

Two New Genera and Species of Ancistrini (Siluriformes: Loricariidae) from the Western Guiana Shield

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Two new ancistrin genera and species are described from main channels and tributaries of the upper Orinoco River in Amazonas, Venezuela. *Micracanthicus vandragti* is black with white spots and distinguished by its small body-size, large gas-bladder capsules, and highly protrusible mandibles with short tooth cups and five to eight long teeth per tooth cup. The known range of *Micracanthicus vandragti* is restricted to the lower Ventuari River and portions of the Orinoco River near its rocky, anastomose confluence with the Ventuari River. *Soromonichthys stearleyi* is green with small yellow-gold spots on the head and thin vertical bars on the body and has long dentary and premaxillary tooth cups with 39–69 teeth per tooth cup. It is distinguished by its coloration and by its unique pattern of plate loss on the snout: plates absent from mesethmoid surface and anteriormost margin of snout. *Soromonichthys stearleyi* is known only from Soromoni Creek, a northern tributary of the upper Orinoco draining southern slopes of Mount Duida.

ONGOING ichthyological inventories of the upper Orinoco Basin in Amazonas, Venezuela, by the first author and colleagues have yielded many new and interesting sucker-mouth armored catfishes (Loricariidae; Lujan et al., 2007, 2009; Lujan, 2008). Eastern tributaries of the Orinoco draining highlands of the western Guiana Shield have been particularly productive in terms of both total number of species and number of undescribed species. Among recent discoveries are two unique and small new species first recognized from material collected in 2005. Phylogenetic analysis of these species by the second author recovered each of them to be representatives of lineages nested within the tribe Ancistrini (Hypostominae; Armbruster, 2008: “New Genus 1” and “New Genus 2”).

“New Genus 1” was recovered as sister to all other members of the *Acanthicus* clade, consisting of (((*Acanthicus* + *Megalancistrus*) *Pseudacanthicus*) *Leporacanthicus*) *Spectracanthicus*) (Armbruster, 2008). Inclusive of “New Genus 1”, the *Acanthicus* clade can be diagnosed as having the following homoplastic autapomorphies: anterohyal with greatest width greater than half of length (vs. greatest width less than half of length); ceratobranchial thin with uniform width (vs. widened anteriorly); hyomandibular with anterior margin sutured to posterior metapterygoid along entire length (vs. slight to large notch between hyomandibular and metapterygoid); maxilla angled dorsally or slightly ventrally (vs. maxilla angled strongly ventrally, almost forming right angle); coracoid with posterior process elongated, thin, pointed (vs. distal end wider than shaft); predorsal plates numbering four or more (vs. two or three); hypertrophied odontodes on nuptial males absent (vs. present); and teeth large but not spoon shaped (vs. small, viliform).

“New Genus 2” was recovered within the *Ancistrus* clade as sister to a clade consisting of the predominantly Andean *Chaetostoma* group (((*Chaetostoma* + *Cordylancistrus platycephalus*) (*Dolichancistrus* + *Leptoancistrus*)) *Cordylancistrus torbesensis*) and the Guiana Shield-endemic clade of *Exastilithoxus* + *Lithoxus* (Armbruster, 2008). Inclusive of “New Genus 2”, the *Ancistrus* clade can be diagnosed by having the following homoplastic autapomorphies: lateral ethmoid with pouch on ventral surface (vs. pouch absent); transverse

process of Weberian complex perforated distally with large foramina (vs. not or only mildly perforated distally); branched anal-fin rays five (vs. four); coracoid posterior process elongated, thin, pointed (vs. distal end about as wide as shaft); coracoid with posterior section straight, short (vs. angled upwards mesially, tall); abdominal plating absent (vs. present).

“New Genus 1” is described here as *Micracanthicus vandragti*, new genus, new species and “New Genus 2” is described here as *Soromonichthys stearleyi*, new genus, new species. *Soromonichthys stearleyi* is one of two recently discovered new genera and species from the western Guiana Shield that exhibit the loss of snout plates and are hypothesized, based on additional osteological characters, to be closely related to the *Chaetostoma* group; the second is *Paulasquama callis* from the upper Mazaruni River in Guyana (Armbruster and Taphorn, 2011).

MATERIALS AND METHODS

Counts and measurements follow Armbruster (2003) and are reported only for those specimens larger than 20 mm SL. Osteology follows Armbruster (2004) except for infraorbital plate numbers, which follow Schaefer (1987), and names of trunk plate rows, which follow Schaefer (1997). We use pterotic to refer to the compound pterotic. Dorsal-fin spinelet is treated as a spine. Institutional abbreviations are as listed at <http://www.asih.org/node/204>. Specimens examined, in addition to those listed below, can be found in Armbruster (2004, 2008).

Micracanthicus, new genus

Type species.—*Micracanthicus vandragti*, new species

Diagnosis.—*Micracanthicus vandragti* can be distinguished from all other Ancistrini except *Hypancistrus* and *Spectracanthicus* by having dentary teeth with longer shafts and larger cusps than premaxillary teeth (Fig. 1); from all other Ancistrini except *Megalancistrus*, *Acanthicus*, and *Panaque* (*Panaque*) by having an enlarged gas bladder and bladder capsule whose posterior margin reaches the expanded rib of the sixth vertebral centrum and whose laterodorsal wall, the

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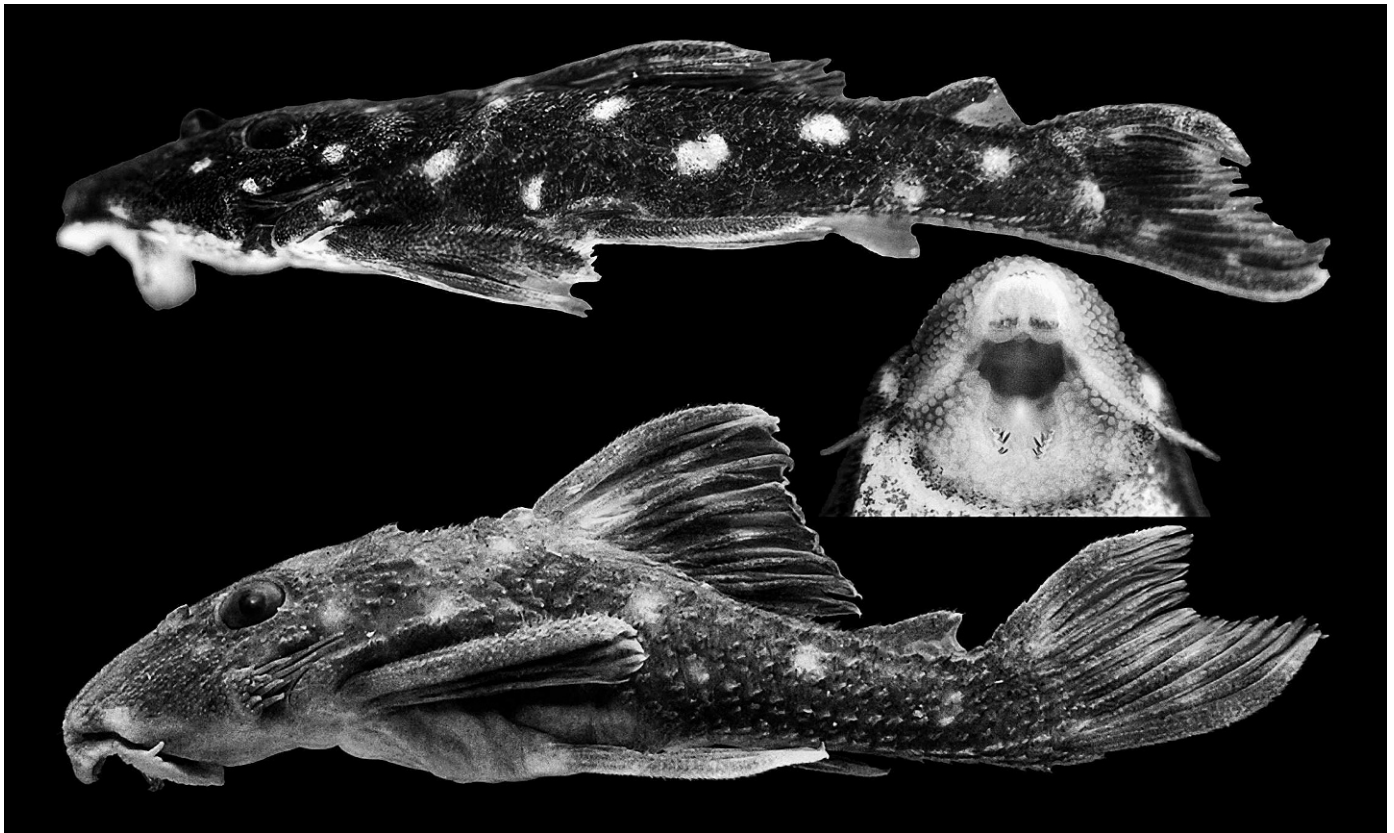


Fig. 1. Above and inset: lateral view and oral disk of uncataloged specimen of *Micracanthicus vandragti* collected from the Ventuari River at Raudales Chipirito, 88.5 km E of San Fernando de Atabapo, 4°04'05"N, 66°54'13"W, N. K. Lujan et al., 1 April 2010. Below: FMNH 117787, 26.5 mm SL, paratype of *Micracanthicus vandragti*, new genus, new species, collected from a shallow rocky reef near the north bank of the Ventuari River, approximately 45 minutes by boat upriver from Ventuari River mouth, 4°4'32"N, 66°53'34"W, N. K. Lujan et al., 3 April 2005.

compound pterotic, bulges dorsally forming a slight convexity visible externally (Fig. 2), with relatively large fenestrae concentrated ventrally (Fig. 2); from all other Ancistrini except *Hypancistrus*, *Panaque*, *Peckoltia*, *Parancistrus*, *Exastilithoxus*, *Lithoxus*, *Leporacanthicus*, *Megalancistrus*, *Pseudacanthicus*, and *Spectracanthicus* by having dentaries with a relatively short tooth cup (Fig. 1; mean = 10.9% HL, vs. typically greater than 15% HL); and by having an intermandibular angle of 90° or less (Fig. 1); from *Hypancistrus*, *Panaque*, *Peckoltia*, and *Parancistrus* by having predorsal plates (excluding nuchal plate) four to five, varying in size and erratically arranged relative to sagittal midline (vs. predorsal plates three to four, similar in size, and bilaterally symmetrical); from *Exastilithoxus*, *Lithoxus*, and *Leporacanthicus* by having a longitudinally oval oral disk (Fig. 1; vs. round oral disk); from *Leporacanthicus*, *Megalancistrus*, and *Pseudacanthicus* by having seven dorsal-fin rays (vs. eight to 11); from *Exastilithoxus* and *Leporacanthicus* by lacking fimbriate papillae on oral disk margins (Fig. 1); from *Exastilithoxus* and *Lithoxus* by not being strongly dorsoventrally flattened; from *Parancistrus* and *Spectracanthicus* by having dorsal and adipose fins separate (vs. connected by a posterior expansion of the dorsal-fin membrane); from *Leporacanthicus* by having premaxillary teeth greater than two per ramus and smaller than dentary teeth (Fig. 1; vs. premaxillary teeth one or two per ramus and larger than dentary teeth); from *Panaque* by lacking plates on the abdomen and by having viliform teeth (Fig. 1; vs. abdomen plated and teeth thickened and spoon-shaped or elongate and spatulate); and from *Hypancistrus* by having the snout pointed (vs. rounded).

Of loriciariid species with which *Micracanthicus vandragti* is known to be sympatric, it is most similar to *Hypancistrus contradens* and *H. lunaorum*. It can be separated from both as diagnosed above from *Hypancistrus*, and from similarly sized *H. contradens* by having spots much smaller than orbit diameter (vs. spots as large as or larger than orbit diameter), and from *H. contradens* and *H. lunaorum* by having hypertrophied cheek and body odontodes at all examined body sizes (vs. only in relatively large and sexually mature adults).

Etymology.—*Micracanthicus* is derived from the Greek *mikros*, meaning small, and *acanthicus*, the name of the supra-generic clade of which this genus is hypothesized to be a basal member (Armbruster, 2008).

***Micracanthicus vandragti*, new species**

Figures 1–3; Table 1

“New Genus 1”.—Armbruster, 2008:47 [phylogenetic relationships].

Holotype.—MBUCV-V-32953, 42.2 mm SL, Venezuela, Amazonas State, Orinoco River at Cupaven Island, near the mouth of the Atabapo River, approximately 4°4'N, 66°42'W, A. Machado, B. Chernoff, D. Machado, J. Wheeler, 29 January 1991.

Paratypes.—59 specimens, all Venezuela, Amazonas State, Orinoco River drainage: AUM 42205, 11 alc, 4 CS, 20.2–36.2 mm SL; ANSP 182804, 9 alc, 20.5–34.2 mm SL; MCNG 55346, 8 alc, 18.4–33.8 mm SL; FMNH 117787, 8 alc, 18.8–

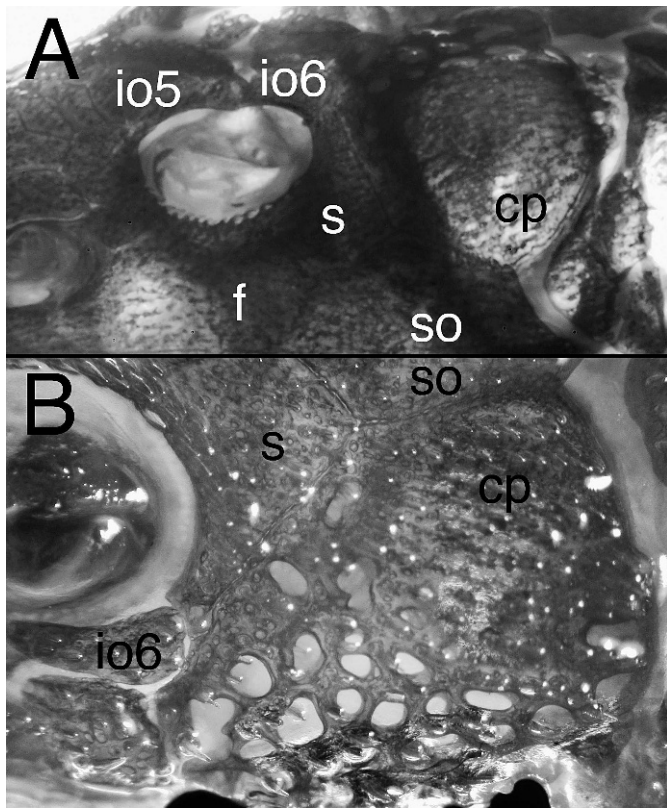


Fig. 2. Orbito-temporal region of *Micracanthicus vandragti* (AUM 42205) in right dorsal (A) and left laterodorsal (B) perspectives. Anterior to left. Labels: cp, compound pterotic; f, frontal; io5 and io6, infraorbitals five and six; s, sphenotic; so, supraoccipital.

31.7 mm SL; MBUCV-V-35365, 8 alc, 18.6–33.2 mm SL; MZUSP 99605, 8 alc, 17.3–33.2 mm SL, Ventuari River, shallow rocky reef near north bank approximately 45 minutes by boat upriver from Ventuari River mouth, 4°4'32"N, 66°53'34"W, N. K. Lujan, M. Arce, E. L. Richmond, M. B. Grant, T. E. Wesley, 3 April 2005; AUM 43273, 2 alc, 20.3, 33.2 mm SL, Orinoco River, 147 km ESE of San Fernando de Atabapo, 3°18'23"N, 66°36'12"W, N. K. Lujan, M. H. Sabaj, M. Arce, T. E. Wesley, 4 March 2005; FMNH 118041, 1 alc, 27.6 mm SL, same data as holotype.

Diagnosis.—As given for genus.

Description.—Morphometrics presented in Table 1. Small loricariid, largest known specimen 42.2 mm SL. In dorsal view, body elongate and teardrop-shaped. Body broadest at evertible cheek plates. Head and snout dorsoventrally flattened and elongate, dorsal profile rising at approximately 35° from anterior margin of head past orbits to nuchal region; nuchal region slightly humped; dorsal profile sloped gently downward from dorsal-fin spinelet to posterior insertion of adipose-fin membrane, then abruptly upward to dorsal caudal-fin spine; body depth greatest in nuchal region. Ventral profile angled slightly downward from snout to coracoid, flat to pelvic-fin insertion, curved slightly upward to posteriormost reach of adpressed anal fin, and downward to ventral procurrent caudal-fin rays.

Entire snout, dorsal and lateral surfaces of trunk armored with plates with hypertrophied odontodes; odontodes on posterior margins of lateral trunk plates slightly larger than those of head and snout. Cheek plates with hypertrophied,

distally-hooked odontodes (mode 17, range 10–26) evertible to approximately 90° from sagittal plane; longest odontodes extending to posterior insertion of pectoral fin. Head contours smooth with slight supraorbital ridge; orbit positioned at anterior margin of posterior half of head; oriented at approximately 45° from sagittal plane in anterior view; iris operculum present.

Oral disk small (Fig. 1), occupying anterior half to two thirds of head; buccal papilla absent. Interpremaxillary tooth row angle greater than 150°; five to eight left premaxillary teeth (mode six). Intermandibular tooth row angle less than or equal to 90°; five to eight right dentary teeth (mode four). All teeth elongate, narrow, and bicuspid with medial cusp larger than lateral; dentary teeth stouter with cusps up to twice as large as premaxillary teeth. Mandibles highly protrusible; such that long axis of dentary tooth cups can be oriented posteriorly in parallel with longitudinal axis of body. Maxillary barbel short, reaching two thirds of distance from mouth to opercular opening; ventral surface and posterior margin of labial disk with rounded papillae decreasing in size toward rictus.

Dorsal fin II,7; dorsal-fin spinelet short and V-shaped; dorsal-fin lock functional; last dorsal-fin ray free, not attached to body. Pectoral fin I,6; pectoral-fin spine slightly surpassing origin of pelvic fin when adpressed ventral to pelvic fin; anterodorsal surfaces of spine ornamented with odontodes gradually increasing in size distally. Pelvic fin I,5; pelvic-fin spine extending beyond posterior insertion of unbranched anal-fin ray when adpressed. Anal fin I,4; small with thickened unbranched first ray. Adipose-fin spine straight or distally hooked; attached to caudal peduncle via fleshy membrane with convex posterior margin in some specimens. Caudal fin I,14,I; dorsal procurrent caudal-fin rays three or four (mode four), ventral procurrent caudal-fin rays three or four (mode four); dorsal caudal-fin spine shorter and stouter than ventral spine; posterior caudal-fin margin obliquely truncate or obliquely and shallowly forked. Posterior margins of all fins except adipose frilled with membranous elongations of branched fin-ray tips; all branched fin rays bearing small odontodes.

Lateral median plates 21–23 (mode 21), middorsal plates 21–22 (mode 21), midventral plates 22–24 (mode 23), caudal peduncle plate rows five, one azygous preadipose plate. Abdomen naked.

Color.—Alcohol preserved adults with gray-brown base color (Fig. 1); melanophores distributed over dorsal and lateral surfaces of body and all fin spines, rays, and membranes; lighter patches of less-densely spaced melanophores distributed across dorsal and lateral surfaces, dorsal, caudal, and paired fins. Abdomen with pale yellow-white base color with less-densely spaced melanophores distributed mainly across lateral margins. Live adults with black base color and white spots no larger than orbits but varying in size; spots distributed evenly across dorsal and lateral surfaces of body, and dorsal, caudal, and paired fins (Fig. 1).

Distribution.—Known only from the lower Ventuari River and the Orinoco River near its confluence with the Ventuari (Fig. 4).

Etymology.—The species epithet *vandragti* is a patronym honoring Randy Van Dragt, Professor of Biology at Calvin College since 1981, whose patient introductions to tropical

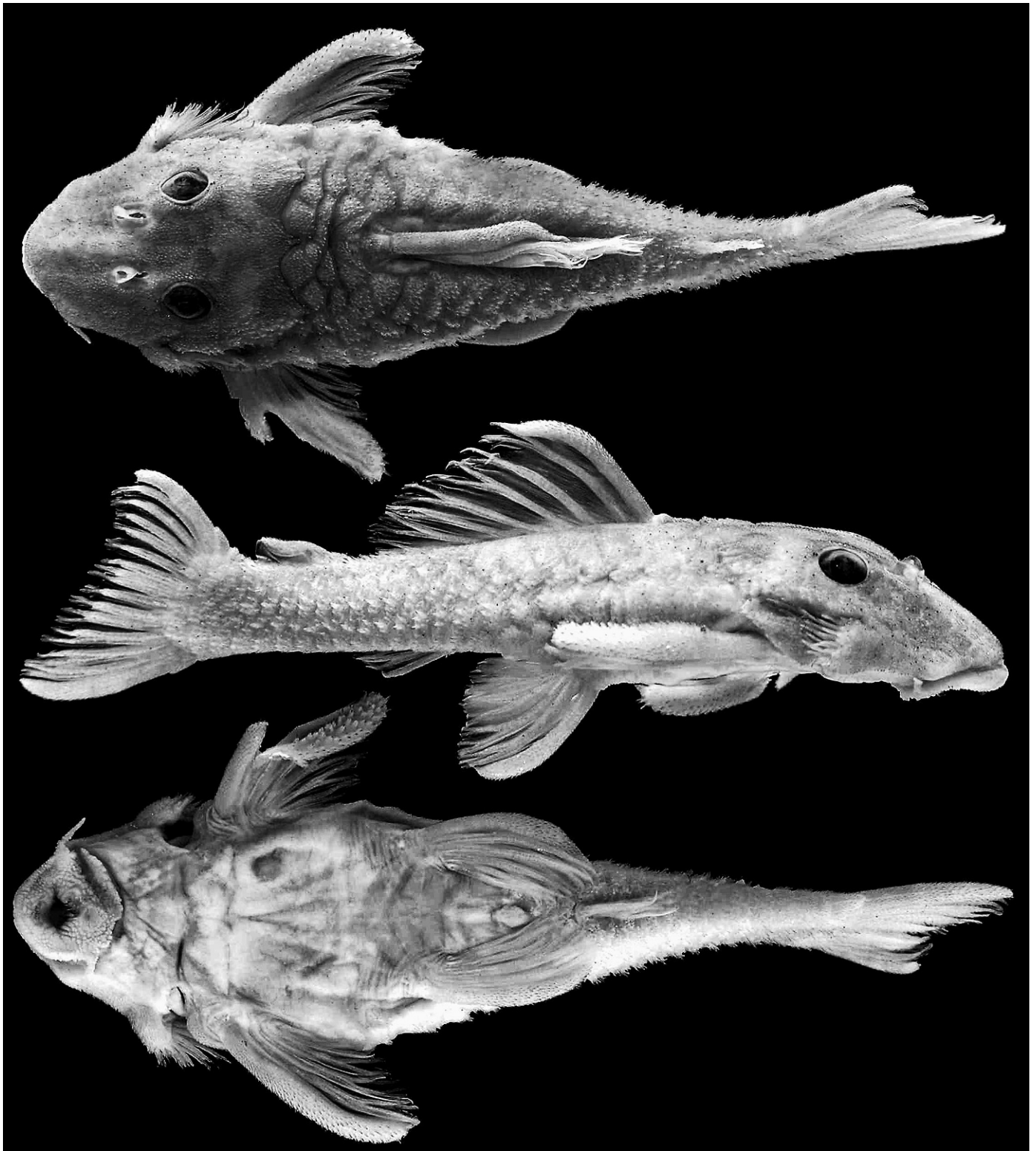


Fig. 3. MBUCV-V-32953, 42.2 mm SL, holotype of *Micrakanthicus vandragti*, new genus, new species, collected from the Orinoco River at Cupaven Island, near the mouth of the Atabapo River, approximately 4°4'N, 66°42'W, A. Machado et al., 29 January 1991. Right side is shown in lateral view due to damage on left side.

ecology and fish ecomorphology benefitted the first author immeasurably.

Habitat.—Most specimens of *Micrakanthicus vandragti* have been collected via application of rotenone to shallow rocky reefs in the main channel of the lower Ventuari River. Water

parameters at one Ventuari River site yielding specimens of *Micrakanthicus vandragti* were as follows: temperature, 32°C; pH, 6.9; specific conductivity, 12.9 μ S/cm; salinity, 0.0 ppt.; dissolved oxygen, 6.6 mg/l or 90.6% saturation. Thirteen other loricariid species have been collected syntopically with *M. vandragti* in the Ventuari River: *Ancistrus macroph-*

Table 1. Selected Morphometric Data for *Micracanthicus vandragt*, New Genus, New Species ($n = 21$) and *Soromonichthys stearleyi*, New Genus, New Species ($n = 6$). Interlandmarks (ILM) are the two points between which measurements were taken (from Armbruster, 2003).

ILM	Measurement	<i>Micracanthicus vandragt</i> , new genus, new species				<i>Soromonichthys stearleyi</i> , new genus, new species			
		Mean	SD	Min	Max	Mean	SD	Min	Max
1–20	Standard length (mm)	32.8	2.7	30.1	42.2	25.9	3.0	20.5	29.7
	Percents of standard length								
1–10	Predorsal length	44.2	1.3	41.4	46.9	48.5	1.4	47.4	51.0
1–7	Head length	37.8	1.4	34.6	40.2	39.2	1.0	38.1	40.4
7–10	Head–dorsal length	6.3	1.4	3.9	8.6	9.6	0.8	8.9	10.6
8–9	Cleithral width	24.4	1.2	21.6	27.0	35.0	1.0	34.2	36.8
1–12	Head–pectoral length	28.7	1.1	26.3	30.1	32.1	1.5	29.8	33.9
12–13	Thorax length	24.0	2.0	20.7	27.7	23.4	1.7	21.1	25.6
12–29	Pectoral-spine length	27.4	1.1	25.5	30.9	27.5	2.4	24.0	31.1
13–14	Abdominal length	21.3	1.4	18.6	23.7	22.4	0.8	21.3	23.2
13–30	Pelvic-spine length	22.8	1.4	20.2	25.9	22.4	0.6	21.8	23.2
14–15	Postanal length	29.5	1.3	26.6	31.8	32.1	1.8	29.3	33.9
14–31	Anal-fin spine length	9.3	1.6	7.2	13.5	9.3	0.7	8.3	10.4
10–12	Dorsal–pectoral depth	24.2	1.4	22.3	28.4	30.1	1.0	28.9	31.5
10–11	Dorsal spine length	25.2	1.7	22.8	27.5	22.6	0.9	21.1	23.4
10–13	Dorsal–pelvic depth	18.7	1.0	15.6	20.9	18.8	1.5	17.6	21.3
10–16	Dorsal-fin base length	26.6	1.4	24.1	29.1	24.3	0.9	22.5	25.0
16–17	Dorsal–adipose distance	11.8	1.4	7.9	14.3	9.4	1.3	7.2	11.2
17–18	Adipose-spine length	9.3	1.2	6.2	10.9	12.3	0.6	11.6	13.5
17–19	Adipose–upper caudal depth	16.0	1.7	11.8	19.0	16.9	1.0	15.5	18.4
15–19	Caudal peduncle depth	11.8	0.6	10.7	13.1	11.7	0.7	11.0	12.5
15–17	Adipose–lower caudal distance	22.3	1.5	18.2	23.8	25.1	1.1	23.6	26.4
14–17	Adipose–anal depth	15.0	1.0	13.2	17.8	15.5	1.4	13.8	17.9
14–16	Dorsal–anal depth	13.2	0.7	11.7	14.3	13.8	0.8	12.5	14.7
13–16	Pelvic–dorsal depth	22.2	1.9	20.1	27.1	23.9	3.2	18.3	27.9
	Percents of head length								
5–7	Head–eye length	37.2	2.2	33.5	42.8	39.3	2.2	36.3	42.8
4–5	Orbit diameter	19.6	2.1	14.8	22.9	15.5	1.3	13.0	16.6
1–4	Snout length	55.4	1.4	52.9	58.9	57.1	2.8	52.7	60.1
2–3	Internares width	11.6	2.2	9.6	19.1	12.9	0.9	11.7	13.7
5–6	Interorbital width	35.1	4.1	29.8	44.8	36.7	1.4	35.0	38.4
7–12	Head depth	55.4	3.8	43.0	62.7	64.0	3.9	57.0	67.9
1–24	Mouth length	34.7	2.9	29.0	38.8	49.7	2.6	47.0	53.3
21–22	Mouth width	35.3	2.5	31.2	39.2	68.4	2.4	65.4	72.0
22–23	Barbel length	12.5	3.6	5.9	17.8	4.8	1.5	2.9	7.3
25–26	Dentary tooth cup length	10.9	2.5	7.7	15.8	22.0	2.5	18.4	24.8
27–28	Premaxillary tooth cup length	10.2	2.2	7.4	15.4	22.4	2.4	18.0	24.8

thalmus, *Baryancistrus beggini*, *Baryancistrus demantoides*, *Hemiancistrus guahiborum*, *Hemiancistrus subviridis*, *Hypancistrus contradens*, *Hypancistrus lunaorum*, *Hypostomus squalinus*, *Leporacanthicus galaxias*, *Pseudancistrus orinoco*, *Pseudolithoxus anthrax*, *Pseudolithoxus tigris*, and *Spatuloricaria* sp.

Remarks.—*Micracanthicus vandragt* has greater freedom of lower jaw movement and bilateral independence of lower jaw rami than any other loricariid previously examined by us. This includes the apparently unique ability (to the extent observable by manipulating jaw elements in live and fixed specimens) to broadly splay their lower jaws distolaterally.

Intestinal contents of three examined individuals mostly consisted of amorphous organic detritus and inorganic sediment, although gut contents of one individual included two small snail shells. The alimentary canal of three examined individuals consisted of a stomach only barely differentiable from intestines and total intestinal length (esophagus to anus)

approximately four times standard length. This is a relatively short gut compared to most other loricariids, but is similar in morphology and relative length to the largely insectivorous *Leporacanthicus galaxias*, another member of the *Acanthicus* clade. Unpublished stable isotope data suggests that all members of the *Acanthicus* clade are relatively carnivorous as compared with other sympatric loricariids (Lujan, 2009).

Soromonichthys, new genus

Type species.—*Soromonichthys stearleyi*, new species

Diagnosis.—*Soromonichthys* may be diagnosed from all other Hypostominae by having a unique pattern of plate loss on the snout (Figs. 5, 6): *Soromonichthys* has naked skin covering its anteriormost snout margin, extending posteromedially over the mesethmoid to level approximately coequal with anterior bony rim of nostrils, and posterolat-

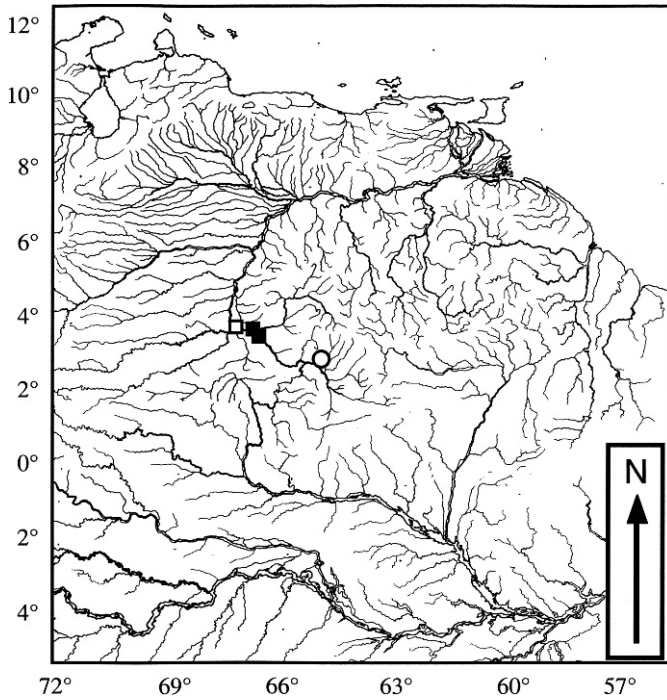


Fig. 4. Known distribution of *Micracanthicus vandragti* (squares) and *Soromonichthys stearleyi* (circle) in northern South America. Open symbols represent type localities.

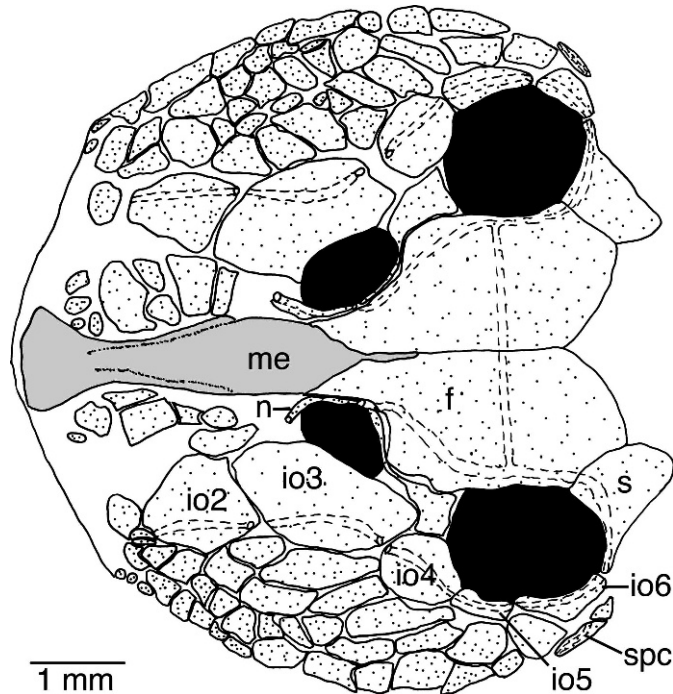


Fig. 5. Dorsal view of head plates and superficial bones of *Soromonichthys stearleyi* (AUM 43872). Stippled areas are bones or plates normally supporting odontodes in loricariids, but may or may not in *S. stearleyi*; unstippled and gray areas are unplated regions or spaces between plates. The mesethmoid, shaded gray and drawn here to show the relative positions of plates, is normally covered by plates in loricariids. Nare (left) and orbit (right) shaded black. Labels on left side: f, frontal; io2–io6, infraorbitals two through six; me, mesethmoid; n, nasal; s, sphenotic; spc, suprapreopercle.

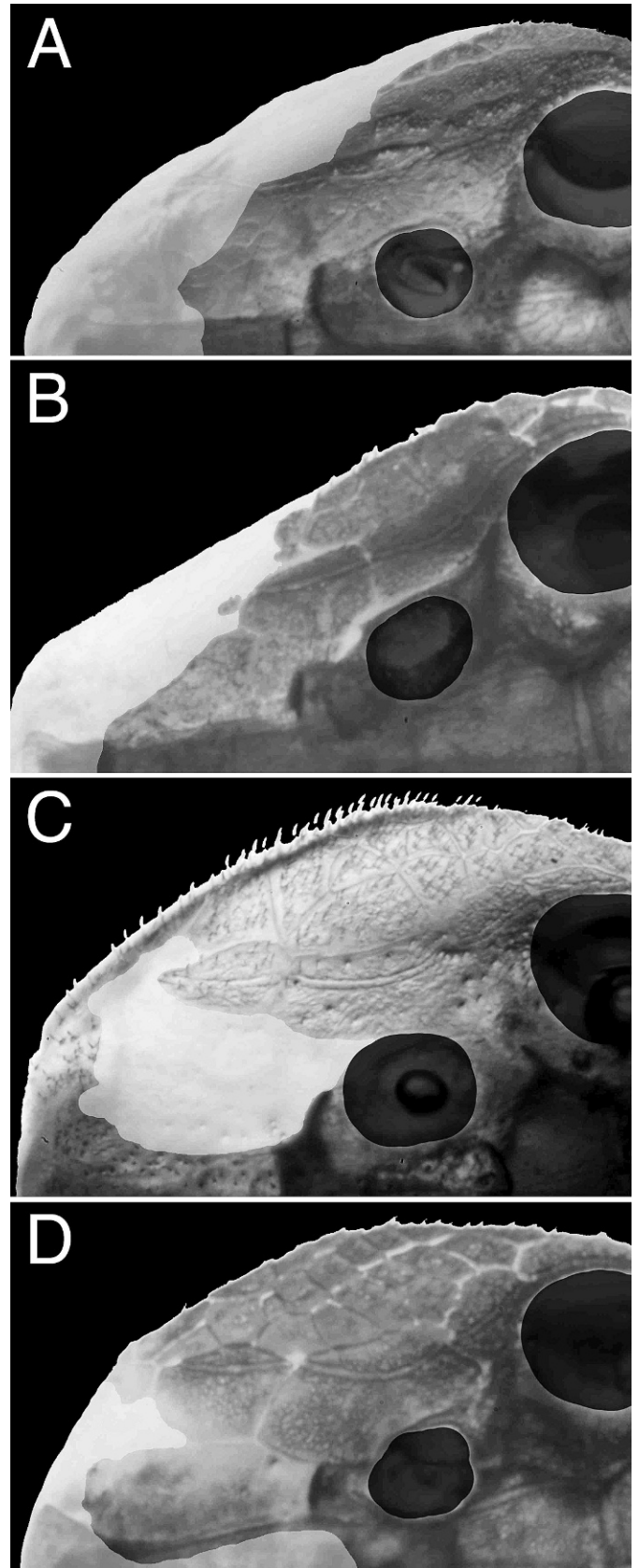


Fig. 6. Right side, dorsal view of snouts of cleared-and-stained (A) *Chaetostoma anomalum* (INHS 34957), (B) *Ancistrus pirareta* (female, UMMZ 206085), (C) *Paulasquama callis* (AUM 50000), and (D) *Soromonichthys stearleyi* (AUM 43872). Nare (left) and orbit (right) shaded black; non-plated regions shaded white. Anterior toward left.

erally to about midlength of snout; plated region restricted to column along either side of mesethmoid that becomes broadly expanded posterolaterally to snout margin. Only three other Hypostominae genera have a loss of snout plates: *Ancistrus*, *Chaetostoma*, and *Paulasquama* (Fig. 6). *Ancistrus* differs from *Soromonichthys* in having the naked region extending more posteriorly along the lateral margins of the snout and more evenly expanded posteriorly to near midlength of the snout (females) or beyond (males); all *Ancistrus* have plates along the posterolateralmost margins of the snout as well as medial plates over the posterior mesethmoid. *Chaetostoma* is similar to *Ancistrus* but with less developed or absent sexual dimorphism. *Paulasquama* differs in having naked region confined to bilaterally symmetrical patches on either side of the mesethmoid, each extending posteriorly to the anterior rim of the nostril; plates covering anterior and lateral margins of the snout and extending posteromedially over the mesethmoid continuous with posterior head plates. *Soromonichthys* is further distinguished from *Ancistrus*, *Chaetostoma*, and *Paulasquama* by having body coloration consisting of thin irregular light yellow to gold bars on a base color of irregularly mixed moderate to dark green (vs. coloration lacking thin light colored bars); from *Ancistrus* by lacking tentacles emergent from unplated regions of the snout, by having nasal no wider than canal (vs. nasal wide and almost square); and from *Chaetostoma* by having seven dorsal-fin rays (vs. eight to ten).

Etymology.—*Soromonichthys* is a combination of Soromoni, the name of the creek which serves as type locality for the type species, and the Greek *ikhthus*, meaning fish.

***Soromonichthys stearleyi*, new species**

Figures 5, 6D, 7; Table 1

“New Genus 2”.—Armbruster, 2008:48 [phylogenetic relationships].

Holotype.—MCNG 55347, 29.7 mm SL, Venezuela, Amazonas State, Soromoni Creek, cobble and gravel shoal approximately 30 minutes by boat from the mouth and 11.8 km E of La Esmeralda, 3°11'37"N, 65°39'07"W, N. K. Lujan, M. Arce, E. L. Richmond, M. B. Grant, T. E. Wesley, 26 March 2005.

Paratypes.—7 specimens, all data same as holotype, MCNG 55348, 2 alc, 26.5 mm SL; AUM 43872, 2 alc, 1 CS, 26.1–26.7 mm SL; ANSP 182803, 2 alc, 20.5, 25.8 mm SL.

Diagnosis.—As given for genus.

Description.—Morphometrics presented in Table 1. Small loricariid, largest known specimen 29.7 mm SL. Body broad at base and compact in length; teardrop-shaped in dorsal view with broadly rounded snout and stout trunk. Dorsal profile rising at approximately 45° from snout to orbits; flat across supraoccipital; then slightly humped in nuchal region; sloped gently downward from insertion of dorsal-fin spine to posterior insertion of adipose-fin membrane, then abruptly up to dorsal caudal-fin spine; body depth greatest in nuchal region. Ventral profile angled slightly downward from snout to coracoid, then flat to caudal fin.

Naked skin covering its anteriormost snout margin, extending posteromedially over mesethmoid to level approximately coequal with anterior bony rim of nostrils, and

posterolaterally to about midlength of snout; plated region restricted to column along either side of mesethmoid that becomes broadly expanded posterolaterally to snout margin (Figs. 5, 6D); plates between opercle and infraorbitals covered in thick skin but apparent along most of lateral head surface via emergence of short odontodes through skin. Cheek plates supporting clusters of moderately hypertrophied odontodes (mode 27, range 22–33) evertible to approximately 90° from sagittal plane. Odontodes on suprapreopercle proximal to cheek plates also moderately hypertrophied. Head contours smooth with orbits flush; orbit angled ventrolaterally approximately 45° from sagittal plane in anterior view; dorsal rim of orbits ornamented with odontodes slightly larger than on remainder of head.

Oral disk broad, occupying most of ventral surface of head; buccal papilla present. Intermandibular and interpremaxillary tooth row angles approximately 150°; tooth rows slightly curved. Left premaxillary teeth 43–65 (mode 55); left dentary teeth 39–69 (mode 57); teeth villiform and bicuspid with medial cusp up to four times as long as lateral cusp. Maxillary barbel short and adnate to posterior labial disk along most of length; ventral surface of labial disk with rounded papillae decreasing in size distally; anterior and posterior margins of labial disk fringed with small digitate papillae.

Dorsal fin II,7; dorsal-fin spinelet short and V-shaped; dorsal-fin lock functional; anterior margins of dorsal-fin spine ornamented with modestly hypertrophied odontodes; last dorsal-fin ray not adnate to body. Pectoral fin I,6; pectoral-fin spine slightly surpassing origin of pelvic fin when adpressed ventral to pelvic fin; anterodorsal surfaces of spine ornamented with modestly hypertrophied odontodes. Pelvic fin I,5; pelvic-fin spine extending to just beyond posterior insertion of anal fin when adpressed; anteroventral surfaces of spine ornamented with slightly hypertrophied odontodes. Anal fin I,5; small with weak spine and few if any odontodes. Adipose-fin spine straight, laterally compressed, with anterior surface ornamented with modestly hypertrophied odontodes; adnate to caudal peduncle via fleshy membrane extending posteriorly beyond spine. Caudal fin I,14,I; dorsal procurrent caudal-fin rays four, ventral procurrent caudal-fin rays three; caudal-fin obliquely truncate. Branched rays of all fins but anal fin with small odontodes.

Lateral median plates 23–24 (mode 24), middorsal plates 18–20 (mode 20), midventral plates 19–21 (mode 20), caudal peduncle plate rows three, one preadipose plate. Abdomen naked.

Color.—Alcohol preserved adults with gray to light-brown base color on head, plated regions of body, and unplated regions of snout and anterior surface of upper lip (Fig. 7). Ventral surfaces of oral disk, head, abdomen, and trunk uniformly pale yellow to white. Dorsal and lateral surfaces of snout, head, and trunk anterior to insertion of dorsal-fin spine with small evenly-spaced light yellow spots transitioning posteriorly to light yellow vermiculations in nuchal region, on pterotic, and near cleithrum; vermiculations transitioning to thin, semi-irregular, bright, light-yellow bars along dorsolateral surface of trunk from insertion of dorsal-fin spine to caudal fin. Color pattern of body contiguous with similar color pattern on all branched and unbranched fin rays; fin membranes hyaline. Hypertrophied odontodes ornamenting orbits, fin spines, and ventrolateral margins of caudal peduncle orange to red. Hypertrophied cheek odon-

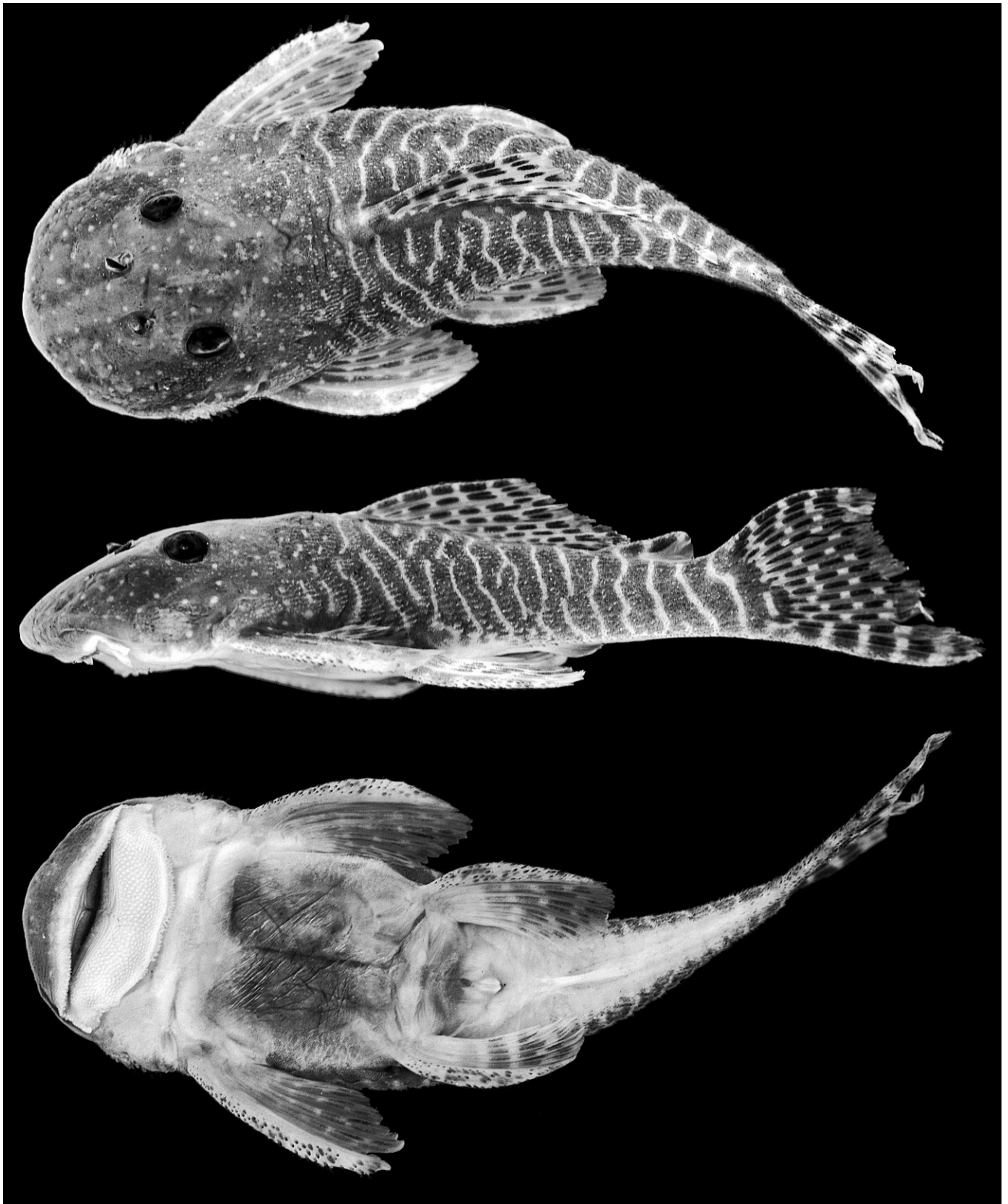


Fig. 7. MCNG 55347, 29.7 mm SL, holotype of *Soromonichthys stearleyi*, new genus, new species, collected from a cobble and gravel shoal in Soromoni Creek, approximately 30 minutes by boat from the mouth and 11.8 km E of La Esmeralda, 3°11'37"N, 65°39'07"W, N. K. Lujan et al., 26 March 2005.

todes with straw-colored shafts and orange to red distal tips. Live adults with light yellow-green to dark green ground color with bright yellow-gold spots, vermiculations, and bars.

Distribution.—Known only from relatively low elevation (ca. 120 m asl) reaches of Soromoni Creek, a clearwater tributary of the upper Orinoco (Fig. 4) draining the southwestern slope of Mount Duida, a tepui at the western margin of the Guiana Shield with a maximum elevation greater than 2300 meters above sea level.

Etymology.—The species epithet *stearleyi* is a patronym honoring Ralph Stearley, Professor of Geology at Calvin College since 1992, whose patient introductory tutelage in fish osteology set the first author on his career.

Habitat.—All individuals collected from shallow riffles and runs over clean cobble substrate interspersed with sand and patches of a rooted, moss-like aquatic macrophyte. Other loricariids collected in Soromoni Creek with *Soromonichthys* were *Ancistrus* sp., *Dekeyseria niveata*, *Exastilithoxus* sp., and *Rineloricaria formosa*.

DISCUSSION

Micracanthicus vandragti, although very small in body size (largest specimen 42.2 mm SL), is recovered at the base of the more typically large-bodied *Acanthicus* clade, a group of approximately 20 species of predominantly carnivorous loricariids that occupy mostly main channel habitats of tropical South American rivers east of the Andes (Armbruster, 2008). The *Acanthicus* clade, including *Micracanthicus*, is characterized by having medium to short tooth cups, with rows of relatively long teeth oriented at acute angles to one another. The genus *Leporacanthicus* carries this trend to its extreme, having usually only two greatly enlarged premaxillary and four dentary teeth with which it pries aquatic insects and other food items from cracks (NKL, pers. obs. and unpubl. gut content data). The phylogenetic proximity and similarity of gut morphology between *Micracanthicus* and *Leporacanthicus* suggest that the former may also have a relatively high-protein diet. Aquarium observations of *Leporacanthicus* specimens using their jaws to separate prey items from convoluted substrates like snail shells suggests that the high mobility of *Micracanthicus* mandibles may serve a similar function. With the inclusion of *Micracanthicus vandragti*, one of the smallest known hypostomine species, the *Acanthicus* clade is also notable for its range of body sizes, which extends up to *Acanthicus hystrix*, the longest known loricariid species, which reaches at least 628 mm SL (C. Chamon, MZUSP, pers. comm.).

Soromonichthys stearleyi was recovered as sister to two clades: a predominantly Andean clade comprised of four genera (*Chaetostoma*, *Cordylancistrus*, *Dolichancistrus*, *Lep-toancistrus*) and a Guiana Shield clade of two genera (*Exastilithoxus*, *Lithoxus*). Across these lineages, considerable variation in jaw morphologies and associated trophic ecology can be observed, from long and parallel tooth-cup jaw morphologies with many teeth in *Soromonichthys* and the predominantly Andean genera, to short and highly-angled tooth-cup jaw morphologies with few teeth in *Exastilithoxus* and *Lithoxus*. Preliminary, unpublished gut-content and stable isotope data collected by the first author suggest that this variation in jaw morphology corresponds with a shift in diet from benthic herbivory and detritivory in

the long-jawed consumers, to insectivory in the short-jawed consumers. Wide variation in jaw morphologies observable within just the *Acanthicus* and *Lithoxus* clades may be attributable to the loss of constraints at the base of the loricariid lineage as posited by the decoupling hypothesis of Schaefer and Lauder (1986). However, estimates of node-ages are needed to demonstrate whether morphological diversification rates are elevated at the base of the loricariid phylogeny or are relatively high throughout the loricariid phylogeny, possibly reflecting a response to key innovations of the loricariid jaw, or are only higher in more derived clades such as those discussed herein, suggesting that extrinsic ecological factors may have been more important influences on jaw morphology than intrinsic decouplings. Regardless of their evolutionary effect on morphological diversification, the biomechanical decouplings described by Schaefer and Lauder (1986) are certainly critical to the remarkable bilateral independence and freedom of lower jaw movement exemplified by *Micracanthicus vandragti*.

Recovery of *Soromonichthys stearleyi* as sister to a trans-highland clade containing both a monophyletic Andean radiation (*Chaetostoma* and relatives) and a monophyletic Guiana Shield radiation (*Exastilithoxus* + *Lithoxus*), suggests that the Andean lineage may have originated on the Guiana Shield. Further support for this hypothesis and its relevance to historical biogeographic events in northern South America can be found in Lujan and Armbruster (2011).

MATERIAL EXAMINED

Ancistrus pirareta: UMMZ 206085, 1, Paraguay, Paraguari State, Arroyo Corriente ca. 12.3 km NNE (by dirt rd) of campground at the falls in Parque Nacional Ybycui, 26°2'30"S, 56°49'W.

Chaetostoma anomalum: INHS 34957, 1, Venezuela, Trujillo State, Motantan River drainage.

Paulasquama callis: AUM 50000, 1, Guyana, Cuyuni-Mazaruni, Waruma River, Kako River, Mazaruni River drainage, riffles and shallow rapids upstream from camp, 5°28'31"N, 60°46'46"W.

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LITERATURE CITED

- Armbruster, J. W. 2003. *Peckoltia sabaji*, a new species from the Guyana Shield (Siluriformes: Loricariidae). *Zootaxa* 344:1–12.
- Armbruster, J. W. 2008. The genus *Peckoltia* with the description of two new species and a reanalysis of the

- phylogeny of the genera of the Hypostominae (Siluriformes: Loricariidae). *Zootaxa* 1822:1–76.
- Armbruster, J. W., and D. C. Taphorn.** 2011. A new genus of weakly armored catfish from the upper Mazaruni River, Guyana. *Copeia* 2011:46–52.
- Lujan, N. K.** 2008. Description of a new *Lithoxus* (Siluriformes: Loricariidae) from the Guayana Highlands with a discussion of Guiana Shield biogeography. *Neotropical Ichthyology* 6:413–418.
- Lujan, N. K.** 2009. Jaw morpho-functional diversity, tropic ecology, and historical biogeography of the Neotropical suckermouth armored catfishes (Siluriformes, Loricariidae). Unpubl. Ph.D. diss., Auburn University, Auburn, Alabama.
- Lujan, N. K., M. Arce, and J. W. Armbruster.** 2009. A new black *Baryancistrus* with blue sheen from the upper Orinoco (Siluriformes: Loricariidae). *Copeia* 2009:50–56.
- Lujan, N. K., and J. W. Armbruster.** 2011. The Guiana Shield, p. 211–224. *In*: Historical Biogeography of Neotropical Freshwater Fishes. J. Albert and R. Reis (eds.). University of California Press, Berkeley.
- Lujan, N. K., J. W. Armbruster, and M. H. Sabaj.** 2007. Two new species of *Pseudancistrus* from southern Venezuela (Siluriformes: Loricariidae). *Ichthyological Exploration of Freshwaters* 18:163–174.
- Schaefer, S. A.** 1987. Osteology of *Hypostomus plecostomus* (Linnaeus), with a phylogenetic analysis of the loricariid subfamilies (Pisces: Siluriformes). *Contributions in Science, Natural History Museum of Los Angeles County* 394:1–31.
- Schaefer, S. A.** 1997. The neotropical cascudinhos: systematics and biogeography of the *Otocinclus* catfishes (Siluriformes: Loricariidae). *Proceedings of the Academy of Natural Sciences of Philadelphia* 148:1–120.
- Schaefer, S. A., and G. V. Lauder.** 1986. Historical transformation of functional design: evolutionary morphology of feeding mechanisms in loricarioid catfishes. *Systematic Zoology* 35:489–508.