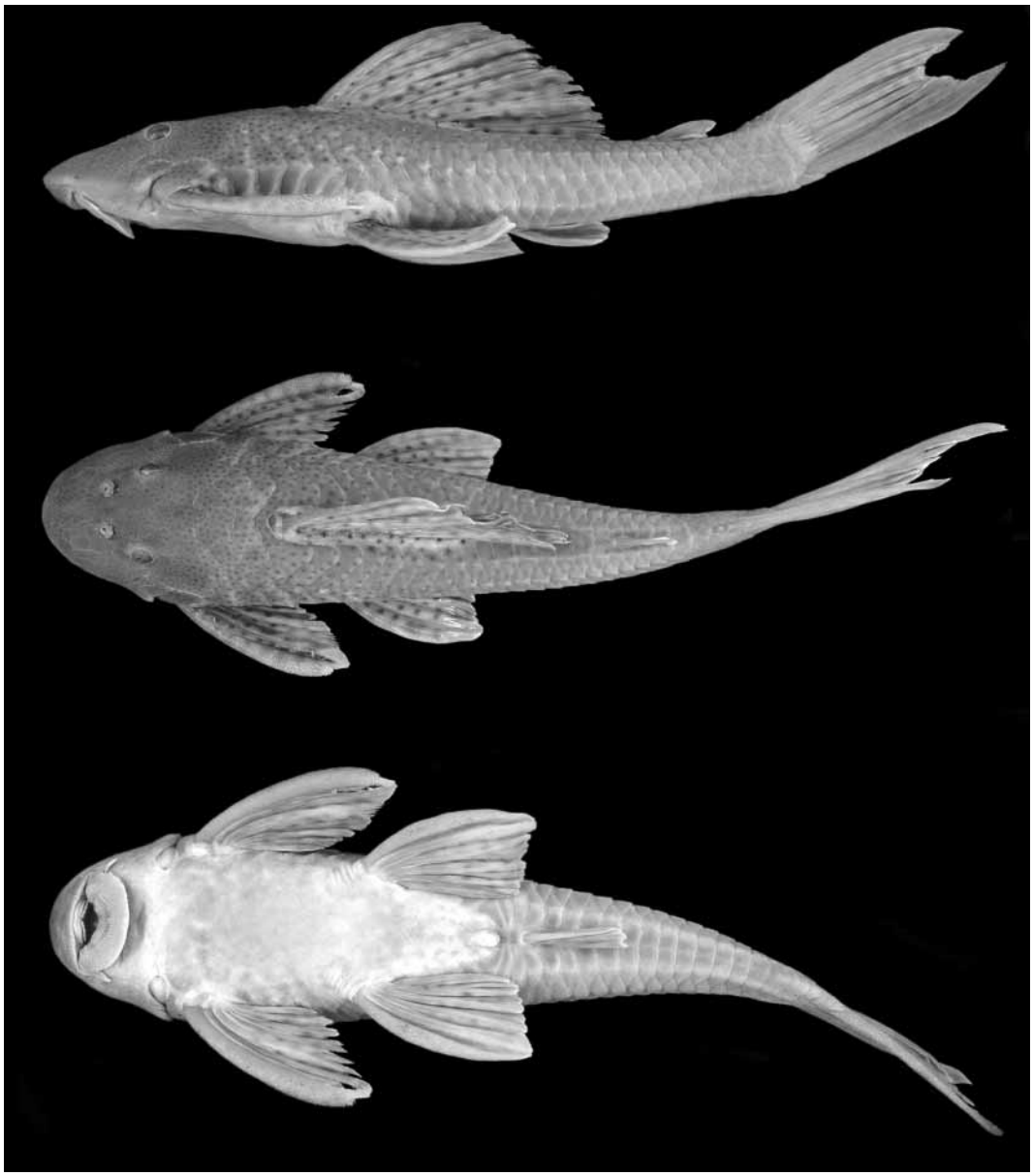

FIGURE 6. Dorsal, lateral, and ventral views of *Hypostomus interruptus*, MZUSP54581, 236.0 mm SL.

Description. Standard length of examined specimens 32.3 to 236.0 mm SL. Counts and proportional measurements presented in Table 2. Dorsal profile gently raising upwards from snout tip to dorsal-fin origin and gently descending from this point to the end of caudal peduncle. Caudal peduncle roughly oval in cross-section, flattened on ventral portion. Dorsal plates between end of dorsal-fin base and adipose-fin spine flattened. One preadipose plate.

Pre-dorsal region of trunk located between pterotic-supracleithrum and vertical through dorsal-fin origin covered by three horizontal series of plates that extends posteriorly to caudal fin. Median series of plates bearing the lateral-line canal. Mid-dorsal series situated above and mid-ventral series situated below median series. Dorsal series of plates starting at dorsal-fin origin. Ventral series of plates starting approximately at midlength of pelvic-fin base extension. Plates of mid-dorsal series not aligned, interrupted by first plate of dorsal series (Fig. 1B). Covering of abdomen ontogenetically variable. Plates restricted to central area of abdomen in specimens up to 95.0 mm SL; in larger specimens abdomen usually covered with minute platelets, leaving a naked area just around the pelvic fin.

Plates on dorsal and lateral portion of body relatively smooth in small and median size specimens. Trunk plates of larger specimens with relatively well developed ridges, forming four keels along flanks. Dorsal-most keel located over dorsal series of plates. Keel on mid-dorsal series of plates interrupted, following the alignment of plates. Anterior portion of this keel somewhat continuous with ridge on pterotic-supracleithrum, crossing the mid-dorsal series of plates on pre-dorsal region of trunk, and not aligned to keel of posterior portion of mid-dorsal series. Keel on median series of plates poorly developed. Keel on three dorsal-most horizontal series of plates usually starting at dorsal-fin origin, except by largest specimens examined that have those keels more conspicuous posterior to the vertical through insertion of sixth branched dorsal-fin ray. Mid-ventral keel well developed, more conspicuous on anterior half of trunk.

Head somewhat triangular, rounded anteriorly. Dorsal and ventral region of head completely covered with dermal ossifications, except for a small oval naked area on snout tip. Outer face of upper lip covered with small platelets, except small specimens that have most of this region naked (smaller than 100.0 mm SL). Ornamentation of pterotic-supracleithrum similar to the remaining surface of head and with odontodes densely distributed. Dorsal margin of orbit slightly elevated, continuing in a low ridge on pterotic-supracleithrum. Larger specimens with a low ridge on supraoccipital, diverging in two weakly developed separated ridges on predorsal plates. Usually two plates, sometimes one, bordering posterior margin of the supraoccipital bone. Space between orbits almost straight or slightly convex. Eyes large.

Mouth wide, rounded. Anterior-most papillae of inner face of lower lip irregular in form, somewhat elongate, followed by roundish papillae decreasing in size posteriorly. Teeth long and bicuspid; medial cusp approximately twice in length of outer cusp and curved inwards. Premaxillary teeth inserted in a relatively straight line; dentary teeth inserted in a concave arch facing mouth cavity; contralateral dentaries forming a relatively wide angle. Maxillary barbels relatively thin, elongated, slightly shorter than eye diameter, and without papillae.

Dorsal-fin origin situated on vertical anterior to pelvic-fin origin, approximately on posterior third of pectoral-fin spine. Dorsal fin relatively small; tips of adpressed last two rays ending on second or third plate anterior to adipose-fin spine. Margin of dorsal fin rel-

atively straight. Adipose-fin spine compressed, moderately strong with posterior-most portion curved ventrally in specimens around 150.0 mm SL and straight in smaller specimens. Distal half of pectoral-fin spine of larger specimens covered dorsally with small odontodes slightly curved forward (larger than 110.0 mm SL). Tip of adpressed pectoral fin beyond origin of pelvic fin. Tip of adpressed pelvic-fin spine reaching origin of anal fin in larger specimens and posterior to origin of the last branched ray in small specimens (up to180.0 mm SL). Basal lamina of first proximal radial of anal fin covered by skin in the majority of specimens examined, except in a few small specimens. Caudal fin margin concave, lower spine slightly longer than upper.

Color in alcohol. Dorsal and lateral surface of body with light brown or grayish ground coloration. Relatively small black or dark-brown roundish spots scattered all over dorsal and lateral surface of body, becoming gradually smaller towards anterior portion of head. Spots on region of trunk posterior to dorsal-fin end more conspicuous in smaller specimens (up to 130.0 mm SL), becoming faded or absent in larger specimens. Lateroventral portion of body below mid-ventral series of plates without spots on specimens 150.0 mm SL or larger. Four dark brown inconspicuous oblique bands on flanks, more visible in juveniles; dorsal portion of anterior-most band aligned with base of first three branched dorsal-fin rays; anterodorsal margin of second band aligned with insertion of last one or two dorsal-fin rays; third band located immediately posterior to dorsal-fin end and last band over posterior portion of caudal peduncle. Ventral surface of body pale or yellowish, usually clear except in some juveniles that have the ventral surface scattered with spots similar to those on body. Overall ground coloration of all fins pale to yellowish; recently fixed specimens pale orange. Dark brown or black spots larger than those of body sparsely distributed over fin rays and interradial membranes; pattern of distribution usually forming series when fins erected in specimens 180.0 mm SL or smaller. Caudal-fin spots arranged in irregular vertical series. Ground color of living specimens usually darker than alcohol preserved specimens and pattern of the four oblique bands more conspicuous.

Distribution and notes. *Hypostomus interruptus* is known to occur only in Ribeira de Iguape river basin. Sampling efforts in this region in the last ten years suggests *Hypostomus interruptus* as the most common *Hypostomus* in the area. This conclusion involves the high number of individuals collected, high diversity of environments inhabited, and wide geographical distribution of this species (Fig. 5). *Hypostomus interruptus* was found in relatively large rivers as exemplified by the rivers Ribeira, Pilões, Catas Altas, Pardo, and also in smaller drainages as Betari, Saibadela, Arataca, a tributary of rio Jacupiranga, and Braço Bonito, a tributary of rio São Lourenço. The area of occurrence of *H. interruptus* varies from 165 to 900 m above sea level.

Plecostomus commeosoni (*lapsus calami pro commersoni*) Miranda-Ribeiro, 1907:188 [reference, distribution].

Plecostomus commersoni. Miranda-Ribeiro, 1908a:4 [reference, distribution]. Miranda-Ribeiro, 1908b: (unnum. pp) [reference, distribution].

Plecostomus commersonni (*lapsus calami pro commersoni*) Miranda-Ribeiro, 1918:710 [reference, distribution].

Holotype. Brazil. São Paulo: MZUSP 55204, 378.3 mm SL; rio Catas Altas, Ribeira; M. R. Santos & C. E. Espírito Santo, 14 October 1995.

Paratypes. Brazil. *São Paulo*: — MZUSP 55205, 1, 264.2 mm SL; collected with the holotype. — MZUSP 38582, 3, 229.0-325.0 mm SL; rio Pardo, tributary of rio Turvo, Água do Padre district, Barra do Turvo; O. T. Oyakawa *et al*., 5-6 February 1987. — MZUSP 61728, 1, 47.3 mm SL; rio Batatal, tributary of rio Ribeira de Iguape, approx. 24º 35' 26,3"S, 48º 16' 23,9"W, Iporanga; Projeto Biota/Fapesp Ribeira, 12 May 2000. — MZUSP 52858, 1, 304.3 mm SL; rio Ribeira de Iguape, Iporanga; S. Buck *et al*., 20 October 1998. — MZUSP 37544, 1, 160.8 mm; Canal do Valo Grande, Cananéia; Cetesb, May-July 1984. — MZUSP 24632, 3, 84.1-154.4 mm SL; rio Ribeira de Iguape, Registro; J. Mandelli Jr., 6 April 1978. — MZUSP 3655, 5, 105.4-124.5 mm SL; Iporanga; Vieira & Lima, 1944. — MZUSP 37589, 2, 130.7-163.1 mm SL; rio Ribeira de Iguape, Registro; J. Mandelli Jr., 17 October 1978. — MZUSP 45416, 2, 238.1-304.0 mm; rio Ribeira de Iguape, close to mouth of rio Pilões and 8 km upstream of rio Batatal, Eldorado; M. Damato, 28 February 1993. – MZUSP 45200, 5, 18.8-40.3 mm SL; tributary of rio Ribeira de Iguape, 8km above rio Batatal, Eldorado; M. Damato, 05 March 1993. — MZUSP 45428, 1, 310.0 mm SL; rio Ribeira de Iguape, close to mouth of rio Pilões and 8 km upstream of rio Batatal, Eldorado; M. Damato, 1 March 1993. — MZUSP 52857, 2, 284.6-262.2 mm SL; rio Ribeira de Iguape, close to mouth of rio Betari, Eldorado; S. Buck *et al*., 24 March 1994. – MZUSP 55216, 2, 197.7-239.1 mm SL; rio Pardo, Barra do Turvo; M. R. Santos & C. E. Espírito Santo, October 1995. — MZUSP 38652, 1, 24.1 mm SL; creek Pariqueramirim, tributary of rio Ribeira de Iguape, Pariquera-Açú; Estagiários MZUSP, 29 March 1987. — ANSP 180330, 2, 240.0-333.0 mm SL; rio Pilões, Iporanga; M. R. Santos & C. E. Espírito Santo, 19 January 1995. – MCP 35596, 3, 183.8-267.6 mm SL; rio Juquiá, Juquiá; M. R. Santos & C. E. Espírito Santo, 11 October 1995. — MNRJ 27503, 3, 220.0-268.5 mm SL; rio Pilões, Iporanga; M. R. Santos & C. E. Espírito Santo, 12 October 1995.

Non-type material examined: Brazil. *São Paulo*: — MZUSP 55212, 1, 268.0 mm SL; rio Iporanga, Iporanga; M. R. Santos & M. Morato, 17 January 1995. — MZUSP 55213, 10, 148.0-321.0 mm SL; rio Catas Altas, Ribeira; M. R. Santos & M. Morato, 23 January 1995. — MZUSP 55477 , 2, 175.2-274.5 mm SL; rio Pardo, Barra do Turvo; M. R. Santos & M. Morato, 25 January 1995. — MZUSP 42800, 4, 174.4-202.0 mm SL; rio Ribeira de Iguape, Ribeira; Expedição MZUSP, 8-27 March 1991. — MZUSP 40200, 1,

181.5 mm SL; rio Pardo, Barra do Turvo; SEMA/SUDELPA. — MZUSP 62887, 1, 250,0 mm SL, Rio Uma do Prelado, Estação Ecológica Juréia Itatins, Peruíbe; Milena, 26 June, 2000.

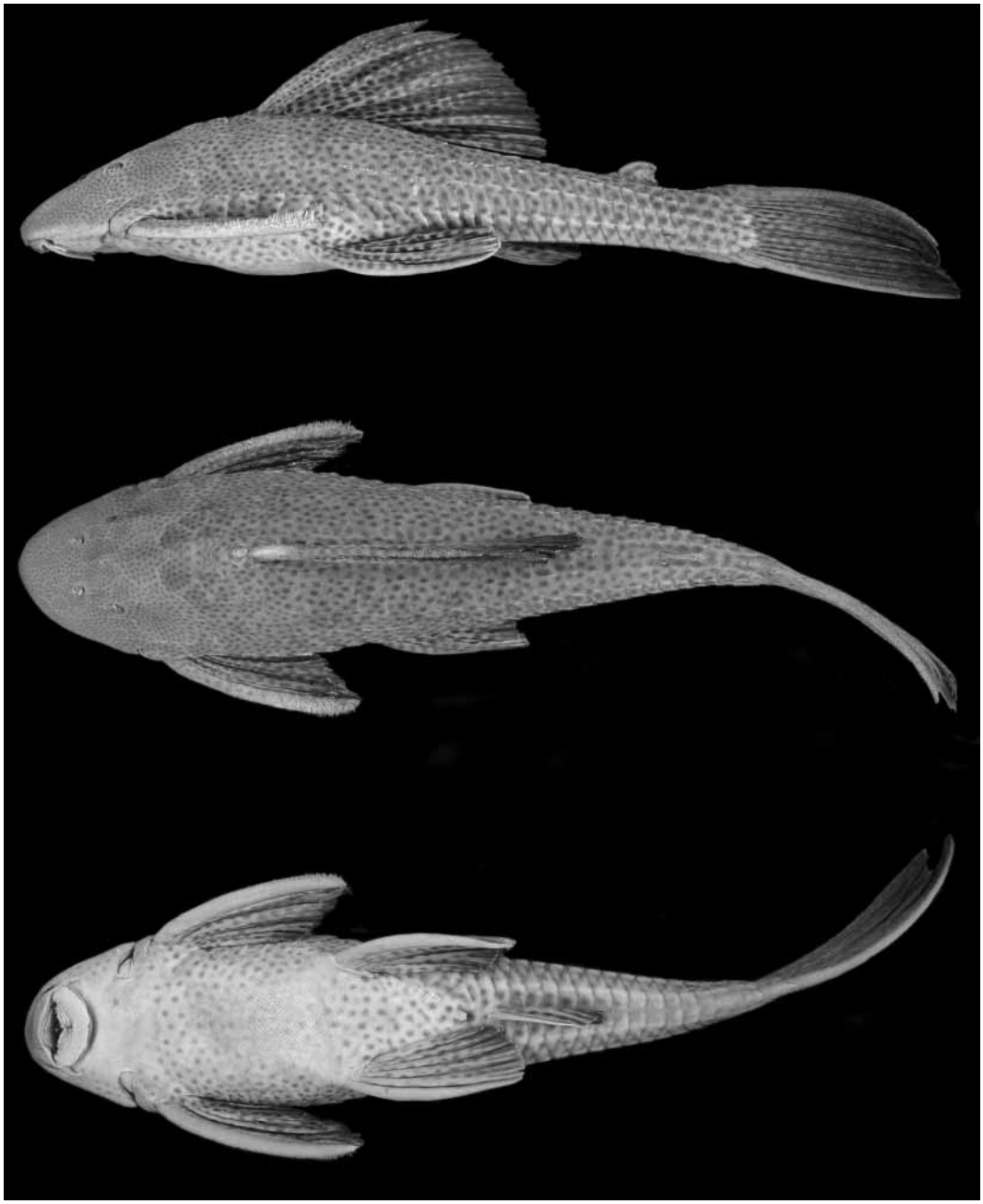

FIGURE 7. Dorsal, lateral, and ventral views of *Hypostomus tapijara*, sp. n., MZUSP 55204, holotype, 378.3 mm SL.

Diagnosis: *Hypostomus tapijara* is distinguished from its congeners inhabiting rio Ribeira de Iguape basin by the presence of well defined large, dark, and roundish spots somewhat homogeneously distributed over body and fins, and by its relative broad dorsal fin (interradial membranes wider than other eastern drainage *Hypostomus* species). In addition, it differs from *H. agna* by the presence of well-developed keels on lateral plates of body, mid-dorsal series of plates of pre-dorsal region of trunk not aligned to any series of plates posterior to this point, and caudal peduncle ovoid in cross-section. *Hypostomus tapijara* can be further distinguished from *H. interruptus* by the absence of dark bands on flanks. Finally, *H. tapijara* also differs from *H. ancistroides* by having the ventral region of head completely covered with dermal ossifications.

Description: Standard length of examined specimens 18.8 to 378.3 mm SL. Counts and proportional measurements presented in Table 2. Dorsal profile slightly convex, raising abruptly upwards from snout tip to dorsal-fin origin, and gently descending from this point to the end of caudal peduncle. Caudal peduncle roughly oval in cross-section; slightly flattened on ventral portion. Dorsal plates between end of dorsal fin base and adipose fin spine flattened. One preadipose plate.

Pre-dorsal region of trunk located between pterotic-supracleithrum and vertical through dorsal-fin origin covered by three horizontal series of plates that extends posteriorly to the caudal fin. Median series of plates bearing the lateral-line canal. Mid-dorsal series situated above and mid-ventral series situated below median series. Dorsal series of plates starting at dorsal-fin origin. Ventral series of plates starting above the insertion of the pelvic-fin. Mid-dorsal series of lateral plates of pre-dorsal region in medium or large specimens not aligned to posterior portion of this series; center of those plates relatively aligned or slightly ventral to dorsal border of plates of the posterior portion of mid-dorsal series, situated posterior to vertical through dorsal-fin origin (Fig. 1B). Specimens of 110.0 mm SL or smaller with mid-dorsal series of plates somewhat aligned throughout its extension. Covering of abdomen ontogenetically variable; completely naked in specimen around 47.0 mm SL; usually covered with minute platelets, leaving a small naked area just around the pelvic fin in larger specimens.

Body with four well-developed keels along flanks, except for specimens under 90.0 mm SL that have no keels. Dorsal-most keel situated on dorsal series of plates. Keel on mid-dorsal series of plates interrupted, following the alignment of plates. Anterior portion of this keel somewhat continuous with ridge on pterotic-supracleithrum, crossing mid-dorsal series of plates of pre-dorsal region of trunk, becoming somewhat posterodorsally oriented and not aligned to keel on plates of the posterior portion of mid-dorsal series. Keel on median series of plates well developed along its entire length. Mid-ventral keel originating immediately posterior to cleithrum, more conspicuous on anterior half of trunk.

Head triangular, somewhat pointed anteriorly, unless for specimens around 85.0 mm SL or smaller that have anterior profile of head distinctly rounded. Dorsal and ventral region of head completely covered with dermal ossifications, except for a small naked area on snout tip, which is reduced in the larger specimens. Outer face of upper lip covered

with small platelets in specimens with 85.0 mm SL or larger. Ornamentation of pterotic-supracleithrum distinct from the remaining surface of head, with odontodes aligned and forming striae. Dorsal margin of orbit elevated, continuing in a low ridge on pterotic-supracleithrum. All examined specimens larger than 85.0 mm SL with a prominent ridge on supraoccipital, diverging in two separated ridges on predorsal plates. Usually one plate (only one specimen with two plates) bordering posterior margin of the supraoccipital bone. Space between orbits slightly convex. Eyes large.

Mouth rounded. Anterior-most papillae of inner face of lower lip irregular in form, somewhat elongate, followed by rounded papillae decreasing in size posteriorly. Teeth long and bicuspid; medial cusp approximately twice in length of outer cusp and curved inward. Premaxillary teeth inserted in a relatively straight line; contralateral dentary row of teeth inserted in a relatively acute angle. Maxillary barbels relatively long, slightly shorter than eye diameter, and with papillae near the base of its inner margin.

Dorsal-fin origin situated on vertical anterior to pelvic-fin origin, approximately at vertical through midlength of pectoral-fin spine. Dorsal fin relatively large; tips of adpressed last three rays reaching preadipose plate in smaller specimens and ending at third pair of plate before preadipose plate in the largest specimen examined. Margin of dorsal fin convex. Adipose-fin spine compressed, somewhat curved ventrally except in specimens of 47.0 mm SL that have this spine straight. Distal half of pectoral-fin spine of large specimens (around 200.0 mm SL) covered dorsally with well-developed odontodes, slightly curved forward. Tip of adpressed pectoral-fin positioned beyond origin of pelvic fin. Tip of adpressed pelvic-fin spine positioned beyond midlength of anal fin in juveniles and posterior to anal-fin origin in largest specimens examined. Basal lamina of first proximal radial of anal fin in small specimens covered by skin; uncovered in larger specimens. Caudal fin margin concave, lower spine longer than upper.

Color in alcohol. Dorsal and lateral surface of body with light brown ground coloration. Ventral surface pale to yellowish. Black or dark-brown roundish spots scattered all over dorsal and lateral surface of body; smaller, close together, and somewhat more irregular in form over head. Spots organized in four horizontal lines on portion of body posterior to dorsal-fin end in most specimens examined (except juveniles); usually one spot in each plate of this region. Somewhat less conspicuous and brownish spots on abdomen, except by clear area from coracoid to posterior margin of lower lip; specimen around 47.0 mm SL without ventral spots. Ventral surface of caudal peduncle in the majority of specimens examined commonly with one central horizontal brown stripe continuing posteriorly from anal fin, bordered by clear areas. Overall ground coloration of all fins light brown, scattered with roundish black or dark-brown spots. Spots on fins slightly larger, darker, and more concentrated than those on body. Dorsal-fin interradial membranes sometimes with two parallel series of spots along ray extension, unless for specimens with 47.0-85.0 mm SL that have fewer spots on dorsal fin, arranged in oblique series. Spots on caudal fin uniformly distributed, not forming series or bands.

Distribution and notes. *Hypostomus tapijara* is the largest loricariid living in Ribeira de Iguape river basin. The species occurs mostly in the channel of the largest rivers in the area, as exemplified by rivers Ribeira de Iguape, Catas Altas, Pardo, and Batatal (Fig. 8). Furthermore, *H. tapijara* is the only species of *Hypostomus* to occur in estuarine environment in Ribeira de Iguape basin, close to the area where Ribeira de Iguape river flows into the ocean, in Cananéia, São Paulo. Examination of loricariids deposited at MZUSP revealed that *H. tapijara* also occurs at the rio Una do Prelado, a coastal river system inside Estação Ecológica da Juréia-Itatins, north of Ribeira de Iguape system. The area of occurrence of *H. tapijara* varies from 13 m of altitude in Cananéia to 500 m in the locality of rio Catas Altas, Ribeira.

Etymology. From tapijara, the common name of the species among the local people, and which means in Tupi language the one who is sedentary or ancient dweller. A noun in apposition.

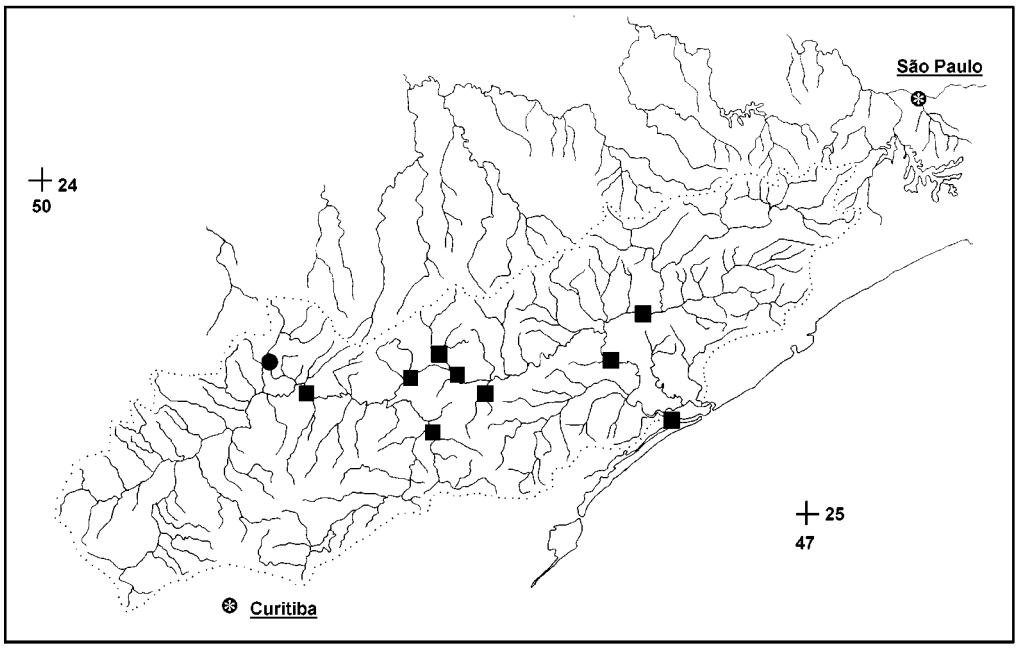

FIGURE 8. Geographic distribution of *Hypostomus tapijara*, sp. n. (circle - Rio Catas Altas, type locality of *H. tapijara*). Dotted lines delimit Ribeira de Iguape river basin.

Discussion

Four nominal species of *Hypostomus* are cited in the literature for rio Ribeira de Iguape basin: *Hypostomus agna* (Miranda-Ribeiro, 1907), *Hypostomus commersonii* Valenciennes, 1840, *Hypostomus interruptus* (Miranda-Ribeiro, 1918), and *Hypostomus lacerta* (Nichols, 1919). *Hypostomus lacerta* was recently transferred to the genus *Kronichthys* by

Armbruster & Page (1997). *Hypostomus commersonii* was described for the La Plata river basin, Uruguay, and to rio São Francisco, Brazil. Subsequent authors registered the species in other Brazilian drainages (e.g., rio Paraíba do Sul (Steindachner, 1876; Miranda-Ribeiro, 1911, 1918), rio Paraná (Miranda-Ribeiro, 1911), and rio Ribeira de Iguape (Miranda-Ribeiro, 1907, 1908a, b, 1918)), broadening the distribution of *H. commersonii*. Weber (1986), on the contrary, restricted the area of occurrence of *H. commersonii* to the La Plata river system and Mazzoni *et al*. (1994) corroborated the absence of this species in the rio Paraíba do Sul drainage. Similarly, we herein confirm the absence of *H. commersonii* in the Ribeira de Iguape river system. Our analysis revealed that the loricariids collected in the Ribeira do Iguape basin and previously identified in the literature as *H. commersonii*, have several distinctive features when compared to the La Plata river form. In fact, this material represents a new species and is described herein as *H. tapijara*, sp. n. Besides having a relatively distinct overall body form, *H. tapijara* can be also distinguished from *H. commersonii* on the basis of several characters including the presence of larger and more numerous dark spots distributed over body and fins, and absence of oblique inconspicuous bands over flanks. These two species can be further distinguished from each other by the relatively higher degree of development of ridges and keels in *H. commersonii*.

As noted in the 'Introduction' some authors provided regional revisions of the genus *Hypostomus*. From those revisions, only Mazzoni *et al*. (1994) examined species from eastern Brazilian basins, recognizing only two valid species for lower portion of rio Paraíba do Sul basin: *Hypostomus affinis* (Steindachner, 1877) and *Hypostomus auroguttatus* Kner, 1854, senior synonym of H. *luetkeni* (Steindachner, 1877) (see Weber, 2003:356). According to Mazzoni *et al*. (1994) both species are only in the rio Paraíba do Sul or northern Brazilian drainages. Furthermore, those species were not cited in the literature for the rio Ribeira de Iguape basin. Examination of specimens of *H. affinis* in the present study revealed some similarities in coloration with *H. interruptus* and *H. tapijara*. However, *H. affinis* have body comparatively more elongated than *H. interruptus* and also have larger and more conspicuous dark spots distributed over body and fins (compare Fig. 6 with fig. 2 of Mazzoni *et al.*, 1994). *Hypostomus affinis* differs from *H. tapijara* by the absence of broad dorsal fin and absence of strongly developed keels characteristic of the later species (compare Fig. 7 with fig. 2 of Mazzoni *et al.*, 1994). According to Bizerril (1994), there is another species from rio Paraíba do Sul basin, *H. punctatus*, which belongs to the *H. commersoni* group, and can be readily distinguished from *H. tapijara* by having smaller spots over body and fins, four dark brown inconspicuous oblique bands, absence of a broad dorsal fin and body not so elongated.

In the case of *Hypostomus auroguttatus*, comparisons with species of *Hypostomus* from rio Ribeira de Iguape basin revealed several similarities with *H. agna*, mainly related to the body shape, alignment of series of plates in anterior and posterior portion of trunk, absence of keels, and coloration (compare Fig. 2 with fig. 3 of Mazzoni *et al.*, 1994).

Although *H. agna* is endemic to the rio Ribeira de Iguape system (Weber, 2003:355) and *H. auroguttatus* was never reported in the literature to occur in this river basin, the distinction between the two species based on the examination of the available material of both species is apparently problematic. In fact, taxonomic difficulties involving *H. auroguttatus* were previously emphasized by Weber (2003:364), under his comments of *Hypostomus vermicularis* (Eigenmann & Eigenmann). According to the author, *H. vermicularis* needs a revision, a task beyond the scope of this study. Considering the known geographic distribution of *H. auroguttatus*, the undoubted presence of *H. agna* in rio Ribeira de Iguape basin and the limited focus of the present study we defer to propose a synonymization of these two species and maintain *H. agna* as the species present in the rio Ribeira de Iguape basin.

Thus the four species found to occur in rio Ribeira do Iguape basin includes those two previously cited in the literature and confirmed to be present in this study, recognized as *H. agna* and *H. interruptus*, one species recorded for the first time in this system that is *Hypostomus ancistroides*, and the new species *H. tapijara*.

Comparative Material Examined

Hypostomus affinis: Brazil. *Minas Gerais*: – MZUSP 75080, 4, 136.7-167.2 mm SL; rio Suaçui Pequeno, Coroaci. — MZUSP 75082, 1, 200.0 mm SL; rio Corrente Grande, Cachoeira do Odilon, approx. 1,5 km below the bridge, Guanhães. *Rio de Janeiro*: — MZUSP 45404, 1, 182.3 mm SL; rio Paraíba do Sul, Ilha dos Pombos, Carmo. — MZUSP 45405, 1, 220.7 mm SL; rio Paraíba do Sul, Três Rios. *São Paulo*: — MZUSP 44534, 1, 133.0 mm SL; córrego do Altão, tributary of rio Bocaina, Silveiras. — MZUSP 52606, 1, 275.1 mm SL; rio Paraíba do Sul, Pindamonhangaba.

Hypostomus commersonii: Brazil. *Rio Grande do Sul*: – MZUSP 40957, 2, 270.8-284.2 mm SL; mouth of rio Santo Cristo, tributary to rio Uruguai, Porto Mauá. – MZUSP 23629, 1, 148.1 mm SL; rio dos Sinos, São Leopoldo. – MZUSP 41075, 1, 194.0 mm SL; rio Uruguai, Irai. – MZUSP 41062, 3, 170.7-204.2 mm SL; rio Piratini, tributary of rio Uruguai, Fazenda dos Hinz, Santo Ângelo.

Hypostomus auroguttatus: Brazil. *Minas Gerais*: — MZUSP 66206, 1, 116.7 mm SL; rio Glória, tributary of rio Muriaé, Muriaé. – MZUSP 66205, 2, 161.0 – 220.0 mm SL; rio Glória, tributary of rio Muriaé, Muriaé. – MZUSP 66207, 2, 194.0-197.0 mm SL; rio Suaçuí Grande, Peçanha. — MZUSP 66208, 1, 204.0 mm SL; rio Suaçuí Grande, São Pedro do Suaçuí. *Rio de Janeiro*: — MZUSP 66213, 1, 188.0 mm SL; rio Paraíba do Sul, Ilha dos Pombos, Carmo. – MZUSP 44512, 1, 79. 0 mm SL; rio Pirapitinga, first bridge on road from Capelinha to Mauá, Bairro da Capelinha, Resende. – MZUSP 45406, 1, 158.0 mm SL; rio Paraíba do Sul, São Fidélis.

Hypostomus punctatus: Brazil. *Rio de Janeiro*: — MZUSP 80305, 6, 40.3-109.6 mm SL; rio São João, on the road Boqueirão to Japuíba.

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