

Review of the genus *Hypostomus* Lacépède, 1803 from Southern Brazil, with descriptions of three new species (Pisces, Siluriformes, Loricariidae)

by

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With 31 figures

ABSTRACT

The South Brazilian species of the loricariid catfish genus *Hypostomus* Lacépède, 1803 are reviewed. Eight species were found in the area: *H. aspilogaster* (Cope, 1894), *H. commersonii* Valenciennes, 1840, *H. luteus* (Godoy, 1980), *H. regani* (Ihering, 1905), *H. cf. ternetzi* (Boulenger, 1895), *H. isbrueckeri* sp. n., *H. roseopunctatus* sp. n., and *H. uruguayensis* sp. n. *Hypostomus luteomaculatus* (Devincenzi & Teague, 1942) is synonymized with *H. regani*. Lectotypes are designated for *H. aspilogaster*, *H. limosus* (Eigenmann & Eigenmann, 1888), and *H. regani*. A key, descriptions and illustrations are provided for all species included.

RESUMO

É feita uma revisão das espécies do gênero *Hypostomus* Lacépède, 1803 (Loricariidae) do sul do Brasil. Oito espécies foram encontradas na área: *H. aspilogaster* (Cope, 1894), *H. commersonii* Valenciennes, 1840, *H. luteus* (Godoy, 1980), *H. regani* (Ihering, 1905), *H. ternetzi* (Boulenger, 1895), *H. isbrueckeri* sp. n., *H. roseopunctatus* sp. n., e *H. uruguayensis* sp. n. *Hypostomus luteomaculatus* (Devincenzi & Teague, 1942) é considerada sinônimo de *H. regani*. Lectótipos são designados para

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H. aspilogaster, *H. limosus* (Eigenmann & Eigenmann, 1888) e *H. regani*. São apresentadas uma chave, descrições e ilustrações de todas as espécies.

INTRODUCTION

The genus *Hypostomus* Lacépède, 1803 is one of the most diverse and complex groups of South American freshwater catfishes. Like most other Neotropical groups studied in the past two centuries, the species of *Hypostomus* have been only briefly and incompletely described, and the available descriptions are often useless for species identification. This, allied to a very limited knowledge of general distribution patterns in South

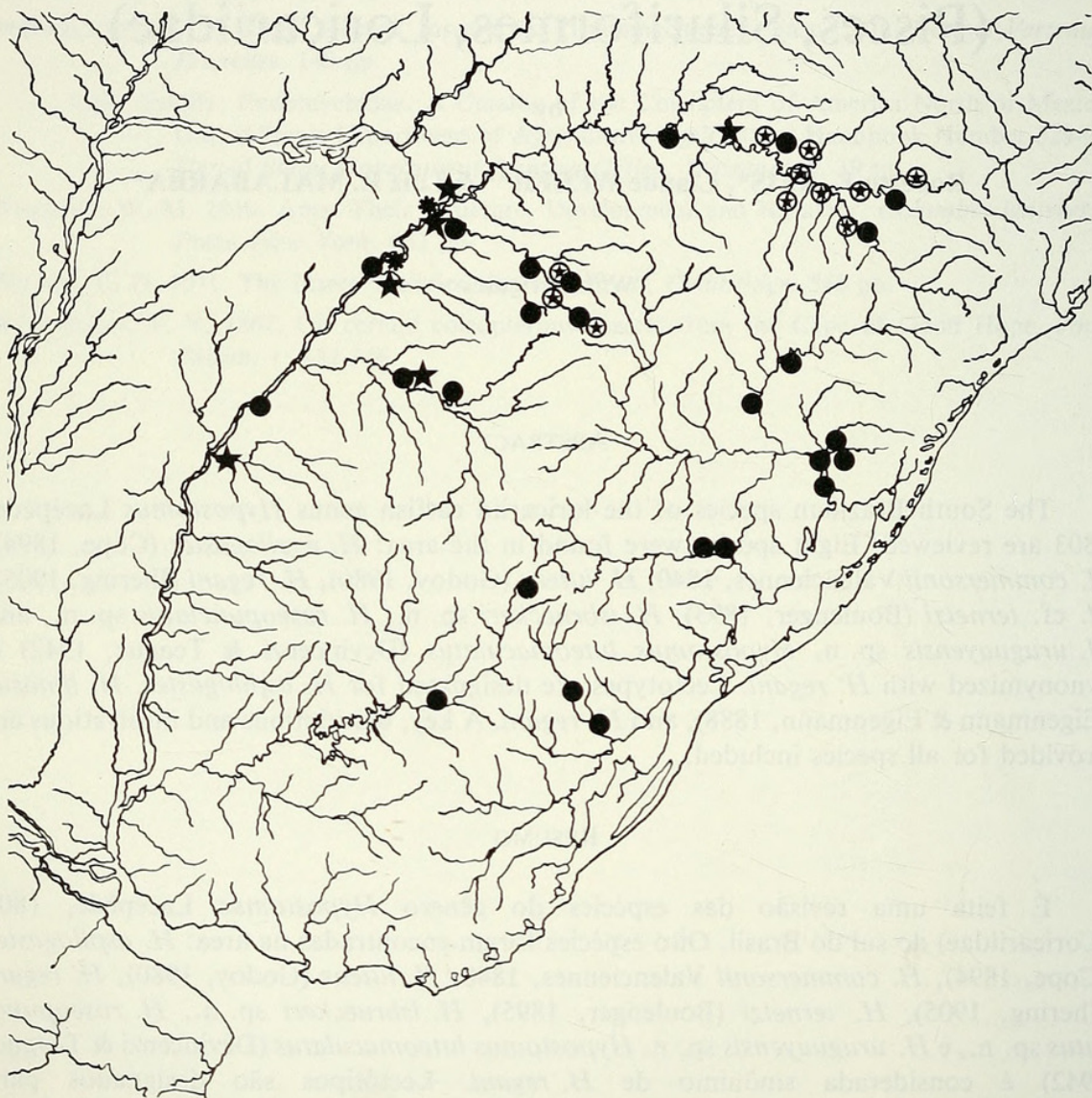


FIG. 1.

Localities of specimens examined: black circle: *H. commersonii*; circled star: *H. isbrueckeri* sp. n.; asterisk: *H. ternetzi*; star: *H. uruguayensis* sp. n. Some symbols represent more than one lot or locality.

American rivers, has resulted in a proliferation of misidentifications in the literature. This can be exemplified in the laguna dos Patos system in Rio Grande do Sul, as will be discussed below.

In this work we present a taxonomic review of the species of the genus *Hypostomus* from Southern Brazil, chiefly the Rio Grande do Sul State. This geopolitical area comprises mainly two hydrographic systems (Figs 1, 2), viz. most of the laguna dos Patos system, with the Jacui river as its main tributary, and the upper and middle parts of the rio Uruguay basin. We believe that regional revisions of diverse and complex groups of freshwater fishes such as *Hypostomus* are an efficient way, and often the only practicable one, to solve problems at the specific level, as was successfully done by BOESEMANN (1968) with *Hypostomus* from Surinam, WEBER (1985, 1986 and 1987) with *Hypostomus* from Paraguay, NIJSSEN & ISBRÜCKER (1983) with *Corydoras* from Colombia, NIJSSEN & ISBRÜCKER (1986) with *Corydoras* from Peru and Ecuador, among others.

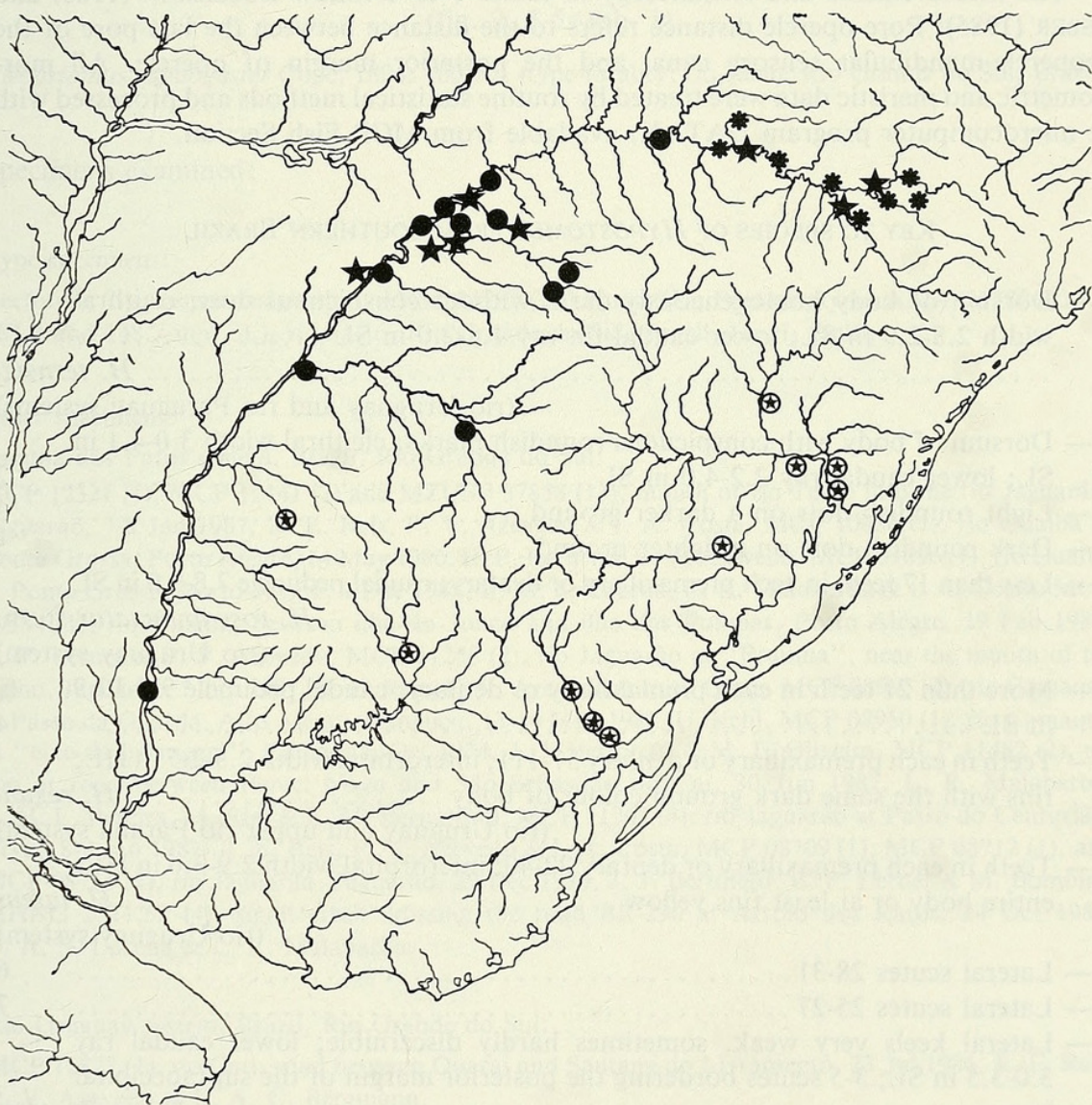


FIG. 2.

Locality of specimens examined: black circle: *H. regani*; circled star: *H. aspilogaster*; asterisk: *H. luteus*; star: *H. roseopunctatus* sp. n. Some symbols represent more than one lot or locality.

METHODS

Specimens examined in this study belong to the fish collections of the Academy of Natural Sciences of Philadelphia, Philadelphia (ANSP); British Museum (Natural History), London (BMNH); Facultad de Humanidades y Ciencias, Montevideo (FHCM); Museu de Ciências da Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre (MCP); Museum of Comparative Zoology, Cambridge (MCZ); Muséum d'Histoire naturelle de Genève, Genève (MHNG); Museo de Historia Natural de Montevideo, Montevideo (MHNM); Muséum national d'Histoire naturelle, Paris (MNHN); Museu de Zoologia da Universidade de São Paulo, São Paulo (MZUSP); National Museum of Natural History, Washington (USNM); and Zoologisches Museum Berlin, Berlin (ZMB). Other abbreviations are: L1 and L2, lower and upper confidence limits; SD, standard deviation; and SL, standard length.

The measurements and terminology in tables 1 to 8 follow BOESEMANN (1968) and WEBER (1985). Pore-opercle distance refers to the distance between the last pore of the preopercle-mandibular sensory canal and the posterior margin of opercle. All morphometric and meristic data were treated by routine statistical methods and processed with the microcomputer program DATAX, available from MCP Fish Section.

KEY TO SPECIES OF *HYPOSTOMUS* FROM SOUTHERN BRAZIL

- 1 — Dorsum of body homogeneously dark, without conspicuous dots; cleithral width 2.8-2.9 in SL; lower caudal-fin ray 1.8-2.0 in SL *H. ternetzi*
(rio Uruguay and rio Paraguay systems)
- 1' — Dorsum of body with conspicuous roundish marks; cleithral width 3.0-4.1 in SL; lower caudal ray 2.2-4.0 in SL 2
- 2 — Light roundish dots on a darker ground 3
- 2' — Dark roundish dots on a lighter ground 5
- 3 — Less than 17 teeth in each premaxillary or dentary; caudal peduncle 7.8-9.0 in SL *H. roseopunctatus* sp. n.
(rio Uruguay system)
- 3' — More than 21 teeth in each premaxillary or dentary; caudal peduncle 9.0-10.9 in SL 4
- 4 — Teeth in each premaxillary or dentary 57-111; interorbital width 2.3-2.7 in HL; fins with the same dark ground colour of body *H. regani*
(rio Uruguay and upper rio Paraná system)
- 4' — Teeth in each premaxillary or dentary 22-40; interorbital width 2.9-3.6 in HL; entire body or at least fins yellow *H. luteus*
(rio Uruguay system)
- 5 — Lateral scutes 28-31 6
- 5' — Lateral scutes 25-27 7
- 6 — Lateral keels very weak, sometimes hardly discernible; lower caudal ray 3.0-3.5 in SL; 3-5 scutes bordering the posterior margin of the supraoccipital bone *H. aspilogaster*
(rio Uruguay and rio Jacui systems)
- 6' — Lateral keels strong, sometimes very rough; lower caudal ray 2.5-2.9 in SL; 1-2 scutes bordering the posterior margin of the supraoccipital bone

- *H. commersonii*
(rio Uruguay and rio Jacui systems)
- 7 — Upper caudal ray equal or longer than head length, 2.2-3.0 in SL; margin of caudal fin strongly concave, with big conspicuous darker dots and never with an yellow band *H. uruguayensis* sp. n.
(rio Uruguay system)
- 7' — Upper caudal ray shorter than head length, 3.4-4.1 in SL; margin of caudal fin truncated to slightly concave, homogeneously dark, often with an yellow (whitish in alcohol preserved specimens) distal band on mature males
..... *H. isbrueckeri* sp. n.
(rio Uruguay system)

***Hypostomus aspilogaster* (Cope)**
(fig. 2, 3-5; tab. 1)

Plécostomus aspilogaster Cope, 1894: 100-101 (type-locality: rio Jacui, Rio Grande do Sul, Brazil).

Specimens examined:

Type-specimens:

Lectotype (by present designation) ANSP 21781 (203.7 mm SL); Paralectotypes ANSP 21782 (120.9, 187.3 and 148.7 mm SL), rio Jacui, Rio Grande do Sul, Brazil, H. H. Smith.

Other specimens:

Laguna dos Patos system, Brazil, Rio Grande do Sul:

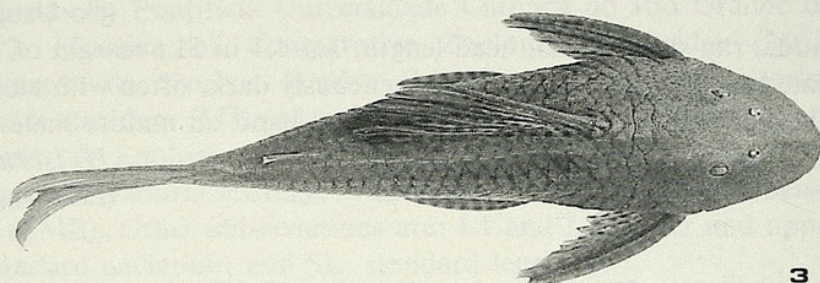
MCP 12321 (1), MCP 12141 (7) and MZUSP 37858 (13), mouth of rio Telho into the rio Jaguarão, Jaguarão, 7-8 Jan 1987, R. E. Reis, P. V. Azevedo & I. A. Costa. MCP 10886 (1), rio Guaíba at Ponta Grossa, Porto Alegre, 14 May 1986, E. P. Lerner & P. V. Azevedo. MCP 09696 (9), rio Guaíba at Ponta Grossa, Porto Alegre, 1 Dec 1983, Z. M. S. Lucena, L. R. Malabarba & I. A. Costa. MCP 10884 (1), rio Guaíba, between ilha do Junco and ilha das Pombas, Porto Alegre, 19 Feb 1986, E. P. Lerner & P. V. Azevedo. MCP 11258 (2), rio Jaguarão at "Prainha", near the mouth of rio Telho, Jaguarão, 7 Jan 1987, R. E. Reis, P. V. Azevedo & I. A. Costa. MCP 08995 (2), rio Camaquã at Passo da Guarda, Alto Alegre, Canguçu, 13-14 May 1982, U. Kehl. MCP 08950 (1), rio Camaquã at "eixo da barragem", Camaquã, Oct 1974, J. J. Bertolotti & M. F. Oliveira. MCP 11482 (2), rio Cai at road between Pareci Novo and São Sebastião do Cai, 30 Jun 1987, L. R. Malabarba, E. H. L. Pereira, M. Ries & L. M. Bernardini. MCP 11265 (4), rio Jaguarão at Passo do Centurião, Erval, 8-9 Jan 1987, R. E. Reis, P. V. Azevedo & I. A. Costa. MCP 08709 (1), MCP 08712 (1), and MCP 08715 (1), rio Jaguarão, Jaguarão, 29 Dec 1975, J. J. Bertolotti, E. P. Lerner & M. Bombim. MHNG 2311.52 (4), small creek crossing the road BR-290 at Arroio dos Ratos, 24 Oct 1982, C. A. S. Lucena & L. R. Malabarba.

Rio Uruguay system, Brazil, Rio Grande do Sul:

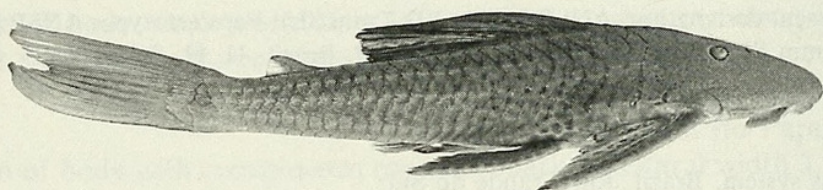
MCP 10877 (1), rio Cati, road between Quarai and Santana do Livramento, 23 Jul 1986, R. E. Reis, P. V. Azevedo & L. A. C. Bergmann.

Uruguay:

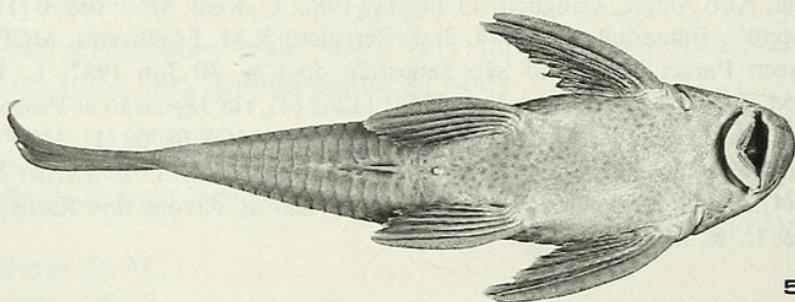
MCP 11088 (1), Río Taquarembó, Ansina, Taquarembó, 5 Oct 1985, C. A. S. Lucena & C. P. Silva.



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FIGS 3-5.

Hypostomus aspilogaster, MCP 08995 (218.8 mm SL); 3) dorsal, 4) lateral, and 5) ventral view.

TABLE 1.

Morphometric and meristic data of *Hypostomus aspilogaster*.

a - lectotype, b - paralectotype.

Character	a	b	n	Range			95% confidence limits		SD
				low	high	mean	L1	L2	
Standard length (A) (mm)	202.8	120.9	20	137.7	266.2	202.0			33.806
Ratios of standard length									
Predorsal distance (D)	2.6	2.7	20	2.6	2.9	2.7	2.696	2.767	
Head length (E)	3.3	3.3	20	3.2	3.6	3.4	3.362	3.468	
Cleithral width (F)	3.5	3.4	20	3.7	4.1	3.9	3.828	3.937	
Length of dorsal fin spine (K)	3.0	3.2	17	3.2	3.8	3.5	3.387	3.576	
Length of dorsal fin base (L)	3.5	4.0	20	3.7	4.6	4.1	4.034	4.256	
Dorsal base to adipose spine (M)	5.4	6.2	20	4.2	5.1	4.5	4.432	4.652	
Trunk length (N)	4.5	4.1	20	4.0	4.8	4.4	4.304	4.488	
Pectoral fin spine length (O)	3.2	3.3	20	3.2	3.8	3.5	3.399	3.572	
Abdominal length (P)	5.2	5.1	20	4.8	5.4	5.1	5.044	5.200	
Pelvic fin spine length (Q)	3.7	4.0	20	4.1	4.6	4.3	4.215	4.345	
Caudal peduncle length (R)	3.1	3.2	20	2.7	3.1	2.9	2.885	2.986	
Caudal peduncle depth (S)	10.6	10.4	20	11.0	12.7	12.0	11.750	12.216	
Adipose fin spine length (T)	15.4	14.6	20	14.7	21.2	17.0	16.212	17.779	
Upper caudal ray length (U)	3.2	3.6	13	3.0	3.5	3.2	3.130	3.312	
Lower caudal ray length (V)	3.3	3.3	17	3.0	3.5	3.2	3.116	3.276	
Ratios of head length									
Head depth (G)	1.8	1.8	20	1.6	1.9	1.8	1.743	1.800	
Snout length (H)	1.7	1.7	20	1.6	1.7	1.7	1.659	1.692	
Horizontal eye diameter (I)	8.0	6.0	20	6.7	8.6	7.7	7.490	7.942	
Least interorbital width (J)	2.7	2.6	20	2.8	3.1	2.9	2.880	2.963	
Rictal barbel	7.7	9.2	20	6.3	10.2	7.6	7.152	8.122	
Right mandibular ramus	5.8	5.8	20	5.7	7.4	6.5	6.326	6.762	
Pore-opercle distance	5.6	5.3	20	5.0	6.5	5.5	5.335	5.674	
Counts									
Series of lateral scutes	30	30	20	29	31	30.1			0.447
Predorsal scutes	4	4	20	3	4	3.3			0.444
Scutes at dorsal fin base	8	8	20	8	10	8.7			0.571
Dorsal to adipose fin scutes	9	8	20	8	10	9.0			0.605
Adipose to caudal fin scutes	—	—	20	4	6	5.7			0.587
Scutes at anal fin base	2	2	20	2	3	2.8			0.444
Anal to caudal fin scutes	16	15	20	14	17	15.3			0.639
Teeth on left premaxilla	41	27	20	25	55	36.8			7.587
Teeth on right premaxilla	47	22	20	24	53	36.5			7.388
Teeth on left dentary	35	28	20	25	56	39.7			8.298
Teeth on right dentary	34	24	20	26	54	39.5			8.029
Plates bordering supraoccipital	4	4	18	3	5	3.6			0.777

Diagnosis: *Hypostomus aspilogaster* is distinguished from all other *Hypostomus* species in Southern Brazil by the larger number of lateral scutes: 29-31 versus 25-27 in all other species except *H. commersonii* and *H. regani*. From *H. commersonii* it is distinguished by the number of scutes bordering the posterior margin of the supraoccipital

bone: 3-5 in *H. aspilogaster* and 1-2 in *H. commersonii*. *H. commersonii* also has a longer lower caudal fin spine (2.5-2.9 in SL; 3.0-3.5 in *H. aspilogaster*), and the lateral scutes are much rougher than those of *H. aspilogaster*. *Hypostomus regani* occasionally has 29 lateral scutes, but it is distinguished from *H. aspilogaster* by its larger eye, longer dorsal fin spine, longer adipose fin spine, larger number of teeth, possession of 1-2 plates bordering the supraoccipital bone (see tabs. 1 and 4), and inverse colour pattern, that is, light dots on darker ground.

Description: standard length of examined specimens 120.9 to 266.2 mm; other meristic and morphometric data summarized in table 1.

Head completely covered with dermal ossifications dorsally except for a comparatively large, roughly ovate naked area on snout tip. Dorsal margin of orbit slightly elevated, hardly continuing in an inconspicuous ridge on posttemporal plate and following scutes. Usually three, sometimes 4 or 5 scutes bordering posterior margin of supraoccipital bone. Body moderately low; dorsal profile gently descending from origin of dorsal fin to end of caudal peduncle. Caudal peduncle wide, roughly ovate in cross-section; widely flattened ventrally. Dorsal scutes between end of dorsal fin base and adipose fin flattened in their dorsal portion; those closer to dorsal fin usually not meeting in midline and with a central area lacking odontodes.

Outer face of upper lip covered with small scutelets; maxillary barbel comparatively short. Teeth very thin but not very numerous, with very small outer cusp.

Body completely covered with rows of smooth scutes dorsally, even in larger specimens. Abdomen and ventral surface of head ranging from completely naked in smaller specimens to completely covered with small scutelets in larger individuals.

Adipose fin spine short and curved. Caudal fin margin concave.

Colour in alcohol: ground colour of dorsal surface light- or yellowish-brown to dark grey-brown; lighter ventrally. Black or dark-brown small, roundish dots scattered all over dorsal surface, fins, and abdomen; smaller and closer together on head. This pattern usually inconspicuous on caudal fin.

Colour in life: living specimens of *H. aspilogaster* just alike alcohol preserved specimens.

***Hypostomus commersonii* Valenciennes**

(Fig. 1, 6-8; tab. 2)

Hypostomus Commersonii Valenciennes, in Cuvier & Valenciennes, 1840: 495-497 (type-locality: Río de La Plata, Uruguay and rio São Francisco, Brazil; restricted to Río de La Plata, Montevideo, Uruguay, by WEBER, 1896).

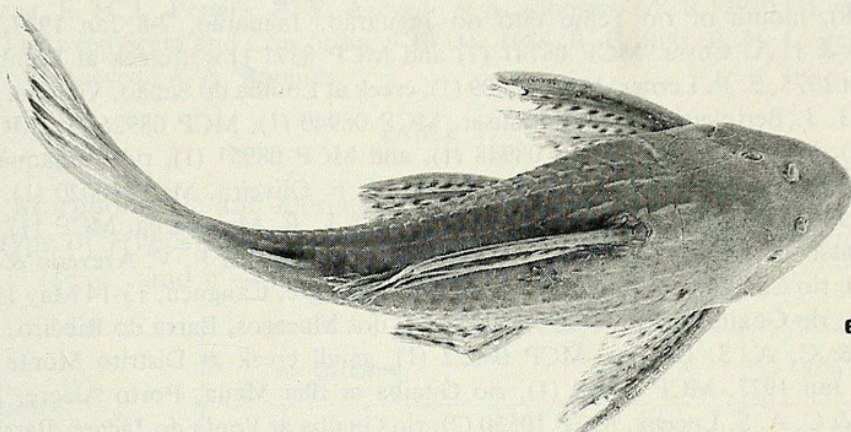
Plecostomus spiniger Hensel, 1870: 73-75 (type-locality: rio Cadeia, Rio Grande do Sul, Brazil).

Plecostomus limosus Eigenmann & Eigenmann, 1888: 167 (type-locality: Rio Grande do Sul; restricted to laguna dos Patos system by MALABARBA, 1989).

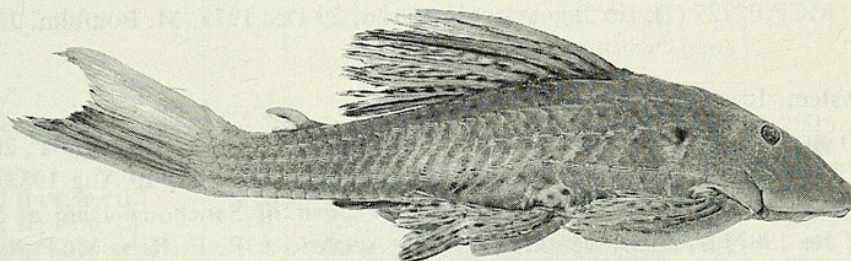
Specimens examined:

Type-specimens:

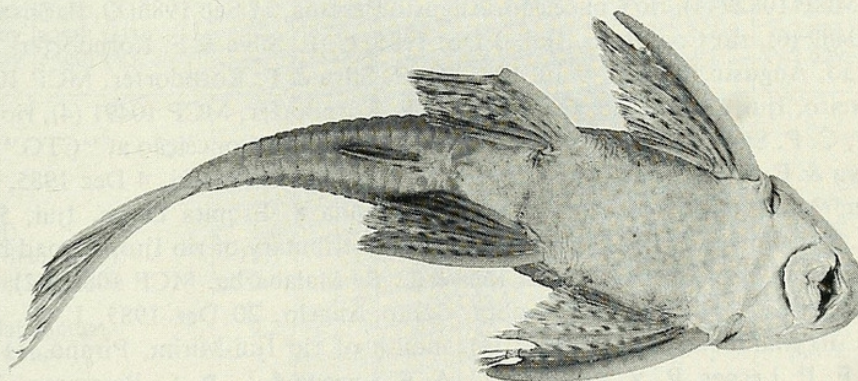
Lectotype of *H. commersonii*: MNHN 99.24.5.7 (423 mm SL — dry specimen), Río de La Plata, Montevideo, Uruguay, A. d'Orbigny. Paralectotypes MNHN 99.24.5.1 (386 mm SL — dry specimen), same data as lectotype; MNHN 99.24.5.4-3 (208.7 and 356.3 mm SL — dry specimens), rio São Francisco, Brazil, 1822, A. Saint-Hilaire.



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FIGS 6-8.

Hypostomus commersonii, MCP 11718 (174.0 mm SL); 6) dorsal, 7) lateral, and 8) ventral view.

Holotype of *P. spiniger*: ZMB 7444 (320 mm SL), rio Cadeia, Rio Grande do Sul, Brazil, R. Hensel. (Photograph and measurements kindly made by Dr. H.-J. Paepke, ZMB).

Lectotype of *P. limosus* (by present designation): MCZ 7869 (159.5 mm SL), Rio Grande do Sul, Apr 1865, Dom Pedro II. Paralectotypes MCZ 7869 (162.8 mm SL) and BMNH 1904.1.28: 1 (166.5 mm SL), same data as lectotype.

Other specimens:

Laguna dos Patos system, Brazil, Rio Grande do Sul:

MCP 11237 (8), mouth of rio Telho into rio Jaguarão, Jaguarão, 7-8 Jan 1987, R. E. Reis, P. V. Azevedo & I. A. Costa. MCP 08741 (1) and MCP 8371 (1×), creek at Lomba do Sabão, Viamão, 22 Oct 1975, E. P. Lerner. MCP 09009 (1), creek at Lomba do Sabão, Viamão, 25 Aug 1982, E. P. Lerner, J. J. Bertolotti & R. Wildhouser. MCP 08940 (1), MCP 08926 (1), MCP 08927 (1), MCP 08925 (1), MCP 08947 (1), MCP 08948 (1), and MCP 08951 (1), rio Camaquã at "eixo da barragem", Camaquã, Oct 1974, J. J. Bertolotti & M. F. Oliveira. MCP 10020 (1), rio Taquari-Mirim, Venâncio Aires, 18 Nov 1983, C. A. S. Lucena & L. R. Malabarba. MCP 11270 (8), arroio Jaguarão at Passo do Centurião, Erval, 8-9 Jan 1987, R. E. Reis, P. V. Azevedo & I. A. Costa. MCP 10939 (1), rio Camaquã at Passo da Guarda, Alto Alegre, Canguçu, 13-14 May 1982, U. Kehl. MCP 06874 (1), rio Guaíba at Ponta do Jacaré, Saco dos Macacos, Barra do Ribeiro, 27 Dec 1984, E. P. Lerner & C. A. S. Lucena. MCP 08522 (1), small creek at Distrito Monte Belo, Bento Gonçalves, 22 Jan 1977. MCP 10454 (1), rio Guaíba at ilha Mauá, Porto Alegre, 29 Jan 1985, J. J. Bertolotti & C. A. S. Lucena. MCP 10530 (2), rio Guaíba at Ponta do Jacaré, Barra do Ribeiro, 27 Sep 1985, R. E. Reis, J. J. Bertolotti & R. Foschiera. MCP 06887 (1), rio Guaíba at Ponta Grossa, Porto Alegre, 27 Sep 1985, R. E. Reis, J. J. Bertolotti & R. Foschiera. MCP 08711 (1), MCP 08718 (1), MCP 08719 (1), rio Centurião, Jaguarão, 29 Dec 1975, J. J. Bertolotti, M. Bombim & E. P. Lerner. MCP 08727 (1), rio Jaguarão, Jaguarão, 29 Dec 1975, M. Bombim, J. J. Bertolotti & E. P. Lerner.

Rio Uruguay system, Brazil, Rio Grande do Sul:

MCP 12217 (1) and MCP 12218 (1), rio Pelotas at Pinhal da Serra, Esmeralda, 20 Aug 1988, Mr. Pedro. MCP 12219 (1), rio Pelotas at Pinhal da Serra, Esmeralda, 20 Aug 1988, Mr. Pedro. MCP 11091 (1), MCP 11089 (1), and MCP 11090 (1), exit of Sanchouri Dam at São Marcos, Uruguaiana, 22 Jul 1987, L. A. C. Bergmann, P. V. Azevedo & R. E. Reis. MCP 9045 (1), creek at road (BR-153) between Bagé and Aceguá, about 33 km South of Bagé, 25 Oct 1982, C. A. S. Lucena & L. R. Malabarba. MCP 12332 (2), rio Pelotas at Pinhal da Serra, Esmeralda, 5-9 Oct 1988, Mr. Pedro. MCP 12637 (1), rio Uruguay at "Rancho da Amizade", São Borja, 31 Oct-1 Nov 1988 C. A. S. Lucena, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 10829 (4), rio Conceição, Augusto Pestana, 12 Sep 1986, C. P. Silva & F. Korndorfer. MCP 10489 (6), rio Conceição, Ijuí, 3 Dec 1985, C. P. Silva & F. Korndorfer. MCP 06630 (5), rio Conceição, Augusto Pestana, 9 Jul 1986, C. P. Silva & F. Korndorfer. MCP 10490 (1), rio Conceição, Barreiro, Ijuí, 3 Dec 1985, C. P. Silva & F. Korndorfer. MCP 10491 (4), rio Conceição, Ijuí, 2 Dec 1985, C. P. Silva & F. Korndorfer. MCP 10485 (2), rio Conceição at "CTG", Ijuí, 4 Dec 1985, C. P. Silva & F. Korndorfer. MCP 10487 (1), rio Conceição, Ijuí, 4 Dec 1985, C. P. Silva & F. Korndorfer. MCP 10496 (1), rio Conceição at Linha 8, Esquita Dutra, Ijuí, 5 Dec 1985, C. P. Silva & F. Korndorfer. MCP 10221 (1), small creek tributary of rio Ijuí, at road between São Luiz Gonzaga and Ijuí, 19 Nov 1984, R. E. Reis & L. R. Malabarba. MCP 10891 (2), rio Piratini at "Fazenda dos Hinz", Distrito de Coimbra, Santo Angelo, 20 Dez 1985, L. R. Malabarba, R. E. Reis & S. B. Mallmann. MCP 11752 (1), mouth of rio Ijuí-Mirim, Pirapó, 11 Nov 1987, J. J. Bertolotti, E. P. Lerner, P. V. Azevedo, C. A. S. Lucena & L. A. C. Bergmann. MCP 05890 (12), sanga das Aguas Frias (about 100 m from rio Uruguay), Irai, 22 Dec 1985, L. R. Malabarba & R. E. Reis. MCP 09500 (1), rio Toropi, Mata, 13 Sep 1983, L. R. Malabarba, R. E. Reis & C. A. S. Lucena. MCP 09253 (1), rio Miracatu, Manoel Viana, 14-15 Sep 1983, R. E. Reis, C. A. S. Lucena & L. R. Malabarba. MCP 11718 (4), MCP 12215 (5), and MCP 12216 (5), rio Potiribu at Parque Assis Brasil, Ijuí, 11 Aug 1987, F. Korndorfer & Winckler. MCP 11862 (2) and MCP 11875 (5), rio Potiribu at Parque Assis Brasil, Ijuí, 17 Dec 1987, F. Korndorfer & Winckler.

Santa Catarina:

MCP 12334 (2), rio Canoas at road between Abdom Batista and Anita Garibaldi, Campos Novos, 8-9 Sep 1988, L. A. C. Bergmann, E. H. L. Pereira, P. V. Azevedo & A. Ramires. MCP 12356 (2), rio Canoas between Vargem and São José do Cerrito, Campos Novos, 10 Sep 1988, L. A. C.

Bergmann, E. H. L. Pereira, P. V. Azevedo & A. Ramires. MCP 12727 (2), rio Canoas at Passo do Canoas, road (SC-458) between Tupitinga and Celso Ramos, Campos Novos, 10 Nov 1988, C. A. S. Lucena, E. H. L. Pereira, P. V. Azevedo & A. Ramires. MCP 12920 (1), rio Jacutinga at road (BR-283) between Seara and Concórdia, 9-10 Dec 1988, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires.

TABLE 2.

Morphometric and meristic data of *Hypostomus commersonii*.

a - lectotype of *Hypostomus commersonii*, b - lectotype of *Plecostomus limosus*, and c — holotype of *Plecostomus spiniger*.

Character	Type-specimens				Range			95% confidence limits		
	a	b	c	n	low	high	mean	L1	L2	SD
Standard length (A) (mm)	423.0	159.5	320.0	23	111.1	301.3	202.4			38.487
					Ratios of standard length					
Predorsal distance (D)	2.7	2.5	3.1	23	2.2	2.8	2.6	2.516	2.621	
Head length (E)	3.5	3.3	3.8	23	2.6	3.5	3.2	3.146	3.306	
Cleithral width (F)	3.9	3.6	4.6	23	3.0	4.0	3.6	3.540	3.731	
Length of dorsal fin spine (K)	—	3.1	—	18	2.6	3.4	3.1	2.948	3.185	
Length of dorsal fin base (L)	4.0	3.5	—	23	3.3	3.9	3.7	3.562	3.741	
Dorsal base to adipose spine (M)	4.4	5.5	—	23	4.8	6.2	5.4	5.198	5.558	
Trunk length (N)	4.6	4.1	—	23	3.6	4.3	3.9	3.844	4.018	
Pectoral fin spine length (O)	4.0	3.4	—	21	3.1	3.6	3.4	3.306	3.442	
Abdominal length (P)	4.6	4.9	—	23	4.7	5.7	5.2	5.092	5.294	
Pelvic fin spine length (Q)	—	4.1	—	23	3.5	4.6	4.1	3.992	4.218	
Caudal peduncle length (R)	3.0	3.3	—	23	3.0	3.5	3.2	3.173	3.305	
Caudal peduncle depth (S)	12.1	10.8	—	23	9.7	12.6	11.2	10.852	11.516	
Adipose fin spine length (T)	13.2	16.3	—	23	13.0	19.4	15.8	14.963	16.578	
Upper caudal ray length (U)	—	—	—	14	2.7	3.2	2.9	2.826	2.993	
Lower caudal ray length (V)	—	—	—	16	2.5	2.9	2.7	2.639	2.791	
					Ratios of head length					
Head depth (G)	1.7	1.6	1.8	23	1.5	1.7	1.6	1.596	1.646	
Snout length (H)	1.6	1.7	1.4	23	1.7	1.8	1.7	1.702	1.726	
Horizontal eye diameter (I)	11.3	7.1	9.2	23	6.7	9.5	8.3	7.995	8.588	
Least interorbital width (J)	2.6	2.6	2.8	23	2.4	2.8	2.6	2.540	2.658	
Rictal barbel	—	6.8	—	23	5.6	11.1	7.3	6.653	7.994	
Right mandibular ramus	9.2	7.7	6.4	22	7.3	9.7	8.5	8.197	8.811	
Pore-opercle distance	—	5.2	—	23	4.6	6.1	5.0	4.892	5.196	
					Counts					
Series of lateral scutes	29	28	—	23	28	30	28.5			0.593
Predorsal scutes	3	3	3	23	3	3	3.0			0.000
Scutes at dorsal fin base	8	9	—	23	8	10	9.0			0.367
Dorsal to adipose fin scutes	8	7	—	23	7	8	7.6			0.499
Adipose to caudal fin scutes	6	5	6	23	3	6	4.9			0.668
Scutes at anal fin base	2	3	3	23	2	3	2.6			0.499
Anal to caudal fin scutes	15	14	15	23	13	15	13.7			0.619
Teeth on left premaxilla	—	31	27	22	22	45	30.5			5.788
Teeth on right premaxilla	—	29	28	22	22	48	32.0			6.525
Teeth on left dentary	—	29	32	22	20	55	31.5			7.475
Teeth on right dentary	—	29	44	22	22	48	31.5			7.015
Plates bordering supraoccipital	1	1	1	23	1	2	1.2			0.388

Uruguay:

MCP 09856 (1), MCP 09857 (1), MCP 09858 (1), MCP 09859 (1), MCP 09860 (1), MCP 09861 (1), MCP 09862 (1), MCP 09863 (1), MCP 09864 (1), MCP 09865 (1), MCP 09866 (1), MCP 09867 (1), MCP 09868 (1), MCP 09869 (1) and MCP 09870 (1), Río Negro, Arreria Farm, Depto. Cerro Largo, 19-21 May 1984, C. A. S. Lucena & others.

Diagnosis: *Hypostomus commersonii* is distinguished from other *Hypostomus* species inhabiting Southern Brazil by the presence of four very rough lateral ridges on flanks. *H. commersonii* has 28-30 lateral scutes (25-27 in remaining species except *H. aspilogaster* and *H. regani*). From *H. regani*, it is easily distinguished by its smaller eye, smaller snout, smaller mandibular ramus, smaller number of teeth (see tabs 2 and 4) and by presenting the inverse colour pattern, that is, dark dots on lighter ground. From *H. aspilogaster*, it is distinguished by the longer lower caudal ray and by having 1-2 scutes bordering the posterior margin of the supraoccipital bone (3-5 in *H. aspilogaster*).

Description: standard length of examined specimens 111.1 to 423.0 mm; other meristic and morphometric data summarized in table 2.

Head completely covered with dermal ossifications dorsally, except for a small, roughly ovate naked area on snout tip, which usually disappears in larger specimens. Dorsal margin of orbit slightly elevated, continuing in a low ridge on posttemporal plate. Another low ridge on supraoccipital, diverging in two separate ridges on predorsal plates always present. Usually one, sometimes two scutes bordering posterior margin of the supraoccipital bone. Body deep; dorsal profile gently descending from origin of dorsal fin to end of caudal peduncle. Caudal peduncle roughly ovate in cross-section; slightly flattened ventrally. Dorsal scutes between end of dorsal fin base and adipose fin spine somewhat flattened in their dorsal portions; those closer to dorsal fin sometimes with a central area devoided of odontodes.

Outer face of upper lip covered with small scutelets; maxillary barbel comparatively short. Teeth small and not much numerous; with a well developed outer cusp of about half length of inner.

Body completely covered with rows of scutes with a rough keel, forming four rough ridges along flanks. These ridges sometimes very strong. Abdomen and lower surface of head usually covered with minute scutelets, even in smaller specimens.

Distal half of pectoral fin spine of larger specimens usually covered dorsally with proeminent odontodes anteriorly curved. Adipose fin spine very strong but short and curved. Caudal fin margin concave to strongly concave; medium-sized outer rays.

Colour in alcohol: ground colour of dorsal surface light- to dark-brown; slightly lighter to whitish ventrally. All body and fins covered with very small, roundish, black or dark-brown dots; smaller and closer together on head. This pattern sometimes inconspicuous on caudal fin and ventral portion of caudal peduncle.

Colour in life: living specimens of *H. commersonii* usually darker than alcohol preserved specimens.

Remarks: *H. commersonii* is by far the largest species in Southern Brazil, attaining more than half a meter. *H. commersonii* was the only species found inhabiting lentic, open environments such as large lagoons and freshwater swamps.

***Hypostomus luteus* (Godoy)**
(fig. 2, 9-14; tab. 3)

Plecostomus luteus Godoy, 1980: 29-32, figs 15, 16 (type-locality: rio Pelotas at Volta Grande Dois, Marcelino Ramos, Rio Grande do Sul, Brazil).

Specimens examined:

Type specimen:

Holotype: unregistered, formalin preserved specimen in the personal collection of Manoel Pereira de Godoy, Pirassununga, São Paulo (221.8 mm SL), rio Pelotas at Volta Grande Dois, Marcelino Ramos, Rio Grande do Sul, Brazil, 15 Apr 1980, M. P. Godoy.

Other specimens:

Brazil, Rio Grande do Sul:

MCP 12813 (3) and MHNG 2430.72 (1), rio Pelotas at road between Anita Garibaldi and Esmeralda, 5-9 Sep 1988, Mr. Pedro. MCP 12807 (1), rio Pelotas at road between Anita Garibaldi and Esmeralda, 19-20 Feb 1989, R. E. Reis, P. V. Azevedo, E. H. L. Pereira & L. A. C. Bergmann. MCP 12812 (3), rio Pelotas at road between Anita Garibaldi and Esmeralda, 11-12 Dec 1988, R. E. Reis, P. V. Azevedo, E. H. L. Pereira, L. A. C. Bergmann & A. Ramires.

Santa Catarina:

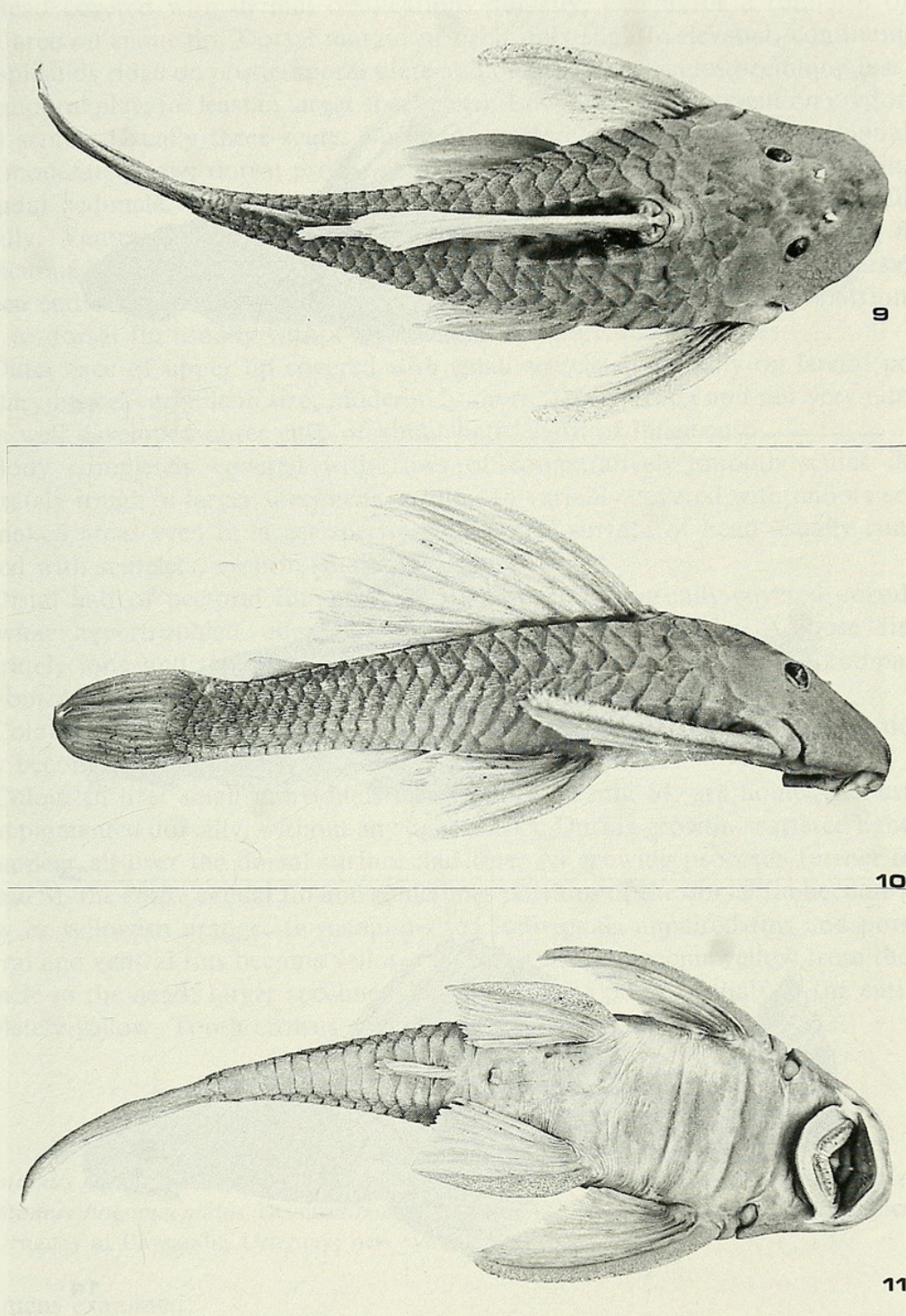
MCP 12815 (1), rio Canoas at road between Anita Garibaldi and Abdom Batista, Campos Novos, 8-9 Feb 1988, R. E. Reis, P. V. Azevedo, E. H. L. Pereira & L. A. C. Bergmann. MCP 12816 (1), rio Canoas at road between Vargem and São Jose do Cerrito, Campos Novos, 16 Jul 1988, R. E. Reis, P. V. Azevedo, E. H. L. Pereira & L. A. C. Bergmann. MCP 12814 (1), rio Canoas at road between Vargem and São José do Cerrito, Campos Novos, 10 Sep 1988, R. E. Reis, P. V. Azevedo, E. H. L. Pereira & L. A. C. Bergmann. MCP 12493 (1), rio Jacutinga at road BR-283 between Seara and Concórdia, Concórdia, 2 Oct 1988, A. Ramires, P. V. Azevedo, E. H. L. Pereira & L. A. C. Bergmann. MCP 12806 (2), rio Uruguay at mouth of rivers Pelotas and Canoas, Barracão, 18-19 Feb 1989, R. E. Reis, P. V. Azevedo, E. H. L. Pereira, L. A. C. Bergmann & A. Ramires. MCP 12744 (1), rio Canoas at road between Anita Garibaldi and Abdom Batista, Campos Novos, 11-12 Nov 1988, C. A. S. Lucena, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12735 (2), rio Canoas at Passo do Canoas, road SC-458 between Tupitinga and Celso Ramos, Campos novos, 10 Nov 1988, C. A. S. Lucena, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12749 (1), rio Canoas at road between Vargem and São José do Cerrito, Campos Novos, 12-13 Nov 1988, C. A. S. Lucena, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12810 (1), rio Canoas at road between Anita Garibaldi and Abdom Batista, Campos Novos, 22-23 Jan 1989, C. A. S. Lucena, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12808 (1), rio Canoas at road between Anita Garibaldi and Abdom Batista, Campos Novos, 22-23 Jan 1989, C. A. S. Lucena, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12809 (1), rio Canoas at Passo do Canoas, road SC-458 between Tupitinga and Celso Ramos, Campos novos, 21-22 Jan 1989, C. A. S. Lucena, L. A. C. Bergmann, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12492 (1), rio Uruguay at Itá, 1 Oct 1988, P. V. Azevedo, E. H. L. Pereira, L. A. C. Bergmann & A. Ramires.

Diagnosis: large *Hypostomus luteus* specimens are distinguished from all other *Hypostomus* species by the impressive bright yellowish-orange colour (pale yellowish in alcohol-preserved specimens). Smaller specimens usually have at least the entire caudal fin and usually also the dorsal fin yellow, and small yellow dots scattered on the dorsal surface. Besides *H. luteus*, the following two South Brazilian species have light dots on darker ground: *H. roseopunctatus* and *H. regani*. The three species are characterized by the number of jaw teeth 6-16 in *H. roseopunctatus*, 22-40 in *H. luteus*, and 57-111 in *H. regani*.

TABLE 3.

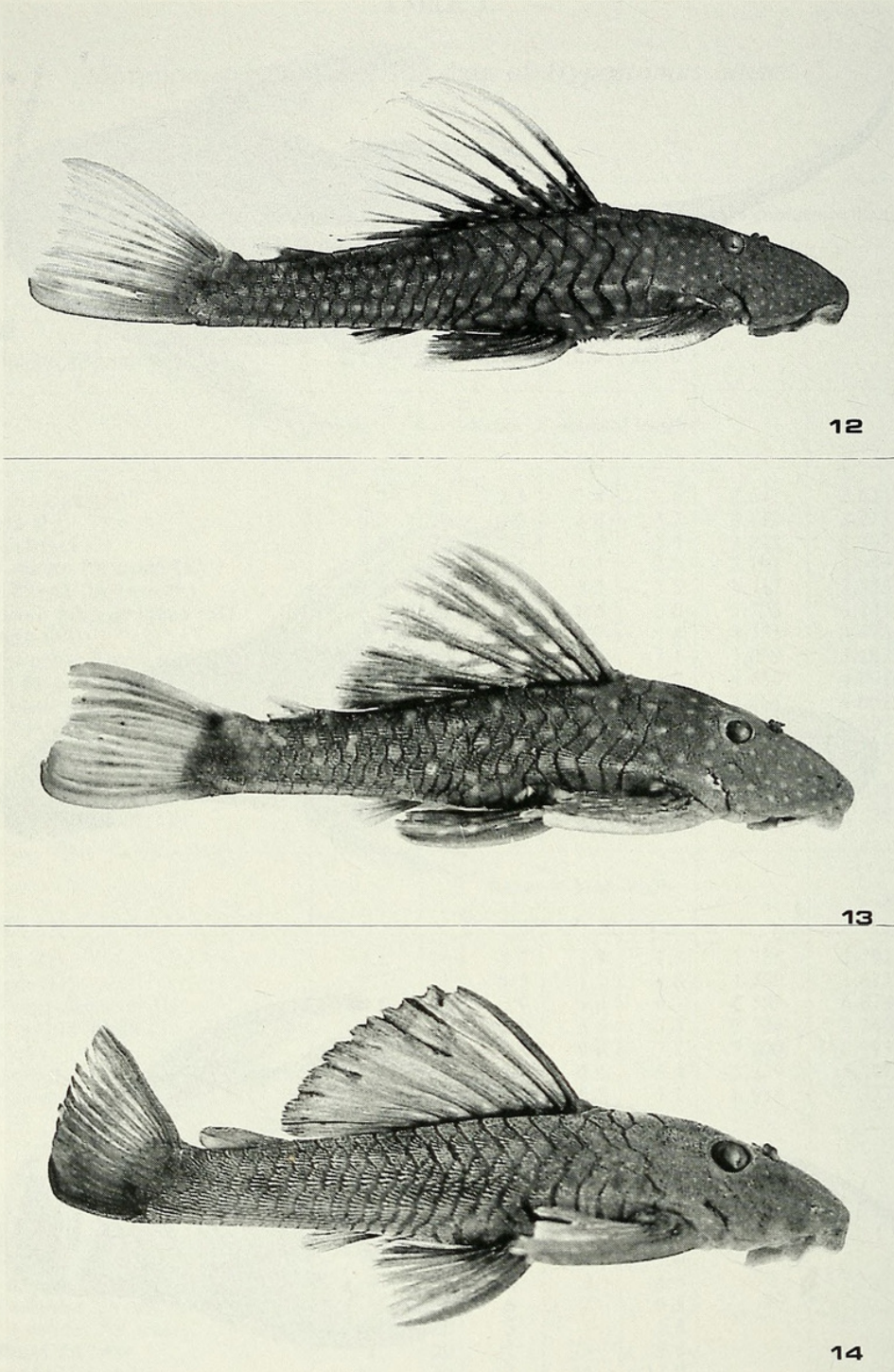
Morphometric and meristic data of *Hypostomus luteus*.

Character	holotype	n	Range			95% confidence limits		SD
			low	high	mean	L1	L2	
Standard length (A) (mm)	221.8	20	134.7	312.5	227.0			39.665
			Ratios of standard length					
Predorsal distance (D)	2.7	20	2.5	2.8	2.6	2.547	2.624	
Head length (E)	3.2	20	3.0	3.4	3.2	3.112	3.213	
Cleithral width (F)	3.6	20	3.1	3.5	3.3	3.222	3.302	
Length of dorsal fin spine (K)	3.1	20	2.5	3.1	2.9	2.791	2.959	
Length of dorsal fin base (L)	3.6	20	3.1	3.7	3.5	3.417	3.555	
Dorsal base to adipose spine (M)	6.0	20	5.4	6.5	6.0	5.795	6.145	
Trunk length (N)	4.4	20	4.2	4.7	4.4	4.355	4.473	
Pectoral fin spine length (O)	3.1	20	2.8	3.3	3.1	3.059	3.182	
Abdominal length (P)	4.7	20	4.4	5.0	4.7	4.654	4.801	
Pelvic fin spine length (Q)	3.9	20	3.7	4.4	4.0	3.884	4.051	
Caudal peduncle length (R)	3.1	20	3.1	3.5	3.3	3.203	3.297	
Caudal peduncle depth (S)	9.5	20	9.0	10.2	9.7	9.544	9.785	
Adipose fin spine length (T)	14.2	20	11.0	13.7	12.4	12.105	12.787	
Upper caudal ray length (U)	3.6	18	3.2	4.0	3.6	3.435	3.672	
Lower caudal ray length (V)	3.3	17	3.1	3.8	3.4	3.291	3.525	
			Ratios of head length					
Head depth (G)	1.8	20	1.7	1.9	1.8	1.735	1.792	
Snout length (H)	1.7	20	1.5	1.7	1.6	1.580	1.617	
Horizontal eye diameter (I)	6.5	20	5.9	7.4	6.7	6.505	6.879	
Least interorbital width (J)	3.2	20	2.9	3.6	3.3	3.194	3.340	
Rictal barbel	—	20	5.9	9.4	7.7	7.200	8.173	
Right mandibular ramus	4.9	19	4.8	6.1	5.4	5.239	5.487	
Pore-opercle distance	—	20	6.5	8.3	7.1	6.918	7.332	
			Counts					
Series of lateral scutes	26	20	25	27	26.0			0.394
Predorsal scutes	3	20	3	3	3.0			0.000
Scutes at dorsal fin base	9	20	8	9	8.5			0.513
Dorsal to adipose fin scutes	6	20	6	7	6.5			0.513
Adipose to caudal fin scutes	4	20	3	5	3.8			0.550
Scutes at anal fin base	2	20	2	3	2.6			0.510
Anal to caudal fin scutes	12	20	12	14	13.0			0.510
Teeth on left premaxilla	25	20	25	36	30.3			3.242
Teeth on right premaxilla	27	19	22	38	29.7			4.148
Teeth on left dentary	26	20	27	39	32.9			3.731
Teeth on right dentary	26	19	27	40	33.7			3.784
Plates bordering supraoccipital	5	20	2	6	3.5			1.192



FIGS 9-11.

Hypostomus luteus, MCP 12807 (279.0 mm SL); 9) dorsal, 10) lateral, and 11) ventral views.



FIGS 12-14.

Hypostomus luteus, progressive development of the yellow color: 12) MCP 12816 (226.0 mm SL), 13) MCP 12493 (134.7 mm SL), and 14) MCP 12492 (77.2 mm SL).

Description: standard length of examined specimens 134.7 to 312.5 mm; other meristic and morphometric data summarized in table 3.

Head covered with dermal ossifications dorsally, except for a roundish of ovate naked area on snout tip. Dorsal margin of orbit only slightly elevated, continuing in an inconspicuous ridge on posttemporal plate and on a series of scutes beginning just behind posttemporal plate (at least in larger specimens). Low ridges also present on predorsal and dorsal scutes. Usually three scutes bordering posterior margin of supraoccipital bone. Body moderately low; dorsal profile gently descending from origin of dorsal fin to end of caudal peduncle. Caudal peduncle roughly ovate in cross-section; slightly flattened ventrally. Ventral scutes of caudal peduncle somewhat expanded laterally, forming conspicuous lateral ridges in its lower margins, at least in larger specimens. Dorsal scutes between end of dorsal fin base and adipose fin spine flat in their dorsal portion; those closer to dorsal fin usually with a central area devoided of odontodes.

Outer face of upper lip covered with small scutelets, specially on lateral portions; maxillary barbel variable in size, moderately short. Teeth strong and not very numerous, with a well developed outer cusp of about half length of inner cusp.

Body completely covered with rows of comparatively smooth scutes dorsally; moderately rough in larger specimens. Abdomen variably covered with minute scutelets; with naked areas even in larger specimens. Ventral surface of head usually completely covered with scutelets, even in smaller specimens.

Distal half of pectoral fin spine of larger specimens usually covered dorsally with somewhat hypertrophied odontodes, slightly curved anteriorly. Adipose fin spine moderately long and straight. Caudal fin margin slightly concave, with comparatively short outer rays.

Colour in alcohol: except for the teeth, all yellow or yellowish orange areas described below become faint yellowish in alcohol preserved specimens.

Colour in life: small individuals up to about 80 mm SL are homogeneously grey-brown pigmented dorsally, without any light marks. During growth, scattered light-yellow dots appear all over the dorsal surface and fins. As growing proceeds further to about 130 mm SL the entire caudal fin and sometimes portions of the dorsal fin become strongly yellow or yellowish orange. In medium-sized individuals unpaired fins and portions of pectoral and ventral fins become yellow. The body scutes become yellow from the caudal peduncle to the head; larger specimens have either the posterior half or the entire body completely yellow. Tooth crowns strongly colored with orange.

***Hypostomus regani* (Ihering)**

(figs 2, 15-17; tab. 4)

Plecostomus regani Ihering, 1905: 558-559 (type-locality: rio Piracicaba, São Paulo, Brazil).

Plecostomus luteomaculatus Devincenzi & Teague, 1942: 20-22, pl. 3, figs 2-3 (type-locality: rio Uruguay at Paysandu, Uruguay; new synonymy).

Specimens examined:

Type-specimens:

Lectotype of *P. regani* (by present designation): BMNH 1905.6.7: 3 (170.8 mm SL); rio Piracicaba, São Paulo, Brazil.

Paralectotypes of *P. regani*: BMNH 1905.6.7: 2 (ca. 233 mm SL), same data as holotype.

Holotype of *P. luteomaculatus*: MHNM CI359 (249.7 mm SL), Rio Uruguay at Paysandu, Uruguay, 1941, G. W. Teague.

Other specimens:

Brazil, Rio Grande do Sul:

MCP 12658 (1), rio Uruguay at Porto de Santo Izidro, São Nicolau, 4-5 Nov 1988, C. A. S. Lucena, L. A. C. Bergmann, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12804 (3), rio Uruguay at Porto de Santo Izidro, São Nicolau, 3-4 Jan 1989, R. E. Reis, L. A. C. Bergmann, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 12805 (1), mouth of rio Ijuí, Roque Gonzales, 5-6 Jan 1989, R. E. Reis, L. A. C. Bergmann, P. V. Azevedo, E. H. L. Pereira & A. Ramires. MCP 11781 (1), rio Uruguay at "Rancho da Amizade", São Borja, 10 Nov 1987, J. J. Bertoletti, C. A. S. Lucena, E. P. Lerner, P. V. Azevedo & L. A. C. Bergmann. MCP 11734 (1), rio Uruguay at "Rancho da Amizade", São Borja, 10 Nov 1987, J. J. Bertoletti, C. A. S. Lucena, E. P. Lerner, P. V. Azevedo & L. A. C. Bergmann. MCP 10222 (1), mouth of rio Ibicuí, Itaqui, 19 Nov 1984, L. R. Malabarba & R. E. Reis. MCP 11860 (3), rio Potiribú, Pejuçara, 16 Dec 1987, Winckler & F. Korndorfer. MCP 11839 (1), rio Uruguay at "Rancho da Amizade", São Borja, 13 Dec 1987, R. E. Reis, L. A. C. Bergmann, P. V. Azevedo, E. H. L. Pereira & E. P. Lerner. MCP 11858 (2), rio Uruguay at "Rancho da Amizade", São Borja, 12 Dec 1987, R. E. Reis, L. A. C. Bergmann, P. V. Azevedo, E. H. L. Pereira & E. P. Lerner. MCP 10470 (2), rio Conceição, Ijuí, 3 Dec 1985, C. P. Silva & F. Korndorfer. MCP 11772 (1), rio Comandai, Porto Lucena, 12 Nov 1987, J. J. Bertoletti, C. A. S. Lucena, E. P. Lerner, P. V. Azevedo & L. A. C. Bergmann. MCP 11769 (1), rio Uruguay at Vera Cruz, Porto Lucena, 12 Nov 1987, J. J. Bertoletti, C. A. S. Lucena, E. P. Lerner, P. V. Azevedo & L. A. C. Bergmann. MCP 05756 (1), rio Uruguay, about 2 km upstream of bridge at Irai, 22-23 Dec 1985, R. E. Reis, L. R. Malabarba & S. B. Mallmann. MCP 12416 (2), rio Piratini near the ferry, São Nicolau, 10 Apr 1988, E. P. Lerner, L. A. C. Bergmann, E. H. L. Pereira, P. V. Azevedo & R. Rossi. MCP 12417 (1), rio Piratini near the ferry, São Nicolau, 10 Apr 1988, E. P. Lerner, L. A. C. Bergmann, E. H. L. Pereira, P. V. Azevedo & R. Rossi. MCP 11795 (1), mouth of rio Ijuí-Mirim, Pirapó, 11 Nov 1987, J. J. Bertoletti, C. A. S. Lucena, E. P. Lerner, P. V. Azevedo & L. A. C. Bergmann. MCP 11726 (1), mouth of rio Ijuí-Mirim, Pirapó, 11 Nov 1987, J. J. Bertoletti, C. A. S. Lucena, E. P. Lerner, P. V. Azevedo & L. A. C. Bergmann. MCP 09257 (1), rio Santa Maria at road between Cacequi and São Simão, Cacequi, 13 Nov 1983, C. A. S. Lucena, L. R. Malabarba & R. E. Reis.

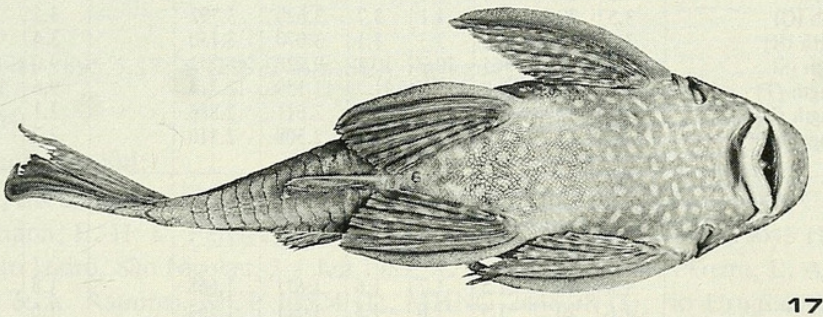
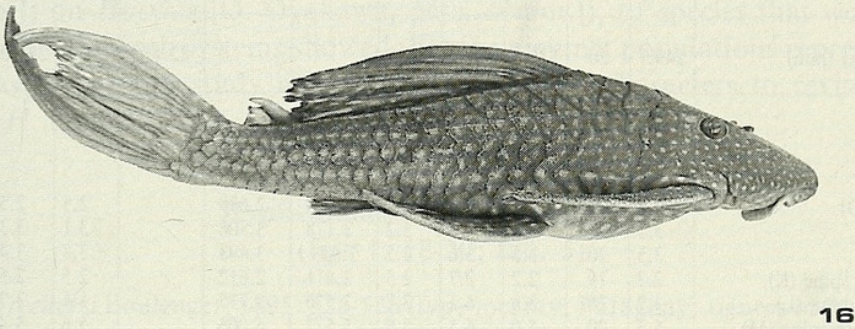
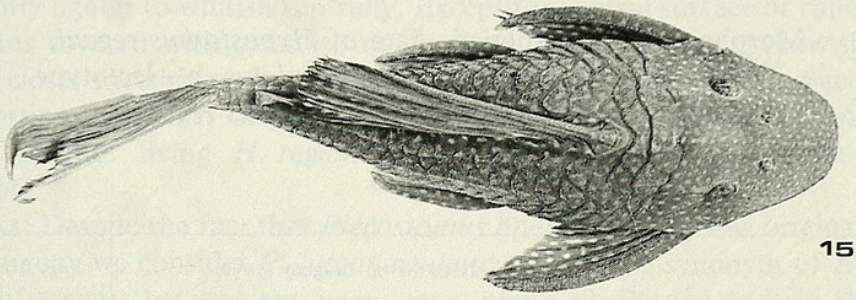
São Paulo:

MZUSP 23005 (1), rio Pardo at "Usina de Limoeiro", 13 Apr 1965, H. A. Britski. MZUSP 22636 (5, 2 measured), rio Paraná at Jupiá, 11 Dec 1960, P. E. Vanzolini & pty.

Diagnosis: *Hypostomus regani* is distinguished from other *Hypostomus* species inhabiting the rio Uruguay system by its characteristic violet-brown ground colour with light dots all over the dorsal surface. Two other species in that area share the light dots on darker ground: *H. roseopunctatus* and *H. luteus*, from which it differs in the larger number of teeth (57-111).

Description: standard length of examined specimens 136.6 to 281.2 mm; other meristic and morphometric data summarized in table 4.

Head covered with dermal ossifications dorsally, except for a small, roughly ovate naked area on snout tip. Dorsal margin of orbit very slightly elevated, hardly continuing in an inconspicuous ridge on posttemporal plate. A very low ridge on supraoccipital, diverging in two separate ridges on predorsal plates often present. Usually one, sometimes two scutes bordering posterior margin of supraoccipital bone. Body deep; dorsal profile gently descending from origin of dorsal fin to end of caudal peduncle. Caudal peduncle roughly ovate in cross-section; flattened ventrally. Dorsal scutes between end of dorsal-fin base and adipose-fin spine flattened in their dorsal portion; those closer to dorsal fin usually with a central area unprovided of odontodes.



FIGS 15-17.

Hypostomus regani, MCP 12804 (259.2 mm SL); 15) dorsal, 16) lateral, and 17) ventral views.

Outer face of upper lip covered with small scutelets on lateral portions; maxillary barbel variable in size, moderately short. Teeth very thin and numerous, with a very small outer cusp.

Body completely covered with rows of smooth scutes dorsally, even in larger specimens. Abdomen completely covered with minute scutelets, even in smaller specimens. Ventral surface of head usually completely covered with scutelets; small naked areas behind lower lip in smaller specimens.

Distal half of pectoral fin spine of larger specimens sometimes covered dorsally with prominent odontodes anteriorly curved. Adipose fin spine long and straight or slightly curved. Caudal fin margin concave to strongly concave; medium-sized outer rays.

TABLE 4.

Morphometric and meristic data of *Hypostomus regani*.
a - holotype of *Plecostomus luteomaculatus*, b - lectotype
and c - paralectotype of *Plecostomus regani*.

Character	Population from the rio Uruguay system								Pop. from upper rio Paraná				
	a	n	Range			95% confidence limits			b	c	n	Range	
			low	high	mean	L1	L2	SD				low	high
Standard length (A) (mm)	249.7	20	136.6	281.2	210.8			42.476	170.8	233.0	3	180.6	241.0
						Ratios of standard length							
Predorsal distance (D)	2.5	20	2.4	2.8	2.6	2.549	2.639		2.5	2.5	3	2.4	2.8
Head length (E)	3.3	20	3.0	3.5	3.2	3.178	3.306		3.1	3.3	3	3.1	3.7
Cleithral width (F)	3.5	20	3.3	3.6	3.5	3.419	3.493		3.3	3.4	3	3.3	3.7
Length of dorsal fin spine (K)	2.2	19	2.2	2.7	2.5	2.471	2.612		2.5	2.5	3	2.1	2.7
Length of dorsal fin base (L)	3.7	20	3.4	4.1	3.7	3.576	3.775		3.6	3.7	3	3.5	3.6
Dorsal base to adipose spine (M)	5.5	20	5.0	6.5	5.8	5.577	6.006		5.6	5.4	3	5.3	5.9
Trunk length (N)	4.6	20	4.0	4.6	4.3	4.176	4.339		4.5	4.2	3	4.1	4.4
Pectoral fin spine length (O)	3.0	20	3.0	3.7	3.3	3.172	3.353		3.2	3.0	3	3.0	3.4
Abdominal length (P)	4.8	20	4.8	5.4	5.0	4.884	5.062		5.0	4.1	3	4.7	5.2
Pelvic fin spine length (Q)	3.5	20	3.4	4.1	3.7	3.620	3.792		3.5	3.7	3	3.3	4.2
Caudal peduncle length (R)	3.1	20	3.0	3.3	3.1	3.070	3.150		3.4	3.2	3	3.1	3.2
Caudal peduncle depth (S)	9.7	20	9.5	10.7	10.1	9.928	10.242		9.0	8.9	3	9.4	10.9
Adipose fin spine length (T)	11.3	20	9.8	13.3	11.7	11.159	12.214		9.6	10.5	3	9.5	13.4
Upper caudal ray length (U)	2.9	12	2.4	3.1	2.7	2.611	2.886		3.1	—	2	2.9	3.7
Lower caudal ray length (V)	2.8	15	2.2	3.2	2.7	2.508	2.810		2.7	3.8	3	2.5	3.5
						Ratios of head length							
Head depth (G)	1.8	20	1.5	1.7	1.6	1.611	1.668		1.8	1.7	3	1.6	1.7
Snout length (H)	1.6	20	1.5	1.6	1.5	1.521	1.564		1.6	1.5	3	1.5	1.5
Horizontal eye diameter (I)	6.0	20	4.9	6.2	5.6	5.436	5.776		5.1	5.3	3	5.0	5.3
Least interorbital width (J)	2.5	20	2.3	2.7	2.5	2.474	2.577		2.7	2.5	3	2.6	2.7
Rictal barbel	10.0	20	6.0	8.7	7.1	6.659	7.483		10.1	9.4	3	5.7	6.4
Right mandibular ramus	6.0	20	5.0	6.5	5.8	5.644	6.021		5.3	5.4	3	5.0	5.7
Pore-opercle distance	—	20	5.7	7.5	6.6	6.325	6.861		—	—	2	6.4	6.7
						Counts							
Series of lateral scutes	28	20	27	28	28.0			0.224	28	29	3	28	28
Predorsal scutes	3	20	3	4	3.2			0.410	4	4	3	3	4
Scutes at dorsal fin base	8	20	8	9	8.7			0.470	8	8	3	8	9
Dorsal to adipose fin scutes	8	20	6	8	7.2			0.523	7	7	3	7	8
Adipose to caudal fin scutes	5	20	3	5	4.4			0.598	5	5	3	4	4
Scutes at anal fin base	2	20	2	3	2.5			0.513	—	—	3	2	3
Anal to caudal fin scutes	16	20	14	16	14.4			0.587	—	—	3	13	14
Teeth on left premaxilla	67	16	57	101	77.8			12.797	86	90	3	65	90
Teeth on right premaxilla	—	16	63	111	79.3			11.791	84	105	3	61	92
Teeth on left dentary	—	16	62	98	75.4			10.243	72	91	3	66	83
Teeth on right dentary	68	16	61	103	76.3			10.767	62	—	3	68	93
Plates bordering supraoccipital	1	19	1	2	1.1			0.229	1	1	3	1	2

Colour in alcohol: ground colour of dorsal surface brown, grey-brown or violet-brown; slightly lighter to whitish ventrally. Except for ventral surface of caudal peduncle, body and fins covered with roundish or elongate, light-brown to yellowish dots. Dots smaller and closer together on head; usually aligned (sometimes forming actual lines) on posterior portion of flanks. Unpaired fin membranes sometimes darker than scutes.

Colour in life: living *H. regani* specimens usually strongly violet-brown with yellowish dots.

Remarks: Despite the fact that *Plecostomus luteomaculatus* was originally described from rio Uruguay we consider *P. luteomaculatus* as a junior synonym of *H. regani*. No diagnostic differences between specimens from upper rio Paraná and rio Uruguay were found. It is rare to find conspecific populations occurring in both the upper Paraná system and the rio Uruguay basin. Many recent studies (on *Cheirodon* and *Odontostilbe* [MALABARBA, 1988]; on *Acestrorhynchus*, *Oligosarcus*, and *Cynopotamus* [N. Menezes, pers. comm.]; on *Hoplias* [O. Oyakawa, pers. comm.]), of species that were previously believed to occur in both systems showed that the disjunct populations represent different species. Maybe a future study will produce diagnostic characters to revise the present concept of *H. regani*.

***Hypostomus ternetzi* (Boulenger)**

(figs 1, 18-20; tab. 5)

Plecostomus ternetzi Boulenger, 1895: 525-526 (type-locality: Paraguay; figures in Boulenger, 1896).

Specimens examined:

Type-specimen:

Holotype: BMNH 1895.5.17: 6 (199.0 mm SL), Paraguay, C. Ternetz.

Other specimens:

Brazil, Rio Grande do Sul:

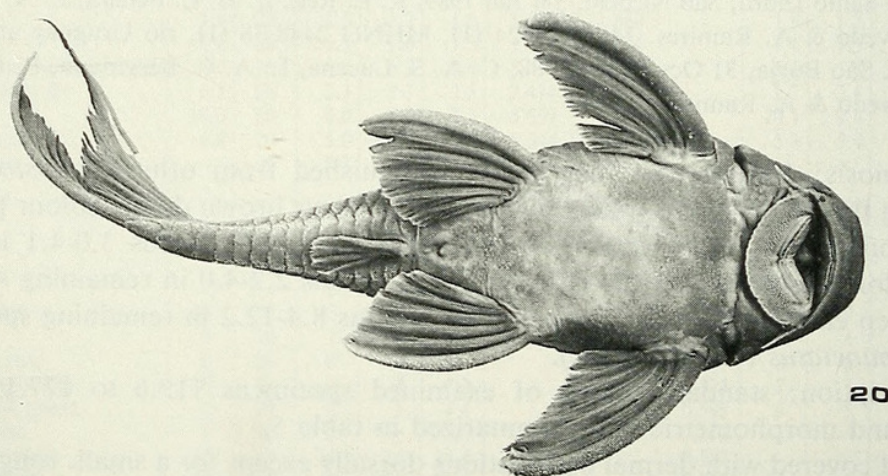
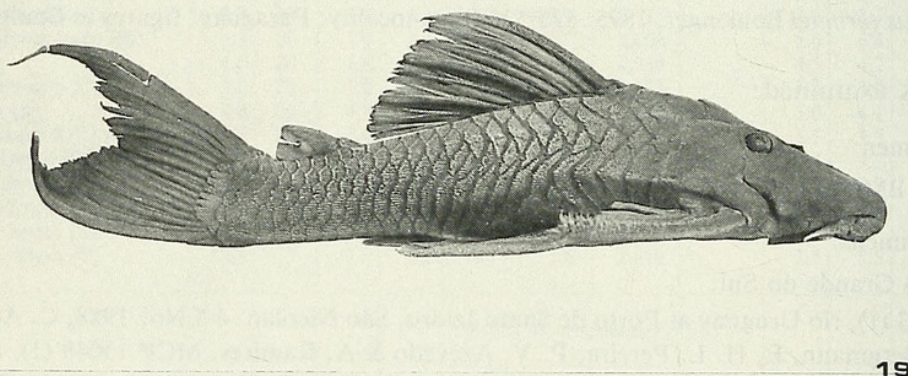
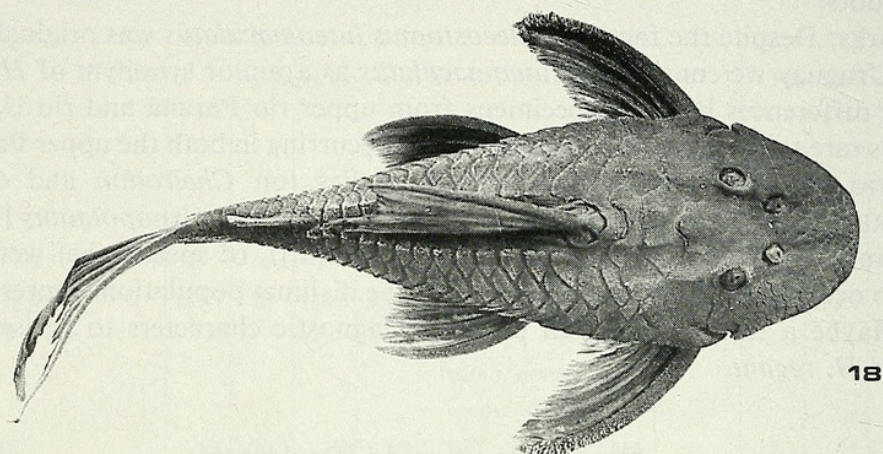
MCP 12523 (1), rio Uruguay at Porto de Santo Izidro, São Nicolau, 4-5 Nov 1988, C. A. S. Lucena, L. A. C. Bergmann, E. H. L. Pereira, P. V. Azevedo & A. Ramires. MCP 13048 (1), rio Uruguay at Porto de Santo Izidro, São Nicolau, 3-4 Jan 1989, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12524 (1), MHNG 2448.38 (1), rio Uruguay at "Rancho da Amizade", São Borja, 31 Oct-1 Nov 1988, C. A. S. Lucena, L. A. C. Bergmann, E. H. L. Pereira, P. V. Azevedo & A. Ramires.

Diagnosis: *Hypostomus ternetzi* is distinguished from other *Hypostomus* species inhabiting the rio Uruguay system by its homogeneous brown dorsal colour pattern, lack of any conspicuous dots, very wide body (2.8-2.9 in SL, versus 3.0-4.1 in remaining species), long lower caudal ray (1.8-2.0 in SL, versus 2.2-4.0 in remaining species), and by the deep caudal peduncle (7.7-8.1 in SL, versus 8.4-12.2 in remaining species) except *H. roseopunctatus* (7.8-9.0 in SL).

Description: standard length of examined specimens 119.6 to 177.1 mm; other meristic and morphometric data summarized in table 5.

Head covered with dermal ossifications dorsally except for a small, roughly squarish or ovate naked area on snout tip. Dorsal margin of orbit slightly elevated, continuing in an low ridge on posttemporal plate. Usually a single (in one specimen two) scutes bordering posterior margin of supraoccipital bone. Body comparatively more raised; dorsal profile gently descending from origin of dorsal fin to end of caudal peduncle.

Caudal peduncle strongly compressed; not much flattened ventrally. Ventral scutes of caudal peduncle somewhat expanded laterally, forming conspicuous lateral ridges in its lower margin. Dorsal scutes between end of dorsal fin base and adipose fin spine somewhat flattened in their dorsal portions, those closer to dorsal fin sometimes with a central area devoided of odontodes.



FIGS 18-20.

Hypostomus ternetzi, MCP 12523 (177.1 mm SL); 18) dorsal, 19) lateral, and 20) ventral views.

TABLE 5.

Morphometric and meristic data of *Hypostomus ternetzi*.

Character	holotype	n	Range		mean
			low	high	
Standard length (A) (mm)	199.0	4	119.6	177.1	154.3
Ratios of standard length					
Predorsal distance (D)	2.2	4	2.3	2.4	2.4
Head length (E)	2.8	4	2.8	3.1	2.9
Cleithral width (F)	2.8	4	2.9	2.9	2.9
Length of dorsal fin spine (K)	2.7	3	2.7	3.1	2.8
Length of dorsal fin base (L)	3.5	4	3.6	3.9	3.7
Dorsal base to adipose spine (M)	6.5	4	6.1	7.1	6.6
Trunk length (N)	4.0	4	3.9	4.3	4.1
Pectoral fin spine length (O)	2.6	4	2.9	3.2	3.0
Abdominal length (P)	4.6	4	5.0	5.4	5.2
Pelvic fin spine length (Q)	3.1	4	3.4	3.8	3.6
Caudal peduncle length (R)	3.8	4	3.2	3.4	3.3
Caudal peduncle depth (S)	7.5	4	7.7	8.1	7.9
Adipose fin spine length (T)	9.1	4	9.2	10.2	9.7
Upper caudal ray length (U)	—	4	2.0	2.3	2.1
Lower caudal ray length (V)	—	3	1.8	2.0	1.9
Ratios of head length					
Head depth (G)	1.6	4	1.5	1.6	1.6
Snout length (H)	1.6	4	1.6	1.6	1.6
Horizontal eye diameter (I)	6.7	4	6.2	6.9	6.7
Least interorbital width (J)	3.1	4	2.6	3.1	2.8
Rictal barbel	8.7	4	4.8	7.8	6.1
Right mandibular ramus	5.2	4	4.8	5.6	5.2
Pore-opercle distance	—	4	7.3	8.2	7.5
Counts					
Series of lateral scutes	26	4	26	26	26.0
Predorsal scutes	3	4	3	3	3.0
Scutes at dorsal fin base	8	4	8	8	8.0
Dorsal to adipose fin scutes	6	4	6	6	6.0
Adipose to caudal fin scutes	3	4	3	3	3.0
Scutes at anal fin base	3	4	3	3	3.0
Anal to caudal fin scutes	—	4	13	13	13.0
Teeth on left premaxilla	—	4	65	88	72.8
Teeth on right premaxilla	56	4	64	92	74.5
Teeth on left dentary	—	4	60	91	71.0
Teeth on right dentary	47	4	61	85	73.0
Plates bordering supraoccipital	1	4	1	2	1.3

Outer face of upper lip usually with small odontodes areas, restricted to lateral portions; maxillary barbel moderately long. Teeth small and numerous, with a small outer cusp.

Body completely covered with rows of comparatively smooth scutes dorsally; low ridges on predorsal scutes and first scutes behind posttemporal plate. Abdomen margins

covered with minute scutelets, leaving central area unprovided of scutelets (at least in three medium-sized specimens examined). Ventral surface of head covered with scutelets, except for a small area just behind lower lip.

Distal half of pectoral fin spines in one specimen covered dorsally with well developed, anteriorly curved prominent odontodes (male?); less developed in others (females?). Adipose fin spine very long and robust; slightly curved. Caudal fin margin strongly concave with very long outer rays.

Colour in alcohol: dorsal surface of head and body with an homogeneous dark pattern; slightly lighter ventrally. Roundish dots slightly darker than dorsum sometimes hardly discernible (in one specimens) or completely absent. Fin membranes usually slightly darker than body.

Remarks: life colour pattern unknown. We have seen only the holotype, two specimens from Paraguay and four specimens from rio Uruguay. The two populations show minor differences. The few available specimens do not allow a conclusive analysis of the taxonomic status of the two populations.

***Hypostomus isbrueckeri* sp. n.**

(figs 1, 21-24; tab. 6)

Etymology: *Hypostomus isbrueckeri* is named in honour of Dr. Isaïc J. H. Isbrücker (ZMA) who has extensively contributed to the knowledge of loricariid diversity.

Type-specimens:

Holotype: MCP 10488 (190.6 mm SL), rio Conceição, Ijuí, Rio Grande do Sul, Brazil, 3 Dec 1985, C. P. Silva & F. Korndorfer.

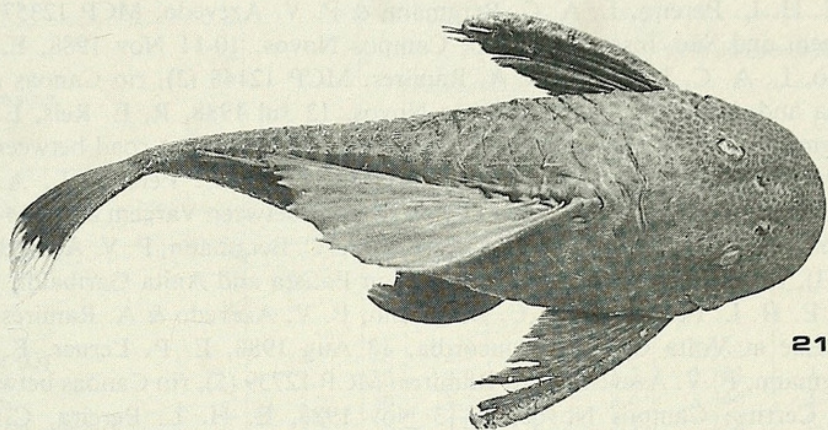
Paratypes:

Brazil, Rio Grande do Sul:

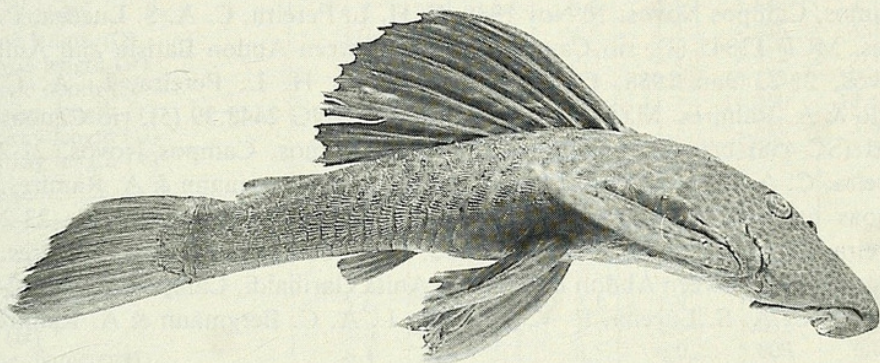
MCP 11861 (1), rio Potiribu, Pejuçara, 16 Dec 1987, F. Korndorfer & Winckler. MCP 12045 (2), rio Ligeiro between Marcelino Ramos and Maximiliano de Almeida, 24 May 1988, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & L. A. Avila. MCP 12495 (3), rio Ligeiro between Marcelino Ramos and Maximiliano de Almeida, 3 Oct 1988, E. H. L. Pereira, P. V. Azevedo, L. A. C. Bergmann & A. Ramires. MCP 10885 (1), rio Conceição, Augusto Pestana, 11 Sep 1986, C. S. Porto & F. Korndorfer. MCP 10862 (2), rio Conceição, Augusto Pestana, 11 Sep 1986, C. S. Porto & F. Korndorfer. MCP 12938 (1), same data as holotype. MCP 10486 (4), rio Conceição at Linha 8, Esquina Dutra, Ijuí, 5 Dec 1985, C. S. Porto & F. Korndorfer. MCP 10495 (1), rio Conceição at the CTG of Ijuí, 4 Dec 1985, C. S. Porto & F. Korndorfer. MCP 10494 (4), rio Conceição at Ijuí, 2 Dec 1985, C. S. Porto & F. Korndorfer. MCP 12305 (2), rio Pelotas at Pinhal da Serra, Esmeralda, 20 Aug 1988, E. P. Lerner, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12306 (7), rio Pelotas at Pinhal da Serra, Esmeralda, 20 Aug 1988, E. P. Lerner, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12310 (15), rio Uruguay at Espigão Alto, Barracão, 19 Aug 1988, E. P. Lerner, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12307 (4), rio Uruguay at Espigão Alto, Barracão, 19 Aug 1988, E. P. Lerner, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12308 (1), rio Uruguay at Espigão Alto, Barracão, 19 Aug 1988, E. P. Lerner, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12494 (3), rio Uruguay at Itá, 1 Oct 1988, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires.

Santa Catarina:

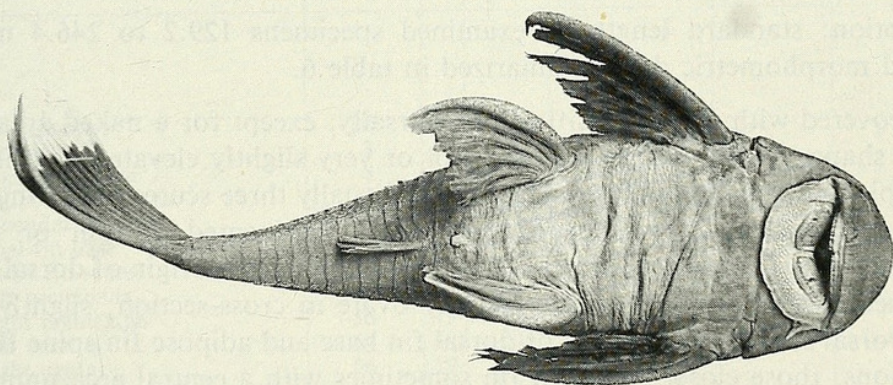
MCP 12044 (1), rio Jacutinga, between Seara and Concórdia, Concórdia, 22 May 1988, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & L. A. Avila. MCP 12519 (5), rio Jacutinga, between Seara and Concórdia, Concórdia, 2 Oct 1988, E. H. L. Pereira, L. A. C. Bergmann,



21



22



23

FIGS 21-23.

Holotype of *Hypostomus isbrueckeri* sp. n., MCP 10488 (190.6 mm SL); 21) dorsal, 22) lateral, and 23) ventral views.

P. V. Azevedo & A. Ramires. MCP 12149 (3), rio Canoas between Vargem and São José do Cerrito, Campos Novos, 16 Jul 1988, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann & P. V. Azevedo. MCP 12164 (4), rio Canoas between Vargem and São José do Cerrito, Campos Novos, 16 Jul 1988, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann & P. V. Azevedo. MCP 12357 (1), rio Canoas between Vargem and São José do Cerrito, Campos Novos, 10-11 Nov 1988, E. H. L. Pereira, P. V. Azevedo, L. A. C. Bergmann & A. Ramires. MCP 12148 (2), rio Canoas at road between Abdon Batista and Anita Garibaldi, Campos Novos, 12 Jul 1988, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann & P. V. Azevedo. MCP 12333 (4), rio Canoas at road between Abdon Batista and Anita Garibaldi, Campos Novos, 8-9 Sep 1988, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12331 (3), rio Canoas between Vargem and São José do Cerrito, Campos Novos, 10-11 Nov 1988, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12358 (3), rio Canoas at road between Abdon Batista and Anita Garibaldi, Campos Novos, 8-9 Sep 1988, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. USNM 303680 (3), rio do Peixe at Volta Grande, Concórdia, 18 Aug 1988, E. P. Lerner, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12739 (5), rio Canoas between Vargem and São José do Cerrito, Campos Novos, 12-13 Nov 1988, E. H. L. Pereira, C. A. S. Lucena, P. V. Azevedo & A. Ramires. MCP 12743 (14), rio Canoas at road between Abdon Batista and Anita Garibaldi, Campos Novos, 10-11 Nov 1988, E. H. L. Pereira, C. A. S. Lucena, P. V. Azevedo & A. Ramires. MCP 12747 (6), rio Canoas at Passo do Canoas, road (SC-458) between Tupitinga and Celso Ramos, Campos Novos, 10 Nov 1988, E. H. L. Pereira, C. A. S. Lucena, P. V. Azevedo & A. Ramires. MCP 12845 (1), rio Canoas at road between Abdon Batista and Anita Garibaldi, Campos Novos, 22-23 Jan 1988, C. A. S. Lucena, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MZUSP 40257 (5) and MHNG 2448.39 (5), rio Canoas at Passo do Canoas, road (SC-458) between Tupitinga and Celso Ramos, Campos Novos, 21-22 Jan 1989, E. H. L. Pereira, C. A. S. Lucena, P. V. Azevedo, L. A. C. Bergmann & A. Ramires. MCP 12911 (1), rio Canoas between Vargem and São José do Cerrito, Campos Novos, 23-24 Jan 1989, E. H. L. Pereira, C. A. S. Lucena, P. V. Azevedo, L. A. C. Bergmann & A. Ramires. MCP 12918 (1), rio Canoas at road between Abdon Batista and Anita Garibaldi, Campos Novos, 22-23 Jan 1989, E. H. L. Pereira, C. A. S. Lucena, P. V. Azevedo, L. A. C. Bergmann & A. Ramires.

Diagnosis: *Hypostomus isbrueckeri* sp. n. is distinguished from all other *Hypostomus* species by the presence in mature males of a yellow vertical band (whitish in alcohol-preserved specimens) in the distal margin of caudal fin.

Description: standard length of examined specimens 129.2 to 246.4 mm; other meristic and morphometric data summarized in table 6.

Head covered with dermal ossifications dorsally, except for a naked area on snout tip, oval in shape. Dorsal margin of orbit not or very slightly elevated, continuing in a very inconspicuous ridge on posttemporal plate. Usually three scutes bordering posterior margin of supraoccipital; these scutes sometimes fragmented in four or five small scutelets. Body very low; dorsal profile gently descending from origin of dorsal fin to end of caudal peduncle. Caudal peduncle roughly ovate in cross-section; slightly flattened ventrally. Dorsal scutes between end of dorsal fin base and adipose fin spine flat in their dorsal portions; those closer to dorsal fin sometimes with a central area unprovided of odontodes.

Outer face of upper lip either with or without minute dermal ossifications; maxillary barbel variable in size, usually moderately long. Teeth small and numerous, with a small outer cusp.

Body completely covered with rows of comparatively smooth scutes dorsally; dorsal ridges of odontodes usually hardly discernible even in larger individuals. Anterior half of ventral surface usually naked; sometimes with a few minute scutelets scattered on

TABLE 6.

Morphometric and meristic data of *Hypostomus isbrueckeri* sp. n.

Character	holotype	n	Range			95% confidence limits		SD
			low	high	mean	L1	L2	
Standard length (A) (mm)	190.6	20	129.2	246.4	177.0			28.734
			Ratios of standard length					
Predorsal distance (D)	2.5	20	2.5	2.7	2.6	2.582	2.658	
Head length (E)	3.1	20	3.0	3.5	3.2	3.133	3.240	
Cleithral width (F)	3.2	20	3.2	3.6	3.4	3.340	3.438	
Length of dorsal fin spine (K)	3.3	18	3.0	3.7	3.3	3.252	3.420	
Length of dorsal fin base (L)	3.7	20	3.5	4.0	3.7	3.668	3.789	
Dorsal base to adipose spine (M)	5.4	20	5.1	5.9	5.4	5.322	5.561	
Trunk length (N)	4.3	20	4.0	4.9	4.5	4.365	4.579	
Pectoral fin spine length (O)	3.0	20	3.0	3.5	3.2	3.136	3.269	
Abdominal length (P)	4.6	20	4.5	5.0	4.7	4.648	4.798	
Pelvic fin spine length (Q)	3.9	20	3.9	4.5	4.2	4.086	4.234	
Caudal peduncle length (R)	3.3	20	2.9	3.3	3.1	3.072	3.175	
Caudal peduncle depth (S)	10.5	20	9.6	11.0	10.3	10.125	10.484	
Adipose fin spine length (T)	12.5	20	10.1	14.0	11.7	11.250	12.128	
Upper caudal ray length (U)	3.4	13	3.4	4.1	3.7	3.580	3.848	
Lower caudal ray length (V)	3.0	16	3.0	4.0	3.4	3.293	3.571	
			Ratios of head length					
Head depth (G)	2.0	20	1.8	2.1	1.9	1.893	1.975	
Snout length (H)	1.6	20	1.6	1.7	1.6	1.632	1.658	
Horizontal eye diameter (I)	6.1	20	5.4	6.5	6.0	5.809	6.092	
Least interorbital width (J)	3.2	20	3.1	3.6	3.3	3.244	3.365	
Rictal barbel	5.9	20	3.3	8.7	6.9	6.339	7.451	
Right mandibular ramus	5.3	20	4.5	5.8	5.1	4.890	5.263	
Pore-opercle distance	7.6	20	4.7	7.7	6.6	6.228	6.951	
			Counts					
Series of lateral scutes	27	20	27	27	27.0			0.000
Predorsal scutes	3	20	3	3	3.0			0.000
Scutes at dorsal fin base	8	20	8	9	8.6			0.503
Dorsal to adipose fin scutes	7	20	6	8	7.1			0.553
Adipose to caudal fin scutes	3	20	3	4	3.6			0.510
Scutes at anal fin base	2	20	2	3	2.4			0.503
Anal to caudal fin scutes	14	20	13	15	13.8			0.616
Teeth on left premaxilla	63	19	48	79	57.7			8.562
Teeth on right premaxilla	56	19	47	89	59.2			9.388
Teeth on left dentary	54	19	50	83	62.4			8.454
Teeth on right dentary	56	19	51	91	63.2			10.586
Plates bordering supraoccipital	3	20	2	5	3.5			0.887

abdomen of larger specimens. Ventral surface of head ranging from almost naked, except for a few scutelets in front of gill openings, to almost completely covered with minute ossifications.

Distal half of pectoral fin spines usually covered dorsally with anteriorly curved prominent odontodes in larger specimens. Adipose fin spine moderately long; straight to slightly curved. Caudal fin margin slightly concave, ventral lobe longer than dorsal.

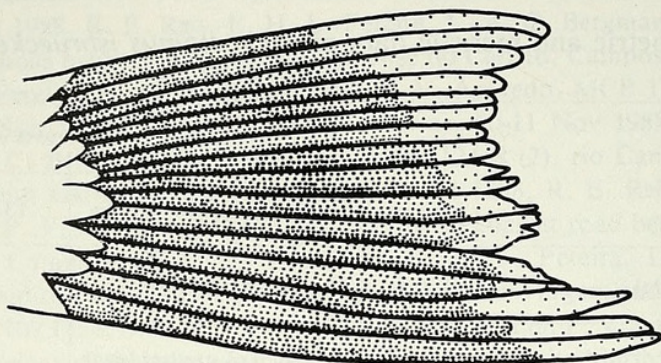


FIG. 24.

Hypostomus isbrueckeri sp. n., yellow band on caudal-fin margin of holotype, MCP 10488.

Colour in alcohol: ground colour of dorsal surface grey-brown; whitish to pale yellowish or even light grey-brown ventrally. Dorsal surface of head and body covered with roundish darker dots, smaller and closer together on head. Paired fins with same colour pattern. Dorsal fin dots may be confluent sometimes, forming small bars. Caudal fin usually darker than body and without dots. Mature males (four specimens dissected) with a whitish vertical band in caudal fin distal margin, varying in width.

Colour in life: living specimens present same basic colour but light band in caudal fin is yellowish-orange.

***Hypostomus roseopunctatus* sp. n.**
(figs 2, 25-28; tab. 7)

Hypostomus sp. — WEBER, 1987: 280-283, figs 6, 7c (one specimen from rio Uruguay at Uruguiana, Rio Grande do Sul, Brazil).

Etymology: *roseopunctatus*, from the latin *roseus*, pink and *punctatus*, meaning dotted, spotted, in allusion to the colour pattern.

Type-specimens:

Holotype: MCP 12239 (232.7 mm SL), rio Pelotas at road from Esmeralda to Anita Garibaldi, Rio Grande do Sul, Brazil, 5-9 Sep 1988, Mr. Pedro.

Paratypes:

Brazil, Rio Grande do Sul:

MCP 11770 (1), rio Comandai (rio Uruguay system), Porto Lucena, 11 Nov 1987, all collectors as holotype. MCP 11773 (1), and MHNG 2414.10 (1), rio Comandai (rio Uruguay system), Porto Lucena, 12 Nov 1987, same collector as holotype. MCP 11771 (1), mouth of rio Ijuí-mirim into rio Ijuí (rio Uruguay system), Pirapo, 11 Nov 1987, same collector as holotype. MCP 11840 (1), mouth of rio Ijuí-mirim into rio Ijuí (rio Uruguay system), Pirapo, 14 Dez 1987, R. E. Reis, L. A. C. Bergmann, P. V. Azevedo, E. H. L. Pereira & E. P. Lerner. MAPA 2315 (1), rio Uruguay at Uruguiana, 14 May 1984, R. E. Reis. MCP 11805 (1), rio Uruguay at "Rancho da Amizade", São Borja, 10 Nov 1987, J. J. Bertoletti, C. A. S. Lucena, P. V. Azevedo, L. A. C. Bergmann & E. P. Lerner. MCP 12393 (2), mouth of rio Ijuí-Mirim, Pirapó, 8 Apr 1988, E. P. Lerner, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & R. Rossi. MCP 12803 (3), mouth of rio Ijuí, Roque Gonzales,

3-4 Jan 1989, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12802 (1), rio Uruguay at Porto de Santo Izidro, São Nicolau, 3-4 Jan 1989, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12800 (1), mouth of rio Ijuí-Mirim, Pirapó, 7-8 Jan 1989, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12702 (1), mouth of rio Ijuí-Mirim, Pirapó, 2-3 Nov 1988, C. A. S. Lucena,

TABLE 7.

Morphometric and meristic data of *Hypostomus roseopunctatus* sp. n.

Character	holotype	n	Range			95% confidence limits		SD
			low	high	mean	L1	L2	
Standard length (A) (mm)	232.7	20	105.8	232.7	168.0			41.447
Ratios of standard length								
Predorsal distance (D)	2.7	20	2.4	2.8	2.6	2.531	2.649	
Head length (E)	3.3	20	2.8	3.3	3.1	3.020	3.176	
Cleithral width (F)	3.3	20	3.0	3.5	3.3	3.243	3.378	
Length of dorsal fin spine (K)	3.0	19	2.5	3.4	2.9	2.788	3.014	
Length of dorsal fin base (L)	3.5	20	3.0	4.0	3.3	3.251	3.446	
Dorsal base to adipose spine (M)	5.5	20	5.5	7.6	6.5	6.277	6.730	
Trunk length (N)	4.3	20	4.1	5.0	4.4	4.280	4.484	
Pectoral fin spine length (O)	3.0	20	2.7	3.4	3.0	2.951	3.130	
Abdominal length (P)	4.6	20	4.4	5.0	4.6	4.496	4.660	
Pelvic fin spine length (Q)	3.8	20	3.3	4.0	3.7	3.579	3.783	
Caudal peduncle length (R)	3.0	20	3.0	3.7	3.3	3.186	3.352	
Caudal peduncle depth (S)	8.9	20	7.8	9.0	8.5	8.376	8.697	
Adipose fin spine length (T)	11.6	20	9.5	15.3	11.1	10.489	11.687	
Upper caudal ray length (U)	—	17	2.8	3.8	3.2	3.057	3.338	
Lower caudal ray length (V)	3.3	16	2.4	3.6	2.9	2.760	3.108	
Ratios of head length								
Head depth (G)	1.6	20	1.5	1.8	1.7	1.640	1.711	
Snout length (H)	1.6	20	1.6	1.7	1.7	1.635	1.672	
Horizontal eye diameter (I)	6.6	20	5.2	7.1	5.9	5.643	6.089	
Least interorbital width (J)	3.2	20	2.7	3.3	3.0	2.908	3.081	
Rictal barbel	6.9	20	3.3	8.9	4.8	4.195	5.480	
Right mandibular ramus	7.8	19	6.4	10.5	8.0	7.446	8.537	
Pore-opercle distance	6.5	20	6.2	7.8	6.9	6.692	7.089	
Counts								
Series of lateral scutes	26	20	25	27	25.9			0.587
Predorsal scutes	3	20	3	3	3.0			0.000
Scutes at dorsal fin base	9	20	9	10	9.1			0.224
Dorsal to adipose fin scutes	6	20	5	6	5.9			0.308
Adipose to caudal fin scutes	4	20	2	4	3.5			0.607
Scutes at anal fin base	2	20	2	3	2.4			0.489
Anal to caudal fin scutes	14	20	11	14	12.8			0.696
Teeth on left premaxilla	9	20	6	14	9.0			1.892
Teeth on right premaxilla	10	20	6	16	9.4			2.681
Teeth on left dentary	12	20	7	15	12.2			2.238
Teeth on right dentary	12	19	7	16	10.5			2.294
Plates bordering supraoccipital	3	20	3	4	3.1			0.224

E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12682 (2), rio Uruguay at "Rancho da Amizade", São Borja, 31 Oct-1 Nov 1988, C. A. S. Lucena, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12952 (1), rio Pelotas at road between Anita Garibaldi and Pinhal da Serra, Esmeralda, 12-13 Dec 1988, R. E. Reis, L. A. C. Bergmann, E. H. L. Pereira, P. V. Azevedo & A. Ramires.

Santa Catarina:

MHNG 2448.40 (2), USNM 303681 (1), and MZUSP 40258 (1), rio Canoas at road between Abdom Batista and Anita Garibaldi, Campos Novos, 22-23 Jan 1989, C. A. S. Lucena, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12736 (1), rio Canoas at "Passo do Canoas", road SC-458 between Tupitinga and Celso Ramos, Campos Novos, 10 Nov 1988, C. A. S. Lucena, E. H. L. Pereira, P. V. Azevedo & A. Ramires. MCP 12994 (2), rio Uruguay at Itá, 7-8 Dec 1988, R. E. Reis, L. A. C. Bergmann, E. H. L. Pereira, P. V. Azevedo & A. Ramires.

Diagnosis: *Hypostomus roseopunctatus* sp. n. is distinguished from other *Hypostomus* species inhabiting Southern Brazil by the lower number of teeth in each premaxillary or dentary (6-16 versus more than 21 in the remaining species). The new species is similar to *H. microstomus* Weber (1987) in the small number of teeth in each premaxillary and dentary (6-16) differing in the size of the mandibular ramus; in the proportion of its length in the interorbital width 2.1-3.6 in the former versus 3.8-5.5 in *H. microstomus*; and in the possession of 3 scutes bordering the posterior margin of the supraoccipital, versus only one in *H. microstomus* (but one *H. microstomus* paratype with 3). Furthermore, *H. roseopunctatus* presents 9-10 scutes accompanying the dorsal fin base, and *H. microstomus* presents 6-7, usually 7. Another species from the upper rio Paraná system, *H. margaritifera* (Regan, 1908), has a small number of teeth. That species, however, shows 18-31 teeth in both upper and lower jaws, versus a maximum of 16 in *H. roseopunctatus*.

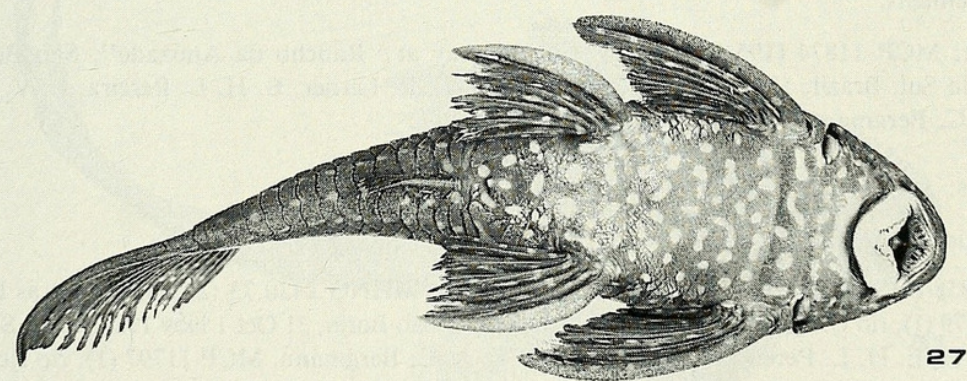
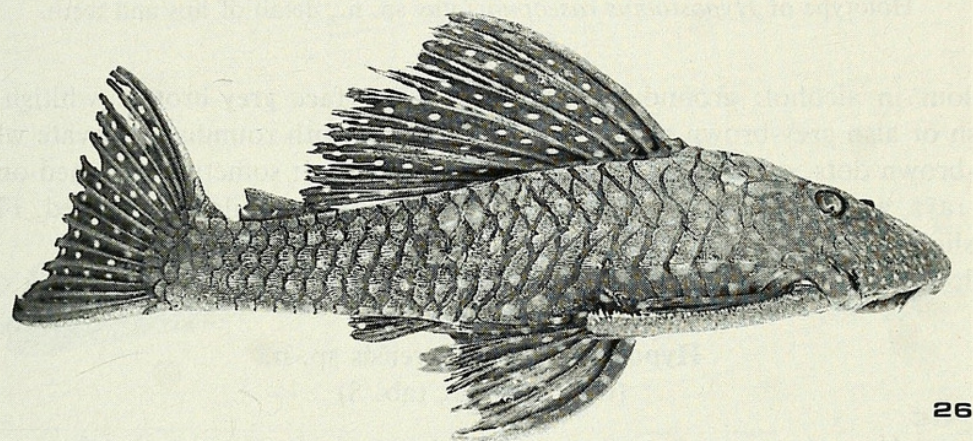
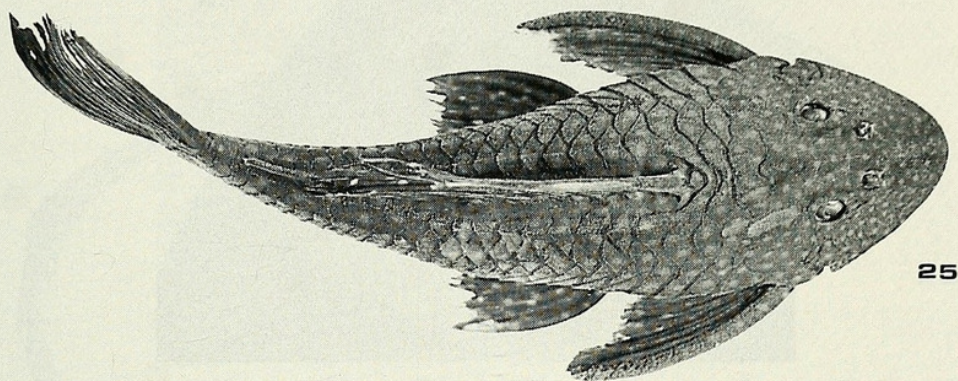
Description: standard length of examined specimens 105.8 to 232.7 mm. Other meristic and morphometric data summarized in table 7.

Head covered with dermal ossifications dorsally, except for a roundish naked area on snout tip. Dorsal margin of orbit elevated, continuing in a gently elevated ridge on post-temporal plate. Usually three (one specimen with 4 and another with 5) scutes bordering posterior margin of supraoccipital. Body not very deep; dorsal profile gently descending from origin of dorsal fin to caudal peduncle. Caudal peduncle roughly ovate in cross-section. Dorsal scutes between end of dorsal fin base and adipose fin spine flat in their dorsal portions; those closer to dorsal fin with a central area devoided of odontodes.

Outer face of upper lip with or without a few dermal ossifications; maxillary barbel long. Teeth big and strong, with a flat, wide outer and small inner cusp (fig. 28).

Body completely covered with rows of somewhat smooth scutes dorsally; first with very slightly prominent odontodes forming three low longitudinal ridges (hardly discernible in smaller individuals). A fourth ridge is present in lateral margin of ventral scutes of caudal peduncle, behind anal fin. Anterior half of ventral surface almost naked (in smaller individuals) to almost completely covered by scutelets. Head ranging from almost naked ventrally, except for a few scutelets in front of gill openings, to almost completely covered with scutelets. Abdomen almost naked, with just a few odontodes scattered between pectoral and pelvic fin insertions, to almost completely covered with small, squarish dermal ossifications.

Distal half of pectoral fin spines covered with slightly prominent odontodes, not modified into hooks, on dorsal surface. Caudal fin margin concave; ventral lobe longer than dorsal. Adipose fin spine moderately long and straight. Ventral spine of caudal fin as long as or slightly longer than the pectoral fin spine.



FIGS 25-27.

Holotype of *Hypostomus roseopunctatus* sp. n., MCP 12239 (232.7 mm SL); 25) dorsal, 26) lateral, and 27) ventral views.

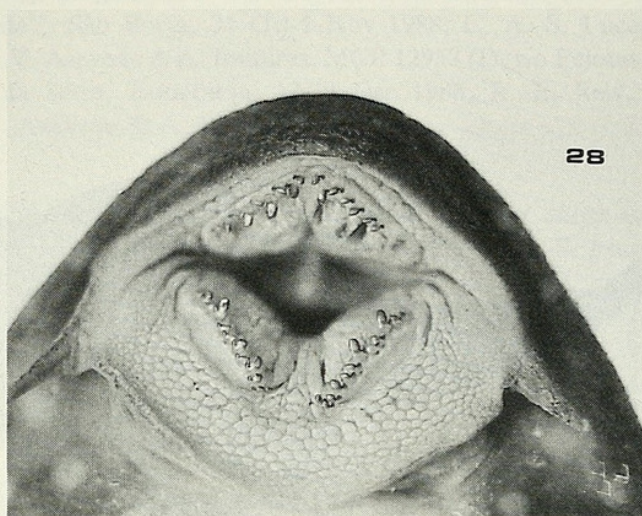


FIG. 28.

Holotype of *Hypostomus roseopunctatus* sp. n., detail of lips and teeth.

Colour in alcohol: ground colour of dorsal surface grey-brown; whitish to pale yellowish or also grey-brown ventrally. Body covered with roundish or ovate whitish to reddish-brown dots, smaller and more numerous on head; sometimes aligned on flanks. Spines, rays, and membranes of all fins with same dots irregularly arranged. Fin membranes slightly darker than scutes.

Colour in life: living specimens darker and slightly bluish with light pink dots.

***Hypostomus uruguayensis* sp. n.**

(figs 1, 29-31; tab. 8)

Etymology: *Hypostomus uruguayensis* sp. n. is named after its type-locality.

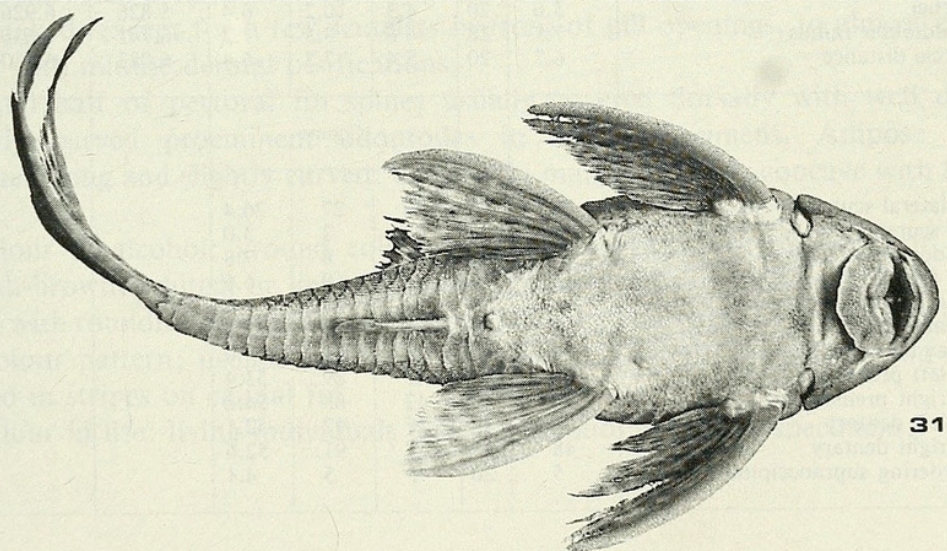
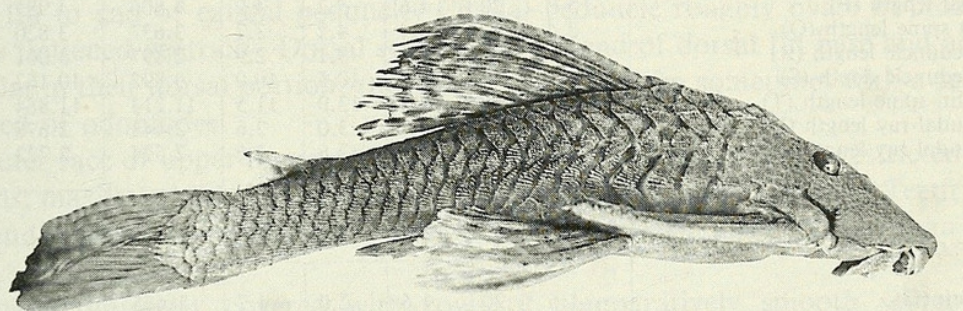
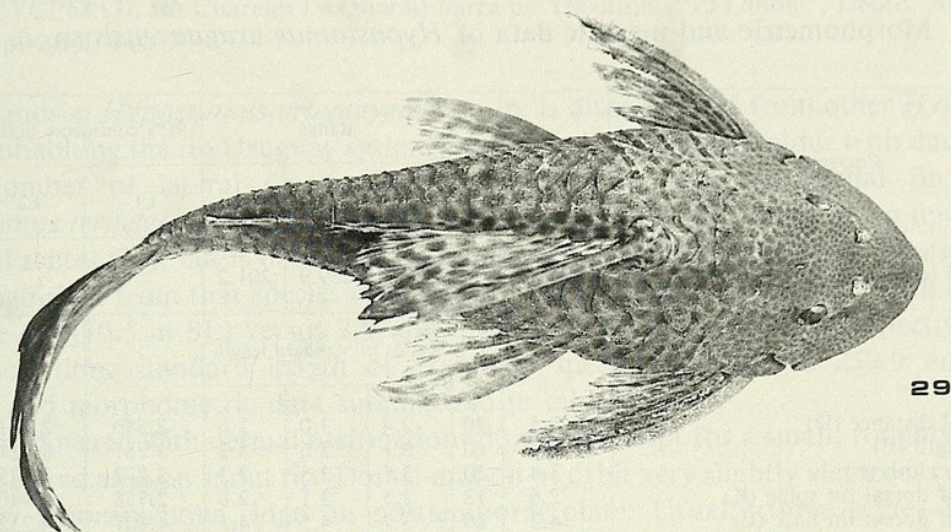
Type-specimens:

Holotype: MCP 11874 (195.6 mm SL), rio Uruguay at "Rancho da Amizade", São Borja, Rio Grande do Sul, Brazil, 12-13 Dez 1987, R. E. Reis, E. P. Lerner, E. H. L. Pereira, P. V. Azevedo & L. A. C. Bergmann.

Paratypes:

Brazil, Rio Grande do Sul:

MCP 11858 (2), MCP 12953 (2), MCP 11973 (3), and MHNG 2430.73 (2), same data as holotype. MCP 12679 (1), rio Uruguay at "Rancho da Amizade", São Borja, 31 Oct-1 Nov 1988, C. A. S. Lucena, A. Ramires, E. H. L. Pereira, P. V. Azevedo & L. A. C. Bergmann. MCP 11797 (1), rio Ijuí-Mirim, Pirapó, 11 Nov 1987, J. J. Bertolotti, E. P. Lerner, C. A. S. Lucena, L. A. C. Bergmann & P. V. Azevedo. MCP 12678 (4), rio Ijuí-Mirim, Pirapó, 2-3 Nov 1988, C. A. S. Lucena, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 12801 (1), rio Ijuí-Mirim, Pirapó, 7-8 Jan 1989, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires. MCP 09252 (1), rio Maracatu (tributary of rio Ibicuí), near Manoel Vianna, 14-15 Sep 1983, R. E. Reis, C. A. S. Lucena & L. R. Malabarba. MCP 12648 (1), rio Uruguay at Porto de Santo Izidro, São Nicolau, 4-5 Nov 1988, C. A. S. Lucena, A. Ramires, E. H. L. Pereira, P. V. Azevedo & L. A. C. Bergmann.



FIGS 29-31.

Holotype of *Hypostomus uruguayensis* sp. n., MCP 11874 (195.6 mm SL); 29) dorsal, 30) lateral, and 31) ventral views.

TABLE 8.

Morphometric and meristic data of *Hypostomus uruguayensis* sp. n.

Character	holotype	n	Range			95% confidence limits		SD
			low	high	mean	L1	L2	
Standard length (A) (mm)	195.6	20	148.3	259.9	201.2			28.186
			Ratios of standard length					
Predorsal distance (D)	2.5	20	2.4	3.0	2.6	2.540	2.681	
Head length (E)	3.3	20	3.1	3.6	3.3	3.281	3.411	
Cleithral width (F)	3.4	20	3.1	3.5	3.3	3.272	3.375	
Length of dorsal fin spine (K)	2.6	18	2.5	3.1	2.8	2.758	2.940	
Length of dorsal fin base (L)	4.2	20	3.7	4.5	4.1	4.007	4.232	
Dorsal base to adipose spine (M)	4.8	19	4.8	6.5	5.5	5.326	5.722	
Trunk length (N)	4.7	20	4.3	4.9	4.6	4.520	4.710	
Pectoral fin spine length (O)	3.1	20	2.9	3.4	3.2	3.141	3.275	
Abdominal length (P)	5.0	20	4.6	5.2	4.9	4.806	4.985	
Pelvic fin spine length (Q)	3.4	20	3.4	4.2	3.7	3.637	3.820	
Caudal peduncle length (R)	2.9	20	2.8	3.1	2.9	2.897	3.001	
Caudal peduncle depth (S)	9.8	20	9.4	10.5	10.0	9.892	10.167	
Adipose fin spine length (T)	11.2	19	10.3	13.0	11.5	11.213	11.884	
Upper caudal ray length (U)	2.2	14	2.2	3.0	2.6	2.443	2.678	
Lower caudal ray length (V)	2.3	13	2.3	2.8	2.6	2.524	2.722	
			Ratios of head length					
Head depth (G)	1.6	20	1.6	2.0	1.7	1.665	1.761	
Snout length (H)	1.6	20	1.6	1.8	1.7	1.665	1.703	
Horizontal eye diameter (I)	6.9	20	6.1	7.2	6.8	6.636	6.924	
Least interorbital width (J)	2.7	19	2.5	3.4	2.7	2.644	2.835	
Rictal barbel	5.6	20	4.3	10.2	6.4	5.826	6.926	
Right mandibular ramus	7.3	18	4.6	9.5	7.2	6.741	7.635	
Pore-opercle distance	6.7	20	5.4	7.8	6.4	6.083	6.630	
			Counts					
Series of lateral scutes	27	20	26	27	26.4			0.513
Predorsal scutes	2	20	3	3	3.0			0.000
Scutes at dorsal fin base	7	20	7	8	7.8			0.444
Dorsal to adipose fin scutes	8	19	6	8	6.6			0.597
Adipose to caudal fin scutes	4	19	3	5	4.1			0.459
Scutes at anal fin base	2	20	2	3	2.4			0.489
Anal to caudal fin scutes	15	20	13	15	14.0			0.605
Teeth on left premaxilla	47	18	42	89	53.4			11.147
Teeth on right premaxilla	50	19	42	88	54.2			11.013
Teeth on left dentary	37	18	37	92	52.1			12.473
Teeth on right dentary	48	19	41	91	52.6			11.577
Plates bordering supraoccipital	5	20	3	5	4.1			0.944

Santa Catarina:

MCP 12309 (1), rio Uruguay at Itá, 16 Aug 1988, E. P. Lerner, E. H. L. Pereira, P. V. Azevedo, L. A. C. Bergmann & A. Ramires. USNM 303682 (1), MZUSP 40259 (1), and MHNG 2448.41 (1), rio Uruguay at Itá, 7-8 Dec 1988, R. E. Reis, E. H. L. Pereira, L. A. C. Bergmann, P. V. Azevedo & A. Ramires.

Uruguay:

FHCM ZVCP68 (3), rio Cuareim (= Quarai) barra de Yucutujá, "El Ombu", Depto. Artigas, Feb 1982, Exp. Zool. Lab.

Diagnosis: *Hypostomus uruguayensis* sp. n. is distinguished from other *Hypostomus* species inhabiting the rio Uruguay system by its very light ground colour with darker dots, lower number of lateral scutes (26-27) and strongly concave caudal fin margin. *Hypostomus ternetzi* has a similar strongly concave caudal fin margin and a low number of lateral scutes (26), but is homogeneously dark dorsally. *Hypostomus uruguayensis* can be distinguished from that species by the body width (3.1-3.5 in SL) and depth of caudal peduncle (9.4-10.5 in SL) versus 2.9 and 7.7-8.1 in SL in *H. ternetzi*, respectively.

Description: standard length of examined specimens 148.3 to 259.9 mm; other meristic and morphometric data summarized in table 8.

Head covered with dermal ossifications dorsally, except for a small, roughly squarish or ovate naked area on snout tip. Dorsal margin of orbit very slightly elevated, continuing in a very inconspicuous ridge on posttemporal plate. Usually three scutes bordering posterior margin of supraoccipital bone; these scutes often fragmented in up to seven small scutelets. Body moderately low; dorsal profile gently descending from origin of dorsal fin to end of caudal peduncle. Caudal peduncle roughly ovate in cross-section; slightly flattened ventrally. Dorsal scutes between end of dorsal fin base and adipose fin spine flat in their dorsal portion; those closer to dorsal fin sometimes with a central area devoided of odontodes.

Outer face of upper lip usually with very small odontodes areas, restricted to lateral portions; maxillary barbel much variable in size, usually moderately long. Teeth very thin, small and numerous, with a large, well developed outer cusp, always longer than half inner cusp.

Body completely covered with rows of comparatively smooth scutes dorsally. Abdomen covered with minute dermal ossifications, even in smaller individuals; some naked areas often present near base of pelvic fins. Ventral surface of head ranging from almost naked, except for a few scutelets in front of gill openings, to almost completely covered with minute dermal ossifications.

Distal half of pectoral fin spines usually covered dorsally with well developed, anteriorly curved proeminent odontodes in larger specimens. Adipose fin spine moderately long and slightly curved. Caudal fin margin strongly concave with long outer rays.

Colour in alcohol: ground colour of dorsal surface pale-yellowish or very light yellowish-brown; whitish or light-yellowish ventrally. Dorsal surface of head and body covered with roundish grey-brown dots; smaller and closer together on head. All fins with same colour pattern; usually very conspicuous in dorsal fin membrane and somewhat arranged in stripes on caudal fin.

Colour in life: living individuals just like alcohol preserved specimens.

DISCUSSION

The large number of *Hypostomus* species names from the laguna dos Patos system in literature deserves some comments. Besides a museum collections survey, recent extensive and niche-explorative sampling throughout the laguna dos Patos system revealed

two *Hypostomus* species: *H. commersonii* and *H. aspilogaster*, although nine species names have been cited in literature. Two of these, *H. spiniger* and *H. limosus*, are junior synonyms of *H. commersonii*. Five other species names are probably misidentifications, repeated in subsequent works: *Plecostomus bicirrosus* (synonym of *H. plecostomus*) cited by HENSEL (1870); *Plecostomus lima* (type-locality: rio das Velhas, Minas Gerais) cited by EIGENMANN & EIGENMANN (1890); *Plecostomus guacari* (synonym of *H. plecostomus*) cited by NICHOLS (1919); *Hypostomus wuchereri* (type-locality: Bahia) cited by BOSSEMEYER *et al.* (1981); and *Plecostomus plecostomus* (type-locality: Surinam) cited by BERTOLETTI (1986).

Plecostomus garmani Regan, 1904 was described from a single specimen from rio das Velhas, previously identified by EIGENMANN & EIGENMANN (1890) as *Plecostomus lima*. Erroneously, EIGENMANN (1910) cited all specimens previously identified as *P. lima* by EIGENMANN & EIGENMANN (1890) as *P. garmani*, including the material from Rio Grande do Sul. This citation was repeated in subsequent works.

Finally, FOWLER (1954) erroneously mentioned *Plecostomus robinii* (Valenciennes) from "Villa de Barro, Rio Grande do Sul, Brazil", following the citation "Villa de Barro, Rio Grande, Brazil" by Stigchel (1947).

Small hirudines are common external parasites of all *Hypostomus* species included in this study.

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