

## Four New *Hypancistrus* (Siluriformes: Loricariidae) from Amazonas, Venezuela

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*Hypancistrus contradens*, *H. debilittera*, *H. furunculus*, and *H. lunaorum* are described based on specimens from the upper Río Orinoco of southern Venezuela. *Hypancistrus furunculus* differs from other *Hypancistrus* based on color pattern: distinct dark oblique stripes ending at posterior insertion of dorsal fin and vertical bands in caudal fin (vs. oblique stripes ending at end of caudal fin in *H. zebra* and thin, indistinct, light-colored bands and vermiculations on a dark background in *H. debilittera*) and color pattern dark with white spots in *H. contradens*, *H. inspector*, and *H. lunaorum*. *Hypancistrus contradens* and *H. lunaorum* differ from *H. inspector* by having the dorsal fin reaching the adipose fin when adpressed (vs. not reaching), having spots on the head the same size as the body or spots absent (vs. spots smaller on head) and by usually having 22–23 mid-ventral plates (vs. 24); and from *H. debilittera*, *H. furunculus*, and *H. zebra* by lacking bars, saddles, or stripes on the body and bands in the fins. *Hypancistrus lunaorum* differs from *H. contradens* by having white spots on the body smaller than nasal aperture diameter (vs. white spots larger than the nasal aperture diameter).

Se describen como especies nuevas a *Hypancistrus contradens*, *H. debilittera*, *H. furunculus*, e *H. lunaorum* sobre la base de especímenes provenientes de la cuenca alta del río Orinoco en el sur de Venezuela. *Hypancistrus furunculus* difiere de todas las demás especies de *Hypancistrus* por su patrón de coloración: barras oscuras oblicuas en el cuerpo que terminan al nivel del punto posterior de la base de la aleta dorsal y bandas verticales en la aleta caudal (vs. barras oblicuas oscuras terminando en el borde posterior de la aleta caudal en *H. zebra* y barras delgadas, indistintas y de color claro con manchas irregulares vermiformes sobre un color base oscuro en *H. debilittera*) y patrón de coloración con puntos blancos en *H. contradens*, *H. inspector*, e *H. lunaorum*. *Hypancistrus contradens* e *H. lunaorum* difieren de *H. inspector* en que la aleta dorsal alcanza la aleta adiposa cuando esta plegada contra el cuerpo (vs. aleta dorsal que no alcanza la adiposa), los puntos de la cabeza son del mismo tamaño de los puntos del cuerpo, o carece de puntos (vs. puntos de la cabeza mas pequeños que los puntos del cuerpo) y en tener usualmente 22–23 placas medioventrales (vs. 24); estas especies difieren de *H. debilittera*, *H. furunculus*, e *H. zebra* en que tienen barras, manchas en forma de silla de montar o franjas en el cuerpo y bandas en las aletas. *Hypancistrus lunaorum* difiere de *H. contradens* en que los puntos blancos del cuerpo son más pequeños que el diámetro de la apertura nasal (vs. puntos blancos más grandes que el diámetro de la apertura nasal).

**H**YPANCISTRUS and its type species, *H. zebra*, were described by Isbrücker and Nijssen (1991) for a uniquely pigmented loricariid catfish from the Rio Xingu, Brazil. *Hypancistrus zebra* has black and white oblique stripes on the body and a patch of black pigment in the shape of an *E* on the snout with the central branch of the *E* located mid-dorsally, the top and bottom branches located just lateral to the nares, the three branches extending anteriorly, and the main stem of the *E* running transversely centered on the nares (hereafter this mark will be referred to as an *E* on the snout). Also used to diagnose the fish was the presence of larger, fewer teeth in the dentary than in the premaxilla. Armbruster (2002) diagnosed and expanded the genus to include a second species, *Hypancistrus inspector*,

with similar tooth morphology, but with a color pattern consisting of a dark background and white spots. During recent collecting trips, four undescribed species of *Hypancistrus* were collected in Amazonas, Venezuela (Fig. 1).

*Hypancistrus* is a member of the tribe Ancistrini of the Hypostominae (Armbruster, 2004). *Hypancistrus* was diagnosed by the presence of a wide anterior separation between the metapterygoid and the lateral ethmoid, a sharply angled adductor palatini crest, and loss of the lateral wall of the metapterygoid channel (Armbruster, 2002). Despite having two unique synapomorphies and one other strong synapomorphy, *Hypancistrus* was not found to be monophyletic (Armbruster, 2004); however, a reanalysis of Armbruster's data with three of the species

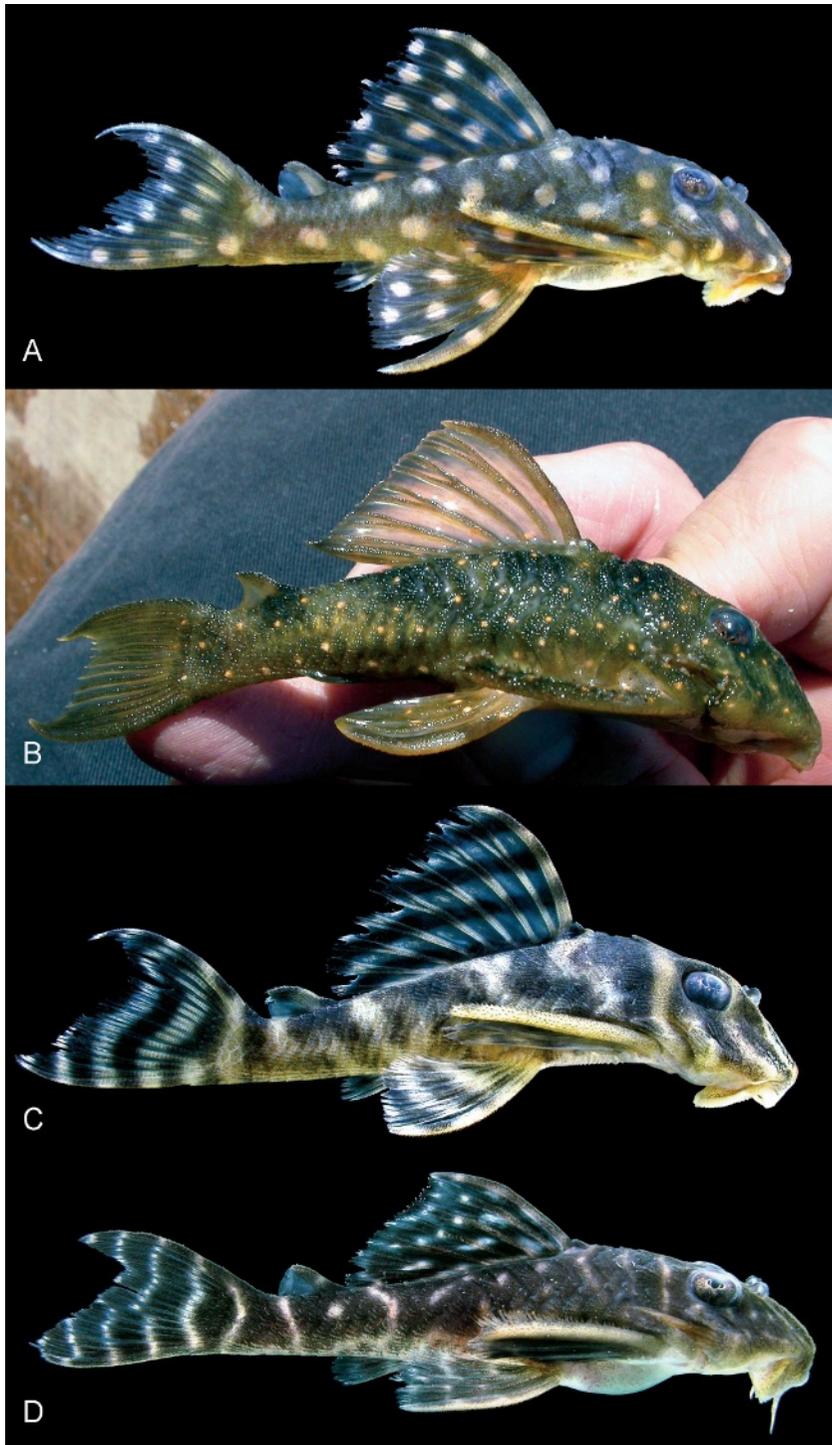


Fig. 1. Live photos of (A) *Hypancistrus inspector*, MCNG 54657, paratype, 60.0 mm SL, (B) *H. lunaorum*, AUM 39247, paratype, 73.7 mm SL, (C) *H. furunculus*, AUM 39225, paratype, 64.5 mm SL, and (D) *H. debilitata*, AUM 42136, paratype, 61.3 mm SL. Photos by M. H. Sabaj.

described herein does retrieve a monophyletic *Hypancistrus* (Armbruster, pers. obs.). Externally, *Hypancistrus* can be distinguished from other similar hypostomines by having the dentary teeth about twice as long as the premaxillary teeth (vs. dentary and premaxillary teeth of approximately equal length). Among the four new species described herein, the pattern on *H. furunculus*, new species, is similar to *H. zebra* with the presence of bold, oblique stripes on the body and a bold, black or dark gray *E* on the snout. The pattern on *H. debilittera*, new species, diverges from this by being inconsistently banded with narrow light-colored bars and broken lines or vermiculations on a dark background. Most individuals of *H. debilittera* lack the dark *E* anterior to the eyes that is diagnostic for *H. furunculus* and *H. zebra*.

Two other species are similar to *Hypancistrus inspector* except that both have the dorsal fin reaching the adipose fin when adpressed (vs. not reaching in *H. inspector*) and by having all of the spots uniform in size (vs. spots on head smaller). These two new species (*H. contradens* and *H. lunaorum*) differ from one another by the size of their spots (large in *H. contradens* and small in *H. lunaorum*). An examination of nearly all of the types and all of the species descriptions of members of the Ancistrini similar in morphology to *Hypancistrus* reveals that no described species fits the specimens of the *Hypancistrus* collected. In this manuscript, *H. contradens*, *H. debilittera*, *H. furunculus*, and *H. lunaorum* are described. In addition, the etymology (that was excluded in the original description) is provided for *H. inspector*.

#### MATERIALS AND METHODS

Methods follow Armbruster (2003). Institutional abbreviations are as listed in Leviton et al. (1985). Two additional counts were made: mid-dorsal plates are the number of plates in the mid-dorsal plate series, and mid-ventral plates are the number of plates in the mid-ventral plate series (plate row names based on Schaefer, 1991). Names of skeletal characteristics are as in Schaefer (1987). The nasal aperture is defined as the fleshy area that surrounds and includes the nares; it represents the dorsal opening of the nasal capsule. The dorsal flap of the iris is termed the iris operculum based on Douglas et al. (2002). Most specimens were collected with a three-meter by two-meter seine, but some specimens were also collected by hand from holes in rocks and via rotenone. The following abbreviations are used in the text: CS = cleared and stained, D. = distance, Dia. = diameter, Dp.

= depth, dr. = drainage, nm. = not measured, L. = length, W. = width.

#### *Hypancistrus contradens*, new species

Figures 1A, 2

*Holotype*.—MCNG 54656, 84.9 mm SL, Venezuela, Amazonas, Río Ventuari, 23 km NE Macuruco, 94 km E San Fernando de Atabapo, 04°04'50"N, 066°51'31"W, 5 April 2004, N. K. Lujan, D. C. Werneke, M. H. Sabaj, L. S. de Souza, and O. León Mata.

*Paratypes*.—All collections Venezuela, Amazonas: AUM 37978, 3, 43.2–49.9 mm SL, Río Guapuchi, first major riffle complex, Río Ventuari dr., 04°07'00"N, 066°46'00"W, 16 April 2003, N. K. Lujan and O. León Mata; AUM 39241, 3, 2 CS, 38.1–72.4 mm SL, ANSP 180237, 3, 43.7–63.7 mm SL, MCNG 54657, 2, 60.0–60.9 mm SL, same data as holotype; AUM 39873, 3, nm., 13.5–16.4 mm SL, Río Ventuari at mouth of Caño Camoni, 145 km NNE Macuruco, 189 km NE San Fernando de Atabapo, 05°03'21"N, 066°19'39"W, 8 April 2004, M. H. Sabaj, N. K. Lujan, D. C. Werneke, L. S. de Souza, and O. León Mata; AUM 42097, 13, nm., 39.9–57.1 mm SL, Río Orinoco, beach and bedrock outcropping, 50 km E of San Fernando de Atabapo, 03°58'13"N, 067°15'18"W, 2 March 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, M. Arce, R. Betancur, and T. E. Wesley; AUM 42106, 47 (42 nm.), 34.1–58.3 mm SL, Río Orinoco, 50 km E of San Fernando de Atabapo, 03°58'02"N, 067°15'12"W, 3 March 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, and M. Arce; AUM 42142, 3, 53.2–80.3 mm SL, Río Ventuari, 163 km SE Samariapo, 04°03'26"N, 066°55'57"W, 1 April 2005, N. K. Lujan, M. Arce, T. E. Wesley, E. L. Richmond, and M. B. Grant; AUM 42170, 6, nm., 44.5–55.6 mm SL, Río Orinoco, 60 km E of San Fernando de Atabapo, 03°58'26"N, 067°09'59"W, 3 March 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, and M. Arce; AUM 42190, 1, nm., 22.8 mm SL, Río Orinoco, Isla Maraya, Punto de Maraya, 80.8 km W of San Fernando de Atabapo, 04°01'23"N, 066°58'19"W, 31 March 2005, N. K. Lujan, M. Arce, M. B. Grant, E. L. Richmond, and T. E. Wesley; AUM 42206, 68 (58 nm.), 23.8–77.7 mm SL, Río Ventuari, near ornamental fish market in the river, 04°04'32"N, 066°53'34"W, 3 April 2005, N. K. Lujan, M. Arce, E. L. Richmond, M. B. Grant, and T. E. Wesley; FMNH 106009, 9, 1 CS, (5 measured), 48.8–61.2 mm SL, pool behind beach of Río Ventuari on south side of river ca. 0.5 hr (ca. 12 km) above mouth in Río Orinoco Laguna Laguna Pavon, 04°04'N, 066°56'W, 24 Jan. 1991, B. Chernoff, A. and D. Machado, and J. Wheeler; FMNH 106010, 1, 54.1 mm SL, Río

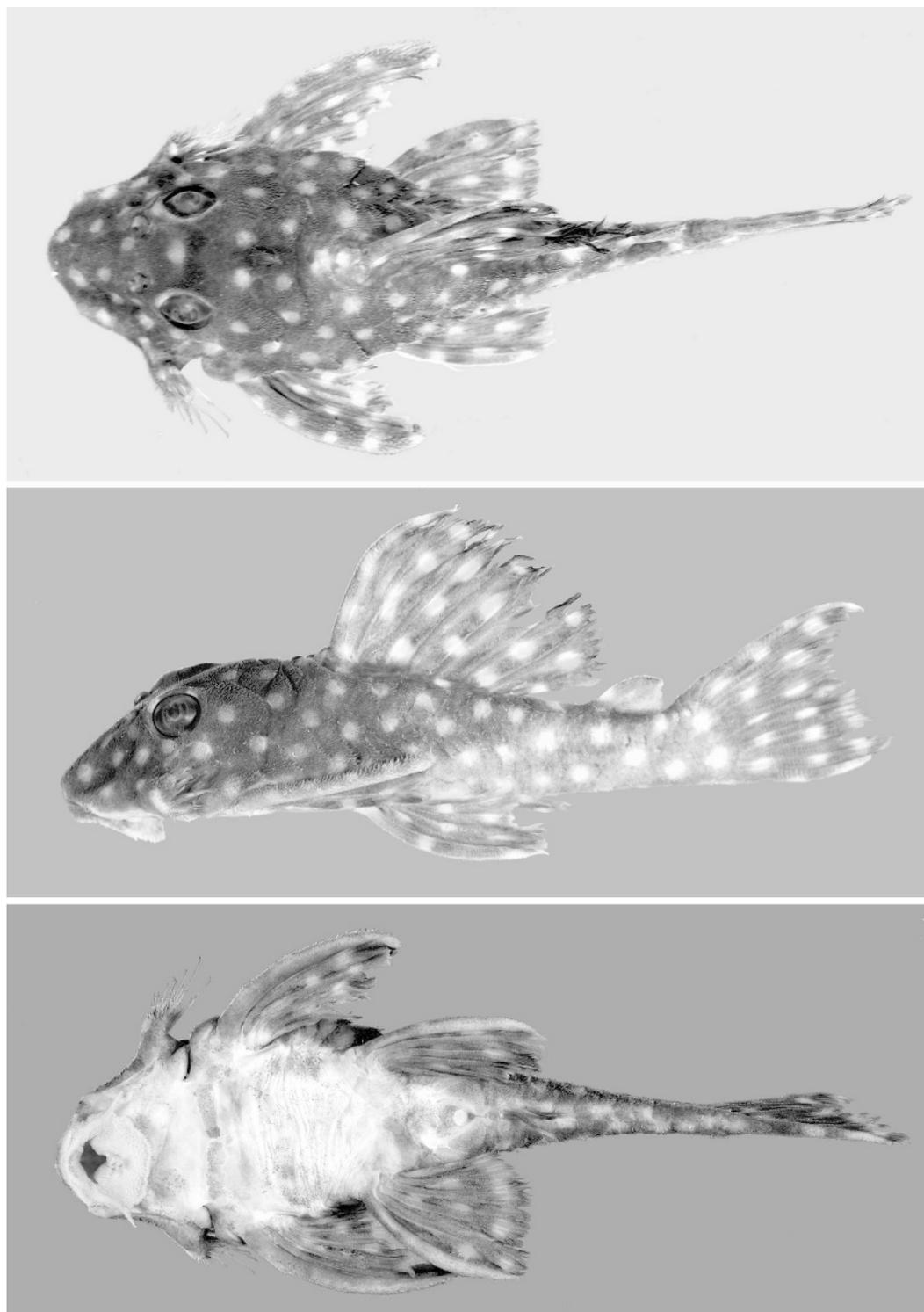


Fig. 2. Dorsal, lateral, and ventral views of *Hypancistrus contradens*, new species, holotype, MCNG 54656, 84.9 mm SL. Photos by J. W. Armbruster.

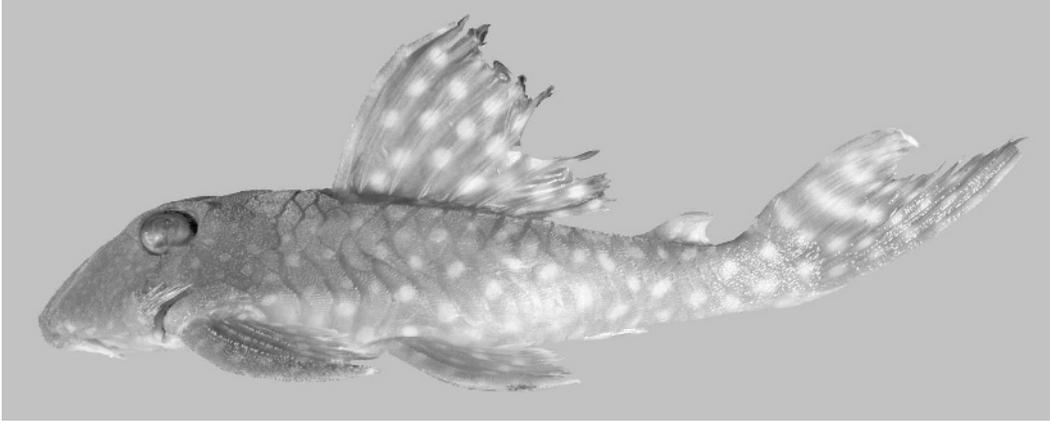


Fig. 3. Lateral view of *Hypancistrus inspector*, paratype, MCNG 37040, 110.7 mm SL. Photo by J. W. Armbruster.

Orinoco ca. 5 h above Atabapo by falca, at rocks and beach, 23 Jan. 1991, B. Chernoff, A. and D. Machado, and J. Wheeler; FMNH 106012, 6, 1 CS, 30.7–53.9 mm SL, Venezuela, Amazonas, rocks and rapids in Río Orinoco at Isla Cupaven, 29 Jan. 1991, A. Machado, B. Chernoff, D. Machado, and J. Wheeler.

*Non-type material.*—AUM 39234, 2, 47.9–48.0 mm SL, Venezuela, Amazonas, Río Ventuari, beach across the river from Picua Village, 34 km ENE Macuruco, 104 km E San Fernando de Atabapo, 04°06'55"N, 066°45'52"W, 5 April 2004, M. H. Sabaj, N. K. Lujan, D. C. Werneke, L. S. de Souza, and O. León Mata.

*Diagnosis.*—*Hypancistrus contradens* can be distinguished from *H. debilitera*, *H. furunculus*, and *H. zebra* by having a dark background with white spots (vs. presence of oblique lines or vermiculations); from *H. lunaorum* by having the spots larger than the nasal aperture diameter (vs. spots smaller than the nasal aperture diameter or absent); and from *H. inspector* (Fig. 3) by having the adpressed dorsal fin reaching the adipose-fin spine (vs. not reaching), the spots on the head the same size as the rest of the body (vs. much smaller on the head), the spots on the caudal fin all free (vs. spots in the upper lobes combining to form bands), and 22–23 (only one of 29 with 24) plates in the mid-ventral series (vs. 24).

*Description.*—All counts  $n = 29$  unless otherwise stated. Morphometrics given in Table 1. Largest specimen examined 85.9 mm SL. Ventral surface from anus to head largely naked in adults, few small platelets located in skin ventral to pectoral girdle, and occasionally some small platelets located along lateral edges of pectoral girdle and

in line connecting the posterior insertion of pectoral fin to anterior insertion of pelvic fin. Lateral plates unkeeled except ventral plate row with moderately elongate odontodes forming one or two keel-like rows on caudal peduncle, and mid-ventral plate row bent above pectoral girdle forming ridge. Cheek plates with 28–58 ( $n = 9$ ) hypertrophied odontodes, longest odontode reaching almost to posterior edge of cleithrum; cheek odontodes and supporting plates evertible at an angle greater than 75° from head. Frontal, infraorbitals, nasal, preopercle, pterotic-supracleithrum, and suprapreopercle supporting odontodes. Adults without odontodes on the opercle; juveniles occasionally with a few (<4).

Caudal fin emarginate, lower lobe longer than upper. Ventral surface flat. Head tall with horizontal distance between anterior of eye and tip of snout short. Head with steep angle from tip of snout to anterior margin of eye. Body depth from anterior margin of eye to maximum depth at anterior insertion of dorsal fin increasing little. Body depth gradually decreases from anterior dorsal-fin insertion to posterior adipose-fin insertion; body depth increases slightly from posterior adipose-fin insertion to insertion of upper caudal-fin spine.

Superorbital crest raised slightly. Orbital opening oriented approximately 45° from sagittal plane. Interorbital isthmus between superorbital crests flat. Supraoccipital crest slightly elevated in mature individuals, flush with surrounding plates in sub-adults and juveniles. Eye large (Table 1) with well-developed iris operculum. Gill opening restricted in *L*-conformation, with two-thirds of opening vertical and opening laterally, and one-third horizontal and opening ventrally.

Dorsal-fin spine short (Table 1); dorsal fin reaching preadipose plate when depressed. De-

TABLE 1. SELECTED MORPHOMETRIC FEATURES OF *Hypancistrus contradens* ( $N = 46$  EXCEPT  $N = 44$  FOR HEAD-DORSAL L., POSTANAL L., ANAL-FIN SPINE L., HEAD DP., CAUDAL PEDUNCLE DP., ADIPOSE-LOW CAUDAL D., MOUTH W., BARBEL L., AND PREMAXILLARY TOOTH CUP L., AND  $N = 42$  FOR DORSAL SPINE L.), *H. inspector* ( $N = 5$  EXCEPT  $N = 1$  FOR DORSAL SPINE L.), AND *H. lunaorum* ( $N = 28$  EXCEPT  $N = 27$  FOR DENTARY AND PREMAXILLARY TOOTH CUP L.). Ratios are percent SL.

Morphometric feature	<i>H. contradens</i>				<i>H. inspector</i>				<i>H. lunaorum</i>			
	Avg.	SD	Min.	Max.	Avg.	SD	Min.	Max.	Avg.	SD	Min.	Max.
SL (mm)	56.3	10.1	40.5	84.2	107.3	14.9	86.3	125.9	49.7	10.5	32.3	73.1
Predorsal L.	43.7	2.2	38.6	49.1	41.9	1.2	40.3	43.5	46.0	2.2	43.2	52.3
Head L.	37.4	2.6	28.0	42.6	35.8	1.1	34.5	37.0	39.6	1.8	36.9	44.7
Head-dorsal L.	5.9	1.0	3.1	7.9	6.6	0.9	5.3	7.5	6.2	1.4	3.7	9.5
Cleithral W.	29.0	2.8	24.8	35.3	29.5	1.0	28.5	30.9	27.7	3.2	23.0	35.2
Head-pectoral L.	28.4	1.7	25.1	32.0	25.1	0.5	24.5	25.6	29.2	2.0	26.3	34.7
Thorax L.	22.5	1.9	19.3	26.7	23.3	1.8	20.8	25.5	23.5	2.5	18.3	29.3
Pectoral-spine L.	34.6	2.1	29.1	39.4	34.6	1.2	33.4	36.2	34.6	1.8	31.6	39.0
Abdominal L.	22.7	1.6	18.5	25.0	25.2	0.7	24.4	26.4	23.0	1.8	20.3	28.9
Pelvic-spine L.	29.1	2.1	24.0	33.3	26.8	0.8	25.6	27.5	29.0	2.1	25.0	32.9
Postanal L.	34.5	2.4	30.4	40.9	34.0	1.2	32.0	35.1	32.6	2.0	28.9	37.4
Anal-fin spine L.	13.2	2.0	8.9	16.9	12.9	0.8	11.8	13.8	12.7	1.7	9.3	16.6
Dorsal-pectoral D.	27.2	2.0	22.2	31.1	26.9	0.8	25.7	27.5	29.0	1.6	25.7	31.3
Dorsal spine L.	31.9	3.7	17.0	37.5	37.6	0.0	37.6	37.6	32.5	4.3	18.4	38.3
Dorsal-pelvic D.	22.6	2.1	18.5	28.0	23.3	1.3	21.4	24.7	25.0	2.0	22.0	29.3
Dorsal-fin base L.	29.2	2.0	24.0	34.7	28.2	0.8	27.3	29.3	29.8	1.7	27.0	34.3
Dorsal-adipose D.	11.1	1.9	6.9	15.6	15.9	1.2	14.2	17.1	12.3	2.9	6.4	18.6
Adipose-spine L.	10.2	1.7	6.6	13.7	9.1	0.7	8.6	10.3	8.8	1.1	6.7	10.9
Adipose-up. caudal D.	15.4	2.6	9.9	20.7	15.9	0.9	14.6	16.7	13.5	2.1	9.9	18.3
Caudal peduncle Dp.	13.2	1.7	8.9	16.5	11.8	0.6	11.1	12.4	12.8	2.0	9.5	16.3
Adipose-low. caudal D.	23.8	2.0	17.9	26.9	22.1	0.5	21.5	22.9	23.0	2.2	18.4	28.4
Adipose-anal D.	17.5	1.4	14.4	20.2	19.4	0.5	18.8	20.1	18.6	1.7	15.4	21.2
Dorsal-anal D.	14.7	1.1	12.5	17.2	15.8	0.5	15.3	16.5	15.9	1.0	13.0	17.4
Pelvic-dorsal D.	27.4	2.1	21.9	32.3	29.0	0.9	27.5	29.9	27.0	2.5	23.1	31.6
Head-eye L.	13.2	1.0	10.3	15.0	11.5	0.5	10.9	12.2	13.8	0.9	12.6	15.9
Orbit Dia.	9.6	1.0	7.4	11.9	8.4	0.5	8.1	9.4	8.8	1.0	7.3	10.8
Snout L.	20.8	1.2	18.5	23.1	20.6	0.7	19.9	21.7	21.7	1.1	19.8	24.0
Internares W.	5.1	1.2	3.5	8.4	3.8	0.3	3.6	4.1	6.0	1.2	3.3	8.0
Interorbital W.	14.6	3.5	9.4	20.1	13.1	3.7	9.0	16.6	17.1	3.1	10.1	21.3
Head Dp.	24.6	1.2	22.2	26.7	24.0	0.6	23.3	25.0	25.5	1.0	22.3	27.2
Mouth L.	14.6	2.2	9.0	19.3	14.0	0.4	13.6	14.3	15.5	1.9	10.3	18.9
Mouth W.	14.5	1.5	11.5	17.9	12.2	0.6	11.5	12.9	14.4	1.6	9.7	17.7
Barbel L.	5.0	0.8	3.4	6.4	4.7	0.4	4.3	5.1	5.1	1.1	2.3	6.9
Dentary tooth cup L.	4.0	0.9	1.7	5.4	2.7	0.4	2.2	3.1	3.9	1.1	1.7	6.1
Premaxillary tooth cup L.	3.9	0.6	2.8	5.4	2.9	0.5	2.4	3.5	3.6	0.8	2.4	5.3

pressed pectoral-fin spine reaching beyond base of pelvic-fin rays; depressed pelvic-fin spine reaching beyond posterior insertion of anal fin. Pectoral-fin spine, when relaxed against the body, angled strongly posterodorsally such that its tip is at the dorsal edge of the median plate series. Dorsal fin II,7; caudal fin I,14,I; three to four dorsal procurrent caudal-fin spines; three to five ventral procurrent caudal-fin spines; anal fin I,4; pectoral fin I,6; pelvic fin I,5.

Lips papillose, forming oval disk, disk much narrower than head. Maxillary barbel long in comparison to other loriciariids, thin, and pointed; barbel rugose proximally, almost smooth distally.

Median plates 22–24 (mode 23); 21–23 mid-dorsal plates (mode 23,  $n = 27$ ); 22–24 mid-ventral plates (mode 23,  $n = 27$ ); five rows of plates on the caudal peduncle. Dentary teeth five to seven ( $n = 18$ ), long and wide with cusps of equal length and width in worn teeth (lateral cusp slightly shorter in new teeth); premaxillary teeth seven to 14 ( $n = 18$ ), fairly wide (but not as wide as dentary teeth) and short, lateral and medial cusps approximately equal in width and lateral cusp slightly shorter than medial.

*Sexual dimorphism.*—Nuptial males with slightly hypertrophied odontodes on lateral plates from head to tail (size of odontodes increases poste-

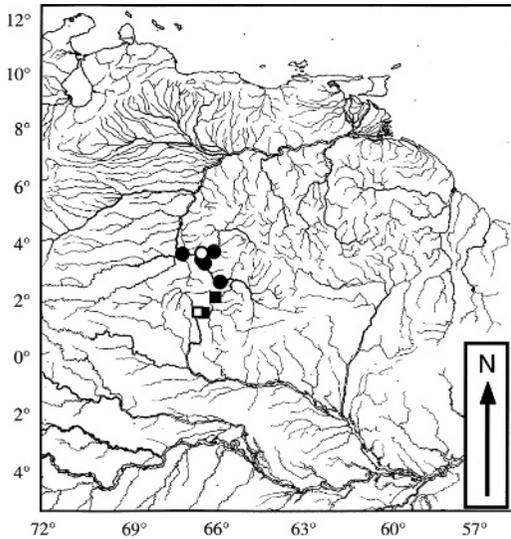


Fig. 4. Distribution of *Hypancistrus contradens* (circles) and *H. inspector* (squares). Open symbols are type localities; symbols may represent more than one locality.

riorly). Hypertrophied pectoral-fin spine odontodes longer in nuptial males than females.

**Coloration.**—Dorsal and lateral base color black in life, gray in alcohol. Bold white spots (faded in alcohol) evenly distributed over fins and body dorsally and laterally from snout to end of caudal fin; spots sometimes light pink in life. Diameter of spots variable within and between individuals, range from diameter of nares to inter-radial distance. Spot diameter approximately the same in juveniles and adults, but spots increasing in number with size; juveniles with as few as eight spots in horizontal series from snout to tip of caudal fin, and adults with as many as 25. Ventral surface from oral disk to anus white to light gray.

**Range.**—All specimens of *Hypancistrus contradens* included herein are from the lower reaches of the Río Ventuari and the mainstem of the Orinoco near the Ventuari mouth (Fig. 4). Juvenile specimens of the same or a very similar species are known from the Casiquiare and the Río Negro.

**Ecology.**—The anterior few centimeters of intestines of two *Hypancistrus contradens* contained a brown organic and inorganic matrix interspersed with strands of filamentous algae. Total intestine length of the two specimens was 5.2 and 9.2 times standard length, respectively. Most individuals were collected in the dry season from cracks in bedrock exposed to slight or moderate

flow. A heterogeneous mixture of fine particulate organic matter, cyanobacteria, green algae, diatoms, and aquatic insects (aufwuchs) and inorganic sediment covered much of the rock surface in many of these habitats. Like most loricariids, *H. contradens* appears to be an omnivorous consumer of aufwuchs.

**Comments.**—Some of the specimens used in the diagnosis of *Hypancistrus inspector* (Armbruster, 2002) are now placed in *H. contradens* (FMNH 106009, 106010, and 106012). These specimens are small, and it was not until a large series of larger fishes was obtained from the Ventuari that we were able to determine that the specimens from the Río Orinoco and the Río Negro drainages are different. It is *H. contradens* and not *H. inspector* that was examined in Armbruster (2004). A revised map for the localities of *H. inspector* is found in Figure 4.

Although adults are easy to identify, small specimens of *Hypancistrus contradens* and small specimens of *H. lunaorum* are very difficult to tell apart. Often, small specimens will have small spots on the body and larger spots on the fins. The specimens can be distinguished by the fact that *H. lunaorum* will have spots smaller than the diameter of the nasal aperture and *H. contradens* will have spots at least on the caudal peduncle and caudal fin larger than the diameter of the nasal aperture.

**Etymology.**—From the Latin *contra* for opposite, or of difference, and *dens* for tooth, in reference to the differently shaped teeth in the dentary and premaxilla. Treated as a noun in apposition.

#### *Hypancistrus debilitera*, new species

Figures 1D, 5

**Holotype.**—MCNG 54661, 67.0 mm SL, Río Orinoco, Pasaganado, 38 km N of San Fernando de Atabapo, 04°23'04"N, 067°46'28"W, 1 March 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, M. Arce, and T. E. Wesley.

**Paratypes.**—AUM 42136, 3, 28.4–61.3 mm SL, ANSP 182800, 2, 56.9–60.9 mm SL, MCNG 54662, 2, 34.4–59.7 mm SL, same data as holotype.

**Non-type material.**—All collections Venezuela, Amazonas: AUM 42219, 2, 27.2–42.9 mm SL, Río Orinoco, near Puerto Ayacucho on beach called Playa Bagre, 05°39'23"N, 067°37'52"W, 13 April 2005, N. K. Lujan, M. Arce, and T. E. Wesley; AUM 42993, 2, nm., 26.7–33.1 mm SL, Río Orinoco, at Puerto Venado, 4.3 km S of

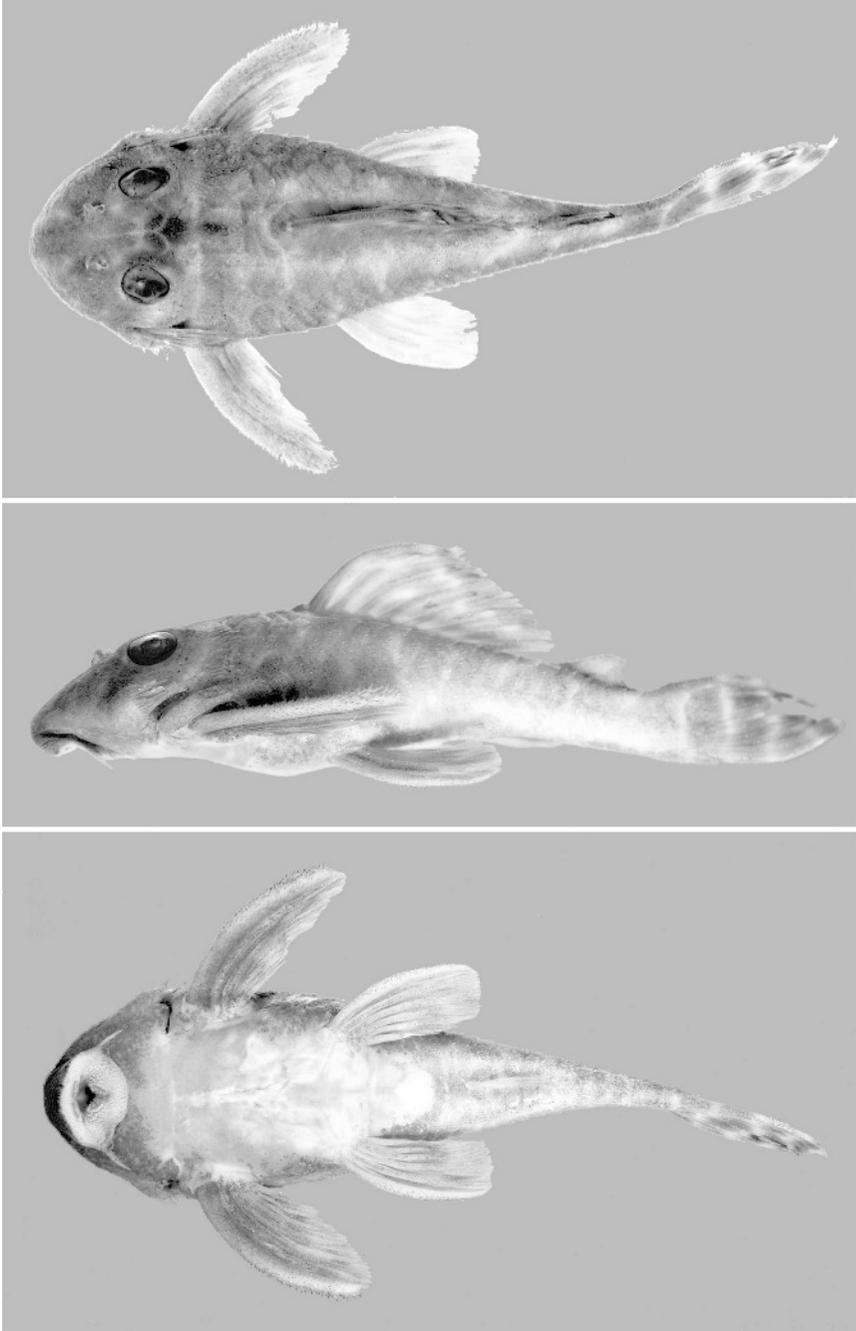


Fig. 5. Dorsal, lateral, and ventral views of *Hypancistrus debilittera*, new species, holotype, MCNG 54661, 67.0 mm SL. Photos by J. W. Armbruster.

Samariapo, 56.4 km SSW of Puerto Ayacucho, 05°12'38"N, 067°48'18"W, 26 Feb. 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, M. Arce, R. Betancur, and T. E. Wesley.

*Diagnosis.*—*Hypancistrus debilittera* can be distinguished from *H. contradens*, *H. inspector*, and *H.*

*lunaorum* by having dark bands and vermiculations on the body (vs. white spots); and from *H. furunculus* and *H. zebra* by having incomplete bands in the dorsal fin (vs. complete bands), dark *E* on snout absent or indistinct (vs. distinct), anterior dark bars incomplete, vermiculate, and/or indistinct (vs. complete, straight, and distinct),

TABLE 2. SELECTED MORPHOMETRIC FEATURES OF *Hypancistrus debilitata* ( $N = 8$  EXCEPT  $N = 7$  FOR DORSAL SPINE L.), *H. furunculus* ( $N = 23$  EXCEPT  $N = 21$  FOR BARBEL L. AND  $N = 19$  FOR DORSAL SPINE L.), AND *H. zebra* ( $N = 5$  EXCEPT  $N = 4$  FOR DORSAL SPINE L. AND BARBEL L. AND  $N = 2$  FOR ANAL-FIN SPINE L.). Ratios are percent SL.

Morphometric feature	<i>H. debilitata</i>				<i>H. furunculus</i>				<i>H. zebra</i>			
	Avg.	SD	Min.	Max.	Avg.	SD	Min.	Max.	Avg.	SD	Min.	Max.
SL (mm)	53.9	13.3	27.2	66.4	47.2	11.1	32.3	66.4	44.5	4.2	39.9	50.0
Predorsal L.	43.0	1.7	41.7	46.8	44.8	1.9	41.8	50.5	42.0	0.9	40.5	42.5
Head L.	36.4	2.4	34.7	41.8	38.5	1.3	36.5	41.6	36.3	1.0	35.3	38.0
Head-dorsal L.	6.6	1.2	5.0	8.7	6.9	1.8	4.0	11.0	5.7	1.0	4.1	6.5
Cleithral W.	24.9	1.0	24.1	27.2	26.3	1.9	22.5	30.0	29.2	0.8	27.8	29.9
Head-pectoral L.	27.6	1.5	25.3	29.8	28.6	1.6	26.0	31.8	27.1	0.9	25.7	27.9
Thorax L.	21.2	1.6	18.8	24.6	22.2	2.0	19.1	26.4	22.7	1.8	21.5	25.9
Pectoral-spine L.	30.4	1.2	29.0	32.4	32.6	1.8	29.7	36.0	33.7	1.3	32.2	35.1
Abdominal L.	22.6	1.0	21.1	24.2	21.2	1.8	17.2	24.8	23.4	1.4	22.1	25.5
Pelvic-spine L.	24.7	1.3	22.5	26.5	26.6	2.6	20.4	30.4	27.5	1.2	26.0	28.8
Postanal L.	34.1	1.6	31.5	36.5	33.8	1.6	29.9	38.0	34.8	2.1	31.5	36.6
Anal-fin spine L.	11.9	1.3	10.1	13.7	11.2	2.0	7.2	15.0	12.8	0.3	12.6	13.1
Dorsal-pectoral D.	26.6	1.3	24.6	28.5	27.3	2.0	24.2	30.7	28.1	1.0	26.6	29.1
Dorsal spine L.	27.8	2.4	23.8	31.5	29.0	2.9	21.0	34.2	34.7	1.1	33.7	36.3
Dorsal-pelvic D.	22.0	1.0	20.7	23.9	19.8	2.2	15.5	23.4	20.8	0.7	20.0	21.4
Dorsal-fin base L.	29.0	1.3	27.4	30.9	27.5	1.5	24.7	31.7	32.1	1.6	29.8	34.1
Dorsal-adipose D.	12.3	1.7	10.3	16.3	12.8	1.9	9.5	17.7	12.6	1.7	11.1	15.5
Adipose-spine L.	9.8	1.2	8.5	11.7	10.6	1.7	5.7	14.1	9.5	0.6	8.8	10.1
Adipose-up. caudal D.	18.2	2.6	13.8	21.6	18.7	2.7	14.7	24.4	15.0	1.2	13.1	16.2
Caudal peduncle Dp.	11.4	1.5	8.3	12.7	12.0	1.2	9.8	13.9	11.3	0.6	10.6	12.3
Adipose-low. caudal D.	23.2	1.9	19.8	25.6	24.0	2.0	19.1	27.6	22.4	0.9	20.9	23.2
Adipose-anal D.	17.9	1.9	16.0	22.0	16.5	2.0	12.5	20.2	19.1	2.0	17.1	21.3
Dorsal-anal D.	13.3	1.2	10.6	14.4	13.6	1.6	10.9	16.3	14.1	0.5	13.1	14.5
Pelvic-dorsal D.	26.8	2.4	21.6	30.0	24.3	2.9	19.0	29.0	29.4	1.8	27.2	31.0
Head-eye L.	13.6	1.5	12.4	17.1	14.3	0.9	12.4	16.0	13.8	0.4	13.1	14.1
Orbit Dia.	8.7	0.6	7.7	9.7	10.1	0.8	8.8	11.8	8.9	0.5	8.4	9.5
Snout L.	19.5	0.6	18.5	20.4	20.5	0.8	19.0	21.7	19.0	0.5	18.4	19.5
Internares W.	4.9	1.3	3.4	7.3	4.9	0.9	3.7	6.6	4.3	0.2	4.1	4.5
Interorbital W.	15.1	1.8	12.4	17.6	14.8	2.1	9.7	18.7	18.2	0.7	17.4	19.0
Head Dp.	23.0	1.6	20.5	25.2	23.7	1.3	21.0	25.7	25.3	0.5	24.4	25.8
Mouth L.	14.2	2.6	11.8	18.9	14.3	2.4	11.3	19.2	15.2	0.7	14.1	16.0
Mouth W.	15.3	1.5	13.4	17.6	15.5	1.6	13.1	18.7	14.6	1.5	13.0	17.0
Barbel L.	5.2	0.3	4.8	5.6	4.3	1.1	2.4	6.2	4.7	0.7	3.8	5.6
Dentary tooth cup L.	4.3	1.1	3.3	6.1	3.6	1.3	1.7	6.7	2.3	0.5	1.7	3.0
Premaxillary tooth cup L.	3.5	1.1	2.1	4.9	3.6	1.1	1.6	5.7	3.0	0.3	2.5	3.4

and by having the light bands in the caudal fin less than half the width of the dark bands (vs. bands of about equal widths).

*Description.*—All counts  $n = 6$ . Morphometrics given in Table 2. Largest specimen examined 67.0 mm SL. Ventral surface from anus to head largely naked in adults, few small platelets located in skin ventral to anterolateral edges of pectoral girdle, and occasionally some small platelets located along lateral edges of pectoral girdle and in line connecting the posterior insertion of pectoral fin to anterior insertion of pelvic fin. Lateral plates unkeeled except ventral plate row with moderately elongate odontodes forming one or two keel-like rows on caudal

peduncle, and mid-ventral plate row bent above pectoral girdle forming ridge. Cheek plates with 22–38 hypertrophied odontodes, longest odontodes occasionally extending beyond posterior edge of cleithrum; cheek odontodes and supporting plates evertible at an angle greater than  $75^\circ$  from head. Frontal, infraorbitals, nasal, preopercle, pterotic-supracleithrum, and supra-preopercle supporting odontodes. Adults without odontodes on the opercle; juveniles with four to six odontodes on the opercle.

Caudal fin emarginate, lower lobe longer than upper. Lower surface flat. Head deep with horizontal distance between anterior of eye and tip of snout short. Head broad, with moderately steep angle from tip of snout to anterior margin

of eye. Body depth from anterior margin of eye to maximum depth at anterior insertion of dorsal fin increasing little. Dorsal head profile from snout to anterior insertion of dorsal fin curved rather than angular. Body depth decreases slowly from anterior dorsal-fin insertion to posterior adipose-fin insertion; body depth increases slightly from posterior adipose-fin insertion to insertion of upper caudal-fin spine.

Dorsal-fin spine short (Table 2); dorsal fin reaching preadipose plate when depressed. Depressed pectoral-fin spine reaching beyond base of pelvic-fin rays; depressed pelvic-fin spine reaching beyond posterior insertion of anal fin. Pectoral-fin spine, when relaxed against the body, angled strongly posterodorsally such that its tip is at the dorsal edge of the median plate series. Dorsal fin II,7; caudal fin I,14,I; four to five dorsal and ventral procurrent caudal-fin spines; anal fin I,4; pectoral fin I,6; pelvic fin I,5.

Superorbital crest raised slightly. Orbital opening oriented at less than 45° from sagittal plane. Interorbital isthmus between superorbital crests flat. Supraoccipital crest slightly elevated in some individuals, flush with surrounding plates others. Eye large (Table 2) with well-developed iris operculum. Gill opening restricted in *L*-conformation, with two-thirds of opening vertical and opening laterally, and one-third horizontal and opening ventrally.

Lips papillose, forming oval disk, disk much narrower than head. Maxillary barbel long in comparison to other loriciariids, thin, and pointed (occasionally bifurcated); barbel rugose proximally, almost smooth distally.

Median plates 23; mid-dorsal plates 23; mid-ventral plates 23; five rows of plates on the caudal peduncle. Dentary teeth four to six, long and wide with cusps of equal length and width in worn teeth (lateral cusp slightly shorter in new teeth); premaxillary teeth 11–14, fairly wide (but not as wide as dentary teeth) and short, lateral and medial cusps approximately equal in width and lateral cusp slightly shorter than medial.

**Sexual dimorphism.**—Nuptial males with slightly hypertrophied odontodes on lateral plates from head to tail (size of odontodes increases posteriorly). Hypertrophied pectoral-fin spine odontodes longer in nuptial males than females.

**Coloration.**—Dark gray base with highly variable light-gray spots, vermiculations, and thin bars distributed across body. Similar pattern in fins although often coalescing into consistent pattern of thin bands in dorsal fin and thin bars in caudal fin. Ventral surface white to light gray from pectoral girdle to anus.

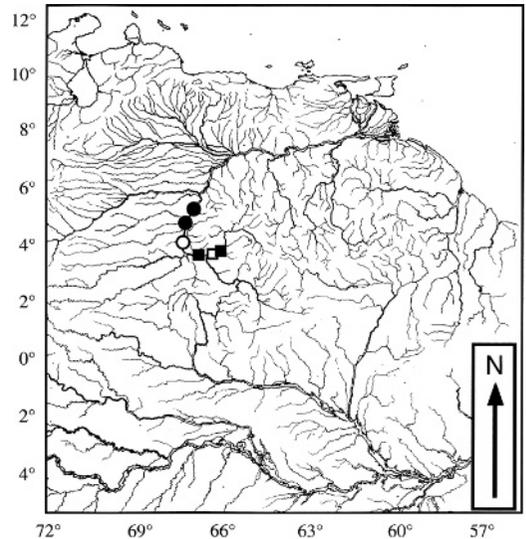


Fig. 6. Distribution of *Hypancistrus debilittera* (circles) and *H. furunculus* (squares). Open symbols are type localities; symbols may represent more than one locality.

**Range.**—Found in the Río Orinoco from Puerto Ayacucho to just north of San Fernando de Atabapo (Fig. 6).

**Ecology.**—Individuals in the largest series were collected from a site having bedrock habitat with slight to moderate flow. Gut contents were not examined. They likely overlap broadly in ecology and habitat with the other species of *Hypancistrus* described herein (see *H. contradens*).

**Etymology.**—A combination of the Latin *debilis* meaning weak and *littera* meaning letter, in reference to the weak or absent *E* on the snout. Treated as a noun in apposition.

#### *Hypancistrus furunculus*, new species

Figures 1C, 7

**Holotype.**—MCNG 54658, 65.3 mm SL, Venezuela, Amazonas, Cucue Amerindian village on Río Orinoco, 60 km E of San Juan de Atabapo, 03°58'26"N, 067°09'30"W, 3 April 2004, M. H. Sabaj, N. K. Lujan, D. C. Werneke, and L. S. de Souza.

**Paratypes.**—All collections Venezuela, Amazonas: AUM 39225, 2, 45–64.5 mm SL, ANSP 180238, 1, 65.5 mm SL, MCNG 54659, 1, 63.5 mm SL, same data as holotype; AUM 39240, 1 CS, 44.0 mm SL, MCNG 54660, 1, 41.4 mm SL, Venezuela, Amazonas, Río Ventuari, 23 km NE of Macuruco, 94 km E of San Fernando de Atabapo, 04°04'50"N, 066°51'31"W, N. K. Lujan, D. C.

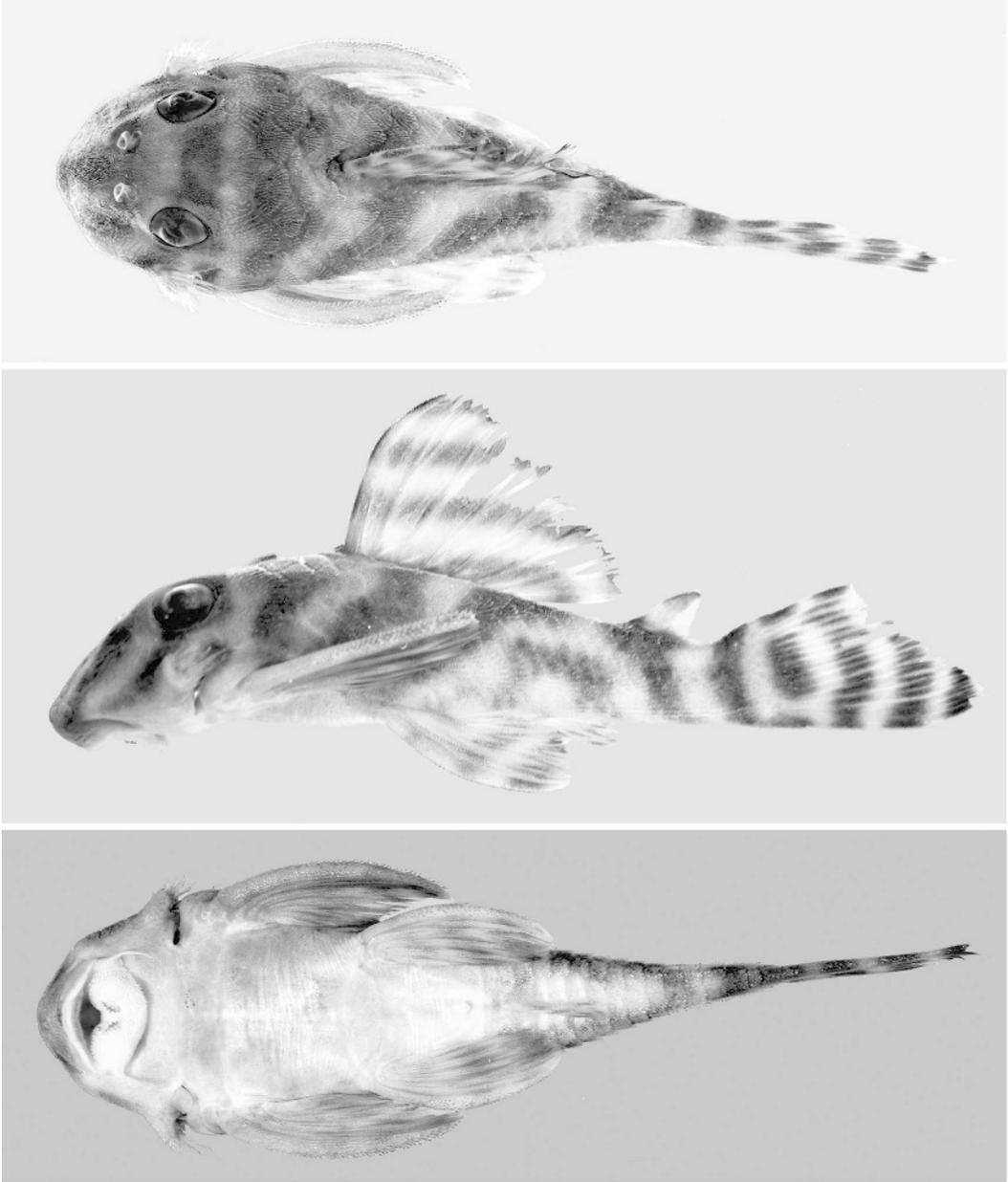


Fig. 7. Dorsal, lateral, and ventral views of *Hypnancistrus furunculus*, new species, holotype, MCNG 54658, 65.3 mm SL. Photos by J. W. Armbruster.

Werneke, M. H. Sabaj, L. S. de Souza, and O. León; AUM 42098, 2, 32.29–35.12 mm SL, Río Orinoco, beach and bedrock outcropping, 50 km E of San Fernando de Atabapo, 03°58'13"N, 067°15'18"W, 2 March 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, M. Arce, R. Betancur, and T. E. Wesley; AUM 42107, 11, 36.4–62.6 mm SL, Río Orinoco, 50 km E of San Fernando de Atabapo, 03°58'02"N, 067°15'12"W, 3 March

2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, and M. Arce; AUM 42143, 1, 54.8 mm SL, Río Ventuari, 163 km SE Samariapo, 04°03'26"N, 066°55'57"W, 1 April 2005, N. K. Lujan, M. Arce, T. E. Wesley, E. L. Richmond, and M. B. Grant; AUM 42171, 2, 47.2–50.0 mm SL, Río Orinoco, 60 km E of San Fernando de Atabapo, 03°58'26"N, 067°09'59"W, 3 March 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, and M. Arce.

*Diagnosis.*—*Hypancistrus furunculus* can be distinguished from *H. contradens*, *H. inspector*, and *H. lunaorum* by having oblique bars on the anterior part of the body and horizontal bands in the dorsal fin (vs. white spots); from *H. debilitera* by having complete bands in the dorsal fin (vs. incomplete bands), dark *E* on snout distinct (vs. absent or indistinct), anterior dark bars complete, straight, and distinct (vs. incomplete, vermiculate, and/or indistinct) and by having the light bands in the caudal about equal in width with dark bands (vs. light bands less than half the width of the dark bands); from *H. zebra* by having a tan background color (vs. almost white), by having only one oblique stripe on the body and dorsal saddles posteriorly (vs. sides completely with oblique stripes).

*Description.*—All counts  $n = 25$  unless otherwise stated. Morphometrics given in Table 2. Largest specimen examined 65.5 mm SL. Ventral surface from anus to head largely naked in adults, few small platelets located in skin ventral to anterolateral edges of pectoral girdle, and occasionally some small platelets located along lateral edges of pectoral girdle and in line connecting the posterior insertion of pectoral fin to anterior insertion of pelvic fin. Lateral plates unkeeled except ventral plate row with moderately elongate odontodes forming one or two keel-like rows on caudal peduncle, and mid-ventral plate row bent above pectoral girdle forming ridge. Cheek plates with 36–51 ( $n = 7$ ) hypertrophied odontodes, longest odontode reaching almost to posterior edge of cleithrum; cheek odontodes and supporting plates evertible at an angle greater than  $75^\circ$  from head. Frontal, infraorbitals, nasal, preopercle, pterotic-supracleithrum, and suprapreopercle supporting odontodes. Adults without odontodes on the opercle; juveniles with four to six odontodes on the opercle.

Caudal fin emarginate, lower lobe longer than upper. Ventral surface flat. Head tall with horizontal distance between anterior of eye and tip of snout short. Head with steep angle from tip of snout to anterior margin of eye. Body depth from anterior margin of eye to maximum depth at anterior insertion of dorsal fin increasing little. Body depth decreases gradually from anterior dorsal-fin insertion to posterior adipose-fin insertion; body depth increases slightly from posterior adipose-fin insertion to insertion of upper caudal-fin spine.

Superorbital crest raised slightly. Orbital opening oriented at less than  $45^\circ$  from sagittal plane. Interorbital isthmus between superorbital crests flat. Supraoccipital crest slightly elevated in some individuals, flush with surrounding plates in

others. Eye large (Table 2) with well developed iris operculum. Gill opening restricted in *L*-conformation, with two-thirds of opening vertical and opening laterally, and one-third horizontal and opening ventrally.

Dorsal-fin spine short (Table 2); dorsal fin reaching preadipose plate when depressed. Depressed pectoral-fin spine reaching beyond base of pelvic-fin rays; depressed pelvic-fin spine reaching beyond posterior insertion of anal fin. Pectoral-fin spine, when relaxed against the body, angled strongly posterodorsally such that its tip is at the dorsal edge of the median plate series. Dorsal fin II,7 (one anomalous specimen II,8); caudal fin I,14,I; four to five dorsal and ventral procurrent caudal-fin spines ( $n = 7$ ), anal fin I,4; pectoral fin I,6; pelvic fin I,5.

Lips papillose, forming oval disk, disk much narrower than head. Maxillary barbel long in comparison to other loricariids, thin, and pointed (occasionally bifurcated); barbel rugose proximally, almost smooth distally.

Median plates 23–26 (mode 23); mid-dorsal plates 22–24 (mode 23); mid-ventral plates 22–25 (mode 24); five rows of plates on the caudal peduncle. Dentary teeth two to seven, long and wide with cusps of equal length and width in worn teeth (lateral cusp slightly shorter in new teeth); premaxillary teeth five to 16, fairly wide (but not as wide as dentary teeth) and short, lateral and medial cusps approximately equal in width and lateral cusp slightly shorter than medial.

*Sexual dimorphism.*—None observed.

*Coloration.*—Black or dark gray banding pattern on white to light-cream colored base beginning with dark *E* anterior to eyes on snout. Four dark oblique bars present from eye to posterior insertion of dorsal fin. Vertical bars present on caudal peduncle and caudal fin. Transitional area between anterior oblique bars and posterior vertical bars highly variable across specimens with dark crescents, stripes, bands, or ocelli. Two to four dark horizontal bands through dorsal fin, bands increase in number with size. Ventral surface white to light gray from oral disk to anus.

*Range.*—Known from the mainstem of the Orinoco from just west of San Fernando de Atabapo upstream to the mouth of the Ventuari, and the mainstem of the lower Ventuari from its mouth upstream to Canaripo (Fig. 6).

*Ecology.*—Most individuals were purchased from ornamental fish collectors in the vicinity of where they had been collected from the wild. The guts

of two individuals were examined but were entirely empty, probably due to their confinement in collector's pens immediately prior to preservation. Total intestine length of the two specimens was 2.8 and 6.5 times standard length, respectively. *Hypancistrus furunculus* likely overlaps broadly in ecology and habitat with the other species of *Hypancistrus* described herein (see *H. contradens*).

*Etymology*.—*Furunculus* is Latin for a petty thief or pilferer, and is in reference to the dark band between the eyes that is similar to a bandit's mask. Treated as a noun in apposition.

*Hypancistrus lunaorum*, new species

Figures 1B, 8

*Holotype*.—MCNG 54665, 60.7 mm SL, Venezuela, Amazonas, Río Guapuchi, first major riffle complex, Río Ventuari dr., 04°07'00"N, 066°46'00"W, 16 April 2003, N. K. Lujan and O. León Mata.

*Paratypes*.—All localities Venezuela, Amazonas: AUM 39277, 2, 2 CS, 47.6–73.7 mm SL, ANSP 180239, 2, 46.4–52.2 mm SL, MCNG 54664, 3, 36.2–57.8 mm SL, Río Parucito at Raudales Salomon, 2.7 km NE San Juan de Manapiare, 05°20'47"N, 066°02'00"W, 16 April 2004, D. C. Werneke, N. K. Lujan, and O. León Mata; AUM 39878, 1, 43.3 mm SL, AUM 37979, 1, 56.2 mm SL, same data as holotype; AUM 39247, 1, 73.7 mm SL, Río Ventuari, Moriche (beach) 116 km NE Macurucu, 169 km NE San Fernando de Atabapo, 04°45'01"N, 066°21'17"W, 7 April 2004, D. C. Werneke, N. K. Lujan, M. H. Sabaj, and L. S. de Souza; AUM 39307, 1, 47.3 mm SL, ANSP 180240, 1, 41.1 mm SL, Río Manapiare, 14.5 km NW San Juan de Manapiare, 05°25'43"N, 066°08'10"W, 12 April 2004, N. K. Lujan, M. H. Sabaj, L. S. de Souza, and D. C. Werneke; AUM 39590, 6 (3 nm.), 11.5–40.3 mm SL, Río Manapiare, 17 km NW San Juan de Manapiare, 05°26'31"N, 066°09'03"W, 13 April 2004, N. K. Lujan, M. H. Sabaj, L. S. de Souza, and D. C. Werneke; AUM 39837, 2, 17.9–49.1 mm SL, Río Manapiare, 10 km NW San Juan de Manapiare, 05°23'13"N, 066°06'57"W, 14 April 2004, N. K. Lujan, L. S. de Souza, D. C. Werneke, and M. H. Sabaj; AUM 42207, 10 (4 nm.), 34.5–59.0 mm SL, Río Ventuari, near ornamental fish market, 04°04'32"N, 066°53'34"W, 3 April 2005, N. K. Lujan, M. Arce, E. L. Richmond, M. B. Grant, and T. E. Wesley; FMNH 106011, 3, 53.4–60.6, rocks and rapids in Río Orinoco at Isla Cupaven, 29 Jan. 2001, A. Machado, B. Chernoff, D. Machado, and J. Wheeler.

*Non-type material*.—All localities Venezuela, Amazonas: AUM 39854, 1, 62.7 mm SL, Río Ventuari, 23 km NE Macurucu, 94 km E San Fernando de Atabapo, 04°04'50"N, 066°51'31"W, 5 April 2004, N. K. Lujan, D. C. Werneke, M. H. Sabaj, L. S. de Souza, and O. León Mata; AUM 42113, 2, 47.9–53.9 mm SL, Río Orinoco, 117 km E of La Esmeralda, 03°17'24"N, 066°36'00"W, 29 March 2005, N. K. Lujan, M. Arce, T. E. Wesley, M. B. Grant, E. L. Richmond, J. Valadez, and D. Brooks; AUM 42120, 1, 56.2 mm SL, Río Orinoco, 33.9 km E of La Esmeralda, Punto Piaroa, 03°08'51"N, 065°51'14"W, 28 March 2005, N. K. Lujan, M. Arce, T. E. Wesley, M. B. Grant, E. L. Richmond, J. Valadez, and D. Brooks; AUM 42163, 2, nm., 36.9–59.5 mm SL, Río Orinoco, bedrock outcrop, 52.9 km SE of San Antonio, 102 km W of La Esmeralda, 03°06'01"N, 066°27'46"W, 4 March 2005, N. K. Lujan, D. C. Werneke, M. H. Sabaj, O. León, M. Arce, R. Betancur, and T. E. Wesley; AUM 42191, 1, nm., 25.0 mm SL, Río Orinoco, Punto de Maraya, Isla Maraya, 80.8 km W of San Fernando de Atabapo, 04°01'23"N, 066°58'19"W, 31 March 2005, N. K. Lujan, M. Arce, M. B. Grant, E. L. Richmond, and T. E. Wesley; AUM 43278, 1, nm., 54.3 mm SL, Río Orinoco, 147 km ESE of San Fernando de Atabapo, 03°18'24"N, 066°36'12"W, 4 March 2005, N. K. Lujan, M. H. Sabaj, M. Arce, and T. E. Wesley.

*Diagnosis*.—*Hypancistrus lunaorum* can be distinguished from *H. debilittera*, *H. furunculus*, and *H. zebra* by having a dark background with white spots (vs. presence of oblique lines or vermiculations); from *H. contradens* by having the spots either absent or smaller than the nasal aperture diameter (vs. spots larger than the nasal aperture diameter); and from *H. inspector* (Fig. 3) by having the adpressed dorsal fin reaching the adipose-fin spine (vs. not reaching), the spots on the head the same size as the rest of the body (vs. much smaller on the head), the spots on the caudal fin all free (vs. spots in the upper lobes combining to form bands), and 22–23 (only one of 30 with 24) plates in the mid-ventral series (vs. 24).

*Description*.—All counts  $n = 30$ . Largest specimen examined 73.7 mm SL. Ventral surface from anus to head largely naked in adults, few small platelets located in skin ventral to anterolateral edges of pectoral girdle, and occasionally some small platelets located along lateral edges of pectoral girdle and in line connecting the posterior insertion of pectoral fin to anterior insertion of pelvic fin. Lateral plates unkeeled except ventral plate row with moderately elon-

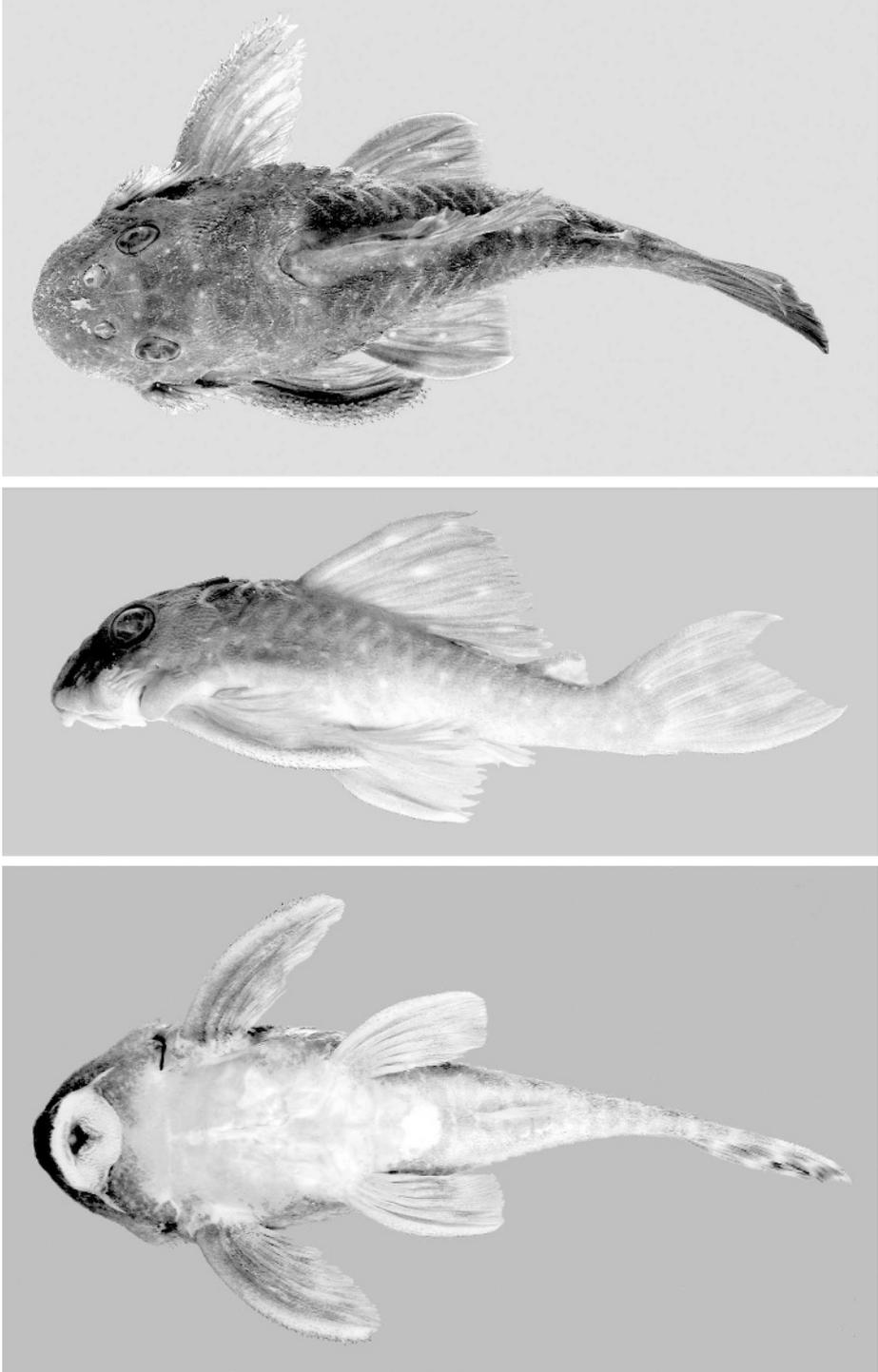


Fig. 8. Dorsal, lateral, and ventral views of *Hypancistrus lunaorum*, new species, holotype, MCNG 54665, 1, 60.7 mm SL. Photos by J. W. Armbruster.

gate odontodes forming one or two keel-like rows on caudal peduncle, and mid-ventral plate row bent above pectoral girdle forming ridge. Cheek plates with 11–50 hypertrophied odontodes, longest odontode reaching almost to posterior edge of cleithral process; cheek odontodes and supporting plates evertible at an angle greater than  $75^\circ$  from head. Frontal, infraorbitals, nasal, preopercle, pterotic-supracleithrum, and supra-preopercle supporting odontodes. Adults without odontodes on the opercle; juveniles occasionally with odontodes on the opercle (<6).

Caudal fin emarginate, lower lobe longer than upper. Ventral surface flat. Head deep with horizontal distance between anterior of eye and tip of snout short. Head with steep angle from tip of snout to anterior margin of eye. Body depth from anterior margin of eye to maximum depth at anterior insertion of dorsal fin increasing little. Body depth decreases gradually from anterior dorsal-fin insertion to posterior adipose-fin insertion; body depth increases slightly from posterior adipose-fin insertion to insertion of upper caudal-fin spine.

Superorbital crest raised slightly. Orbital opening oriented  $45^\circ$  from sagittal plane. Interorbital isthmus between superorbital crests flat. Supraoccipital crest slightly elevated in some individuals, flush with surrounding plates in others. Eye large (Table 1) with well developed iris operculum. Gill opening restricted in *L*-conformation, with two-thirds of opening vertical and opening laterally, and one-third horizontal and opening ventrally.

Dorsal-fin spine short; dorsal fin reaching preadipose plate when depressed. Depressed pectoral-fin spine reaching beyond base of pelvic-fin rays; depressed pelvic-fin spine reaching beyond posterior insertion of anal fin. Pectoral-fin spine, when relaxed against the body, angled strongly posterodorsally such that its tip is at the dorsal edge of the median plate series. Dorsal fin II,7; caudal fin I,14,I (one anomalous specimen I,12,I and one I,15,I); three to five dorsal procurrent caudal-fin spines; four to five ventral procurrent caudal-fin spines; anal fin I,4; pectoral fin I,6; pelvic fin I,5.

Lips papillose, forming oval disk, disk much narrower than head. Maxillary barbel long in comparison to other loriciariids, thin, and pointed (occasionally bifurcated); barbel rugose either just proximally or along its entire length.

Median plates 23–24 (mode 23); mid-dorsal plates 21–23 (mode 23); mid-ventral plates 22–24 (mode 23); five rows of plates on the caudal peduncle. Dentary teeth three to nine, long and wide with cusps of equal length and width in worn teeth (lateral cusp slightly shorter in new

teeth); premaxillary teeth six to 15, fairly wide (but not as wide as dentary teeth) and short, lateral and medial cusps approximately equal in width and lateral cusp slightly shorter than medial.

*Sexual dimorphism.*—Nuptial males with slightly hypertrophied odontodes on lateral plates from head to tail (size of odontodes increases posteriorly). Hypertrophied pectoral-fin spine odontodes longer in nuptial males than females.

*Coloration.*—Dorsal and lateral base color black in life, faded to gray in alcohol. Ventral skin from oral disk to anus white to light gray. Small white spots (faded in alcohol) evenly distributed over fins and body dorsally and laterally from snout to end of caudal fin. Diameter of spots never exceeding size of nasal aperture, more commonly half the diameter of nasal aperture but variable within and between individuals. Range of spot diameter consistent between juveniles and adults, exhibiting no allometric influence. Number of spots per individual highly variable with strong allometric influence. Juveniles having a total of eight spots or fewer in horizontal series from snout to tip of caudal fin, and adults having 25 or more.

*Range.*—Found throughout much of the Río Ventuari from its mouth upstream to the Río Maniari and Salto Salomon in the Río Parucito. Also from the mainstem of the Río Orinoco from the mouth of the Ventuari upstream to Punto Piaroa just above the Tama Tama bifurcation (Fig. 9).

*Ecology.*—The guts of one individual contained small pieces of moss (Bryophyta) along with filamentous alga and sand grains. The guts of another individual contained no identifiable organic material, only small sand grains and clay similar to the lateritic substrate of the river. Total intestine length of the two specimens was 6.3 and 8.8 times standard length, respectively. They likely overlap broadly in ecology and habitat with the other species of *Hypancistrus* described herein (see *H. contradens*). Specimens were collected from areas with flow along bedrock outcrops and lateritic ridges.

*Comments.*—See Comments section of *Hypancistrus contradens*.

*Etymology.*—Named in honor of the Luna family, founders of the village of Macurucu on the Orinoco near the mouth of the Ventuari. Their

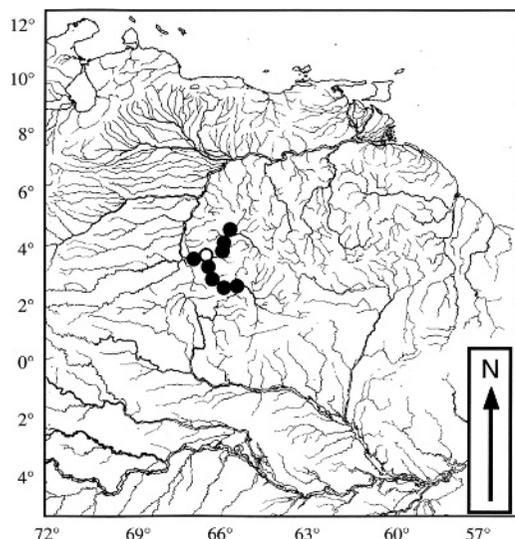


Fig. 9. Distribution of *Hypancistrus lunaorum*. Open symbol is type locality; symbols may represent more than one locality.

progressive interest in the development of Macurucu via promotion of scientific research in the nearby region has been indispensable to the completion of recent fieldwork.

#### DISCUSSION

Measurements of *Hypancistrus inspector* (Table 1) were updated from Armbruster (2002) to represent the measurements of Armbruster (2003), and measurements of some specimens of *H. zebra* are also provided (Table 2). Despite the fact that multiple morphometric analyses were run, no morphometric characters were found to separate species of *Hypancistrus*. Nearly all of the differences between the species are color pattern differences. In addition to the species described herein, there are many undescribed species of *Hypancistrus* that have been discovered. Some of these (like the Queen Arabesque Pleco of Brazil) are common in the pet trade, but fairly rare in collections. In addition there are multiple other Brazilian undescribed species, a species known from just one specimen from the Takutu of Guyana, and a species known only from faded specimens from the Río Cinaruco of Venezuela. We do not describe the Cinaruco species here as it is either difficult to discern color pattern on the specimens available, or they are in poor shape. Given that color pattern is the main way to diagnose the species of *Hypancistrus*, it would be unwise to describe species based on poor specimens.

Similar situations to *Hypancistrus* occur in other genera of the Ancistrini. Armbruster (2005) revised *Lasiancistrus* and found few characteristics other than color pattern to separate the species. The species of the *Peckoltia vittata* group also vary mainly in color pattern (Armbruster, pers. obs.). Color pattern is not a particularly satisfactory set of characters upon which to base species descriptions as it evolves very quickly (McClure and McCune, 2003); however, color patterns are the main way that humans can observe differences between species, and they may be the main way that the fishes observe species differences as well. The sheer scope of color pattern variation in the described and undescribed *Hypancistrus* is incredible, suggesting that color pattern is important in the life history of the fishes.

Sexual dimorphism may also be important in *Hypancistrus*. Many basal ancistrins such as *Hemiancistrus*, *Peckoltia*, and *Panaque* (*Panaqolus*) have nuptial males with highly hypertrophied odontodes on the lateral plates (Isbrücker and Nijssen, 1992; Armbruster, 2004). *Hypancistrus contradens*, *H. debilitata*, and *H. lunaorum* have all been observed with hypertrophied nuptial odontodes, although none have them as large as species of *Hemiancistrus*, *Peckoltia*, or *Panaque* (*Panaqolus*). No *H. furunculus* or *H. inspector* have been examined with nuptial odontodes, but this may be due to low sample sizes. *Hypancistrus zebra* is commonly spawned in aquaria, and there are no reports of nuptial odontodes in the species. The species do not have enough interspecific variation upon which to build a phylogenetic hypothesis.

The etymology of *Hypancistrus inspector* was inadvertently left out of Armbruster (2002) and is provided here. *Inspector* is the Latin for a viewer or observer and is in reference to the very large eyes of the species; treated as a noun in apposition.

#### MATERIAL EXAMINED

*Hypancistrus inspector*.—All collections Venezuela, Amazonas, Río Casiquiare-Río Negro-Río Amazonas drainage: MCNG 12133, 1, 100.2 mm SL, holotype, AUM 31019, 86.3 mm SL, paratype, ca. 10 river km above the Río Negro, below Solano, 1°58'N, 67°05'W; MCNG 37040, 3, 110.7–125.9 mm SL, paratypes, at Isla Cuamate upstream of Solano (about 25 km upstream from confluence with Río Negro); AUM 42198, 1, nm., Río Casiquiare, 153 km NE of San Carlos de Río Negro, 02°47'56"N, 066°00'23"W.

*Hypancistrus zebra*.—MZUSP 41668, 1, 41.0 mm SL, holotype, MZUSP 43193, 4, 39.9–50.0 mm SL, paratypes, Brazil, Pará, about 1 hr upstream

of Altamira by speedboat, anastomoses of Rio Xingu.

KEY TO THE SPECIES OF *Hypancistrus*

- 1a. Color pattern consisting of vertical stripes, dorsal saddles, or vermiculations..... 2
- 1b. Color pattern consisting of white, pink, or gold spots on a dark background..... 4
- 2a. Body base color white or cream with dark oblique stripes at least through posterior insertion of dorsal fin; patch of black pigment in the shape of an *E* on the snout with the central branch of the *E* located mid-dorsally, the top and bottom branches located just lateral to the nares, the three branches extending anteriorly, and the main stem of the *E* running transversely centered on the nares..... 3
- 2b. Body base color dark with light colored stripes or vermiculations occasionally coalescing to form bands; patch of black pigment in the shape of an *E* on the snout either weakly formed or absent. .... *H. debilittera*
- 3a. Body with usually just one oblique stripe, stripe ending behind dorsal fin, saddles present; background color white or light cream..... *H. furunculus*
- 3b. Body with oblique stripes continuing from just behind head through caudal fin, saddles absent; background color white..... *H. zebra*
- 4a. Dorsal fin does not reach adipose fin when adpressed. Spots smaller on head than on body (Fig. 2); spots on upper lobe of caudal fin combine to form bands (Fig. 2); mid-ventral plates 24.... *H. inspector*
- 4b. Dorsal fin reaches adipose fin when adpressed. Spots the same size on head and body or absent (Figs. 2, 8); spots on upper lobe of caudal fin all free and do not form bands, mid-ventral plates usually 22–23 (rarely 24). .... 5
- 5a. Spots ranging in diameter from that of nasal aperture to that of interradial distance of the dorsal fin; in life, spots are white to pink..... *H. contradens*
- 5b. Spots smaller in diameter than nasal aperture or absent; in life, spots are gold..... *H. lunaorum*

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