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Redescription of *Pterygoplichthys punctatus* and description of a new species of *Pterygoplichthys* (Siluriformes: Loricariidae)

Jonathan W. Armbruster* and Lawrence M. Page**

Pterygoplichthys punctatus and *P. weberi*, new species, are unique among hypostomines in having a medially divided buccal papilla. The two species can be separated from one another by color (small spots in *P. punctatus*, large in *P. weberi*), condition of the buccal papilla (deeply divided at all ages in *P. punctatus vs.* shallowly divided in adults of *P. weberi*), condition of the lateral keel odontodes (fairly short and directed posteriorly in *P. punctatus vs.* large and directed almost laterally in *P. weberi*), and body width (SL/cleithral width 3.6-4.0 in *P. punctatus vs.* 3.3-3.4 in *P. weberi*). *Pterygoplichthys punctatus* is known from the rio Madeira drainage and the rio Urubu of Brazil and has published, but unconfirmed localities in the rio Purus and rio Tocantins basin, and *P. weberi* is known from the Río Marañon, Río Ucayali, and upper Río Amazonas drainages of Colombia, Ecuador, and Peru.

Pterygoplichthys punctatus e *P. weberi*, espécie nova, são únicos entre os hipostomíneos por possuirem uma papila bucal dividida medialmente. As duas espécies podem ser separadas entre si pela coloração (pequenos pontos em *P. punctatus*, pontos grandes em *P. weberi*), condição da papila bucal (profundamente dividida em jovens e adultos de *P. punctatus vs.* dividida superficialmente em adultos de *P. weberi*), condição da quilha de odontódios laterais (pequena e dirigida posteriormente em *P. punctatus vs.* grande e dirigida quase lateralmente em *P. weberi*), e largura do corpo (comprimento padrão/largura no cleitro 3.6-4.0 em *P. punctatus vs.* 3.3-3.4 em *P. weberi*). *Pterygoplichthys punctatus* é conhecida da drenagem do rio Madeira e do rio Urubu no Brasil and tem sido citada, porém sem confirmação, para localidades nas bacias dos rio Purus e Tocantins, e *P. weberi* é conhecida do río Marañon, río Ucayali, e drenagens do alto río Amazonas na Colômbia, Ecuador e Peru.

Key words: Hypostominae, Systematics, Pterygoplichthyini, suckermouth armored catfishes

Introduction

With about 80 genera and over 700 species, Loricariidae is the largest family of catfishes (Siluriformes). Loricariids are endemic to South America (absent in Chile), Panama, and Costa Rica and are characterized by having large bony plates and a ventral suctorial mouth with or without noticeable barbels.

A group of loricariid catfishes with 10 or more dorsal-fin rays is commonly referred to as sailfin catfishes. Weber (1991, 1992) reviewed variation among sailfin catfishes and assigned them to three genera. Species with an elevated supraoccipital process were placed in *Glyptoperichthys* Weber, 1991, those lacking the elevated supraoccipital process and with the supraoccipital bone bordered posteriorly by one large plate were assigned to *Pterygoplichthys* Gill, 1858, and those lacking the elevated supraoccipital process and with the supraoccipital bone bordered posteriorly by three plates were assigned to *Liposarcus* Günther, 1864.

Armbruster (2004) noted that the synapomorphies provided by Weber (1991, 1992) were inadequate to diagnose three genera, and that neither *Pterygoplichthys* nor *Glyptoperichthys* could be recovered as monophyletic. He placed *Liposarcus* and *Glyptoperichthys* in the synonymy of *Pterygoplichthys* and recognized the tribe Pterygoplichthyini (originally misspelled as Pterygoplichthini) for *Pterygoplichthys* and an undescribed genus (the *Hemiancistrus annectens* group of Armbruster, 1998) from the trans-Andean region. Pterygoplichthyini was diagnosed by an increased number of plates between the opercle and the suprapreopercle (two or three *vs.* zero or one) and the presence of a large, respiratory stomach attached to the dorsal wall of the abdominal cavity via a sheet of connective tissue. *Pterygoplichthys* cannot be diagnosed by any unique synapomorphies; however, Armbruster (2004) listed several homoplasic synapomorphies: the presence of more than seven dorsal-fin rays, no or a diminutive interopercle that is on the

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hyomandibula when present, and a reduction in the number of vertebrae (eight to 11 *vs.* 12-20) between the dorsal fin and hypural.

Pterygoplichthys punctatus was based on a specimen from the rio Madeira drainage of Brazil (Günther, 1864). In his revision of sailfin catfishes, Weber (1992) considered the range of *P. punctatus* to include much of the upper Amazon, and he included photographs of the holotype and a specimen from the Río Ucayali of Peru that he considered to be *P. punctatus*; however, our examination of specimens reveals that those from the upper Amazon, including the Río Ucayali, differ from those in the rio Madeira in terms of color, shape, and the presence of large, sharp keel odontodes. In this paper, we describe the species in the upper Amazon as new, redescribe *P. punctatus*, and provide a revised key to the species of *Pterygoplichthys*.

Materials and Methods

Measurements were made with digital calipers to the nearest 0.1 mm. Names of plate rows follow Schaefer (1997). Measurements follow Weber (1992), which largely follow Boeseman (1968). Counts include lateral-line plates (plates in median plate row), adipose-caudal plates (plates in dorsal series from posterior edge of adipose-fin spine to caudal fin), anal-caudal plates (plates in ventral series from plate posterior to posterior insertion of anal fin to caudal fin), and dorsal-adipose plates (plates in dorsal series from plate posterior to posterior insertion of dorsal fin to plate anterior to insertion of adipose-fin spine). Plate counts exclude the column of triangular plates beyond the hypural. Tooth counts were made on the left dentary and premaxillary bones and included all fully erect teeth. SL = standard length, HL = head length. Other specimens examined are listed in Page *et al*. (1996) and Armbruster (1998, 2004). Institutional abbreviations are as listed at http://www.asih.org/files/codons.pdf.

Key to the Species of *Pterygoplichthys* (partially modified from Weber, 1992 and Page *et al.*, 1996):

1. Supraoccipital forming elevated median crest higher than the plates in the nuchal region 2
1'. Supraoccipital flat or rounded and on same plane as plates of nuchal region, not forming elevated crest 6
2. Dorsal fin without spots or vermiculations. Caudal fin dark with much lighter upper spine. Height of flap between anterior and posterior nares more than 0.6 diameter of orbit. Body without spots, usually with large dark dorsal saddles ..... *P. scrophus* (Cope, 1874)
2'. Dorsal fin with light or dark spots or vermiculations. Caudal fin without much lighter upper spine. Height of flap between anterior and posterior nares less than 0.6 diameter of orbit. Body with dark or light spots, without large dorsal saddles 3
3. Venter with uncoalesced spots 4
3'. Venter with spots coalescing to form vermiculations 5
4. Venter with large, dark spots ..... *P. gibbiceps* (Kner, 1854)
4'. Venter with light spots ..... *P. xinguensis* (Weber, 1991)
5. Weakly developed hypertrophied odontodes on evertible cheek plates; ratio of preopercular height to eye diameter 2.9-3.8 ..... *P. lituratus* (Kner, 1854)
5'. Well developed hypertrophied odontodes on evertible cheek plates; ratio of preopercular height to eye diameter 3.7-4.1 ..... *P. parnaibae* (Weber, 1991)
6. Buccal papilla at least shallowly divided medially (Fig. 1a and b) 7
6'. Buccal papilla single, tongue-shaped structure (Fig. 1c) 8

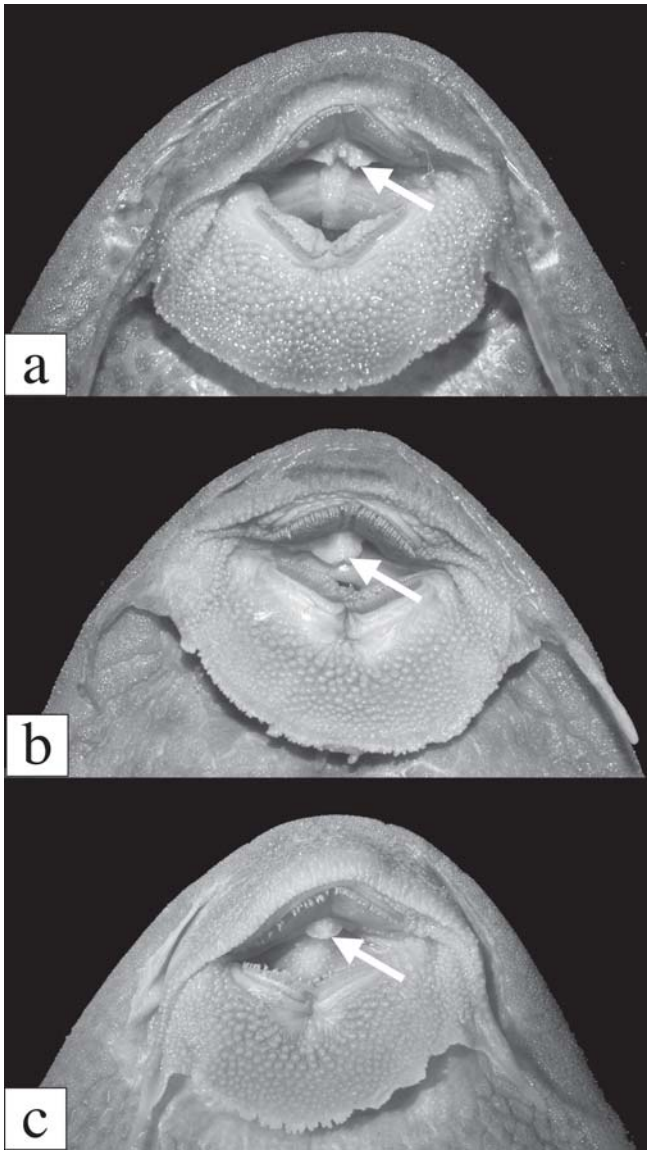

Fig. 1. Mouth and buccal papilla (indicated by arrow) of a. *Pterygoplichthys punctatus*, MCP 35755, 203.1 mm SL, b. *P. weberi*, FMNH 96959, holotype, 183.9 mm SL, c. *P. multiradiatus*, AUM 18947, 153.3 mm SL. Photos by J.W. Armbruster and L.M. Page.

7. Few spots on abdomen and base of fins. Lateral plates with long keel odontodes directed nearly perpendicular to body; longest keel odontodes in adult longer than lateral-line plates. Buccal papilla shallowly divided in adult. SL/cleithral width ratio 3.3-3.4 ..... *P. weberi* new species
7'. Many, small spots on abdomen and base of fins. Lateral plates with shorter keel odontodes directed posteriorly; longest keel odontodes in adult shorter than lateral-line plates. Buccal papilla deeply divided at all sizes. SL/cleithral width ratio 3.6-4.0 ..... *P. punctatus* Günther, 1864
8. Adult typically without hypertrophied odontodes on evertible cheek plates (some very large adults may have one or two very slightly elongated cheek odontodes). Usually 12-14 (occasionally 11) dorsal-fin rays. Occurring in the rio Amazonas, río Orinoco, and rio Paraná drainages 9
8.' Adult with hypertrophied odontodes on evertible cheek plates. Usually 10-11 (occasionally 12) dorsal-fin rays. Occurring in the rio São Francisco, río Magdalena, and lago Maracaibo drainages 13
9. Light spots on dark background. Ventral surface consisting of light and dark vermiculations with light vermiculations wider than dark vermiculations or with light spots on a dark background 10
9'.Dark spots on light background. Ventral surface with dark spots on light background or with light and dark vermiculations of same width or light vermiculations narrower than dark vermiculations 11
10. Abdomen usually with a complex network of light and dark vermiculations. Light areas on body wider than dark areas. Rio Paraná drainage .... *P. anisitsi* Eigenmann & Kennedy, 1903
10.' Abdomen with white spots usually separate, at most two to three combining. Light areas on body narrower than dark areas. Rio Tocantins drainage .... *P. joselimaianus* (Weber, 1991)
11. Dark spots discrete, never coalescing or forming dark chevrons on posterior half of body .... *P. multiradiatus* (Hancock, 1828)
11'.Dark spots often coalescing to form vermiculations and/or lines on abdomen and head and chevrons on caudal peduncle 12
12. Adults with a geometric pattern of light lines on head. Spots on abdomen of adults mostly discrete, usually no more than five spots coalescing to form short vermiculations. Lateral spots coalescing to form chevrons that outline the posterior border of the lateral plates (particularly strong ventrally posteriorly to the pectoral fin). Juveniles with chevrons laterally, abdominal spots separate ..... *P. pardalis* (Castelnau, 1855)
12'.Adults with spots and blotches on head and no geometric pattern of light lines. Nearly all spots on abdomen of adults coalescing to form vermiculations (spots may be separate in juveniles). Lateral spots usually separate, not forming chevrons. Juveniles with spots or blotches laterally ..... *P. disjunctivus* (Weber, 1991)
13. SL/HL = 2.7-3.0; SL/interdorsal length = 5.9-8.0. Occurring in the rio São Francisco of eastern Brazil .... *P. etentaculatus* (Spix & Agassiz, 1829)
13'.SL/HL = 3.0-3.4; SL/interdorsal length 4.9-5.8. Occurring west of the Andes in the río Magdalena and lago Maracaibo drainages 14
14. SL/HL = 3.0-3.3. Río Magdalena drainage ....**P. undecimalis* (Steindachner, 1878)
14'.SL/HL = 3.3-3.4. Lago Maracaibo drainage ....**P. zuliaensis* Weber, 1991

* Recent examination suggests that these measurements are not sufficient for separating these two species (JWA pers. obs.), but this must be examined in greater detail.

Pterygoplichthys punctatus Günther 1864

Fig. 2

Material Examined. Brazil, Mato Grosso. AUM 42928, 1, 166.9 mm SL and UF 148742, 2, 78.5-160.1 mm SL. MCP 35755, 1, 203.1 mm SL, Brazil, Mato Grosso, rio Bugre (rio Madeira drainage), about 42 km N of rio Guaporé on highway BR-174, 14°51'35"S, 059°17'57"W, 12 July 2004. MCP 35753, 3, 81.9-117.8 mm SL, creek, tributary of rio Novo which is tributary to rio Guaporé (rio Maderia drainage) on highway BR-174, 14°13'26"S, 59°41'27"W, 12 July 2004. MCP 35754, 2, 156.6-196.5 mm SL and MNRJ 28496, 1, 167.1 mm SL, creek, tributary of rio Pindaituba, circa 27 km N rio Guaporé on highway BR-174, 14°59'53"S, 59°17'10"W, 12 July 2004. ANSP 180225, 2, 160.0-183.3 mm SL, MCP 35756, 6, 131.3-196.5 mm SL, MNRJ 28497, 2, 165.8-184.1 mm SL, and UF 149606, 2, 154.3-177.2 mm SL, small river (tributary of the rio Guaporé) on highway BR-174, near Pontes e Lacerda and Comodoro, 14°55'15"S, 59°17'29"W, 12 July 2004. USNM 177716, 1, Brazil, rio Urubu, 1958. NMW 76587, 1 (Holotype, photographs provided by H. Wellendorf, not measured), rio Guaporé, Amazon system, San Vincente, rio Madeira drainage, Brazil, 8 January 1827, (= Arraial de São Vincente, a village that is no longer extant in northern Mato Grosso; Papavero, 1971 in Weber, 1992). Bolivia. ZMA 109.199, 1, 124.8 mm SL, south of Todos Santos, in pool of standing water, 8 August 1966.

Diagnosis. *Pterygoplichthys punctatus* can be separated from all other *Pterygoplichthys* except *P. weberi* by having the buccal papilla divided medially and lobulate (*vs.* entire and simple, Fig. 1, or lobulate but not divided medially). *Pterygoplichthys punctatus* can be separated from *P. weberi* by having the buccal papilla deeply divided at all ages (*vs.* shallowly divided in adult, more deeply divided in juvenile), by having many spots on the abdomen and the fin bases (*vs.* few spots), by having a narrower body (SL/cleithral width 3.6-4.0 *vs.* 3.3-3.4), and by having the lateral keel odontodes sloped posteriorly (*vs.* almost perpendicular to the plates) and shorter than the lateral-line plates (*vs.* longer than lateral-line plates in adult).

Pterygoplichthys punctatus can be further separated from *P. scrophus, P. gibbiceps, P. xinguensis, P. lituratus,* and *P. parnaibae* by lacking an elevated supraoccipital crest (*vs.* having an elevated supraoccipital forming an obvious crest

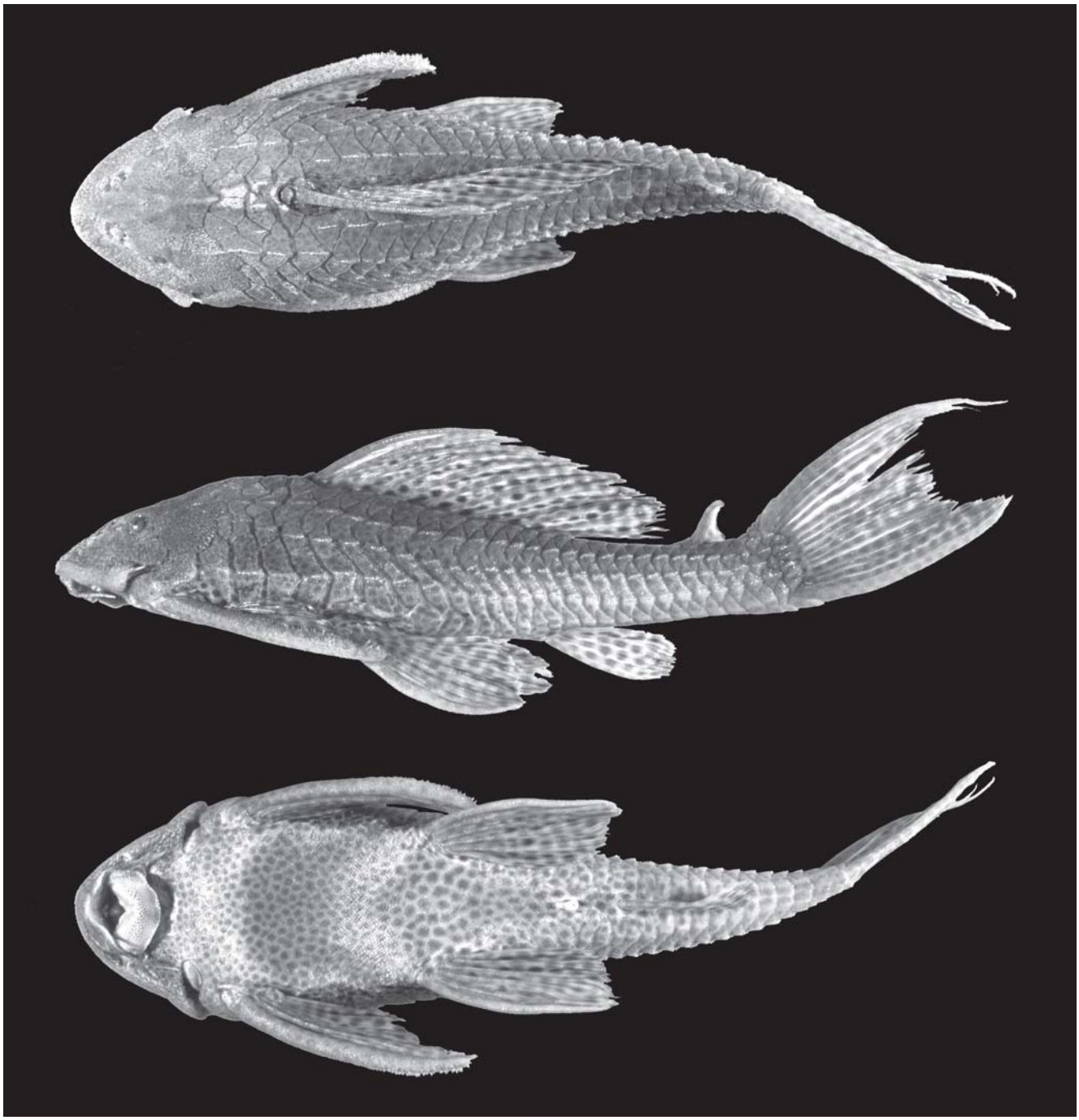

Fig. 2. Dorsal, lateral, and ventral views of *Pterygoplichthys punctatus*, MCP 35755, 203.1 mm SL. Photos by J.W. Armbruster.

higher than the plates in the nuchal region); from *P. etentaculatus* by having fewer than five hypertrophied odontodes on the cheek plates (*vs.* more than five); from *P. joselimaianus* by having dark spots (*vs.* light spots); from *P. undecimalis* and *P. zuliaensis* by having a broadly round snout (*vs.* a narrow pointed snout, Fig. 3); from *P. zuliaensis* by having a greater HL to interorbital width ratio (2.3-2.6 *vs.* 2.0-2.2); from *P. multiradiatus* by having usually 11 dorsal-fin rays (only 3 of 27 with 12 *vs.* 12-13 *fide* Weber, 1992); and from *P. anisitsi, P. disjunctivus, P. multiradiatus,* and *P. pardalis* by having hypertrophied odontodes on the cheek plates of the adult (*vs.* no hypertrophied cheek odontodes).

Description. Member of Hypostominae: Pterygoplichthyini: *Pterygoplichthys* as diagnosed by Armbruster (2004). Morphometric data given in Table 1. Largest specimen 205.1 mm SL. Head forming arch from tip of snout to anterior margin of supraoccipital. Supraoccipital and nuchal region forming hump. Body depth decreases from origin of dorsal fin to dorsal procurrent caudal spines, and then increases to caudal

Table 1. Selected morphometrics of *Pterygoplichthys punctatus* (N=27 except D/K, N=24) and *P. weberi* (N=11 except D/K, N=7). The letters refer to codes for measurements in Boeseman (1968).

	Pterygoplichthys punctatus						*Pterygoplichthys weberi*					
	Average ± SD			Range			Average ± SD			Range		
SL (mm)	145.7	±	43.3	77.6	-	205.1	149.6	±	42.7	86.6	-	196.9
SL/Predorsal L. (SL/D)	2.46	±	0.1	2.29	-	2.65	2.38	±	0.06	2.30	-	2.52
SL/HL (SL/E)	3.2	±	0.17	2.89	-	3.42	3.15	±	0.24	2.74	-	3.65
SL/Cleithral W. (SL/F)	3.72	±	0.16	3.5	-	3.9	3.32	±	0.1	3.09	-	3.42
HL/Cleithral W. (E/F)	1.16	±	0.03	1.11	-	1.21	1.06	±	0.06	0.94	-	1.17
HL/Head D. (E/G)	1.44	±	0.07	1.35	-	1.56	1.41	±	0.09	1.27	-	1.55
HL/Snout L. (E/H)	1.92	±	0.08	1.82	-	2.02	1.88	±	0.08	1.80	-	2.04
HL/Orbit Dia. (E/I)	7.61	±	0.59	6.71	-	8.68	6.98	±	0.59	5.72	-	7.56
HL/Interorbital W. (E/J)	2.36	±	0.08	2.19	-	2.44	2.48	±	0.11	2.36	-	2.71
Predorsal L./Dorsal Spine L. (D/K)	1.47	±	0.06	1.41	-	1.55	1.51	±	0.26	1.25	-	1.93
SL/Dorsal Base L. (SL/L)	2.91	±	0.1	2.79	-	3.08	2.79	±	0.10	2.62	-	2.91
SL/Interdorsal L. (SL/M)	6.57	±	0.63	5.75	-	7.56	7.17	±	1.09	5.69	-	9.58
SL/Thorax L. (SL/N)	4.06	±	0.09	3.97	-	4.18	3.94	±	0.30	3.47	-	4.38
SL/Pectoral Spine L. (SL/O)	3.23	±	0.15	3.05	-	3.56	3.09	±	0.16	2.85	-	3.38
SL/Abdominal L. (SL/P)	4.24	±	0.17	3.97	-	4.48	4.08	±	0.22	3.78	-	4.51
SL/Pelvic Spine L. (SL/Q)	3.72	±	0.19	3.56	-	4.11	3.7	±	0.30	3.3	-	4.15
SL/Postanal L. (SL/R)	2.97	±	0.13	2.76	-	3.19	3.16	±	0.21	2.9	-	3.53
Interdorsal L./Caudal Peduncle D. (M/S)	1.63	±	0.14	1.42	-	1.86	1.26	±	0.20	0.93	-	1.49
Postanal L./Caudal Peduncle D. (R/S)	3.61	±	0.3	3.23	-	4.07	2.82	±	0.38	2.32	-	3.45

fin. Ridge from anterodorsal corner of orbit runs ventral to nares, ending slightly anteroventral of anterior nare. Crest continuing posteriorly from supraorbital ridge with portion on sphenotic and pterotic bent strongly dorsally, posterior portion on pterotic angled dorsally, continuous with keel of mid-dorsal plate series. Dorsal rim of orbit slightly higher than interorbital space.

Keels on lateral plates prominent, formed of ridges of bone and slightly hypertrophied odontodes. Keels present on all plate rows. One or two plates forming short, accessory row between dorsal and mid-dorsal plate series near head; keel on accessory plate row contiguous with but widely separated from keel on dorsal plate series beginning posteriorly to origin of dorsal fin. Keel on anterior plates of dorsal series beginning at midline just anteriorly to posterior margin of supraoccipital, angled to lateral edge of nuchal plate. Ridge on pterotic contiguous with keel on anterior three plates of mid-dorsal plate series; keel on remaining plates of mid-dorsal plate series ventral to that of keel on anterior three plates.

Nares separated by short flap of skin held erect in life.

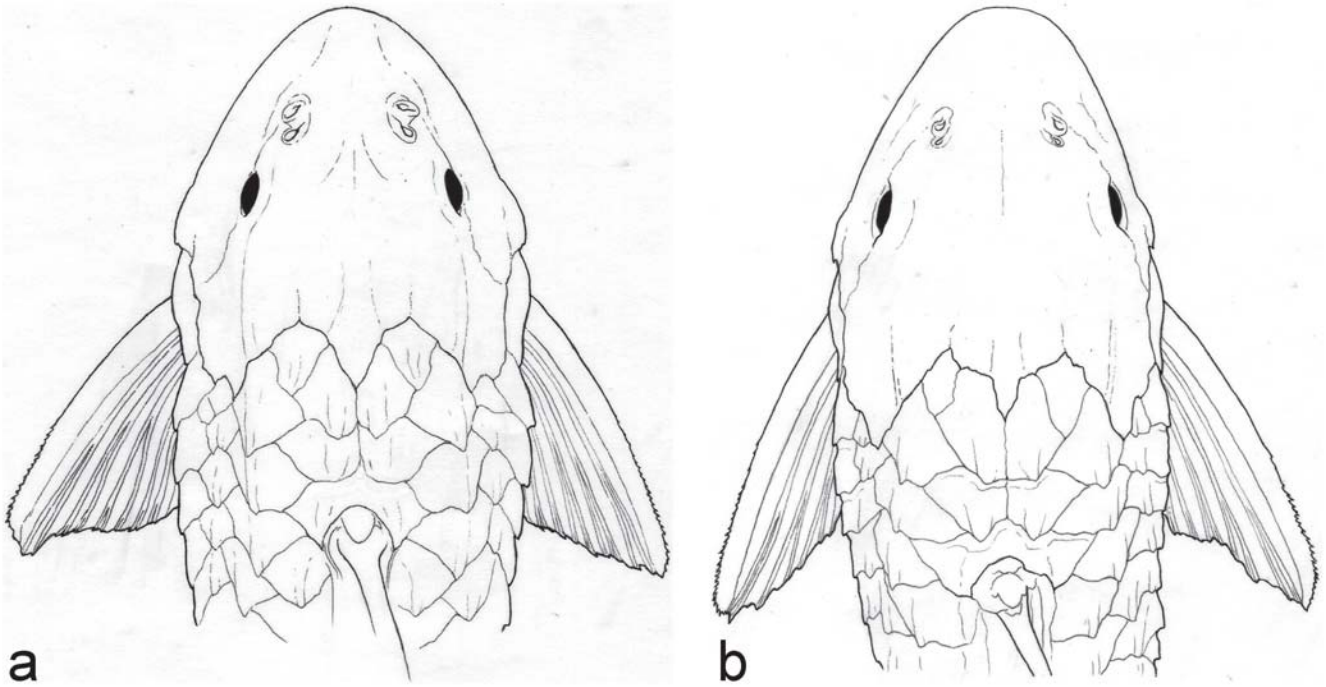

Fig. 3. Dorsal profiles of snouts of a. *Pterygoplichthys punctatus*, UF 148742, 160.1 mm SL and b. *P. zuliaensis*, AUM 22586, 222.0 mm SL.

Dorsal, mid-dorsal, median and mid-ventral plate rows complete from head to caudal fin. Ventral plate row begins posteriorly to insertion of pelvic fin and continues to caudal fin. Base of caudal fin covered in elongate, roughly triangular plates. Ventral surface of body (except region dorsal to pectoral fin and ventral to mid-ventral plate row) covered in small plates. Plates on abdomen increase in number with standard length. Head covered in small plates. Frontal, nasal, sphenotic, infraorbitals, pterotic-supracleithrum, suprapreopercle, and supraoccipital supporting odontodes. Opercle with small patch of odontodes in juvenile, none in adult. Platelets covering anteroventral corner of opercle separated from opercle; platelets may be everted to approximately 90° from head. Evertible cheek plates with zero to three slightly hypertrophied odontodes (largest extending approximately to posterior end of opercle).

Dorsal fin long and low in adult, higher in juvenile, consisting of small, V-shaped spinelet, fairly strong spine, usually 11 dorsal-fin rays (three of 27 with 12); adpressed dorsal fin does not reach adipose fin. Caudal fin forked, lower lobe longer than upper. Pectoral-fin spine strong, reaches posteriorly to pelvic-fin rays when depressed ventral to pelvic fin; cleithrum with exposed process dorsal to pectoral-fin rays and strongly angled dorsally; pectoral fin inserted on same plane as pelvic fin such that spine, when depressed parallel with body, lies on top of and in contact with pelvic fin. Pelvic-fin spine thin, flexible, reaches barely to base of anal fin. Anal fin with relatively strong, unbranched first ray supporting odontodes. Adipose fin consisting of single median preadipose plate and strong, pointed spine; adipose-fin membrane not reaching procurrent caudal-fin spines. Dorsal fin II,11, pectoral fin I,6, pelvic fin I,5, anal fin I,4, caudal fin usually I,14,I (one specimen I,13,I). Jaws weakly angled, dentaries forming angle of approximately 90º. Teeth bicuspid, median cusp short, lateral cusp about half length of median cusp, stalk moderately long; 20-36 dentary teeth, 19-38 premaxillary teeth. Median plates 26-29 (mode 28), adipose-caudal plates four to six (mode five), anal-caudal plates 11-13 (mode 12), dorsal-adipose plates five to seven (mode six). Buccal papilla lobulate and divided medially (Fig. 1a).

Color in alcohol. Body and fins light brown to gray and covered with black spots. Spots smallest on snout, progressively larger to caudal peduncle; spots on fins nearly as large as eye. Venter covered with discrete (uncoalesced) spots; spots smallest on throat and becoming progressively larger to interpelvic area. Spots proportionally larger and more distinct on juvenile. Caudal peduncle lighter ventrally than dorsally.

Range. Known from the rio Madeira drainage and the rio Urubu of Brazil (Fig. 4). Weber (1992) additionally notes localities in the rio Purus and the rio Tocantins basin; however, we did not confirm these identifications. Also, not all specimens available to Weber (1991, 1992) from the upper Amazon were available to us, and their identity needs to be verified.

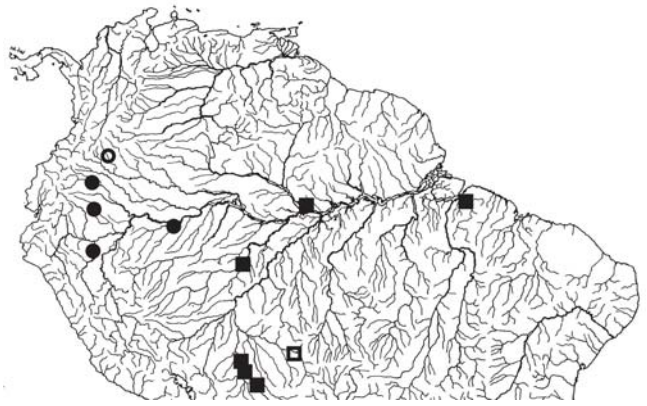

Fig. 4. Localities for *Pterygoplichthys punctatus* (squares) and *P. weberi* (dots). Open symbols are type localities. Localities for *P. punctatus* from Weber (1992) and specimens examined in this study. Because the rio Urubu locality of *P. punctatus* did not have precise locality information, the locality is indicated at random in the lower Urubu. Base map by M. J. Weitzman.

Pterygoplichthys weberi, new species

Fig. 5

Holotype. ICNMHN 13455, holotype, 191.4 mm SL, Colombia, Caquetá, Florencia, Río Caqueta drainage, Laguna El Vaticano, August 2004, no collector.

Paratypes. FMNH 96959, 3 alc., 1 cs. 166.5-196.0 mm SL, Ecuador, Napo, quebrada to Río Tiputini, (Río Napo drainage), D. Stewart, M. Ibarra, and R. Barriga, 29 October 1981. MSU 2736.2, 1, 196.9 mm SL. Ecuador (no precise locality given). FMNH 101378, 1, 110.5 mm SL, Colombia, Amazonas, Amazon River at 2 to 3 miles upstream from Leticia, Navarro, Thomerson, *et al*., 13 November 1973. USNM 177204, 1, 172.8 mm SL, Ecuador, Chichinota, on left bank of Bobonaza River, 2°22'S, 76°38'W, R. Olalla, January 1949.

Non-types. CAS 56746, 2, 86.6-137.0 mm SL and USNM 86761, 101.7-102.8 mm SL, Peru, Loreto, Yurimaguas creeks, W.R. Allen, November 1920.

Diagnosis. *Pterygoplichthys weberi* can be separated from all other *Pterygoplichthys* except *P. punctatus* by having the buccal papilla at least shallowly divided medially; and from all other *Pterygoplichthys* by having the lateral keel odontodes almost perpendicular to the plates (*vs.* sloped posteriorly) and by having the longest keel odontodes longer than the plates in the lateral-line row in the adult. *Pterygoplichthys weberi* can be further separated from *P. punctatus* by having the buccal papilla partially divided in the adult (*vs.* fully divided at all ages; Fig. 1), by having few spots on the abdomen and the bases of the fins (*vs.* many spots), and by having a wider body (SL/cleithral width 3.3-3.4 *vs.* 3.6-4.0).

Pterygoplichthys weberi can be further separated from *P. scrophus, P. gibbiceps, P. joselimaianus, P. xinguensis, P. lituratus,* and *P. parnaibae* by lacking an elevated supraoc-

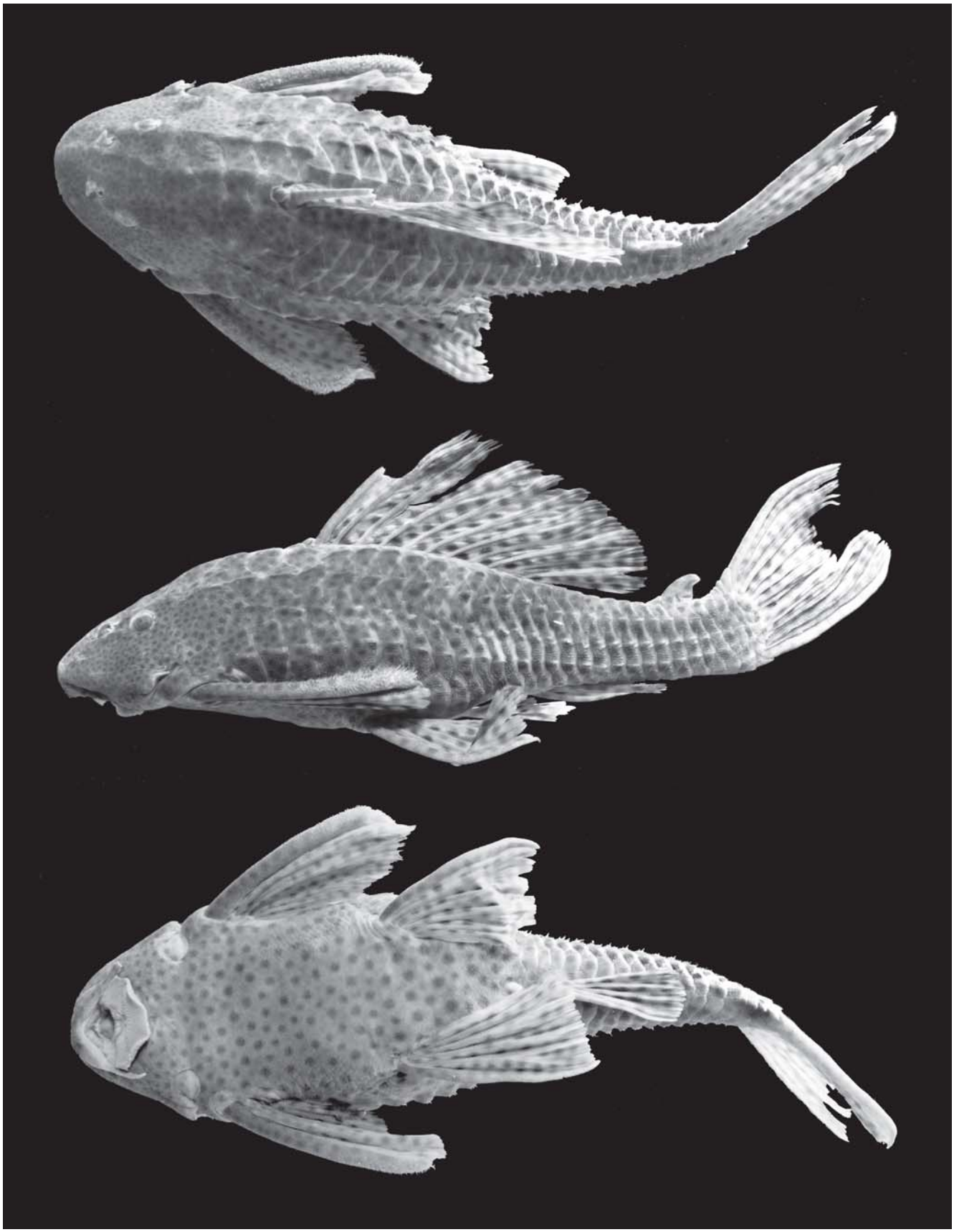

Fig. 5. Dorsal, lateral, and ventral views of *Pterygoplichthys weberi*, ICNMHN 13455, holotype, 191.4 mm SL. Photos by J.W. Armbruster and M. Arce.

cipital (*vs.* having an elevated supraoccipital forming an obvious crest); from *P. etentaculatus* by having fewer than five hypertrophied odontodes on the cheek plates (*vs.* more than five); from *P. joselimaianus* by having dark spots (*vs.* light spots); from *P. undecimalis* and *P. zuliaensis* by having a broadly round snout (*vs.* a narrow pointed snout, Fig. 3); from *P. multiradiatus* by usually having 11 dorsal-fin rays (occasionally 12 *vs.* 12-13 *fide* Weber, 1992); and from *P. anisitsi, P. disjunctivus, P. multiradiatus,* and *P. pardalis* by having hypertrophied odontodes on the cheek plates of the adult (*vs.* hypertrophied cheek odontodes absent).

Description. Member of Hypostominae: Pterygoplichthyini: *Pterygoplichthys* as diagnosed by Armbruster (2004). Morphometric data given in Table 1. Largest specimen 196.9 mm SL. Head forming arch from tip of snout to anterior margin of supraoccipital. Supraoccipital and nuchal region forming hump. Body depth decreases from origin of dorsal fin to dorsal procurrent caudal spines, and then increases to caudal fin. Ridge from anterodorsal corner of orbit runs ventral to nares, ending slightly anteroventral of anterior nare. Crest continuing posteriorly from supraorbital ridge with portion on sphenotic and pterotic bent strongly dorsally, posterior portion on pterotic angled dorsally, continuous with keel of mid-dorsal plate series. Dorsal rim of orbit slightly higher than interorbital space.

Keels on lateral plates prominent, formed of ridges of bone and hypertrophied, thick, very sharp odontodes. Keels present on all plate rows. One or two plates forming short, accessory row between dorsal and mid-dorsal plate series near head; keel on accessory plate row contiguous with but widely separated from keel on dorsal plate series beginning posteriorly to origin of dorsal fin. Keel on anterior plates of dorsal series beginning at midline just anteriorly to posterior margin of supraoccipital, angled to lateral edge of nuchal plate. Ridge on pterotic contiguous with keel on anterior three plates of mid-dorsal plate series; keel on remaining plates of mid-dorsal plate series ventral to that of keel on anterior three plates.

Nares separated by short flap of skin held erect in life. Dorsal, mid-dorsal, median and mid-ventral plate rows complete from head to caudal fin. Ventral plate row begins posteriorly to insertion of pelvic fin and continues to caudal fin. Base of caudal fin covered in elongate, roughly triangular plates. Ventral surface of body (except region dorsal to pectoral fin and ventral to mid-ventral plate row) covered in small plates. Plates on abdomen increase in number with standard length. Head covered in small plates. Frontal, nasal, sphenotic, infraorbitals, opercle, pterotic-supracleithrum, suprapreopercle, and supraoccipital supporting odontodes. Platelets covering anteroventral corner of opercle separated from opercle; platelets may be everted to approximately 90° from head. Evertible cheek plates with zero to four slightly hypertrophied odontodes (largest extending approximately to posterior end of opercle).

Dorsal fin long and low in adult, higher in juvenile, consisting of small, V-shaped spinelet, fairly strong spine, and 11-12 rays; adpressed dorsal fin does not reach adipose fin. Caudal fin forked, lower lobe longer than upper. Pectoral-fin spine strong, reaches posteriorly to pelvic-fin rays when depressed ventral to pelvic fin; cleithrum with exposed process dorsal to pectoral-fin rays and strongly angled dorsally; pectoral fin inserted on same plane as pelvic fin such that spine, when depressed parallel with body, lies on top of and in contact with pelvic fin. Pelvic-fin spine thin, flexible, reaches barely to base of anal fin. Anal fin with relatively strong, unbranched first ray supporting odontodes. Adipose fin consisting of median unpaired preadipose plate and strong, pointed spine; adipose-fin membrane not reaching procurrent caudal-fin spines. Pectoral fin I,6, pelvic fin I,5, anal fin I,4, caudal fin I,14,I. Jaws weakly angled, dentaries forming angle of approximately 90º. Teeth bicuspid, median cusp short, lateral cusp about half length of median cusp, stalk moderately long; 26-31 dentary teeth, 23-30 premaxillary teeth. Median plates 27-28 (mode 28), adipose-caudal plates three to five (mode four), anal-caudal plates 11-12 (mode 12), dorsal-adipose plates six to seven (mode seven). Buccal papilla lobulate and divided medially in juvenile, but only slightly bifurcated in adult (Fig. 1b).

Color in alcohol. Body and fins brown and covered with medium to large black spots. Spots smallest on snout, progressively larger posteriorly, sometimes fading on caudal peduncle. Venter covered with discrete (uncoalesced) spots; spots smallest on throat and becoming progressively larger to interpelvic area. Spots proportionally larger on juvenile. Caudal peduncle lighter ventrally than dorsally. Four faint dorsal saddles; first under anterior rays of dorsal fin, second under last few rays of dorsal fin and slightly posteriorly, third under adipose fin and anteriorly to fin, and fourth at base of caudal peduncle.

Range. Known from the Río Marañon, Río Ucayali, Río Caquetá, and upper Río Amazonas drainages of Colombia, Ecuador, and Peru (Fig. 4).

Etymology. Named for Claude Weber of the Muséum d'histoire naturelle, Geneva, for his fine work on *Pterygoplichthys* and his contributions to loricariid systematics.

Discussion

Pterygoplichthys punctatus and *P. weberi* can be diagnosed from all other hypostomines examined by the presence of a complex and bifurcated buccal papilla. The function of the buccal papilla is unknown, but the structure is widely variable, and sometimes absent, in loricariids (Armbruster & Page, 1996; Armbruster, 2003). The rugose texture of the buccal papilla suggests that it is covered in taste buds and func-

tions as an accessory sensory organ. In some juvenile specimens, the buccal papilla has not yet developed its rugose condition, and an ontogenetic change takes place in *P. weberi* in which the juvenile has a deeply divided buccal papilla, and the adult has a shallowly divided papilla.

Pterygoplichythys weberi is easily diagnosable from *P. punctatus* by color, buccal papilla condition, and keel odontodes. It also appears to be wider than *P. punctatus*, as expressed by SL/cleithral width; however, only 11 individuals of *P. weberi* were available for examination, and additional data are needed on body shape.

Pterygoplichthys punctatus is most similar in color pattern to *P. multiradiatus* from the Orinoco; however, adult *P. multiradiatus* never develop hypertrophied odontodes on the cheek and lack the bifurcated buccal papilla. The color pattern of *P. punctatus* is similar also to that of the trans-Andean *P. undecimalis* and *P. zuliaensis*, and to that of *P. etentaculatus* from the São Francisco, but these species differ in body shape and distribution of odontodes as described above.

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