

Four new species of the suckermouth armored catfish genus *Lasiancistrus* (Loricariidae: Ancistrinae)

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Species of a monophyletic group of loricariid catfishes from southern Venezuela were analyzed and four undescribed species were discovered. Placement of the species into a genus is difficult, and the species are placed in *Lasiancistrus* at least temporarily. The new species *L. anthrax*, *L. dumus*, *L. nicoi*, and *L. tigris* are described. The four species occur in Amazonas State in the upper Río Orinoco, the Río Ventuari, the Río Casiquiare, and the upper Río Negro. *Lasiancistrus anthrax* also occurs in Bolívar State in the Río Caura and the Río Aro. The four species likely represent a monophyletic group based on the derived presence of extremely hypertrophied odontodes on the pectoral-fin spine and hypertrophied odontodes along the snout margin in both sexes.

Las especies de un grupo monofilético de bagres loricáridos del sur de Venezuela fueron analizadas y se descubrieron cuatro especies no descritas. La ubicación de estas especies en un género es difícil, las mismas han sido colocadas en *Lasiancistrus* temporalmente. Se describen las especies nuevas *Lasiancistrus anthrax*, *L. nicoi*, *L. dumus*, y *L. tigris*. Las cuatro especies se encuentran en el Estado Amazonas, alto Río Orinoco, Río Ventuari, Río Casiquiare y alto Río Negro. Solo la especie *L. anthrax* se encuentra en el Estado Bolívar, Ríos Caura y Aro. Las cuatro especies aparentemente representan un grupo monofilético ya que comparten caracteres derivados tales como: odontodes extremadamente hipertrofiados sobre la espina de la aleta pectoral y odontodes hipertrofiados en el margen del hocico, en ambos sexos.

Introduction

With approximately 645 valid species, the Loricariidae is the largest family of catfishes in the world (Isbrücker, 1980; pers. obs.). Recent expeditions into areas that hitherto have been virtually unexplored have yielded many undescribed species and genera of the Loricariidae. Amazonas, the southernmost state of Venezuela, has

been one such area. While examining fishes collected in Amazonas, we became aware of a monophyletic group of species of the subfamily Ancistrinae that are characterized by evertible cheek plates, a very dorsoventrally flattened body, extremely hypertrophied odontodes (integumentary teeth) on elongated pectoral spines and along the snout margin, and 3 rows of plates on the caudal peduncle. In addition, it appears as if

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females as well as males develop hypertrophied snout and pectoral-fin odontodes, traits normally restricted to nuptial males. Comparison of these species with types and/or original descriptions of other loriciids has led us to the conclusion that the species are undescribed.

The four new species described herein are most similar to *Lasiancistrus* Regan. A review of some type specimens and all original species descriptions of *Lasiancistrus* reveals that *Lasiancistrus* (sensu Isbrücker, 1980 and Heitmans et al., 1982) is a polyphyletic taxon. At present, there are no published studies that diagnose *Lasiancistrus*; however, the unpublished study of Armbruster (1997) suggests that *Lasiancistrus* be restricted to those species that can be superficially recognized by the presence of long, narrow odontodes on the evertible cheek plates that look like whiskers. Sabaj et al. (1999) suggest a close relationship of *Lasiancistrus* sensu stricto with *Ancistrus* based on the shared derived presence of large tentacles on the snouts of males (in *Lasiancistrus*, the tentacles are not as large as those of *Ancistrus* and they are associated with hypertrophied odontodes). The four new species lack whiskerlike odontodes and large tentacles; however, until the genera of Ancistrinae can be better diagnosed and a phylogeny becomes available, it is most conservative to describe the new species in *Lasiancistrus*.

In this manuscript, *L. anthrax*, *L. dumus*, *L. nicoi* and *L. tigris* are described and compared, and some of the biogeographical aspects of their evolution are discussed. The four species described herein are referred to as the *L. anthrax* species group.

Materials and methods

Measurements are made with the use of digital calipers to the nearest 0.1 mm. Measurements and counts of bilaterally symmetrical features are from the left side of the body when possible; if a feature is missing or broken on the left side, it is examined on the right side. Measurements are as in Boeseman (1968) or as modified in Armbruster & Page (1996) and Armbruster & Hardman (1999). All measurements are natural log-transformed and principal components analyses (PCA) are performed using a covariance matrix in SYSTAT ver. 5.0 (Systat, 1992). Three PCA's are completed: (1) with all species included,

(2) only with *L. anthrax* and *L. nicoi*, and (3) only with *L. dumus* and *L. tigris*. Analyses include all measurements except for *L. anthrax* versus *L. nicoi* where adipose-caudal length and dorsal-fin spine length are excluded so that all specimens could be analyzed.

Meristics are defined as follows: lateral line plates are the number of plates bearing the lateral-line canal from the pterotic-supracleithrum up to, but not including, the elongate plate that covers the insertion of the caudal-fin rays; dorsal plates are the number of plates below the dorsal fin; interdorsal plates are the number of lateral plates that contact one another from the plate just posterior to the dorsal-fin membrane up to, but not including, the median, unpaired preadipose plate; adipose-caudal plates are the number of lateral plates in a dorsal series beginning where interdorsal plates ended up to, and including, the elongate plate that covers the base of the caudal-fin rays; folded dorsal-fin plates are the number of plates below the dorsal fin to the posterior-most tip when the dorsal fin is completely depressed (includes only those plates that the dorsal fin completely surpasses); and postanal plates are the number of plates in a ventral series from the plates just posterior to the insertion of the last anal-fin ray up to, and including, the elongate plate that covers the base of the caudal-fin rays. Plate counts are from the left side of the body. Dorsal-, pectoral-, pelvic-, and anal-fin ray counts are also included; the dorsal-fin spinelet is counted as a spine, and the first anal-fin ray is counted as a spine. Counts for holotypes are in parentheses in the species descriptions.

Specimens were cleared and stained for examination of bone and cartilage using the methods of Taylor & Van Dyke (1985). Institutional abbreviations follow Leviton et al. (1985) with the addition of MAC-PAY for the non-permanent collection of the Ministerio de Agricultura y Cria, Puerto Ayacucho. Comparative specimens of other loriciids examined are listed in Armbruster (1998).

Diagnosis of *L. anthrax* species group

The *L. anthrax* species group differs from *Lasiancistrus* sensu stricto by lacking thin, whiskerlike odontodes on the evertible cheek plates and from all other ancistrines except *Ancistrus*, *Dekeyseria*, *Exastilithoxus*, *Lithoxus*, and *Neblinichthys* by hav-

ing 3 rows of plates on the caudal peduncle (vs. 4-5; all described *Lasiancistrus* that do not have whiskerlike odontodes have 4-5 rows of plates on the caudal peduncle). The *L. anthrax* species group further differs from *Ancistrus* by having plates along the anterior margin of the snout (vs. anterior part of snout naked) and by lacking tentacles on the snout; from *Dekeyseria* by lacking well-keeled lateral plates; from *Exastilithoxus* by lacking frimbriae on the lower lip; from *Exastilithoxus* and *Lithoxus* by having much greater than 20 teeth per jaw ramus; and from *Nebelinichthys* by lacking elongate odontodes on the top of the snout of breeding males. The key below serves to separate the species of the *L. anthrax* group and a similar, sympatric species referred to as *Lasiancistrus* sp. (see Discussion).

Key to the species of the *L. anthrax* species group

1. - Body black, usually with white spots (the white spots may be faded and indistinct in preserved specimens). Dark bands absent on caudal fin.
..... 2
- Body with brown and tan bars or gray-brown with black spots. Dark bands usually present on caudal fin.
..... 4
2. - Caudal fin with white band at distal margin.
..... *L. nicoi*
- Caudal fin without white band at distal margin.
..... 3
3. - Base of dorsal-fin length to caudal depth ratio 2.1-2.2. 5 anal-fin rays (rarely 4).
..... *L. anthrax*
- Base of dorsal-fin length to caudal depth ratio 2.9-3.5. 4 anal-fin rays.
..... *Lasiancistrus* sp.
4. - Color pattern consisting of black spots on head and anterior part of body.
..... *L. dumus*
- Color pattern consisting of brown and tan bars on head and anterior part of body.
..... *L. tigris*

Lasiancistrus anthrax, new species (Fig. 1)

Holotype. MBUCV V-18384, 123.7 mm SL; Venezuela, Estado Amazonas, Río Orinoco backwater behind sand beach ca. 0.5 hr. upstream from Isla Temblador, 03°04'N 66°28'W; B. Chernoff, W. G. Saul, J. Fernandez, O. Castillo & M. E. Antonio, 10 Mar 1987.

Paratypes. All from Venezuela, Estado Amazonas. ANSP 162175, 3, 50.7-112.5 mm SL; MBUCV V-17545, 2, 67.3-105.2 mm SL; USNM 355199, 1, 85.7 mm SL; collected with holotype. - FMNH 106026, 2, 52.9-74.4 mm SL; Río Ventuari, S side of river ca 0.5 hr. (ca. 12 km) above mouth in Río Orinoco, Laguna Pavón, 4°04'N 66°56'W; B. Chernoff, A & D. Machado & J. Wheeler, 24 Jan 1991. - AUM 28354, 1, 105.4 mm SL; FMNH 106028, 3, 39.2-113.2 mm SL; MBUCV V-23104, 4, 74.6-122.17 mm SL; Río Orinoco, Isla Cupoven, rocks and rapids; A & D. Machado & J. Wheeler, 29 Jan 1991. - MBUCV V-17562, 1, 120.3 mm SL; Río Orinoco, in rocks 1 km above La Esmeralda; B. Chernoff, W. G. Saul, J. Fernandez, O. Castillo & M. E. Antonio, 14 Mar 1987. - ANSP 162161, 2, 51.3-67.3 mm SL; Río Orinoco, creek between the island and the beach, just downstream from Quiritare (Quiritare: 03°02'N 66°04'W); B. Chernoff, H. Lopez, J. Fernandez & W. G. Saul, 11 Mar 1987.

Additional material (non-types). Venezuela, Estado Bolivar: ANSP 135902, 1, 94.4 mm SL; Río Caura, Surapire rapids ca. 2 hrs. upstream from Río Caura - Río Nichare junction, 06°30'N 64°40'W; J. E. Böhlke et al., 23 Jan 1977. - LACM 43364-2, 1, 100.3 mm SL; MBUCV V-11586, 2, 61.1-87.3 mm SL; Río Aro (Río Orinoco drainage), about 3 km downstream from bridge rt. 19; J. N. Baskin, 4 Nov 1979.

Venezuela, Estado Amazonas: ANSP 162168, 1, 102.9 mm SL; collected with MBUCV V-17562.

Diagnosis. *Lasiancistrus anthrax* can be diagnosed by color pattern from most *Lasiancistrus*: charcoal gray to black with white spots. *Lasiancistrus anthrax* differs from *L. nicoi* by the absence of a white band along the edge of the caudal fin, from *L. dumus* and *L. tigris* by the absence of bands in the caudal fin, and from *Lasiancistrus* sp. (see Discussion) by a greater dorsal base length to caudal depth ratio (2.9-3.5 vs. 2.1-2.2) and by

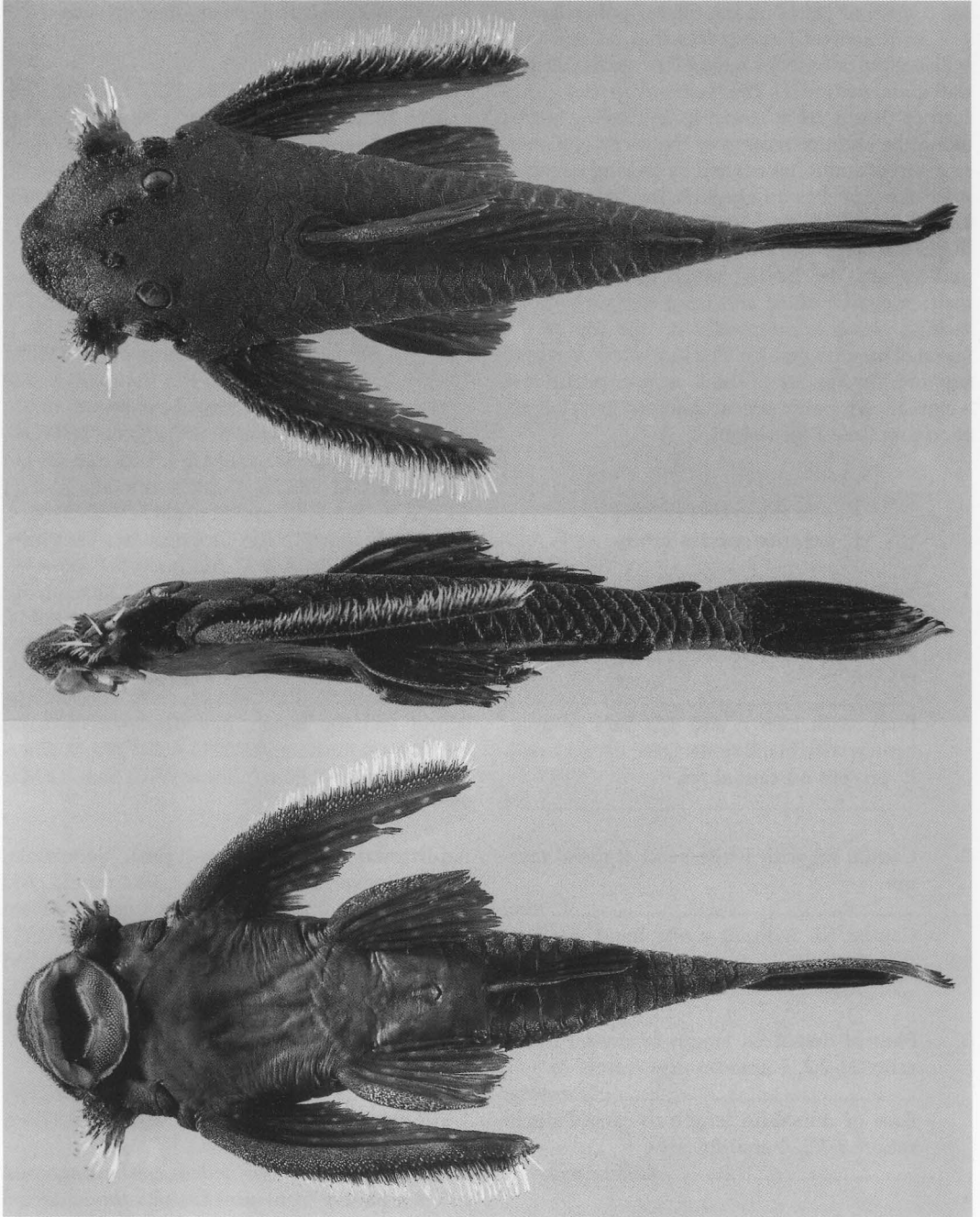


Fig. 1. *Lasiancistrus anthrax*, holotype, MBUCV V-18384, 123.7 mm SL (photographs by J. W. Armbruster).

usually having 5 anal-fin rays (versus 4; one specimen of *L. anthrax* examined has 4 anal-fin rays).

Description. Morphometrics presented in Ta-

ble 1. Body very dorsoventrally flattened with both ventral- and dorsal-surface flat. Pectoral fins very elongate, pectoral-fin spine reaching anal fin in adults (only to anus in juveniles); very long,

flexible odontodes present anterodistally on pectoral-fin spine. Dorsal-fin spine weak; dorsal-fin spinelet supporting odontodes, v-shaped. Dorsal fin short; folded dorsal fin not reaching median, unpaired preadipose plate. Caudal fin weakly forked, lower lobe longer than upper. Eyes mostly dorsal. 3 rows of plates on caudal peduncle. Pterotic-supracleithrum bordered posteriorly at lateral line by small naked area ventrally and small plate dorsally. Abdomen without plates. Cheek odontodes hypertrophied, numerous, and set on evertible plates; odontodes fold into groove underneath opercle when relaxed. Opercle studied with moderately elongate, stout odontodes along ventral margin. Cheek plates and opercle never with thin, whiskerlike odontodes. Both males and females develop hypertrophied odontodes along snout margin and on distal tip of pectoral-fin spine. Males develop greatly elongated anal fin.

Dorsal fin II 7-8 (usually 7); pectoral fin I 6; pelvic fin I 5; anal fin I 4-5 (anal-fin spine about half first branched ray). Teeth long and slender with large lateral and small mesial cusp; teeth 43-87 (47-64) per jaw ramus; tooth number tends to increase with standard length. Lateral line plates 24-26 (26); dorsal plates 7-8 (8); interdorsal plates 6-7 (6); adipose-caudal plates 7-8 (7); folded dorsal-fin plates 11-14 (13); and postanal plates 12-14 (13).

Color in alcohol charcoal gray to black, with faint, small, sparse light spots on head, fin rays, fin spines, and body; in life, spots are brighter and more numerous (see photos in Weidner, 1996: 756). Fins not with bands. Five faint dorsal saddles often visible, first anterior to dorsal fin, second beginning at level of second dorsal-fin ray, third below and slightly beyond posterior two rays of dorsal fin, fourth between dorsal and adipose fins, and fifth below and slightly beyond

Table 1. Selected morphometric features of *Lasiancistrus anthrax* (n=21; 20 where noted by asterisk [*]) and *L. nicoi* (n=9). Ratios expressed as percent of standard length (SL).

morphometric feature	<i>L. anthrax</i>			<i>L. nicoi</i>		
	holotype	mean ± SD	range	holotype	mean ± SD	range
SL (mm)	123.7	90.1 ± 22.6	50.7-123.7	114.3	85.3 ± 22.3	60.3-114.3
Predorsal length	40.1	40.5 ± 0.7	39.4-42.1	40.7	41.7 ± 0.7	40.6-42.6
Head length	32.6	33.5 ± 0.9	32.2-35.9	32.9	34.0 ± 1.0	32.1-35.4
Orbit diameter	5.6	6.1 ± 0.6	5.3- 7.4	5.1	6.4 ± 0.8	5.1- 7.5
Snout length	20.1	20.2 ± 0.7	19.2-21.6	19.7	20.2 ± 0.7	19.1-21.5
Interorbital width	10.1	10.1 ± 0.4	9.4-11.1	9.1	9.4 ± 0.4	8.9-10.2
Snout-pectoral length	27.4	27.2 ± 0.8	25.6-28.9	27.4	27.3 ± 0.5	26.8-28.3
Thorax length	19.6	20.7 ± 1.1	18.4-22.6	22.6	21.7 ± 0.9	20.3-22.8
Pectoral spine length	44.0	37.1 ± 3.8	31.5-44.5	40.3	35.9 ± 2.9	32.1-40.3
Abdomen length	24.6	24.0 ± 0.9	21.9-25.8	24.8	23.4 ± 0.8	22.3-24.8
Pelvic spine length	23.5	23.3 ± 1.4	20.8-26.5	23.4	22.8 ± 1.5	19.8-24.4
Postanal length	29.0	26.9 ± 1.0	26.9-30.8	27.9	28.6 ± 0.7	27.3-29.8
Anal fin length	21.6	16.8 ± 3.7	14.0-31.5	19.7	16.7 ± 3.0	13.9-22.3
Caudal peduncle depth	8.0	7.9 ± 0.4	7.1- 8.6	7.3	7.2 ± 0.2	6.8- 7.5
Adipose-caudal length	11.4*	11.6 ± 1.1	10.3-14.0	11.7	13.1 ± 0.9	11.7-14.3
Interdorsal length	22.0	20.9 ± 1.1	18.6-22.9	21.9	20.4 ± 0.8	19.1-21.9
Base of dorsal length	23.6	25.3 ± 1.3	22.4-28.3	23.8	24.0 ± 0.6	23.1-24.6
Dorsal spine length	24.3*	23.1 ± 1.3	20.8-26.1	24.7	24.0 ± 1.4	22.7-27.0
Head depth	15.5	15.1 ± 0.8	13.6-17.0	15.2	16.4 ± 0.9	15.2-17.9
Dorsal-pectoral length	23.8	23.7 ± 0.9	21.7-25.7	24.3	24.2 ± 0.4	23.5-24.9
Dorsal-pelvic length	16.2	16.5 ± 0.8	14.5-18.0	15.5	16.3 ± 1.4	14.1-18.8
Pelvic-dorsal length	25.1	25.7 ± 1.5	22.0-28.4	25.9	24.3 ± 1.6	22.6-27.4
Dorsal-anal fin length	9.4	9.7 ± 0.5	8.7-10.7	9.9	10.0 ± 0.4	9.3-10.5
Anal fin-adipose length	22.6	21.7 ± 1.3	18.7-24.1	21.4	20.0 ± 1.3	18.4-22.2
Anal fin width	16.8	15.9 ± 1.1	13.2-17.4	15.0	14.7 ± 1.0	13.2-16.6
Cleithral width	29.1	28.9 ± 0.9	27.2-30.5	27.0	27.7 ± 0.6	27.0-28.6
Mouth width	16.4	18.4 ± 1.3	15.1-21.0	17.3	17.5 ± 1.0	16.5-19.7
Mouth length	16.0	16.1 ± 0.7	14.2-17.2	17.4	16.9 ± 0.6	15.9-17.8

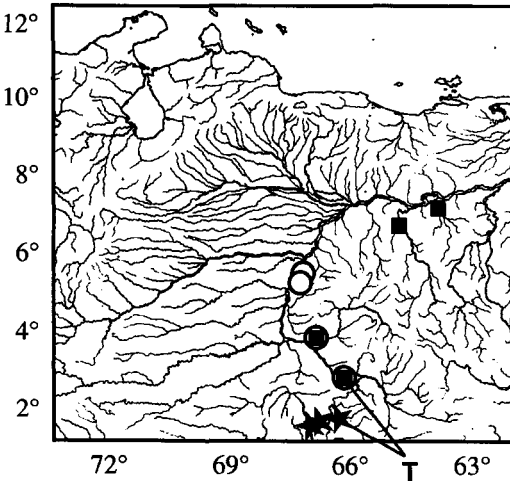


Fig. 2. Distribution of *L. anthrax* (■), *L. dumus* (○), and *L. nicoi* (★). T indicates type localities (*L. anthrax* and *L. dumus* have the same type locality). Symbols may represent more than one collecting locality.

the adipose-fin membrane. Abdomen slightly lighter than side, occasionally with light spots. Ventral surface posterior to pelvic girdle colored as side. Light spots usually present at the tips of caudal-fin spines. White band never present at edge of dorsal or caudal fins.

Distribution. Found in the Río Orinoco in Estado Amazonas and in the Ríos Caura and Aro of Estado Bolívar, Venezuela (Fig. 2).

Etymology. From the Greek *anthrax* for coal, in reference to the dark, coal-like color; treated as a noun in apposition. *Lasiancistrus anthrax* is referred to as Fliegerwels (flying catfish) in the German aquarium literature (Weidner, 1996) probably in reference to the long pectoral fins in adults.

Lasiancistrus dumus, new species
(Fig. 3)

Holotype. MBUCV V-17544, 86.8 mm SL; Venezuela, Estado Amazonas, Río Orinoco, backwater behind sand playa circa 0.5 hr upstream from Isla Temblador, 03°04'N 66°28'W; B. Chernoff, H. Lopez, W. G. Saul, J. Fernandez, O. Castillo, M. E. Antonio & J. Moreno, 10 Mar 1987.

Paratypes. All from Venezuela, Estado Amazonas. ANSP 162403, 1, 70.6 mm SL; MBUCV V-17543, 1, 79.9 mm SL; collected with holotype. – MCNG 25796, 1, 58.4 mm SL; Departamento Atabapo, Río Ocamo at Raudal Arata, 03°08'N 64°34'W; L. Nico & J. Castillo, 24 Jan 1990. – ANSP 162160, 1, 99.1 mm SL; Río Orinoco, creek between the island and the beach, just downstream from Quiritare (Quiritare: 03°02'N 66°04'W); B. Chernoff, H. Lopez, J. Fernandez & W. G. Saul, 11 Mar 1987.

Additional material (non-types). All from Venezuela, Estado Amazonas. FMNH 106027, 2, 81.9–83.5 mm SL; MBUCV V-23082, 1, 41.9 mm SL; Río Ventuari, S side of river ca 0.5 hr. (ca. 12 km) above mouth in Río Orinoco, Laguna Pavón, 04°04'N 66°56'W; B. Chernoff, A. & D. Machado & J. Wheeler, 24 Jan 1991. – ANSP 160769, 1, 101.2 mm SL; MBUCV V-16867, 1, 76.1 mm SL; Morichal, 26 km from Puerto Ayacucho on road to Caicara; B. Chernoff, B. Saul & R. Royero, 15 Nov 1985. – MBUCV V-14649, 1, 89.6 mm SL; Río Cataniapo, Raudal Yawi 5 river km upstream from La Reforma; 28 Dec 1984.

Diagnosis. *Lasiancistrus dumus* is diagnosed from other *Lasiancistrus* by the presence of a light body color with large, black spots at least anteriorly (spots may combine posteriorly to form bars). *Lasiancistrus dumus* can also be separated from all but *L. tigris* by the presence of light orange to cream-colored spots at the tip of the dorsal- and caudal-fin spines.

Description. Morphometrics presented in Table 2. Body very dorsoventrally flattened with both ventral and dorsal surface flat. Extremely hypertrophied odontodes present anterodistally on pectoral-fin spine. Dorsal-fin spine weak; dorsal-fin spinelet supporting odontodes, v-shaped. Dorsal fin short; folded dorsal fin not reaching median, unpaired preadipose plate. Caudal fin weakly forked, lower lobe longer than upper. Eyes mostly dorsal. 3 rows of plates on caudal peduncle. Pterotic-supracleithrum bordered posteriorly at lateral line by small naked area ventrally and small plate dorsally. Abdomen without plates. Cheek odontodes hypertrophied, numerous, and set on evertible plates; odontodes fold into groove underneath opercle when relaxed. Edge of snout anterior to evertible cheek plates with numerous hypertrophied odontodes.

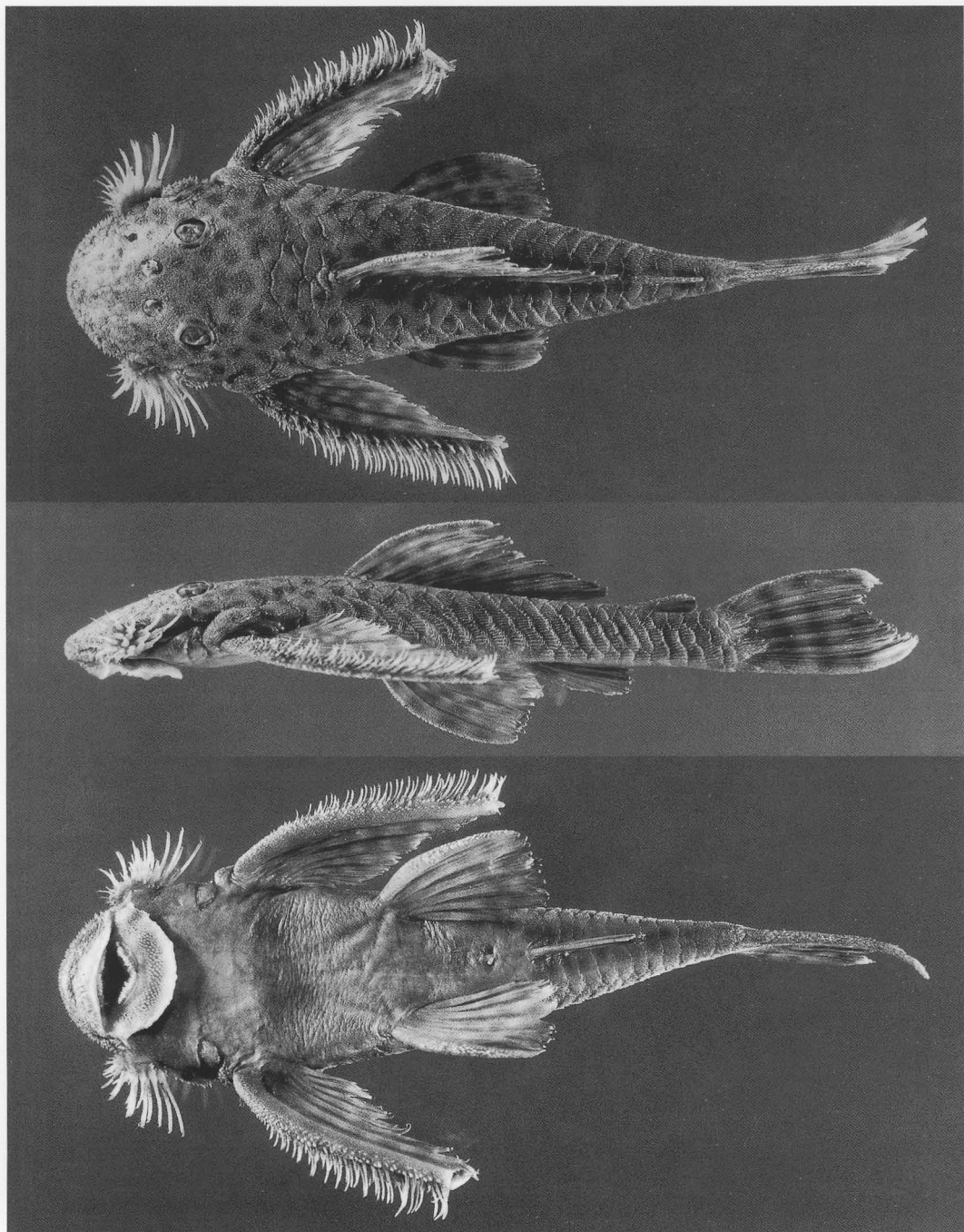


Fig. 3. *Lasiancistrus dumus*, holotype, MBUCV V-17544, 86.8 mm SL (photographs by J. W. Armbruster).

All odontodes on opercle moderately elongated and stout. Cheek plates and opercle never with thin, whiskerlike odontodes. Pectoral-fin spine

moderately elongated, reaching anus.

Dorsal II 7; pectoral fin I 6; pelvic fin I 5; anal fin I 5 (anal-fin spine about half first branched

ray). Teeth long and slender with large lateral and small mesial cusp; teeth 37-79 (58-67) per jaw ramus; tooth number tends to increase with standard length. Lateral line plates 24-25 (25); dorsal plates 6-9 (7); interdorsal plates 6-7 (6); adipose-caudal plates 6-7 (6); folded dorsal-fin plates 11-14 (12); and postanal plates 11-13 (12).

Color in alcohol consists of gray-brown base color and fairly large, black spots on head and body to below middle of dorsal fin. Spots fade towards caudal fin, spots either absent on caudal peduncle, present only along midline, or combine to form thin, often wavy black bars (see Comments). Four faint saddles occasionally visible on back, first below anterior of dorsal fin, second below posterior of dorsal fin, third between dorsal and adipose fins, and fourth under adipose-fin membrane. Fin rays and spines spotted so that fins appear banded (caudal fin occa-

sionally entirely gray). Dorsal- and caudal-fin spines tipped with light orange or cream-color spots. Adipose-fin membrane dark. Abdomen just slightly lighter than side.

Distribution. Known from the upper Río Orinoco and tributaries of southern Venezuela from about Puerto Ayacucho to the Río Casiquiare (Fig. 2).

Comments. It is possible that *L. dumus* as described above represents two or three species. Those specimens from northern Amazonas have a well-spotted caudal peduncle, those from the mouth of the Río Ventuari and the Río Cataniapo have spots only along the mid-line on the caudal peduncle, and the type series from near the Río Casiquiare have the spots combining to form bands on the caudal peduncle. The limited sam-

Table 2. Selected morphometric features of *Lasiancistrus dumus* (n=8) and *L. tigris* (n=4). Ratios expressed as percent of standard length (SL).

morphometric feature	<i>L. dumus</i>			<i>L. tigris</i>		
	holotype	mean ± SD	range	holotype	mean ± SD	range
SL (mm)	86.8	78.4 ± 10.0	58.4-89.6	49.2	36.46 ± 8.9	28.8-49.2
Predorsal length	40.4	41.0 ± 1.2	39.8-43.1	41.7	42.4 ± 0.5	34.4-35.9
Head length	33.2	33.3 ± 1.0	31.7-35.2	35.0	35.0 ± 0.7	34.4-35.9
Orbit diameter	5.9	6.1 ± 0.5	5.5- 6.9	6.8	7.3 ± 1.6	5.2- 8.5
Snout length	20.4	20.1 ± 0.6	19.3-20.9	19.8	20.2 ± 0.3	19.8-20.5
Interorbital width	10.1	10.6 ± 0.4	10.1-11.3	8.3	9.1 ± 0.7	8.3- 9.8
Eye height	8.2	7.0 ± 0.7	5.8- 8.2	7.0	6.9 ± 0.7	5.9- 7.6
Snout-pectoral length	28.0	27.4 ± 0.9	26.2-29.1	28.4	27.7 ± 1.5	25.4-28.5
Thorax length	21.2	22.0 ± 1.7	20.0-24.4	17.8	21.0 ± 2.3	17.8-22.7
Pectoral spine length	40.6	36.8 ± 2.1	34.3-40.6	29.6	28.4 ± 1.8	25.7-29.6
Abdomen length	23.9	23.7 ± 0.8	22.5-24.9	24.2	22.6 ± 1.7	20.2-24.2
Pelvic spine length	24.9	24.4 ± 1.6	21.5-26.3	25.5	25.3 ± 0.4	25.0-25.8
Postanal length	27.3	28.5 ± 1.0	27.3-30.4	27.6	27.7 ± 1.2	26.1-29.0
Anal fin length	18.4	16.0 ± 1.2	14.8-18.4	12.0	14.0 ± 1.6	12.0-15.3
Caudal peduncle depth	8.2	8.1 ± 0.4	7.4- 8.7	7.1	7.6 ± 1.1	6.3- 8.6
Adipose-caudal length	11.7	11.9 ± 0.5	11.1-12.7	14.6	14.8 ± 1.0	13.6-15.9
Interdorsal length	21.6	21.4 ± 1.6	19.6-23.9	16.5	15.8 ± 3.1	13.9-16.7
Base of dorsal length	24.8	24.6 ± 0.7	23.4-25.6	23.9	23.7 ± 1.7	21.2-24.9
Dorsal spine length	25.5	26.4 ± 1.2	24.3-27.9	22.5	24.2 ± 1.4	22.5-25.8
Head depth	17.5	16.4 ± 1.4	14.3-18.5	14.1	16.6 ± 2.8	14.1-19.1
Dorsal-pectoral length	23.5	24.0 ± 1.0	22.4-25.5	23.1	23.6 ± 1.8	21.2-25.3
Dorsal-pelvic length	17.3	16.2 ± 0.5	16.2-18.1	14.0	15.6 ± 1.7	14.0-17.2
Pelvic-dorsal length	24.8	24.7 ± 1.0	22.8-25.7	24.3	22.7 ± 3.4	17.7-25.3
Dorsal-anal fin length	9.8	10.4 ± 0.7	9.1-11.0	9.3	9.9 ± 1.0	8.7-10.7
Anal fin-adipose length	20.2	21.1 ± 0.9	19.8-22.7	18.0	16.9 ± 1.1	15.3-18.0
Anal fin width	15.3	15.7 ± 0.6	14.9-16.7	13.0	12.0 ± 1.8	9.4-13.2
Cleithral width	29.3	29.2 ± 0.9	27.9-30.6	27.5	27.0 ± 0.7	26.1-27.5
Mouth width	18.7	18.2 ± 1.6	15.5-19.8	19.9	20.9 ± 0.7	19.9-21.6
Mouth length	16.8	16.2 ± 0.9	14.8-17.3	16.9	17.7 ± 0.7	16.9-18.5

ple size does not allow us to conclude whether these color differences are significant.

Etymology. From the Latin *dumus* for thorn-bush, in reference to the well developed odontodes on the pectoral-fin spines and snout; treated as a noun in apposition.

Lasiancistrus nicoi, new species

(Fig. 4)

Holotype. MCNG 37033, 114.3 mm SL; Venezuela, Estado Amazonas, Departamento Río Negro, Río Manipitare (Río Siapa drainage), from about 5 to 8 km upstream from confluence with Río Siapa; L. Nico, S. Walsh, K. Winemiller & A. Arrington, 16 Jan 1998.

Paratypes. All from Venezuela, Estado Amazonas. MCNG 12441, 1, 112.4 mm SL; Departamento Río Negro, Río Negro en San Carlos, 01°55'N 67°04'W; L. Nico, 22 Apr 1985. – MCNG 12149, 1, 105.5 mm SL; Departamento Casiquiare, Río Casiquiare (Río Negro drainage), a lagoon adjacent to an area approximately 15 river kilometers above the mouth, 01°58'N 66°55'W; L. Nico, E. Conde, R. Stergios, G. Aymand & P. Cardozo, 14 Apr 1985. – MCNG 12290, 1, 71.2 mm SL; Departamento Río Negro, Río Emoni (Río Siapa drainage), approximately 2 river km above the mouth with Río Siapa, 01°58'N 66°55'W; L. Nico, E. Conde, R. Stergios, G. Aymand & P. Cardozo, 14 Apr 1985. – MBUCV V-29125, 1, 98.6 mm SL; collected with holotype. – ANSP 177766, 1, 67.4 mm SL; MCNG 37034, 2, 32.3 mm SL; Río Siapa (Río Casiquiare drainage), at campsite near Laguna Cunicapi between Río Emoni and Río Manipitare; K. Wine-miller et al., 16 Jan 1998. – MCNG 37035, 1, 37.0 mm SL; Río Pasimoni (Río Casiquiare drainage) at Piedra Arapacoa – right descending bank, 01°52.5'N 66°35.2'W; L. Nico, D. Jepsen, S. Walsh & A. Barbarino, 20 Jan 1998. – MCNG 37036, 1, 48.3 mm SL; Río Emoni (Río Siapa drainage), approximately 1-2 km upstream from confluence with Río Siapa, approx. 02°07'N 66°20' W; L. Nico, S. Walsh, G. Yavinape & D. Payema, 19 Jan 1998. – MBUCV V-27916, 1, 60.5 mm SL; MCNG 37037, 1, 47.5 mm SL; Río Emoni (Río Siapa drainage), from near mouth to approx. 2-3 km upstream; S. Walsh et al., 17 Jan 1999. – MCNG 37038, 1, 60.3 mm SL; Río Manipitare (Río Siapa drainage), ca. 8 km upstream from its mouth; K. Wine-

Miller, L. Nico, S. Walsh & A. Barbarino, 16 Jan 1998. – AUM 28355, 1, 77.0 mm SL; MCNG 37039, 2, 45.5 mm SL; Río Manipitare (Río Siapa drainage), approx. 4-5 km upstream from mouth; S. Walsh & D. Jepsen, 15 Jan 1998.

Diagnosis. *Lasiancistrus nicoi* can be diagnosed by color pattern from most *Lasiancistrus*: charcoal gray to black with white spots and a white band in the caudal fin. *Lasiancistrus nicoi* differs from *L. anthrax* by the presence of a white band at the edge of the caudal fin, and from *Lasiancistrus* sp. (see Discussion) by a greater dorsal base length to caudal depth ratio (3.2-3.5 vs. 2.1-2.2) and by having 5 anal-fin rays (vs. 4).

Description. Morphometrics presented in Table 1. Body very dorsoventrally flattened with both ventral- and dorsal-surface flat. Pectoral fins very elongate, pectoral-fin spine reaching anal fin in adults (only to anus in juveniles); very long, flexible odontodes present anterodistally on pectoral-fin spine. Dorsal-fin spine weak; dorsal-fin spinelet supporting odontodes, v-shaped. Dorsal fin short; folded dorsal fin not reaching median, unpaired preadipose plate. Caudal fin weakly forked, lower lobe longer than upper. Eyes mostly dorsal. 3 rows of plates on caudal peduncle. Pterotic-supracleithrum bordered posteriorly at lateral line by small naked area ventrally and small plate dorsally. Abdomen without plates. Cheek odontodes hypertrophied, numerous, and set on evertible plates; odontodes fold into groove underneath opercle when relaxed. Opercle studied with moderately elongate, stout odontodes along the ventral margin. Cheek plates and opercle never with thin, whiskerlike odontodes. Edge of snout anterior to evertible cheek plates with numerous hypertrophied odontodes.

Dorsal fin II 7, pectoral fin I 6, pelvic fin I 5, anal fin I 5 (anal-fin spine about half length of first branched ray). Teeth long and slender with large lateral and small mesial cusp; teeth 52-80 (54-63) per jaw ramus; tooth number tends to increase with standard length. Lateral line plates 23-25 (25); dorsal plates 6-7 (7); interdorsal plates 5-7 (6); adipose-caudal plates 7-8 (8); folded dorsal-fin plates 11-12 (12); and postanal plates 11-12 (12).

Color in alcohol charcoal gray to black, with faint, small, sparse light spots on head, fin rays, fin spines, and body. Fish occasionally without spots. Fins not banded. Five faint dorsal saddles often visible, first anterior to dorsal fin, second

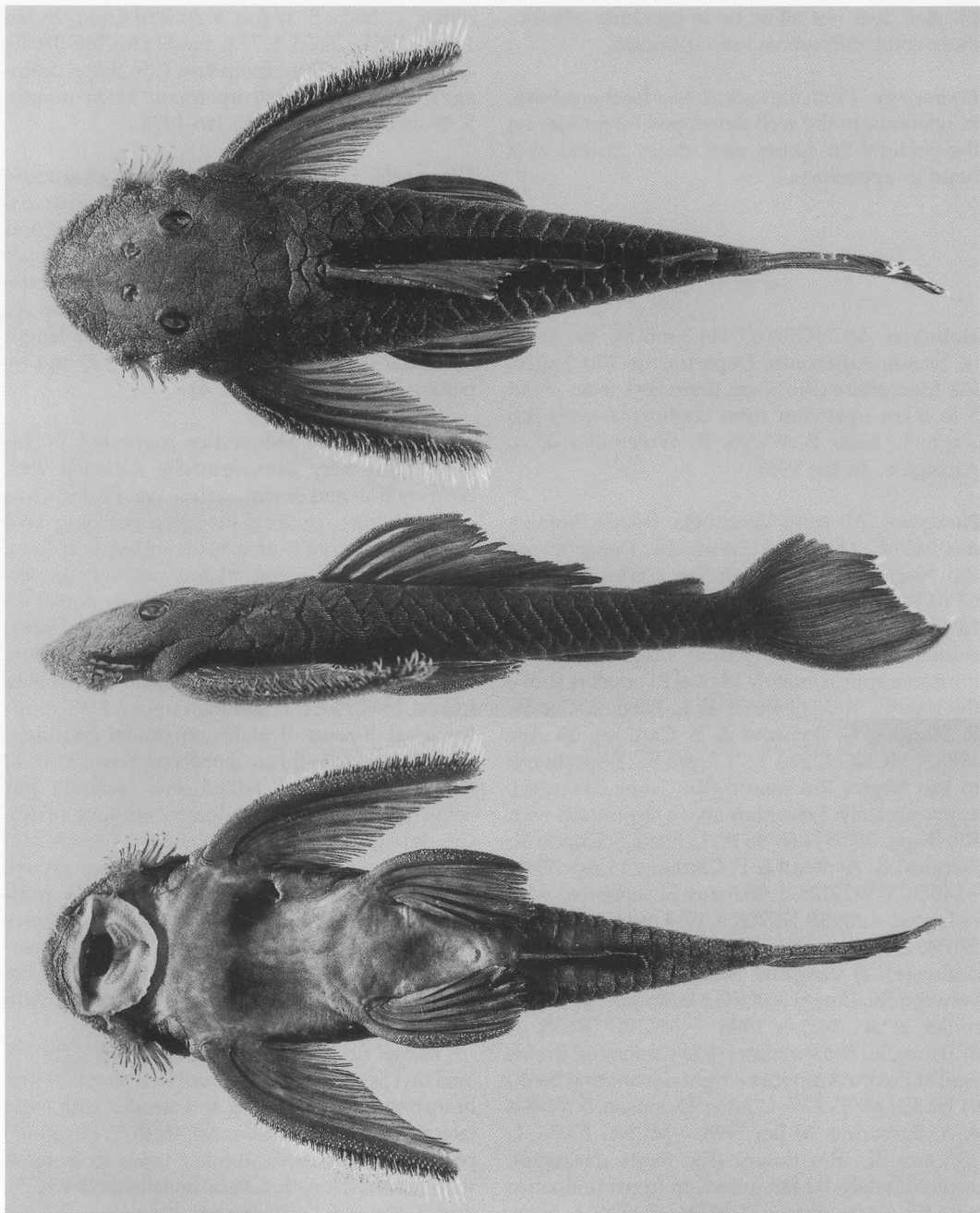


Fig. 4. *Lasiancistrus nicoi*, holotype, MCNG 37033, 114.3 mm SL (photographs by J. W. Armbruster).

beginning at level of second dorsal-fin ray, third below and slightly beyond posterior two rays of dorsal fin, fourth between dorsal and adipose fins, and fifth below and slightly beyond the adipose-fin membrane. Abdomen slightly light-

er than side, occasionally with light spots. Ventral surface posterior to pelvic girdle colored as side. A white band always present at the edge of caudal fin; a white band occasionally present at edge of dorsal fin.

Distribution. Found in the Río Casiquiare and upper Río Negro in Estado Amazonas, Venezuela (Fig. 2).

Etymology. Named for Leo Nico of the United States Biological Service in appreciation of the fact that he collected most of the known specimens of this species.

***Lasiancistrus tigris*, new species**
(Fig. 5)

Holotype. MBUCV V-17546, 49.2 mm SL; Venezuela, Estado Amazonas, backwater of Río Orinoco behind sand playa ca. 0.5 hr. upstream from Isla Temblador, 03°04'N 66°28'W; B. Chernoff, W. G. Saul, H. Lopez, J. Fernandez, O. Castillo, M. E. Antonio & J. Moreno, 10 Mar 1987.

Paratypes. All from Venezuela, Estado Amazonas. ANSP 161496, 1, 28.8 mm SL; collected with holotype. – MBUCV V-23086, 2, 33.1–34.8 mm SL; Río Ventuari, S side of river ca 0.5 hr. (ca. 12 km) above mouth in Río Orinoco, Laguna Pavón, 04°04'N 66°56'W; A. Machado, B. Chernoff & J. Wheeler, 24 Jan 1991. – MBUCV V-23107, 1, 21.8 mm SL; Río Orinoco at Isla Cupoven, rapids and rocks; A. Machado & B. Chernoff, 29 Jan 1991.

Additional material (non-types). Venezuela, Estado Amazonas: MBUCV V-16843, 1, 93.6 mm SL; Río Hacha, a tributary of the Río Ventuari, 04°40'N 65°20'W; I. Rodriguez et al., 22 Feb 1972. – MBUCV V-17557, 1, 50.7 mm SL; Río Orinoco, creek between the island and the beach, just downstream from Quiritare (Quiritare: 03°02'N 66°04'W); B. Chernoff, H. Lopez, J. Fernandez & W. G. Saul, 11 Mar 1987.

Colombia, Departamento Meta: MAC-PAY 01555, 1, 61 mm SL; Río Tomo (Río Orinoco drainage), Aceiticos, approximately 5 km from Centro Administrativo del INDERENA, western margin of the Río Orinoco.

Diagnosis. *Lasiancistrus tigris* is diagnosed by the presence of numerous, black bars on the body and head. Among other loricariids, only some undescribed *Panaque* have a similar color pattern, but they have less than 15 large, spoon shaped teeth per jaw ramus (vs. more than 30 thin teeth per jaw ramus).

Description. Morphometrics presented in Table 2. Body very dorsoventrally flattened with both ventral- and dorsal-surface flat. Extremely hypertrophied odontodes present anterodistally on pectoral-fin spine. Dorsal-fin spine weak; dorsal-fin spinelet supporting odontodes, v-shaped. Dorsal fin short; folded dorsal fin just barely reaching median, unpaired preadipose plate. Caudal fin weakly forked, lower lobe longer than upper. Eyes mostly dorsal. 3 rows of plates on caudal peduncle. Pterotic-supracleithrum bordered posteriorly at lateral line by small naked area ventrally and small plate dorsally. Abdomen without plates. Cheek odontodes hypertrophied, numerous, and set on evertible plates; odontodes fold into groove underneath opercle when relaxed. Edge of snout anterior to evertible cheek plates with numerous hypertrophied odontodes. Opercle studded with moderately elongate, stout odontodes along ventral margin. Cheek plates and opercle never with thin, whiskerlike odontodes. Pectoral fins not elongated, but only small individuals examined.

Dorsal fin II 7; pectoral fin I 6; pelvic fin I 5; anal fin I 5 (anal-fin spine about half length of first branched ray). Teeth long and slender with large lateral and small mesial cusps; teeth 35–49 (42–49) per jaw ramus; tooth number increases with size. Lateral line plates 23–24 (23); dorsal plates 7–8 (7); interdorsal plates 4–5 (5); adipose-caudal plates 7–8 (8); folded dorsal-fin plates 11–12 (12); and postanal plates 11–12 (12).

Color in alcohol consists of numerous alternating dark brown and tan to orange bars. Tan bars generally much thinner than dark bars, bars often squiggly or interconnecting. Tan bars continue onto head where they form interconnecting lattice. Dark spots present on fin spines and rays making fins appear banded. Abdomen white; lower surface posterior to pelvic girdle tan. See Comments.

Distribution. Known from the upper Río Orinoco and the Río Ventuari (Fig. 6).

Comments. *Lasiancistrus tigris* probably matures at a small size. The holotype is only 49.2 mm SL, yet the snout and pectoral-fin spine odontodes are greatly elongated. In similarly sized specimens of the other species of the *L. anthrax* group, the snout and pectoral-fin spine odontodes are just beginning to develop and cannot be described as hypertrophied.

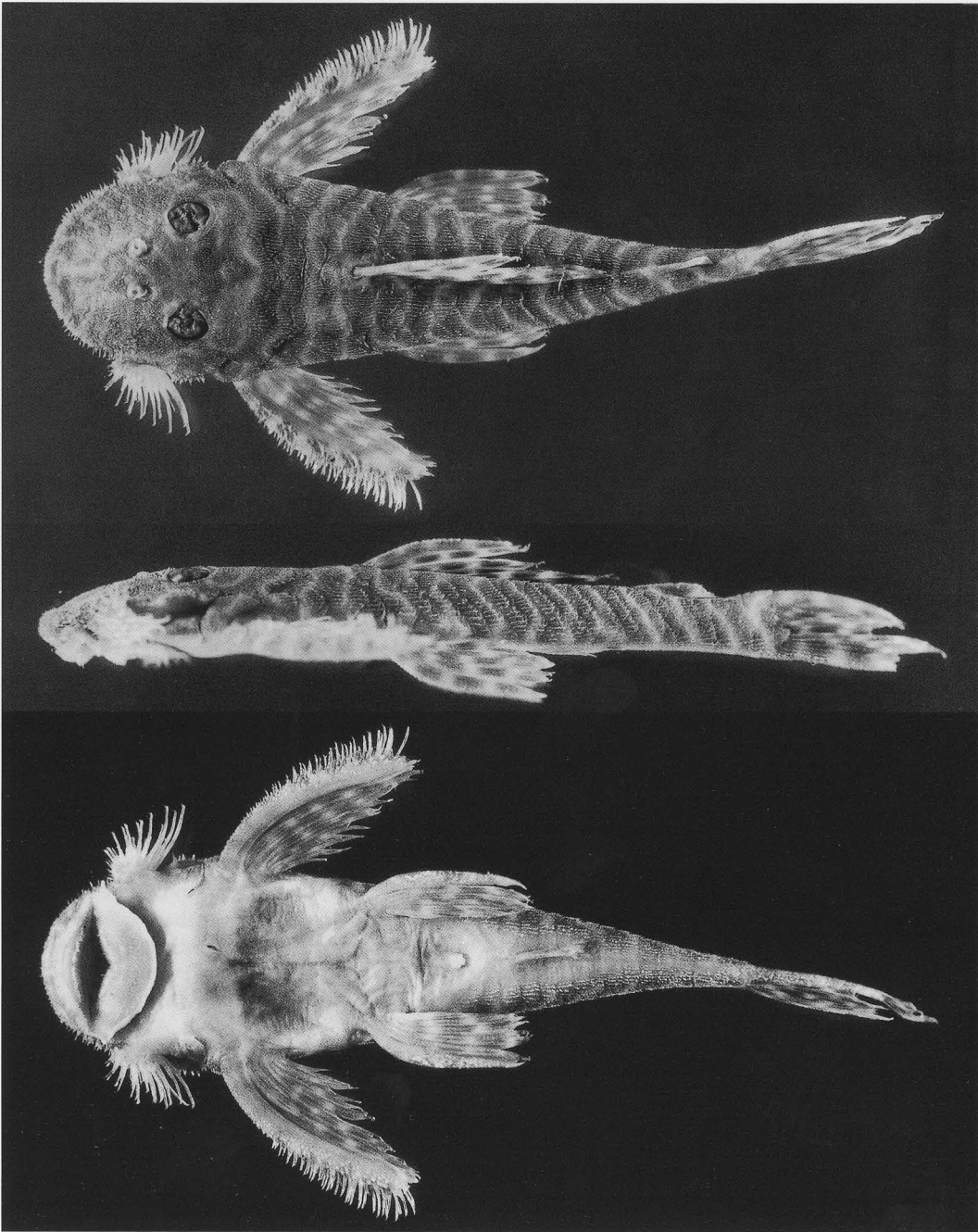


Fig. 5. *Lasiancistrus tigris*, holotype, MBUCV V-17546, 49.2 mm SL (photographs by J. W. Armbruster).

Lasiancistrus tigris may actually represent more than one species. One specimen from near the type locality (MBUCV V-17557) has a similar color pattern to the type specimens, but the tan bars

are wider than the dark bars, it appears to have a slightly deeper body (dorsal-pectoral length 26.1 % SL vs. 21.2-25.3 % SL), and the eyes are more lateral. Specimens from the upper Río Ven-

tuari (MBUCV V-16843) appear to have the same body shape as the types; however, they are old, faded specimens whose identity could not be confirmed. The specimens of MBUCV V-17557 and MBUCV V-16843 were not used in the morphometric analyses. We defer splitting *L. tigris* into other species until more specimens become available.

Etymology. From the Latin *tigris* for tiger in reference to the tigerlike markings; treated as a noun in apposition.

Results

Principal component analysis when applied to the four species described herein or with just *L. dumus* and *L. tigris* provided no information. An analysis with just *L. anthrax* and *L. nicoi* showed separation of the two species on principal component 2 (Fig. 7). Principal component 2 was most strongly and negatively affected by caudal depth, dentary length, and anal-adipose length; and most strongly and positively by adipose-hypural length, adipose spine length, and head depth. Few specimens were available for the analysis, but because the separation between the two groups is strong and because this morphometric difference is correlated with a distinct color pattern difference, the recognition of *L. nicoi* as distinct from *L. anthrax* is supported.

Discussion

The range of *L. anthrax* versus *L. nicoi* is very interesting biogeographically. Due to their very similar color patterns, *L. anthrax* and *L. nicoi* most likely represent sister taxa. As such, it is interesting to note that *L. anthrax* ranges throughout the upper Río Orinoco (as well as the Río Caura and Río Aro) with collections available almost to the Río Casiquiare. In contrast, *L. nicoi* is found in the Río Casiquiare and the upper Río Negro. The Río Casiquiare connects the Río Orinoco with the Río Negro. The distribution of the species suggests that the Río Negro and the Río Orinoco once were split, and the current connection between the two arose only recently.

We propose that the species described herein represent a monophyletic group based on the shared, derived presence of extremely hypertro-

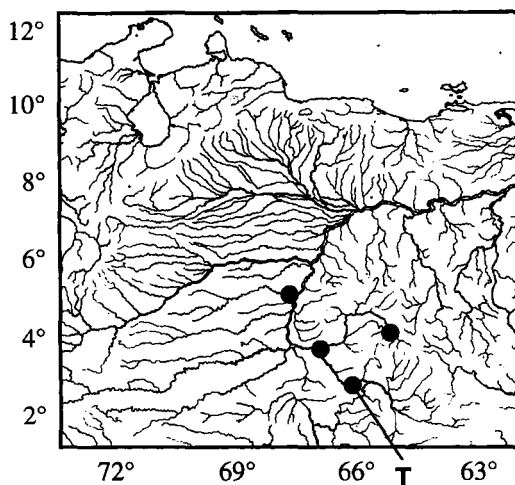


Fig. 6. Distribution of *L. tigris*. T indicates type locality. Symbols may represent more than one collecting locality.

phied, flexible odontodes on the pectoral-fin spines. Among potentially closely related ancistrines, only *Lithoxus* Eigenmann develops similar structures. Unfortunately, few specimens have been available for a detailed examination of the osteology of these species, and the authors disagree with the distribution of various character states among ancistrines. Therefore, we defer discussion of the osteology of these species to a later date. The presence of hypertrophied odontodes along the snout in both males and females is probably also a synapomorphy, but not enough specimens are available to determine if this trait

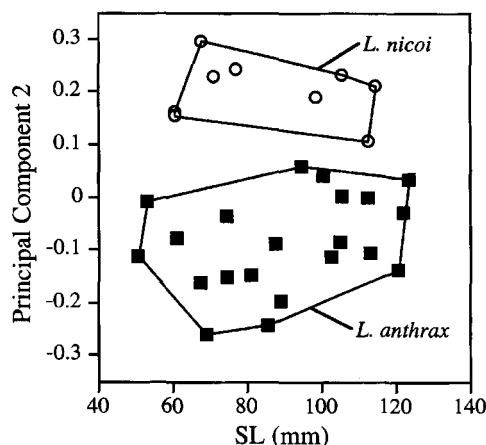


Fig. 7. Results of the principal component analysis for *Lasiancistrus anthrax* and *L. nicoi*.

is present in all species. Among ancistrines, only *Pseudancistrus* and *Lithoxancistrus* have hypertrophied odontodes along the snout in both males and females (hypertrophied snout odontodes are usually restricted to nuptial males when present). Based on the characters of Armbruster (1997), the *L. anthrax* group is not the sister group to *Lithoxus*, *Pseudancistrus*, or *Lithoxancistrus*.

During the course of this study, we have also found a species that resembles *L. anthrax* and *L. nicoi* from Amazonas, Venezuela. The species is referred to as *Lasiancistrus* sp. in the key above. *Lasiancistrus* sp. is also black with white spots, but is not as strongly dorsoventrally flattened as *L. anthrax* and *L. nicoi*, and it does not have particularly elongate odontodes on the pectoral-fin spines. The body shape is much more indicative of the shape of other species of *Lasiancistrus*; however, *Lasiancistrus* sp. also lacks whiskerlike odontodes on the cheek and tentacles on the snout. We do not describe *Lasiancistrus* sp. here because it does not appear to be part of the *L. anthrax* species group, and we have insufficient material.

Comparative material. *Lasiancistrus* sp. All from Venezuela, Estado Amazonas. MBUCV V-18505, 1, 72.6 mm SL; Upper Río Siapa, Siapa Camp, Tapirapeco expedition, R. Royero et al., 26 Mar 1988. – MBUCV V-18525, 1, 76.6 mm SL; same locality; R. Royero, 25 Mar 1988. – MBUCV V-18627, 1, 71.4 mm SL; same locality; R. Royero et al., 26 Mar 1988. – MBUCV V-19242, 1, 81.9 mm SL; Río Siapa, upstream of camp J; C. Ferraris, R. Royero & A. Machado, 3 Dec 1989.

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