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THE CATFISHES OF VENEZUELA, WITH DESCRIPTIONS
OF THIRTY-EIGHT NEW FORMS

By LEONARD P. SCHULTZ

IN THE winter of 1942, at the invitation of Dr. Guillermo Zuloaga, assistant chief of explorations, Standard Oil Co. of Venezuela, Caracas, I undertook to study and make collections of fishes in the Maracaibo Basin of Venezuela. I proceeded to Venezuela under the auspices of the Smithsonian Institution and the United States Department of State and was a guest there of the Standard Oil Co. of Venezuela and of the Lago Petroleum Corporation, Lago Maracaibo. To the officials of these companies I must express my deep appreciation, for it was a great pleasure to accept this wonderful opportunity.

This report on the catfishes of Venezuela is based on collections made by me in the Maracaibo Basin and in other localities of the country, totaling 9,920 specimens, as well as on additional specimens in the collections of the United States National Museum. It is planned to report later on the other groups of fishes represented in the collections made during this trip.

I wish especially to thank the following for their aid and hospitality during the course of my work: Hon. Frank P. Corrigan, United States Ambassador, Caracas, Renwick S. McNiece, American Consul, Maracaibo, and Thomas Maleady, second secretary, American Embassy, Caracas, for their fullest cooperation in helping me obtain the necessary papers connected with my extensive travels in Venezuela and making my visit to that country so pleasant; Dr. Walter Dupouy, director of the Museo de Ciencias Naturales, Caracas, who

was especially helpful in regard to my work on the fishes; Mr. and Mrs. William H. Phelps and Mr. and Mrs. William H. Phelps, Jr., who made me so comfortable in their homes in Caracas; and Dr. Guillermo Zuloaga, W. H. Phelps, Jr., and Roger H. Sherman for taking me on a short collecting trip in the upper part of the Río Guarico, which I shall long remember.¹

Nearly four months were spent in various parts of Venezuela from February through May, and during this time I was able to collect about 34,700 fish specimens, as well as numerous specimens of crustaceans, mollusks, amphibians, reptiles, and insects, which are now in the collections of the United States National Museum.

ITINERARY

I left Washington, D. C., on February 1, 1942, for Miami, Fla., and departed from there on February 3 by plane, arriving in Maracaibo that evening, and proceeding the next day to Caracas by air. From February 4 to 11, I made numerous new acquaintances and obtained necessary travel papers and collecting permits from the Venezuelan Government officials, who were most cooperative at all times.

Upon arriving again at Maracaibo on February 11, I was a guest of the Lago Petroleum Corporation, whose officials cooperated fully and helped me in every possible way to make collections in the Maracaibo Basin and in the Andes. My equipment arrived at Maracaibo and was assembled so that collecting actually began on February 20, 1942. From then until March 14, I made various trips on the western side of Lago Maracaibo as far south as the Río Negro (Santa Ana system) and as far as 35 kilometers north of Sinamaica in a caño leading into the Golfo de Venezuela.

Between March 14 and March 26, I collected along the eastern side of Lago Maracaibo from the Río Motatán northward to the Río Cocuiza at El Mene, east of Altagracia, as well as in Lago Maracaibo off Lagunillas.

¹ In addition, I take this opportunity to express my thanks and sincere appreciation to the following persons who cooperated and helped me in every way possible: John Allen, geologist, La Salina; Chester L. Babin, district superintendent, Lagunillas; Raymond L. Bodenhamer, warehouseman, La Salina; Walter W. Butcher, geologist, Maracaibo; James A. Cox, warehouseman, Lagunillas; John Durr, geologist, La Salina; Don Juan F. Emanuel, Maracaibo; Dr. Alvin J. Freie, division geologist, Maracaibo; Marcus G. Geiser, gravity meter operator, Lagunillas; John Kallimnic, Maracaibo; Will S. Link, public relations supervisor, Maracaibo; Henry E. Linam, general manager, Standard Oil Co. of Venezuela, Caracas; Rafael Navarro, Maracaibo; Bethea Martin, geologist, La Salina; Serafin Martínez, senior clerk, Maracaibo; Edward E. Peake, district superintendent, La Salina; Chesley B. Pickle, party chief, Lagunillas; Frank J. Pospisil, geologist, La Salina; Arthur T. Proudfit, division manager, Lago Petroleum Corporation, Maracaibo; Joseph Ratway, geologist, La Salina; Bernard C. Reishauge, geologist, Maracaibo; George H. Seely, resident engineer, Lagunillas; Mr. Slightholm, Lagunillas; Aden Stiles, Maracaibo; Dr. Frederick A. Sutton, senior geologist, Maracaibo; and John Taylor, Maracaibo.

Mrs. Aime M. Aul, artist, United States National Museum, drew all the figures of the new species and retouched some of those photographed.

I wish to express my thanks also to my wife, who spent much time helping me with the checking of the manuscript and proof.

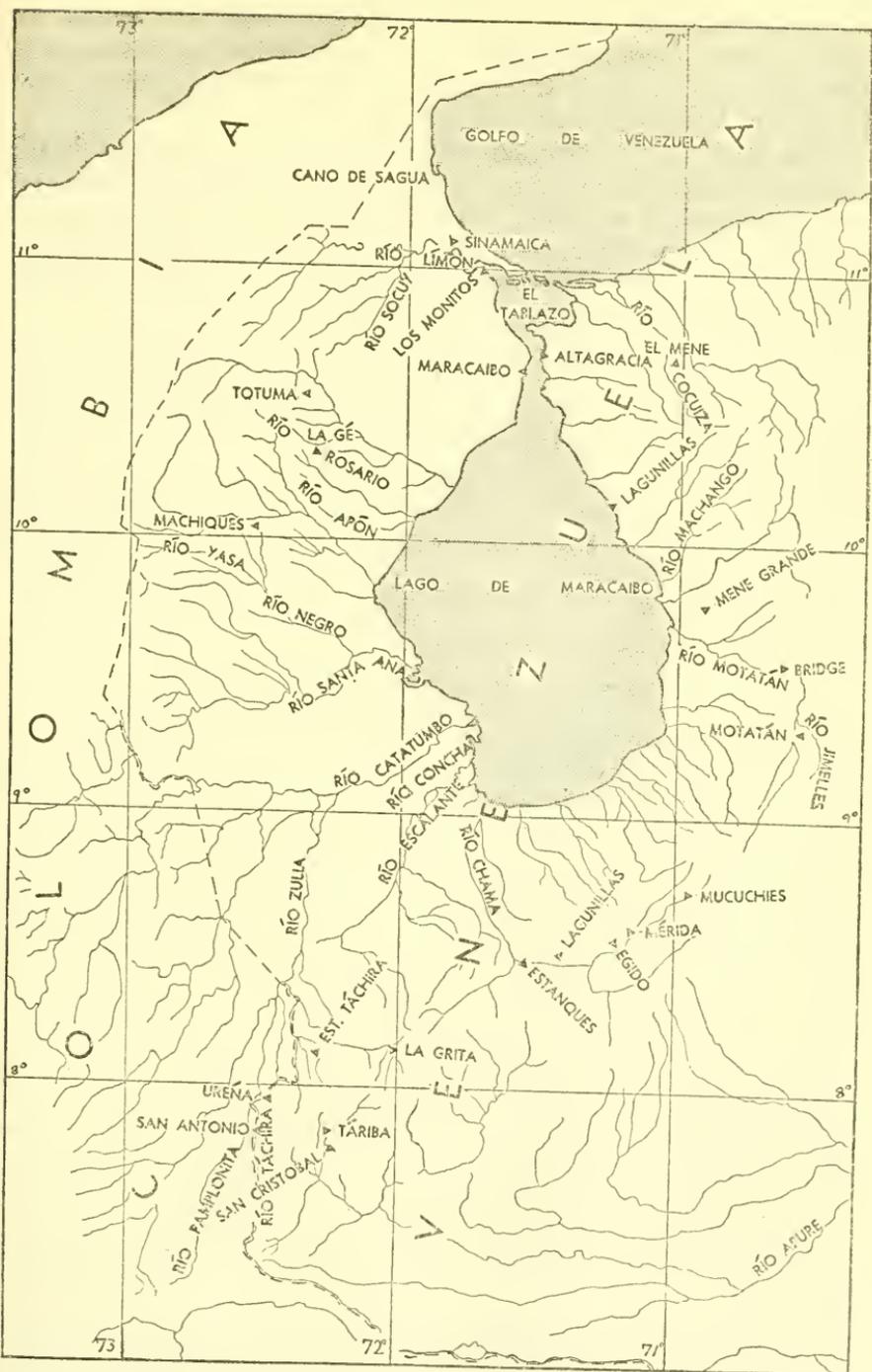


FIGURE 1.—Map of the Maracaibo Basin of Venezuela, showing collecting localities visited by the author in 1942 and other localities recorded in this report.

In order to obtain fishes from the headwaters of the rivers at the southern end of Lago Maracaibo, a trip into the high Andes was made from March 27 to April 4. The Río Chama, Río Catatumbo, and Orinoco systems yielded many specimens.

From April 7 to 23 collections were made in Lago Maracaibo in the vicinity of Lagunillas and Pueblo Viejo, eastern side of the lake.

Between April 29 and May 5 collections were made in the lake and in rivers at the southern end of Lago Maracaibo. Chesley Pickle kindly took me and my equipment in the *Indiana* so that I could stay on the boat *Emma* as guest of John Taylor.

A second trip was made to Caracas on May 9 by airplane, and while there I was the guest of Mr. and Mrs. William H. Phelps, who entertained me graciously and to whom I extend my sincere thanks and appreciation for an enjoyable stay in Caracas.

Upon returning again to Maracaibo on May 14, I secured specimens of fishes from the Maracaibo market until the 21st, when it was necessary to send my specimens and equipment to the dock for shipment back to the United States.

I returned by plane to Miami, Fla., on May 24, and arrived in Washington, D. C., on May 26, 1942.

LIST OF COLLECTING STATIONS

The following is a list of the localities (see map, fig. 1, of Maracaibo Basin) where collections of fishes were made by me while in Venezuela from February through May 1942:

February 20, 3 to 5 km. north of Maracaibo at Salina Santa Rosa, Salina Rica, and in Lago Maracaibo, opposite these salt marshes.

February 21-22, Río Palmar, about 100 km. west and a little southwest of Maracaibo, near an oilfield called Totuma. The river here was 100 to 300 feet wide and made up of a succession of rapids and ponds, with muddy to sandy bottoms in the quiet pools and rubble to sand in the rapids.

February 24, Río Socuy, about 3 km. above its mouth, Río Limón system north of Maracaibo. The river here was 100 to 150 feet in average width, with sandy to muddy bottom and very deep holes in the sharp bends.

February 26, Río Apón, about 35 km. by road south of Rosario. This river, about 100 feet wide, has a sandy bottom, muddy in pools.

February 26, Río San Ignacio, south of Rosario. This creek is dry except for isolated pools during the dry season.

February 26, Río San Juan, about 12 km. south of Rosario. This shallow stream is about 10 feet wide, with sandy to muddy bottom.

February 27, Lago Maracaibo at Maracaibo Yacht Club located at northern end of city of Maracaibo. The lake here had gravel to sand bottom. Specific gravity 1.006.

March 1, Lago Tulé, about 80 km. west of Maracaibo, is a body of water about three-quarters of a mile long and half a mile wide, about 10 feet deep, bottom mud, shores weedy and junglelike. This lake is said to overflow into the Río Socuy system.

March 2-3, Río Negro, a tributary of the Río Santa Ana, below the mouth of the Río Yasa, 75 km. by road south of Rosario. This river, 35 to 50 feet wide, with deep muddy holes and gravelly riffles, had cut itself a steep, clay-banked channel 10 feet or more below the general level of the ground.

March 5, Lago Maracaibo at Maracaibo Yacht Club.

March 6, Río Palmar at the bridge about 70 km. southwest of Maracaibo. This stream, 75 to 100 feet wide, has a gravelly to sandy bottom, current rapid. No deep pools.

March 6, Lago Maracaibo, 7 km. south of Maracaibo. Sandy beach.

March 8, a small pond, tributary to the Río Gé, Río Palmar system, 2 km. west of Rosario.

March 10, Campo de Lago Petroleum Corporation, Maracaibo.

March 11, Los Monitos, 45 km. north of Maracaibo, a tidal caño connected with the lower Río Limón.

March 11, caño $\frac{3}{4}$ km. west of Sinamaica, about 60 km. north of Maracaibo. This is a tidal caño connected with the lower Río Limón.

March 11, Ciénaga del Guanavana, about 10 km. north of Sinamaica. This swamp was muddy and shallow, about 3 feet deep in places during the dry season. The bottom was made up of shell and vegetable debris.

March 12, Caño de Sagua, about 35 km. north of Sinamaica. Salinity 1.021.

March 12, channel of Salina Rica, 5 km. north of Maracaibo.

March 15, Lago Maracaibo, 2 km. off Lagunillas, water depth 15 feet, bottom muddy. Specific gravity 1.004.

March 16, Río Machango at bridge about 35 km. south of Lagunillas. This stream has a muddy bottom. It was about 20 feet wide, with high clay banks.

March 17, Río Motatán at the bridge 22 km. by road north of Motatán. This river is very swift, with rubbly to gravelly bottom and 200 feet or more wide.

March 17, Río San Juan (tributary of Río Motatán), at bridge about 20 km. south of Mene Grande. This river, with deep pools and riffles, was 100 to 150 feet wide; riffles mostly rubble and the pools with muddy bottoms.

March 19, a roadside pond, tributary to the Río Cocuiza during the rainy season, is about 50 km. by road east of Altagracia and 10 km. west of El Mene. Bottom mud.

March 20, Río San Juan at bridge, same as March 17. This stream was nearly dry, except for the deep pools.

March 20, Río San Pedro (tributary of Río Motatán), at bridge about 18 km. south of Mene Grande. This stream, with riffles and pools, was nearly dry except for the pools. Its width was about 50 feet.

March 21, Río Machango, about 20 km. above bridge south of Lagunillas. The river here was 75 to 100 feet wide, but now almost dry except for deep pools and a trickle of water over the stony riffles.

March 21, a hot spring, temperature 109° F., tributary to Río Machango, 20 km. above the bridge south of Lagunillas. Fish were taken in water 100° F. and at lower temperatures.

March 24, Río Motatán, about 8 km. below Motatán. This river was 80 to 125 feet wide and flowing rapidly, torrential in places. Bottom rubble to gravel. Depth to 4 feet, no pools.

March 24, Río Jimelles, 12 km. east of Motatán, tributary to Río Motatán. Width of river 50 to 100 feet, depth to 2 or 3 feet, current rapid to torrential.

March 25, Río Motatán, 4 km. above Motatán. Width 75 to 150 feet; depth to 4 feet; current torrential.

March 28, Río Chama above Mucuchies. Width 15 to 30 feet; current rapid to torrential; pools up to 4 feet in depth. Bottom stones, gravel, and sand.

March 29, Río Barregas, tributary of Río Chama, just below Egido, Estado de Mérida. Current rapid; bottom boulders, rubble to gravel and sand; depth to 2 feet; width 15 feet.

March 29, Río Gonzáles, tributary of Río Chama at town of La Gonzáles, Estado de Mérida. Width 50 feet; bottom of big boulders, rubble to sand; depth to 4 feet; current very rapid.

March 30, dry quebrada 4 km. below Lagunillas, Estado de Mérida, Río Chama drainage.

March 30, Río Chama, 10 km. below Lagunillas, Estado de Mérida; width of river bed 400 feet; collected from channel 25 feet wide, depth to 2 feet, current torrential; bottom rubble and sand.

March 31, Río Cobre (tributary to Río Quinta, latter tributary to Río La Grita of Catatumbo system), below La Grita, Estado de Táchira; width 20 feet; depth to 3 feet; bottom large rubble to sand; current torrential.

March 31, Río Torbes, 1 km. above Táriba, Estado de Táchira, Orinoco drainage. Width 30 to 50 feet; depth to 3 feet; big boulders, rubble to gravel and sand; current very rapid.

April 1, Río Táchira, 7 km. north of San Antonio, Estado de Táchira. Width of river bed up to 200 feet, but only a small flow of water among rubble bottom; current rapid; depth in a pool up to 2 feet.

April 3, a quebrada at Estanques, Estado de Mérida, Río Chama system; width 20 feet; bottom rubble to gravel; current rapid.

April 7, Lago Maracaibo, 20 km. off Pueblo Viejo at surface.

April 7-8, Lago Maracaibo, 1 to 2 km. off Pueblo Viejo; use of flashlight at night.

April 7-9, Lago Maracaibo, 1 km. off Pueblo Viejo; depth 2 meters; gill nets set over night.

April 10, Lago Maracaibo near Palmarejo; fishes received from Mr. Pospisil from hook and line fishing.

April 11-12, Lago Petroleum Corporation camp at Lagunillas, Estado de Julia.

April 14, Lago Maracaibo off dock at Lago Petroleum Corporation camp at Lagunillas.

April 16-18, Lago Petroleum Corporation camp at Lagunillas.

April 30, Río de Los Pajaros, 3 km. above Lago Maracaibo (southwestern end of the Lake); a caño 200 feet wide; 15 feet deep; bottom mud and debris; shores swamp and dense jungle.

May 1, Río Agua Caliente, 2 to 3 km. above Lago Maracaibo; caño 300 feet wide, 15 feet deep; bottom mud and debris; shores swamp and dense jungle.

May 2, Río Conecha at its mouth and in Lago Maracaibo, gill nets set at 5 feet and 18 feet depth; bottom mud; shores swamp and dense jungle.

May 12, Río Guárico and tributaries between San Sebastián and San Casimiro, Estado de Aragua; water to 4 feet depth; width 40 feet, bottom rubble to sand and mud; aided in this collection by Dr. G. Zuloaga, Roger Sherman, and William H. Phelps, Jr.

May 12, quebrada just south of Caracas, at El Valle, tributary to Río Guaire (Río Tuy system), Distrito Federal; width 10 to 20 feet, depth to 3 feet; bottom rock, sand, mud; aided in this collection by Dr. G. Zuloaga, Roger Sherman, and William H. Phelps, Jr.

May 15-19, Maracaibo market (probably these fish were taken in El Tablazo or in channel entrance of Lago Maracaibo).

May 16, Lago Maracaibo at Maracaibo Yacht Club.

DEFINITION OF TERMS

Terms used in this report upon the catfishes of Venezuela are defined as follows:

Standard length is measured from tip of snout to midbase of caudal fin; *length of head* is distance from tip of snout to rear end of operculum unless otherwise specified, as in the family Loricariidae; *width of head* is across bony base just in front of insertion of first pectoral ray; *depth* is greatest depth of body; *snout* is from tip of snout to front of eye; *distance between nostrils* or *nostrils to eye* is measured from edge of nasal openings; *interorbital space* is distance between the eyes; *postorbital length of head* is distance from eye to rear end of operculum; *caudal peduncle length* is measured from base of last anal ray to midbase of caudal fin; distances involving the *anus* are measured from center of anus.

Simple, flexible, nonpungent rays are represented by small and *pungent spines* by large Roman numerals. *Branched rays* are indicated by Arabic numerals.

Other terms will be found self-explanatory as the species involved are carefully studied.

SUMMARY OF RESULTS IN THE MARACAIBO BASIN

Catfishes belonging to 11 different families of Nematognathi were collected in the Maracaibo Basin, as follows: Bagreidae, Pimelodidae, Auchenipteridae, Ageneiosidae, Bunocephalidae, Cetopsidae, Pygidiidae, Doradidae, Callichthyidae, Astroblepidae, and Loricariidae.

I was able to collect 51 species and subspecies in 36 genera from the Maracaibo Basin and 8 species and subspecies in 7 genera in the headwaters of the Orinoco system. For the Maracaibo Basin, 36 genera and 53 species and subspecies are known. A species of *Pygidium* from above Mérida in the Río Chama system and *Bagre bagre* were not collected by me.

For all Venezuela, 127 species and subspecies in 63 genera are recognized in this study. Without doubt these totals will be greatly increased as soon as adequate collections are made in the Orinoco system and in the coastal streams and when further collections are made in the Maracaibo Basin.

Certain elements among the Nematognathi are distinctive for the Maracaibo Basin, but in general the fauna of this great basin has much in common with that of the Orinoco and Magdalena systems.

The number of genera and number of species of catfishes occurring in the Maracaibo Basin of Venezuela are distributed among the 11 families as follows:

The Bagreidae, marine catfishes, as was expected, had no distinctive

species found only in the Maracaibo Basin. There were three genera and four species.

The Auchenipteridae are represented by one genus and one species, closely related to a form in the Magdalena Basin.

The Pimelodidae were represented by 11 genera and 13 species in the Maracaibo Basin. Two of these genera have not been found elsewhere in South America. The other genera have representatives that occur outside of the Maracaibo Basin.

The Agenciosidae were represented by a single genus and species, related to a form in the Magdalena Basin.

In the Bunocephalidae two genera and three species occur in the Maracaibo Basin and these genera are not found elsewhere in South America.

The Cetopsidae had but a single genus and species in the Maracaibo Basin, and this one was related to a similar form outside the basin.

The Pygidiidae are represented by two genera and six species. A new genus and new species are especially distinctive for this basin, as the subfamily to which it belongs was never before reported outside of the Amazon Basin.

The Doradidae, not previously reported from the Maracaibo Basin, were represented by a new genus and species.

The Callichthyidae, represented by one genus and species, appear to be the same as in adjoining basins.

The Astroblepidae, with one genus and three species, had but one species confined to the Maracaibo Basin.

In the Loricariidae 12 genera and 19 species were collected, and only one was a new genus as yet found only in the Maracaibo Basin.

In this report 38 new forms are described: Four new species and one new subspecies from the Orinoco system; six new genera, 16 new species, and 17 new subspecies from the Maracaibo Basin.

No attempt will be made to discuss in detail the distribution of Venezuelan fishes until all the material collected by me has been identified.

TAXONOMIC SECTION

Order NEMATOGNATHI

Fishes without scales, bodies naked, or with bony plates; first four vertebrae united to form the Weberian apparatus; subopercle absent; opercle well developed or vestigial; maxillary reduced, forming the basis for the maxillary barbel; mental and nasal barbels present or absent; adipose fin usually present, variable, absent in certain groups; air bladder well developed or minute, united with the Weberian apparatus; paired and median fins usually well developed, with certain exceptions.

KEY TO THE FAMILIES OF CATFISHES, OR BAGRE, REPORTED FROM VENEZUELA

- 1a. $\overline{\text{M}}$ Mouth terminal or inferior in position, but lower lip not reverted or folded back to form a disklike mouth.
- 2a. Anterior and posterior nasal openings close together, posterior openings covered with a valve; skin naked, no plates; a pair of maxillary and 2 pairs of mental barbels present; teeth villiform, conical or granular on jaws, present or absent on vomer and palatines; gill membranes broadly attached to each other and to isthmus with or without a free fold across it; eyes superior in position; pelvics inserted behind base of dorsal fin; adipose fin present, base restricted; branched caudal fin rays usually 13 to 15 (marine catfishes).....**Bagreidae** (p. 182)
- 2b. Nostrils distinctly separated by skin covering head, anterior and posterior nasal openings usually far apart.
- 3a. Skin smooth and naked, without bony plates completely covering sides and no series of plates along the lateral line with backward-projecting spines;
- 4a. Adipose fin present, long or short; opercle well developed; maxillary barbels sometimes obscured in a groove; pelvics inserted under or a little behind base of dorsal; 14 to 16 branched caudal fin rays.
- 5a. Mental barbels 4, usually arranged in 2 pairs; air bladder well developed.
- 6a. Gill membranes not joined to each other but extending far forward before their attachment to isthmus; eyes superior in position.
- 7a. Teeth villiform, in a band on lower jaw and usually a similar band on premaxillaries; pelvics usually inserted under rear of base of dorsal fin; adipose fin base long or short.
Pimelodidae (p. 185)
- 7b. Numerous teeth in a single row in each jaw, these teeth evenly spaced and incisorlike, rounded distally; pelvics inserted a little behind dorsal base; adipose fin base very long.
Callophysidae (p. 235)
- 6b. Gill opening not extending far forward, gill membranes joined to isthmus or in front of or above pectoral fin; eyes lateral in position, margins of eyes not free; dorsal rays I, 4 to I, 6; no teeth on palatines; pelvics inserted behind base of dorsal fin; adipose fin short.....**Auchenipteridae** (p. 236)
- 5b. Mental barbels absent; teeth villiform on jaws only; gill membranes joined to isthmus, gill opening not extending forward; eyes lateral, margin not free; air bladder much reduced, enclosed in bony processes of cervical vertebrae.....**Ageneiosidae** (p. 240)
- 4b. Adipose fin absent.
- 8a. Dorsal fin in middle or anterior part of body; a pair of maxillary barbels and 2 pairs of mental barbels; opercle and interopercle without spines; gill membranes joined to isthmus, gill opening restricted, not extending forward along isthmus; pelvics inserted under dorsal or behind it.
- 9a. Caudal fin rays usually $i+6$ to $8+i$, or about 6 to 10 if they are all simple rays; anal rays always fewer than 11; teeth villiform; gill openings usually a small slit in front of pectorals; head and skin with knobs, sometimes with platelets along anal or dorsal fins; pectoral spines strongly serrated; opercle vestigial; air bladder well developed; body depressed forward, expanded to form head; anus near middle of length.....**Bunocephalidae** (p. 243)

- 9b. Branched caudal fin rays usually 15, rarely 14 or 16; branched anal rays 20 to 29; skin naked; body excessively streamlined; teeth villiform to incisor on jaws and vomer; gill membranes joined to isthmus, or gill openings sometimes restricted to in front of pectoral base; eyes nearly concealed in skin, margins fused; opercle well developed; pelvics inserted under last dorsal ray or behind dorsal base; dorsal rays i, 6----**Cetopsidae** (p. 250)
- 8b. Dorsal fin posteriorly on body, usually in posterior half of standard length; anal also far back; opercle and interopercle spinous; no mental barbels; usually twin barbels at each corner of mouth; nasal barbels present or absent; pelvics inserted under or in front of dorsal fin; branched caudal fin rays usually 10 to 12.
Pygidiidae (p. 256)
- 3b. Body covered with bony plates or at least a series along lateral line posteriorly, these with backward-projecting spines.
- 10a. A series of bony plates along midsides, these with a backward-directed spine, at least posteriorly; a pair of maxillary and 2 pairs of mental barbels present; barbels sometimes branched or fimbriated; gill membranes united with isthmus; air bladder much specialized; adipose fin present, short, base usually somewhat restricted; branched caudal fin rays usually 15; dorsal rays I, 4 to I, 6; anal rays about 10 to 16; dorsal and pectoral spines strong, with a locking mechanism; humeral process present; pectoral spine serrated.**Doradidae** (p. 269)
- 10b. Two longitudinal rows of plates completely covering sides of body; twin barbels at each rictus or corners of mouth; teeth villiform; gill membranes broadly joined to isthmus; nostrils not together but only a little distance apart; eyes superior or lateral; adipose, if present, represented by a spiny projection and membrane; branched caudal fin rays usually 12, occasionally 11; dorsal rays 7 to 12.
Callichthyidae (p. 275)
- 1b. Mouth inferior; lower lip reverted, forming with upper lip a disklike mouth; gill membranes broadly united with isthmus; nasal openings close together; no mental barbels; maxillary barbel more or less joining with lips to form disklike mouth; adipose fin, if present, represented by a bony projection and a membrane.
- 11a. Body naked, with plates; teeth bicuspid, in a narrow band on each jaw; pelvics inserted under dorsal base; branched caudal fin rays usually 11-----**Astroblepidae** (p. 278)
- 11b. Body completely covered with bony plates, in rows; teeth erect, with bilobed or spoon-shaped tips, on jaws, none on vomer or palatines; premaxillary elements separated at midline each with a single series of active teeth, dentary similar; branched caudal fin rays usually about 10 or about 14; intestinal canal coiled upon itself; air bladder minute.
Loricariidae (p. 285)

Family BAGREIDAE

This family includes the marine catfishes, with representatives in brackish waters. They are naked forms, with a pair of maxillary barbels and one or two pairs of mental barbels, but differ from other related forms in having the anterior and posterior nasal openings close together, with the rear nasal opening covered with a valve; insertion of pelvic fins behind base of dorsal fin; adipose fin base shorter than

its length and posteriorly free from the caudal peduncle; gill membranes broadly attached to each other, with or without free fold across isthmus.

KEY TO THE SPECIES OF BAGREIDAE REPORTED FROM VENEZUELA

- 1a. Mental barbels in one pair; maxillary barbels broad, bandlike; dorsal and pectoral spines usually with long bandlike filaments.
- 2a. Anal rays about 20 to 24, including rudiments; distance of dorsal from tip of snout 2.9 to 3 in length; distance of adipose from dorsal fin 2.8 to 3 in length; longest anal ray about as long as base of anal fin, the latter $5\frac{1}{2}$ to $6\frac{1}{2}$ in standard length.....*Bagre marinus* (Mitchill)
- 2b. Anal rays 32 to 35; distance from tip of snout to origin of dorsal $3\frac{1}{3}$ in length; distance of adipose fin from dorsal fin base $2\frac{3}{4}$ in length or longer; base of anal fin $4\frac{1}{2}$ in length or longer; longest anal ray less than half length of anal fin base; vomerine and palatine patches of teeth separate (after Eigenmann).....*Bagre bagre* (Linnaeus)
- 1b. Mental barbels in two pairs.
- 3a. No groove across snout at rear of posterior nasal openings; palatine teeth granular in a patch at each side of front of mouth; no vomerine teeth; barbels short, maxillary reaching to front of pectorals; anal rays about vi or vii, 16; gill rakers about 6+14; pectoral rays I, 10; dorsal I, 6.....*Arius spixii* (Agassiz)
- 3b. A groove across snout between posterior margins of rear nasal openings, and front of this groove with a membrane on adults, smooth in young, but somewhat finely papillate; vomerine patches of teeth, villiform, across front of roof of mouth; maxillary barbels short, not reaching quite to tips of pelvises in young and not to tips of pectorals in adults; anal rays about vi, 12; gill rakers about 6+17; pectoral rays I, 10; dorsal I, 6.....*Selenaspis herzbergii* (Bloch)

Genus BAGRE Oken

- Bagre* OKEN, Isis, 1817, p. 1183 (after *les Bagres* of Cuvier, Règne animal, vol. 2, 1817; type by tautonomy, *Silurus bagre* Linnaeus). (Ref. copied.)
- Breviceps* SWAINSON, The natural history and classification of fishes . . . , vol. 1, p. 328. 1838 (preoccupied).
- Felichthys* SWAINSON, *ibid.*, vol. 2, p. 305, 1839. (Type, *Silurus bagre* Linnaeus.)
- Ailurichthys* BAIRD and GIRARD, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, p. 26, 1854 (*Silurus marinus* Mitchill).

BAGRE MARINUS (Mitchill)

- Silurus marinus* MITCHILL, Trans. Lit. Philos. Soc. New York, vol. 1, p. 433, 1814.
- Aelurichthys marinus* STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 41, p. 158, 1879 (Orinoco near Ciudad Bolívar).

U.S.N.M. No. 121205, a specimen 273 mm. in standard length, bought by Leonard P. Schultz at the market in Maracaibo, probably caught in El Tablazo or Gulf of Venezuela, May 15, 1942; U.S.N.M. No. 126417, 3 specimens from Gulf of Venezuela, Estanques Bay, December 8, 1924, U.S.S. *Niagara*; U.S.N.M. No. 126416, 2 specimens, Gulf of Venezuela off Cape Macolla, January 10 and February 18, 1925, U.S.S. *Niagara*.

BAGRE BAGRE (Linnaeus)

Silurus bagre LINNAEUS, *Systema naturae*, ed. 12, vol. 1, p. 505, 1766.

Galeichthys gronovii CUVIER and VALENCIENNES, *Histoire naturelle des poissons*, vol. 15, p. 40, 1840 (Maracaibo).

Bagre bagre FOWLER, *Proc. Acad. Nat. Sci. Philadelphia*, vol. 83, p. 408, 1931 (Punta Tigre at mouth of St. Juan River, Venezuela).

Genus ARIUS Cuvier and Valenciennes

Arius CUVIER and VALENCIENNES, *Histoire naturelle des poissons*, vol. 15, p. 53, 1840. (Type, *Pimelodus arius* Buchanan.)

ARIUS SPIXII (Agassiz)

Pimelodus spixii AGASSIZ, in Spix, *Selecta genera et species piscium* . . . Brasiliam . . . , p. 19, 1829.

Arius spixii REGAN, *Proc. Zool. Soc. London*, 1906, pt. 1, p. 386 (Brazil; Guiana; Caroni River, Trinidad; Venezuela).

The following specimens were collected by Leonard P. Schultz during 1942 in the Maracaibo Basin of Venezuela:

U.S.N.M. No. 121206, 11 specimens, 120 to 162 mm. in standard length. Río de Los Pajaros, 3 km. above Lago Maracaibo, April 30.

U.S.N.M. No. 121208, 2 specimens, 165 and 243 mm., Río Agua Caliente, 2 to 3 km. above Lago Maracaibo, May 1.

U.S.N.M. No. 121207, 3 specimens, 137 to 142 mm., mouth of Caño de Sagua, 35 km. north of Sinamaica, March 12.

U.S.N.M. No. 121210, 13 specimens, 110 to 137 mm., Lago Maracaibo, 1 km. off Pueblo Viejo, April 7-9.

U.S.N.M. No. 121209, 1 specimen, 131 mm., Lago Maracaibo at Yacht Club, Maracaibo, May 16.

The following specimens from the Gulf of Venezuela were collected by the U. S. S. *Niagara*:

U.S.N.M. No. 125527, 1 specimen, 66 mm. in standard length, off Jacuque Point, January 26, 1925.

U.S.N.M. No. 125526, 4 specimens, 116 to 160 mm., off Point Macolla, April 19, 1925.

Genus SELENASPIS Bleeker

Selenaspis BLEEKER, *Ichthyologiae Archipelagi Indici Prodrromus*, vol. 1, p. 62, 1858. (Type, *Silurus herzbergii* Bloch.)

SELENASPIS HERZBERGII (Bloch)

Silurus herzbergii BLOCH, *Naturgeschichte der ausländischen Fische*, vol. 8, p. 33, pl. 367, 1794.

Arius herzbergii REGAN, *Proc. Zool. Soc. London*, 1906, pt. 1, p. 386 (Trinidad; Brazil; Guiana; Venezuela).

The following specimens were collected by Leonard P. Schultz during 1942 in the Maracaibo Basin of Venezuela:

U.S.N.M. No. 121203, 8 specimens, 105 to 139 mm. in standard length, Lago Maracaibo at the Yacht Club, Maracaibo, May 16.

U.S.N.M. No. 121204, 24 specimens, 40 to 244 mm., mouth of Caño de Sagua, 35 km. north of Sinamaica (salinity 1.021), March 12.

U.S.N.M. No. 121202, 2 specimens, 122 and 132 mm., Lago Maracaibo at Yacht Club, Maracaibo, March 5.

The following 16 examples were collected by F. F. Bond for the University of Michigan Museum of Zoology and were lent me through the courtesy of Dr. Carl L. Hubbs:

14 specimens, 47 to 86 mm., Laguna de Tacarigua, Estado de Miranda, Venezuela, February 3, 1939.

2 specimens, 173 and 188 mm., tributary of Lago Maracaibo, 10 km. south of Lagunillas, March 23, 1938.

Family PIMELODIDAE

KEY TO THE GENERA OF PIMELODIDAE REPORTED FROM VENEZUELA (INCLUDING CERTAIN OTHER RELATED GENERA)

- 1a. Gill membranes not joined to one another but extending far forward before their attachment to isthmus, sometimes with a narrow free fold; pelvics usually inserted under rear of base of dorsal fin.
- 2a. No prominent or distinct small to large patches or bands of teeth in roof of mouth other than on premaxillaries (occasionally a few scattered obsolete villiform teeth may be detected on vomer of *Pimelodus*, but these do not form a prominent patch); dentaries with a band of teeth; dorsal rays i, 6 or I, 6, rarely with 5 branched rays; eyes superior in position, not visible from below.
- 3a. Premaxillaries, vomer, and palatines edentulous except the first when fish are about 32 mm.; dentary with a narrow band of villiform teeth; pectoral spine pungent but not serrated anteriorly; first simple ray of dorsal flexible, not spinous; adipose fin very long; anal base short; caudal fin deeply forked; 1 pair of maxillary and 2 pairs of mental barbels, their bases almost in a straight line; margin of eye free above, but ventrally margin more or less fused or not free; predorsal plate and supraoccipital process meeting; dorsal surface of head bony, not covered with skin posteriorly; postcleithral process lacking; both sides of gill arches with papillae in rows at bases of filaments; gill rakers numerous, about 10+22; occipital fontanel a narrow slit, short; dorsal rays i, 6; anal v, 6 or 7; pectoral I, 10 or 11; pelvic i, 5.
Sovichthys, new genus
- 3b. A distinct and wide band of villiform teeth on premaxillaries and on dentary; no rows of papillae at base of gill filaments on gill arches as in 3a.
- 4a. Width of head across base of pectorals equal to length of head or nearly so, snout noticeably depressed; dorsal and pectoral spines pungent; dorsal surface of head covered with skin.
- 5a. Margin of eye free, not fused with flesh around rim of eye; caudal fin forked, lobes more or less rounded, the two shortest mid-caudal fin rays with membrane deeply incised; adipose fin long; anal base short; predorsal plate not meeting supraoccipital process; postcleithral process short, broad-based; posterior nostril a little closer to eye than to anterior nostril; bases of the 2 pairs of mental barbels nearly or in a straight line.

Rhamdia Bleeker

- 5b. Margin of eye not free, eye small; adipose fin short, with much restricted base; anal base short; postcleithral process a short knob in adults, a very small spiny projection in young; bases of anterior pair of barbels much farther forward than bases of posterior pair.
- 6a. Anterior edge of pectoral spine smooth; gill rakers 1 or 2+3 or 4; predorsal plate meeting and fitting into a small notch of supraoccipital process; posterior nostril about equal distance from eye and anterior nostril; caudal fin forked, lobes more or less pointed; outer ends of premaxillary band of teeth with backward-projecting angles.....**Zungaro** Bleeker
- 6b. Anterior edge of pectoral spine serrated; gill rakers 2 or 3+6 to 8; predorsal plate meeting or not meeting supraoccipital process, not fitting into a notch in it; posterior nostril closer to eye than anterior nostril; caudal fin more or less forked in young, lobes rounded, but caudal fin usually rounded in adults; outer ends of premaxillary band of teeth rounded in small ones or with backward-projecting angles in adults.

Pseudopimelodus Bleeker

- 4b. Head much longer than its width across base of pectorals; lateral ends of premaxillary band of teeth rounded at all ages; caudal fin deeply forked.
- 7a. Barbels bandlike, long, with membranous border and reaching to anal fin; adipose fin long, 2 to 2.2 in standard length; first dorsal ray more or less pungent; first pectoral ray articulate, not pungent; supraoccipital process extending onto predorsal plate; head $4\frac{1}{2}$, depth 6, in standard length; eye $3\frac{1}{2}$ to $5\frac{1}{2}$ in snout; head depressed.....**Pinirampus** Bleeker
- 7b. Barbels round or nearly so in cross section, filiform, sometimes a little compressed basally.
- 8a. Dorsal and pectoral spines strongly pungent, very sharp-pointed; predorsal plate meeting tip of supraoccipital process; anal fin base short.
- 9a. Postcleithral process platelike, broad-based, triangular in shape, eye contained one or more times in width of base of this bone; dorsal truncate; anal emarginate; adipose base about as long as anal base; bases of mental barbels not in a straight line, inner pair farther forward; margin of eye distinctly free all way around; top of head bony.

Pimelodus Lacepède

- 9b. Postcleithral process a spiny projection, width across its base about $\frac{1}{2}$ to $\frac{1}{4}$ eye; dorsal and anal rounded posteriorly; adipose base short to long, usually longer than anal base, which is short; bases of mental barbels in a straight line or nearly so; margin of eye free dorsally but more or less fused ventrally; top of head covered with thin skin.
- Pimelodella** Eigenmann and Eigenmann
- 8b. Dorsal ray flexible, not pungent; pectoral spines weakly pungent or flexible; predorsal plate not quite meeting supraoccipital process; posterior margins of dorsal and anal fins mostly truncate.
- 10a. Postcleithral process absent; first ray of pectorals not pungent but flexible.

- 11a. Base of each lobe of caudal fin with embedded black pigment spot, this pair visible at all ages; bases of anterior pair of mental barbels much in front of bases of posterior pair; margin of eye free dorsally, more or less fused ventrally; posterior pair of nasal openings closer to anterior ones than to eye; underside of snout flat, in same plane as underside of head and belly.-----**Megalonema** Eigenmann
- 11b. No pair of embedded pigment spots in caudal region; bases of mental barbels in a straight line or nearly so; margin of eye not free; posterior nasal openings closer to eye than to anterior nasal openings; underside of head convex; usually a pale saddle across occiput.
- Cetopsorhamdia** Eigenmann and Fisher
- 10b. Postleithral process represented by a very small spine off upper posterior base of pectoral fin; pectoral spine weakly pungent; dorsal margin of eye free in well-preserved specimens, otherwise the margin dorsally and ventrally appearing fused; posterior nostrils much closer to eye than to anterior nasal opening; bases of mental barbels in a straight line or nearly so.-----**Nannorhamdia** Regan
- 2b. Prominent and distinct paired patches or bilaterally symmetrical patches or bands of teeth in roof of mouth behind premaxillary band of teeth; dentaries with a band of teeth; teeth more or less conical, villiform, sometimes depressible; head broad, depressed anteriorly, snout sometimes produced, spatula-shaped; margin of eye free; nostrils widely separated, the posterior one always much closer to anterior nasal opening than to eye; inner edge of operculum with one or two folds of skin or "pouches", dorsal rays I, 6 to I, 10. (See fig. 3.)
- 12a. Upper jaw shorter than lower jaw, latter projecting a little beyond tip of snout; inner or anterior mental barbels near tip of chin or lower lip; maxillary barbels not extending beyond base of adipose fin; adipose fin longer than anal fin base; patches of villiform teeth in upper surfaces of mouth; dorsal rays I, 6; anal v, 8; pectoral I, 9.
- Hemisorubim** Bleeker
- 12b. Upper jaw equal to or longer than lower jaw; bases of mental barbels remote from edge of lower lip.
- 13a. Upper jaw and lower jaw equal; maxillary barbels bandlike, extending to middle of pectorals; caudal forked; vomerine patch of teeth broad at sides; no teeth on palatines; dorsal rays I, 6; anal 16; pectoral I, 9.-----**Platynemateichthys** Bleeker
- 13b. Lower jaw distinctly shorter than upper jaw when closed.
- 14a. Upper jaw or snout greatly prolonged, flattish, with teeth on underside of snout, mostly in front of lower jaw; dorsal rays I, 6.
- 15a. Eyes lateral so that they can be seen from above or below; band of premaxillary teeth, mostly on underside of snout, horseshoe-shaped; patches of teeth in roof of mouth; maxillary barbel not reaching past dorsal fin; distance across angles of mouth about equal to widest part of head; adipose fin shorter than anal fin; anal v, 14; pectoral I, 8. (Fig. 3, h.)
- Sorubim** Agassiz
- 15b. Eyes superior, not visible from below.
- 16a. Patch of premaxillary teeth arrow-shaped; adipose fin longer than anal fin base; vomer and palatine patches of teeth widely separated; first half of maxillary barbel ossified and

rest flexible, extending past caudal fin; width of mouth about $1\frac{1}{2}$ in length of head. (Fig. 3, f.)

Platystomatichthys Bleeker

- 16b. Adipose fin base shorter than anal fin base; eye nearer to end of snout than end of operculum; premaxillary band of teeth very wide, not arrow-shaped; 2 patches of vomer and palatine teeth; width across angle of mouth $\frac{1}{2}$ length of head; maxillary barbel reaching to anal fin; color darker above, paler below, with black spots on head, back, dorsal and pectoral fins; an interrupted blackish longitudinal band from axil of pectoral to base of anal fin.-----**Sorubimichthys** Bleeker

- 14b. Upper jaw not greatly prolonged and flattish but normal, lower jaw only a little shorter than upper jaw; eyes superior.

- 17a. Dorsal rays I, 9 or I, 10; small patches of palatine teeth remote from vomer and transversely arranged; maxillary barbels long, reaching past caudal fin; adipose longer than anal fin base; caudal deeply forked; eyes superior.

Sciades Müller and Troschel

- 17b. Dorsal rays I, 7 or I, 8; patches of vomerine and palatine teeth separated, each patch smaller than eye, the two vomerine patches of teeth meeting in midline in large adult; width of head 1.2 in its length; maxillary barbels heavy, reaching to caudal fin; width of mouth $1\frac{1}{2}$ in width of head and $1\frac{1}{10}$ in length of head; interorbital space concave; inner mental barbel remote from lip; occipital process longer than wide and meeting predorsal plate; adipose fin much longer than anal; gill rakers 4 or 5+11. (Fig. 3, d.)-----**Perrunichthys**, new genus

- 17c. Dorsal rays I, 6 or I, 7; vomerine and palatine patches of teeth if widely separated larger than eye;

- 18a. Occipital process very broad, as is predorsal plate, and not meeting the latter; toothed areas of vomer and palatine contiguous, in large pentagonal patches; head as broad as long; dorsal I, 7; maxillary barbel not reaching past dorsal fin; adipose fin with rays distally; width of head at angle of mouth 2 in head; gill rakers 4+15. **Phractocephalus** Agassiz

- 18b. Occipital process longer than broad and meeting or almost meeting predorsal plate.

- 19a. Teeth on premaxillary longer, depressible, and slenderer than short villiform teeth on vomer and palatines arranged in a band; width of head about $1\frac{1}{4}$ to $1\frac{3}{4}$ in its length; dorsal rays I, 6; maxillary barbel reaches to adipose or as far as caudal fin; width of mouth $1\frac{1}{4}$ in head and $1\frac{1}{4}$ in width of head; occipital process not quite meeting predorsal plate; caudal deeply forked; adipose fin longer than anal base. (Fig. 3, e)-----**Brachyplatystoma** Bleeker

- 19b. Villiform teeth in roof of mouth and on dentaries, all uniform.

- 20a. Teeth on vomer in form of a band behind premaxillary band of teeth (see fig. 3, c); width of head 1.2 in its length; maxillary barbel not reaching past dorsal fin; width of mouth at angle of jaws 1.4 in width of head.

Paulicea Ihering

20b. Teeth not in form of a band behind premaxillary band of teeth.

21a. Width of head equals length of head; no patches of palatine teeth, but two patches of vomerine teeth; dorsal rays I, 6 or I, 7; maxillary barbel reaching or not reaching as far as adipose fin; width of mouth $1\frac{1}{2}$ in width of head.

Steindachneria Eigenmann and Eigenmann

21b. Length of head longer than width of head, latter 1.5 to 2.3 in its length; premaxillary band of teeth very wide, with a backward-projecting arm, laterally.

22a. Palatine patch of teeth comma-shaped, confluent with vomerine patch; width of head 2.2 in its length; maxillary barbel not reaching past dorsal fin, width of mouth nearly equal to width of head, 3.2 in length of head; adipose about equal length of anal fin base; back and sides of body with blackish bars; all fins with black spots; anal rays v, 9; pectoral I, 8; gill rakers about 3+9. (Fig. 3, a)-----*Pseudoplatystoma* Bleeker

22b. Palatine patches of teeth oval and separated from vomerine patches.

23a. Vomerine patches of teeth widely separated; premaxillary band of teeth with a concavity lacking teeth at inner midline but almost enclosed posteriorly by a toothed armlike projection toward midline; maxillary barbels longer than total length, ossified out as far as opposite dorsal fin, thence flexible and bandlike, ending in a long hairlike filament; total length of adipose fin much longer than base of anal fin; width of head $1\frac{1}{10}$ in its length; width of mouth across angles $1\frac{1}{10}$ in width of head and $2\frac{7}{10}$ in length of head; gill rakers about 5+12. (Fig. 3, g.)

Platysilurus Haseman

23b. Vomerine patches of teeth confluent in midline; premaxillary band of teeth wide without partially enclosed edentulous space at inner side at midline; maxillary barbel reaching a little past caudal fin but not ossified or bandlike; width of head $1\frac{1}{2}$ in length of head; width of mouth across angles $1\frac{1}{2}$ in width of head and 2.2 in length of head; gill rakers about 4+11; adipose fin much longer than anal fin base. (Fig. 3, b.)

Duopalatinus Eigenmann and Eigenmann

1b. Gill opening not extending far forward, gill membranes joined to isthmus or in front of pectoral fin; dorsal rays I, 6; teeth villiform in a band on premaxillaries and on dentaries; no teeth on vomer or palatines; margin of eye not free; pelvics inserted far behind base of dorsal fin; pectoral spine pungent, about I, 7; anal base long, of 16 to 40 branched rays; postcleithral process a triangular, broad-based spiny projection. (AUCHENIPTERIDAE).

SOVICHTHYS, new genus

This remarkable new genus of Pimelodidae differs greatly from all other members of that family, except *Iheringichthys* Eigenmann and Norris, 1900, in lacking teeth on the premaxillaries, except in the young. *Sovichthys* is remarkable in having about 14 to 17 minute tubes in the skin, associated with tiny papillae or pores, extending at right angles to the lateral line and mostly encircling the body.

The Pimelodidae are usually defined as catfishes with nares widely separated, remote from the orbits; four mental barbels and two maxillary barbels; a well-developed adipose fin; gill membranes free from isthmus; the skin without bony plates; teeth in villiform bands on premaxillaries and dentaries. However, the description of the character of the premaxillary teeth as usually understood must be modified if *Iheringichthys* and *Sovichthys* are to remain in that family. The premaxillaries are edentulous in the adults of both these genera and in the half-grown of *Sovichthys*. On a specimen of *Sovichthys* at a length of 32 mm. a very small patch of delicate villiform teeth was found near the midline on each premaxillary, but at a length of 59 mm. the teeth were absent and a firm plate could be felt where the teeth were to be expected. The teeth in a specimen of *Iheringichthys megalops* (U.S.N.M. No. 52611), 134 mm. in standard length, were well developed on the premaxillaries. In the adults of *Sovichthys* the premaxillaries are thickly covered with the skin and tissues of the upper lip and each dentary has a narrow band of delicate villiform teeth.

The supraoccipital process has a wide base, then tapers backward and meets the predorsal plate; the first simple ray of the dorsal is not spinous but articulated and is longer than the first branched ray; pectoral spines not locking open; the first ray of the pectoral fin is distinctly a spine, the front margin near tip with small teeth pointing basally, and with posterior edge of this spine having numerous sharp teeth pointing toward base of spine, in adults the anterior margin of the spine being rough; frontal fontanel present but narrow; occipital fontanel narrow, its anterior end beginning opposite rear margin of orbits; no postcleithral process from pectoral girdle behind and above base of pectoral; snout produced, mouth inferior; margin of eye free; gill membranes free from the isthmus, extending forward, joined in midline anteriorly; in front of this juncture is a pouch that extends to under inner pair of mental barbels; another pouch occurs between upper lip and base of maxillary barbel that extends nearly to midline under upper lip, separated from its fellow on opposite side by a membranous partition; interorbital space flat; air bladder well developed and in contact with skin behind pectoral girdle; inside of gill cavity, below orbit, are three folds of tissue; along front of gill arches at base

of gill filaments are two or three rows of short papillae; the gill rakers are triangular in shape and of a fleshy nature; the posterior side of the gill arches is broad with three or four rows of papillalike fleshy gill rakers, the inner row composed of more or less elongate ridges; at upper ends of gill arches occur a few folds of tissue; the fifth gill arch without gill filaments has a series of fleshy gill rakers, and then below is a band of villiform teeth.

Remarks.—The following key indicates some of the essential characters that separate *Sovichthys* from *Itheringichthys*.

- 1a. Pectoral spine pungent, serrated anteriorly and strongly serrated posteriorly; locking mechanism fully and functionally developed; posterior process of cleithrum broad and extending backward nearly half length of pectoral spine; dorsal spine pungent, with locking mechanism fully and functionally developed; unlocking mechanism functions by pulling out short spine between predorsal plate and base of dorsal spine (encircling tubes in skin with pores extending at right angles to lateral line not observed by me and not described); origin of adipose fin more than two orbit diameters behind base of dorsal fin.....*Itheringichthys* Eigenmann and Norris²
- 1b. Pectoral spine pungent, not serrated anteriorly but serrated posteriorly; locking mechanisms of pectoral spine and of dorsal first simple ray not developed and nonfunctional; no small spine between predorsal plate and base of first dorsal ray; first dorsal ray flexible and thus not pungent; no backward-projecting process of cleithrum over base of pectoral fin; about 14 to 17 lines or tubes in skin, associated with tiny papillae or pores, extending at right angles to lateral line and mostly encircling body; origin of adipose fin immediately behind (about one orbit diameter) base of dorsal fin.

Sovichthys, new genus

Named *Sovichthys* in honor of the Standard Oil Co. of Venezuela, an organization that has aided in the industrial development of Venezuela and helped make possible this study of the fishes of the Maracaibo Basin.

Genotype.—*Sovichthys abuelo*, new species.

SOVICHTHYS ABUELO, new species

BAGRE ABUELO

PLATE 1, A

Holotype.—U.S.N.M. No. 121183, a specimen 215 mm. in standard length, taken by Leonard P. Schultz, April 30, 1942, in the Río de Los Pajaros, 3 km. above Lago Maracaibo, at a depth of 15 feet.

Paratypes (all collected by Leonard P. Schultz).—U.S.N.M. No. 121198, 4 specimens, collected along with the holotype and bearing same data; U.S.N.M. No. 121188, Río Agua Caliente, 2 to 3 km.

² *Itheringichthys* Eigenmann and Norris, Rev. Mus. Paulista, vol. 4, p. 354, 1900. (Type, *Pimelodus labrosus* Kröyer.)

Bergiella Eigenmann and Norris, Rev. Mus. Paulista, vol. 4, p. 355, 1900. (Type, *Pimelodus westermanni* Reinhardt.)

I have observed in the literature that three species have been referred to this genus: *I. labrosus* (Kröyer), *I. westermanni* Reinhardt, and *I. megalops* Eigenmann and Ward.

above Lago Maracaibo, May 1, 1942, 3 examples, 170 to 183 mm.; U.S.N.M. No. 121186, caño half a mile west of Sinamaica, March 11, 1942, 2 specimens, 141 and 155 mm.; U.S.N.M. No. 121185, Río Palmar at bridge, 70 km. southwest of Maracaibo, taken March 6, 1942, 3 examples, 169 to 177 mm.; U.S.N.M. No. 121187, Ciénaga del Guanavana, about 10 km. north of Sinamaica, March 11, 1942, 3 specimens, 32, 136, and 146 mm.; U.S.N.M. No. 121184, Río Negro below mouth of Río Yasa, March 2, 1942, 4 examples, 138 to 172 mm.; U.S.N.M. No. 121211, Río Apón, about 35 km. south of Rosario, Maracaibo Basin, February 26, 1942, 17 specimens, 124 to 176 mm.; U.S.N.M. No. 121212, Río Socuy, 3 km. above mouth, February 24, 1942, 57 examples, 59 to 220 mm.

Description.—Based on the holotype and paratypes. Detailed measurements were made on the holotype and two paratypes, data for these being expressed in hundredths of the standard length and recorded below, first for the holotype, then for the two paratypes in parentheses, respectively. Standard length (in mm.) 215 (162; 101).

Length of head to tip of supraoccipital process 30.2 (28.9; 30.5); length of head to end of gill cover 23.2 (22.0; 23.7); greatest depth of body 19.4 (17.3; 17.8); width of head at base of pectorals 15.1 (14.1; 14.6); length of snout 9.86 (10.2; 9.52); diameter of eye 5.11 (4.37; 6.44); diameter of bony orbit 5.58 (5.86; 7.23); width of fleshy interorbital 7.95 (8.88; 7.03); width of bony interorbital space 6.65 (6.30; 5.64); distance from eye to posterior nostril 4.65 (4.63; 3.96); distance between posterior and anterior nostrils 2.84 (3.08; 3.07); postorbital length of head 9.30 (7.90; 9.12); total length of adipose fin 3.91 (4.13; 3.77); greatest height of adipose fin 4.88 (5.74; 6.44); least depth of caudal peduncle 7.44 (7.78; 7.23); length of caudal peduncle 19.3 (19.8; 19.9); length of first simple ray of dorsal 25.4 (29.9; 35.0); length of pectoral spine 19.5 (21.3; 21.8); length of longest pelvic fin ray 18.0 (20.2; 20.3); length of longest anal ray 14.1 (15.5; 14.9); length of upper caudal fin lobe 33.0 (37.0; 35.2); length of lower caudal fin lobe 28.2 (30.9; 32.8); length of shortest midcaudal fin rays 8.93 (9.38; 9.12); distance from tip of snout to dorsal fin origin 29.8 (34.4; 34.9); distance from snout to anal origin 72.6 (78.4; 71.8); snout to adipose origin 51.6 (46.6; 52.1); snout to pelvic insertion 44.6 (42.0; 42.6); snout to pectoral insertion 22.1 (20.3; 23.0); snout to anus 49.0 (47.1; 47.0); anus to anal origin 24.2 (26.9; 23.7); length of maxillary barbel 102.0 (136.0; 156.0); length of outer mental barbel 30.0 (38.9; 42.1); length of inner mental barbel 16.7 (21.0; 24.8); width of base of supraoccipital process 4.65 (4.93; 4.96); length of supraoccipital process from rear end of occipital fontanel to its tip 5.58 (5.86; 7.23).

Counts were made as follows: Dorsal rays i, 6 (i, 6; i, 6); anal v, 6 (v, 7; v, 7); pectoral I, 11 (I, 11; I, 10); pelvic always I, 5; branched rays of caudal fin 15 or 16 usually 16; number of gill rakers on first gill

arch -- (10+22; 10+22). Five specimens had v, 7 anal rays and four had v, 6; one fish had I, 10 pectoral rays, 6 had I, 11, and one I, 12; gill rakers on first gill arch were in 6 specimens counted, one with 9+21, two with 10+20, one 10+21, and two 10+22.

In addition to the characters discussed under the description of the genus, a few other features of this new species should be described. The maxillary barbel in the young extends to tips of caudal fin rays or a little beyond, but in the adults only to the base of the caudal fin; outer mental barbels to base of pelvics or a little beyond; inner mental barbels about halfway out the pectoral fins; center of eye behind middle of head; origin of adipose near rear base of dorsal fin or not more than three-fourths diameter of eye behind base of last dorsal ray; least depth of caudal peduncle $2\frac{1}{2}$ in its length; barbels round in shape; pectoral spines not locking open; length of pectoral spine one-half length of adipose fin and reaching or almost reaching base of pelvics; the latter reaching two-thirds the way to anal origin.

Color.—Darker above, paler below, upper surfaces profusely black-spotted, these spots often on dorsal and adipose fins; another color phase from muddy waters is pale, with but a few of the black spots evident; also this pale color phase has a more or less darkish blotchy band along upper midsides, above and below, which is a pale band without spots; in small specimens the general darker pigment of upper sides extends a little below the lateral line, then the lower sides are abruptly pale or white; paired and caudal fin darkish, without spots; mental barbels white, maxillary barbels blackish or grayish; in alcohol some of the specimens still retain a dull yellowish color in all the fins; underside of head dull yellowish.

Remarks.—This new species is distinguished from all others in the family Pimelodidae by a combination of characters as follows: First dorsal ray simple, articulated; pectoral fin with a strong spine; no teeth on premaxillaries, vomer, or palatines; gill arches with papillae both anteriorly and posteriorly and fleshy gill rakers, triangular in shape; gill cavity with folds of tissue below orbit; pectoral spine not locking; supraoccipital process meeting the predorsal plate; adipose fin very long, its origin just behind base of dorsal fin.

Named *abuelo*, the common name of this species as given to me by the people living in the Maracaibo Basin. Probably called *abuelo*, meaning grandfather, because of its extremely long "beard" or maxillary barbels usually nearly as long as, or longer than, its total length.

Genus RHAMDIA Bleeker

Rhambia BLEEKER, Ichthyologiae Archipelagi Indici Prodromus, vol. 1, pp. 197, 207, sp., 1858; Nederl. Tijdschr. Dierk., vol. 1, p. 101, 1863. (Type, *Pimelodus quelen* Quoy and Gaimard.)

KEY TO THE SPECIES OF RHAMDIA REPORTED FROM VENEZUELA

- 1a. Maxillary barbel extending past middle of adipose fin or to caudal peduncle; interorbital space 2.6 to 2.7 in head; pectoral spine with teeth on posterior margin and small ones anteriorly; depth $5\frac{1}{2}$; head 3.5 to 4 in standard length; anal rays vi, 9; gill rakers 5+14; pectoral I, 9.
Rhamdia sebae (Cuvier and Valenciennes)
- 1b. Maxillary barbel not reaching past tips of pelvics; depth 6 to $6\frac{1}{2}$ in standard length; dorsal I, 6; pectoral I, 9; anal 11 to 13; distance of adipose fin from dorsal $1\frac{1}{4}$ to $1\frac{3}{4}$ in head.
- 2a. Pectoral spine slightly serrated along both edges; head $4\frac{2}{3}$ in standard length; coloration uniform, dorsal blackish with a pale band across its basal portion.....*Rhamdia humilis* (Günther)
- 2b. Pectoral spine nearly smooth behind, with hooks along anterior margin decreasing in size toward base; head 4 to $4\frac{2}{3}$ in standard length; premaxillary band of teeth slightly wider at sides, with small backward-projecting angle.....*Rhamdia guairensis* Eigenmann
- 1c. Maxillary barbel extending past tips of pelvics but not past middle of adipose fin; interorbital 2.8 in head; pectoral spine serrated on both margins; depth 5 to $5\frac{1}{2}$; head 4 to 4.5; anal about vi, 9; gill rakers about 4+8 from a Guiana specimen.....*Rhamdia quelen* (Quoy and Gaimard)

RHAMDIA SEBAE (Cuvier and Valenciennes)

Pimelodus sebae CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 169, 1840.

The specimens from the Maracaibo Basin, here tentatively identified as *R. sebae*, may represent a distinct subspecies. This form, though fully described on the following pages, was not given a new name because critical comparative material is lacking at present.

The following specimens were collected by Leonard P. Schultz during 1942 in the Maracaibo Basin of Venezuela:

U.S.N.M. No. 121190, 16 specimens, 20.5 to 201 mm. in standard length, from the Río Machango at the bridge south of Lagunillas, March 16.

U.S.N.M. No. 121196, a specimen 209 mm. collected in Lago Maracaibo near the mouth of the Río Concho, May 2.

U.S.N.M. No. 121193, 3 specimens, 101 to 148 mm., taken in the Río San Juan at the bridge, Motatán system, March 20.

U.S.N.M. No. 121192, 5 examples, 170 to 269 mm., obtained on March 11 from a caño half a mile west of Sinamaica.

U.S.N.M. No. 121197, 2 specimens, 91 and 277 mm., taken March 2 in the Río Negro below the mouth of the Río Yasa.

U.S.N.M. No. 121191, a specimen 264 mm., collected February 26 in the Río San Juan, about 12 km. south of Rosario, Estado de Zulia.

U.S.N.M. No. 121199, an example, 112 mm., taken February 21, 1942, in the Río Palmar near Totuma, about 100 km. southwest of Maracaibo.

U.S.N.M. No. 121194, 2 specimens, 34 and 40 mm., collected March 17 in the Río Motatán at bridge 22 km. north of Motatán.

U.S.N.M. No. 121195, 4 specimens, 87 to 105 mm., taken in the Río San Pedro at bridge (Motatán system), March 20.

This species was taken most frequently over muddy to sandy bottoms of pools in rivers, as well as in swamps and in Lago Maracaibo.

Detailed measurements of three specimens were made, and these data are expressed in hundredths of the standard length and recorded below. Standard length (in mm.) 188; 101; 277.

Length of head to tip of supraoccipital 28.5; 28.2; 29.2; length of head to end of operculum 27.7; 28.2; 27.8; greatest depth of body 19.1; 18.3; 18.4; width of head at base of pectorals 20.5; 20.3; 21.8; length of snout 10.7; 11.7; 11.9; diameter of eye 3.62; 5.15; 3.72; width of fleshy interorbital space 11.3; 9.70; 12.1; length of maxillary barbel 86.7; 94.1; 68.6; length of outer mental barbel 31.9; 36.6; 27.8; length of inner mental barbel 22.3; 23.6; 20.4; total length of adipose fin 38.6; 40.6; 37.2; height of adipose fin 6.70; 6.83; 4.94; length of base of anal fin 13.2; 14.4; 12.4; least depth of caudal peduncle 10.2; 11.4; 9.40; length of caudal peduncle 19.2; 19.8; 20.6; distance between anterior and posterior nasal openings 3.62; 3.56; 3.72; distance from eye to posterior nasal opening 5.58; 5.15; 5.56; distance from tip of snout to origin of dorsal fin 34.3; 34.4; 35.7; snout to origin of anal fin 68.4; 68.8; 72.2; snout to adipose origin 54.0; 54.1; 58.4; snout to pectoral insertion 24.7; 24.0; 24.8; snout to pelvic insertion 47.0; 48.7; 50.2; anus to anal origin 15.2; 12.0; 14.8; length of dorsal spine 12.0; 13.1; 11.3; length of pectoral spine 13.1; 14.9; 13.8; length of longest (third branched) ray of anal fin 12.5; 14.6; 12.3; length of longest ray of pelvic fins 13.8; 16.3; 14.7; snout to anus 54.8; 57.8; 58.2; length of longest ray of upper lobe of caudal fin 22.5; 27.3; 21.5; length of longest ray of lower lobe of caudal fin 22.6; 28.6; 21.7; postorbital length of head to end of operculum 14.1; 12.7; 13.9; width of head across rictus of mouth 14.5; 15.1; 16.2; tip of chin to base of inner mental barbel 4.63; 4.85; 4.62; tip of chin to base of outer mental barbel 5.58; 6.44; 6.35.

The following counts were made, respectively: Dorsal rays I, 6; I, 6; I, 6; anal vi, 8; v, 9; vi, 8; pectoral I, 9; I, 10; I, 9; pelvics always i, 5; branched caudal rays 7+9; 7+9; 7+9; gill rakers on first gill arch --; 4+8; 4+10. Head depressed anteriorly, snout rounded and broad, the distance across the mouth at angles $1\frac{7}{10}$ in the head to end of operculum; width of head at base of pectorals $1\frac{1}{2}$ to $1\frac{1}{2}$ in head; adipose fin about $2\frac{1}{2}$ to $2\frac{1}{2}$ in standard length; height of adipose fin $1\frac{3}{4}$ in interorbital space and 6 or 7 times in its total length; lower jaw a little shorter than upper jaw; all teeth similar, villiform, and in a band (with lateral ends rounded) on premaxillaries and on dentaries; gill membranes extending forward, free from the isthmus, in front of which is a pouch; dorsal and pectoral fins each with a sharp, stiff spine; posterior edge of pectoral spines serrated, anterior edge rough basally, with serrations distally but pointing basally; dorsal spine smooth; eye with a free margin; interorbital space nearly flat, a trifle convex; all barbels blackish; mental barbels all in a nearly

straight line; anterior nostrils tubular, forward of base of maxillary barbel; anterior and posterior barbels widely separated; supraoccipital process covered with skin and not meeting the predorsal plate; gill rakers about 4+8 to 10; caudal lobes rounded, upper lobe with 7 branched rays and lower with 9; caudal peduncle compressed. No teeth on vomer or palatines; posterior margins of dorsal, anal, pectoral, and pelvic fins rounded; lower lobe of caudal fin rounded, broader than upper lobe; upper and lower lobes separated by a deep incision of the membrane between the two shortest mid-caudal fin rays; adipose fin very long, its origin about an eye diameter behind base of dorsal fin; maxillary barbel flattish, reaching to caudal peduncle or a little shorter, outer mental barbel extends to tips of pectorals or to base of pelvics; inner mental barbel reaching to base of pectorals or one-third out their length; pelvic fins reach two-thirds the way to origin of anal fin, and pectorals two-thirds the way to the insertion of the pelvic fins; the free margin of the eye becomes less free ventrally on the small specimens and on those as short as 20.5 and 26 mm. the margin of the eye is not free (it is thought that the identification of the two small specimens is correct); the top of the head is covered with rather thick skin, so that the posterior end of the supraoccipital process is obscured, but it does not meet the embedded predorsal plate; fontanel in middorsal line between the orbits small, closed or nearly closed in adults.

Color.—The general color is blackish above, paler below, with the belly and underside of head nearly white; a blackish blotch occurs over the tympanic area of air bladder just behind head and forms a faint darkish band just in front of dorsal fin base, most distinct on the half grown and young; all fins grayish to blackish; in the young the lateral line is blackish; posteriorly the interradiial membrane of the dorsal fin is blackish along its middle third with a hyaline area anteriorly, less distinct in the larger specimens; peritoneum pale.

RHAMDIA HUMILIS (Günther)

Pimelodus humilis GÜNTHER, Catalogue of the fishes in the British Museum, vol. 5, p. 129, 1864 (Venezuela).

Rhamdia humilis EIGENMANN and EIGENMANN, Occ. Pap. California Acad. Sci., vol. 1, p. 126, 1890 (Venezuela).—EIGENMANN and ALLEN, Fishes of western South America, p. 94, 1942 (Venezuela).

RHAMDIA GUAIRENSIS Eigenmann

Rhamdia guairensis EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 6, 1920 (Río Guaire near Caracas, Venezuela).

RHAMDIA QUELEN (Quoy and Gaimard)

Pimelodus quelen QUOY and GAIMARD, Voyage autour du monde . . . *Uranie*, Zool., pl. 49, figs. 3-4, 1824.

Rhamdia quelen EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 6, 1920 (Río Castaño and Río Bue, Maracay; El Concejo, Río Tiquirito).—PEARSE, Univ. Wisconsin Studies, No. 1, pp. 23, 45, 1920 (Río Castaño, Venezuela).

The specimens from British Guiana on which the key is based may differ from those in the Valencia Basin of Venezuela.

Genus ZUNGARO Bleeker

Zungaro BLEEKER, Nederl. Tijdschr. Dierk., vol. 1, p. 101, 1863. (Type, *Pimelodus zungaro* Humboldt.) (Ref. copied.)

ZUNGARO ZUNGARO (Humboldt)

Pimelodus zungaro HUMBOLDT, Recueil d'observations de zoologie. . . , vol. 2, p. 170, p. 46, fig. 1, 1811.

Pseudopimelodus zungaro RIBEIRO, Rev. Mus. Paulista, vol. 10, p. 728, 1918 (Río Cabriale, Venezuela).

The following nine examples of this fish were taken by Leonard P. Schultz during 1942 in the Maracaibo Basin of Venezuela:

U.S.N.M. No. 121283, 8 specimens, 153 to 264 mm., from the Río San Juan at the bridge south of Mene Grande, tributary Río Motatán, March 20.

U.S.N.M. No. 121284, a specimen, 242 mm., from the Río Negro below mouth Río Yasa, March 2.

Genus PSEUDOPIMELODUS Bleeker

Pseudopimelodus BLEEKER, Ichthyologiae Archipelagi Indici Prodromus, vol. 1, p. 196, 207, 1858 (sp.); Nederl. Tijdschr. Dierk., vol. 1, p. 101, 1863. (Type, *Pimelodus raninus* Cuvier and Valenciennes.) (Ref. copied.)

The relationships and validity of certain genera and species of South American catfishes allied to *Pseudopimelodus* are not well defined and need careful study. There are not sufficient specimens available at present to enable me to work out the limits of the genera or species under question, except to point out that *Zungaro* Bleeker differs from the related genera, *Pseudopimelodus* and *Microglanis*, in having the lower jaw a little longer than the upper, the predorsal plate slender, meeting and fitting into a notch of the supraoccipital process, and the anterior margin of the pectoral spine smooth. In defining the genus *Pseudopimelodus* Eigenmann and Allen (Fishes of western South America, pp. 90-91, 1942) describe the "intermaxillary teeth without angle projecting backward." Eigenmann (Mem. Carnegie Mus., vol. 5, p. 155, 1912) in defining the genus *Microglanis* distinguishes it from *Pseudopimelodus* by "premaxillary patches of teeth without backward projecting angles." He says further that the members of this genus are "small Pimelodines, reaching a maximum length of 110 mm." Doubt is cast on the validity of this genus after studying a large series of a related form from the Maracaibo Basin. The premaxillary band of teeth in this series is angular in the small ones 40 to 50 mm. in length, and in the large ones this angle projects more posteriorly as described for *Pseudopimelodus*. In a small paratype of *Microglanis poecilus* the outer or lateral ends of the premaxillary band of teeth are more rounded and the predorsal plate does not meet the supraoccipital process; neither does it in the specimens from the Maracaibo Basin.

Eigenmann describes the predorsal plate of *Pseudopimelodus raninus* (*op. cit.*, 154) as "nearly touching the occipital process," and so it does in a small specimen before me from the Río Meta in Colombia, but the premaxillary band of teeth has the lateral ends rounded. Unfortunately no specimen of *Pseudopimelodus raninus* is now available to me for study, and thus I am unable to determine with certainty that my specimens should be referred to *Pseudopimelodus*.

Eigenmann (*op. cit.*, pp. 152, 153) describes two new species of *Pseudopimelodus* from British Guiana. Certain features of *Pseudopimelodus albomarginatus* Eigenmann (*op. cit.*, p. 153) indicate that this species is based on the young. I draw my conclusions from the large series of specimens of the related form from the Maracaibo Basin, because in this form the caudal fin changes with age from a deeply cleft, longer, rounder upper caudal lobe than lower, in the young, to then a concave caudal fin, later to a truncate one, and finally, in those 100 mm. to 184 mm., it is rounded or almost rounded. Thus *P. albomarginatus* agrees with the young from the Maracaibo Basin in regard to the caudal fin, and in addition it has the juvenile color pattern, which changes to the adult color pattern at about 100 mm. of length. *Pseudopimelodus villosus* Eigenmann (*op. cit.*, p. 152), holotype 148 mm. in length, shows the rounded caudal fin and the spotted color pattern found on the adults of a similar form from the Maracaibo Basin. I would conclude that *villosus* and *albomarginatus* are the same species if Eigenmann did not separate them in his key (*op. cit.*, p. 151) by the predorsal plate meeting the occipital process for *albomarginatus*. Also, he distinguishes *villosus* from *albomarginatus* by no humeral spine in the former. Again, the humeral spine is reduced in length with increase in size in the form from Maracaibo Basin.

Although the status of these two species is questioned, as well as the validity of the genus *Microglanis*, it is clear that the form in the Maracaibo Basin differs sufficiently from those in British Guiana to be recognized as a new subspecies, which I describe below.

KEY TO THE SUBSPECIES OF *PSEUDOPIMELODUS VILLOSUS* REPORTED FROM VENEZUELA

- 1a. Maxillary barbels reaching gill openings in largest specimens and much past gill openings in those 150 mm. and shorter; if white blotch is present on basal posterior half of dorsal fin it does not occur on more than last three interradial membranes except very rarely as a small speck on fourth, but usually much reduced in size on third from last; least depth of caudal peduncle 2.7 to 3.1 in the head; snout to dorsal spine base 2.4 to 2.6, head 2.8 to 3.1, depth 4.8 to 5.2, in the standard length; eye $3\frac{1}{2}$ to $5\frac{1}{2}$ in snout, 4 to 6 in interorbital space. — ***Pseudopimelodus villosus butcheri***, new subspecies
- 1b. Maxillary barbels not quite reaching gill openings; white blotch on basal half of posterior side of dorsal fin occurring on last four interradial membranes and not reduced in size on any of them; least depth of caudal peduncle 2.9 to $3\frac{1}{2}$ in head; snout to dorsal spine base $2\frac{1}{4}$ to $2\frac{2}{3}$, head $2\frac{2}{3}$ to 3.2, depth $4\frac{2}{3}$ to 5.3, in standard length; eye 3 to 4 in snout and 5 in interorbital space.

Pseudopimelodus villosus villosus Eigenmann

PSEUDOPIMELODUS VILLOSUS BUTCHERI, new subspecies

PLATE 1, B

Holotype.—U.S.N.M. No. 121270, a specimen 107 mm. in standard length, collected by Leonard P. Schultz, March 17 and 20, 1942, in the Río San Juan near bridge south of Mene Grande, tributary to Río Motatán, Maracaibo Basin.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121273, 58 specimens, 29.5 to 172 mm., collected along with the holotype and bearing the same data; U.S.N.M. No. 121280, 2 examples, 34 and 184 mm., March 24, 1942, from the Río Motatán, 8 km. below Motatán; U.S.N.M. No. 121272, 2 specimens, 39.5 and 44 mm., March 17, 1942, from the Río Motatán, at bridge 22 km. north of Motatán; U.S.N.M. No. 121271, 25 specimens, 29.5 to 69 mm., March 20, 1942, from the Río San Pedro near bridge south of Mene Grande, tributary to Motatán system; U.S.N.M. No. 121278, 1 specimen, 27.5 mm., March 24, 1942, from the Río Jimelles, 12 km. east of Motatán, tributary to Río Motatán; U.S.N.M. No. 121276, 11 examples, 35 to 60 mm., March 21, 1942, from the Río Machango, 20 km. above bridge south of Lagunillas, Maracaibo Basin; U.S.N.M. No. 121277, 1 specimen, 45 mm., March 6, 1942, from the Río Palmar at the bridge 70 km. southwest of Maracaibo; U.S.N.M. No. 121275, 1 specimen, 38 mm., February 21, 1942, from the Río Palmar near Totuma, about 100 km. southwest of Maracaibo; U.S.N.M. No. 121274, 6 examples, 16 to 52 mm., February 24, 1942, from the Río Socuy, 3 km. above its mouth, Maracaibo Basin; U.S.N.M. No. 121279, 5 specimens, April 1, 1942, from the Río Táchira, 7 km. north of San Antonio, Catatumbo system.

Description.—Based on holotype and paratypes listed above. Measurements, expressed in hundredths of the standard length, are recorded below, first for the holotype, then for two paratypes in parentheses, respectively. Standard length (in mm.) 107 (45.5; 184).

Length of head to end of operculum 33.6 (36.2; 33.3); greatest depth of body 22.0 (20.9; 21.7); length of snout 12.2 (12.5; 12.5); diameter of eye 3.36 (3.73; 2.83); width of fleshy interorbital space 12.3 (11.4; 15.5); distance between rims of anterior and posterior nostrils 4.20 (4.18; 4.62); distance from eye to rim of posterior nostril 2.80 (2.42; 3.21); width of premaxillary band of teeth 2.24 (2.42; 2.39); width across outer angles of maxillaries 2.15 (2.20; 2.45); width across base of pectorals 29.2 (29.7; 29.6); length of maxillary barbels 30.4 (34.1; 28.8); length of anterior mental barbels 9.53 (9.44; 10.7); length of posterior mental barbels 19.6 (15.6; 16.8); least depth of caudal peduncle 13.5 (13.0; 12.8); length of caudal peduncle 14.5 (16.0; 16.5); total length of adipose fin 18.2 (22.0; 15.2); length of base of adipose fin 12.6 (15.8; 11.7); length of base of anal fin 13.1 (14.3; 12.8); dis-

tance from snout to dorsal origin 42.1 (41.8; 41.6); snout to anal origin 72.5 (75.8; 74.5); snout to adipose origin 76.0 (71.4; 75.5); snout to pelvic insertion 52.8 (53.8; 55.4); snout to pectoral insertion 30.8 (31.9; 30.8); snout to anal origin 59.8 (62.6; 63.4); length of dorsal spine 10.8 (11.9; 7.50); length of pectoral spine 15.4 (16.5; 13.2); longest branched ray of pelvics 15.9 (17.8; 14.9); longest branched ray of pectorals 19.1 (18.7; 16.1); longest branched ray of dorsal 18.2 (19.8; 18.5); longest branched ray of anal 15.9 (16.5; 15.5); longest ray of upper lobe of caudal fin 25.2 (28.6; 20.1); longest ray of lower lobe of caudal fin 24.3 (25.5; 19.4).

The following counts were made, respectively: Dorsal rays I, 6 (I, 6; I, 6); anal iv, 8 (v, 8; iv, 7); pelvic i, 5—i, 5 (i, 5—i, 5; i, 5—i, 5); pectoral I, 6—I, 6 (I, 6—I, 6; I, 6—I, 6); branched rays of caudal 12 (13; 13); gill rakers on first arch—(3+7; 3+6). For additional counts see table 1.

TABLE 1.—Counts made on species of *Zungaro* and *Pseudopimelodus* from the Maracaibo Basin

Species	Number of fin rays								Number of branched caudal fin rays			Number of gill rakers on first gill arch									
	Dorsal	Anal					Pelvic	Pectoral		12	13	14	Above angle			Below angle					
		I, 6	iv, 7	iv, 8	v, 6	v, 7		v, 8	i, 5				I, 6	I, 7	1	2	3	3	4	5	6
<i>Zungaro zungaro</i>	4	-----	4	4	-----	4	1	8	-----	4	2	1	-----	2	2	-----	-----	-----	-----		
<i>Pseudopimelodus villosus butcheri</i> ..	4	2	4	-----	3	1	6	7	-----	2	2	-----	-----	2	6	-----	-----	-----	2	5	1

Head depressed, its width across base of pectorals about 1.1 to 1.2 in its length; body compressed at caudal peduncle; adipose fin with a short base; anal base short, about equal to snout; origin of adipose fin over origin of anal fin or a trifle in front of the latter; insertion of pelvics under posterior end of dorsal fin base; margin of eye not free, the eye small, $3\frac{1}{2}$ to 5 times in interorbital space; gill membranes extend far forward, attached to isthmus without a free fold; nostrils wide apart, the anterior one tubular, near front of snout, the posterior nostril funnel-shaped with a minute point or barblet on the anterior edge of the membranous rim; teeth villiform, in a wide band on dentaries and premaxillaries; at the lateral ends of the premaxillary band is a posteriorly projecting arm on adults, but only angular to rounded in the young; no teeth on vomer or palatines; the predorsal plate does not meet the supraoccipital process; dorsal surface of head fleshy, the bones covered with thick skin; gill rakers short, pointed, two to three above and six to eight below the angle of first gill arch; both jaws equal, mouth terminal, gape wide; pectoral spine about 2 to $2\frac{1}{2}$ in the head, with long teeth on front and rear margins, those on front margin antrorse distally, and on inner margin retrorse; dorsal spine

short, 3 to 3½ in the head, smooth on all sides and about two-thirds the length of the branched rays of the dorsal fin; posterior margins of pelvic fins rounded, of the pectoral truncate or a little rounded, the fleshy tip of the pectoral spine reaching beyond the longest branched ray; adipose fin with short base, the tip of adipose extending beyond base and free; the caudal fin changes remarkably with age, in specimens 20 to 40 or 50 mm. in standard length, the upper lobe longest and separated from the lower lobe by short rays, the caudal fin being deeply emarginate; but in a little larger specimen the caudal fin has rounded upper and lower lobes with the middle rays shorter, the fin being a little concave; in the largest specimens and some about 80 mm. and longer the caudal fin being evenly rounded; anal fin rounded; maxillary barbel reaching past head but not quite to opposite dorsal origin; posterior mental barbel reaching a little past the pectoral insertion; anterior mental barbel short, reaching a very little past a vertical line through rear margin of eye; pelvics not quite reaching to anal origin, and pectorals reaching about three-fourths the way to pelvic insertion; the larger specimens as well as some of the smaller ones are profusely covered all over the dorsal and lateral surfaces of the head with minute papillae called "hair-like filaments" by Eigenmann for *villosus*.

Color.—In large adults the upper parts are blackish to dark brown, ventral surfaces brownish mottled, and sides and dorsal surfaces sometimes dark spotted, almost obscured; the large specimens, when preserved, have a thick coat of mucus covering the color pattern; specimens 50 to 60 mm. in standard length have the following color pattern, which remains more or less apparent in even a few of the largest specimens: A pale bar across occiput; margins of gill membranes pale; usually a pale spot at origin of dorsal and another at origin of adipose fins; a pale bar on middle of length of side of body just behind base of caudal fin and extending directly upward and sometimes more or less confluent with a small white spot in middle to base of posterior rays of dorsal fin; another pale blotch on side under adipose fin; sometimes basal part of posterior anal rays with pale blotch; a small white blotch on both upper and lower edges of caudal peduncle; outer margins of all the fins white, remainder black or mottled with black and white; the caudal fin is variable, usually with a wide white margin posteriorly, then spotted or mottled with black and white, or it may be all white as in the specimens from the Río Táchira and one from the Motatán system; in some of the larger specimens just inside the wide pale band the caudal fin may have a wide blackish band somewhat broken by white spots. The above color pattern becomes obscured in the largest specimens, and its place is taken by a spotted or mottled pattern; the white margins to the fins remain distinct at all sizes.

Remarks.—This new subspecies is very closely related to Eigenmann's *Pseudopimelodus albomarginatus* and *P. v. villosus*, differing from the former in having the predorsal plate not meeting the supra-occipital process. From *P. v. villosus* it differs in having longer barbels, as indicated in the key on page 198, and a reduction of the white central blotch on the dorsal fin to not more than the last three interradiation membranes instead of four in *villosus*. The caudal fin in *villosus* appears to become rounded at a greater length than this new form in the Maracaibo Basin.

Named *butcheri* in honor of Walter W. Butcher, geologist, Lago Petroleum Corporation, who aided me in collecting fishes near Rosario, western side of Lago Maracaibo.

PSEUDOPIMELODUS VILLOSUS VILLOSUS Eigenmann

Pseudopimelodus villosus EIGENMANN, Mem. Carnegie Mus., vol. 5, p. 153, pl. 10, fig. 1, 1912 (Potaro Landing; Kumaka, Demerara; Wismar).

?*Pseudopimelodus albomarginatus* EIGENMANN, *ibid.*, p. 153, pl. 11, fig. 1 (Tukeit and Waratuk, British Guiana).

?*Pimelodus (Pseudopimelodus) raninus* PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 470 (Apure River, Venezuela).

Genus PIMELODUS Lacepède

Pimelodus LACEPÈDE, Histoire naturelle des poissons, vol. 5, 1803 (polygeneric).—
CUVIER, Règne animal, vol. 2, p. 203, 1817 (restricted to species having only a single band of teeth in upper jaw). (Type, *P. maculatus* Lacepède = *clarias*.) (Ref. copied.)

KEY TO THE SPECIES OF PIMELODUS REPORTED FROM VENEZUELA

- 1a. Dorsal spine contained 6 to $6\frac{1}{2}$ times in standard length; teeth along nearly entire front margin of pectoral spine; total length of adipose fin contained 0.7 to 0.8 time in dorsal spine and 0.6 in pectoral spine; a large black blotch in dorsal fin; a light streak from dorsal spine to above pelvis, thence to middle of caudal fin rays, another above it; snout broad, depressed.
***Pimelodus ornatus* Kner**
- 1b. Dorsal spine length contained fewer than 5 times in standard length; no ornate spot in dorsal fin.
- 2a. Length of adipose fin contained 5 to $6\frac{1}{4}$ times in standard length; anal rays v, 8 to v, 10, usually v, 9; pectoral with I, 8 to I, 10, usually I, 9 or I, 10.
- 3a. Length of adipose fin contained 6 to $6\frac{3}{4}$ times in standard length, 1.3 to 1.8 in dorsal spine, 1.2 to 1.6 in pectoral spine; height of adipose fin 2.1 to 2.8 in its total length; width of head a little greater than length of adipose; greatest depth of body 3.5 to 4 in standard length; dorsal spine 3.4 to 4.2 in length of body; sides with black blotches more or less separated by about two pale streaks, the one along the lateral line always distinct. . . . ***Pimelodus clarias coprophagus*, new subspecies**
- 3b. Length of adipose fin 5 times in standard length, 0.8 to 1.1 in dorsal spine and equal to length of pectoral spine; height of adipose fin $3\frac{1}{2}$ to $3\frac{3}{4}$ in its length; width of head 1.2 to 1.4 in length of adipose fin; greatest depth of body 5 to $5\frac{1}{2}$ in standard length; dorsal spine 4.1 to 4.5 times in length of body; color usually plain grayish above, lighter below. . . . ***Pimelodus clarias clarias* (Bloch)**

U.S.N.M. No. 121145, Río de Los Pajaros, 3 km. above Lago Maracaibo, April 30, 1942, 6 specimens, 123 to 158 mm.

U.S.N.M. No. 121159, Lago Maracaibo at Yacht Club, Maracaibo, March 5, 1942, 2 specimens, 123 and 148 mm.

U.S.N.M. No. 121158, Lago Maracaibo, 1 km. off Pueblo Viejo, April 7-9, 1942, 2 specimens, 230 to 239 mm.

U.S.N.M. No. 121147, Río Palmar near Totuma, about 100 km. southwest of Maracaibo, February 21, 1942, 25 specimens, 117 to 154 mm.

U.S.N.M. No. 121157, Río Palmar at bridge 70 km. southwest of Maracaibo, March 6, 1942, 5 specimens, 110 to 159 mm.

U.S.N.M. No. 121152, Ciénaga del Guanavana about 10 km. north of Sinamaica, March 11, 1942, 1 specimen, 195 mm.

U.S.N.M. 121156, Río Socuy, 3 km. above its mouth, Maracaibo Basin, February 24, 1942, 15 specimens, 125 to 218 mm.

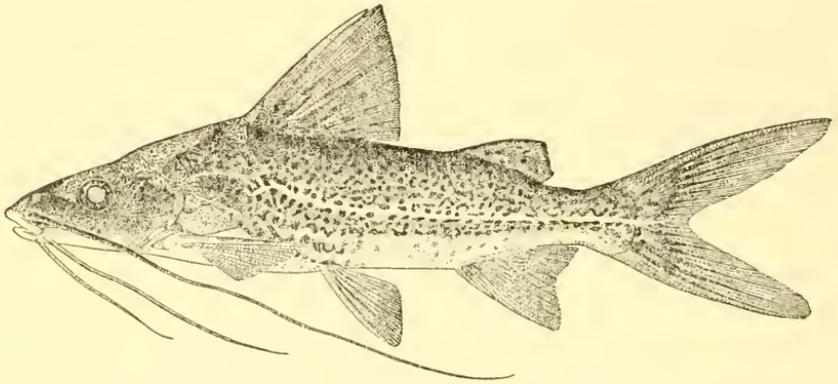


FIGURE 2.—*Pimelodus clarias coprophagus*, new subspecies: Holotype (U.S.N.M. No. 121150), 163 mm. in standard length.

U.S.N.M. No. 121148, Río Apón, about 35 km. south of Rosario, Maracaibo Basin, February 26, 1942, 31 specimens, 118 to 192 mm.

U.S.N.M. No. 121155, Río Negro below mouth of Río Yasa, March 2, 1942, 7 specimens, 118 to 195 mm.

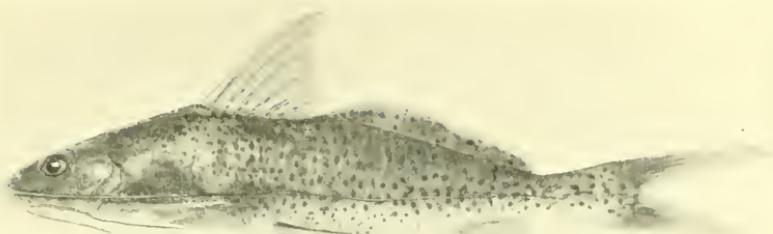
U.S.N.M. No. 121149, caño half a mile west of Sinamaica, March 11, 1942, 5 specimens, 162 to 176 mm.

U.S.N.M. No. 121151, Río Motatán at bridge 22 km. north of Motatán, March 17, 1942, 11 specimens, 117 to 167 mm.

U.S.N.M. No. 121146, Río Motatán 8 km. below Motatán, March 24, 1942, 1 specimen, 128 mm.

Description.—Certain features on the holotype and two paratypes were carefully measured, and the resulting data, expressed in hundredths of the standard length, are recorded in table 3. The following counts were made on the holotype and paratypes, respectively: Dorsal rays I, 6; I, 6; I, 6; anal v, 9; v, 9; v, 9; pectoral I, 9; I, 9; I, 9; pelvic i, 5; i, 5; i, 5; branched rays of caudal fin 15; 15; 14; number of gill rakers on first gill arch --; 9+24; 8+23. Additional counts in table 2.

Upper surface of head bony, the supraoccipital process with broad base tapering to a rounded point posteriorly, touching but not fused with the predorsal plate; eye with free margin; premaxillary band of



A



B

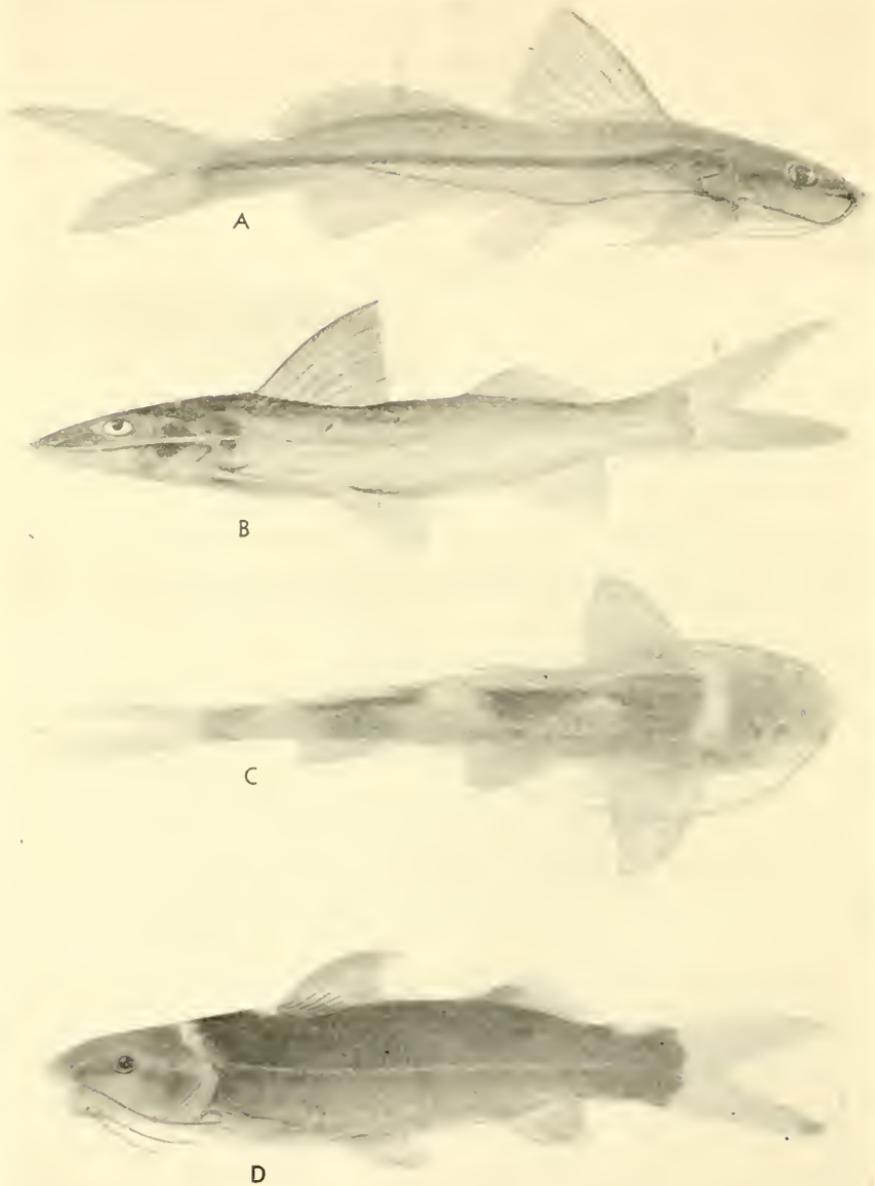


C



D

A, *Sovichthys abueto*, new genus and species: Holotype (U.S.N.M. No. 121183), 215 mm. in standard length; B, *Pseudopimelodus villosus butcheri*, new subspecies: Holotype (U.S.N.M. No. 121270), 107 mm.; C, *Pimelodus grosskopfii navarroii*, new subspecies: Holotype (U.S.N.M. No. 121174), 252 mm.; D, *Pimelodella linami*, new species: Holotype (U.S.N.M. No. 121132), 75.2 mm. Retouched photographs.



A, *Pimelodella chagresi odynea*, new subspecies: Holotype (U.S.N.M. No. 121133), 89 mm. in standard length; B, *Megalonema platycephalum psammium*, new subspecies: Holotype (U.S.N.M. No. 121175), 133.5 mm.; C, *Cetopsorhamdia shermani*, new species: Holotype (U.S.N.M. No. 121216), 30.7 mm.; D, *C. picklei*, new species: Holotype (U.S.N.M. No. 121217), 88 mm. Retouched photographs.

teeth broad with lateral end rounded; no teeth on vomer or palatines; snout projecting beyond lower lip the width of the upper lip; maxillary barbels reaching to anal fin or to caudal peduncle; outer mental barbels reaching almost to insertion of the pelvics and inner mental barbels extending a little past insertion of pectorals; the bases of the outer mental barbels are a little behind those of the anterior mental barbels; pectoral spine with numerous sharp-pointed retrorse teeth along its posterior margin and tiny numerous antrorse teeth along the basal half of the anterior margin of the pectoral spine in the half-grown, but in those specimens 200 mm. in standard length the front of the spine is rough only; posterior margin of dorsal spine with numerous retrorse teeth, anterior margin without teeth; length of gill rakers about $\frac{1}{2}$ eye; posterior margin of dorsal fin a little concave; rear margin of adipose truncate to a trifle concave; posterior margin of anal concave, usually the first branched ray longest; first branched ray of pectoral longest, the rear margin of this fin a little concave; caudal deeply forked, usually the upper lobe is longest; in the almost perfectly preserved specimens the head is profusely supplied with very minute papillae; head is depressed forward, but the supraoccipital process has a rounded keel; caudal peduncle a little compressed; total length of adipose fin less than length of snout and eye; dorsal spine $1\frac{1}{4}$ in distance from snout to dorsal origin; adipose fin shorter than distance from rear base of dorsal to adipose origin; pectoral spine not quite reaching to pelvic insertion, and dorsal spine not reaching adipose origin; gill membranes extend far forward, free from the isthmus.

Color.—Color pattern variable but always with black spots or blotches more or less separated by pale streaks along sides. The holotype has the profusely spotted color phase, in which the spots are round to elongate and more or less joined, giving a mottled pattern but with a very distinct pale streak along the lateral line; predorsal plate with black sides, this black color extending a short distance down on the skin below the plate; adipose fin faintly spotted, but often plain grayish, with its basal half a little yellowish; dorsal fin pigmented but usually with hyaline areas on the membranes a third of the way out, followed behind and below by intensification of the black pigment. Another color phase, probably the commonest, consists of a wide pale streak along the lateral line above and below, which is a row more or less of black blotches or an irregularly blackish band; below this blackish broken band another wide pale streak and then a series of blackish pigment areas occurs; sometimes the black blotches or black streak above the pale lateral band is set off by a pale streak from the blackish blotches on upper part of the back; dorsal surface of head usually not spotted, but sometimes blackish color bars more or less meet at middle

base of supraoccipital process; belly usually silvery, but occasionally a few diffuse spots occur anteriorly; peritoneum pale.

Named *coprophagus* in reference to its feeding habits.

Remarks.—This new subspecies is so distinct from *P. clarias clarias* of the Magdalena River system that it might have been best to give it the rank of a full species. The relationships of *P. clarias clarias* and other populations close to *clarias* ranging southward from the Maracaibo Basin need careful study, for they appear to differ somewhat from the Magdalena form, that in the Maracaibo Basin, and also *P. clarias punctatus* from Panama. *P. clarias clarias* has a plain coloration without spots or streaks, *P. clarias punctatus* is spotted when young but plain in color when older, while *P. clarias coprophagus* is profusely spotted with pale streaks at all sizes and ages. This new subspecies differs from all other species with a similar color pattern in its very short and high adipose fin, the height usually continued about 2.5 times in its total length. In the key other differences are given that aid in its separation from species reported in Colombia or Venezuela.

In Lago Maracaibo *P. clarias coprophagus* is one of the commonest species and is taken some distance up the rivers. Around the docks in the oilfields and along the waterfront at Maracaibo it is a scavenger, eating any refuse that it can get. Off Lagunillas in Lago Maracaibo I saw it swimming in large schools at the surface just under the film of oil that covers the water in that part of the lake. Often it sweeps its long blackish maxillary barbels forward and backward under this oil film, and on a few occasions I have seen individuals swallow large globules of thick petroleum more or less settling in the water. Because of its feeding habits around the oilfields it is thoroughly despised.

PIMELODUS CLARIAS CLARIAS (Bloch)

Silurus clarias BLOCH, Naturgeschichte der ausländischen Fische, pl. 35, figs. 1-2, 1785 [= *S. clarias* Linnaeus in part; not *S. clarias* Hasselquist, which is *Synodontis clarias* from the Nile (ref. copied)].

Pimelodus clarias (Bloch) STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 39, p. 15, 1878 (Magdalena River) (I have selected this locality as representing the type locality on which to base comparison); vol. 41, p. 158, 1879 (Ciudad Bolívar; Río Mamoni at Chepo).

Pimelodus maculatus PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 470 (Cala-bozo, Venezuela).—PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

?*Pseudariodes pantherinus* LÜTKEN, Vid. Medd. Naturh. Foren. Kjøbenhavn, pts. 12-16, p. 192, 1874 (Caracas, Venezuela). (One of Lütken's specimens, probably a cotype, is in the United States National Museum, No. 44970, and it greatly resembles my specimens of *Pimelodus clarias coprophagus* from the Maracaibo Basin except in certain color characteristics. Lütken's types of *pantherinus* need careful comparison with the Maracaibo form. Perhaps they were not taken at Caracas.)

PIMELODUS GROSSKOPFII NAVARROI, new subspecies

PLATE 1, C

Holotype.—U.S.N.M. No. 121174, a specimen, 252 mm. in standard length, taken in the Río Palmar at the bridge 70 km. southwest of Maracaibo by Leonard P. Schultz, March 6, 1942.

Paratypes.—U.S.N.M. No. 121172, 17 specimens, 61 to 191 mm., collected by Leonard P. Schultz in the Río Socuy 3 km. above mouth, north of Maracaibo, February 24, 1942; U.S.N.M. No. 121173, 4 specimens, 76 to 147 mm., collected by Leonard P. Schultz in the Río Negro below mouth of Río Yasa, March 2, 1942; U.S.N.M. No.

TABLE 3.—Measurements (in hundredths of the standard length) for species of *Pimelodus*

Character	<i>clarias clarias</i>		<i>clarias coprophagus</i>			<i>grosskopfii navarroii</i>	
	U.S.N.M. No. 116456, Magdalena system		Río Socuy, paratype	Río Apón, paratype	Río Agua Caliente, holotype	Río Palmar, holotype	Río Socuy, paratype
Standard length (in mm.)	103	103.7	122.6 ⁵ / ₄	121.6	163	252	150.5
Head to end of supraoccipital process	34.4	35.0	36.0	36.7	36.3	31.0	33.3
Head to end of operculum	28.6	28.2	29.3	29.5	29.5	24.8	25.8
Width of head at base of pelvics	16.7	17.5	18.8	18.0	19.5	18.8	18.5
Greatest depth of body	20.9	20.8	22.3	21.8	24.2	19.4	19.9
Length of snout	11.6	12.0	12.7	12.5	13.1	11.5	12.3
Diameter of eye	6.80	5.98	6.20	6.25	5.52	4.09	4.98
Distance from eye to posterior nostril	5.24	5.30	6.69	6.25	6.75	6.00	5.38
Distance between anterior and posterior nostrils	3.49	3.57	3.75	3.78	3.50	2.90	3.39
Width of fleshy interorbital space	9.80	9.84	10.3	10.4	10.7	9.13	8.30
Postorbital length of head	10.0	11.6	11.3	12.2	11.4	9.72	10.6
Total length of adipose fin	18.9	20.7	17.9	16.9	15.6	22.5	22.2
Height of adipose fin	6.80	6.75	6.60	6.08	5.21	5.76	6.04
Least depth of caudal peduncle	9.22	8.97	9.46	8.64	9.32	8.02	8.63
Length of caudal peduncle	19.4	19.8	20.1	17.1	16.6	18.7	18.7
Length of dorsal spine	21.8	22.3	25.7	28.0	27.0	22.2	26.0
Length of pectoral spine	19.7	19.9	23.7	24.5	23.3	18.8	20.6
Length of longest ray of pelvics	17.3	16.6	18.3	17.0	18.1	14.8	17.3
Length of longest ray of anal	16.9	17.0	17.5	16.0	17.8	14.3	15.9
Length of upper caudal lobe	33.5	35.2	37.2	35.6	34.4	22.2	33.3
Length of lower caudal lobe	29.6	30.0	34.0	30.4	31.4	22.4
Length of shortest middle caudal rays	9.22	9.16	9.14	8.64	8.96	6.75	8.63
Distance from snout to dorsal origin	38.4	39.2	41.9	42.0	41.5	35.6	39.2
Distance from snout to anal origin	69.9	69.1	72.7	70.7	72.1	72.0	71.7
Distance from snout to adipose origin	68.9	67.2	69.1	70.5	72.0	64.8	65.5
Distance from snout to pelvic insertion	48.0	47.6	50.4	49.8	51.8	46.6	48.1
Distance from snout to pectoral insertion	26.2	25.8	25.8	25.2	26.4	22.9	23.7
Distance from snout to anus	53.0	54.2	56.8	56.1	57.0	55.4	55.7
Anus to anal origin	17.5	15.6	15.9	14.6	14.5	16.5	14.7
Length of maxillary barbel	109	93.6	89.5	92.6	84.7	78.2	100.0
Length of outer mental barbel	44.6	36.2	37.5	45.2	44.8	41.7	35.9
Length of inner mental barbel	24.7	23.1	24.1	26.7	27.6	22.2	21.6
Width of base of supraoccipital process	6.31	6.27	7.01	6.99	7.05	6.35	6.17
Length of supraoccipital process	10.6	10.1	10.6	11.2	11.3	9.84	10.7

101614, a 173-mm. specimen collected by Nicéforo María in the Río Pamplonita, near Cucuta, Colombia (Catatumbo system).

Description.—Measurements of the holotype and one paratype were carefully made, and the data, expressed in hundredths of the standard length, are recorded in table 3.

The following counts were made: Dorsal rays I, 6; I, 6; anal v, 8; v, 8; pectoral I, 10 and I, 11; pelvic i, 5; i, 5; caudal with branched rays —; 15. Additional counts are recorded in table 2.

Upper surface of head depressed; the supraoccipital process elevated along the midline and touching the predorsal plate; eye with a free margin; premaxillary band of teeth broad with rounded corners laterally; no teeth on vomer or palatines; snout projecting beyond lower jaw a distance a little greater than width of lower lip; maxillary barbel extends anywhere from rear of anal fin base to middle of length of caudal fin; outer mental barbel reaching a little beyond the base of pelvics and inner mental barbel to middle of pectorals; bases of outer mental barbels a trifle behind base of inner mental barbels; anterior edge of pectoral and dorsal spines smooth or nearly so; posterior sides of pectoral spine strongly toothed, that of dorsal weakly serrated or only rough with age; gill rakers $\frac{1}{2}$ diameter of eye; rear margins of dorsal, anal, pectoral, and pelvic fins a little concave; caudal fin deeply forked; minute papillae on head; body compressed posteriorly; total length of adipose fin a little shorter than length of head and longer than distance from base of dorsal to adipose origin by the depth of the caudal peduncle; dorsal spine $1\frac{1}{4}$ in distance from tip of snout to dorsal origin, pectoral spine reaching three-fourths the way to pelvic insertion; dorsal spine not quite reaching adipose origin; upper caudal lobe a little longer than lower lobe.

Color.—Black spots occur everywhere on upper surface, even on top of the head and adipose and dorsal fins in the type; paired fins and anal with their bases yellowish; underside of body whitish; caudal fin plain; peritoneum pale. In specimens up to 190 mm. the color pattern consists of black spots more or less separated by pale streaks, one extending from predorsal plate obliquely downward to lateral line, thence to caudal fin base, and one along middle of upper sides; often the top of head and all fins are plain in color, and in the smallest specimens before me the black spots disappear or fade out posteriorly.

Named *navarroi* in honor of Rafael Navarro, of Maracaibo, who acted as my assistant in collecting many of the fishes herein reported upon from the Maracaibo Basin.

Remarks.—This new subspecies, *grosskopfi navarroi*, may be separated from *grosskopfi grosskopfi* of the Magdalena system by the shorter adipose fin. Other differences are indicated in the key and in the tables.

Genus *PIMELODELLA* Eigenmann and Eigenmann

Pimelodella EIGENMANN and EIGENMANN, Proc. California Acad. Sci., ser. 2, vol. 1, p. 131, 1888. (Type, *Pimelodus cristatus* Müller and Troschel.)

It is with considerable regret that I must add new names to this already complicated group of species, but since it has been impossible to obtain the loan of needed comparative material, I have felt it necessary to describe the Maracaibo forms as new and hope their relationships can be worked out more correctly when the genus is again carefully revised.

Brachyrhamdia imitator Myers, Bull. Mus. Comp. Zool., vol. 68, No. 3, pp. 123-124, 1927, a new genus and species, described without a figure, based on a single specimen 50 mm. in length, is not distinguishable from *Pimelodella* in the published account, and Dr. Chapman, of the California Academy of Sciences, informs me that the type cannot be found. I therefore quote the description:

"BRACHYRHAMDIA, gen. nov.

"βραχῦς, short, and *Rhamdia*, a genus of Pimelodidae.

"Genotype.—*Brachyrhamdia imitator* Myers.

"Pimelodinae. Allied to *Pimelodella*.

"Body rather compact; somewhat compressed and deep. Occipital process forming a bridge with the dorsal plate. Dorsal and pectoral spines pungent those of the latter with thorns along the basal half of the posterior edge. Humeral process spine-like. Fontanel not continued behind eyes, without a bridge. Eyes with free orbital rims. Barbels normal. Caudal deeply forked. Head entirely covered with skin.

"BRACHYRHAMDIA IMITATOR, sp. nov.

"Head $3\frac{1}{2}$ in body-length. Depth $3\frac{1}{2}$. Eye $3\frac{1}{4}$ in head, circular. Dorsal I, 6. Anal 9.

"Body in general shape like *Corydoras*, the head deep and the skull arched. Maxillary barbel lying in a groove below eye, long, reaching tip of anal rays. Outer mental barbel nearly reaching tip of pectoral spine. Inner mental barbel shorter. Premaxillary teeth in a band, without backward projecting angles. Pectoral spines very slightly longer than dorsal spine, the latter smooth, the former with eight strong thorns along the basal half of the posterior margin. Dorsal origin $1\frac{1}{2}$ times as far from caudal base as from snout-tip. Pelvics inserted on vertical of next to last dorsal ray. Adipose fin high, the length of its base slightly less than length of dorsal spine.

"Dull brownish yellow, light on belly. Posterior sides finely mottled. A black masque-like zone from occiput down over eyes and across cheek. Another wide black zone from dorsal origin to humeral process, this running up and involving the spine and first ray of dorsal.

"Type.—17,695 I.U. 50 mm. Venezuela: Caño de Quiribana, near Caicara. May, 1925. Carl Ternetz.

"Taken with, and very similar in color and form to *Corydoras melanistius* Regan."

Unfortunately not enough information is given for *B. imitator* Myers to enable me to include it in the keys prepared for this report.

KEY TO THE SPECIES OF PIMELODELLA REPORTED FROM VENEZUELA

- 1a. Upper caudal lobe shorter than lower; length of adipose fin 2.8 in standard length; eye 1.2 in distance from rear base of dorsal to origin of adipose fin; eye 1.25 in interorbital; maxillary barbel extending to end of adipose fin; outer mental barbel nearly to pelvics; inner mental barbel just beyond insertion of pelvics; first ray of dorsal not quite so long as head; a dark stripe from snout to caudal fin base; dorsal fin hyaline at base, dusky distally (Río Tapa Tapa).....*Pimelodella tapatapae* Eigenmann
- 1b. Upper caudal lobe longer than the lower.
- 2a. First ray of dorsal fin prolonged into a filament about twice as long as other rays of dorsal and one-third longer than head; head contained in upper caudal lobe $1\frac{1}{4}$ times; length of adipose fin 3.2 in standard length; maxillary barbel reaching to tips of pelvics; outer mental barbel reaching to middle of length of pectorals; inner mental barbels reaching to insertion of pectorals; eye contained 2.8 in distance between base of dorsal and origin of anal fin; eye 1.3 in interorbital; anus closer to base of caudal than tip of snout by a distance equal to $\frac{3}{4}$ of snout; dorsal fin hyaline in basal third, pale dusky distally; a black stripe from snout to base of caudal.....*Pimelodella linami*, new species
- 2b. First ray of dorsal fin not extending beyond other rays of that fin, and about same length as head.
- 3a. Maxillary barbel extending to base of caudal fin or farther; upper lobe of caudal fin 2.5 in standard length; length of adipose fin less than 3 times in length....*Pimelodella gracilis* (Cuvier and Valenciennes)
- 3b. Maxillary barbel not extending beyond tip of anal fin.
- 4a. Basal portion of dorsal fin hyaline, with middle part blackish, fading distally; length of adipose fin contained 3 to 3.25 in standard length.
Pimelodella metae Eigenmann
- 4b. Dorsal fin with dark pigment just in front of each ray on interradiation membrane, anterior half of this membrane hyaline; length of adipose fin contained 2.8 to 3.2 times in standard length.
- 5a. Maxillary barbels reaching anywhere from middle of anal base to a trifle beyond tips of anal fin; outer mental barbel extending to opposite tips of pectorals, and inner a little past base of pectorals; dorsal and pectoral spines almost equal in length, rarely is pectoral longer.....*Pimelodella chagresi odynea*, new subspecies
- 5b. Maxillary barbels reaching almost to anal origin, sometimes only to tips of pelvics; outer mental barbels extending almost to middle of length of pectorals, and inner mental barbels reaching only two-thirds way to base of pelvics; pectoral spine a little longer than dorsal spine, rarely equal.

Pimelodella chagresi chagresi (Steindachner)

PIMELODELLA TAPATAPAE Eigenmann

Pimelodella tapatapae EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 5, 1920 (mouth of Río Tapa Tapa, Valencia Basin).

PIMELODELLA LINAMI, new species

PLATE 1, D

Holotype.—U.S.N.M. No. 121132, the only known specimen, 75.2 mm. in standard length, collected by Leonard P. Schultz, March 31, 1942, in the Río Torbes, 1 km. above Táriba, Venezuela, Orinoco system.

Description.—Body naked; two pairs of mental barbels, the outer reaching to middle of length of pectorals, the inner barely to the insertion of the pectorals; one pair of maxillary barbels that reach almost to anal origin; nostrils widely separated, the anterior pair tubular; mouth subterminal, the snout projecting a little beyond lower lip; gill membranes extending far forward, free from the isthmus except where they join it; supraoccipital process extending backward a distance equal to postorbital length of head almost reaching the predorsal plate but not joining it; orbital rim free from the eye; pectoral spine with 9 or 10 teeth on posterior side, the distal third without teeth; anterior side of pectoral spine with a few low serrations on distal third; anus closer to base of caudal than tip of snout by a distance equal to diameter of eye; first ray (spine) of dorsal elongated with a filamentous tip, the soft portion of ray extending twice the length of the spine beyond tip of the spine; upper lobe of the caudal fin elongate, $2\frac{1}{2}$ in standard length and almost twice length of head; a wide band of villiform teeth on premaxillaries and at front of dentaries; no teeth on palatines or vomer; adipose fin about 3 in the standard length; eye 1.8 in snout, 1.2 in interorbital, and 4.4 in head; head 4.2 in standard length; depth $5\frac{1}{4}$ in length.

Detailed measurements of the holotype are presented in table 4.

Dorsal rays I, 6; anal v, 8; pectoral I, 9; pelvics i, 5; caudal with 15 branched rays.

Color.—Grayish above, with a black lateral streak from snout to base of caudal peduncle; back a little more heavily pigmented than upper sides.

Remarks.—This new species differs from all other species of *Pimelodella* except *P. griffini* Eigenmann in having the first ray of the dorsal fin filamentous and extending beyond the spine and all branched rays. The adipose fin of *griffini* is less developed, its total length contained 3.5 to 4.5 times in the standard length instead of but 3 times in *linami*; also the barbels are longer in *linami* than in *griffini*, the maxillary reaching almost to anal origin, the outer mental to middle of pectorals and inner mental almost to insertion of pectorals instead of the maxillary barbel to middle of pelvics, the outer mental barbel a little beyond base of pectorals and the inner mental not to insertion of pectorals in *griffini*.

Named *linami* in honor of Henry E. Linam, of Caracas, general manager of the Standard Oil Co. of Venezuela, who extended the formal invitation for me to stay at their camps and study the fishes of the Maracaibo Basin.

PIMELODELLA GRACILIS (Cuvier and Valenciennes)

Pimelodus gracilis CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 181, 1840 (Buenos Ayres, Paranáat Corrientes).

- Pimelodella gracilis* EIGENMANN, Mem. Carnegie Mus., vol. 7, No. 4, p. 238, 1917 (La Plata Basin; Uruguay Basin; ? Amazon; ? Orinoco).—EIGENMANN and ALLEN, Fishes of western South America, p. 102, 1942 (Orinoco).
- Pimelodus (Pseudorhamdia) gracilis* STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 41, p. 157, 1879 (Ciudad Bolívar).

TABLE 4.—Measurements (in hundredths of the standard length) for species of *Pimelodella*

Characters	linami (holo- type)	chagresi chagresi				chagresi odynea			
		Río Chama system		U.S.N.M. No. 78256 Upper Trinidad, Panama	Río Tá- chira (para- type)	Río Motatán system			
						Para- type	Para- type	Holo- type	
Standard length (in mm.)	75.2	84	83.1	86.0	102.5	75.3	92	82.5	89
Length of head to tip of supraoccipital	28.2	28.0	28.9	30.5	29.7	28.7	28.4	28.3	28.2
Length of head to end of operculum	24.1	23.2	24.4	25.0	23.9	22.6	23.9	22.0	22.4
Greatest depth at origin of dorsal	18.0	18.7	19.3	17.6	18.5	19.9	18.6	17.7	17.0
Width of head at base of pectorals	16.0	17.4	18.1	17.4	—	17.4	18.5	16.4	16.4
Length of snout	9.84	10.0	10.8	9.88	9.27	9.56	10.1	8.60	9.10
Diameter of eye	5.58	4.88	4.45	6.16	5.56	5.71	4.90	5.58	5.06
Least width of fleshy interorbital space	6.78	6.90	7.22	5.93	5.95	5.98	7.06	6.54	6.86
Postorbital length of head	10.0	10.1	10.6	10.0	9.37	8.76	10.0	9.45	8.76
Length of maxillary barbel	62.5	65.0	61.4	61.6	63.4	81.6	75.0	93.3	96.5
Length of inner mental barbel	14.0	14.6	15.6	10.5	14.1	14.6	17.9	20.0	16.2
Length of outer mental barbel	25.9	25.6	25.9	21.5	23.9	26.5	28.9	32.7	36.0
Total length of adipose fin	31.0	32.4	30.8	31.1	33.2	32.5	32.1	31.5	34.8
Greatest height of adipose fin	4.65	5.60	4.94	5.23	4.68	5.18	6.20	6.54	4.94
Least depth of caudal peduncle	10.0	8.45	8.19	8.14	8.30	8.63	8.80	7.88	7.75
Length of caudal peduncle	20.6	19.6	20.8	19.5	21.0	22.4	21.7	21.3	20.9
Distance between anterior and posterior nostrils	3.99	2.98	3.73	3.72	3.61	3.32	3.80	3.15	3.37
Distance from eye to posterior nostril	3.19	3.69	3.73	3.49	3.61	3.32	3.80	3.27	3.48
Distance from snout to origin of dorsal	32.7	33.3	34.4	35.5	33.7	33.3	32.6	32.7	33.2
Distance from snout to origin of anal	69.2	69.2	67.6	67.1	66.9	65.0	66.5	67.8	68.6
Distance from snout to insertion of pelvics	47.5	45.8	44.6	47.2	47.1	46.6	46.2	44.8	44.4
Distance from snout to insertion of pectorals	24.1	20.4	21.2	23.3	22.5	21.4	21.7	21.3	19.8
Distance from snout to center of anus	54.0	52.0	51.8	54.2	54.6	51.3	52.6	50.5	52.7
Anus to anal origin	15.6	15.5	16.5	12.8	13.7	12.6	13.6	16.6	15.8
Length of longest ray of anal fin	12.6	11.8	13.2	12.0	12.5	12.6	12.5	13.3	12.6
Length of first ray of dorsal fin	38.7	18.2	19.1	21.5	19.5	20.0	19.6	20.0	21.7
Length of longest ray of upper caudal lobe	39.9	31.1	28.9	29.8	28.3	35.8	—	36.4	33.2
Length of longest ray of pelvic fin	13.7	15.0	13.8	13.4	14.8	14.5	14.1	16.4	14.7
Length of longest ray of lower caudal lobe	26.6	22.1	20.1	23.3	23.9	25.4	23.8	26.0	23.8
Length of dorsal spine	14.0	13.1	13.2	15.3	16.1	13.9	14.1	20.0	15.5
Length of pectoral spine	14.5	15.0	14.4	17.1	18.1	15.1	14.9	19.4	15.8

PIMELODELLA META EIGENMANN

- Pimelodella metae* EIGENMANN, Mem. Carnegie Mus., vol. 7, No. 4, p. 244, pl. 31, fig. 2, 1917 (Quebrada Cramalote and Río Negro, near Villavicencia; Barrigona, Río Meta; all Colombia); Indiana Univ. Studies, vol. 7, No. 44, p. 5, 1920 (Maracay, Río Bue, and Río Castaño, all Valencia Basin, Venezuela).—PEARSE, Univ. Wisconsin Studies, No. 1, p. 22, 1920 (mouth Río Bue).—EIGENMANN, Mem. Carnegie Mus., vol. 9, No. 1, p. 222, 1922 (Lake Valencia Basin).
- ?*Pimelodella buckleyi* RIBEIRO, Rev. Mus. Paulista, vol. 10, p. 731, 1918 (Río Cabriale, Venezuela).

PIMELODELLA CHAGRESI ODYNEA, new subspecies

PLATE 2, A

Holotype.—U.S.N.M. No. 121133, a specimen, 89 mm. in standard length, collected by Leonard P. Schultz, March 17 and 20, 1942, in the Río San Juan at the bridge south of Mene Grande, Motatán system, Maracaibo Basin.

Paratypes.—U.S.N.M. No. 121141, 26 specimens, 49 to 92 mm., collected along with the holotype and bearing the same data. Other paratypes as follows (collected by L. P. Schultz unless otherwise indicated):

U.S.N.M. No. 121140, Río Motatán, 4 km. above Motatán, March 25, 1942, 88 specimens, 29 to 90 mm. (several females have their abdomens enlarged with eggs).

U.S.N.M. No. 121134, Río Motatán at bridge 22 km. north of Motatán, March 17, 1942, 50 specimens, 44 to 80 mm.

U.S.N.M. No. 121136, Río Motatán, 8 km. below Motatán, March 24, 1942, 103 specimens, 23.5 to 71 mm.

U.S.N.M. No. 121143, Río Jimelles, 12 km. east of Motatán, Motatán system, March 24, 1942, 8 specimens, 26.5 to 57.5 mm.

U.S.N.M. No. 121137, Río San Pedro at bridge, Motatán system, March 20, 1942, 3 specimens, 70 to 77 mm.

U.S.N.M. No. 121138, Río Machango, at bridge south of Lagunillas, Maracaibo Basin, March 16, 1942, 3 specimens, 51 to 80.5 mm.

U.S.N.M. No. 121144, Río Machango, 20 km. above the bridge south of Lagunillas, March 21, 1942, 3 specimens, 26.5 to 77.5 mm.

U.S.N.M. 121142, Río Socuy, 3 km. above its mouth, Maracaibo Basin, February 24, 1942, 18 specimens, 33.5 to 90 mm.

U.S.N.M. No. 82618, Sierra de Perija, obtained by Theodoor de Booy, mountains north of Maracaibo, 1 specimen, 42.5 mm.

U.S.N.M. No. 121135, Río Apón, about 35 km. south of Rosario, Maracaibo Basin, February 26, 1942, 2 specimens, 52 and 61 mm.

U.S.N.M. No. 121213, Río Negro below mouth of Río Yasa, Maracaibo Basin, March 2, 1942, 22 specimens, 30.5 to 69.5 mm.

U.S.N.M. No. 101610, Río Pamplonita, near Cucuta, Santander del Norte, Catatumbo system, Maracaibo Basin, Colombia, collected by Nicéforo María, 1 specimen, 84.5 mm.

U.S.N.M. No. 121252, Cucuta, Colombia, collected by Nicéforo María, 1 specimen, 100 mm.

U.S.N.M. No. 121139, Río Táchira, 7 km. north of San Antonio, Catatumbo system, April 1, 1942, 1 specimen, 75.3 mm.

Description.—Body naked, gill membranes extending far forward on isthmus; two pairs of nostrils, widely separated, the anterior pair tubular; a wide band of villiform teeth on premaxillaries and a narrower band on dentaries; posterior edge of pectoral spine with 9 to 12 teeth, the distal third smooth; the distal third of the anterior edge of pectoral spine with shallow serrations; maxillary pair of barbels reaching to caudal peduncle, sometimes only to end of anal fin; outer mental barbel reaching to opposite tips of pectorals, and inner mental barbel reaching a little past base of pectorals; eye 1.8 or 1.9 in snout,

and 1.1 to 1.3 in interorbital; pectoral and dorsal spines almost equal in length; supraoccipital process about as long as the snout; adipose fin elongate, its total length contained from 2.8 to 3.2 in the standard length, and origin of adipose $2\frac{3}{4}$ eye diameters behind base of dorsal fin; head about $4\frac{1}{2}$ in the standard length and depth 5 to 6 times; anus almost equidistant from tip of snout and base of caudal fin; first dorsal ray not longer than branched rays of that fin; intestine with a few convolutions.

Detailed measurements were made on the holotype and a few paratypes, and these data are recorded in table 4.

Color.—Grayish, with a black lateral streak from snout to base of caudal fin, fading on middle rays of that fin; a blackish streak along each side of dorsal fin extending to head; dorsal fin with pigment in front of each ray on interradiial membrane, the anterior two-thirds of membrane hyaline; anterior tubular nostril blackish; peritoneum silvery.

Fin-ray counts are recorded in table 5, but the holotype has the following: Dorsal I, 6; anal v, 8; pectoral I, 8–I, 8; pelvic i, 5; branched rays in caudal fin 15.

Remarks.—This new subspecies differs from *P. chagresi chagresi* (Steindachner) by having longer barbels, as indicated in the key.

Named *odynea* in reference to the severe pain caused by these little catfishes when my fingers were pricked by their pectoral spines.

PIMELODELLA CHAGRESI CHAGRESI (Steindachner)

Pimelodus (*Pseudorhamdia*) *chagresi* STEINDACHNER, Sitzb. Akad. Wiss. Wien, vol. 74, p. 34, 1876 (Río Chagres and its tributary, near Obispo).

U.S.N.M. No. 121130, 14 specimens, 26 to 83 mm., collected by Leonard P. Schultz in the Río Gonzáles at La Gonzáles, Río Chama system, Maracaibo Basin, Estado de Mérida, March 29, 1942.

U.S.N.M. No. 121131, 32 specimens, 48 to 82 mm., collected by Leonard P. Schultz in the Río Chama at Estanques, Estado de Mérida, April 3, 1942.

TABLE 5.—*Fin-ray counts for certain species of Pimelodella from the Maracaibo Basin, Venezuela*

Species	Dorsal	Anal		Pectoral		Pelvic
	I, 6	v, 7	v, 8	I, 8	I, 9	i, 5
<i>linami</i>	1	-----	1	-----	1	1
<i>chagresi odynea</i>	10	2	8	6	7	4
<i>chagresi chagresi</i>	10	3	6	-----	8	3

Genus PINIRAMPUS Bleeker

Pinirampus BLEEKER, Ichthyologiae Archipelagi Indici Prodrumus, vol. 1, p. 198, 1858. (Type, *Pimelodus pinirampu* Agassiz.)

PINIRAMPUS PIRINAMPU (Agassiz)

- Pimelodus pirinampu* AGASSIZ, in Spix, *Selecta genera et species piscium . . .*
Brasiliam . . ., p. 20, pl. 8, 1829 (ref. copied).
- Pirinampus pirinampus* EIGENMANN and EIGENMANN, *Occ. Pap. California Acad. Sci.*, vol. 1, p. 104, 1890 (Venezuela).—RIBEIRO, *Arch. Mus. Nac. Rio de Janeiro*, vol. 16, No. 4, p. 304, 1911 (Venezuela).
- ? *Pimelodus barbancho* HUMBOLDT, *Recueil d'observations de zoologie . . .*, vol. 2, p. 172, 1811 (Venezuela). (Ref. copied.)

Genus MEGALONEMA Eigenmann

Megalonema EIGENMANN, *Rep. Princeton Univ. Exped. Patagonia*, vol. 3, p. 383; 1910 (*nomen nudum*); *Mem. Carnegie Mus.*, vol. 5, p. 150, fig. 31, pl. 10; fig. 2, 1912. (Type, *Megalonema platycephalum* Eigenmann.)

Since *Megalonema punctatum* Meek and Hildebrand and *M. robustum* Meek and Hildebrand have been referred to *Pimelodus clarias punctatus* by these authors, there remain three other species in the genus: *Megalonema platycephalum* Eigenmann, *M. xanthum* Eigenmann, and *M. rhabdostigma* Fowler (*Proc. Acad. Nat. Sci. Philadelphia*, 1914, p. 256, fig. 10, from Rupununi River).

Although I have not seen the type of the last-named species, Fowler's figure 10 of *rhabdostigma* does not appear to belong to the genus *Megalonema* for the following reasons: (1) He says "eyelids free without adipose development," while the true members of this genus have free eyelids and the eyes have adipose eyelids strongly developed dorsally; (2) dorsal and pectorals with definite spines, but in *Megalonema* the first ray is articulated; (3) "occipital process and articulating predorsal buckler, besides exposure of shoulder-girdle over pectoral origin"; in *Megalonema* the supraoccipital process does not nearly reach the predorsal plate, there is no exposure of shoulder-girdle over the pectoral base, and there is no backward extension of the coracoids above or behind base of pectorals; (4) Fowler says "P. I, 9," while in *Megalonema* the various species have I, 12 to I, 14 rays in the pectoral fin; (5) the color pattern, shape, and all characters described by Fowler cause me to conclude that his *Megalonema rhabdostigma* should be referred to the genus *Pimelodus*, and it no doubt will be proved to be a synonym of *Pimelodus ornatus* Kner.

KEY TO THE SPECIES OF MEGALONEMA

- 1a. Total length of adipose fin contained about $2\frac{1}{2}$ times in standard length; first ray of dorsal fin two-thirds length of adipose fin; anal rays v, 8 to 10, usually 9 or 10 branched rays; pectoral I, 13 or I, 14; gill rakers 4 or 5+14 or 15; depth $4\frac{3}{4}$ to 5; first dorsal ray reaches $\frac{1}{4}$ along adipose fin; maxillary barbel reaching to caudal fin base or nearly there.

*Megalonema xanthum*³ Eigenmann

³ This species was reported from Girardot and Apulo, Colombia, Magdalena system, by Eigenmann. *Indiana Univ. Bull.*, vol. 10, No. 8, pp. 16-17, 1913.

- 1b. Total length of adipose fin contained about $4\frac{1}{2}$ to 5 times in standard length; first dorsal ray longer than length of adipose fin; caudal fin base with a pair of hidden or embedded dark spots, persistent at all sizes.
- 2a. Lower lobe of caudal fin with a darkish oblong blotch, below which ventral margin of caudal fin is distinctly pale or whitish; upper sides and back above the lateral line grayish or brownish, below which the sides are pale, distinctly set off from darker pigment above, pale sides extending about an eye diameter above black lateral line; distance from base of dorsal to origin of adipose fin a little greater than snout and eye; anal rays v, 8 to 10, usually 9 branched rays; pectoral rays I, 13 or I, 14; gill rakers 2 or 3+10 or 11.

Megalonema platycephalum psammium, new subspecies

- 2b. Pigment of lower lobe of caudal fin not restricted to a large blotch set off ventrally by a white ventral margin on lower caudal lobe; pigment on back and sides extends below lateral line anteriorly and along it posteriorly, no pale area above lateral line; distance from base of dorsal to origin of adipose equal to snout and eye.

Megalonema platycephalum platycephalum ⁴ Eigenmann

MEGALONEMA PLATYCEPHALUM PSAMMIUM, new subspecies

PLATE 2, B

Holotype.—U.S.N.M. No. 121175, a specimen 133.5 mm. in standard length, taken by Leonard P. Schultz in the Río Palmar at the bridge, 70 km. southwest of Maracaibo, March 6, 1942.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121178, 15 specimens, 74 to 105 mm., taken along with the holotype and bearing the same data; U.S.N.M. No. 121177, 46 examples, 35 to 152 mm., Río Socuy, 3 km. above mouth, February 24, 1942; U.S.N.M. No. 121176, 14 specimens, 64.5 to 102 mm., Río Apón, about 35 km. south of Rosario, Maracaibo Basin, February 26, 1942. The specimens were taken mostly over sandy bottoms.

Description.—The holotype and one paratype were carefully measured, and data for these, expressed in hundredths of the standard length, are recorded below, respectively. Standard length (in mm.) 133.5 and 107.

Length of head to end of supraoccipital 28.5 (29.4); length of head to end of gill cover 28.8 (29.0); greatest depth of body at dorsal origin 15.0 (16.1); width of head at base of pectorals 16.2 (16.3); length of snout 12.7 (13.1); diameter of eye 4.42 (4.86); width of fleshy interorbital space 7.34 (6.73); width of bony interorbital space 5.02 (4.67); distance from margin of eye to posterior nostril 5.77 (5.89); distance from anterior to posterior nostril 4.64 (4.65); postorbital length of head 12.1 (11.7); total length of adipose fin 22.8 (21.1); height of adipose 5.62 (6.54); least depth of caudal peduncle 8.32 (7.85); length of caudal peduncle or distance from rear of anal base to midbase of caudal fin 18.0 (18.2); length of first ray of dorsal 23.2 (24.8); length

⁴ This species is known from Tumatumari, British Guiana, in the original description by Eigenmann, Mem. Carnegie Mus., vol. 5, p. 150, fig. 31, pl. 10, fig. 2, 1912.

of first ray of pectoral 20.4 (19.0); length of longest pelvic ray 15.9 (16.7); length of longest anal ray 15.0 (15.1); length of longest ray of upper caudal lobe 30.3 (30.0); length of longest ray of lower caudal lobe 24.7 (27.1); shortest midcaudal ray 9.36 (9.82); distance from tip of snout to dorsal origin 36.7 (36.9); snout to anal origin 72.6 (71.5); snout to adipose origin 66.1 (66.4); snout to pelvic insertion 47.2 (45.8); snout to pectoral insertion 26.2 (25.8); snout to anus 53.5 (51.4); anus to anal origin 19.6 (19.2); length of maxillary barbel 73.4 (79.4); length of outer mental barbel 29.6 (32.7); length of inner mental barbel 14.6 (16.8); distance across ends of premaxillary band of teeth 9.36 (9.35); diameter of bony orbit 5.69 (5.98).

The following counts were made: Dorsal i, 6 (i, 6); anal v, 9 (v, 10); pectoral i, 13 (i, 13); pelvic i, 5 (i, 5); branched rays in caudal fin 15 (15); gill rakers — (3 + 10). In addition the following counts were made: Anal v, 8 in one fish, v, 9 in nine specimens; pectoral i, 14 in six examples, and i, 13 in four; gill rakers 2 + 10 in one fish, 2 + 11 in another, 3 + 11 in two, and 3 + 10 in five specimens.

Dorsal surface of head depressed anteriorly; ventral contour nearly straight, the lower surface flattish so that the upper lip is on same plane as lower jaw, the snout projecting a distance equal to diameter of eye; supraoccipital process with a narrow base and projecting backward a distance about equal to eye and not meeting the predorsal plate; premaxillary band of villiform teeth wide, teeth depressible; band of villiform teeth at front of dentaries; no teeth on vomer or palatines; interorbital space slightly concave or flattish; gill rakers not quite so long as pupil; adipose fin high, its height about 3.8 to 4 in its length; space between base of dorsal and adipose origin a little greater than length of snout and eye; adipose fin base twice length of anal fin base; adipose fin contained $4\frac{1}{2}$ to $4\frac{3}{4}$ in standard length; posterior margins of dorsal, anal, and pectorals a little concave; pelvics rounded; caudal fin deeply forked, the upper lobe a little longer than lower; length of caudal peduncle 1.2 in adipose fin length; frontal fontanel extends to opposite rear margin of eye, this fontanel bordered by two small cartilaginous ridges that converge forward and then expand at front of snout; nasal cavities bordered by a black cartilaginous rod at sides and anteriorly; occipital fontanel minute; center of eye in middle of head; first ray of dorsal and of pectoral simple, articulated, and not spinous, these rays a little longer or equal to the first branched ray; barbels somewhat flattened anteriorly, the maxillary one in young reaching to caudal fin but in larger specimens only to end of adipose fin; outer mental barbels with base farther back than inner mental barbels, and reaching in young to pelvic insertion but only to pectoral insertion in those about 150 mm. in standard length; inner mental barbels reach to or almost to pectoral insertion; gill membranes extend forward and are free from the isthmus.

Color.—Grayish to light brownish above, white below, the color abruptly paler about an eye diameter above the blackish lateral line; two embedded black spots near base of each lobe of the caudal fin; black spots, more or less embedded, between bases of each ray of dorsal fin; lower lobe of caudal fin darker, the ventral margin distinctly pale and contrasting with the blackish pigment; under the eye a dark band, with the cheek below abruptly white; peritoneum white.

Remarks.—This new subspecies differs from other forms referred to the genus *Megalonema* as indicated in the key on page 215. The most distinct difference is in the color along its side, the pale area extending above the lateral line, while in *platycephalum* the darker pigment is continuous to below the lateral line.

Named *psammium* in reference to its occurrence over sandy areas of rivers.

Genus CETOPSORHAMDIA Eigenmann and Fisher

Cetopsorhamdia EIGENMANN and FISHER, in Eigenmann, Ann. Carnegie Mus., vol. 10, p. 83, 1916. (Type, *Cetopsorhamdia nasus* Eigenmann and Fisher.)

Eigenmann described the genus *Chasmocranus* (genotype: *C. longior* Eigenmann) and referred another species, *C. brevior*, to it. An examination of a paratype, U.S.N.M. No. 66133, indicates that *Chasmocranus* has a depressed head and backward-projecting angles at the outer ends of the premaxillary band of teeth, as described by Eigenmann. Gosline (Stanford Ichth. Bull., vol. 2, No. 3, p. 88, 1941) recognizes the genus and refers to it the following species: *C. truncatorostris* Borodin, 1927, and *C. quadrizonatus* Pearson, 1937. Perhaps these species, along with those referred to the genera *Imparfinis* and *Pariolius* by Gosline (*loc. cit.*), need careful reexamination, as certain of these species do not have their heads depressed so much as is indicated in Gosline's key in contrast to the "head conical" for *Cetopsorhamdia*.

The forms described as new below have the outer ends of the premaxillary band of teeth rounded.

KEY TO THE SPECIES OF CETOPSORHAMDIA

- 1a. Total length of adipose fin contained in standard length less than 4 times, and head in standard length about 4.6 to 4.8 times.
- 2a. Total length of adipose fin 0.7 times in distance from dorsal origin to adipose origin and 2.9 in standard length; no pale bars on back or sides, color plain darkish; distance from pelvic insertion to anal origin 2.1 in snout to pelvic insertion; length of shortest midcaudal fin rays in total length of adipose fin 3.1, in longest caudal fin ray 2.2, and 2.5 in distance from dorsal origin to adipose origin (Magdalena Basin near Honda).

Cetopsorhamdia boquillae Eigenmann ⁵

⁵ *Cetopsorhamdia boquillae* Eigenmann, Mem. Carnegie Mus., vol. 10, No. 1, p. 37, pl. 1, fig. 3, 1922 (Boquilla).

- 2b. Total length of adipose fin 0.8 to 0.9 in dorsal origin to adipose origin and $3\frac{1}{4}$ in standard length. Six pale bars across back and somewhat on sides, first between upper end of gill openings, second at origin of dorsal, next rear base of dorsal, fourth origin of adipose, another under middle of adipose and last across caudal peduncle; these pale bars separated by blackish; distance from pelvic insertion to anal origin 1.5 in snout to pelvic insertion; length of shortest midcaudal fin rays in total length of adipose fin 1.9, in longest caudal fin ray 1.4, and 1.9 in distance from dorsal origin to adipose origin.---*Cetopsorhamdia rosae* (Eigenmann) ⁶
- 2c. Total length of adipose fin 1.2 in dorsal origin to adipose origin and 3.7 in standard length; color nearly uniform, with traces of paler bars on back anteriorly; distance from pelvic insertion to anal origin 1.6 in snout to pelvic insertion; length of shortest midcaudal fin rays 3 times in total length of adipose fin, 2.2 in longest caudal fin ray, and 3.4 in distance from dorsal origin to adipose origin.---*Cetopsorhamdia mirini* (Haseman) ⁷
- 1b. Total length of adipose fin contained more than 4 times in standard length and about 1.4 to 2.0 times in distance from dorsal origin to adipose origin.
- 3a. Greatest height of adipose fin contained 2 to 3.8 times in its total length.
- 4a. Three or four distinct pale bars across back and on sides, first between upper end of gill openings, second represented as a white spot at base of first rays of dorsal connecting with a palish area below, third from between dorsal and adipose, last across caudal peduncle (only a single blackish bar under adipose); greatest depth of adipose 2.2 in its total length; length of shortest midcaudal fin rays 1.6 in total length of adipose, 2.5 in longest ray of caudal fin, and 2.3 in distance from dorsal origin to adipose origin; distance between pelvic insertion and anal origin 2.1 in snout to pelvic insertion; total length of adipose fin 4.8 in standard length and 1.4 in distance from dorsal origin to adipose origin; head 3.6, and width of head across base of pelvics 5, in standard length; anal origin a very little in advance of adipose origin, almost under it.-----*Cetopsorhamdia shermani*, new species
- 4b. Color not as in 4a; no wide pale color bars between dorsals or on caudal peduncle; color plain blackish posteriorly; anal origin directly under adipose origin or a very little behind it.
- 5a. Distance from pelvic insertion to anal origin 1.3 to 2.0 times in snout to pelvic insertion.
- 6a. Distance from pelvic insertion to anal origin 1.4 in snout to pelvic insertion; total length of adipose fin 4.5 or 4.6 in standard length, and 1.5 in distance from dorsal origin to adipose origin; width of head across pectoral bases $5\frac{1}{2}$, head 5.2, depth about $5\frac{3}{4}$ in standard length; height of adipose about 3.7 in its length; length of shortest midcaudal fin rays $2\frac{1}{2}$ in total length of adipose, 3.1 in dorsal origin to adipose origin and 2.5 in longest (upper lobe) rays of caudal fin; a dark blotch or bar on back just behind head, one at origin of dorsal, third at rear base of dorsal, fourth between base of dorsal and adipose origin, the spaces between these a little paler but not white bars; caudal fin blackish, not white and sharply contrasting with blackish caudal base.

Cetopsorhamdia hasemani (Steindachner) ⁸

⁶ *Chasmocranus rosae* Eigenmann, Mem. Carnegie Mus., vol. 9, No. 1, p. 220, pl. 1, fig. 4, 1922 (Río Negro, Villavicencio, Colombia). Gosline (*op. cit.*, p. 88) refers this species to *Parolius* Cope. I cannot agree that its head is noticeably depressed.

⁷ *Imparfinis mirini* Haseman, Ann. Carnegie Mus., vol. 7, p. 318, pl. 47, 1911. Gosline (*op. cit.*, p. 88) refers this species to *Cetopsorhamdia* also.

⁸ *Imparfinis hasemani* Steindachner, Denkschr. Akad. Wiss. Wien, vol. 93, p. 59, figs. 1-3, 1917 (Río Surumú at Serra do Mello; Río Branco at Bem Querer; Río Tapajos at Santarem).

- 6b. Distance from pelvic insertion to anal origin 1.6 to 1.9 times in snout to pelvic insertion; total length of adipose fin 5.4 to $6\frac{1}{4}$ times in standard length and 1.6 to 2.0 in distance from dorsal origin to adipose origin.
- 7a. Shortest midcaudal fin rays in total length of adipose fin 2, in dorsal origin to adipose origin about 3.4, and in longest rays of caudal fin about 3 times; head $4\frac{1}{2}$, depth 5 in standard length; color plain blackish without pale caudal fin sharply contrasting with black caudal base; a white spot at origin of dorsal fin.
- Cetopsorhamdia insidiosa** (Steindachner)
- 7b. Shortest midcaudal fin ray 1.5 to 1.7 in total length of adipose fin, 3.0 to 3.2 in dorsal origin to adipose origin, and 2.7 to 2.9 in longest (lower lobe) rays of caudal fin; head 3.8 to 4.0 and width across pectoral bases 5 to 5.5 in standard length; caudal fin white, sharply contrasting with blackish caudal base; a narrow pale bar over occiput connecting across upper ends of gill openings; a white spot at origin of dorsal fin; a short narrow white area along middorsal line of caudal peduncle just in front of bases of upper caudal rays; midventral line of caudal peduncle white----- **Cetopsorhamdia picklei**, new species
- 5b. Distance from pelvic insertion to anal origin 3 times in snout to pelvic insertion; length of shortest midcaudal fin rays into longest rays of lower lobe of caudal fin 3.2 times; head 4 to 4.3 times in standard length; everywhere darkish in color dorsally; a dark band at base of caudal and a light band about width of eye extending between upper margins of gill openings across base of occipital; a pale spot at dorsal origin.

Cetopsorhamdia nasus Eigenmann and Fisher⁹

- 3b. Greatest height of adipose fin 5 to 7 times in its total length; origin of adipose fin nearly over middle of anal fin base; anal origin to midbase of caudal fin contained $1\frac{1}{4}$ times in snout to anal origin; total length of adipose fin 4.2 to 4.3, and head 4, width of head across base of pectorals about 5, all in standard length; a pale bar between upper ends of gill openings across occiput; a wide, somewhat obscure, pale bar between dorsals and another across caudal peduncle; base of caudal fin black; sometimes a pale spot on half-grown at origin of adipose fin; no pale spot at origin of dorsal fin; no black color extending up on basal part of caudal fin rays; length of shortest midcaudal fin rays, 1.7 in total length of adipose fin, 2.0 in longest ray of caudal fin, and 2.7 in distance from dorsal origin to adipose origin.

Cetopsorhamdia orinoco, new species

CETOPSORHAMDIA SHERMANI, new species

PLATE 2, C

Holotype.—U.S.N.M. No. 121216, the only known specimen, 30.7 mm. in standard length, collected by Leonard P. Schultz, Guillermo Zuloaga, Roger Sherman, and William Phelps, Jr., May 12, 1942, in the Río Guárico and tributaries between San Sebastián and San Casimiro (Orinoco system), Estado de Aragua, Venezuela.

Description.—Detailed measurements are expressed in hundredths of the standard length:

⁹ *Cetopsorhamdia nasus* Eigenmann and Fisher, Ann. Carnegie Mus., vol. 10, p. 83, 1916 (Honda).

Length of head to end of operculum 28.7; width of head across base of pectorals 19.9; greatest depth of body 19.9; length of snout 12.1; diameter of eye 4.56; distance from eye to rim of posterior nostril 2.28; distance between anterior and posterior nostrils 4.89; width of interorbital space 9.45; postorbital length of head 14.3; total length of adipose fin 22.2; greatest height of adipose fin 7.50; least depth of caudal peduncle 10.4; length of caudal peduncle from base of anal to midbase of caudal fin 22.2; length of first ray of dorsal fin 27.4; length of first ray of pectoral 22.8; longest branched ray of pelvic fin 17.9; longest branched ray of anal fin 18.9; length of longest ray of upper lobe of caudal fin 32.2; longest ray of lower lobe of caudal fin 31.9; length of shortest rays of caudal fin 12.7; distance from snout to dorsal origin 40.0; snout to anal origin 67.1; snout to adipose origin 68.4; snout to pelvic insertion 45.6; snout to pectoral insertion 23.1; dorsal origin to adipose origin 31.3; anus to anal origin 10.1; length of maxillary barbel 46.9; length of outer mental barbel 22.8; length of inner mental barbel 13.4; length of base of anal 13.0.

TABLE 6.—Counts made on seven species of *Cetopsorhamdia*

Species	Number of fin rays											Number of gill rakers on first arch																		
	Dorsal		Anal			Pectoral				Pelvic	Above angle			Below angle						Total										
	i, 6	iv, 7	iv, 8	v, 7	i, 8	i, 9	i, 10	i, 11	i, 5	1	2	3	6	7	8	9	10	11	12	7	8	9	10	11	12	13	14	15		
<i>orinoco</i>	5			5		4	6		5	4			2	2						2	2									
<i>shermani</i>	1	1				2			2																					
<i>picklei</i>	9	6	3			1	11		4	1	2	12			4	5	1	1	1							1	5	3	1	1
<i>nasus</i>	1	1							1	1																				
<i>boquillae</i>	1		1			1	1		1																					
<i>rosae</i>	1	1	1						1																					
<i>brevior</i>	1	1							1																					

The following counts were made: Dorsal rays i, 6; anal iv, 7; pectoral i, 8-i, 8; pelvic i, 5-i, 5; branched rays of caudal fin 15.

First rays of pectoral and dorsal not spines but segmented rays; margin of eyes not free; gill membranes extending far forward, free from isthmus, not joined to each other; a pair of maxillary barbels in a groove to below eye and extending to opposite tips of pectorals; two pair of mental barbels, the outer pair reaching a little behind base of pectorals, the inner pair not quite reaching to opposite pectoral insertion; origin of anal a trifle in advance or under origin of adipose fin; pelvics inserted under fourth branched ray dorsal fin; caudal fin deeply forked, lobes about equal; nasal openings far apart, the posterior ones near eyes, funnel-shaped, the anterior nasal openings directly in front of the posterior ones and tubular; snout projecting, lower jaw

shorter, included, so that mouth is subterminal; teeth villiform in a narrow band on premaxillaries and dentaries; no teeth on vomer or palatines.

Body compressed posteriorly, head depressed anteriorly, profile rounded; distance from anal origin to midbase of caudal fin $1\frac{1}{2}$ in snout to pelvic insertion; snout to dorsal about $1\frac{1}{2}$, head $3\frac{1}{2}$, depth 5, width of head at pectoral base 5, all in standard length; first ray of dorsal longest, extending past next branched ray, margin of this fin concave; first branched ray of anal longest, rear margin a little concave; first ray of pectoral a trifle longer than first branched ray, rear margin truncate; first branched ray of pelvics longest, rear margins truncate.

Color.—A pale color bar extending from base of pectorals past upper ends of gill openings across occiput, the blackish opercle extending into this band, but the thin membranes around operculum white; a white spot below base of first three dorsal fin rays, but not in front of fin; base of dorsal and back below dorsal blackish, then a pale hour-glass-shaped area, with an elongate blackish blotch along lateral line, then paler below; a wide pale bar between dorsals extending to in front of anal; another wide pale band across caudal peduncle; base of caudal fin blackish, sharply contrasting with pale caudal fin; all fins pale except base of adipose and base of dorsal; anal base with some black pigment cells; dorsal surface of head blackish; tip of snout white; mental barbels white; basal half of maxillary barbels pigmented.

Remarks.—This new species differs in color from all other species referred to the genus *Cetopsorhamdia* and may be separated from them by the key on pages 218–220.

Named *shermani* in honor of Roger Sherman, of the Standard Oil Co. of Venezuela, who helped me in many ways while I was in Venezuela.

CETOPSORHAMDIA PICKLEI, new species

PLATE 2, D

Holotype.—U.S.N.M. No. 121217, a specimen 88 mm. in standard length, collected by Leonard P. Schultz, March 25, 1942, in the Río Motatán, 4 km. above Motatán, Maracaibo Basin.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121218, 37 specimens, 45 to 118 mm., taken along with the holotype and bearing the same data; U.S.N.M. No. 121222, 29 examples, 46 to 96 mm., March 24, 1942, from the Río Jimelles, 12 km. east of Motatán, Motatán system; U.S.N.M. No. 121220, 7 specimens, 53 to 95.5 mm., March 24, 1942, from the Río Motatán, 8 km. below Motatán; U.S.N.M. No. 121219, 24 specimens, 37 to 75.5 mm., March 17 and 20, 1942, from the Río San Juan near bridge south of Mene Grande, Motatán system; U.S.N.M. No. 121221, 17 examples, 37.5 to 70.5

mm., February 21, 1942, from the Río Palmar near Totuma, about 100 km. southwest of Maracaibo.

The largest specimens are females, their abdomens swollen with eggs.

Description.—Based on the holotype and paratypes listed above. Detailed measurements of the holotype and two paratypes, expressed in hundredths of the standard length, are recorded below, first for the holotype, then for the two paratypes in parentheses, respectively. Standard length (in mm.) 88 (39.7; 118).

Length of the head to end of operculum 25.7 (28.5; 23.7); width of head across base of pectorals 19.0 (16.9; 18.6); greatest depth 21.7 (16.6; 25.4); snout 10.5 (11.3; 9.58); diameter of eye 4.43 (5.04; 3.98); distance from eye to posterior nostril 2.16 (2.77; 2.20); distance between anterior and posterior nostrils 4.54 (5.29; 3.90); width of fleshy interorbital space 6.59 (6.80; 6.02); postorbital length of head 12.4 (13.8; 11.7); total length of adipose fin 19.3 (16.4; 19.9); greatest height of adipose fin 6.14 (5.80; 5.59); least depth of caudal peduncle 13.3 (11.6; 13.7); length of caudal peduncle from rear base of anal to midbase of caudal fin 21.0 (21.2; 22.4); length of first (simple) ray of dorsal fin 22.7 (23.2; 21.1); length of first or upper pectoral ray 17.8 (18.9; 14.7); longest pelvic ray 16.8 (16.9; 15.9); longest anal ray 18.2 (16.4; 15.3); length of longest ray of upper lobe of caudal fin 30.1 (33.2; 26.3); length of longest ray of lower lobe of caudal fin 30.9 (33.2; 27.1); length of shortest middle ray of caudal fin 11.4 (11.3; 11.0); distance from tip of snout to dorsal origin 36.5 (41.6; 36.2); snout to anal origin 70.9 (70.5; 69.5); snout to adipose origin 70.8 (69.5; 68.3); snout to pelvic insertion 48.8 (47.4; 47.4); snout to pectoral insertion 24.1 (27.2; 21.7); distance from dorsal origin to adipose origin 33.5 (27.7; 33.9); anus to anal origin 12.5 (13.8; 12.7); length of maxillary barbel 30.9 (32.2; 25.8); length of outer mental barbel 15.3 (18.9; 14.5); length of inner mental barbel 8.52 (12.1; 8.48); length of base of anal fin 12.5 (12.3; 13.1).

The following counts were made, respectively; Dorsal rays i, 6 (i, 6; i, 6); anal iv, 8 (iv, 7; iv, 8); pectoral i, 9-i, 9 (i, 9; i, 9); pelvic i, 5-i, 5 (i, 5; i, 5); branched rays in caudal fin 15 (15; 15).

Head a little depressed; body compressed posteriorly; gill membranes extending far forward, free from the isthmus; teeth villiform in a band on premaxillaries and on dentary, no posteriorly projecting toothed areas laterally; margins of eyes not free; a pair of maxillary barbels, in a groove to under eye, these barbels reaching to opposite middle of pectorals; two pairs of mental barbels, their bases nearly in a straight line; the outer mental barbel reaches to pectoral base and the inner one two-thirds the way to pectoral base; nasal openings far apart, the posterior nostril near eye and funnel-shaped, the anterior nostril near front of snout tubular; mouth subterminal,

the snout projecting; no teeth on vomer or palatines; pelvic insertion under the fifth branched ray of the dorsal; anal origin under the adipose origin; the adipose fin is short and high, its height about $2\frac{1}{2}$ to 3 times in its total length, and the latter $5\frac{1}{8}$ to $6\frac{1}{4}$ times in the standard length; the first rays of dorsal and pectorals are soft, not spinous; the first dorsal ray is about as long as the first branched ray, the rear margin of this fin slightly concave; last simple ray of anal about as long as first branched ray, rear margin of anal truncate; posterior margins of paired fins rounded; first ray of pectoral four-fifths as long as first branched ray; pectoral fins reaching two-thirds the way to the pelvics, the latter three-fourths the way to the anal origin; anus closer to snout than caudal fin base by length of snout and eye; lobes of caudal fin equal, this fin deeply forked; a membrane occurs along margin of shoulder girdle becoming free toward pectoral base but ending before reaching that far.

Color.—General color blackish above, paler below; a white bar or saddle across occipital, extending down to base of pectorals; a white spot at origin of dorsal fin but no white spot at origin of adipose; middorsal line of caudal peduncle with a white oblong spot just in front of base of upper rays of caudal fin; caudal fin yellowish, sharply contrasting with its black basal portion; paired fins pale; anal fin pale with some dark pigment basally; base of dorsal fin black, pale distally; anterior base of adipose dark, pale distally; underside of snout white, blackish dorsally; maxillary barbel pigmented dorsally, pale ventrally; mental barbels whitish; when alive, this species was blackish above, tinged with orange-yellowish ventrally, abruptly so below groove behind base of maxillary barbel; pale saddle across occipital yellow, as is spot at origin of dorsal; all median fins tinged with orange-yellow color; posterior margin of caudal fin with a wide, slightly darkish band; anterior rays of anal orange-yellow as is mid-ventral area of caudal peduncle; peritoneum dusky laterally.

Remarks.—This new species can be separated from all others in the genus *Cetopsorhamdia* by the key on page 218. It is most closely related to *nasus*, of the Magdalena system, but differs in a more robust body, depth 4.8 to 5.2 instead of over 6 times in *nasus*. Eigenmann gives i, 11 pectoral rays for *nasus*, but *picklei* has i, 9; the lower caudal lobe of *nasus* is much longer than the upper lobe, while in this new species they are equal; the length of the adipose fin in *picklei* equals the space between rear of dorsal and adipose origin, but in *nasus* the adipose is contained $1\frac{1}{4}$ times; other differences occur, and some are given in the key.

Named *picklei* for Chesley B. Pickle, of the Lago Petroleum Corporation, who aided me in the collection of fishes at the southern end of Lago Maracaibo.

CETOPSORHAMDIA ORINOCO, new species

PLATE 3, A

Holotype.—U.S.N.M. No. 121214, a specimen 53.5 mm. in standard length, collected by Leonard P. Schultz, March 31, 1942, in the Río Torbes, 1 km. above Táriba, Orinoco system, Venezuela.

Paratypes.—U.S.N.M. No. 121215, 4 specimens, 32.5 to 51.5 mm., taken along with the holotype and bearing the same data.

Description.—Based on the holotype and paratypes listed above. Detailed measurements of the holotype and a paratype, expressed in hundredths of the standard length, are recorded below, respectively. Standard length (in mm.) 53.5 and 33.7.

Length of head to end of operculum 25.4 and 29.1; width of head across base of pectorals 20.6 and 20.8; greatest depth 14.2 and 14.8; length of snout 10.7 and 11.6; diameter of eye 3.74 and 3.26; distance from eye to posterior nostril 2.42 and 2.38; distance between anterior and posterior nostrils 3.92 and 3.86; width of interorbital space 6.72 and 8.01; postorbital length of head 12.5 and 15.1; total length of adipose fin 22.6 and 24.3; height (greatest) of adipose fin 3.92 and 4.75; least depth of caudal peduncle 8.60 and 9.20; length of caudal peduncle from anal base to midbase of caudal fin 23.6 and 24.0; length of first ray of dorsal fin 18.5 and 22.6; length of first ray of pectoral fin 17.9 and 23.1; longest ray of pelvic fin 14.6 and 18.4; longest branched ray of anal fin 14.6 and 16.3; longest ray of upper lobe of caudal fin 21.9 and 24.6; longest ray of lower lobe of caudal fin 24.9 and 27.3; length of shortest midcaudal fin rays 12.3 and 15.7; distance from tip of snout to dorsal origin 37.9 and 40.0; snout to anal origin 67.3 and 68.0; snout to adipose origin 70.4 and 70.0; snout to pelvic insertion 44.5 and 45.1; snout to pectoral insertion 23.7 and 26.7; dorsal origin to adipose origin 34.2 and 30.9; anus to anal origin 14.0 and 13.7; length of maxillary barbel 28.6 and 37.1; length of outer mental barbel 15.1 and 20.5; length of inner mental barbel 11.6 and 13.4; length of anal base 13.1 and 13.7.

Head depressed anteriorly, body compressed posteriorly; snout bluntly rounded, projecting beyond the subterminal mouth; villiform teeth in a band on premaxillaries and on dentaries, without posteriorly projecting angles laterally; no teeth on vomer or palatines; nostrils wide apart, the posterior one funnel-shaped near eye, the anterior one near front of snout; a pair of maxillary barbels, lying in a groove to under eye and extending to opposite four-fifths the length of pectoral fin; two pairs of mental barbels, their bases almost in a straight line, the outer pair reaching almost to rear of base of pectoral fin and the inner pair about four-fifths the way to opposite pectoral insertion, eye without a free margin; a thin membrane along margin of shoulder girdle under gill cover; caudal fin deeply concave or forked, but the

lobes are not pointed and only partially rounded, of equal length; first dorsal ray soft, equal in length to first branched ray, margin of dorsal fin truncate; simple rays of anal fin graduated, the first branched soft ray longest, margin of this fin truncate; paired fins with rounded posterior margins; first ray of pectoral not spinous, about equal in length to first branched ray; the adipose fin is long but somewhat high, its total length about 4 times in the standard length, and much longer than the space from rear base of dorsal to adipose origin; pelvics inserted under second branched ray of dorsal; anal origin about an eye diameter in advance of a vertical line through adipose origin; anus a trifle closer to caudal fin base than tip of snout.

Color.—General color blackish above, paler below, with the pale caudal fin sharply contrasting with the black base of caudal fin; a pale bar, sometimes obscure, across occipital and down to upper end of gill openings; origin of dorsal and the area just in front blackish, sometimes behind this a small, paler blotch, then at rear base of dorsal the pigment is more intensive; body below dorsal fin base paler except a blackish diffuse oblong blotch along lateral line; a wide pale bar between dorsal across body to in front of anal, another on caudal peduncle, these pale bar pigments somewhat obscure in larger specimens; the black bar from base of caudal fin to anal is obvious; on the smaller specimens a small pale spot occurs at origin of adipose, absent on larger specimens; paired fins pale, dorsal and anal pale; snout pale; front of chin and lower jaw pigmented.

Remarks.—This new species differs from the other members of the genus *Cetopsorhamdia* with elongate adipose fins in color, and it is the only one of the species having the anal fin origin so far in advance of the adipose origin.

Named *orinoco* for the river system in which it was collected.

Genus NANNORHAMDIA Regan

Nannorhamdia REGAN, Ann. Mag. Nat. Hist., ser. 8, vol. 12, p. 467, 1913. (Type, *Nannorhamdia spurrelli* Regan.)

The state of preservation determines to a large extent whether the rim of the orbit is free from the eye dorsally. If the eye bulges even a little, the dorsal edge of the rim does not appear free; only in well-preserved specimens the dorsal rim of the orbit is distinctly free and then not strongly. The first ray of the dorsal fin is definitely not a pungent spine. The segmentation of this ray can be seen occurring nearly to its base. The pectoral spine is not a pungent spine, but if the soft-rayed portion is broken off at the proper place a more or less sharp-pointed spine can be felt and seen. The posterior half of the first pectoral ray or spine is segmented nearly to its base. There are usually seven gill rakers on the lower half of the first gill arch. The number of fin rays varies according to the data recorded in table 7. The caudal fin usually has 15 branched rays.

TABLE 7.—*Fin-ray counts in specimens of Nannorhamdia nemacheir*

Locality	Dorsal rays		Anal rays				Pectoral rays		
	i, 5	i, 6	iv, 6	iv, 7	iv, 8	v, 7	I, 8	I, 9	I, 10
Río Palmar.....		8	3	4		1		8	
Ríos Motatán and Machango.....	1	12	1	10	1		1	6	3

NANNORHAMDIA NEMACHEIR Eigenmann and Fisher

Nannorhamdia nemacheir EIGENMANN and FISHER, in Eigenmann, Ann. Carnegie Mus., vol. 10, p. 83, 1916 (Girardot, Colombia).

The following specimens of this catfish were collected in the Maracaibo Basin, Venezuela, by Leonard P. Schultz during 1942:

U.S.N.M. No. 121171, Río Machango, 20 km. above the bridge south of Lagunillas, March 21, 15 specimens, 36 to 53.5 mm.

U.S.N.M. No. 121166, Río Machango, at bridge south of Lagunillas, March 16, 112 specimens, 24 to 45 mm.

U.S.N.M. No. 121163, Río Motatán, at bridge 22 km. north of Motatán, March 17, 43 specimens, 32.5 to 63.8 mm.

U.S.N.M. No. 121160, Río Motatán, 4 km. above Motatán, March 25, 12 specimens, 49.5 to 74 mm.

U.S.N.M. No. 121169, Río Jimelles, 12 km. east of Motatán, Motatán system, March 24, 3 specimens, 54 to 64 mm.

U.S.N.M. No. 121167, Río San Juan, at and above bridge south of Mene Grande, Motatán system, March 17 and 20, 33 specimens, 32.5 to 69 mm.

U.S.N.M. No. 121164, Río Motatán, 8 km. below Motatán, March 24, 13 specimens, 35 to 64.5 mm.

U.S.N.M. No. 121170, Río San Pedro, at bridge south of Mene Grande, Motatán system, March 20, 12 specimens, 37 to 61.7 mm.

U.S.N.M. No. 121161, Río Apón, about 35 km. south of Rosario, February 26, 8 specimens, 38 to 48.5 mm.

U.S.N.M. No. 121165, Río Palmar, at bridge 70 km. southwest of Maracaibo, March 6, 3 specimens, 50.5 to 55 mm.

U.S.N.M. No. 121162, Río Palmar near Totuma, about 100 km. southwest of Maracaibo, February 21, 118 specimens, 36.5 to 72.5 mm.

U.S.N.M. No. 121168, Río San Juan, 12 km. south of Rosario, Estado de Zulia, February 26, 10 specimens, 28.5 to 39 mm.

The specimens listed above do not agree exactly with Eigenmann's descriptions of *N. nemacheir*, but since none are available for direct comparison from the Río Magdalena, I hesitate to name the Maracaibo specimens as a new subspecies.

SORUBIMINAE, new subfamily

The pinelodid catfishes herein grouped under the subfamily Sorubiminae have certain characters in common, as follows: Broad heads much depressed anteriorly, with patches or bands of villiform teeth in the roof of the mouth on vomer or on palatines or on both, and with

wide bands on the dentary and premaxillary; eye with free margin, and nostrils widely separated nearer front of snout than eye; inner edge of operculum with one or two folds or "pouches"; gill rakers stiff. The similarity in the above-mentioned characters has influenced me to separate them as a subfamily, although its limits are ill defined, and doubt must be cast on such grouping.

Only those genera and species so far found in Venezuela are listed below, but other genera were included in the key on pages 187-189 in order to indicate relationships among the various genera and to record those genera that may belong to the Sorubiminae.

Genus HEMISORUBIM Bleeker

Hemisorubim BLEEKER, Nederl. Tijdschr. Dierk., vol. 1, p. 97, 1863. (Type, *Platystoma platyrhynchus* Cuvier and Valenciennes.)

HEMISORUBIM PLATYRHYNCHOS (Cuvier and Valenciennes)

DORMILÓN

Platystoma platyrhynchus CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 27, 1840.

Hemisorubim platyrhynchus PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 470 (Calabozo, Venezuela).

Genus SORUBIM Agassiz

Sorubim AGASSIZ, in SPIX, Selecta genera et species piscium . . . Brasiliam . . . , p. 24, 1829. (Type, *Silurus lima* Bloch.)

SORUBIM LIMA (Bloch)

PALETA

FIGURE 3, h

Silurus lima BLOCH, in Schneider, Systema ichthyologiae, p. 384, 1801.

Sorubim lima PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 469 (Calabozo, Venezuela).—PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

Genus SORUBIMICHTHYS Bleeker

Sorubimichthys BLEEKER, Nederl. Tijdschr. Dierk., vol. 1, p. 98, 1863. (Type, *Platystoma spatula* Agassiz.)

SORUBIMICHTHYS PLANICEPS (Agassiz)

Platystoma planiceps AGASSIZ, in Spix, Selecta genera et species piscium . . . Brasiliam . . . , p. 25, 1829 (ref. copied).—PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 469 (Calabozo, Venezuela).—ERNST, Estudios sobre la flora y fauna de Venezuela, p. 282, 1877 (creeks near Caracas).

Sorubimichthys planiceps EIGENMANN and ALLEN, Fishes of western South America, p. 115, 1942 (Amazon and Orinoco).

PERRUNICHTHYS, new genus

This new genus of pimelodid catfish, with a greatly depressed head anteriorly, differs from all other genera of the subfamily Sorubiminae in its very small patches of villiform teeth on palatines and vomer, the latter with their long axis running transversely. The two palatine patches are widely separated from the vomerine patches, all teeth uniform. The premaxillary band of teeth does not have posteriorly projecting angles laterally, but the ends are rounded. In the adult

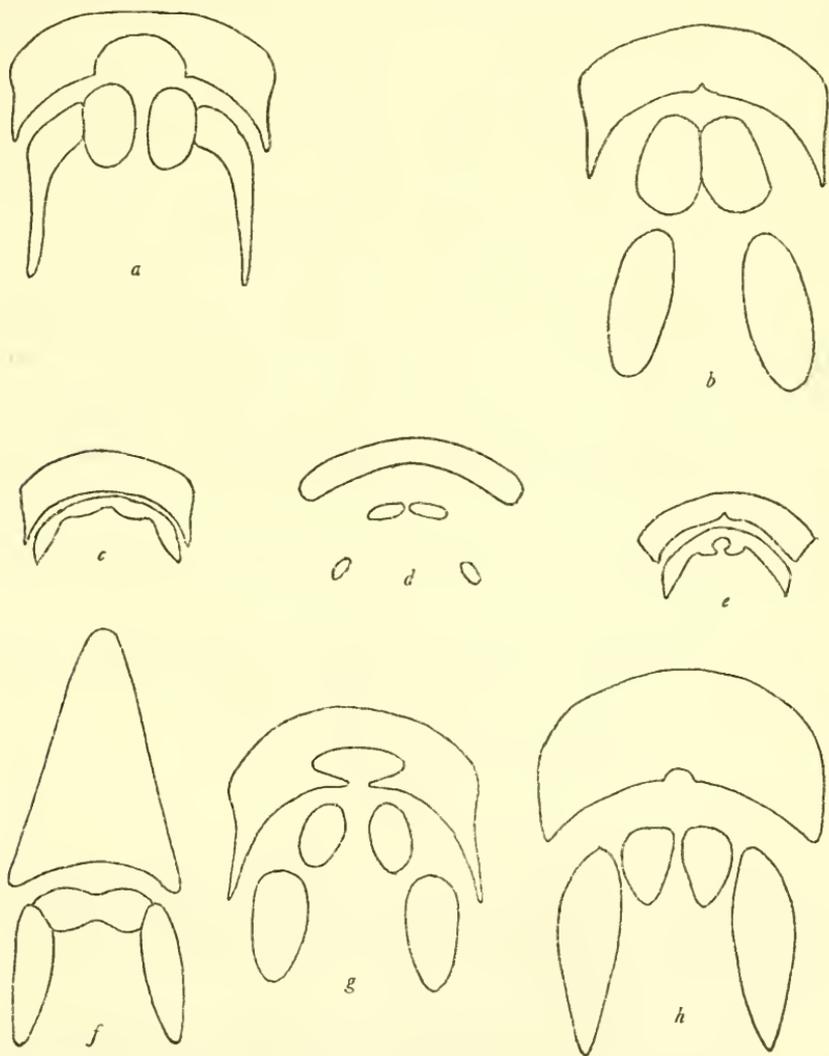


FIGURE 3.—Sketches of the toothed areas in roof of mouth of various species of South American Pimelodidae: a, *Pseudoplatystoma fasciatum*; b, *Duopalatinus emarginatus*; c, *Paulicea lütkeni* (after Ribeiro); d, *Perrunichthys perruno*; e, *Brachyplatystoma vaillanti* (after Ribeiro); f, *Platystomatichthys sturio*; g, *Platysilurus malarmo*; h, *Sorubim lima*.

the vomerine patches meet in the midline, but in the type they are a little separated; dentary with a band of villiform teeth. The width of the head is contained about $1\frac{1}{2}$ to $1\frac{1}{4}$ in length of head to end of opercle, while the width of the head across the angles of the mouth is contained 1.7 in head length and about $1\frac{1}{3}$ in width of head; interorbital space a little concave, the eye contained about $3\frac{1}{4}$ in the interorbital space; eyes with a free margin; nostrils closer to end of snout than eye, and widely separated, the anterior nostril tubular, the posterior one covered with a flap; gill membranes extend forward, free from isthmus, with the usual narrow free fold in front of which is a pouch; a sharp-pointed, acutely triangular, spiny projection, a little longer than eye, extending backward from shoulder girdle above axil of pectoral fin; dorsal spine pungent, with a flexible produced tip extending beyond branched rays a distance nearly equal to eye; pectoral spine heavy, broad, with antrorse spines anteriorly and strong retrorse spines along its posterior margins; gill rakers stiff, about 4 or 5+11; the maxillary barbel is heavy, gradually tapering to a fine filament and ending opposite caudal fin, shorter in the large paratype; adipose fin very long, twice length of anal fin base, $1\frac{1}{4}$ in length of head, and 3.9 in standard length; caudal peduncle rounded; caudal fin deeply forked; air bladder large. Mental barbels remote from tip of chin; eyes superior, not visible from below; supraoccipital process longer than its base and meeting the predorsal plate; below the lateral line are groups of fingerlike canals branching from the lateral line and ending in pores.

This new genus may be distinguished from related genera by the key on pages 187-189.

Genotype.—*Perrunichthys perruno*, new species.

Named *Perrunichthys* after the common name of this species, called *bagre perruno* by the people of the Maracaibo Basin.

PERRUNICHTHYS PERRUNO, new species

PERRUNO

FIGURE 3, d; PLATE 3, B

Holotype.—U.S.N.M. No. 121189, a specimen 270 mm. in standard length, taken in the Río Negro below the mouth of the Río Yasa, about 75 km. south of Rosario, west side of Lago Maracaibo, by Leonard P. Schultz, March 2, 1942.

Paratype.—U.S.N.M. No. 121200, a large specimen 620 mm. in standard length, taken along with the holotype and bearing the same data. In addition, a larger specimen was collected, but one of the men cut it in pieces with his machete and ruined it; thus it was not preserved. The top of head of the paratype also was cut deeply by a machete.

Description.—Based on the holotype and paratype. Detailed measurements of the two type specimens, in hundredths of the standard length, are given below, first for the holotype, followed by the paratype in parentheses. Standard length (in mm.) 270 (620).

Length of head to tip of supraoccipital process 34.6 (—); length of head to end of opercle 31.1 (29.4); greatest depth of body 17.6 (23.9); greatest width of head at base of pectorals 25.4 (26.9); length of snout 15.0 (14.8); diameter of eye 4.14 (3.23); width of fleshy interorbital space 12.8 (13.9); length of maxillary barbel 115 (82); length of outer mental barbel 50.4 (33.0); length of inner mental barbel 27.8 (21.0); total length of adipose fin 25.5 (24.7); length of base of anal fin 10.0 (12.3); height of adipose fin 5.36 (5.32); least depth of caudal peduncle 7.40 (7.90); length of caudal peduncle 18.9 (19.0); distance from anterior to posterior nasal opening 3.44 (2.90); distance from eye to posterior nasal opening 7.10 (7.58); snout to origin of dorsal fin 37.6 (—); snout to origin of anal 71.0 (68.0); snout to adipose 63.3 (66.0); snout to pelvic insertion 49.6 (—); snout to pectoral insertion 26.3 (—); anus to anal origin 10.7 (12.3); snout to anus 61.4 (—); length of dorsal spine 21.1 (14.5); length of dorsal spine and its prolonged fleshy tip 26.7 (21.8); length of longest ray of anal (first or second branched ray) 14.4 (13.4); length of longest (first branched) ray of pelvic fins 16.6 (14.8); length of pectoral spine 21.8 (19.0); length of longest ray of upper lobe of caudal fin 28.9 (25.3); length of longest ray of lower lobe of caudal fin 26.3 (—); length of shortest midcaudal ray 13.0 (11.3); postorbital length of head 14.0 (13.1); width of head across angle of mouth 18.5 (18.1); distance from tip of chin to base of inner mental barbel 5.00 (5.00); tip of chin to base of outer mental barbel 8.51 (7.90).

The following counts were made: Dorsal rays I, 8 (I, 7); anal v, 7 (v, 7); pectoral I, 10–I, 11 (I, 11–I, 11); pelvic i, 5 (i, 5); branched caudal fin rays 15 (15); number of gill rakers on first gill arch 5+11.

In addition to the characters given in the generic diagnosis, others are mentioned below. The greatest depth is about $5\frac{1}{2}$, head $3\frac{1}{4}$, in standard length; eye $3\frac{1}{2}$ in snout, $7\frac{1}{4}$ to 9 in head; bases of inner mental barbels only a trifle in front of bases of outer mental barbels, the latter reaching to base of pelvics or a little beyond; inner mental barbels reaching a little past pectoral bases in the holotype; posterior margins of dorsal and anal fins a little rounded, pectoral almost truncate and pelvics a little rounded to truncate; adipose fin high, its depth $4\frac{1}{2}$ in its length, the distance from adipose origin to rear base of dorsal about $1\frac{1}{2}$ height of adipose or $\frac{3}{4}$ interorbital space. All teeth villiform, and similar in mouth. Underside of head flat, nearly all in same plane.

Color.—Plain dark brownish above, pale below; somewhat mottled with pale brown; all median fins with large roundish, dark blotches,

giving these fins a mottled appearance; paired fins blackish; maxillary barbel blackish to dark brown basally, barred with brown distally; outer mental barbel barred with brownish; inner mental barbel pale; just inside band of teeth on lower jaw is a darkish band.

Remarks.—This new species differs from all other pimelodid catfishes in the shape, size, and arrangement of the villiform patches of teeth in the roof of the mouth, as well as in color pattern, length and shape of barbels, and concave interorbital space, among other differences.

Named *perruno* after the common name of this species in the Maracaibo Basin.

Genus BRACHYPLATYSTOMA Bleeker

Brachyplatystoma BLEEKER, Nederl. Tijdschr. Dierk., vol. 1, p. 97, 1863. (Type, *Platystoma vaillanti* Cuvier and Valenciennes.)

BRACHYPLATYSTOMA VAILLANTI (Cuvier and Valenciennes)

FIGURE 3, e

Platystoma vaillanti CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 21, pl. 423, 1840 (Cayenne and Surinam).—PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 469 (Calabozo).

Genus PSEUDOPLATYSTOMA Bleeker

Pseudoplatystoma BLEEKER, Nederl. Tijdschr. Dierk., vol. 1, p. 97, 1863. (Type, *Silurus fasciatus* Linnaeus).

PSEUDOPLATYSTOMA FASCIATUM (Linnaeus)

BAGRE RAYADO

FIGURE 3, a

Silurus fasciatus LINNAEUS, Systema naturae, ed. 12, vol. 1, p. 505, 1766.

Pseudoplatystoma fasciatum EIGENMANN and ALLEN, Fishes of western South America, p. 108, 1942 (La Plata northward to the Magdalena, Orinoco, and Guiana).—RÖHL, Fauna descriptiva de Venezuela, p. 375, 1942 (Río Apure at Bolívar).

Platystoma fasciatum PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 469 (Calabozo, Venezuela).

Genus PLATYSILURUS Haseman

Platysilurus HASEMAN, Ann. Carnegie Mus., vol. 7, p. 320, pl. 52, 1911. (Type, *Platysilurus barbatus* Haseman.)

This genus of pimelodid catfishes was not adequately described by Haseman. The following description is based entirely on the species found in the Maracaibo Basin:

Head greatly depressed; wide bands of villiform teeth on premaxillaries, vomer, palatines, and dentary. The arrangement of the teeth in roof of mouth is illustrated in figure 3, *g*. A broad, depressed snout, projecting a little beyond the lower jaw; nostrils widely separated, far forward on snout; eye superior; extremely long maxillary barbels, ossified as far back as opposite end of dorsal fin, then becoming flexible, band-shaped to opposite caudal fin base, thence tapering to a fine, hairlike filament opposite rear of caudal fin and continued beyond tips of rays of caudal fin; outer pair of mental barbels not quite so long as length of snout; inner or anterior pair of mental barbels about half length of outer or posterior ones; supraoccipital moderately broad, meeting the predorsal plate; a wide fontanel beginning on snout continues in middorsal line to behind eye where it becomes a narrow groove in the supraoccipital process; center of eye a little closer to tip of supraoccipital process than to tip of snout, and the width of the interorbital space closer to posterior end of gill cover than to tip of snout; interorbital space a little concave; pectoral spines strong, wide, with weak antrorse teeth on anterior margin and strong retrorse teeth on posterior margin, this spine as long as snout and eye together; dorsal spine strong, smooth anteriorly, but toothed along its posterior margin; gill membranes extending forward, free from the isthmus; a pouch in front of isthmus between bases of mental barbels; a large dermal fold on inside of gill cover; gill rakers bony, about 5 + 14; air bladder large, extending as far back as opposite pelvic girdle; snout projecting beyond tip of lower jaw; width of head at base of pectorals one-half distance from tip of snout to rear of supraoccipital process, or equal to distance from tip of snout to center of eye; base of adipose fin longer than anal fin base; caudal peduncle slender, caudal fin deeply forked; upper lobe with the upper ray produced, more or less filamentous; contour of ventral surface from pelvics to tip of snout flat, mostly in same plane.

KEY TO THE SPECIES OF PLATYSILURUS

- 1a. Total length of adipose fin 2.1 in snout to dorsal origin; anal origin barely behind a vertical line through adipose origin; pelvic insertion under bases of third to fourth dorsal soft rays and equal distance between tip of snout and midbase of caudal fin rays; head $3\frac{1}{2}$ in standard length; shortest midcaudal fin rays 2 times in eye to dorsal origin. *Platysilurus barbatus* Haseman
- 1b. Total length of adipose fin 2.3 to 2.7 in snout to dorsal origin; anal origin distinctly behind a vertical line through adipose origin; pelvic insertion under bases of 5 to 6 soft rays of dorsal and equal distance between base of maxillary barbel and midbase of caudal fin; head about 3 in standard length; shortest midcaudal fin ray about 3 times in distance from rear of eye to dorsal origin. *Platysilurus malarmo*, new species

PLATYSILURUS MALARMO, new species

MALARMO

FIGURE 3, *g*; PLATE 3, C

Holotype.—U. S. N. M. No. 121179, a specimen 316 mm. in standard length, collected by Leonard P. Schultz on May 2, 1942, in Lago Maracaibo, near the mouth of the Río Concho.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121182, 4 specimens, 276 to 328 mm., Río Socuy, 3 km. above mouth, February 24, 1942; U.S.N.M. No. 121201, a specimen 560 mm., same data; U.S.N.M. No. 121180, 4 specimens, 223 to 323 mm., Río Negro below mouth of Río Yasa, March 2, 1942; U.S.N.M. No. 121181, 4 specimens, 288 to 350 mm., Río Apón, about 35 km. south of Rosario, Maracaibo Basin, February 26, 1942. All these specimens came from deep pools over sandy to muddy bottoms.

Description.—Based on the holotype and paratypes listed. Measurements for these, expressed in hundredths of the standard length, first for the holotype, then for the paratype in parentheses, respectively, are given below. Standard length (in mm.) 316 (223).

Length of head from tip of snout to tip of supraoccipital process 38.9 (38.3); length of head to end of operculum 34.5 (34.1); greatest depth 18.7 (15.5); width of head at base of pectorals 20.0 (19.3); length of snout 19.3 (19.5); postorbital length of head (to end of operculum) 12.2 (11.9); width of snout through corners (rictus) of mouth 12.7 (12.6); diameter of eye 3.16 (3.95); width of fleshy interorbital space 7.55 (7.62); length of maxillary barbel 194.5 (to where filament begins 161); length of outer mental barbel 22.0 (16.8); length of inner mental barbel 12.3 (10.3); total length of adipose fin 17.5 (17.8); greatest height of adipose fin 5.44 (7.18); length of base of anal fin 9.82 (10.5); least depth of caudal peduncle 5.85 (4.93); length of caudal peduncle 16.2 (16.2); distance from anterior to posterior nostril 4.55 (5.16); distance from eye to posterior nostril 13.0 (12.4); tip of chin to base of inner or anterior mental barbel 12.7 (12.6); tip of chin to outer or posterior mental barbel 13.0 (11.4); snout to origin of dorsal fin 43.1 (42.6); snout to origin of anal 76.6 (74.9); snout to origin of adipose fin 71.2 (69.5); snout to insertion of pelvics 55.4 (52.0); snout to insertion of pectorals 33.4 (29.7); anus to anal origin 17.1 (17.1); snout to anus 60.1 (57.8); length of dorsal spine 17.6 (—); length of pectoral spine 21.7 (23.6); length of longest ray of pelvics 15.2 (12.7); length of longest ray of anal 13.8 (12.6); length of longest ray of upper lobe of caudal fin 51.2 (38.6 with tip broken off); length of longest ray of lower lobe of caudal fin 39.5 (—); length of shortest midcaudal fin ray 10.3 (7.2).

The following counts were made: Dorsal I,6 (I,6); anal vi, 9 (vi,9); pectoral I,10 (I,9); pelvic i,5 (i,5); branched rays of caudal fin 15 (16); number of gill rakers on first gill arch — (5+12).

The caudal peduncle is slender, rounded; origin of anal a little behind that of adipose origin; pelvies inserted about under the fourth branched ray of the dorsal; the supraoccipital process is a little divided in the midline posteriorly, so that the predorsal plate projects a little into the supraoccipital process; a fontanel begins on snout and extends backward through interorbital space almost to base of supraoccipital process; eyes superior-lateral in position, not showing from below, about 2 to 2.2 in interorbital space, and 4.8 to 5.3 in the snout; postorbital length of head about $\frac{1}{10}$ length of snout; width of snout at corners of mouth $\frac{3}{4}$ width of head at base of pelvies; total length of adipose fin 5 to $6\frac{1}{2}$ times in standard length; height of adipose fin about $2\frac{1}{2}$ in its total length; adipose fin length a little shorter than snout but much longer than base of anal fin; pectoral spine almost as long as snout and eye; the filamentous end of the maxillary barbel, if unbroken, is as long as or longer than the ossified part of this barbel, the ossified part reaching to opposite rear of dorsal fin; other characters described under the genus.

Color.—Grayish to blackish or brownish above, paler on lower sides, white ventrally; the most consistent and prominent color mark is a large black spot at base of upper lobe of caudal fin; sides of body with an irregular row of large black blotches more or less along lateral line anteriorly, but above it on caudal peduncle; in the holotype the black spots are less prominent than on all the other paratypes, but it was selected because it was a more perfect specimen otherwise; sometimes smaller black spots are scattered on back, as well as on dorsal, adipose, and sometimes on basal parts of caudal fin; anal and paired fins white; lower half of lower lobe of caudal fin blackish, the upper part of this lobe white; upper lobe pale grayish, the long upper simple ray dark grayish; peritoneum pale.

Remarks.—This new species differs from all other pimelodid catfishes in the extremely long barbels in combination with the color pattern and arrangement of the broad villiform patches of teeth widely separated from each other and from *P. barbatus* as indicated in the key on page 233.

Named *malarmo* (bony-cheek) after the common name of this species as given to me by the Venezuelans who went along with me on the trip to the Río Negro in the territory of the hostile Motilone Indians.

Family CALLOPHYSIDAE

Genus CALLOPHYSUS Müller and Troschel

Callophysus MÜLLER and TROSCHER, Horae ichthyologicae, pt. 3, p. 1, 1849.
(Type, *Pimelodus macropterus* Lichtenstein.) (Ref. copied.)

CALLOPHYSUS MACROPTERUS (Lichtenstein)

ZAMURITO

Pimclodus macropterus LICHTENSTEIN, Wiedemann's Zool. Mag., vol. 1, pt. 3, p. 59, 1819 (Brazil).

Callophysus macropterus PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 470 (Apure River, Venezuela).

Family AUCHENIPTERIDAE

KEY TO THE GENERA OF AUCHENIPTERIDAE REPORTED FROM VENEZUELA

- 1a. Anal base long, of 16 to 40 branched rays; pectoral spine pungent, pectoral rays usually I, 7; postcleithral process a triangular, broad-based, spiny projection.
- 2a. Teeth villiform in a band on premaxillaries and on dentaries, no teeth on palatines.
- 3a. Pelvic rays i, 5; caudal fin truncate or a little concave; anterior or outer margin of pectoral spine serrated distally, the teeth antrorse; bases of anterior pair of mental barbels far in advance of bases of posterior ones; lower jaw a little longer than upper jaw.—*Trachycorystes* Bleeker
- 3b. Pelvic rays i, 7; caudal fin forked; anterior margin of pectoral spine smooth, not serrated; bases of anterior pair of mental barbels in front of bases of posterior ones.....*Pseudauchenipterus* Bleeker
- 2b. Upper jaw sharp-edged, with a single series of teeth along edge, lower jaw with about 2 series of teeth in front, a single series on side; pectoral spine with spines on anterior and posterior sides; caudal fin forked; adipose fin short; dorsal and pectoral spine pungent.—*Entomocorus* Eigenmann
- 1b. Anal base short, of about 7 to 11 rays; adipose fin base shorter than anal fin base; pelvic rays i, 5 and pectoral about i, 5; postcleithral process a narrow-based spiny projection; dorsal surface of head covered by a wide bony plate with lateral wings opposite dorsal origin, this plate formed by expanded supraoccipital process fused with dorsal plate; caudal fin forked.
Centromochlus Kner

Genus TRACHYCORYSTES Bleeker

Trachycorystes BLEEKER, Act. Soc. Sci. Ind.-Med., vol. 4, p. 200, 1857-58. (Type, *Trachycorystes typus* Bleeker.)

KEY TO THE SPECIES OF TRACHYCORYSTES REPORTED FROM VENEZUELA

- 1a. Least depth of caudal peduncle 2.2 to 2.7 in length of anal base and 1.6 to 2.0 in pectoral spine; caudal fin slightly concave; anal rays iii, 23 to iii, 25.
Trachycorystes insignis peloichthys, new subspecies
- 1b. Least depth of caudal peduncle 1.5 to 1.9 in length of anal base and 1.2 to 1.4 in pectoral spine; caudal fin truncate or a trifle rounded; anal rays iii, 24 in a specimen from British Guiana.....*Trachycorystes galeatus* (Linnaeus)

TRACHYCORYSTES INSIGNIS PELOICHTHYS, new subspecies

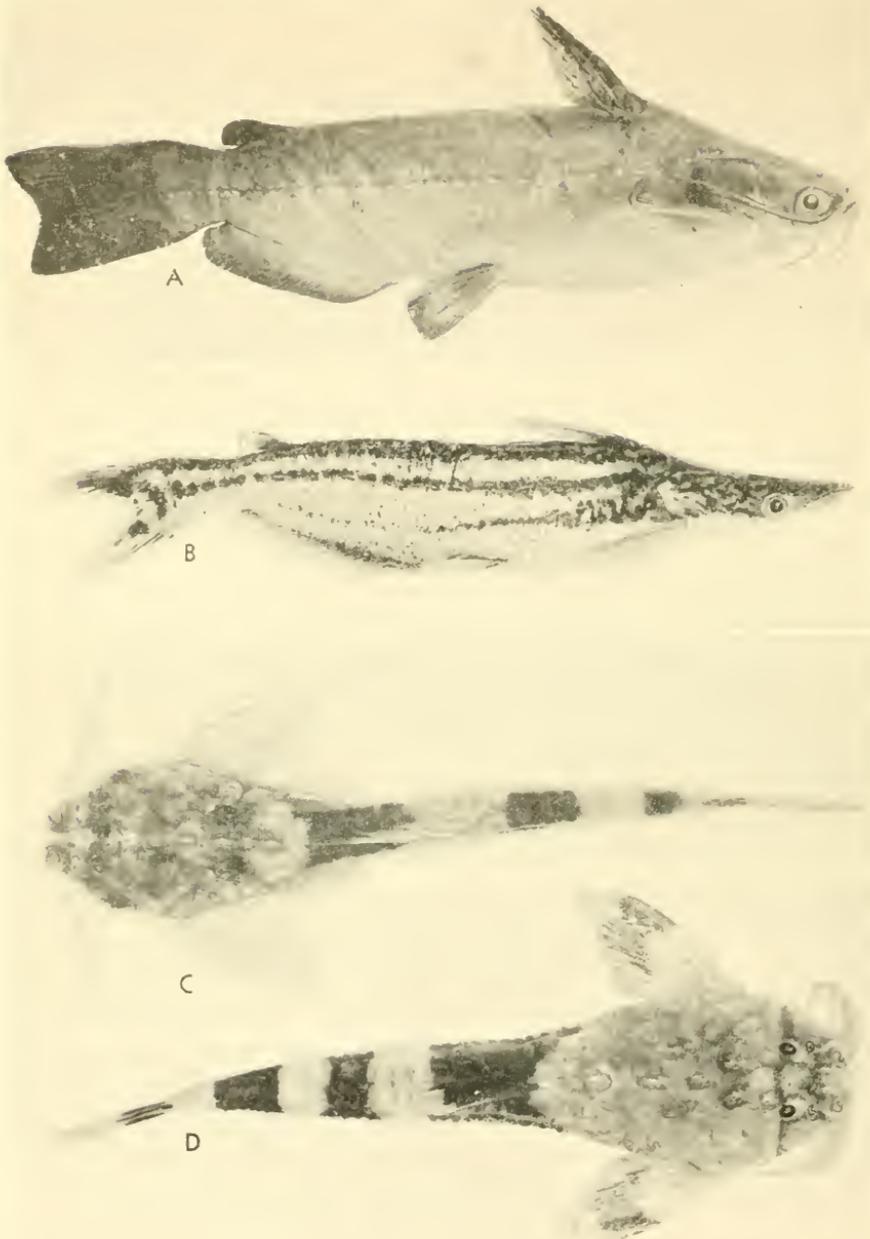
PLATE 4, A

Holotype.—U.S.N.M. No. 121281, a specimen 160 mm. in standard length, collected by Leonard P. Schultz, May 1, 1942, in the Río Agua Caliente, 2 to 3 km. above Lago Maracaibo, Venezuela.

Paratypes.—U.S.N.M. No. 121282, 4 specimens, 133 to 160 mm. in



A, *Cetopsorhamdia orinoco*, new species: Holotype (U.S.N.M. No. 121214), 53.5 mm. in standard length; B, *Perrunichthys perruno*, new genus and species: Holotype (U.S.N.M. No. 121189), 270 mm.; C, *Platysilurus malarino*, new species: Holotype (U.S.N.M. No. 121179), 316 mm. A and B, retouched photographs; C, drawing.



A, *Trachycorystes insignis peloichthys*, new subspecies: Holotype (U.S.N.M. No. 121281), 160 mm. in standard length; B, *Ageneiosus freiei*, new species: Holotype (U.S.N.M. No. 121260), 207 mm.; C, *Hoplomyzon atrizona petroleus*, new subspecies: Holotype (U.S.N.M. No. 121070), 25.3 mm.; D, *Dupouyichthys sapito*, new genus and species: Holotype (U.S.N.M. No. 121072), 23 mm. Retouched photographs.

standard length, taken along with the holotype and bearing the same data. These types were taken in about 18 feet of water, the bottom very muddy and with much vegetable debris.

Description.—Based on the holotype and four paratypes. Detailed measurements were made on the holotype and two paratypes, and these data are recorded in table 8.

The following counts were made, respectively, for holotype, then paratypes: Dorsal rays I, 6; I, 6; I, 6; I, 6; anal iii, 25; iii, 25; iii, 24; iii, 25; iii, 23; pectoral I, 7-1, 7; I, 8; I, 7-I, 7; I, 7-I, 7; I, 7-I, 7; pelvic i, 5; i, 5; i, 5; i, 5; i, 5; branched caudal rays on three paratypes counted were 15; a paratype had 2+7 gill rakers on first gill arch.

TABLE 8.—Measurements, expressed in hundredths of the standard length, for two subspecies of *Trachycorystes insignis*

Characters	<i>peloichthys</i>			<i>insignis</i>
	Holotype (♀)	Paratypes (♀)	Paratype (♂)	U.S.N.M. No. 79233 (from El Banco, Colombia) (♀)
Standard length (in mm.)	160	161	140	162.5
Length of head to end of operculum	27.3	29.2	27.1	27.7
Greatest depth	26.3	25.5	26.1	26.5
Length of snout	10.2	9.63	10.7	9.53
Diameter of eye	5.32	6.33	4.71	4.92
Interorbital width	17.4	17.0	18.2	16.6
Anterior to posterior nostrils	4.69	4.66	4.36	4.61
Distance from eye to anterior nostril	5.63	4.97	6.07	5.66
Width of mouth across its outer angles	15.6	17.4	15.7	14.6
Width of head across base of pectorals	23.4	25.5	25.1	23.4
Length of maxillary barbel	33.5	35.4	40.7	34.5
Length of anterior mental barbel	12.1	12.7	11.9	9.84
Length of posterior mental barbel	20.4	22.1	23.9	18.5
Least depth of caudal peduncle	10.6	11.8	10.7	11.4
Length of caudal peduncle	11.8	11.0	9.43	11.7
Total length of adipose fin	11.9		12.7	10.5
Length of base of a lipose fin	6.88	6.20	5.72	5.54
Length of base of anal fin	26.3	27.3	28.6	25.8
Snout to dorsal origin	31.9	32.2	32.0	31.4
Snout to anal origin	65.6	63.5	64.3	63.8
Snout to adipose origin	81.0	79.5	78.0	79.4
Snout to pelvic insertion	51.6	50.9	50.2	51.0
Snout to pectoral insertion	21.9	24.2	23.9	22.5
Snout to anus	63.5	61.5	60.7	62.1
Length of dorsal spine	21.6		32.9	25.6
Length of pectoral spine	21.1	22.0	21.4	21.6
Longest branched ray of pelvics	13.3	14.0	16.4	13.8
Longest branched ray of pectorals	18.8	20.7	18.6	21.2
Longest branched ray of dorsal	20.7	17.9	24.0	21.8
Longest branched ray of anal	10.3	10.9	12.1	8.61
Longest ray of upper lobe of caudal fin	21.1	25.5	24.0	23.7
Longest ray of lower lobe of caudal fin	21.3	22.7	23.4	22.6
Distance from tip of gill cover to tip of postcleithral process above upper base of pectoral fins	7.56	7.76	7.96	9.54

Head much depressed anteriorly, body compressed; snout bluntly rounded, the lower jaw a little projecting; eyes lateral, visible from below as well as from above; gill membranes joined to sides of head, the gill opening not extending beyond base of pectoral fin; margin of eye not free; teeth villiform, in a narrow band on premaxillaries and on dentary, no teeth on vomer or palatines; pectoral spine strong, the anterior or outer margin with antrorse teeth, and much stronger retrorse ones on inner surface; dorsal spine strong, not serrated, in males this spine longer, bent, and crooked; nostrils wide apart, the anterior pair tubular at front of snout; maxillary barbel in a groove below eye, not extending quite to tip of pectoral spine, this barbel with a bony base in males; two pairs of mental barbels, the anterior pair shortest, their bases near front of lower jaw and reaching a little past a line between rear margins of eye, the posterior pair about opposite front of eye and reaching to behind pectoral base; adipose fin base short and fin short; anal base as long as head; least depth of caudal peduncle about 3 times in snout to dorsal origin, 1.6 to 2.0 in pectoral spine, and 2.2 to 2.7 in anal fin base; length of postcleithral process behind head 2.3 to 3.1 in length of pectoral spine, 3.5 to 4.5 in snout to dorsal origin, and 1.5 to 1.7 in least depth of caudal peduncle; head 3.4 to 3.7 and depth 3.7 to 4.0 in standard length; caudal fin a little concave; eye 3.7 to 3.9 in interorbital space; rear margins of dorsal and of pectorals truncate, other fins rounded; dorsal and pectoral spines about equal in length, except in males the dorsal spine elongated and crooked; supraoccipital process broad, reaching base of dorsal fin and giving off nine pairs of wings that reach a little below front of dorsal fin base; frontal fontanel narrow, between orbits; anus near anal origin; pelvics reach to anal origin, pectoral reaches two-thirds the way to pelvic base; first anal rays of male longer than other rays of this fin.

Color.—Blackish above with golden-brown reflections showing on upper sides and back when alive, this golden-brown fading when specimens were preserved and remaining as pale areas, giving an obscure mottled effect; belly paler, white in most of the specimens, although the black pigment occurs on front of lower jaw and under side of head in irregular patches; all fins blackish, the caudal a little mottled; peritoneum pale.

Remarks.—This new subspecies differs from *Trachycorystes insignis insignis* in having a shorter postcleithral process, the length of this behind the operculum being 2.3 to 3.1 in length of pectoral spine, 3.5 to 4.5 in snout to dorsal origin and 1.5 to 1.7 in least depth of caudal peduncle instead of 2.1 to 2.5 in the pectoral spine, 2.8 to 3.2 in snout to dorsal origin, and 1.0 to 1.3 in least depth of the caudal peduncle. The dorsal and pectoral spines in females are little longer in *insignis* than in *peloichthys*.

Named *peleichthys* in reference to its living in very muddy bottoms with much vegetable debris.

TRACHYCORYSTES GALEATUS (Linnaeus)

Silurus galeatus LINNAEUS, Systema naturae, ed. 12, vol. 1, p. 503, 1766 (based on Seba, Locupletissimi rerum naturalium thesauri . . ., vol. 3, pl. 29, fig. 7, 1761). (Ref. copied.)

Auchenipterus galeatus PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 470 (Calabozo, Venezuela).

Auchenipterus maculosus PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

Trachycorystes galeatus EIGENMANN and ALLEN, Fishes of western South America, p. 119, pl. 5, fig. 1, 1942 (Orinoco).

Genus PSEUDAUCHENIPTERUS Bleeker

Pseudauchenipterus BLEEKER, Nederl. Tijdschr. Dierk., vol. 1, p. 88, 1863. (Type, *Silurus nodosus* Bloch.)

PSEUDAUCHENIPTERUS NODOSUS (Bloch)

Silurus nodosus BLOCH, Naturgeschichte der ausländischen Fische, vol. 8, p. 35, pl. 368, 1794.

Pseudauchenipterus guppyi FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 63, p. 433, 1911 (Pedernales, Venezuela).

Pseudauchenipterus nigrolineatus FOWLER, *ibid.*, p. 434, fig. 5 (Pedernales, Venezuela).

P. guppyi Regan, and *P. nodosus* as figured by Eigenmann (Mem. Carnegie Mus., vol. 5, pl. 20, fig. 2, 1912), are the same species as described by Fowler as *P. nigrolineatus* (*op. cit.*, fig. 5). Although *guppyi* and *nigrolineatus* are the same species, it is possible that they differ from *nodosus*, but they cannot be separated until a large series of color variations is studied.

Genus ENTOMOCORUS Eigenmann

Entomocorus EIGENMANN, Ann. Carnegie Mus., vol. 11, p. 403, 1917. (Type, *Entomocorus benjamini* Eigenmann.)

ENTOMOCORUS BENJAMINI Eigenmann

Entomocorus benjamini EIGENMANN, Ann. Carnegie Mus., vol. 11, p. 403, fig. 3, pl. 41, 1917 (San Joaquin; Río Santa Rita).—MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 97, 1942 (Laguna El Guacimo, 3 km. west of San Fernando de Apure, Venezuela).

Genus CENTROMOCHLUS Kner

Centromochlus KNER, Sitzb. Akad. Wiss. Wien, vol. 26, p. 430, 1858. (Type, *Centromochlus megalops* Kner.) (Ref. copied.)

KEY TO THE SPECIES OF CENTROMOCHLUS REPORTED FROM VENEZUELA

- 1a. Insertion of pelvic fins closer to tip of snout than to midcaudal base; anal rays 9 or 10; chocolate-brown above, pale below, sides and caudal with oval light spots.....**Centromochlus aulopygius** Kner
- 1b. Insertion of pelvic fins closer to midcaudal base than to snout tip; anal rays 7; no oval light spots.....**Centromochlus heckelii** (Filippi)

CENTROMOCHLUS AUOPYGIUS Kner

Centromochlus auopygius KNER, Sitzb. Akad. Wiss. Wien, vol. 26, p. 432, pl. 8, figs. 25, 1858 (Río Guapore).—PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

CENTROMOCHLUS HECKELII (Filippi)

Auchenipterus heckelii FILIPPI, Guer. Rev. et Mag. Zool., 1853, p. 166 (ref. copied).

Centromochlus heckelii PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

Family AGENEIOSIDAE

Genus AGENEIOSUS Lacepède

Ageneiosus LACEPÈDE, Histoire naturelle des poissons, vol. 5, p. 132, 1803. (Type, *Ageneiosus armatus* Lacepède.)

KEY TO THE SPECIES OF AGENEIOSUS REPORTED FROM VENEZUELA

- 1a. Caudal fin forked; pectoral spines pungent.
- 2a. No wide black band along middle of sides continuous to base of caudal fin and no trace of another black band below this one; anal base without pigment or with just a trace; greatest depth at dorsal origin 1.6 to 1.75 in the head; center of eye to tip of snout greater than distance from center of eye to rear of head by the distance between anterior and posterior nostrils; pectoral rays usually I, 11 or I, 12; anal rays iv, 32 to iv, 35.
Ageneiosus caucanus Steindachner
- 2b. A wide black lateral band, sometimes broken into more or less continuous black blotches posteriorly, continuing to base of caudal fin; another band below this anteriorly, fading into a series of small spots over anal base and not reaching caudal fin; all black bands separated by wide pale bands, the one above black lateral band enclosing a large black blotch each side in front of dorsal fin; anal base heavily pigmented; greatest depth at dorsal origin 2.0 to 2.3 times in head; center of eye to tip of snout equal to distance or greater than distance from center of eye to rear of head by not over 0.4 distance between nostrils; pectorals usually I, 13.....*Ageneiosus freiei*, new species
- 1b. Caudal fin emarginate; pectoral rays not pungent; width of head about $1\frac{1}{2}$ in its length; steel-blue above, pale below; dorsal spotted; caudal with pale margin.....*Ageneiosus brevifilis* Cuvier and Valenciennes

AGENEIOSUS CAUCANUS Steindachner

Ageneiosus caucanus STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 42, p. 61, pl. 6, figs. 1, 1a, 1879 (Río Cauca).

Ageneiosus paradalis LÜTKEN, Vid. Medd. Naturh. Foren. Kjøbenhavn, pts. 12-16, p. 190, 1874 (Caracas, Venezuela). (Probably this is some other species, but since its identity is not clear from the description by Lütken it is best to leave it with *caucanus* where other authors have referred it.)

AGENEIOSUS FREIEL, new species

DONCELLA

PLATE 4, B

Ageneiosus caucanus MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 97, 1942 (river 10 km. south of Lagumillas, tributary to Lago Maracaibo, Venezuela).

Holotype.—U.S.N.M. No. 121260, a specimen 207 mm. in standard length, collected by Leonard P. Schultz, May 1, 1942, in the Río Agua Caliente, 2 to 3 km. above Lago Maracaibo.

Paratypes.—U.S.N.M. No. 121261, 2 examples, 215 and 228 mm., collected along with the holotype and bearing the same data; U.S.N.M. No. 121262, 2 specimens, 203 and 370 mm., collected by Leonard P. Schultz, March 2, 1942, in the Río Negro below the mouth of the Río Yasa, west side of Lago Maracaibo, Venezuela.

Description.—Based on the holotype and paratypes listed above. Detailed measurements were made on the holotype and two paratypes, and these data are recorded in table 9. Certain counts were made and these have been recorded in table 10. In one specimen of *freiei* the pectoral fin on one side had the count of I, 11, but the last ray was much larger than usual and perhaps an injury had removed the last rays, although it looked normal otherwise. The holotype has the following fin-ray counts: Dorsal rays I, 6; anal iv, 33; pectoral I, 13—I, 13; pelvic i, 6; branched caudal fin rays 15. The number of gill rakers is 3+10.

The body is compressed, but the front of the head, especially the snout, is greatly depressed, flat, and thin; the snout projects beyond the lower jaw; the eyes are lateral and can be seen equally from above or below; the width of the head across outer angle of maxillaries is about equal to the width across base of pectorals; the profile just in front of dorsal fin is steep; the supraoccipital process meets the bony predorsal plate; the nostrils are widely separated, the posterior one is twice the distance between the anterior and posterior ones from the eye, anterior nostril near front of snout; teeth villiform, in a wide band on premaxillaries, and a narrower band on dentaries; gill membranes joined to the isthmus; adipose fin small, with a narrow base; dorsal spine pungent, as is pectoral spine; anal fin long, its base almost as long as the head; depth at origin of dorsal about $5\frac{1}{2}$ to $6\frac{1}{4}$ in the standard length, and 2 to $2\frac{1}{2}$ in the head; width across angles of mouth 1.6 to 1.95 in the head; head 2.6 to 3 in standard length; maxillary barbel not reaching past rictus of mouth; gill rakers short, stiff, few in number; margin of eyes not free; caudal fin deeply concave, forked, lobes almost equal, the upper a little more pointed and a trifle longer; rear margin of pectoral fin truncate; posterior margin of pelvics truncate to a little concave; first branched rays of anal longest.

TABLE 9.—Measurements, in hundredths of the standard length, for two species of *Agegneiosus*.

Characters	<i>freiei</i>			<i>caucanus</i>
	U.S.N.M. No. 121260	U.S.N.M. No. 121261	U.S.N.M. No. 121262	U.S.N.M. No. 78254
Standard length (in mm.).....	207	215	370	204
Length of head to end of operculum.....	33.6	35.7	32.3	29.4
Greatest depth of body.....	19.3	18.6	16.7	17.4
Length of snout.....	15.9	16.7	16.5	14.5
Diameter of eye.....	4.83	4.05	3.11	4.76
Width of interorbital space.....	14.4	16.0	16.9	13.4
Distance between anterior and posterior nostrils.....	3.67	3.68	3.40	3.68
Distance from eye to anterior nostril.....	10.2	11.2	10.8	9.85
Width (greatest) of premaxillary band of teeth.....	3.29	3.35	2.97	2.55
Width of mouth across outer corners of upper jaw.....	16.5	16.7	18.9	15.7
Width of head at base of pectorals.....	18.8	18.7	19.9	17.9
Length of maxillary barbel.....	4.54	3.05	5.86	3.73
Least depth of caudal peduncle.....	7.49	6.51	6.49	6.86
Length of caudal peduncle.....	10.8	9.77	12.0	12.1
Total length of adipose fin.....	8.50	6.70	7.43	7.45
Length of anal fin base.....	27.8	29.7	29.6	29.1
Snout to dorsal origin.....	35.1	36.3	34.7	32.5
Snout to anal origin.....	63.3	62.8	60.8	62.2
Snout to adipose origin.....	82.2	81.7	81.9	80.9
Snout to pelvic insertion.....	52.6	51.6	49.8	47.6
Snout to pectoral insertion.....	30.7	32.1	29.2	28.7
Snout to anus.....	61.1	60.5	59.4	57.0
Length of dorsal spine.....	16.4	-----	10.5	17.9
Length of pectoral spine.....	14.5	12.9	13.5	14.7
Longest branched ray of pelvic fin.....	13.0	12.3	10.1	13.0
Longest branched ray of pectoral fin.....	14.3	14.5	13.3	14.0
Longest branched ray of dorsal fin.....	18.0	17.4	15.7	17.6
Longest branched ray of anal fin.....	10.6	9.07	8.38	11.0
Longest ray of upper lobe of caudal fin.....	22.0	21.1	14.6	20.7
Longest ray of lower lobe of caudal fin.....	21.5	19.0	14.5	19.4

TABLE 10.—Counts made on three species of *Agegneiosus*.

Species	Number of fin rays										Number of gill rakers on first arch										
	Dor- sal	Anal					Pectoral					Above angle		Below angle				Total			
		I, 6	iv, 32	iv, 33	iv, 34	iv, 35	I, 11	I, 12	I, 13	I, 14	i, 15	3	4	10	11	12	13	13	14	15	16
<i>freiei</i>	5	1	2	2	-----	?1	-----	8	1	-----	2	1	1	-----	1	1	1	-----	1	-----	1
<i>caucanus</i>	6	1	4	4	1	3	8	-----	-----	-----	3	3	1	3	2	-----	1	2	2	1	-----
<i>brevifilis</i>	2	2	-----	-----	-----	-----	-----	-----	-----	4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Color.—Dark above, paler below, with a pale band beginning around a large black blotch back of head and a little in front and below dorsal origin, continuing to base of caudal fin, where it may be interrupted by a more or less broken band at base of caudal fin rays; a wide black band beginning near upper end of gill opening continues along upper midsides to midbase of caudal fin, this band posteriorly sometimes

composed of more or less joined black blotches; another black band beginning near upper base of pectoral fin, sometimes connected to the black band above by branching black bars, continues posteriorly and curves gently below middle of sides, then fades out over base of anal fin; sometimes the pale areas on sides are finely spotted; dorsal surface of head mottled; a pale middorsal streak along the back behind dorsal fin; the black band at each side of this pale streak meets in front of dorsal origin; upper surfaces of paired fins pigmented; dorsal and anal fins speckled; the caudal fin is variable in color, usually a black blotch occurs in middle of basal part of caudal rays surrounded by pale, then enclosed dorsally and posteriorly by wide areas of black pigment and sometimes anteriorly and ventrally too; in the largest specimen the color of the caudal fin is reduced to the midbasal black blotch and a large black blotch near middle of each lobe of the caudal fin with other black blotches of various sizes distally and basally; underside of head and belly white except a narrow line of pigment under and around lower margin of orbit.

Remarks.—This new species is most closely related to *Ageneiosus caucanus* and differs from it and all other species of *Ageneiosus* in its color pattern. It has two black bands on sides below the one along the back instead of but one or two very incomplete ones on *caucanus*. In addition, *freiei* has I, 13 or I, 14 (usually I, 13) pectoral fin rays instead of I, 11 or I, 12 (usually I, 12) in *caucanus* (counts made on specimens from the Río Tuysa, Panama). No specimen was available from the type locality, Río Cauca, but since Eigenmann, as well as Meek and Hildebrand, has identified the Panama specimens as the same as those in the Río Cauca, my separation is based on examination of numerous Panama specimens, and figures published by Steindachner on specimens from the Río Cauca of Colombia.

Named *freiei* in honor of Dr. Alvin J. Freie, division geologist of the Lago Petroleum Corporation, Venezuela, who helped me in many ways to collect fishes in the Maracaibo Basin.

AGENEIOSUS BREVIFILIS Cuvier and Valenciennes

LAULÁO

Ageneiosus brevifilis CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 242, 1840 (Cayenne).

Hypophthalmus dawall RÖHL, Fauna descriptiva de Venezuela, p. 385, 1942 (Apure and Orinoco; market of Ciudad Bolívar).

Family BUNOCEPHALIDAE

KEY TO THE GENERA AND SPECIES OF BUNOCEPHALIDAE FROM THE MARACAIBO BASIN

- 1a. Three plates between anus and origin of anal fin, these plates appearing to be fused in midventral line and the one in front of anal fin having lateral wings; no papillae or barbel on upper lip or around corners of mouth; 4 black color bars meeting in midventral line; a narrow black band across

head through eyes; 6 barbels, 4 mental and 2 maxillary; dorsal i, 4 or i, 5; anal ii, 5 or ii, 6; platelets in lateral line 33 to 39. (Fig. 4, b.)

Dupouyichthys sapito, new genus and species

1b. Five or six plates between anus and origin of anal fin; a barbel at each corner of gape of mouth near base of maxillary barbel; dorsal i, 6; anal usually iii, 4; 4 short papillae on upper lip; 4 mental and 2 maxillary barbels; no black streak across eyes; platelets in lateral line 50.

2a. Four black saddles dorsally, the last one on base of caudal fin rays and next to last at posterior end of caudal peduncle, separated by a narrow pale interspace; black area of dorsal fin with concave dorsal margin and the black is restricted to basal part of fin. (Fig. 4, a.)

Hoplomyzon atrizona petroleus, new subspecies

2b. Three black saddles dorsally, the last one extending on basal portion of caudal fin rays; black blotch on dorsal fin with convex dorsal or distal margin and occupying anterior two-thirds of fin. (Fig. 4, a.)

Hoplomyzon atrizona atrizona Myers

DUPOUYICHTHYS, new genus

This new bunocephalid catfish genus from the Motatán system, Maracaibo Basin, is related to *Hoplomyzon* Myers. It differs in having but three plates in front of the anal origin instead of five or six, in lacking a barbel at front corners of mouth, and the absence of four papillae on the upper lip; in addition, the fleshy tips of the spiny pelvic fin rays are exerted.

This genus has a depressed head and hexagonally shaped body posteriorly, the under surface on the same general plane; a bony protuberance at rear of supraoccipital, followed by two or more between this one and origin of dorsal; a line passing through insertion of pelvics is about a third closer to origin of dorsal than to insertion of the pectoral fin; greatest depth of body at origin of dorsal and greatest width of body at bases of pectoral fins; body armed by a dorsal and a ventral series of plates and a series of tiny platelets along the lateral line; these plates are essentially the same as in *H. atrizona*; skin everywhere finely papillate; upper lip without the four papillae found in the other related species; lower lip thin, not papillate; nostrils widely separated, the anterior one tubular; anus a trifle closer to tip of snout than end of depressed anal fin and about a snout's length in front of the origin of the anal fin; snout broadly rounded, with a median depression; interorbital a little concave, the supraorbital rims elevated anteriorly; six barbels, two pairs of mental barbels and a maxillary pair, the latter connecting with the side of the head in front of the orbits by a membrane; maxillary barbels extend to front of base of coracoid process; pectoral spine armed on its inner side with five or six spines; pelvic spine with exerted tip, the first soft ray about a third longer than the spine; a membrane connects the tip of the last soft dorsal ray with the back; but the membrane connecting the last ray of anal with the body does not extend quite to the tip of the

last anal ray; gill openings small, inferior, a little in front of base of pectorals; eyes small, their rear margin about equidistant between the tip of snout and end of supraoccipital knob; caudal fin truncate, the first branched ray of lower lobe longest.

Genotype.—*Dupouyichthys sapito*, new species.

Named *Dupouyichthys* in honor of my friend Dr. Walter Dupouy, director of the Musco de Ciencias Naturales, Caracas, Venezuela.

DUPOUYICHTHYS SAPITO, new species

SAPITO

PLATE 4, D; FIGURE 4, b

Holotype.—U.S.N.M. No. 121072, a specimen 23 mm. in standard length, collected by Leonard P. Schultz, March 17, 1942, in the Río Motatán, at the bridge 22 km. north of Motatán.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121073, 3 specimens, 21 to 22.7 mm. in standard length, taken along with the holotype and bearing the same data; U.S.N.M. No. 121074, 3 specimens, 18 to 18.5 mm., from the Río San Juan about 12 km. south of Rosario, Maracaibo Basin, February 26, 1942; U.S.N.M. No. 121122, 1 specimen, 18.5 mm., from the Río Negro, below mouth of Río Yasa, Maracaibo Basin, March 2, 1942.

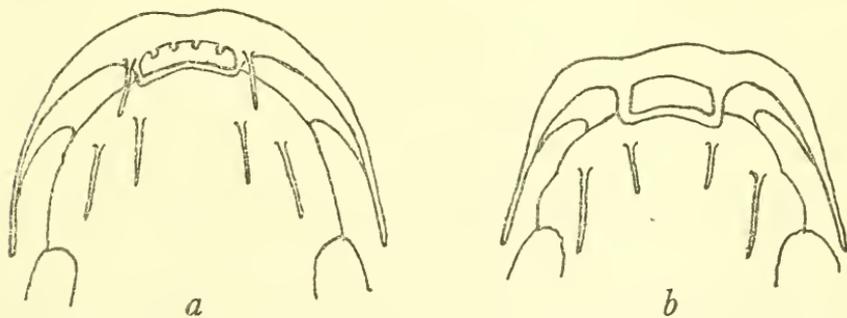


FIGURE 4.—Sketches of the underside of the head of two Bunocephalidae: a, *Hoplomyzon atrizona atrizona* Myers and *H. a. petroleus*, new subspecies; b, *Dupouyichthys sapito*, new genus and species.

Description.—Based on the holotype and 7 paratypes listed above. Detailed measurements were made on the holotype and one paratype and recorded in hundredths of the standard length, respectively. Standard length (in mm.) 23 and 20.7; total length 27.4 and 26 mm.

Length of head from tip of snout to posterior tip of supraoccipital 30.9 and 31.4; width of head at coracoids 30.0 and 33.3; greatest depth of body 17.4 and 18.4; postorbital length of head 16.1 and 17.4; length of snout 13.5 and 15.0; diameter of eye 2.61 and 2.90; width of fleshy

interorbital space 7.82 and 8.21; width of gape of mouth 9.13 and 9.66; longest (outer) mental barbel 11.3 and 11.1; length of maxillary barbel measured from its anterior base to its tip 22.2 and 20.3; distance between anterior nostrils 5.15 and 5.80; anus to anal origin 11.7 and 13.5; tip of snout to anus 4.09 and 5.84; length of base of dorsal fin from bony origin to end of membranous base 24.8 and 24.6; length of first ray of dorsal fin 20.9 and 22.2; length of last ray of dorsal fin 13.5 and 12.5; length of first ray of anal fin 23.9 and 19.3; length of pectoral spine to its fleshy tip 28.2 and 32.4; length of pelvic spine to its fleshy tip 16.5 and 18.4; length of upper ray of caudal fin 18.3 and 19.3; length of lower simple ray of caudal fin 21.9 and 25.1; length of (longest) branched ray of caudal fin 21.7 and 22.9; length of depressed anal fin 28.3 and 28.5; length of caudal peduncle or distance from base of last anal ray to midbase of caudal fin rays 32.1 and 33.3; least depth of caudal peduncle 3.91 and 4.75; distance from eye to origin of dorsal fin 45.6 and 47.3; distance from eye to origin of anal fin 52.2 and 57.0; distance from eye to insertion of pelvic fins 36.1 and 38.2.

The following counts were made, respectively: Dorsal rays i, 4; i, 4; i, 5; i, 5; i, 4; i, 4; i, 4; i, 4; anal rays ii, 5; ii, 5; ii, 6; ii, 5; ii, 5; ii, 5; ii, 5; ii, 5; pelvics always i, 5 and pectorals always I, 6; number of caudal fin rays i+7+i; i+7+i; i+7+i; i+8+i; i+7+i; i+7+i; i+7+i; number of platelets along the lateral line 37; 39; 34; 38; 35; 35; 33; number of plates in the dorsal series from origin of dorsal to base of caudal fin 21; 21; 21; 20; 21; 22; 23; number of plates in the ventral series from anus to base of caudal fin 21; 20; 20; 21; 21; 21; 21; plates behind base of last anal ray to base of caudal 12; 11; 11; 11; 12; 13; 13; plates in front of origin of anal fin always 3; number of spines on inner edge of pectoral spine 5; 5; 5; 6; 6; 6; 6.

Color.—The color pattern consists of four wide black bars, the first through middle of dorsal fin across body, meeting its fellow around the anal origin, thus basally from the first to third dorsal rays the color is white, with a wide white margin posteriorly on the dorsal fin; the second bar is at rear of anal fin but does not extend on that fin; third across caudal peduncle and the fourth across second quarter of the caudal fin; conspicuous black bar near middle front of pectoral fin; basal third of soft rays of pelvics black, the spiny ray pale; a narrow black line across top of head through eyes to base of outer mental barbel; anal fin pale.

Remarks.—This new species differs from *Hoplomyzon atrizona petroleus* and *Hoplomyzon atrizona atrizona* in lacking barbels near front corner of mouth, and in having four black color bars and a black line across top of head. The three plates in front of the anal fin separate it from both species.

Named *sapito* after the common name of this species in the Maracaibo Basin.

Genus HOPLOMYZON Myers

Hoplomyzon MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 94, 1942. (Type, *Hoplomyzon atrizona* Myers.)

It was with more than usual interest that I examined, late in 1942, the description of the new genus *Hoplomyzon*, especially after I had described two new genera in my manuscript in preparation on the Venezuelan catfishes. One of these, *Dupouichthys*, I still believe is valid, but the other one, after careful study, I consider to be the same as *Hoplomyzon*, but that could not be determined from the description. Since my two specimens from the Río Motatán of the Maracaibo Basin resembled *H. atrizona* in so many details, I suspected at once that Dr. Myers in his necessary haste to prepare the paper for publication may have overlooked the barbel at each corner of the mouth. The artist who drew one of the paratypes did not include that pair of barbels either.

At my request, Miss Margaret Storey, in the absence of Dr. Myers in Brazil, kindly lent a paratype, Stanford University No. 36495, of *Hoplomyzon atrizona*, and, upon examination, the barbels were seen to be as obvious as those on my specimens from the Río Motatán, Maracaibo Basin. This paratype, however, differed slightly in color from my specimens, so again I wrote to Miss Storey to see if the type could be examined. She asked William Gosline to examine the type, and he replied to me as follows:

"I have reexamined the type of 'the species that Myers described as *Hoplomyzon atrizona*,' and am enclosing a rough sketch of the mouth parts. The only additional barbel I can find is at the point indicated."

His sketch of *H. atrizona* confirmed my suspicion that a barbel at the front corners of the mouth should have been drawn and described, as the pair was present, as shown in figure 4, *a*.

The generic description follows: Head depressed, under surface of the body forming a plane surface, body quadrangularly shaped anteriorly and hexagonally shaped in cross section posteriorly; greatest depth at origin of dorsal fin, greatest width at pectoral fin insertion; body armed by a dorsal series of paired bony plates beginning near origin of dorsal fin and a similar series of paired plates along the ventral side beginning behind anus; along the lateral line at each pore is a tiny platelet; behind the anal and dorsal fins the plates are close together and probably fused; all plates are covered with a thin skin; skin everywhere rugose, especially on the head; vent equidistant between rear edge of basal membrane of anal fin and tip of snout; a vertical line through insertion of pelvics about equidistant between such a line through insertion of pectorals and origin of dorsal fin; anal origin under base of next to last ray of dorsal; anus about twice the

width of the interorbital space in front of the anal fin origin; eight barbels as follows: two pairs of mental barbels, the outer pair longest; a pair of large maxillary barbels, with a membrane that connects with the side of the head opposite the eye, the maxillary barbels reaching a little past the middle of the coracoid process; a pair of barbels near outer front corners of the mouth at base of maxillary barbels on ventral surface of snout; snout broadly rounded anteriorly, with a median indentation; upper lip composed of four large papillae; lower lip thin, without papillae, the small gill opening just in front of base of pectoral fin on lower surface of body; upper surface of head with a lump at rear tip of supraoccipital, behind which are two more elongated ridges, then the origin of the dorsal; orbital rims slightly elevated, the interorbital space otherwise flattish; eyes very small, the posterior margin of orbit a little closer to tip of snout than to rear tip of supraoccipital; mouth opening equal to interorbital space; two pairs of nostrils widely separated, the anterior ones tubular; caudal fin truncate, the first outer branched ray of lower lobe longest, the upper simple ray shortest; pectoral spine with six long spines on its inner edge, pectoral spine with a fleshy tip; pelvic spine about two-thirds the length of the first branched ray; dorsal fin connected with body by a membrane to tip of last ray; anal similarly connected by a membrane to the body but not quite to the tip of the last anal ray.

HOPLOMYZON ATRIZONA PETROLEUS, new subspecies

PLATE 4, C; FIGURE 4, a

Holotype.—U.S.N.M. No. 121070, a specimen 25.3 mm. in standard length, collected by Leonard P. Schultz, March 25, 1942, in the Río Motatán, 4 km. above Motatán, Maracaibo Basin, Venezuela.

Paratype.—U.S.N.M. No. 121071, a specimen 24.7 mm. in standard length, taken along with the holotype and bearing the same date.

Description.—Based on holotype and paratype. Detailed measurements of these, expressed in hundredths of the standard length, are recorded, respectively. Standard length (in mm.) 25.3; 24.7; total length 30.9 and 29.5 mm.

Length of head from tip of snout to posterior tip of supraoccipital 26.5 and 27.1; width of head at coracoids 26.9 and 26.7; greatest depth of body 12.0 and 12.1; postorbital length of head 14.6 and 14.2; length of snout 11.1 and 10.1; diameter of eye 1.98 and 2.02; width of fleshy interorbital space 7.90 and 7.29; width of gape of mouth 7.90 and 7.70; longest (outer) mental barbel 7.90 and 6.48; length of maxillary barbel measured from its anterior base to its tip 20.5 and 19.4; length of barbel at front corner of upper lip 4.74 and 4.86; distance between anterior nostrils 5.14 and —; anus to anal origin 14.2 and 15.4; tip of snout to anus 36.3 and 35.6; length of base of dorsal fin from bony

origin to end of membranous base 30.4 and 32.5; length of first ray of dorsal fin 17.8 and 16.6; length of last ray of dorsal fin 12.6 and 13.0; length of first ray of anal fin 15.4 and 14.2; length of pectoral spine to its fleshy tip 26.1 and 27.1; length of pelvic spine to its fleshy tip 13.0 and 14.2; length of upper ray of caudal fin 18.2 and 16.2; length of lower simple ray of caudal fin 18.6 and 22.3; length of lower (longest) branched ray of caudal fin 22.9 and —; length of depressed anal fin 27.3 and 28.3; length of caudal peduncle, or distance from base of last anal ray to midbase of caudal fin rays 34.0 and 34.4; least depth of caudal peduncle 3.95 and 4.04; distance from eye to origin of dorsal 39.5 and 38.5; distance from eye to origin of anal 51.8 and 47.4; distance from eye to insertion of pelvics 30.4 and 28.3.

The following counts were made, respectively: Dorsal rays i,6 and i,6; anal iii,4; and iii,4; pelvic i,5 and i,5; pectoral I,6 and I,6; number of caudal fin rays $i+7+i$ and $i+7+i$; number of platelets along the lateral line 50 and 50; dorsal series of plates from origin of dorsal to base of caudal fin 23 and 23; ventral series of plates from anus to base of caudal fin 23 and 23; plates behind the base of last anal ray 12 and 11; plates in front of origin of anal fin 5 and 6; number of spines on inner edge of the pectoral spine 6 and 6.

Color.—The general color pattern consists of four black saddles across back and on sides, the first from under base of dorsal fin rays down to and including the lateral line and below it a little posteriorly, this bar extending only on the base of the dorsal fin except anteriorly where it reaches halfway out the first ray; the second is just behind the end of basal membrane of dorsal fin; third at smallest part of caudal peduncle and last across the basal fifth of the caudal fin rays; the ventral bony plates are pigmented, more so under the region of the dorsal saddles; the area around the tubular anterior nostrils is blackish; undersides pale, dorsal surface of head brownish.

Remarks.—This new subspecies differs in color from *Hoplomyzon a. atrizona* Myers and *Dupouyichthys sapito*, as indicated in the key.

Named *petroleus* in honor of the Lago Petroleum Corporation of Venezuela, the company that aided me so much in traveling around the Maracaibo Basin of Venezuela and in whose camps I stayed.

HOPLOMYZON ATRIZONA ATRIZONA Myers

Hoplomyzon atrizona MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 95, fig. 3, 1942 (brook tributary to Río Zulia, Estacion Táchira, 60 km. north of San Cristobal, Venezuela).

The following counts were made on a paratype: Dorsal i,6; anal iii,4; pelvic i,5-i,5; pectoral I,6-I,6; caudal fin rays $i+7+i$; plates in lateral line 50; plates on dorsal side 23; plates on ventral side 23; spines on inner edge of pectoral spine 6; plates behind base last anal ray 11; plates in front of anal origin 5.

Family CETOPSIDAE

The genera and species centering around *Cetopsis* Agassiz have caused me some trouble in attempting to learn their limits, and their nomenclature has not been clarified by Eigenmann in his various papers. Bleeker divided the genus *Cetopsis* into three parts (Versl. Akad. Amsterdam, vol. 14, p. 403, 1862) and added the fourth genus (*Paracetopsis*) in his Atlas ichthyologique. . . , vol. 2, p. 16, 1862. He retained *Cetopsis* Agassiz and designated *Cetopsis coecutiens* Agassiz as its type, defining the genus somewhat as follows: Teeth simple, on premaxillary triserial, on dentary and vomer uniserial; branchial opening a small slit before base of pectoral fin; pelvic fins not united; eye small; B. 10; A. 21.

Hemicetopsis Bleeker (*op. cit.*, pp. 403 and 16) was defined as having teeth simple, on premaxillaries, dentaries, and vomer uniserial; pelvics not united; eye inconspicuous; A. 29. Bleeker designated as type "*Hemicetopsis candira* = *Cetopsis candira* Ag."

Pseudocetopsis Bleeker (*op. cit.*, pp. 403 and 16) was defined as having teeth on premaxillaries and dentaries many-rowed, vomer uniserial; gill opening about as long above as below base of pectoral fin; pelvic fins united; eye conspicuous; dorsal and pectorals with a produced filament, A. 22. Bleeker designated as type "*Pseudocetopsis gobioides* = *Cetopsis gobioides* Kner."

Paracetopsis Guichenot (*in* Bleeker, *op. cit.*, p. 16) is defined as having the teeth on premaxillaries, dentaries, and vomer in many rows, vomerine teeth in a transverse band interrupted in the middle; eye conspicuous; B. 9; A. 30. Bleeker designated as the type "*Paracetopsis bleekeri* Guich. (Mus. Paris)." Neave (Nomenclator Zoologicus, vol. 3, p. 558, 1940) indicates that Bleeker used a manuscript name of Guichenot for the new genus and species.

Bleeker (Nederl. Tijdschr. Dierk., vol. 1, pp. 115, 116, 1863) cites the genera *Cetopsis*, *Hemicetopsis*, and *Pseudocetopsis* and defines them the same as in 1862. *Paracetopsis* was not mentioned.

Eigenmann and Eigenmann (Proc. California Acad. Sci., vol. 1, p. 157, 1888) list *Hemicetopsis*, *Cetopsis*, *Pseudocetopsis*, and "? subgen. nov. ?" Under the last they list two species, *Cetopsis occidentalis* Steindachner and *Cetopsis ventralis* Gill. The genera are not defined. Eigenmann and Bean (Proc. U. S. Nat. Mus., vol. 31, p. 665, 1907) give a key to the genera discussed above and name the fourth genus listed that lacked a name in Eigenmann and Eigenmann (*op. cit.*, p. 157). They say "the fourth, with *occidentalis* as the type, may be named *Paracetopsis* (see fig. 3)." In their key they define their new genus as: "Teeth all villiform, in bands, those on vomer in two patches; ventrals partly joined to the belly—*Paracetopsis*." This definition by Eigenmann and Bean (*op. cit.*, p. 665) agrees with that

of Bleeker (Atlas ichthyologique . . . , vol. 2, p. 16, 1862), but the type species have different names.

Now Bleeker (*loc. cit.*) apparently used a manuscript name of Guichenot when he designated the genotype *Paracetopsis bleekeri* Guichenot of his new genus *Paracetopsis*. This is the first description of *P. bleekeri*, and apparently it is valid, so the name must be accepted. Steindachner (Denkschr. Akad. Wiss. Wien, vol. 42, p. 99, pl. 8, fig. 2, 2a, 1879) described *Cetopsis occidentalis* from Guayaquil, Ecuador, which agrees in dentition with *bleekeri*. Since no locality is given for *bleekeri*, as first reviser I am referring *occidentalis* to *Paracetopsis bleekeri*. Thus *Paracetopsis* Eigenmann and Bean becomes a synonym of *Paracetopsis* Bleeker because they have the same species as genotype. Eigenmann (Rep. Princeton Univ. Exped. Patagonia, vol. 3, p. 398, 1910) proposed the genus *Cetopsogiton* as a new name for *Paracetopsis* Eigenmann and Bean, which he says is preoccupied; he gave the type as *Cetopsis occidentalis* Steindachner. Thus *Cetopsogiton* Eigenmann becomes a synonym of *Paracetopsis* Bleeker.

Unfortunately, Eigenmann and Bean (*op. cit.*, p. 665) in their key do not define the other three genera (*Cetopsis*, *Hemicetopsis*, and *Pseudocetopsis*) the same as Bleeker did, and from this confusion has resulted. In the following key I have attempted to define the genera according to Bleeker's diagnoses based on the genotypes:

KEY TO THE GENERA OF CETOPSIDAE

- 1a. Gill opening restricted to a slit mostly in front of pectoral fin base.
- 2a. Teeth conical, in three rows on premaxillaries and in one row on dentaries and on vomer; pelvic fins not united.....*Cetopsis*¹⁰ Agassiz
- 2b. Teeth simple (probably all are incisors) in a single row on premaxillaries, dentaries and on vomer; pelvic fins not united; anterior nasal openings much farther apart than posterior ones.....*Hemicetopsis*¹¹ Bleeker
- 1b. Gill opening wide, not restricted to in front of pectoral fin base but reaching a little farther below than above pectoral base; pelvic fins united to each other and to abdomen along their inner ray.
- 3a. Teeth conical, in a band of 3 or 4 rows on premaxillaries and dentaries and transverse band on vomer interrupted in middle; anterior pair of nostrils a little farther apart than posterior ones.....*Paracetopsis*¹² Bleeker
- 3b. Teeth conical, in a band of 2 to 4 rows on premaxillaries and dentaries, and in 1 to 3 irregular rows on vomer, not interrupted in middle.
- Pseudocetopsis*¹³ Bleeker

Genus CETOPSIS Agassiz

Cetopsis AGASSIZ, in Spix, *Selecta genera et species piscium* . . . Brasiliam . . . , p. 11, 1829. (Type designated as *Cetopsis coecutiens* Agassiz by Bleeker, 1862.)

¹⁰ Genotype, *Cetopsis coecutiens* Agassiz.

¹¹ Genotype, *Hemicetopsis candira* (Agassiz).

¹² Genotype, *Paracetopsis bleekeri* Guichenot, in Bleeker = *Cetopsis occidentalis* Steindachner.

¹³ Genotype, *Cetopsis gobioides* Kner. The following species undoubtedly belong to this genus: *Cetopsis ventralis* Gill; *Cetopsis chalmersi* Norman; *Hemicetopsis macilentus* Eigenmann; *Hemicetopsis minutus* Eigenmann; *Hemicetopsis othonops* Eigenmann; *Hemicetopsis amphiloza* Eigenmann; *Cetopsis plumbeus* Steindachner.

CETOPSIS COECUTIENS (Lichtenstein)

Silurus coecutiens LICHTENSTEIN, Wiedemann's Zool. Mag., vol. 1, pt. 3, p. 61, 1819 (ref. copied).

Cetopsis coecutiens AGASSIZ, in Spix, Selecta genera et species piscium . . . Brasiliam . . . , p. 12, tab. 10, fig. 2, and tab. A., fig. 5, 1829 (ref. copied).

Cetopsis coecutiens PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

Genus PSEUDOCETOPSIS Bleeker

Pseudocetopsis BLEEKER, Versl. Akad. Amsterdam, vol. 14, p. 403, 1862; Atlas ichthyologique, vol. 2, p. 16, 1862. (Type, *Cetopsis gobioides* Kner.)

TENTATIVE KEY TO THE SPECIES OF PSEUDOCETOPSIS

1a. Dorsal rays i, 5; anal rays about iii or iv, 20 to 23.

2a. Head 4 to $4\frac{1}{2}$ and depth $4\frac{1}{2}$ to $5\frac{1}{2}$ in standard length.

3a. Snout to dorsal origin 2.7 and length of anal base 3.4 in standard length; caudal peduncle longer than deep; maxillary barbel reaching to end of head, posterior mental barbel to end of gill membranes under head; maxillary barbel 1.7 in anal base; pelvics reaching to anus; anus a trifle closer to base of caudal than end of snout.

Pseudocetopsis minutus (Eigenmann)

3b. Snout to dorsal origin a little over 3 in standard length; caudal peduncle as deep as long.-----*Pseudocetopsis chalmersi* (Norman)

2b. Head 3.2, depth 3.2, snout to dorsal 2.8, all in standard length; snout to dorsal 0.85 in anal base and latter 3.1 in standard length; maxillary barbel reaches halfway to end of head and posterior mental barbel two-thirds way to edge of gill membranes below head; anus much closer to base of caudal fin than to snout tip; branchings of chromatophores parallel or nearly so. [This may be the young of some other species already named]-----*Pseudocetopsis macilentus* (Ligennann)

1b. Dorsal rays i, 6; anal rays iii or iv, 20 to 29; pelvics i, 5; head 4 to $4\frac{1}{4}$; depth 4 to $5\frac{1}{2}$ in standard length.

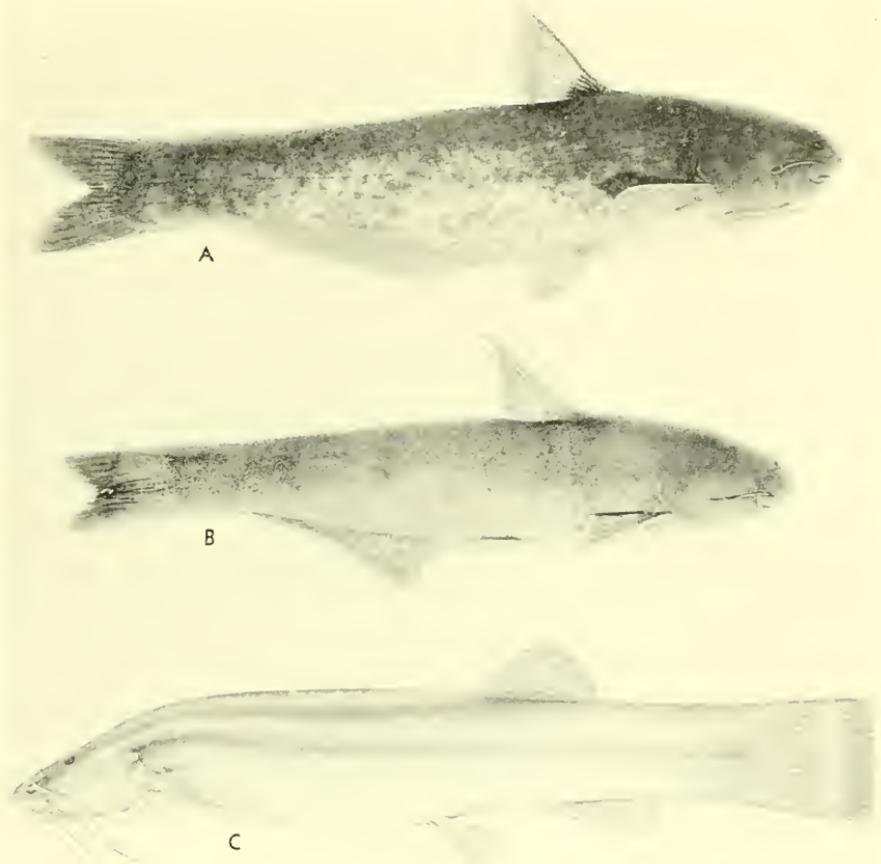
4a. Anal rays about iii or iv, 26 to 29; barbels short, about 3 or 4 times diameter of eye and none reaching more than halfway to end of gill membranes; pelvics reach to anus; latter about equal distance from caudal base to tip of snout or a trifle closer} *Pseudocetopsis ventralis* (Gill)
to caudal base.-----} *Pseudocetopsis amphiloza* (Eigenmann)

4b. Anal rays iii or iv, 20 to 24; anus a little closer to base of caudal fin than to tip of snout.

5a. Color plain grayish above, paler to silvery below, without dark blotches about size of eye; anal rays iii or iv, 20 to 21; head 4 to $4\frac{1}{2}$ and depth 4 to $4\frac{1}{2}$.

6a. Snout to dorsal origin in anal base 1.1 and 3.2 in standard length; anal base 3 in standard length; posterior mental barbel reaches halfway to edge of gill membrane below head, and maxillary barbel two-thirds way to end of head; length of maxillary barbel 2.9 in anal fin base; longest rays of both pectoral and dorsal fins about 1.9 in snout to dorsal-----*Pseudocetopsis gobioides* (Kner)

6b. Snout to dorsal origin 0.8 in anal base and 2.9 in standard length; anal base 3.2 to 3.6 in standard length; posterior mental barbel reaching to edge of gill membranes below head, and maxillary barbel reaching halfway to end of head; maxillary barbel 2.2 in anal base; longest



A, *Pseudocetopsis plumbeus orinoco*, new subspecies: Holotype (U.S.N.M. No. 121263), 95 mm. in standard length; B, *P. plumbeus motatanensis*, new subspecies: Holotype (U.S.N.M. No. 121265), 146.5 mm.; C, *Pygidium emanueli emanueli*, new species and subspecies: Holotype (U.S.N.M. No. 121223), 174 mm. A and B, retouched photographs; C, drawing.



A, *Pygidium emanueli motatanensis*, new subspecies: Holotype (U.S.N.M. No. 121232), 71 mm. in standard length; B, *P. banneau maracaiboensis*, new subspecies: Holotype (U.S.N.M. No. 121227), 43.7 mm.; C, *Tridensimilis venezuelae*, new genus and species: Holotype (U.S.N.M. No. 121290), 19.5 mm. Retouched photographs.

branched rays of dorsal and pectorals 2 to 2.4 in snout to dorsal. (Pectoral rays on six specimens i,8; anal rays iv,20 and iv,21 equally on four examples; pelvis i,5 on six specimens).

Pseudocetopsis othonops (Eigenmann)

5b. Color darker above, paler below, with numerous dark blotches on sides, a little larger than eye; anal base 3.0 to 3.2 in standard length; snout to dorsal 2.8 to 3.2 in standard length and 0.9 to 1.0 in length of anal base; longest branched ray of pectorals 2.0 to 2.3 in snout to dorsal; anal rays iii or iv, 21 to 24.

7a. Posterior mental barbel reaching to edge or a little past gill membranes on underside of head; depth 4.9, head 4.2, all in standard length; least depth of caudal peduncle equal to its length and 2.2 in anal fin base; length of maxillary barbel 3.1 in anal base and it reaches two-thirds way to end of head; anal rays iii (iv ?), 23 or 24.

Pseudocetopsis plumbeus plumbeus (Steindachner)

7b. Posterior mental barbel reaching four-fifths way to edge of gill membrane; depth 3.7 to 4.0; head 3.5 to 4.0 in standard length; least depth of caudal peduncle 0.98 to 1.01 in its length and 2.2 to 2.5 times in length of anal fin base; length of maxillary barbel 4 to 4.2 in anal base and it reaches halfway to end of head; pelvis do not reach anus; anal rays iii or iv, 22 or 23; pectoral rays usually i,9, occasionally i,8.

Pseudocetopsis plumbeus orinoco, new subspecies

7c. Posterior mental barbel reaching two-thirds way to edge of gill membranes or four-fifths in some males; depth 4.6 to 5.1, head 3.5 to 4.0 in standard length; least depth of caudal peduncle 1.2 to 1.25 in its length and 2.6 to 2.8 times in length of anal fin base; length of maxillary barbel $2\frac{1}{2}$ to $3\frac{1}{2}$ in anal base and reaching one-half to three-quarters way to end of head; pelvis not reaching to anus; anal rays iii or iv, 21 to 24, usually 22 or 23; pectoral rays i,9, rarely i,8.

Pseudocetopsis plumbeus motatanensis, new subspecies

PSEUDOCETOPSIS PLUMBEUS ORINOCO, new subspecies

PLATE 5, A

Holotype.—U.S.N.M. No. 121263, a specimen 95 mm. in standard length, collected by Leonard P. Schultz, March 31, 1942, in the Río Torbes, 1 km. above Táriba, Orinoco system, Venezuela.

Paratypes.—U.S.N.M. No. 121264, 2 specimens, 64.5 and 92 mm., collected by L. P. Schultz, G. Zuloaga, Roger Sherman, and William Phelps, Jr., May 12, 1942, in the Río Guárico and tributaries between San Sebastián and San Casimiro, Estado de Aragua, Venezuela.

Description.—Detailed measurements made on the three types are recorded below, in hundredths of the standard length, first for the holotype and then for the paratypes in parentheses, respectively. Standard lengths (in mm.) 95 (92; 64.5).

Length of head 26.1 (27.3; 27.1); greatest depth 25.3 (26.7; 25.1); length of snout 9.16 (7.94; 8.22); diameter of eye 2.53 (2.61; 3.26); width of interorbital space 10.0 (10.8; 9.46); postorbital length of head 17.8 (17.9; 17.7); distance between anterior pair of nasal openings

6.10 (6.20; 6.51); distance between the posterior pair of nasal openings 5.48 (5.32; 5.58); tip of snout to dorsal origin 34.7 (35.1; 33.6); snout to anal origin 59.0 (58.7; 59.0); snout to pectoral insertion 24.2 (25.1; 24.2); snout to pelvic insertion 40.8 (42.4; 41.4); snout to anus 53.7 (54.4; 54.2); length of maxillary barbel 10.2 (8.70; 9.46); length of inner or anterior mental barbel 9.05 (9.24; 6.98); length of posterior (outer) mental barbel 10.1 (9.78; 9.61); length of anal base 31.8 (32.1; 31.5); length of caudal peduncle or distance from base of last anal ray to midbase of the caudal fin 13.2 (14.1; 14.7); least depth of the caudal peduncle 13.2 (13.9; 13.9); length of first simple ray of dorsal fin 19.5 (19.3; —); length of longest or first branched ray of dorsal 17.0 (17.5; 17.2); length of first simple ray of pectoral fin 17.9 (16.6; 18.9); length of first or longest branched ray of pectoral fin 14.7 (14.9; 15.5); length of longest branched ray of pelvic fins 11.0 (10.3; 10.4); length of longest upper ray of caudal fin 23.8 (20.1; 24.0); length of longest lower ray of caudal fin 24.7 (19.7; 24.3); shortest middle ray of caudal fin 11.6 (12.5; 13.8); width of head across base of pectorals 18.4 (19.6; 18.0).

The following counts were made, respectively: Anal rays iii,23 (iii,23; iv,22); dorsal i,6 (i,6; i,6); pectoral i,8-i,8 (i,9-1,9; i,8-i,8); pelvics always i,5; branched rays of caudal fin 15 (15; 15); gill rakers — (2 + 6; —).

Head rounded anteriorly, body compressed posteriorly, snout projecting a little beyond the lower jaw, so that mouth is subterminal; anterior nostrils at sides of tip of snout, this pair a little farther apart than posterior pair; eyes embedded, without free margins; gill membranes broadly joined to isthmus, the gill opening wide and extending a little farther below the pectoral base than above it; gill rakers short about 2 + 6 or 7; the pair of maxillary barbels lying in a groove, as do the two pairs of mental barbels on underside of head; first ray of dorsal and pectoral produced beyond branched rays in males; anus equidistant between midcaudal fin base and tip of chin; caudal fin deeply concave; pectoral fin a little rounded; dorsal truncate posteriorly; pelvics at midline joined to body and to each other; caudal peduncle as long as deep; teeth conical in three of four rows on premaxillaries and on dentaries and in one or two irregular rows on the vomer, the latter parallel with premaxillary band of teeth, not interrupted in the middle.

Color.—Brownish black, dark or grayish above, silvery below, the upper sides with numerous blackish blotches, some a little larger than eye; all margins of caudal fin edged with a narrow white band; paired fins pale; dorsal plain grayish, anal with a few black pigment cells mostly posteriorly; peritoneum mostly pale.

Remarks.—This new subspecies is separated from all related forms as indicated in the key on pages 252-253.

This species was taken in a mountain stream in very swiftly flowing water among gravel and rubble.

Named *orinoco* in reference to the river system in which it was collected.

PSEUDOCETOPSIS PLUMBEUS MOTATANENSIS, new subspecies

PLATE 5, B

Holotype.—U.S.N.M. No. 121265, a specimen 146.5 mm. in standard length, collected by Leonard P. Schultz, March 25, 1942, in the Río Motatán, 4 km. above Motatán.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121268, 2 specimens, 113 and 160 mm., collected along with the holotype and bearing the same data; U.S.N.M. No. 121266, an example 57 mm. in standard length, from the Río San Juan at the bridge, south of Mene Grande, Motatán System, March 20, 1942; U.S.N.M. No. 121267, 2 specimens, 67 and 81 mm., from the Río Motatán, 8 km. below Motatán, March 24, 1942; U.S.N.M. No. 121269, 5 examples, 57 to 113 mm., from the Río Motatán at the bridge 22 km. north of Motatán, March 17, 1942.

Description.—Detailed measurements made on the holotype and two paratypes, expressed in hundredths of the standard length, are recorded below, respectively, first for the holotype, then in parentheses for the paratypes. Standard length (in mm.) 146.5 (113; 57).

Length of head 25.2 (25.2; 28.4); greatest depth 21.5 (19.9; 20.5); length of snout 7.16 (7.52; 7.19); diameter of eye 2.46 (2.65; 4.20); interorbital space 10.2 (9.30; 10.0); postorbital length of head 17.1 (17.3; 17.5); distance between anterior pair of nasal openings 5.46 (5.13; 5.61); distance between posterior pair of nasal openings 4.10 (3.81; 4.74); tip of snout to dorsal origin 33.5 (32.7; 35.4); snout to anal origin 58.4 (55.8; 60.2); snout to pectoral insertion 23.2 (23.4; 25.4); snout to pelvic insertion 44.1 (41.6; 44.2); snout to anus 53.9 (53.2; 57.4); length of maxillary barbel 9.56 (12.8; 13.9); length of anterior mental barbel 7.85 (9.74; 11.9); length of outer or posterior mental barbel 8.53 (10.7; 12.3); length of anal fin base 30.7 (30.6; 31.6); length of caudal peduncle 13.6 (13.7; 14.4); least depth of caudal peduncle 11.1 (11.3; 11.9); length of first or simple ray of dorsal fin 21.9 (30.5; 21.8); length of first or simple ray of pectoral fin 16.1 (20.9; 16.0); length of longest or first branched ray of dorsal fin 17.7 (20.3; 18.6); length of longest or first branched ray of pectoral fin 14.4 (16.8; 15.3); length of longest branched pelvic ray 9.22 (11.1; 12.1); length of longest upper ray of caudal fin 20.2 (25.2; 22.3); length of longest lower branched ray of caudal fin 21.9 (24.0; 23.2); length of shortest midcaudal ray 12.3 (13.7; 14.2); width of head across base of pelvics 18.1 (16.4; 16.8).

The following counts were made, respectively: Anal rays iii, 24

(iv, 22; iv, 23; iii, 22; iii, 22; iv, 22; iii, 23; iii, 23; iii, 22; iii, 22; iv, 21); dorsal rays i, 6 (i, 6; i, 6); pectoral rays on ten i, 9-i, 9, on one paratype i, 8-i, 8; pelvics always i, 5 and branched caudal fin rays 15 (15; 15); gill rakers — (—; 2+7).

Head bluntly rounded anteriorly, body compressed posteriorly, snout projecting a little beyond the lower jaw; mouth subterminal; gape moderately wide; anterior pair of nostrils at sides of snout a little more separated than the posterior pair, which is situated between the eyes; interorbital space convex; eyes embedded, their margins not free; gill membranes broadly joined to the isthmus; gill openings wide, a little longer below than above base of pectoral fins; gill rakers short, stiff, about 2+6 or 7; maxillary barbels lying in a groove; mental barbels lying in a shallow depression on under side of head; first ray of dorsal and of pectoral considerably produced in the males beyond the branched rays; anal rays of males longer than in females; anus equal distance from midbase of caudal fin and a little behind rear of eye; caudal fin deeply concave; dorsal truncate or slightly concave posteriorly; pelvics a little rounded and pectorals truncate or rounded; inner sides of pelvics joined and fused with midline of abdomen; caudal peduncle longer than deep; teeth all conical in about three irregular rows on premaxillaries, two on dentaries and an irregular row on vomer, the latter not interrupted in the middle.

Color.—Grayish to brownish above, paler below, with the sides well supplied with small dark blotches, more or less obscure in some specimens; these spots are much less evident in this form than in *orinoco*. Caudal fin edged with white on all margins; inside of white posterior margin the caudal fin pigment is intensified considerably; paired fins plain, pale in color, the dorsal grayish; anal with distal half dark, the edge white; peritoneum mostly pale.

Remarks.—This new species may be separated from all related forms by means of the key on page 253. It was taken in swiftly flowing water among rubble to coarse gravel.

Named *motatanensis* after the stream system in which it was collected.

Family PYGIDIIDAE

KEY TO THE GENERA OF PYGIDIIDAE REPORTED FROM VENEZUELA (MODIFIED MOSTLY AFTER EIGENMANN)

- 1a. Anal fin short with 7 to 11 rays, its origin usually behind, rarely under that of dorsal fin; eyes superior.
- 2a. A pair of nasal barbels; no mental barbels; mandible with considerable anteroposterior extent, teeth extending along less than half its total length; teeth strong; anal short; no mental barbels; opercle and interopercle with spines; two barbels at angle of mouth; opercle without a dermal flap; caudal peduncle compressed; anal partly or entirely behind dorsal; pelvics present; outer pectoral ray usually prolonged.

Pygidium Meyen

- 2b. No nasal or mental barbels; mouth inferior; anal short, of 7 to 11 rays, its origin usually behind, rarely under that of dorsal; lower barbel at angle of mouth minute; eyes superior.
- 3a. Mouth wide, teeth very numerous, in several very regular series; rami of lower jaw transverse, meeting, with teeth along its entire length; premaxillary large.
- 4a. Accessory caudal rays few, not conspicuous; caudal not fan-shaped or excessively contracted at base; upper tip with fine, hairlike, movable teeth.
- 5a. Gill membrane confluent with isthmus; gill openings reduced to a narrow slit in front of pectoral; opercle with 4 to 12 spines.
- 6a. Caudal emarginate or obliquely rounded, origin of pelvics nearly equidistant from base of caudal fin and snout to opercle; color, if present, in spots.....*Homodiaetus* Eigenmann and Ward
- 6b. Caudal rounded; few accessory rays; origin of pelvics $1\frac{1}{2}$ to 2 times as far from snout as from caudal.
- 7a. Eyes superior and close together.....*Stegophilus* Reinhardt
- 7b. Eyes large, far apart, and lateral.....*Haemomaster* Myers
- 5b. Gill membrane, united free from isthmus...*Acanthopoma* Lütken
- 4b. Accessory caudal rays very numerous, tail like that of a tadpole, base of caudal very narrow; no hairlike teeth on upper lip.
Ochmacanthus Eigenmann
- 3b. Mouth narrow, rami of lower jaw not transverse, teeth few, feeble, not meeting in middle; a few depressible teeth in a single series in middle of upper jaw; mandibles without teeth, or with a few excessively minute teeth on ends of rami; caudal rounded to emarginate; long, slender fishes.....*Vandellia* Cuvier and Valenciennes
- 1b. Anal long with 15 to 25 rays; its origin in front of that of dorsal fin; eyes lateral, seen as well from above as from below. (TRIDENTINAE.)
Tridensimilis, new genus

Subfamily STEGOPHILINAE

Genus PYGIDIUM Meyen

Trichomycterus VALENCIENNES, in Humboldt, Recueil d'observations de zoologie . . . , vol. 2, p. 348, 1811 (non *Trichomycterus* Humboldt).

Pygidium MEYEN, Reise um die Erde, vol. 1, p. 475, 1834 (ref. copied from Neave). (Type, *Pygidium fuscum* Meyen.)

KEY TO THE SPECIES OF PYGIDIUM REPORTED FROM VENEZUELA

- 1a. Caudal fin rounded; maxillary barbels slender, reaching to middle of pectoral rays; nasal barbel short, reaching a little past eye or about halfway to end of operculum; origin of dorsal a trifle closer to base of midcaudal fin rays than to tips of branched rays of pectoral; insertion of pelvics equal distance between base of midcaudal fin rays and end of operculum; length of upper prolonged pectoral ray $1\frac{1}{2}$ times in distance from its tip to insertion of pelvics; a vertical line through origin of dorsal passes a little closer to insertion of pelvics than to anus; color pattern of dark diffuse spots or blotches, no lateral band.....*Pygidium meridae* (Regan)
- 1b. Caudal fin emarginate or a little concave; teeth all pointed, no incisors, on jaws.
- 2a. Color plain or sides with one or more continuous dark bands, but no dark spots on back or sides.

3a. Three dark bands, two on sides and one along middorsal line anteriorly; a wide diffuse blackish band along lateral line, with wide pale streaks above and below; above upper pale band a second wide blackish band beginning at base of nasal barbel and passing through eye, thence along upper sides close to base of dorsal fin, thence fading posteriorly on upper sides of caudal peduncle; a third blackish streak separated from second black band by a pale streak running along middorsal line of head and back, fading in front of dorsal fin; nasal barbel long, reaching past end of operculum; origin of dorsal equal distance between base of midcaudal fin rays and posterior one-quarter of length of branched pectoral rays; insertion of pelvics equal distance from base of midcaudal fin rays and middle of postorbital length of head or eye in young; length of prolonged upper ray of pectoral fin about equal to distance from its tip to insertion of pelvics; usually a more or less evident dark streak across outer two-thirds of length of caudal fin.....*Pygidium emanueli emanueli*, new species and subspecies

3b. Three dark bands on sides, none along middorsal line of back anteriorly; a blackish band on midsides along lateral line, above and below which is a pale band or streak; below lower pale streak a band, more or less a series of diffuse blotches running together, beginning in axil of pectoral and continuing above pelvic base and fading posteriorly; above upper pale streak a third intense dark band, beginning at base of nasal barbel, passing through eye, thence a little distance away from base of dorsal, fading posteriorly; no middorsal dark streak; origin of dorsal fin equal distance from base of midcaudal fin rays and middle of length of branched rays of pelvics; insertion of pelvics equal distance from base of midcaudal fin rays and about middle of postorbital length of head; nasal barbel reaches past end of operculum; length of upper prolonged pectoral ray contained 1 to $1\frac{1}{2}$ times in distance from its tip to insertion of pelvics.

Pygidium emanueli motatanensis, new subspecies

3c. Color plain in adults, but in young about 30 to 40 mm. or shorter, a single black streak along midsides, but at 70 mm. the streak barely discernible; origin of dorsal equal distance from base of midcaudal fin rays and tips of branched rays of pectoral; insertion of pelvics equal distance from base of midcaudal fin rays and middle of postorbital length of head; length of first (prolonged) ray of pectoral contained $1\frac{1}{2}$ to $1\frac{3}{4}$ in distance from its tip to insertion of pelvics; nasal barbel reaches a little past end of operculum; pelvics not reaching past anus.

Pygidium knerii (Steindachner)

2b. Back or sides or both with numerous blackish or brownish spots, these small or of moderate size; caudal fin a little concave; belly plain; sometimes spots along midsides more or less fusing into a dark, narrow streak; origin of dorsal a little closer to tips of branched rays of pectoral fin than to midbase of caudal fin; insertion of pelvics equidistant from midcaudal fin base and second third of postorbital length of head; length of upper prolonged ray of pectoral equal to 0.9 to 1.2 times in distance between its tip and pelvic insertion; nasal barbel extending considerably past end of operculum.

Pygidium banneau maracaiboensis, new subspecies

PYGIDIUM MERIDAE (Regan)

- Trichomycterus meridae* REGAN, Ann. Mag. Nat. Hist., ser. 7, vol. 12, p. 624, 1903 (Río Albireggas, above Mérida, Venezuela [Río Chama system]).—RIBEIRO, Rev. Mus. Paulista, vol. 10, p. 725, 1918 (Mérida).
- Pygidium meridae* EIGENMANN, Mem. Carnegie Mus., vol. 7, No. 5, p. 315, pl. 49, fig. 2, 1918 (Cordillera of Mérida, Venezuela); Bol. Soc. Col. Cien. Nat., vol. 8, p. 161, 1920 (Mérida).

PYGIDIUM EMANUELI EMANUELI, new species and subspecies

LAUCHA

PLATE 5, C

Holotype.—U.S.N.M. No. 121223, a specimen 174 mm. in standard length, collected by Leonard P. Schultz, April 3, 1942, in the Río Chama at Estanques, Estado de Mérida, Venezuela.

Paratypes (all taken by L. P. Schultz).—U.S.N.M. No. 121224, 51 examples, 52 to 170 mm. in standard length, collected along with the holotype and bearing the same data; U.S.N.M. No. 121225, 19 specimens, 74 to 203 mm., from the Río Gonzáles tributary to Río Chama, at La Gonzáles, Estado de Mérida, March 29, 1942; U.S.N.M. No. 121226, 14 specimens, 58 to 245 mm., in the Río Chama, 10 km. below Lagunillas, Estado de Mérida, March 30, 1942.

The above specimens were taken in swift mountain streams among rubble and loose gravel in the Río Chama system.

Description.—Based on the holotype and paratypes listed above. Measurements of the holotype and two paratypes, expressed in hundredths of the standard length, are recorded below, the paratypes in parentheses, respectively. Standard length (in mm.) 174 (245; 77.7).

Length of head to end of opercle 18.0 (18.5; 19.0); width of head across base of pectorals 14.2 (15.3; 14.1); greatest depth of body 18.6 (20.8; 16.1); length of snout 8.9 (9.3; 9.0); diameter of eye 1.38 (1.55; 2.06); least width of fleshy interorbital space 5.17 (6.12; 6.05); post-orbital length of head 8.15 (8.57; 9.01); length of longest ray (first branched) of anal fin 11.8 (12.2; 12.5); length of longest ray of dorsal 10.6 (12.1; 14.2); length of longest ray of pelvics 8.67 (9.43; 10.7); length of prolonged upper ray of pectoral fin 18.3 (18.2; 17.6); least depth of caudal peduncle 12.6 (13.9; 12.2); length of caudal peduncle 21.0 (22.0; 22.0); length of longest ray of caudal fin 14.6 (15.3; 19.0); distance from snout to origin of dorsal fin 62.0 (63.7; 64.6); distance from snout to origin of anal fin 69.8 (73.0; 71.5); snout to anus 65.4 (67.4; 67.7); snout to pelvics 55.5 (56.6; 57.7); distance from insertion of pelvics to anal origin 17.3 (17.1; 18.1); length of maxillary barbel 15.9 (16.3; 17.4); length of lower maxillary barbel 12.2 (12.2; 14.2); length of nasal barbel 14.5 (13.6; 16.1); distance from eye to margin of posterior nostril 3.39 (3.88; 3.22); distance from tip of prolonged upper pectoral ray to pelvic fin insertion 20.3 (23.8; 17.5); distance that upper ray of pectoral extends beyond tips of branched pectoral rays 6.60 (6.32; 3.86).

The following counts were made: Dorsal rays v, 6 (v, 6; v, 6); anal v, 4 (v, 4; v, 4); pectoral i, 8—i, 8 (i, 8—i, 8; i, 8); pelvic always i, 4; branched rays of caudal fin 11 (11; 11); number of gill rakers on first gill arch usually 2+5.

Head depressed, body compressed posteriorly; gill membranes extending moderately forward, joined, and forming a narrow free fold; anus about three-fourths the way from base of pelvics to anal origin; a vertical line through dorsal origin passes about midway between pelvic insertion and anal origin; pelvics do not reach past anus; caudal fin truncate; other fins rounded; eye small, without free margin, more or less embedded; maxillary barbel reaching to rear of base of pectoral fin; lower maxillary barbel reaching to insertion of pectorals or a trifle beyond; nasal barbel reaching a little past tip of opercle; teeth villiform, pointed, in a band on premaxillaries and at front of dentaries.

Color consisting of a dark band along midsides, another along upper sides from nostrils through eye past base of dorsal fin and a third along middorsal line anteriorly fading before dorsal fin, these three black bands separated by pale bands; no spots anywhere; belly plain, light grayish yellow. The band along midsides very intense in the young but more or less diffuse in adults; all fins grayish.

Remarks.—This species differs from all other forms with a truncate caudal fin and nasal barbels that reach past the opercle in having three blackish bands, two on the side and one along middorsal line anteriorly.

Named *emanueli* in honor of Juan F. Emanuel, former governor of the district of Goajira, who acted as my guide in much of my collecting in the lowlands of the Maracaibo Basin.

PYGIDIUM EMANUELI MOTATANENSIS, new subspecies

LAUCHA

PLATE 6, A

Holotype.—U.S.N.M. No. 121232, a specimen 71 mm. in standard length, taken by Leonard P. Schultz, March 17 and 20, 1942, in the Río San Juan at the bridge south of Mene Grande, Motatán system, Maracaibo Basin.

Paratypes.—U.S.N.M. No. 121233, 5 specimens, 42.5 to 56 mm., collected along with the holotype and bearing the same data.

All the types came from among rubble and coarse gravel.

Description.—Based on the holotype and paratypes listed above. Measurements of the holotype and paratype, expressed in hundredths of the standard length, are recorded below, first for the holotype, then for the paratype in parentheses, respectively. Standard length (in mm.) 71 (45.6).

Length of head to end of operculum 18.4 (21.5); width of head to base of pectorals 14.4 (16.9); greatest depth 18.0 (16.5); length of snout 8.17 (8.77); diameter of eye 2.53 (3.29); width of fleshy interorbital 5.92 (6.59); postorbital length of head 9.16 (9.87); length of longest (first branched) ray of anal fin 11.5 (13.2); length of longest dorsal ray 14.5 (15.4); length of longest pelvic ray 9.43 (10.5); length of first (upper) ray of pectoral 18.3 (18.6); least depth of caudal peduncle 13.4 (12.9); length of caudal peduncle 20.4 (20.0); length of longest ray of caudal fin 18.4 (20.4); distance from tip of snout to origin of dorsal 63.0 (65.8); snout to anal origin 73.4 (73.7); snout to pelvic insertion 58.0 (57.2); snout to anus 65.9 (66.9); distance from pelvic insertion to anal origin 18.2 (17.5); length of maxillary barbel 18.3 (21.9); length of lower maxillary barbel 13.4 (15.1); length of nasal barbel 18.4 (20.0); distance from eye to rim of posterior nostril 2.96 (2.85); distance from tip of prolonged upper pectoral ray to pelvic insertion 21.8 (21.1); length of prolonged tip of upper pectoral ray beyond branched rays of pectoral 6.34 (4.17). Caudal fin truncate or a trifle concave; other fins rounded; barbels as in *P. emanueli emanueli*.

The following counts were made: Dorsal always v, 6; anal always v, 4; pelvic always i, 4; branched caudal rays 11; pectoral rays i, 8—i, 8 (i, 8—i, 8); gill rakers about 2+5 to 7, rather rudimentary.

The shape and proportions of the body are the same as in *Pygidium emanueli emanueli* from the Río Chama system.

Color.—No black band along middorsal line of back; belly pale, yellowish in alcohol. The black band along middorsal line is most distinct, bordered above and below by a pale band; above the upper pale band is another blackish band extending from nostrils through eye backward to opposite dorsal fin, fading posteriorly; below the lower pale band is a third darkish band made up of more or less diffuse spots that run together, this band begins in axil of pectoral fin and passes above base of pelvics, then fading posteriorly; all fins a little grayish; peritoneum pale.

Remarks.—This subspecies differs from *P. emanueli emanueli* in lacking the black streak anteriorly along the middorsal line and in the presence of a dark streak on lower lateral sides.

Named *motatanensis* after the river system in which it was collected.

PYGIDIUM KNERII (Steindachner)

Trichomycterus knerii STEINDACHNER, Sitzb. Akad. Wiss. Wien, vol. 86, p. 81, pl. 5, fig. 1, 1a, 1882 (Canelos).

U.S.N.M. No. 121235, 9 specimens, 29 to 160 mm. in standard length, collected March 31, 1942, by Leonard P. Schultz, in the Río Torbes, 1 km. above Tárriba, Orinoco system. The three smallest specimens in this lot have a distinct black streak along middorsal line; on a specimen about 71 mm. in length, this black streak is barely visible, while on larger sizes the sides are plain brownish in alcohol.

U.S.N.M. No. 121234, 2 specimens, 29 and 65.5 mm., collected by Leonard P. Schultz, March 31, 1942, in the Río Cobre above its mouth, tributary to Río Quinta, thence Río La Grita, Catatumbo system; U.S.N.M. No. 101616, an example 53.5 mm., collected by Nicéforo María in the Río Pamplonita near Cucuta, Colombia (Catatumbo system).

Certain measurements were made on two specimens of *knerii*, the first from the Río Torbes and the other from the Río Cobre; these data, expressed in hundredths of the standard length, respectively, are recorded below. Standard length (in mm.) 71.2, 64.7.

Length of head to end of opercle 19.2, 19.3; greatest depth 15.7, 16.2; length of longest pelvic ray 9.97, 10.2; length of upper prolonged ray of pectoral 14.9, 16.2; distance from tip of snout to origin of dorsal 64.0, 64.2; snout to pelvic insertion 54.8, 59.5; snout to anal origin 71.4, 74.2; distance from dorsal origin to tip of caudal fin 52.5, 52.8; pelvic insertion to tip of caudal fin 61.0, 60.1; distance from pelvic insertion to anal origin 15.9, 15.3; length of snout 8.85, 8.50; post-orbital length of head 9.13, 8.81; interorbital space 5.62, 6.18; length of nasal barbel 16.3, 14.8; length of upper maxillary barbel 19.8, 18.6.

For counts of fin rays see table 11.

PYGIDIUM BANNEAUI MARACAIBOENSIS, new subspecies

PLATE 6, B

Holotype.—U.S.N.M. No. 121227, a specimen 43.7 mm. in standard length, collected by Leonard P. Schultz, March 17 and 20, 1942, in the Río San Juan near bridge, south of Mene Grande, tributary to Río Motatán, Maracaibo Basin.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121228, 5 examples, 31 to 56 mm., taken along with the holotype and bearing the same data; U.S.N.M. No. 121229, 16 specimens, 31.5 to 48.6 mm., from the Río Machango, 20 km. above the bridge south of Lagunillas, Maracaibo Basin, March 21, 1942; U.S.N.M. No. 121231, 2 specimens, 33.5 and 65 mm., from the Río Motatán, 4 km. above Motatán, March 25, 1942; U.S.N.M. No. 121230, an example 50.7 mm., from the Río Palmar near Totuma, about 100 km. southwest of Maracaibo, February 21, 1942.

Description.—Based on the holotype and paratypes listed above. Measurements of the holotype and two paratypes, expressed in hundredths of the standard length, are recorded below, first for the holotype followed by those for the paratypes in parentheses, respectively. Standard length (in mm.) 43.7 (46.5; 33.5).

Length of head to end of opercle 20.1 (19.3; 20.3); width of head across base of pectorals 15.6 (15.3; 15.2); greatest depth 15.6 (19.3; 14.3); length of snout 8.70 (8.17; 8.36); diameter of eye 2.29 (1.93; 2.39); interorbital space (fleshy) 5.26 (5.38; 5.97); postorbital length of head 10.3 (11.2; 10.4); length of longest or first branched ray of

anal fin 13.0 (14.4; 12.8); length of longest ray of dorsal 13.0 (15.3; 14.0); length of longest ray of pelvics 10.8 (9.89; 9.85); length of prolonged ray of pectoral 20.4 (19.3; 18.8); least depth of caudal peduncle 11.9 (13.1; 9.85); length of caudal peduncle 19.9 (18.9; 21.2); length of longest ray of caudal fin 19.7 (17.6; 17.6); tip of snout to origin of dorsal fin 67.0 (69.0; 66.2); snout to origin of anal 73.2 (74.8; 72.2); snout to anus 68.2 (69.9; 67.2); snout to pelvic insertion 57.9 (57.0; 56.7); distance from pelvic insertion to anal origin 15.1 (17.4; 15.8); length of maxillary barbel 25.2 (22.6; 20.9); length of lower maxillary barbel 18.3 (16.1; 14.9); length of nasal barbel 21.3 (18.5; 16.7); distance from eye to posterior nostril 2.52 (2.15; 2.09); distance from tip of prolonged upper ray of pectoral fin to pelvic insertion 19.7 (21.5; 20.0); length of the prolonged upper pectoral ray beyond tips of branched rays 5.95 (5.59; 4.18).

The following counts were made, respectively: Dorsal v, 6 (v, 6; v, 6); anal v, 4 (v, 4; v 4); pectoral i, 7-1, 7 (i, 7-1, 7; i, 7-i, 7); pelvic i, 4 (i, 4; i, 4); branched rays of caudal fin always 11. For additional counts refer to table 11.

Head depressed, body compressed, greatest depth a little in front of pelvics; nasal barbel extending considerably past rear of head; upper maxillary barbel reaching almost to middle of branched pectoral rays; lower maxillary barbel reaches a little past pectoral insertion; caudal fin a little concave, all other fins rounded; least depth of caudal peduncle is near the middle of its length instead of just behind anal fin base; distance from origin of dorsal fin to midbase of caudal fin is equal to distance from origin of dorsal fin to tip of prolonged upper pectoral ray; pelvics equidistant from midbase of caudal fin and second third of postorbital length of head; origin of dorsal a little in front of a line through anus, about over tips of pelvics which do not quite reach to anus; length of upper prolonged ray of pectoral equal to 0.9 to 1.2 times in the distance from its tip to insertion of pelvics.

Color.—Everywhere, except on ventral surface in front of anus, the body is profusely brown-spotted; on some specimens these spots are a little larger than the eye, while on others they are smaller; usually the spots are more or less arranged in a row along midsides, with a pale streak above and below more or less setting that series of spots off; however, in females with abdomens distended with eggs, the spots are smaller and not arranged in such definite rows; dorsal surface of head spotted; fins plain grayish, with a little intensification of the pigment basally.

Remarks.—This new subspecies is like *Pygidium banneaui banneaui* Eigenmann, except in color. In *banneaui* there is a series of large brown spots well separated from each other along midsides and another

similar series each side of middorsal line anteriorly, with a few along middorsal line, while in the new subspecies, *maracaiboensis*, the dorsal surface has numerous small irregularly placed brown spots, and below the series along the midsides is another series of small spots, lacking in *banneau*.

Named *maracaiboensis* after the drainage basin in which it was collected.

TABLE 11.—*Fin-ray counts for various species of Pygidium*

Species	Dorsal	Anal	Pectoral			Pelvic	Caudal (branched rays)
	v,6	v,4	i,7	i,8	i,9	i,4	11
<i>knerii</i>	5	5	2	6	-----	3	3
<i>emanueli emanueli</i>	9	8	-----	11	-----	7	5
<i>emanueli montanensis</i>	7	7	-----	12	1	4	3
<i>banneau maracaiboensis</i>	12	12	24	-----	-----	4	3
<i>banneau banneau</i>	4	4	7	-----	-----	3	3

Genus HOMODIAETUS Eigenmann and Ward

Homodiaetus EIGENMANN and WARD, in Eigenmann, McAtee, and Ward, Ann. Carnegie Mus., vol. 4, p. 117, 1907. (Type, *Homodiaetus anisitsi* Eigenmann and Ward.)

HOMODIAETUS HAEMOMYZON Myers

Homodiaetus haemomyzon MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 98, 1942 (Río Guárico, at Calabozo and at El Sombrero; lagoon 10 km. south of San Fernando de Apure, Venezuela).

Genus STEGOPHILUS Reinhardt

Stegophilus REINHARDT, Vid. Medd. Naturh. Foren. Kjøbenhavn, 1858, p. 79, pl. 2. (Type, *Stegophilus insidiosus* Reinhardt.)

STEGOPHILUS SEPTENTRIONALIS Myers

Stegophilus septentrionalis MYERS, Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 130, 1927 (Santa Barbara, Orinoco, Venezuela).

Genus HAEMOMASTER Myers

Haemomaster MYERS, Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 131, 1927. (Type, *Haemomaster venezuelae* Myers.)

HAEMOMASTER VENEZUELAE Myers

Haemomaster venezuelae MYERS, Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 131, 1927 (Santa Barbara, Orinoco; Playa Tama-Tama, Bifurcation, Orinoco, Venezuela).

Genus ACANTHOPOMA Lütken

Acanthopoma LÜTKEN, Vid. Medd. Naturh. Foren. Kjøbenhavn, 1891, p. 53, fig. (Type, *Acanthopoma annecleris* Lütken.)

ACANTHOPOMA BONDI Myers

Acanthopoma bondi MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 97 fig. 5, 1942 (Río Apure at San Fernando de Apure; Río Guárico at El Sombrero, Venezuela).

Genus OCHMACANTHUS Eigenmann

Ochmacanthus EIGENMANN, Mem. Carnegie Mus., vol. 5, p. 213, 1912. (Type, *Ochmacanthus flabelliferus* Eigenmann.)

KEY TO THE SPECIES OF OCHMACANTHUS REPORTED FROM VENEZUELA

1a. Marking variable, a double or triple series of large, irregular, alternating blotches with narrow interspaces, the spots usually partially coalescing forward on back; some specimens finely mottled; caudal mottled, in some a dark medium streak to tip; head $5\frac{1}{2}$, depth $5\frac{1}{2}$ in standard length; dorsal rays 8, anal 8, pectoral 6; eye $4\frac{1}{2}$ in head.

Ochmacanthus alternus Myers

1b. Back mottled, a single series of oblong dark patches of unequal length down middle of sides to caudal base; head 6, depth $6\frac{2}{3}$ in standard length; eye 4 in head; dorsal rays 8, anal 7, pectoral 5.

Ochmacanthus orinoco Myers

OCHMACANTHUS ALTERNUS Myers

Ochmacanthus alternus MYERS, Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 129, 1927 (Caño de Quirihana, near Caicara, Venezuela).

OCHMACANTHUS ORINOCO Myers

Ochmacanthus orinoco MYERS, Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 130, 1927 (Playa Matepalma, Orinoco, Venezuela).

Subfamily VANDILLIINAE

Genus VANDELLIA Cuvier and Valenciennes

Vandellia CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 18, p. 386, pl. 547, 1846. (Type *Vandellia cirrhosa* Cuvier and Valenciennes.)

KEY TO THE SPECIES OF VANDELLIA REPORTED FROM VENEZUELA (AFTER EIGENMANN)

1a. Dorsal rays 8 or 9; anal 9 or 10; pectoral 6; depth 9 in standard length; premaxillaries with 5 to 8 teeth; maxillary barbel 2 in the head; caudal fin slightly emarginate, the lobes rounded, equal; pectorals longer than head.

Vandellia cirrhosa Cuvier and Valenciennes

1b. Dorsal rays 9; anal 8; pectoral 7; depth 12; premaxillaries with 5 to 9 teeth; maxillary barbels less than half length of head; caudal emarginate, lobes rounded; pectorals as long as head.....*Vandellia plazaii* Castelnau

VANDELLIA CIRRHOSA Cuvier and Valenciennes

Vandellia cirrhosa CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 18, p. 386, pl. 547, 1846.—PELLEGRIN, Bull. Soc. Philom. Paris, vol. 1, p. 198, 1909 (Apure).—EIGENMANN, Mem. Carnegie Mus., vol. 7, No. 5, p. 361, fig. 29, 1918 (Apure, Orinoco).

VANDELLIA PLAZAII Castelnau

Vandellia plazaii CASTELNAU, Expédition dans les parties centrales de l'Amérique du Sud . . . , vol. 3, Poissons, p. 51, pl. 28, fig. 1, 1855.

Vandellia plazai PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

Subfamily TRIDENTINAE

KEY TO THE GENERA OF THE SUBFAMILY TRIDENTINAE

- 1a. Opercular and interopercular patches of spines confluent; several series of strong teeth in each jaw; gill membranes broadly united with isthmus, without a free margin.....*Miuroglanis*¹⁴ Eigenmann and Eigenmann
- 1b. Opercular and interopercular patches of spines distinct and separately movable; eyes lateral, seen as well from below as from above; gill membranes joined across isthmus, forming a wide free fold.
- 2a. Opercle with 10 curved spines; interopercle with 3 or 4 smaller but similar spines; depth 13, head 9, in standard length; 2 maxillary barbels present but minute; nasal barbels absent; branchiostegals 4; dorsal rays 10 to 12; anal 20 to 25; pelvic i, 2, minute; pectoral i, 4; caudal said to be rounded.....*Tridens*¹⁵ Eigenmann and Eigenmann
- 2b. Opercular spines 6 to 10; interopercular spines 4 to 8; depth 4 to 8; head 5 to 6½ in standard length; teeth curved and in 3 rows in upper jaw.
- 3a. Opercular spines 10; interopercular spines 8; 2 maxillary barbels well developed; nasal barbel present or absent; dorsal rays 7 to 10; anal 17 to 21; pelvic probably i, 4.....*Tridentopsis*¹⁶ Myers
- 3b. Opercular spines 6; interopercular spines 4 to 6, usually 6; dorsal rays 9 to 11; anal 20 to 23; nasal barbel absent; branchiostegals 5; pelvics i, 4; pectorals i, 5.....*Tridensimilis*, new genus

TRIDENSIMILIS, new genus

Eigenmann and Eigenmann (Proc. California Acad. Sci., ser. 2, vol. 2, pp. 53-54, 1889) described the genus *Tridens*, based on *T. melanops* (genotype) and represented by 27 specimens from Iça, Amazons. One of the paratypes, U.S.N.M. No. 41522, was sent to the National Museum and has been studied by me. At the same time, Eigenmann and Eigenmann (*op. cit.*, p. 54) described *Tridens brevis* from a single specimen taken at Tabatinga, but this type was lost years ago at the Museum of Comparative Zoology. Myers (Copeia, No. 148, p. 84, 1925) described the genus *Tridentopsis*, based on *T. pearsoni* (genotype) and recorded previously by Pearson (Indiana Univ. Studies, No. 64, pp. 17-18, 1924) as *Tridens brevis* from Lake Rogoagua, Bolivia. Miss La Monte (Amer. Mus. Nov., No. 1024, p. 1, 1939) described *Tridentopsis tocantinsi* from the Rio Tocantins, northeastern Brazil. Obviously her species is close to *pearsoni*, except in the absence of nasal barbels.

It should be noted that up to the present time all species referred to the Tridentinae have come from the Amazon Basin. However, I had

¹⁴ Genotype, *Miuroglanis platycephalus* Eigenmann and Eigenmann, Proc. California Acad. Sci., vol. 2, p. 58, 1889 (Jutahy).

¹⁵ Genotype, *Tridens melanops* Eigenmann and Eigenmann, Proc. California Acad. Sci., vol. 2, p. 53, 1889 (Iça). Most of these data are from U.S.N.M. No. 41522, one of the paratypes of *T. melanops*.

¹⁶ Genotype, *Tridentopsis pearsoni* Myers, Copeia, No. 148, p. 84, 1925, based on *Tridens brevis* Pearson (not of Eigenmann and Eigenmann) (Lake Rogoagua, Bolivia).—*Tridentopsis tocantinsi* La Monte, Amer. Mus. Nov., No. 1024, p. 1, 1939 (Rio Tocantins, Brazil).

the good fortune to collect 29 specimens of a new species in the Lago Maracaibo Basin. This is the first record of this subfamily in northern South America.

Eigenmann (Mem. Carnegie Mus., vol. 7, No. 5, p. 369, 1918) suggested that *Tridens brevis* should probably be placed in* a separate genus. Thus Myers created the genus *Tridentopsis* and said, "I feel justified in forming a new genus for *brevis* and Pearson's fish, which I provisionally recognize as a distinct species." Thus *brevis*, because of its inadequate description with no figure, has been shifted about. Now I feel justified in view of new material in putting *brevis* into still another genus.

This new genus, *Tridensimilis*, may be distinguished from all other members of the subfamily Tridentinae by the following combination of characters: Opercular spines 6 in number and interopercular spines 4 to 6, these patches of spines separately movable and distinctly separated; gill membranes joined across isthmus with a broad free fold; eyes lateral; depth of body 6 to 8, head 5 to 6½ in standard length, teeth small, curved, conical, in three separate rows above; dorsal rays ii or iii (probably iii), 7 or 8; anal ii or iii (probably iii as the first simple ray is rudimentary) 18 to 21; pelvic i,4; pectoral i,5; branchiostegals 5; nasal barbel absent.

Other characters are those of the new species, *Tridensimilis venezuelae*, described below.

Genotype.—*Tridensimilis venezuelae*, new species.

TRIDENSIMILIS VENEZUELAE, new species

PLATE 6, C

Holotype.—U.S.N.M. No. 121290, a specimen 19.5 mm. in standard length (total length 23.5), collected by Leonard P. Schultz, March 2, 1942, in the Río Negro below the mouth of the Río Yasa, Maracaibo Basin.

Paratypes.—U.S.N.M. No. 121291, 28 specimens, 13.8 to 20.5 mm. in standard length and 16.5 to 24 mm. in total length, collected along with the holotype and bearing the same data.

Description.—Based on the holotype and paratypes listed above. Measurements of the holotype and one paratype, expressed in hundredths of the standard length are recorded below, first for the holotype, then for the paratype in parentheses. Standard length (in mm.) 19.5 (20.4).

Length of head 16.9 (15.7); width of head across eyes 14.9 (15.7); greatest depth of body 16.9 (17.1); length of snout 8.72 (8.82); diameter of eye 4.62 (3.92); width of interorbital space 8.72 (9.32); postorbital length of head 6.16 (5.88); length of longest ray of anal fin 6.66 (7.35); longest ray of dorsal fin 8.20 (8.33); longest ray of pelvics

7.18 (7.84); longest ray of pectorals 10.2 (9.80); least depth of caudal peduncle 6.66 (6.86); length of caudal peduncle 17.9 (17.6); longest ray of caudal fin 14.9 (16.7); distance from tip of snout to origin of dorsal fin 7.08 (6.96); snout to anal origin 55.9 (64.2); snout to pelvics 45.1 (44.6)*.

The following counts were made: Dorsal rays iii,8 (iii,8) and, in addition, 6 paratypes had iii,8, and 3, iii,9 rays; anal rays iii,18 (iii,20), in addition one paratype had iii,18, 2, iii,19, 3, iii,20, and 2, iii,21 anal rays; pectoral rays i,5 (i,5) and i,5 in 9 other examples counted; pelvic rays always i,4; branched caudal fin rays always 11, with 5 above and 6 below.

The head is greatly depressed forward, the body becoming rounded opposite pectoral fins and much compressed from pelvic fins posteriorly; the greatest depth occurs between pelvics and anal origin; the greatest width is across the eyes; mouth inferior but lower lip not reverted except at corner of mouth; a single maxillary barbel not reaching past pupil; margin of eyes not free; pupil round; gill membranes joined across isthmus with wide free fold; pectorals reaching about one-third the way to pelvics; pelvics short, the distance between pelvic insertion and anal origin about 6 times in standard length; pelvics inserted closer to tip of snout than to base of caudal fin by 2 eye diameters; anal origin about $1\frac{1}{2}$ eye diameters in front of a vertical line through dorsal origin; first rays of anal longest, tapering to shorter rays posteriorly; caudal fin concave; nostrils widely separated, connected by a tube, the anterior nostril with a raised rim, posterior opening covered by a valvular flap; anus immediately in front of anal origin.

Color (in alcohol).—White, eyes black; a series of black pigment cells along bases of dorsal and anal fins, and a line of larger black pigment cells extends from below and behind pectoral fins to anal origin; caudal fin slightly dusky posteriorly, other fins translucent. No pigment spots on top of the head.

Remarks.—This new species may be distinguished from all other members in the subfamily Tridentinae by means of the keys on page 266 and below.

The following key gives the main differences between *Tridensimilis venezuelae* and *T. brevis*, which I believe should be referred to this new genus until such time as additional specimens of *brevis* are collected and then its true nature determined. Perhaps then on the basis of two maxillary barbels *brevis* should be made the type of still another genus.

- 1a. A single maxillary barbel present at angle of mouth not extending past pupil; distance of origin of dorsal $2\frac{1}{2}$ in total length; distance of anal origin from tip of caudal $2\frac{1}{4}$ to $2\frac{1}{2}$ in total length; first pectoral ray not produced; no pigment spots on head.-----*Tridensimilis venezuelae*, new species

- 1b. Two maxillary barbels at angle of mouth, outer one extending to base of pectoral, inner to gill opening; distance of origin of dorsal from tip of caudal a little more than 2 in length; origin of anal from tip of caudal less than 2 in length; first pectoral ray greatly produced; head with brown dots.

Tridensimilis brevis (Eigenmann and Eigenmann)

Family DORADIDAE

KEY TO THE GENERA AND SPECIES OF [DORADIDAE] REPORTED FROM [VENEZUELA]¹⁷

- 1a. Head depressed, width of head across base of pectorals (cleithrum) greater than length of head to end of opercle; barbels all simple.

- 2a. Series of lateral scutes, numbering 19 to 25, beginning over region of anus and continuing posteriorly along the lateral line; anteriorly lateral line without scutes; caudal peduncle naked above and below; eye in front of middle of head; mouth subterminal, upper lip in front of tip of lower jaw; pectoral spines serrated in front and behind; dorsal spine serrated in front and in small specimens behind, only rough in adults; adipose fin base longer than base of anal, but without keel forward; caudal fin forked; dorsal II, 5; anal iv, 8 to 10; pectoral about I, 9; scutes 19 to 25; color blackish above, paler below, peritoneum white.

Doraops zuloagai, new genus and species

- 2b. Lateral scutes in a continuous series along lateral line; caudal peduncle covered above and below by plates.

- 3a. Lateral scutes very narrow, as wide as eye, leaving greater part of sides naked, with one in feeble contact with dorsal plate; eye just anterior to middle of head; head $3\frac{1}{2}$ in standard length; eye $6\frac{1}{2}$ in head; dorsal I, 5; anal 11; lateral scutes 29; mouth terminal; caudal forked; color blackish with a white line down row of scutes, continued forward to eye; dorsal mottled lightly, first soft ray and its membrane black; caudal mottled, with two longitudinal black bands, these continuing the black of sides above and below white scutes.

Orinocodoras eigenmanni Myers

- 3b. Lateral scutes very deep, leaving only a narrow naked area along back; 3 scutes in contact with dorsal plate; eye in middle of head; dark brown, rows of large white spots above and below lateral line; smaller white spots on belly and caudal; dorsal black with a few large white spots; maxillary with black and white rings; outer surface of humeral process with two series of spines, reaching fourth lateral scute; 29 lateral scutes; maxillary barbel reaching pectoral.

Agamyxis albomaculatus (Peters)

- 1b. Head not depressed; width of head across base of pectorals (cleithrum) shorter than length of head to end of opercle; teeth feeble or lacking.

- 4a. Maxillary barbel simple; mental barbels not united by a membrane joining their bases; nuchal shields without a foramen; adipose fin continued forward as a low keel, longer than anal fin base; first nostril remote from lip; eye behind middle of head; caudal peduncle naked above and below; lateral scutes 3 + 18 to 23; rows of tentacles on roof of mouth; dorsal I, 6; anal 11; head 3 to $3\frac{3}{4}$ in length; eye $4\frac{1}{2}$ to 8 in head; color dark brown, fins black-----*Pseudodoras niger* (Valenciennes)

¹⁷ I am not certain which species is actually involved in Eigenmann and Eigenmann's (Occ. Papers California Acad. Sci., vol. 1, p. 234, 1890) reference to *Doras armatulus* from Venezuela.

- 4b. Maxillary barbel fringed with minute barbels; mental barbels with barblets; nuchal shields with a foramen; back without scutes; origin of pelvics nearer caudal fin than to snout; adipose not continued forward as a ridge; scutes well developed, keel and point of humeral process below line of hooks of lateral series; a black spot on base of dorsal and a narrow oblique black spot on base of each caudal lobe; color marking diffuse; pale along lateral scutes, which number 33 to 35; dorsal I, 5; anal 12.-----*Opsodoras leporhinus* (Eigenmann)

DORAOPS, new genus

Description.—Head depressed, its length a little greater than its width at base of pectoral spines, or the width of coracoids $1\frac{1}{2}$ in length of head; eye in front of middle of length of head and from 3 to 4 times in the snout; width of mouth contained about $2\frac{1}{4}$ times in head; gill openings restricted, extending a little below base of pectorals and their length a little greater than length of snout; mouth subterminal, the upper lip in front of lower jaw; a wide median dorsal groove in front of middle of head with a fontanel posteriorly between rear of orbits; a wide band of villiform teeth on premaxillaries and at front of dentaries, the length of these bands about equal to the length of the snout; barbels all simple, not fringed, a pair of maxillary and two pairs of mental barbels; two pairs of nostrils, without barbels, the anterior pair tubular and the posterior pair with elevated rims; lateral scutes posteriorly beginning over region of anus and ending at base of caudal fin rays, numbering 19 to 25; each scute provided with a spine posteriorly directed; no scutes on dorsal or ventral sides of caudal peduncle; three or four partly embedded bony scutes, without spines, at front of the lateral line, the first two of which are each connected with the epiotic by a bony stay; pectoral spines serrated in front and behind; dorsal spine serrated in front and in small specimens behind, rough only in adults 300 mm. in standard length and becoming obsolete with age; adipose fin base longer than base of anal but not continued forward to form a keel; intestines much convoluted; peritoneum white; skin leathery; caudal fin forked; air bladder very large, with an anterior compartment separated from the posterior section by a constriction, the posterior section having long fingerlike projections, with numerous constrictions across them, that extend to under the end of the body cavity posteriorly.

Remarks.—This new genus differs from other genera of the family Doradidae in having spiny scutes only posteriorly in the lateral series, for in all other genera referred to the family as revised by Eigenmann (Trans. Amer. Philos. Soc., vol. 22, pp. 304–306, 1925) the lateral series of spiny scutes is continuous.

Myers (Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 124, 1927) described the new genus *Orinocodoras* as having laminate plates

entirely covering the caudal peduncle above and below, while in *Doraops* this area is naked.

Fowler (Proc. Acad. Nat. Sci. Philadelphia, vol. 91, p. 226, 1940) described a new Peruvian genus, *Liosomadoras*, and referred it to the family Doradidae. This genus differs from *Doraops* in lacking the lateral series of bony scutes and in having an adipose fin with its base shorter than that of the anal fin. The large air bladder does not agree in structure with any figure of an air bladder from other species.

Named *Doraops* in reference to its similarities to other members of the family Doradidae.

Genotype.—*Doraops zuloagai*, new species.

DORAOPS ZULOAGAI, new species

MARIANO

FIGURE 5; PLATE 7, A

Holotype.—U.S.N.M. No. 121015, a female, 287 mm. in standard length, taken by Leonard P. Schultz in Río de Los Pajaros, 3 km. above Lago Maracaibo, April 30, 1942. This "río" is actually a caño about 200 feet wide and 15 feet deep that extends back into a "ciénaga" or swampy jungle for several kilometers. Bottom of deep mud and debris.

Paratypes (all taken by L. P. Schultz).—U.S.N.M. No. 121017, 4 specimens, 231 to 355 mm. in standard length, from the Río Negro, about 3 km. below the mouth of the Río Yasa, Santa Ana system, Maracaibo Basin, March 2, 1942; U.S.N.M. No. 121018, a specimen 365 mm. in standard length, taken April 7–9, 1942, in a gill net set in Lago Maracaibo 1 km. off Pueblo Viejo in 2 meters of water; U.S.N.M. No. 121016, 7 specimens, 318 to 460 mm. in standard length, from the Río Apón, a few kilometers below the mouth of the Río Cogollo and about 35 km. south of Rosario, Maracaibo Basin, February 26, 1942.

In all these localities where this fish occurred the bottom was muddy. They had been feeding on small crabs and snails.

Description.—Based on the holotype and 12 paratypes listed above. All measurements are given in hundredths of the standard length, those for the holotype outside the parentheses and those for the paratypes within parentheses, respectively. Standard length (in mm.) 287 (365; 355; 317; 231); total length (in mm.) 345 (447; 432; 380; 275). The caudal fin appears to wear off with age so that the upper and lower lobes wear off rounded, thus giving a proportionally shorter fish in relation to the standard length.

Width of head at base of pectoral spine 23.0 (23.3; 21.8; 22.5; 23.3); length of head 24.9 (25.2; 26.2; 24.9; 25.4); length of snout 9.23 (9.04; 8.73; 8.36; 8.49); postorbital length of head 14.5 (14.5; 15.8;

14.5; 14.9); least width of fleshy interorbital space 7.51 (7.59; 7.47; 7.35; 7.36); diameter of eye 2.54 (2.28; 2.90; 2.90; 3.46); length of caudal peduncle or distance from base of last anal ray to midbase of caudal fin rays 16.9 (17.0; 15.8; 18.5; 16.5); least depth of caudal peduncle 6.00 (6.51; 5.38; 6.30; 6.50); length of base of adipose fin 18.1 (17.8; 16.2; 14.5; 16.7); length of base of anal fin 12.4 (13.3; 11.7; 11.5; 12.5); length of base of dorsal fin 14.4 (13.1; 12.8; 12.4; 13.8); greatest depth of body at base of dorsal spine 24.4 (21.9; 21.7; 19.4; 18.2); distance between centers of anterior and posterior nostrils 5.05 (4.21; 3.95; 4.42; 4.37); length of maxillaries or tip of snout to

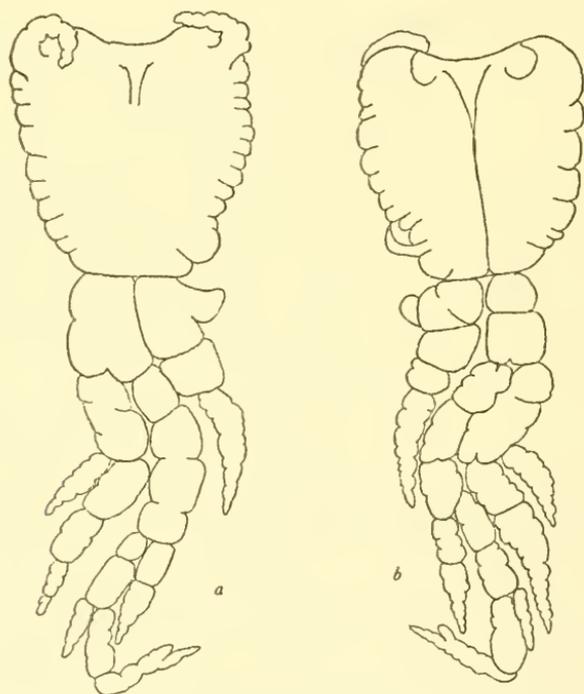


FIGURE 5. Sketch of air bladder of *Doraops zuloagai*: a, Ventral side; b, Dorsal side.

rear edge of mouth 6.76 (8.04; 6.99; 7.10; 6.71); length of maxillary barbel 32.3 (17.5; 29.0; 31.3; 27.9), this pair of barbels becoming shorter and heavier with age; length of inner mental barbel 7.67 (6.01; 8.17; 7.57; 8.87); length of outer mental barbel 14.5 (11.0; 12.5; 12.9; 12.8); distance from tip of snout to origin of dorsal fin 35.5 (35.6; 36.6; 34.7; 36.4); snout to origin of anal 72.2 (69.9; 73.2; 73.5; 72.7); snout to origin of adipose fin 68.0 (67.1; 70.4; 68.1; 68.0); snout to insertion of pelvises 54.0 (54.8; 55.2; 54.6; 53.7); snout to anus 66.9 (66.0; 66.8; 67.2; 65.0); snout to tip of humeral process 36.1 (35.9; 38.1; 36.0; 39.4); length of shortest midray of caudal fin 8.01 (8.36; 8.74; 8.20; 8.76); length of longest upper ray of caudal lobe 20.6 (25.4; 23.5;

23.8; 23.8); length of longest lobe of caudal 18.7 (20.8; 20.0; 20.3; 20.2); length of pectoral spine 19.2 (21.9; 21.2; 20.5; 23.4); length of dorsal spine 20.9 (24.7; 19.9; 22.4; 22.3); distance from origin of anal fin to center of anus 4.45 (5.04; 6.68; 6.30; 5.84).

The following counts were made: Anal rays iv, 8; (iv, 10; iv, 9; iv, 9; iv, 8; iv, 9; iv, 8; iv, 8; iv, 8; iv, 8; iv, 8; iv, 8; iv, 8); dorsal rays always II, 5; pectoral I, 9; number of scutes with spines in the lateral series 21-21 (21-21; 20-20; 24-25; 19; 20; 20; 19; 20; 20; 22; 21; 19); branched caudal fin rays usually 15.

Head depressed; dorsal surface of head bony, with a raised crest from occiput to origin of dorsal fin and a shallow groove in middorsal line between orbits, but not quite reaching tip of snout; posteriorly this groove has a fontanel; mouth small, subterminal, the upper lip in front of lower jaw, both lips somewhat plicate; a wide band of villiform teeth on front of premaxillaries and on front of dentary; the pair of maxillary barbels blackish and the two pairs of mental barbels grayish, pale on some specimens; gill membranes united, the opening restricted mostly to the sides, and the distance between the lower edges of gill opening equal to length of caudal peduncle; posterior nostril about an eye diameter in front of eye; pectoral spine with a backward curve serrated anteriorly and posteriorly; dorsal spine with a similar backward curve serrated anteriorly and posteriorly in young, but the posterior serrations becoming obsolete with age; pelvics reaching to opposite anus; intestine much coiled and convoluted; the lateral series of scutes, each bearing a spine, directed posteriorly beginning over anus and ending at base of midcaudal fin rays; the length of the humeral process about $1\frac{1}{2}$ times interorbital space; gill rakers on first gill arch of one paratype 7+17, short and slender; air bladder large, the anterior compartment divided by a median partition, and deep groove along dorsal midline; at the outer ventral anterior angles is a convoluted horn; the posterior section separated from the anterior by a constriction with several long convoluted tubelike projections extending past the anus to the posterior end of the body cavity; these fingerlike projections constricted in several places; measurements as follows: Total length of air bladder 185 mm., in a female specimen 405 mm. standard length, greatest width anterior compartment 65 mm. and its length 70 mm.; greatest width of posterior section 38 mm. and to first constriction on dorsal side 28 mm.; the fingerlike projections extend backward for 90 mm. with a forward-projecting recurved tip 30 mm. Origin of adipose fin above anus, its base a little longer than that of anal fin; caudal peduncle somewhat constricted without plates on its dorsal or ventral sides; caudal fin forked, the upper lobe longest.

The lateral series of plates is represented by three or four more or less embedded rough plates without spines at the anterior end of the series; then no scutes until over the anus, where they begin and con-

tinue to base of caudal fin rays, each scute posteriorly with a single backward-directed sharp spine; the first two plates at the anterior end of the series are each connected with the epiotic by a bony stay just under the skin; skin somewhat thick and a little leathery.

Color.—Blackish above and white to pale grayish below; in some specimens the belly is mottled with grayish and in others almost blackish; dorsal and pectoral fins blackish with a wide, pale border distally; adipose blackish; caudal fin blackish, on one specimen grayish with some scattered blackish spots; distally the caudal fin is pale in color; pelvics and anal grayish to blackish; maxillary barbels blackish, mental barbels grayish; peritoneum white.

Remarks.—This new species can be distinguished from all other genera and species referred to the family Doradidae by the absence of lateral scutes anteriorly, these beginning over region of anus and continuing to base of caudal fin.

Named *zuloagai* for Dr. Guillermo Zuloaga, assistant chief of exploration, Standard Oil Co. of Venezuela, who was largely responsible for inviting me to study the fishes of the Maracaibo Basin. In his honor I take much pleasure in naming this species.

Genus ORINOCODORAS Myers

Orinocodoras MYERS, Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 124, 1927. (Type, *Orinocodoras eigenmanni* Myers.)

ORINOCODORAS EIGENMANNI Myers

Orinocodoras eigenmanni MYERS, Bull. Mus. Comp. Zool., vol. 68, No. 3, p. 124, 1927 (Caño de Quiribana, near Caicara, Venezuela).

Genus AGAMYXIS Cope

Agamyxis COPE, Proc. Amer. Philos. Soc., vol. 17, p. 322, 1878. (Type, *Agamyxis pectinifrons* Cope.)

AGAMYXIS ALBOMACULATUS (Peters)

Doras albomaculatus PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 470 (Calabozo, Venezuela).—EIGENMANN and EIGENMANN, Proc. California Acad. Sci., ser. 2, vol. 1, p. 161, 1888; Occ. Papers California Acad. Sci., vol. 1, p. 231, 1890 (Calabozo, Venezuela).

Platydoras albomaculatus EIGENMANN, Trans. Amer. Philos. Soc., vol. 22, pt. 5, p. 317, 1925 (Calabozo).

Agamyxis albomaculatus MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 97, 1942 (Caño de Quiribana, Caicara, Río Orinoco, Venezuela).

Genus PSEUDODORAS Bleeker

Pseudodoras BLEEKER, Ichthyologiae Archipelagi Indici Prodrum, vol. 1, p. 53, 1858. (Type, *Doras niger* Valenciennes.)

PSEUDODORAS NIGER (Valenciennes)

Doras niger VALENCIENNES, in Humboldt, Recueil d'observations de zoologie . . . ; vol. 2, p. 184, 1811.

Rhinodoras niger PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 471 (Calabozo, Venezuela).

Pseudodoras niger EIGENMANN, Trans. Amer. Philos. Soc., vol. 22, pt. 5, p. 333, pl. 1, fig. 16; pl. 17, figs. 1-4; pl. 23, fig. 1; figs. 2, 6, 7, 10; 1925.

Genus OPSODORAS Eigenmann

Opsodoras EIGENMANN, Trans. Amer. Philos. Soc., vol. 22, pt. 5, p. 348, 1925.
(Type, *Opsodoras orthacanthus* Eigenmann.)

OPSODORAS LEPORHINUS (Eigenmann)

Hemidoras leporhinus EIGENMANN, Rep. Princeton Univ. Exped. Patagonia, vol. 3, p. 394, 1910 (*nomen nudum*); Mem. Carnegie Mus., vol. 5, p. 195, pl. 19, fig. 1, 1912 (British Guiana at Tumatumari, Potaro River and Crab Falls, Essequibo River).

Opsodoras leporhinus EIGENMANN, Trans. Amer. Philos. Soc., vol. 22, pt. 5, pp. 303, 354, 1925 (Orinoco and Venezuela).

Family CALLICHTHYIDAE

KEY TO THE GENERA OF CALLICHTHYIDAE REPORTED FROM VENEZUELA (AFTER GOSLINE, 1940)

- 1a. Snout depressed, interorbital width greater than or equal to depth of head at forward margin of orbit; eye more or less superiorly situated, i. e., not equally visible from above and below, its diameter contained two or more times in its distance from lower end of bony opercle; foremost plates of upper lateral series, or nuchal plates, fused across midline between supra-occipital and dorsal.
- 2a. Abdomen between pectoral fins completely covered with flesh; suborbital covered with flesh.....*Callichthys* Scopoli
- 2b. Coracoids expanded on surface of abdomen between bases of pectorals; suborbital bones not covered with flesh.....*Hoplosternum* Gill
- 1b. Snout compressed or rounded, interorbital width considerably less than depth of head at forward rim of orbit; barbels at either end of mouth, i. e., rictal barbels, not reaching much beyond gill opening; lower lips reverted to form a single pair of short barbels; nuchal plates not meeting along middorsal line; coracoids usually more or less expanded on abdomen between pectoral bases; fontanel elongate; dorsal fin with a spine and 7 or 8, possibly 9, rays.
Corydoras Lacepède

Genus CALLICHTHYS Scopoli

Callichthys (Gronovius) SCOPOLI, Introductio ad historiam naturalem, p. 451, 1777. (Type, *Callichthys cirris quattuor* Gronovius=*Callichthys callichthys* Linnaeus). (Ref. copied.)

CALLICHTHYS CALLICHTHYS (Linnaeus)

CURITO

Silurus callichthys LINNAEUS, Systema naturae, ed. 10, p. 307, 1758 (America).

Callichthys callichthys PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 83, p. 408, 1931 (Pitch Lake at Guanoco, Venezuela).

Genus HOPILOSTERNUM Gill

Hoplosternum GILL, Ann. Lyc. Nat. Hist. New York, vol. 6, p. 395, 1858. (Type, *Callichthys laevigatus* Valenciennes=*H. littorale* Hancock.)

KEY TO THE SPECIES OF HOPILOSTERNUM REPORTED FROM VENEZUELA (AFTER GOSLINE, 1940)

1a. Median (azygous) preadipose scutes extending two-thirds of way or less forward to dorsal; postorbital a weak vertical rod; no platelet below anterior scute of upper lateral series; all caudal rays of approximately same thickness; body, dorsal, and caudal spotted.

Hoplosternum thoracatum (Cuvier and Valenciennes)

1b. Azygous preadipose scutes extending the entire distance between adipose and dorsal; postorbital well developed, longer than deep; a roundish platelet below anterior scute of upper lateral series; outer caudal rays considerably thickened; body, dorsal, and caudal plain in color.

Hoplosternum littorale (Hancock)

HOPILOSTERNUM THORACATUM THORACATUM (Cuvier and Valenciennes)

Callichthys thoracatus CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 309, pl. 443, 1840.—PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 471 (San Fernando de Apure, Venezuela).—REGAN, Proc. Zool. Soc. London, 1906, pt. 1, p. 388 (Brazil; Guiana; Venezuela; Trinidad).—RÖHL, Fauna descriptiva de Venezuela, p. 375, 1942 (Orinoco).

Hoplosternum thoracatum FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 63, p. 436, 1911 (La Pedrita, on the Caño Uracoa, Venezuela).

Hoplosternum thoracatum thoracatum GOSLINE, Stanford Ichth. Bull., vol. 2, No. 1, p. 7, 1940 (Orinoco).

Hoplosternum oronocoi FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 66, p. 229, fig. 8, 1915 (La Pedrita, Caño Uracoa, Venezuela).

HOPILOSTERNUM THORACATUM MAGDALENAE Eigenmann

Hoplosternum magdalenae EIGENMANN, in Ellis, Ann. Carnegie Mus., vol. 8, Nos. 3, 4, p. 412, 1913.

I do not have available at present sufficient specimens of the forms from the Orinoco and Magdalena systems to be able to distinguish the form in the Maracaibo Basin from the other supposed subspecies.

The following specimens were collected by Leonard P. Schultz during 1942, in the Maracaibo Basin, Venezuela:

U.S.N.M. No. 121118, a specimen 87.7 mm. in standard length, from the Río San Juan at bridge, tributary to Río Motatán, March 20, 1942.

U.S.N.M. No. 121120, 30 specimens, 17 to 65 mm., muddy pool, tributary, during rainy season, Río Gé, near Rosario, collected with the aid of Mr. Butcher and Mr. Refshauge, March 8, 1942.

U.S.N.M. No. 121119, 4 specimens, 17 to 30 mm., pond tributary to Río Gé at Rosario, Río Palmar drainage, March 8, 1942, collected with the aid of Mr. Butcher and Mr. Refshauge. The fishes were dark reddish brown, pale ventrally, barbels dark reddish brown. They lived in the mud and among weeds.

HOPILOSTERNUM LITTORALE (Hancock)

Callichthys littoralis HANCOCK, Zool. Journ., vol. 4, p. 244, 1828.—PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

Hoplosternum littorale FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 63, p. 436, 1911 (La Pedrita, on the Caño Uracoa, Venezuela); vol. 66, p. 229, 1915 (Trinidad and Venezuela).

Genus *CORYDORAS* Lacepède

Corydoras LACEPÈDE, Histoire naturelle des poissons, vol. 5, p. 145, 1803.
(Type, *Corydoras geoffroy* = *C. punctatus* Bloch.)

KEY TO THE SPECIES OF *CORYDORAS* REPORTED FROM VENEZUELA (AFTER GOSLINE, 1940)

- 1a. Snout long, its profile straight or concave; bony interorbital contained 1.7 to 2 times in snout; 22 or 23 scutes in upper lateral series; no bristles on cheek; width of body contained 1.4 times or less in depth; sides of body in adult without small spots but with striking black blotches; anal and posterior rays of dorsal plain; posterior dark blotch extending vertically across caudal peduncle just ahead of caudal fin; interorbital 2.6 to 3.3 in head..... *Corydoras septentrionalis* Gosline
- 1b. Snout short, its profile rounded or sometimes nearly straight; bony interorbital contained 1.4 or less in snout; no black, hastate spot at base of caudal; width of naked area between coracoids greater than diameter of eye; coracoids incompletely surrounding pectoral bases on surface of body; dorsal spine not reaching adipose when laid back.
- 2a. Depth of suborbital in adult equal to or greater than diameter of eye; dorsal spine short, about equal to length of snout.

Corydoras aeneus (Gill)

- 2b. Depth of suborbital in adult less than diameter of eye.

3a. Sides of body with a trilineate pattern formed of a dark band along junction of rows of lateral scutes bordered on either side by a lighter band, these lighter bands in turn delimited above and below by darker pigmentation of sides; flesh of abdomen without small platelets; dorsal without a black blotch; caudal plain... *Corydoras bondi* Gosline

3b. Sides of body without a trilineate pattern; sides with many small dark spots but no blotches and no band along junction of rows of scutes; depth 3 or less in standard length; 21 to 24 scutes in upper lateral series; eye 5 or less in head; dorsal spine about equal to length of head; a vertical band from top of head through eye.

Corydoras melanistius Regan*CORYDORAS SEPTENTRIONALIS* Gosline

Corydoras septentrionalis GOSLINE, Stanford Ichth. Bull., vol. 2, No. 1, p. 16, 1940 (Río Pina, north of Maturin; Río Guanipa, north of El Tigre; Río Amaná, east of Santa Barbara; Río Tinaquillo, at Tinaquillo, Venezuela).—MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 100, fig. 6, 1942 (Venezuela).

CORYDORAS AENEUS (Gill)

Hoplosoma aeneum GILL, Ann. Lyc. Nat. Hist. New York, vol. 6, p. 403, 1858 (Trinidad).

Corydoras venezuelanus IHERING, Rev. Mus. Paulista, vol. 8, p. 383, 1911 (Río Cabriales, Valencia, Estado de Carabobo, Venezuela).

Corydoras aeneus EIGENMANN, Indiana Univ. Studies, vol. 7, No. 4, p. 9, 1920 (Maracay, Río Bue, Venezuela).—GOSLINE, Stanford Ichth. Bull., vol. 2, No. 1, p. 19, 1940 (Lake Valencia; Río Urana, 40 km. west of Puerto Cabello; Río Carichapo, 30 km. east of Upata, in Venezuela).—RIBEIRO, Rev. Mus. Paulista, vol. 10, p. 721, 1918 (Río Cabriale, Venezuela).

CORYDORAS BONDI Gosline

Corydoras bondi GOSLINE, Stanford Ichth. Bull., vol. 2, No. 1, p. 20, 1940 (Río Yuruari, 3 km. east of El Callao and at El Callao; Río Carichopo, tributary of Río Yuruari, 30 km. east of Upata, in Venezuela).—MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 100, fig. 2, 1942 (Venezuela).

CORYDORAS MELANISTIUS Regan

Corydoras melanistius REGAN, Ann. Mag. Nat. Hist., ser. 8, vol. 10, p. 216, 1912 (Essequibo).—MYERS, Bull. Mus. Comp. Zool., vol. 68, p. 126, 1927 (Caño de Quiribana, near Caicara, on the Orinoco).—GOSLINE, Stanford Ichth. Bull., vol. 2, No. 1, p. 21, 1940 (Venezuela).

Family ASTROBLEPIDAE

Genus ASTROBLEPUS Humboldt

Astroblepus HUMBOLDT, Recueil d'observations de zoologie . . . , vol. 1, p. 37, 1805. (Type, *Astroblepus grimaldii* Humboldt.)

In working up the fishes of this family from the Maracaibo Basin, I found it necessary to prepare the following tentative key, separating various species referred to the genus *Astroblepus*. This key should not be considered a revision, since many of the data were obtained from the original description and specimens of several species were not obtainable for examination. This genus is a very difficult one and is in need of careful revision. Perhaps too much emphasis has been placed on the length of the first rays of pelvics and pectorals.

TENTATIVE KEY TO THE SPECIES OF ASTROBLEPUS OF NORTHERN SOUTH AMERICA

- 1a. Teeth in outer row of premaxillary (except possibly last one or two lateral ones) bicuspid or incisors.
- 2a. Teeth (except sometimes one or two of lateral ones) in outer row of premaxillary Y-shaped or bicuspid, sometimes one lobe smaller than the other; pectoral spine extending one-half to three-quarters way out pelvics; nasal flaps not ending in a distinct barbel.
- 3a. Maxillary barbel reaching to gill opening or beyond; pelvic fins reaching two-thirds to three-quarters way to anus.
- 4a. Adipose fin with spine connected by a membrane to caudal peduncle; pelvics inserted in front of dorsal origin (Colombia).

Astroblepus homodon (Regan)

- 4b. Adipose fin without spine or with it embedded and only tip showing; pelvics inserted under dorsal origin.

5a. Interorbital space equal to distance from eye to posterior nasal opening (Ecuador)-----*Astroblepus fissidens* (Regan)

5b. Interorbital space about equal to three-quarters distance from eye to posterior nasal opening (Magdalena system, Colombia).

Astroblepus nicefori Myers

- 3b. Maxillary barbel not quite reaching gill opening, usually three-quarters to four-fifths of the distance; pelvic fins reaching to anus; adipose fin with a spine connected by membrane to caudal peduncle; pelvics inserted almost under origin of dorsal; interorbital space a little narrower than distance from eye to posterior nasal opening (Colombia).

Astroblepus guentheri (Boulenger)

- 2b. Bilobed teeth of outer row of premaxillaries gradually changing to broadly pointed incisors laterally; nasal flap ending in a barblet; adipose fin elongate but no spine showing; interorbital space about equal to distance from eye to posterior nostril; pelvics reach from three-quarters way to a little beyond anus; pectorals extending one-half to two-thirds way out pelvics; pelvics inserted a little behind origin of dorsal; maxillary barbel reaches to gill opening or beyond; anus closer to base of caudal than gill opening.....*Astroblepus festae* (Boulenger)
- 2c. Outer row of premaxillary teeth incisors, but sometimes with a notch at centers; these teeth never sharp-pointed.
- 6a. Teeth of both upper and lower jaws broad incisors; adipose fin with spine connected to caudal peduncle by a membrane; interorbital space a little shorter than distance from eye to posterior nostril; pelvics inserted under or a trifle in front of dorsal origin; pectoral spine reaches to middle of pelvics; nasal flap ending in a barblet; barbel reaches to gill opening; pelvics extending one-half way to anus (Magdalena system, Colombia).....*Astroblepus chapmani* (Eigenmann)
- 6b. Teeth of only upper jaw incisors, those of lower jaw bilobed; adipose fin without spine or with it embedded and only tip showing; pelvics extending one-half to two-thirds way to anus; pectorals extending one-third to one-half way out pelvics; nasal flap not ending in a barbel.
- 7a. Pelvics inserted considerably in advance of dorsal origin; maxillary barbel reaching to rear of lip or one-half way to gill opening; adipose fin with spine embedded but showing; interorbital space equals distance from eye to posterior nasal opening (Río Negro in Colombia).
Astroblepus latidens Eigenmann
- 7b. Pelvics inserted under or almost under dorsal origin; adipose fin without an evident spine.
- 8a. Interorbital about equal to distance from eye to posterior nasal opening; maxillary barbel reaching about three-quarters to four-fifths way to gill opening; pelvics reach two-thirds way to anus (Peru).....*Astroblepus simonsi* (Regan)
- 8b. Interorbital a little less than distance from eye to posterior nasal opening; pelvics reaching one-half to three-fifths way to anus (Peru).....*Astroblepus peruanus* (Steindachner)
- 1b. In outer row all lateral teeth on premaxillary unicuspid, but sometimes blunt pointed, often one or two pairs of bicuspid teeth occurring at midline.
- 9a. Adipose fin absent or almost absent, at least not developed enough to be definitely evident; pelvics inserted under dorsal origin; maxillary barbel extending three-quarters to four-fifths way to gill opening; pelvics reaching two-thirds to three-quarters way to anus; interorbital space a little less than distance from eye to posterior nasal opening; pectorals extending one-third to one-half way out pelvics; nasal flap without barbel (Peru and Ecuador).....*Astroblepus vanceae*¹⁸ (Eigenmann)
- 9b. Adipose fin developed, with a free spine or with it embedded in adipose tissue of fin or with it absent.
- 10a. Insertion of pelvics considerably in advance of a vertical line through origin of dorsal fin; interorbital space a little narrower than distance from eye to posterior nasal opening.

¹⁸ To this species I refer as a synonym *Astroblepus mariae* (Fowler).

- 11a. Adipose fin well developed, with spine absent or embedded; barbel short, barely reaching to opposite rear margin of lower lip; teeth in outer row of premaxillary broadly unicuspid; pelvics reaching one-half to two-thirds way to anus; pectorals reaching one-third way out along pelvics; no nasal barbel on flap; anus usually a little closer to base of pelvics than base of caudal fin.
Astroblepus orientalis (Boulenger)
- 11b. Adipose fin with an obvious spine and usually connected by a membrane to caudal peduncle.
- 12a. Maxillary barbel reaching to gill opening, pelvics extending three-fourths way to anus; pectorals extending two-thirds out pelvics; nasal flap without barbel (Canelos, Ecuador).
Astroblepus boulengeri (Regan)
- 12b. Maxillary barbel reaching not more than one-half distance to gill opening or to opposite lower lip.
- 13a. Pectorals reaching one-third to two-fifths way out pelvics; nasal flap with a small barblet; barbel reaching halfway to gill opening; pelvics reaching four-fifths way to anus; color pattern in young with three pale bars, but in adults reduced to a single bar across caudal peduncle (Balsas, Peru).
Astroblepus supramollis Pearson
- 13b. Pectorals reaching one-half to four-fifths distance out pelvics; nasal flap triangular without barblet.
- 14a. A pale bar across caudal peduncle in adults and three in young; premaxillary teeth broadly pointed; pelvics reach two-thirds way to anus; maxillary barbel reaches to rear of lower lip (Río Dagua, Colombia).
Astroblepus trifasciatus (Eigenmann)
- 14b. No pale bars on body; teeth pointed; maxillary barbel reaching halfway to gill openings.
- 15a. Lips very thick and wide; pelvics reach three-fourths way to anus (Balsas, Peru)-----*Astroblepus labialis* Pearson
- 15b. Lips normal; pelvics reach two-thirds way to anus (Río Dagua, Colombia)----*Astroblepus retropinna* (Regan)
- 10b. Insertion of pelvic fins a trifle in front, directly under, or a little behind origin of dorsal fin.
- 16a. First ray of pectorals long, reaching to tips of pelvics or beyond, pelvics long too, the first ray reaching to anus or beyond; adipose fin elongate without a spine or spine completely embedded; teeth on outer row of premaxillary broadly pointed, and in large adults, 140 mm. long, some of teeth may be bilobed; maxillary barbel reaching to gill opening or a little beyond; interorbital equal to or a trifle shorter than distance from eye to margin of posterior nostril; anus about one-third to three-eighths closer to pelvic base than to caudal fin base; nasal flap ending in a short barbel (Peru to Colombia)-----*Astroblepus longifilis*¹⁹ (Steindachner)
- 16b. First ray of pectorals not reaching to tips of first ray of pelvics, usually not more than three-fourths way out pelvics.
- 17a. Adipose fin without spine, or spine completely embedded, or with tip of spine showing.
- 18a. Maxillary barbel reaching to gill opening or beyond.

¹⁹ To this species I refer as a synonym *A. heterodon* (Regan).

- 19a. Interorbital space equal to or a little greater than distance from eye to margin of posterior nasal opening.
- 20a. Nasal flap without a barbel at its tip; pelvics reaching a little beyond anus; pectorals reaching three-fourths way out pelvics.
- 21a. Spine of adipose fin embedded, its tip sometimes showing (Ecuador, Colombia, northern Venezuela).
*Astroblepus chotae*²⁰ (Regan)
- 21b. No trace of spine in adipose fin.
Astroblepus pirrense (Meek and Hildebrand)
- 20b. Nasal flap with a short barbel at its tip; pelvics reach to anus; pectorals extend halfway out pelvics (Peru).
Astroblepus rosei Eigenmann
- 19b. Interorbital space a little less than distance from eye to margin of posterior nasal opening.
- 22a. Pelvics reaching two-thirds way to anus; pectorals reaching two-thirds way out pelvics; triangular nasal flap without a barbel at its tip (Peru to Colombia).
Astroblepus taczanowskii (Boulenger)
- 22b. Pelvics reaching to anus or a little beyond; pectorals one-third to one-half way out pelvics; nasal flap sometimes with a small barbel (Ecuador to Colombia).
*Astroblepus grixalvii*²¹ Humboldt
- 18b. Maxillary barbel not reaching to gill opening.
- 23a. Pelvics reaching to anus or beyond; interorbital space a little shorter than distance between eye and margin of posterior nasal opening; nasal flap without a barbel.
- 24a. Maxillary barbel reaching halfway to gill opening; pectorals extend to middle of pelvics (Peru and Ecuador).
*Astroblepus sabalo*²² (Cuvier and Valenciennes)
- 24b. Maxillary barbel reaching three-fourths to four-fifths way to gill opening; pectorals extending two-thirds to three-fourths way out pelvics (Magdalena system).....*Astroblepus micresens* Eigenmann
- 23b. Pelvics not reaching to anus; nasal flap without barbel at its tip.
- 25a. Maxillary barbel relatively long, reaching three-fourths to four-fifths way to gill opening; no pale bar across caudal peduncle; pectorals extending two-thirds way out pelvics; interorbital space a little narrower than distance from eye to rim of posterior nasal opening; pelvics reaching two-thirds to three-fourths way to anus (Peru and Bolivia).
Astroblepus longiceps Pearson
- 25b. Maxillary barbel short reaching not over halfway to gill openings, usually about opposite the lower lip.
- 26a. Pelvics reaching only halfway to anus; interorbital space a little wider than distance from eye to

²⁰ To this species I refer as a synonym *A. marmoratus* (Regan).

²¹ To this species I follow Eigenmann and refer as synonyms the following species: *A. prenadilla* (Cuvier and Valenciennes); *A. brachycephalus* (Günther); *A. vailanti* (Regan); *A. regani* (Pellegrin); *A. whymperei* (Boulenger); *A. eigenmanni* (Regan).

²² I refer to this species as a synonym *A. ubidiai* Pellegrin, which was described from Lake St. Paul.

posterior nasal opening; pectorals extending one-third way out pelvics; anus five-elevenths or five-twelfths closer to pelvic base than base of caudal fin; no pale bar across caudal peduncle (Peru).

Astroblepus praeliorum Allen

- 26b. Pelvics extending two-thirds to four-fifths way to anus; interorbital space a little narrower than distance from eye to rear margin of posterior nasal opening; a pale bar across caudal peduncle below spine of adipose fin; pectorals extending one-third to one-half way out pelvics; premaxillary teeth in outer row broadly pointed (Peru to Colombia).

*Astroblepus frenatus*²³ Eigenmann

- 17b. Adipose fin with spine movable and connected by a membrane to dorsal surface of caudal peduncle, or continuation of adipose tissue.
- 27a. Pelvics reaching to anus; interorbital space equal to or a little greater than distance from eye to margin of posterior nasal opening; barbel reaches out to last fifth before gill opening; nasal flap sometimes with a short barbel.

- 28a. A pale color bar across peduncle; maxillary barbel reaching to gill opening; pectorals reach one-fourth to middle of pelvics (Ecuador and Colombia).

*Astroblepus cyclopus cyclopus*²⁴ (Humboldt)

- 28b. A pale color bar across caudal peduncle; maxillary barbel not quite reaching to gill opening; pectorals reaching only to base of pelvics (Ríos Dagua and San Juan).

*Astroblepus cyclopus cirratus*²⁵ (Regan)

- 28c. No pale color bar across caudal peduncle (Santander, Colombia)-----*Astroblepus cyclopus santanderensis* Eigenmann

- 27b. Pelvics not reaching to anus; interorbital space two-thirds to equal to distance from eye to margin of posterior nasal opening; no barbel at tip of nasal flap.

- 29a. Maxillary barbel extends four-fifths way to gill opening; pectorals extend to middle of pelvics; a pale bar across the caudal peduncle (Río Dagua and Magdalena systems).

Astroblepus unifasciatus (Eigenmann)

- 29b. Maxillary barbel reaching to rear of lower lip or a trifle farther, not over halfway to gill opening; no definite pale bar across caudal peduncle, but region just behind and below the adipose spine pale; body plain grayish or with black spots, or sometimes marbled; anus halfway between insertion of pelvics and base of caudal fin or a little closer to base of pelvics.

Astroblepus phelpsi, new species

ASTROBLEPUS ORIENTALIS (Boulenger)

Arges orientalis BOULENGER, Ann. Mag. Nat. Hist., ser. 7, vol. 11, p. 601, 1903 (Albirregas and Milla Rivers above Mérida, Venezuela).—REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 313, pl. 21, fig. 4, 1904 (Albirregas and Milla Rivers above Mérida).

²³ To this species I refer *A. mancoi* Eigenmann as a synonym.

²⁴ To this species I refer as a synonym *A. chimborazoi* Fowler.

²⁵ I follow Eigenmann and refer *A. ventrale* (Eigenmann) to this species as a synonym.

The following specimens were collected by Leonard P. Schultz in the Maracaibo Basin during 1942:

U.S.N.M. No. 121125, Río Gonzáles, tributary to Río Chama at La Gonzáles, Estado de Mérida, March 29, 78 specimens, 18.5 to 60.5 mm.

U.S.N.M. No. 121124, Río Chama at Estanques, Estado de Mérida, April 3, 1 specimen, 45.7 mm.

U.S.N.M. No. 121123, Río Barregas, tributary to Río Chama just below Egido, Estado de Mérida, March 29, 2 specimens, 28.5 and 47 mm.

ASTROBLEPUS CHOTAE (Regan)

Arges chotae REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 313, pl. 21, fig. 5, 1904 (Chota Valley, Marañon Basin, northern Peru).

Three of the specimens listed below from the Río Cobre were measured, and the data are presented in table 12.

U.S.N.M. No. 121129, Río Cobre, above its mouth, tributary to Río Quinta, latter tributary to Río La Grita, Catatumbo system, March 31, 1942, Leonard P. Schultz, 9 specimens, 35 to 93.5 mm.

U.S.N.M. No. 101617, Río Pamplonita, near Cucuta, Colombia, Maracaibo Basin, Nicéforo María, 1 specimen, 60 mm.

ASTROBLEPUS FRENATUS Eigenmann

Astroblepus frenatus EIGENMANN, Proc. Amer. Philos. Soc., vol. 56, p. 676, 1918 (Quebrada de San Joaquín, Santander, Colombia).

U.S.N.M. No. 121128, Río Torbes, 1 km. above Táriba, Venezuela, Orinoco drainage, collected by Leonard P. Schultz, March 31, 1942, 72 specimens, 20.5 to 52.5 mm.

ASTROBLEPUS PHELPSI, new species

PLATE 7, D

Holotype.—U.S.N.M. No. 121126, a male specimen 53.6 mm. in standard length, collected by Leonard P. Schultz, March 31, 1942, in the Río Cobre above its mouth near La Grita, tributary of Río Quinta, latter tributary to Río La Grita, Catatumbo system, Venezuela.

Paratypes.—U.S.N.M. No. 121127, 550 specimens, 9 to 65 mm., collected along with the holotype and bear the same data.

These types were taken from among rubble in rapidly flowing water.

Description.—The holotype and two paratypes, male and female, were measured, and data for these, expressed in hundredths of the standard length, are recorded in table 12. In addition certain counts were made, and these are presented in table 13.

The head is contained about 4 times in the standard length, and the greatest depth at origin of dorsal about 4 times; the insertion of the pelvics is nearly under the origin of the dorsal; premaxillary teeth unicuspid but blunt-pointed in outer row, but as is usual in this genus one or two pairs of the median teeth may be bilobed, outer row of teeth on each ramus numbers seven or eight; teeth of lower jaw all

strongly bilobed; interorbital space a little narrower than the distance from the eye to the rim of the posterior nasal opening; maxillary barbel short, scarcely reaching as far back as opposite the rear margin of the lower lip; all the lips finely papillate; anus five-elevenths to five-twelfths closer to the insertion of the pelvics than to the midbase of the caudal peduncle; adipose fin elongate, with a spine partly embedded but the tip is connected by a membrane to the caudal peduncle, which sometimes appears to be a continuation of the adipose fin; first ray of dorsal not extending beyond the branched rays, this fin short, contained 2 times in distance from insertion of pelvics to origin of anal fin; pectorals short, reaching about one-fourth the way out the short pelvics, the latter extending three-fourths the way to the anus, tips of first rays of pelvics, pectorals, and caudal very slightly elongate; snout $1\frac{1}{2}$ in the head; eye small, $2\frac{1}{4}$ to 3 times in the interorbital space.

Color.—Variable, usually plain grayish with a pale area at adipose spine, or the body may be mottled to brown or black spotted; caudal fin barred; sometimes on small specimens the pale area at adipose spine extends as a broken pale bar across the caudal peduncle, and a similar pale bar across middle of caudal fin, belly pale.

TABLE 12.—Measurements, in hundredths of the standard length, for species of *Astroblepus* from the Maracaibo Basin

Character	<i>Astroblepus phelpsi</i>			<i>Astroblepus chotae</i>		
	Paratype	Holotype	Paratype			
Standard length (in mm.).....	64	53.6	35.6	93.5	64.7	47.6
Length of head to gill opening.....	25.8	27.4	28.1	25.6	26.0	26.0
Width of head at base of pectorals.....	25.3	25.9	28.4	28.4	28.6	28.6
Length of maxillary barbel.....	10.9	8.58	8.70	16.0	17.9	16.2
Postorbital length of head.....	6.72	7.28	7.02	7.49	7.73	6.93
Greatest depth.....	20.3	20.5	19.9	23.0	22.4	21.8
Length of snout.....	18.1	18.6	19.7	17.6	17.3	17.0
Diameter of eye.....	2.03	2.05	3.09	2.24	2.63	3.36
Width of interorbital.....	5.78	6.90	7.30	6.95	8.04	7.98
Distance from eye to rear nostril.....	9.22	7.28	8.14	6.95	7.11	6.51
Width of ramus of upper jaw.....	7.50	7.10	7.30	6.20	7.42	6.51
Width of gape of mouth.....	13.3	13.2	13.2	12.9	12.4	11.3
Distance from anus to anal origin.....	11.4	11.6	10.1	14.6	13.4	12.8
Tip of snout to anus.....	71.9	67.4	69.1	64.6	68.0	65.1
Tip of snout to dorsal origin.....	42.6	45.0	45.2	47.0	42.6	43.9
Tip of snout to anal origin.....	84.6	78.4	77.2	79.4	78.6	78.0
Tip of snout to pectoral insertion.....	26.6	28.2	30.9	30.2	28.6	27.1
Tip of snout to pelvic insertion.....	43.9	43.8	43.0	39.1	44.2	41.0
Length of first dorsal ray.....	17.5	18.1	21.3	20.1	22.7	21.0
Length of first anal ray.....	11.8	13.6	15.7	12.4	13.8	17.2
Length of first pelvic ray.....	20.5	21.5	22.8	21.9	23.5	21.4
Length of first pectoral ray.....	20.6	24.4	22.5	31.0	32.8	30.7
Length of longest upper caudal ray.....	25.5	25.9	28.9	26.1	31.1	33.2
Length of shortest middle caudal ray.....	18.6	18.8	21.9	19.8	18.9	22.1
Length of caudal peduncle.....	18.3	17.7	16.9	16.0	16.1	17.0
Least depth of caudal peduncle.....	14.1	14.9	13.2	-----	-----	-----

Remarks.—This new species may be distinguished from others referred to the genus *Astroblepus* by the key to the species prepared for this genus, pages 278–282.

Named *phelpsi* in honor of William H. Phelps, of Caracas, who is a well-known leader in furthering the development of the biological sciences in Venezuela.

TABLE 13.—Counts made on two species of *Astroblepus*

Species	Number of fin rays							Number of branched rays in caudal fin
	Dorsal		Anal	Pectoral			Pelvic	
	i, 6	i, 7	i, 6	i, 9	i, 10	i, 11	i, 4	
<i>phelpsi</i>	31	-----	13	1	10	2	10	3
<i>chotae</i>	7	2	9	4	8	-----	6	3

Family LORICARIIDAE

KEY TO THE GENERA OF LORICARIIDAE REPORTED FROM VENEZUELA BASED ON SPECIMENS FROM THAT AREA

- 1a. Eyes on dorsal surface of head and not at all visible from below; bones of pectoral arch not exposed that connect across ventral side of body between pectoral fin bases.
- 2a. Caudal peduncle not greatly depressed and elongate, but if present rounded or triangular or compressed; adipose fin represented by a spine; no notch in posterior part of orbit; snout not greatly produced or pointed; plates in lower lateral series 30 or fewer.
- 3a. Width of ramus of lower jaw contained fewer than $1\frac{1}{2}$ times in interorbital space, usually the two being nearly equal in length and width; belly naked; teeth, bilobed, very numerous, about 100 to 150 on each ramus of jaw; dorsal origin a little in advance of a vertical line through insertion of pelvics; dorsal rays I, 7 to I, 9; anal I, 2 to I, 5; plates along lower sides 23 to 27.
- 4a. At least one-fourth of anterior dorsal surface of snout naked and without barbels; interopercle and opercle separately movable, former with short evertible spines, sometimes with curved or hooked tips..... *Chaetostoma* Heckel
- 4b. Snout bony to its tip; interopercle and opercle separately movable, former with graduated elongate, hooked spines not arranged in a rosette, but evertible..... *Pseudancistrus* Bleeker
- 3b. Width of ramus of lower jaw contained more than $1\frac{3}{4}$ times in interorbital space, usually 2 to 5 times.
- 5a. Dorsal rays I, 10 to 15; anal I, 3 or I, 4; interopercle and opercle moderately but not independently movable, former sometimes with spines or with spines rudimentary; dorsal origin in front of the pelvic insertion; plates keeled; teeth numerous, bilobed.
Pterygoplichthys Gill
- 5b. Dorsal rays I, 6 to I, 8 (usually I, 7); anal I, 3 to I, 5.

6a. Anterior fourth or more of upper surface of snout naked and with barbels at least in males well developed; in females snout bonier and barbels sometimes absent; interopercle and opercle separately movable, former with graduated evertible spines with tips hooked; belly naked; teeth with elongate bilobed tips; dorsal a little in front of pelvics; about 23 to 26 plates in lower lateral series.

Ancistrus Kner

6b. Anterior dorsal surface of snout bony, except on a few species with tip of snout having a roundish naked patch not much larger, sometimes smaller than orbit.

7a. Teeth usually 3-3 on premaxillaries and 6 to 12+6 to 12 on dentaries, tips elongate but not spoon-shaped; interopercle with a bunch of spines with curved tips; dorsal I, 7; anal I, 3 to I, 5; pectoral I, 5 or I, 6; lateral scutes about 24 to 26.

Lithoxus Eigenmann

7b. Teeth in ramus of each jaw number 5 to 16, expanded tips spoon-shaped or cupped, with or without a smaller lobe; dorsal rays always I, 7; anal I, 4; no barbels on tip of snout.

8a. Interopercle and opercle separately movable, former with graduated, elongate, evertible spines, except in young; about 6 to 8 cup-shaped teeth on ramus of each jaw; belly covered with platelets, except on young; dorsal origin nearly over insertion of pelvics; 24 to 26 plates in lower lateral series.

Panaque Eigenmann and Eigenmann

8b. Interopercle and opercle slightly but not independently movable; spines on interopercle absent or obsolete; dorsal origin a little in front of a verticle line through insertion of pelvics; 25 to 28 plates in lower lateral series; color of upper surfaces usually consisting of numerous dark spots, these sometimes occurring on belly.....*Cochliodon*²⁶ Heckel

7c. Teeth in each ramus of jaws number more than 20, usually 25 to 65, and expanded tips are elongate and bilobed; dorsal origin in front of that of pelvics.

9a. Interopercle and opercle separately movable, former with a rosette of graduated spines with hooked tips and long slender bristles arranged around outer margin of spines; dorsal I, 7; anal I, 5; plates in lower lateral series 24 or 25; belly naked.....*Lasiancistrus* Regan

9b. Spines and bristles on interoperculum, if present, not arranged in pattern of a rosette; belly with latelets except in young.

10a. Interopercle and opercle separately but moderately movable, former with short or elongate evertible spines; plates along lower sides 26 to 28 in number.

Hemiancistrus Bleeker

10b. Interopercle and opercle slightly but not independently movable; interopercle without spines, or spines obsolete; plates along lower sides about 28 in number.

Hypostomus Lacepède

²⁶ On the young up to a standard length of about 50 mm. the unworn teeth of my specimens from the Maracaibo Basin have their expanded tips twice as long as wide and a small lobe on the outer side, but in those about 60 mm. the lobe seems to have fused with the rest of the tooth as it wears down to half its original length; the teeth on the lower jaw lack the second small lobe at a much shorter length, it appears, therefore, from the specimens available, that one must cast serious doubt on the validity of the genus *Cheiridodus* Eigenmann.

- 2b. Caudal peduncle greatly depressed and sometimes almost knifelike; adipose fin lacking; snout may be greatly produced and pointed; interopercle and opercle not separately movable; dorsal surface of snout bony; spines absent on interopercle, except bristles on males.
- 11a. Teeth on each ramus of jaws about 4 to 13; a more or less distinct notch at posterior dorsal corner of orbit; dorsal origin over insertion of pelvis; plates in lower lateral series 28 to 31.
- 12a. Teeth with elongate bilobed tips.....**Loricaria** Linnaeus
- 12b. Tips of teeth with both lobes spoon-shaped, inner lobe largest.
Spatuloricaria, new genus
- 11b. Bilobed teeth on ramus of each jaw 15 to 40; no notch at rear of orbit; plates in lower lateral series 32 to 37; belly plated.
- 13a. Dorsal origin nearly over anal origin; 8 or 9 plates between dorsal and supraoccipital; teeth 15 to 29 on each ramus of jaws.
Farlowella Eigenmann and Eigenmann
- 13b. Dorsal origin nearly over insertion of pelvis; 4 plates in front of dorsal; teeth 30 to 40 on each ramus of jaws...**Sturisoma** Swainson
- 1b. Eyes at sides of head situated so that they are visible from below as well as from dorsal aspect; bones exposed on under side of body that connect between base of pectorals, in two series of one pair each; adipose a rudimentary spine; snout depressed; teeth numerous, bifid in a single row; 23 or 24 plates along sides.....**Hypoptopoma** Günther

Genus CHAETOSTOMA²⁷ Heckel

Chaetostoma HECKEL, in Tschudi, Fauna Peruana, Ichthyologie, p. 26, 1846.
(Type, *C. lobarhyncha* Tschudi.)

KEY TO THE SPECIES OF CHAETOSTOMA REPORTED FROM VENEZUELA

- 1a. A small, fleshy, usually blackish keel at rear tip of supraoccipital plate; dorsal rays I, 8; anal I, 5; usually 4 or 5 hooked spines on interopercle; blackish spots on membranes of dorsal fin between rays and not on rays.
- 2a. About 25 to 28 marginal lappets on rear edge of lower lip; a group of about 3 short papillae inside of mouth about two-thirds way out from midline on plate; a similar group but longer papillae about halfway out on plate of lower jaw; upper surface of head anteriorly with numerous small darkish spots, none on body; a black spot on the membrane between base of dorsal spine and first soft ray and fainter dark spots, mostly on membrane and naked area at base of fin near base of each soft ray; 5 or 6 dark spots on membranes between dorsal rays and not on rays; other fins mostly plain pale; caudal fin deeply concave, color plain, with dark pigment evident near tips of middle rays forming an obscure dark band across rear edge of caudal, except white tips of upper and lower lobes.....**Chaetostoma tachiraensis**, new species
- 2b. Dorsal surface of head and that of body everywhere covered with numerous blackish spots, those on sides of body arranged in about 4 to 6 rows; caudal fin only slightly concave, tips of upper and lower lobes white; about 16 to 22 marginal lappets on rear edge of lower lip; inside of mouth about halfway out on plate of upper jaw a group of 3 or 4 papillae, sometimes lacking; those on plate of lower jaw well developed.

Chaetostoma milesi Fowler

²⁷ The specimen reported upon by Myers as *C. anomalus* Regan from the upper Rio Meta system, Guacaramo, Colombia, is without doubt some other species and should not be associated with the true *C. anomala* of the Maracaibo Basin.

1b. No fleshy keel at posterior edge of supraoccipital plate; if dark color bars present on dorsal fin, color occurring on rays, not as round dark spots on membranes between rays; dorsal surface of head and of body without dark spots.

3a. Anal rays I, 4; dorsal I, 8; about 4 or 5 hooked spines on interopercle.

4a. A dark spot on membrane between dorsal and first soft ray; upper surface of head with some pale areas; pectoral fin with 2 or 3 cross bars; eye 5 to 7 times in head.

*Chaetostoma guairensis*²⁸ Steindachner

4b. Eye diameter 10 times in head; no black spots anywhere along base of dorsal fin..... *Chaetostoma stanni* Lütken

3b. Anal rays usually I, 3 or I, 4, rarely I, 5; dorsal rays I, 7 to I, 9; about 5 to 10 spines on the interopercle, these spines nearly straight, except a little hooked in *pearsei*.

5a. Dorsal rays I, 8 or I, 9; anal I, 4 occasionally I, 3.

6a. A distinct black spot on membrane between dorsal spine and first soft ray, but no such spots near base of following soft rays.

7a. Usually 3 (2 to 4) dark bars across upper rays of caudal fin; eye contained in interorbital space 2.3 to 3.0 times; Río Motatán system, Maracaibo Basin.

Chaetostoma anomala sovichthys, new subspecies

7b. Usually 4 (3 to 5) dark bars across upper rays of caudal fin; eye 2.6 to 3.2 in interorbital space.

Chaetostoma anomala anomala Regan

6b. No black spots at bases of dorsal rays; dorsal fin rays I, 9, anal I, 4; upper parts with faint light spots... *Chaetostoma pearsei* Eigenmann

5b. Dorsal I, 7, anal I, 4; a black spot on membrane between dorsal spine and next ray and on membrane near base of each following ray.

Chaetostoma nudirostris Lütken

CHAETOSTOMA TACHIRAENSIS, new species

CORRONCHO

PLATE 7, B, C

Holotype.—U.S.N.M. No. 121052, a specimen 58.6 mm. in standard length collected by Leonard P. Schultz in the Río Táchira 7 km. north of San Antonio, Estado de Táchira, Venezuela, on April 1, 1942. The Río Táchira is a tributary of the Río Zulia, Catatumbo system, Maracaibo Basin.

Paratype.—U.S.N.M. No. 101612, a specimen 87.0 mm. in standard length collected by Nicéforo María in the Río Pamplonita, near Cucuta, Colombia, Catatumbo system, Maracaibo Basin.

Description.—Based on the holotype and paratype; all measurements are given in hundredths of the standard length, those for the paratype in parentheses. Standard length (in mm.) 58.6 (87.0); total length 83.0 (—) mm.

²⁸ Although I have not seen material of this species, I am inclined to believe that it was based on an immature specimen and may be the same as *milesi* or my *tachiraensis*.

TABLE 14.—Counts and measurements made on the species and subspecies of *Chaetostoma* from the Maracaibo Basin

Species and locality	Number of fin rays					Number of dark bars across upper half of caudal fin			Number of times eye is contained in inter-orbital space														
	Dorsal			Anal		2	3	4	5	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	
	I, 7	I, 8	I, 9	I, 2	I, 3																		I, 4
<i>anomala anomala</i> :																							
Rfo Chama.....	2	13			2	13										1			2	4	2	1	
Rfo Barregas.....		6				6		1	11	1													
Rfo Chama (Regan).....	15	197	23	2	47	186																	
Total.....	17	216	23	2	49	205		1	11	1					1			2	4	2	1		
<i>anomala sorichthys</i> :																							
Rfo San Pedro.....		15			3	12	2	10	2				2		2	1	1	3		2			
Rfo San Juan.....		5	1			6																	
Rfo Motatán.....	1	5				6	1	6						1	1	2							
Total.....	1	25	1		3	24	3	16	2				2	1	3	3	1	3		2			
<i>tachiraensis</i>			2				2							1			1						
<i>milesi</i>		4					4				1			1									

TABLE 15.—Measurements, in hundredths of the standard length, made on various species of *Chaetostoma*

Characters	<i>anomala sorichthys</i>	<i>enomala anomala</i>			<i>tachiraensis</i>		<i>fisheri</i> (Panama)	<i>milesi</i>	
					Holo-type	Para-type		Honda, Colombia	Rfo Guarico
Standard length.....	43.2-72.0	82.5	44.2	61.1	58.6	87.0	76.6	89.0	108.5
Greatest depth body.....	16.9-18.7	19.5	17.9	19.1	20.5	21.3	17.0	18.2	21.2
Width head at coracoids.....	36.6-40.2	39.3	37.6	35.1	35.4	35.6	30.3	32.8	32.9
Length head (to supraoccipital).....	34.7-37.3	33.4	35.7	36.0	36.0	33.6	31.1	34.5	32.0
Snout.....	24.5-28.0	24.6	25.1	24.5	24.9	24.3	21.0	24.3	22.6
Interorbital.....	11.5-12.7	11.6	12.4	12.6	12.5	12.4	10.4	10.3	10.7
Eye.....	4.20-5.09	3.64	4.75	4.58	5.12	4.55	4.57	4.72	4.06
Length caudal peduncle.....	22.2-26.9	27.9	25.1	25.0	26.3	29.0	28.9	28.7	24.9
Least depth caudal peduncle.....	11.8-12.3	12.2	12.2	13.3	14.7	14.6	12.0	12.8	13.2
Length first ray dorsal.....	18.7-22.5	21.2	24.4	23.7	28.5	29.1	27.5	26.1	27.2
Length last ray dorsal.....	16.4-20.1	16.5	14.9	17.2	16.6	17.4	14.6	16.6	16.8
Length outer upper ray caudal.....	18.5-25.0	24.4	28.5	27.5	35.0		26.1	30.2	29.5
Length first ray caudal.....	26.8-32.4	29.6	34.2	33.4	40.3		33.3	36.6	35.0
Length pectoral spine.....	24.5-27.1	25.2	25.3	26.4	30.9	35.4	28.1	28.5	28.9
Longest ray anal.....	8.10-9.51	9.94	10.2	8.84	12.0	12.8	12.4	13.7	12.0
Length ramus lower jaw.....	10.1-10.9	11.5	12.0	12.6	12.0	12.5	9.00	10.3	10.6
Distance nostrils to snout.....	18.5-25.0	17.0	17.2	19.3	17.0	18.6	15.0	17.1	16.8
Distance nostrils to eye.....	5.32-6.48	5.54	6.70	6.3	5.12	5.98	4.30	4.72	5.13
Distance snout to origin dorsal.....	46.5-48.6	46.8	48.2	48.2	48.1	44.3	42.0	44.8	42.4
Distance snout to origin anal.....	69.6-74.1	69.7	72.4	71.8	70.3	69.5	67.4	71.6	61.3
Distance snout to origin adipose.....	82.4-85.7	83.1	83.7	83.8	83.7	84.0	80.4	81.0	77.0
Length base of dorsal fin.....	25.2-26.6	26.7	27.1	27.1	27.5	25.6	22.2	25.0	25.0
Eye to rear edge temporal plate.....	8.40-9.20	8.12	8.60	7.69	8.58	10.5	8.50	8.20	7.92
Snout to gill opening.....	30.6-34.0	32.2	30.6	31.1	29.2	28.4	25.5	27.6	27.5

Width of head at base of humeral process or coracoids 35.4 (35.6); length of head from tip of snout to posterior end of supraoccipital plate 36.0 (33.6); length of head from snout to rear of temporal plate 37.9 (34.6); tip of snout to upper edge of gill opening 29.2 (28.4); greatest depth of body 20.5 (21.3); length of snout 24.9 (24.3); width of fleshy interorbital space 12.5 (12.4); diameter of eye 5.12 (4.55); length from base of last anal ray to midbase of caudal fin rays 26.3 (29.0); least depth of caudal peduncle 14.7 (14.6); length of ramus of lower jaw 12.0 (12.5); greatest width of lower lip 6.49 (6.55); rear edge of eye to posterior edge of temporal plate opposite first lateral line pore 8.88 (10.5); length of first ray of dorsal fin 28.5 (29.1); length of last ray of dorsal 16.6 (17.4); length of pectoral spine 30.9 (35.4); length of upper ray of caudal fin 35.0 (—); length of lower ray of caudal fin 40.3 (—); length of ray of adipose fin 11.1 (10.8); length of longest anal fin ray 12.0 (12.8); length of base of dorsal fin 27.5 (25.6); distance from bony edge of nasal opening to tip of snout 17.0 (18.6); distance from edge of nasal opening to eye 5.12 (5.98); tip of snout to origin of dorsal fin 48.1 (44.3); tip of snout to origin of anal fin 70.3 (69.5); tip of snout to origin of adipose 83.7 (84.0); distance from anus to anal origin 8.20 (9.30).

The following counts were made: Dorsal rays I,8 (I,8), anal I,5 (I,5); pelvic I,5 (I,5); pectoral I,6 (I,6); series of lateral scutes 24 (24); pores in lateral line 25 (25); interopercle with 4 (5) hooked spines; about 6 (8) spines on operculum; 11 (12) scutes between anal and base of caudal; 5 (5) scutes between dorsal and adipose and 4 (4) in front of dorsal.

The body is short and its width broad as in *C. anomala*; the width at coracoids is equal to the distance from tip of snout to rear of supraoccipital plate and is contained 2.9 times in the standard length; a small dermal keel, a little longer than pupil, lies along middorsal line at rear tip of the supraoccipital plate; interorbital space about 1% in the snout; eye 2½ in interorbital space and 4% in the snout; length of depressed anal a little longer than the width of interorbital space; plates all prickly; dorsal spine not much larger than the soft rays; pectoral spine enlarged with strong spines; soft rays of pelvics and pectorals with prickles; anterior third of snout fleshy, without plates, but with small folds; lips papillate; belly naked; a barbel at each corner of the mouth; a narrow naked area along base of dorsal, but along base of adipose the naked area is obsolete; intestines much coiled; peritoneum blackish; caudal fin deeply concave, the upper lobe equal to distance from snout to rear of supraoccipital.

Color.—Grayish brown above paler below; top of head and sides with small dark spots caudal plain grayish, as in many specimens of *C. anomala anomala* and *C. anomala sovichthys*, but the forked caudal

has pale tips to the upper and lower caudal lobes; the middle rays at tips are slightly blackish, interradiial membranes of caudal with black pigment; a somewhat diffuse yet distinct dark streak along midsides; traces of four dark saddles on back, one in front of dorsal, the second at front of dorsal, third at rear of dorsal, fourth through adipose base and on caudal peduncle; pectoral spines blackish above; pelvics plain like body; the conspicuous black spot between dorsal spine and first branched ray is present but smaller, then less distinct dark spots occur on the naked area of body between the bases of each soft dorsal ray, the pigment extends a trifle on the base of the interradiial membranes; membranes between soft dorsal rays with five or six dark spots, the rays pale

Named *tachiraensis* for the river in which it was taken.

Remarks.—This new species may be distinguished from all other species of *Chaetostoma* by the small dermal fold or keel at rear tip of the supraoccipital, this keel about equal in length to diameter of pupil. Fowler (Proc. Acad. Nat. Sci. Philadelphia, vol. 91, p. 238, figs. 28, 29, 1940) describes *C. furcata* from Peru as having a bony protuberance at rear tip of supraoccipital, but in *tachiraensis* this is a dermal keel. *C. furcata* has I, 4 anal and I, 7 dorsal rays, while the new species has I, 5 and I, 8 rays, respectively. The color pattern of small dark spots anteriorly on head and with the pigment spot on the interradiial membranes of the dorsal instead of on the rays is characteristic of this new species. The species most closely related to *tachiraensis* is Fowler's *C. milesi* (Notulae Naturae, No. 73, p. 2, figs. 1-5, 1941) described from Honda, Colombia. This species is represented by three specimens in U.S.N.M. No. 116467, measuring 64 to 89 mm. in standard length, from the Magdalena River, Honda, Colombia. Regan's species *C. thomsoni* (Trans. Zool. Soc. London, vol. 17, pt. 3, p. 250, pl. 14, fig. 2, 1904), from Villeta, Colombia, is very similar to *C. milesi* Fowler. However, both of these species differ in color; the dorsal fin of *C. tachiraensis* has the color spots on the membranes of the dorsal instead of on the rays as in *C. thomsoni*, there is a lateral dark band on *tachiraensis*, but in *C. milesi* there are about four rows of small dark spots along the sides; all three specimens of *milesi* before me agree with Fowler's figures, except there are no spots on the dorsal membranes. The caudal fin is much less concave in *milesi* and *thomsoni* than in *tachiraensis*, it is almost forked in the latter.

CHAETOSTOMA MILESI Fowler

Chaetostoma milesi FOWLER, Notulae Naturae, No. 73, p. 2, figs. 1-5, 1941 (Honda, Colombia).

U.S.N.M. No. 121051, 2 specimens, 98 and 130 mm., from Río Guárico (Orinoco system) and tributaries between San Sebastián and San Casimiro, Estado de

Aragua, Venezuela, collected by Leonard P. Schultz, W. H. Phelps, Jr., Roger Sherman, and G. Zuloaga, May 12, 1942.

U.S.N.M. No. 116467, from Magdalena River, near Honda, Colombia, collected by Cecil Miles.

Measurements for this species are given in tables 14 and 15.

CHAETOSTOMA GUAIRENSIS Steindachner

CORRONCHO

Chaetostomus guairensis STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 43, p. 121, pl. 3, figs. 1, 1a, 1882 (Guaire at Caracas, Venezuela).—REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 249, 1904 (Caracas).—EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 9, 1920 (Río Castaño, at Maracay, Venezuela).—RÖHL, Fauna descriptiva de Venezuela, p. 384, 1942 (no locality).

CHAETOSTOMA STANNII Lütken

Chaetostomus stannii LÜTKEN, Vid. Medd. Naturh. Foren. Kjøbenhavn, pts. 12–16, p. 206, 1874 (Puerto Cabello, Venezuela).—STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 43, p. 120, pl. 5, fig. 4, 4a, 1882 (Puerto Cabello).—REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 248, 1904 (Puerto Cabello).

CHAETOSTOMA ANOMALA SOVICHTHYS, new subspecies

CORRONCHO

PLATE 8, A, B

Holotype.—U.S.N.M. No. 121053, a specimen 71.5 mm. in standard length taken by Leonard P. Schultz on March 20, 1942, near the bridge over the Río San Pedro, a tributary of the Río Motatán, southeast of Mene Grande, in the Maracaibo Basin. This river was a succession of pools and riffles, the bottom covered with rubble.

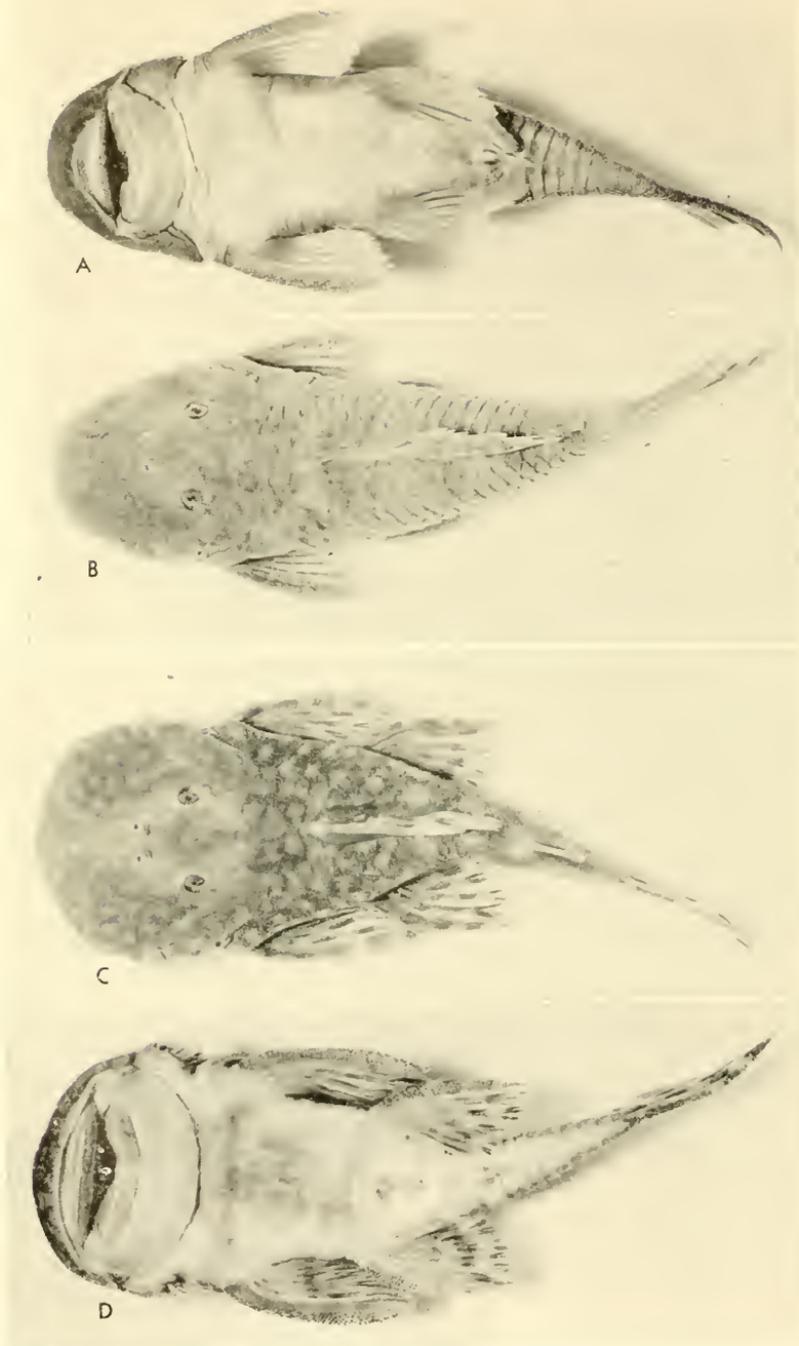
Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121056, 118 specimens, 19 to 72.5 mm. in standard length, taken along with the holotype and bearing the same data; U.S.N.M. No. 121058, 14 specimens, 43.8 to 62.7 mm. in standard length, taken on March 17 and 20, 1942, near the bridge in the Río San Juan, tributary of the Río Motatán, southeast of Mene Grande, Maracaibo Basin; U.S.N.M. No. 121055, 20 specimens, 12.8 to 45.2 mm. from the Río Motatán, 4 km. above Motatán, March 25, 1942; U.S.N.M. No. 121057, 3 specimens, 17.5 to 45 mm., from the Río Jimelles, 12 km. east of Motatán, a tributary of the Río Motatán, Maracaibo Basin, March 24, 1942; U.S.N.M. No. 121054, 15 specimens, 12 to 30 mm., from the Río Motatán, 8 km. below Motatán, March 24, 1942.

In addition, Dr. H. Pittier, in 1923, collected 2 specimens, U.S.N.M. No. 86262, 20 and 36.5 mm., in the Río Motatán near Valeria, Estado de Trujillo, Venezuela.

In all the localities where this species occurred the water flowed rapidly and the stream bottoms were composed of gravel to rubble.



A, *Doraops zuloagai*, new genus and species: Holotype (U.S.N.M. No. 121015), 287 mm. in standard length; B, C, *Chaetostoma tachiraensis*, new species: Holotype (U.S.N.M. No. 121052), 58.6 mm.; D, *Astroblepus phelpsi*, new species: Holotype (U.S.N.M. No. 121126), 53.6 mm. A, drawing; B and C, photographs; D, retouched photograph.



A, B, *Chaetostoma anomala sovichthys*, new subspecies: Holotype (U.S.N.M. No. 121053), 71.5 mm. in standard length; C, D, *Pseudancistrus torbesensis*, new species: Holotype (U.S.N.M. No. 121001), 64.6 mm. Photographs.

Description.—Based on the holotype and numerous paratypes listed above. All measurements are given in hundredths of the standard length, those for the holotype first and then in parentheses those for the paratypes that were measured in detail. Standard length (in mm.) 71.5 (72.0; 43.2; 60.2); total length 96.1 (92.0; 58.1; 77.0) mm.

Width of head at base of humeral process in front of base of pectoral spine 28.0 (27.5; 25.0; 24.5); length of head from tip of snout to posterior end of supraoccipital plate 36.5 (36.4; 37.3; 34.7); tip of snout to upper edge of gill opening 33.0 (34.0; 30.8; 33.0; 30.6); greatest depth of body 18.3 (18.7; 17.4; 16.9); length of snout 28.0 (27.5; 25.0; 24.5); width of fleshy interorbital space 11.9 (11.5; 12.7; 11.5); diameter of eye 4.20 (4.30; 5.09; 5.00); the eye is larger on the smaller specimens; length from base of last anal ray to midbase of caudal fin rays 26.9 (25.7; 22.2; 24.4); least depth of caudal peduncle 12.2 (11.8; 12.3; 12.1); length of ramus of lower jaw 10.6 (10.1; 10.9; 10.3); greatest width of lower lip 7.27 (6.94; 7.64; 6.29); rear edge of eye to posterior edge of temporal plate opposite first lateral line pore 8.40 (8.61; 9.20; 8.71); length of first ray of dorsal fin 22.4 (22.4; 22.5; 18.7); length of last dorsal ray 17.5 (20.1; 16.4; 18.7); length of pectoral spine 26.7 (27.1; 24.5; 24.5); length of upper bony ray of caudal fin 23.6 (22.5; 25.0; 18.5); length of lower bony ray of caudal fin 30.1 (30.0; 32.4; 26.8); length of ray of adipose fin 6.71 (7.08; 6.72; 8.38); length of longest anal fin ray 9.51 (8.48; 8.10; 8.54); length of base of dorsal fin 26.6 (26.5; 25.7; 25.2); distance from bony edge of nasal opening to tip of snout 19.9 (19.7; 25.0; 18.5); distance from edge of nasal opening to eye 6.29 (5.73; 6.48; 5.32); tip of snout to origin of dorsal fin 47.6 (46.5; 48.6; 47.6); tip of snout to origin of anal 74.1 (73.1; 73.2; 69.6); tip of snout to origin of adipose 84.6 (85.2; 85.7; 82.4); distance from anus to anal origin 8.67 (9.03; 10.4; 8.55).

The following counts were made, respectively: Rays in dorsal fin I, 8 (I, 8; I, 8; I, 8); anal fin I, 4 (I, 4; I, 4; I, 4); pectoral rays always I, 6 and pelvic rays always I, 5; pores in lateral line 24 (24; 24; 25); series of plates along sides 24 (23; 24; 24); always 4 series of plates in front of dorsal, and 4 or 5 plates between dorsal and adipose fins; 11 series of plates between anal base and midbase of caudal fin rays; the spines on the opercle consist of 2 strong ones and 6 to 8 weaker ones, those on the interopercle are irregular in number, usually in three groups of 2 or 3 + 2 to 4 + 3 or 4, starting dorsally.

Head broad, depressed, its width at base of pectoral a little greater than its length (from tip of snout to rear of supraoccipital); eyes small mostly in posterior quarter of the head; bony covering everywhere

prickly; the first rays of all the fins, except anal, are enlarged and bony, with strong prickles, and those on the pectoral spine recurved spinules; the soft rays of pelvics and pectorals also with prickles; the anterior third of the snout not bony and without prickles, this fleshy area is more or less composed of very small plicate folds; both lips papillate; the small barbel at the outer corners of the lips is rather short, and is contained about 3 to $3\frac{1}{4}$ times in the fleshy interorbital space; two pairs of nasal openings close together near middorsal line, a little in front of the eyes, the posterior opening of each pair covered by a dermal flap; a rather wide area along base of dorsal and adipose fins naked; belly naked to anal fin; intestine elongate, much coiled.

Color.—Grayish to brownish above, paler below, the blackish peritoneum conspicuous through the skin; five pale areas dorsally separated by dark saddles, the first at front of dorsal, second at rear base of dorsal, third in front of adipose fin, last behind that fin; these dark-colored saddles join along midsides to form a more or less obvious wide lateral band. Top of head finely mottled or speckled with pale; dorsal fin barred, the black and pale areas on the rays, the membranes pale or plain grayish; caudal fin with three distinct bars on upper and middle rays with an additional bar on the lower lobe near the ends of the rays, seldom are there two or four bars on the upper lobe of the caudal fin; pelvics sometimes with two dark bars and pectorals plain or with about three or four bars; anal with its base usually blackish; dorsal fin with a conspicuous black spot on the membrane between the bases of the spine and first soft ray; belly yellowish when alive and also the tip of the upper lobe of caudal fin yellowish.

Named *sovichthys* in honor of and in appreciation of the help extended to me by the Standard Oil Co. of Venezuela while I was a guest at the camps of the Lago Petroleum Corporation.

Remarks.—This new subspecies differs from *Chaetostoma anomala anomala* Regan of the Río Chama system, Maracaibo Basin, in having a larger eye, in reference to width of interorbital space, and in color. The eye is contained 2.3 to 3.0 (average about 2.7) in the interorbital space in *sovichthys* of the Río Motatán system, and in *anomala* 2.7 to 3.3 (average about 3.0) on specimens of comparable sizes, 25 to 75 mm. in standard length. The dark bars on the upper lobe and middle rays of the caudal fin in *sovichthys* are wider and number three, only occasionally two or four, while in *C. a. anomala* they are narrower and almost always number four, only rarely three or five; thus the caudal fin of the Río Chama form is barred the same as the dorsal, while *sovichthys* of the Motatán system has more distinct but fewer dark bars across its caudal. There are in addition some statistical differences in bodily proportions when the same sizes of specimens are compared.

CHAETOSTOMA ANOMALA ANOMALA Regan

CORRONCHO; CHAROCA

Chaetostomus anomalus REGAN, Ann. Mag. Nat. Hist., ser. 7, vol. 11, p. 599, 1903 (Mérida, Venezuela, 1,500 meters; Albirregas and Milla Rivers above Mérida, 3,500 meters); Trans. Zool. Soc. London, vol. 17, pt. 3, p. 250, pl. 12, fig. 2, 1904 (Mérida, Venezuela).

Collections made in 1942 by Leonard P. Schultz in the Maracaibo Basin of Venezuela:

U.S.N.M. No. 121059, taken April 3, in the Río Chama at Estanques, Estado de Mérida, 60 specimens, 23.5 to 79 mm.

U.S.N.M. No. 121060, taken March 30, in the Río Chama 10 km. below Lagunillas, Estado de Mérida, 5 specimens, 18.5 to 26 mm.

U.S.N.M. No. 121061, Río Táchira, 7 km. north of San Antonio, Catatumbo system, April 1, 1 specimen, 61.1 mm.

U.S.N.M. No. 121062, Río Barregas, tributary to Río Chama just below Egi-do, Estado de Mérida, March 29, 457 specimens.

U.S.N.M. No. 121063, Río Gonzáles, tributary to Río Chama at La Gonzáles, Estado de Mérida, March 29, 159 specimens, 10.2 to 76.6 mm.

In addition, U.S.N.M. Nos. 101608 and 101615, one specimen each, were collected by Nicéforo María in the Río Pamplonita, near Cucuta (Catatumbo system), Santander del Norte, Colombia.

The following measurements, expressed in hundredths of the standard length, were made on two specimens from the Río Barregas at Egi-do, Estado de Mérida (standard length 82.5; 44.2 mm., total length 107; 60.2 mm.): Width of head at base of humeral process or in front of base of pectoral spine 39.3; 37.6; length of head from tip of snout to posterior end of supraoccipital plate 33.4; 35.7; tip of snout to upper edge of gill opening 32.2; 30.6; greatest depth of body 19.5; 17.9; length of snout 24.6; 25.1; width of fleshy interorbital space 11.6; 12.4; diameter of eye 3.64; 4.75; length from base of last anal ray to midbase of caudal fin rays 27.9; 25.1; least depth of caudal peduncle 12.2; 12.2; length of ramus of lower jaw 11.5; 12.00; greatest width of lower lip 7.52; 7.96; rear edge of eye to posterior edge of temporal plate opposite first lateral line pore 8.12; 8.60; length of first ray of dorsal fin 21.2; 24.4; length of last dorsal ray 16.5; 14.9; length of pectoral spine 25.2; 25.3; length of upper bony ray of caudal fin 24.4; 28.5; length of lower bony ray of caudal fin 29.6; 34.2; length of ray of adipose fin 6.30; 5.56; length of longest anal fin ray 9.94; 10.2; length of base of dorsal fin 26.7; 27.1; distance from bony edge of nasal opening to tip of snout 17.0; 17.2; distance from edge of nasal opening to eye 5.54; 6.79; tip of snout to origin of dorsal fin 46.8; 48.2; tip of snout to origin of anal fin 69.7; 72.4; tip of snout to origin of adipose 83.1; 83.7; distance from anus to origin of anal 10.5; 10.6.

The number and arrangement of scutes and spines appear to be the same in both *anomala* and *sovichthys*.

CHAETOSTOMA PEARSEI Eigenmann

CORRONCHO

Chaetostomus pearsei EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 8, fig. 3, pl. 2, 1920 (Río Castaño at Maracay, Río Tuy at El Concejo, Venezuela).—PEARSE, Univ. Wisconsin Studies, No. 1, pp. 20, 43, 1920 (Río Castaño, Venezuela).

CHAETOSTOMA NUDIROSTRIS Lütken

Chaetostomus nudirostris LÜTKEN, Vid. Medd. Naturh. Foren. Kjøbenhavn, 1874, p. 207 (Valencia, Venezuela).—STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 43, p. 120, pl. 5, fig. 2, 2a, 1882 (Valencia).—REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 251, 1904 (Valencia).—EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 8, 1920 (no specimen secured).

Genus PSEUDANCISTRUS Bleeker

Pseudancistrus BLEEKER, Atlas ichthyologique, vol. 2, p. 2, 1862; Ned. Tijdschr. Dierk., 1863, vol. 1, p. 78. (Type, *Hypostomus barbatus* Cuvier and Valenciennes.) (Ref. copied.)

KEY TO THE SPECIES OF PSEUDANCISTRUS FROM VENEZUELA

- 1a. Anal rays I, 5; 3 plates from dorsal fin base to adipose origin.
Pseudancistrus torbesensis, new species
- 1b. Anal rays I, 4; 4 to 6 plates from dorsal base to adipose origin.
- 2a. Dorsal rays usually I, 6 or I, 7.
- 3a. Five plates from dorsal fin base to adipose origin; 11 plates from anal base to midbase of caudal fin.
Pseudancistrus coquenani (Steindachner)
- 3b. Four plates from dorsal fin base to adipose origin; 9 (probably 10) plates from base of anal to midbase of caudal fin.
Pseudancistrus yaravi (Steindachner)
- 2b. Dorsal rays usually I, 8 or I, 9; usually 11 plates between anal base and midcaudal fin base; 5 or 6 plates from dorsal fin base to adipose origin.
Pseudancistrus pediculatus cobrensis, new subspecies

PSEUDANCISTRUS TORBESENSIS, new species

PLATE 8, C, D

Holotype.—U.S.N.M. No. 121001, a specimen 64.6 mm. in standard length, taken by Leonard P. Schultz on March 31, 1942, 1 km. above Táriba in the Río Torbes, Orinoco system.

Paratypes.—U.S.N.M. No. 121002, 174 specimens, 15.5 to 64.6 mm. in standard length, taken along with the holotype and bearing the same data. These types all came from swiftly running water among boulders, rubble to coarse gravel.

Description.—Based on the holotype and paratypes; detailed measurements, expressed in hundredths of the standard length, are recorded for the holotype and three paratypes, the data for the latter included in parentheses, respectively. Standard length (in mm.) 64.6 (64.5; 51.2; 44.2; 21.5); total length 83.0 (82.0; 66.8; 59.8; 28.7) mm.

TABLE 16.—Counts recorded for certain species and subspecies of *Pseudancistrus*

Species	Number of fin rays										Number of plates												Number of spines on interopercle			
	Dorsal					Anal					In lower lateral series				From dorsal fin to origin adipose fin				From anal to base of mid-caudal fin rays							
	I, 6	I, 7	I, 8	I, 9	I, 3	I, 4	I, 5	24	25	26	27	3	4	5	6	7	9	10	11	12	6-10	11-15	16-20	21-25		
<i>daguae</i>			11	32		1		1	1					1	1										Av.	
<i>carnegiei</i>			3	10		1		1	1	1				1	1						Few	Av.				
<i>setosus</i>	1	1			1									1	1									Av. ♀	Av. ♂	
<i>pediculatus pediculus</i>	5	46	2		2		1	2	1					1	1	1				1	Av.					
<i>pediculatus cobrensis</i>	2	44	8		4		3	1						7	7				4		14					
<i>torbesensis</i>			28				28	4	1				5					1	4				3		1	
<i>coquenani</i>	1	1			3		3							1					1							
<i>yaravi</i>	1				1		1						1						1					Av.		

TABLE 17.—Measurements, in hundredths of the standard length, for two species of *Pseudancistrus*, computed from Steindachner's descriptions

Character	<i>yaravi</i>	<i>coquenani</i>	
Standard length (in mm.).....	47	81	76
Length of head.....	38.3	35.8	34.9
Width of head.....	31.9	30.9	32.9
Greatest height of body.....	19.2	18.5	18.4
Height of caudal peduncle.....	10.6	12.3	11.8
Length of caudal peduncle.....	31.9	25.9	26.3
Diameter of eye.....	6.38	3.70	3.29
Length of snout.....	22.3	23.5	23.7
Length of mandible.....	8.50	8.64	9.21
Width of interorbital space.....	12.8	11.1	10.5
Height of dorsal rays.....	23.4	21.0	21.7
Height of last dorsal rays.....		13.6	13.1
Length of dorsal base.....	25.5	22.8	22.4
Snout to dorsal origin.....	46.8	44.4	46.0
Distance from base last dorsal ray to adipose fin.....	12.8	16.1	14.5
Length of pectoral.....	29.8	25.9	26.3
Length of pelvic.....	29.8	23.5	22.4
Snout to pelvic insertion.....	46.8	49.4	48.7
Height of anal.....	10.6	11.1	11.8
Length of lower lobe of caudal.....	26.6	30.9	32.9
Distance of nasal opening from front border of head.....	16.0		
Distance of nare from front of eye.....	6.38		
Distance between nostrils.....	5.32		

Length of head from tip of snout to rear edge of temporal plate 41.2 (40.3; 39.5; 41.0; 37.2); length from tip of snout to posterior tip of supraoccipital 39.0 (39.7; 38.1; 41.0; 37.7); width of head at base of pectoral spine 39.3 (39.1; 38.1; 38.7; 32.1); greatest depth of body 15.5 (13.2; 15.6; 17; 14.0); length of snout 28.2 (27.3; 27.1; 29.4; 23.7); width of fleshy interorbital space 11.6 (11.3; 11.3; 11.8; 11.2);

distance from eye to bony edge of nostril 6.50 (6.82; 6.44; 6.56; 5.16); longest spine of interopercle 15.5 (16.4; 16.4; 13.1; —); diameter of eye 3.87 (4.34; 4.50; 4.52; 5.11); length of ramus of lower jaw 12.9 (12.7; 13.9; 13.1; 10.7); greatest width of lower lip 10.1 (9.92; 10.7 11.8; 11.6); length of caudal peduncle (distance from base of last anal ray to base of midcaudal fin rays) 25.5 (24.0; 27.7; 25.1; 28.4); least depth of caudal peduncle 7.60 (6.66; 6.83; 7.02; 6.05); length of depressed dorsal 32.8 (33.3; 33.4; 32.2; 29.3); length of depressed anal 7.74 (7.75; 6.83; 8.47; 11.6); length of base of dorsal fin 23.5 (24.8; 25.6; 24.5; 22.8); length of dorsal spine 22.6 (22.6; 22.5; 23.8; 19.5); length of adipose spine 12.7 (12.1; 12.9; 11.2; 9.77); length of pectoral spine 31.0 (31.0; 27.3; 28.5; 25.6); length of pelvic spine 27.1 (27.3; 24.6; 26.9; 22.8); length of upper ray of caudal fin 19.7 (19.1; 20.5; 22.2; 25.6); length of lower ray of caudal fin 29.7 (28.4; 33.2; 33.3; 35.3); distance from snout to origin of dorsal fin 47.8 (48.8; 46.9; 51.2; 44.2); snout to origin of adipose fin 78.0 (77.5; 78.5; 77.6; 74.0); snout to origin of anal fin 68.2 (71.0; 70.8; 69.8; 61.4); snout to insertion of pelvic fin 53.4 (55.2; 53.2; 55.5; 51.2).

The following counts were made, respectively: Dorsal rays I, 8 (I, 8; I, 8; I, 8; I, 8); anal I, 5 (I, 5; I, 5; I, 5; I, 5); pectoral I, 6 (I, 6; I, 6; I, 6; I, 6); pelvic I, 5 (I, 5; I, 5; I, 5; I, 5); number of scutes in lower lateral series 24 (24; 24; 24; 25); plates from dorsal to origin of adipose 3 (3; 3; 3; 3); plates from base of anal to base of midcaudal fin rays 11 (11; 11; 10; 11); plates in front of dorsal fin always 3; spines on interopercle about 20 (23; 16; 19; undeveloped); for additional counts see table 17.

This species is greatly depressed forward; the greatest depth at front of dorsal is about twice the least depth of the caudal peduncle, one-half length of snout, and $2\frac{3}{4}$ in width at base of pectorals; prickles on head completely covering the snout; interorbital space flat, rims of orbits a trifle elevated on large males, the area from eye to nostrils strongly convex; supraoccipital plate bordered posteriorly by the pair of plates at its outer edges, and in the midline by a median plate, which has a median suture; the posterior tip of the supraoccipital plate is fleshy; strong spines occur on the upper surfaces of the pectoral spine in mature males; the interopercular spines are graduated in length evenly from the front of the bony elements to the most posterior spine, which is longest; all have hooked tips except the shortest ones; on the fully mature males, there is along the upper surface of each ray an elongate dermal flap, the one on the pelvic spine widest and a little more than diameter of eye; cross section of the caudal peduncle would show it to be triangular in shape, the ventral surface flat; the scutes along the lower lateral series posteriorly are keeled; adipose fin well developed; anal fin small, the anal spine weak and without prickles as in the other fins.

Color.—Grayish above, paler below, with a blackish irregular band along the midsides that joins with four or five blackish saddles dorsally and has four or five dark projections ventrally; first dorsal saddle under front of dorsal fin, second at rear of dorsal fin, third in front of adipose; fourth behind adipose; fifth at base of caudal fin rays; these saddles enclose pale areas dorsally, ventrally the pale areas are not enclosed by the dark bars; usually three dark bars on pelvics and four across pectorals, these bars diffuse in the immature so that the fins are evenly blackish except distally pale; dorsal with irregular, wide bars in adults, plain blackish in young, tips of first dorsal rays pale; caudal similar to dorsal but with four or five dark bars on lower ray; tips of rays of upper lobe of caudal fin pale.

Remarks.—This new form differs from all other species referred to the genus *Pseudancistrus* in having only three plates between the dorsal and adipose fins and in its color pattern. Other members of the genus have four or more plates between dorsal and adipose. The greatly depressed and very wide head, compared with the short body, is a characteristic feature of this new species.

Named *torbesensis* after the stream in which it was found.

PSEUDANCISTRUS COQUENANI (Steindachner)

Ancistrus (Pseudancistrus) coquenani STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 93, p. 90, pl. 11, figs. 3 to 5, 1917 (Río Coquenán, tributary to Río Caroní in Venezuela). (Based on *A. guntheri* Regan, ♀; see table 17 for measurements.)

PSEUDANCISTRUS YARAVI (Steindachner)

Ancistrus (Hemiancistrus) yaravi STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 93, p. 87, 1917 (Río Coquenán, Venezuela).

See table 17 for measurements. It is doubtful that this and the preceding species are correctly placed. Steindachner does not mention certain characters needed for this identification. They are placed in *Pseudancistrus* because the rami of the jaws are contained fewer than $1\frac{1}{2}$ times in the interorbital, which is flattish.

PSEUDANCISTRUS PEDICULATUS COBRENSIS, new subspecies

PLATE 9, A, B

Holotype.—U.S.N.M. No. 121036, a male 78.6 mm. in standard length, total length 105 mm., taken by Leonard P. Schultz on March 31, 1942, in the Río Cobre, tributary to Río Quinta, latter tributary to Río La Grita, below La Grita, Catatumbo system, Maracaibo Basin.

Paratypes.—U. S. N. M. No. 121037, 4,820 specimens, 9 to 79 mm. in standard length, taken along with the holotype and bearing the same data. All these were taken in very swiftly running water among rubble to gravel.

Description.—Based on the holotype and paratypes. Detailed measurements, expressed in hundredths of the standard length, are recorded for the holotype and three paratypes, respectively. The data for the paratypes are enclosed in parentheses. Standard length (in mm.) 78.6 (56.9; 53.7; 31.7); total length 105 (76.6; 71.6; 42.5) mm.

Length of head from tip of snout to rear edge of temporal plate 35.8 (35.5; 35.0; 36.9); length from tip of snout to posterior tip of supraoccipital 34.6 (34.5; 33.9; 36.6); width of head at base of pectoral spine 34.5 (33.6; 34.6; 34.7); greatest depth of body 17.2 (17.6; 18.3; 19); length of snout 22.9 (22.5; 21.8; 24.0); longest spine of interopercle 25.0 (21.1; 17.3; 24.6); width of fleshy interorbital space 10.2 (10.7; 10.4; 12.3); distance from eye to bony edge of nostril 5.10 (5.27; 4.66; 5.99); diameter of eye 3.82 (4.39; 4.65; 5.36); length of ramus of lower jaw 10.1 (10.5; 10.6; 9.78); greatest width of lower lip 7.76 (8.44; 8.84; 8.20); length of caudal peduncle (distance from base of last anal ray to base of midcaudal fin rays) 26.1 (23.7; 26.1; 25.8); least depth of caudal peduncle 10.8 (10.5; 11.0; 11.7); length of depressed dorsal 38.8 (39.5; 39.1; 36.0); length of depressed anal 9.29 (8.96; 6.70; 6.62); length of base of dorsal fin 26.7 (28.3; 25.0; 24.6); length of dorsal spine 23.5 (24.8; 24.2; 25.2); length of adipose spine 9.68 (8.79; 7.45; 10.7); length of pectoral spine 45.8 (39.4; 23.3; 30.9); length of pelvic spine 25.2 (24.0; 22.3; 25.8); length of upper ray of caudal fin 22.3 (23.7; 23.5; 28.0); length of lower ray of caudal fin 32.4 (34.3; 31.7; 36.6); distance from snout to origin of dorsal fin 47.3 (46.8; 46.2; 48.9); snout to origin of adipose 87.3 (87.2; 85.6; 80.8); snout to origin of anal 70.2 (73.8; 72.4; 72.6); snout to origin of pelvics 44.6 (51.0; 49.4; 51.1).

The following counts were made, respectively: Dorsal rays I,8 (I,9; I,8; I,8); anal rays I,4 (I,4; I,4; I,4); pectorals I,6 (I,6; I,6; I,6); pelvics I,5 (I,5; I,5; I,5); number of scutes in lower lateral series 25 (24; 24; 24); plates from dorsal to origin of adipose fin 6 (5; 6; 5); plates from base of anal to base of midcaudal fin rays 11 (11; 11; 11); plates in front of dorsal fin always 4; spines on interopercle always 2 long ones with 2 to 4 or 5 very short ones posteriorly on the interopercular bony elements. For additional counts see table 16.

Head and body depressed, interorbital space a little convex; no enlarged prickles around eye; prickles on head continuing to snout, but there is a small naked area near tip of snout, on males a few enlarged prickles occur at sides of snout; supraoccipital plate bounded posteriorly by a paired plate; belly naked to anal fin; lips papillate; the posterior margin of lower lip with about 20 to 25 lappets; teeth on jaws bifid, slender, very numerous, 75 or more on each ramus; spines of interopercle graduated, one very long spine reaching past head, then a shorter one, both with hooked tips, then two to four or five

very short spines; separately the two interopercular bony elements bearing spines are barely movable; bases of movable interopercular bones in front of opercle and eye; barbel at corner of mouth about equal to diameter of pupil; on the males the pectoral rays are greatly elongate, sometimes extending to tips of pelvic rays, while in females and young they extend to opposite the middle third of the pelvic fins; adipose fin well developed; anal fin small, the spiny element rarely with prickles as found on the spine of the other fins.

Color.—Grayish, with about five more or less indistinct dark blotches, little larger than eye, along midsides posteriorly; a black spot on membrane between base of dorsal spine and first soft ray of dorsal; dorsal fin barred, the pale and dark colors on the rays and not on the membranes; caudal fin similarly barred; four small dark blotches or saddles on back, first at front of dorsal, second at rear of dorsal fin base; third in front of origin of adipose and last on upper edge of caudal peduncle; pelvics and pectorals occasionally with indications of two or three dark bars, these at best indistinct.

Remarks.—This new subspecies differs mostly in color pattern from *C. pediculatus pediculatus* of the upper Río Meta system, Villavicencio, Colombia, and in small average differences in counts as recorded in the table.

Named *cobrensis* after the stream in which it was collected.

Genus PTERYGOPLICHTHYS Gill

Pterygoplichthys GILL, Ann. Lyc. Nat. Hist. New York, vol. 6, p. 408, 1858.
(Type, *Hypostomus duodecimalis* Cuvier and Valenciennes.)

KEY TO THE SPECIES OF PTERYGOPLICHTHYS REPORTED FROM VENEZUELA

- 1a. Interorbital space 2.4 to 2.6 in head; dorsal rays I, 12; or I, 13; plates along sides 28 to 30.-----*Pterygoplichthys punctatus* Günther
1b. Interorbital space 2 to 2.25 in head; ramus of lower jaw $3\frac{1}{2}$ to 4 in interorbital space; dorsal rays I, 12 or 13; plates along sides 28 to 30.
Pterygoplichthys multiradiatus (Hancock)

PTERYGOPLICHTHYS PUNCTATUS Günther

Pterygoplichthys punctatus GÜNTHER, Catalogue of the fishes in the British Museum, vol. 5, p. 251, 1864 (S. Vincente, Brazil).—EIGENMANN and EIGENMANN, Occ. Papers California Acad. Sci., vol. 1, p. 431, 1890 (Venezuela).

Ancistrus punctatus GÜNTHER, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 229, 1904 (Venezuela; Upper and Middle Amazon).

Pterygoplichthys duodecimalis PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Apure River, Venezuela).

PTERYGOPLICHTHYS MULTIRADIATUS (Hancock)

CORRONCHO

Hypostomus multiradiatus HANCOCK, Zool. Journ., vol. 4, p. 245, 1828 (Demarara) (ref. copied).

Plecostomus (Liposarcus) pardalis PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 471 (Calabozo, Venezuela).

Genus ANCISTRUS²⁹ Kner

Ancistrus KNER, Denkschr. Akad. Wiss. Wien, vol. 7, p. 272, 1854. (Type, *Hypostomus cirrhosus* Cuvier and Valenciennes.)

For certain counts made on species of this genus see table 18.

KEY TO THE SPECIES OF ANCISTRUS REPORTED FROM VENEZUELA

1a. Anal rays I, 3; plates from dorsal fin base to origin of adipose fin usually 4, rarely 5; plates in lower lateral series usually 23, seldom 24; pale spots on belly, if present, not running together, but roundish in shape: black spot at base of front of dorsal indistinct; ramus of lower jaw 1.7 to 2.4 in interorbital (upper Río Meta system).

Ancistrus triradiatus triradiatus Eigenmann^{29a}

1b. Anal rays about equally I, 3 and I, 4; plates from dorsal to adipose 5; plates in lower lateral series usually 24; pale spots on adults elongate and oblong on the belly and running together; black spot at front base of dorsal distinct; ramus of lower jaw contained 2.3 to 2.7 in interorbital space (upper Catatumbo system)-----*Ancistrus triradiatus martini*, new subspecies

1c. Anal rays I, 4, rarely I, 3; plates from dorsal to adipose 5 to 7, rarely 4.

2a. Plates from dorsal to adipose fin usually 6 or 7; from anal to caudal fin base 10 or 11; in lower lateral series 23 or 24; ramus of lower jaw 2.4 to 2.6 in interorbital space; interorbital space 2 to 2.25 in head; a dark spot at base of first interradiation membrane in dorsal (San Esteban and Puerto Cabello, Venezuela)-----*Ancistrus gymnorhynchus* Kner

2b. Plates from dorsal to adipose fin usually 5, rarely 4; plates in lower lateral series almost always 24, rarely 23 or 25.

3a. Body plain in color, apparently without pale spots; no black spots at front of base of dorsal fin; two or three black spots in front of dorsal fin; no pale bar across caudal peduncle on base of caudal fin rays; ramus of lower jaw 3.0 to 3.5 in interorbital space (Río Tuy system).

Ancistrus brevifilis brevifilis Eigenmann

3b. Body anteriorly on adults with numerous pale spots; a black spot at front base of dorsal fin on membrane between spine and first soft ray; no black spots in front of dorsal; pale bar across caudal peduncle at base of caudal fin rays; ramus of lower jaw 2.3 to 3.0 in the interorbital space.

Ancistrus brevifilis bodenhameri, new subspecies

ANCISTRUS TRIRADIATUS MARTINI, new subspecies

PLATE 9, C, D

Holotype—U.S.N.M. No. 121064, a male 81.5 mm. in standard length, collected by Leonard P. Schultz on April 1, 1942, in the Río Táchira, 7 km. north of San Antonio, Catatumbo system.

²⁹ Regan gives an indefinite record for *Xenocara cirrhosum* Cuvier and Valenciennes in the Proc. Zool. Soc. London, 1906, pt. 1, p. 389, as "Paraguay to Venezuela." Steindachner (Denkschr. Akad. Wiss. Wien, vol. 43, p. 123, 1852) records *Chaetostomus (Ancistrus) dolichopterus* Kner from Caracas, Venezuela. A reexamination of the material mentioned above will be necessary before it is possible to identify the specimens.

^{29a} *Ancistrus triradiatus triradiatus* Eigenmann, Proc. Amer. Philos. Soc., vol. 56, No. 7, p. 650, 1917 (Quebrada Cramalote, Villavicencio, Barrigona, Colombia), is included in this key for purposes of comparison with *A. l. martini*, although it has not been reported from Venezuela.

TABLE 18.—Counts made on species of *Ancistrus*

Species	Number of fin rays				Number of plates											
	Dorsal		Anal		From dorsal to adipose fin				From anal to caudal fin			In lower lateral series				
	I, 6	I, 7	I, 3	I, 4	4	5	6	7	10	11	12	23	24	25	26	
<i>triradiatus triradiatus</i>	1	6	7	---	6	1	---	---	---	2	5	6	1	---	---	
<i>triradiatus martini</i>	---	4	2	2	---	4	---	---	---	---	4	---	4	---	---	
<i>brevifistis brevifistis</i>	---	1	---	1	---	1	---	---	---	---	1	---	1	---	---	
<i>brevifistis bodenhameri</i>	---	15	1	14	1	14	---	---	---	7	8	1	13	1	---	
<i>chagresi</i>	---	2	2	1	---	1	1	1	---	2	2	---	1	1	1	
<i>spinus</i>	---	1	---	1	---	---	---	1	---	1	1	---	1	---	---	
<i>rothschildi</i>	---	1	---	1	---	---	---	1	1	1	1	---	1	1	---	

Paratypes.—U.S.N.M. No. 121065, 3 specimens, 14 to 51.6 mm., taken along with the holotype and bearing the same data; U.S.N.M. No. 120094, a female, 80 mm. in standard length, collected by Nicéforo María, near Cúcata, Colombia, Catatumbo system.

Description.—Based on the holotype and paratypes listed above. Measurements, expressed in hundredths of the standard length, are recorded for the holotype, followed by those for two paratypes in parentheses. Standard length (in mm.) 81.5 (51.6; 80); total length 104.5 (71.1; --) mm.; sex ♂ (♀; ♀).

Length of head from tip of snout to rear edge of temporal plate 38.9 (36.0; 34.6); length of head to posterior tip of supraoccipital 38.6 (36.5; 33.8); width of head at base of pectorals 31.5 (33.9; 32.0); postorbital length of head 12.5 (10.1; 11.2); greatest depth of body 12.5 (10.1; 11.2); length of snout 24.5 (22.5; 20.2); distance from eye to middorsal tip of bony area of snout 13.1 (20.0; 18.6); diameter of eye 4.29 (5.23; 4.50); width of preorbital bony space 2.45 (9.11; 8.88); width of fleshy interorbital space 17.1 (16.9; 15.9); length of ramus of lower jaw 6.26 (6.00; 5.75); length of longest spine on interopercle 10.5 (6.59; 6.62); distance from eye to bony edge of nostril 3.19 (3.49; 4.87); greatest width of lower lip 6.13 (5.92; 5.25); length of caudal peduncle 26.5 (27.7; 24.4); least depth of caudal peduncle 10.8 (11.6, 11.9); length of depressed dorsal fin 39.9 (40.1; 40.3); length of depressed anal fin 11.2 (10.3; 10.8); length of base of dorsal fin 22.1 (24.2; 24.1); length of dorsal spine 27.0 (29.1; 27.2); length of last ray of dorsal fin 20.1 (19.5; 18.2); length of adipose spine 7.36 (9.11; 7.87); length of pectoral spine 33.7 (33.1; 33.8); length of anal spine 8.94 (10.1; 8.38); length of pelvic spine 26.4 (29.1; 26.9); length of upper ray of caudal fin 27.8 (30.2; --); length of lower ray of caudal fin 29.9 (37.8; --); distance from snout to origin of dorsal fin 49.1 (47.1; 47.0); distance from snout to origin of adipose fin 80.5

(83.3; 83.5); distance from snout to origin of anal fin 68.2 (70.7; 72.5); distance from snout to insertion of pelvics 51.3 (49.6; 52.7).

The following counts were made, respectively: Dorsal rays I, 7 (I, 7; I, 7; I, 7); anal I, 3 (I, 3; I, 4; I, 4); pectoral always I, 6 and pelvic always I, 5; number of scutes in lower lateral series 24 (24; 24; 24); plates from dorsal to origin of adipose 5 (5; 5; 5); plates from base of anal to base of midcaudal fin rays 12 (12; 12; 12); plates in front of dorsal fin 4 (4; 4; 4); number of spines on the interopercle 15 (13; 13; 12); number of tentacles at corner of mouth plus marginal series plus those at other corner of mouth 5+8+5 (0+0+0; 0+0+0; 5+8+5); for additional counts see table 13.

Head depressed, snout with the anterior portion without bony covering, this area much wider in males than in females; the dermal cirri on adult males are multifid, especially those in the Y-shaped group near the middorsal line; I can find no tentacles on the snout of females; the preopercular spines are hooked, and the longest are contained $1\frac{1}{2}$ to 2 times in the interorbital length; there are three plates bordering the supraoccipital behind, the middle one not divided in the midline; in addition there are three other plates in front of the dorsal; depressed dorsal fin reaches to base of the long adipose spine thus beyond the platelet in front of this spine but forming part of that fin; none of the plates keeled; belly naked; breast naked; teeth small, very numerous and bifid; lips papillate; a small barbel at corners of mouth; pectoral spine on adult male reaches to beginning of second third of length of pelvic spine; caudal fin concave in young but a little convex in adults, lower lobe longest; posterior margin of dorsal a little convex.

Color.—Dorsal surfaces anterior to dorsal fin with obvious pale spots more or less oblong to squarish, belly with pale, elongate to oblong streaks or spots, some of which join each other to form a loose marbling effect; the pale spots and blotches may be obscure or entirely absent on the young; a black spot at base of membrane between dorsal spine and first soft ray, dorsal fin barred, these numbering four to six; other fins similarly barred; tips of upper and lower caudal lobes white; a pale bar across caudal peduncle, more distinct in smaller specimens, at base of caudal fin rays; sides of body more or less with darkish blotches; a somewhat obscure pale oblique bar between rear base of dorsal and adipose fin from back downward across upper sides.

Remarks.—This new subspecies differs from *Ancistrus triradiatus triradiatus* Eigenmann from the upper Orinoco system in having the anal rays about equally I, 3 or I, 4 instead of almost always I, 3; the number of plates from the dorsal fin base to the origin of the adipose is usually four (seldom five) in *triradiatus* while in *martini* almost

always five; *triradiatus* averages about one less plate in the lower lateral series than does *martini*. The pale color spots on *triradiatus* are round and less distinct, but on *martini* they are elongate and especially distinct on the ventral surfaces anteriorly.

Named *martini* after Bethea Martin, of the Lago Petroleum Corporation, who aided me in the collection of fishes in Venezuela.

ANCISTRUS GYMNORHYNCHUS Kner

Ancistrus gymnorhynchus KNER, Denkschr. Akad. Wiss. Wien, vol. 7, p. 275, 1854 (Puerto Cabello, Venezuela).—GÜNTHER, Catalogue of the fishes in the British Museum, vol. 5, p. 249, 1864 (Puerto Cabello).

Xenocara rothschildi REGAN, Nov. Zool., vol. 12, p. 242, 1905 (San Esteban, near Puerto Cabello, Venezuela).

?*Chaetostomus gymnorhynchus* LÜTKEN (not of Kner), Vid. Medd. Naturh. Foren. Kjøbenhavn, pts. 12–16, p. 204, 1874 (Puerto Cabello, Venezuela).

ANCISTRUS BREVIFILIS BREVIFILIS Eigenmann

Ancistrus brevifilis EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 7, fig. 2, pl. 1, 1920 (El Concejo, Río Tiguirito, Venezuela).

ANCISTRUS BREVIFILIS BODENHAMERI, new subspecies

PLATE 10, A

Holotype.—U.S.N.M. No. 121066, a male 61.2 mm. in standard length, taken March 20, 1942, by Leonard P. Schultz in the Río San Pedro at the bridge south of Mene Grande, Motatán system.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121067, 132 specimens, 22.5 to 65. mm. in standard length, collected along with the holotype and bearing the same data; U.S.N.M. No. 121068, 1 specimen, 25.6 mm., taken February 26, 1942, in the Río San Juan about 12 km. south of Rosario in Maracaibo Basin; U.S.N.M. No. 121069, 2 specimens, 28 and 54.4 mm., taken March 16, 1942, in the Río Machango at the bridge south of Lagunillas, Estado de Zulia; U.S.N.M. No. 121299, a specimen 26.8 mm., taken February 26, 1942, in the Río San Juan 12 km. south of Rosario, western side of Maracaibo Basin.

Description.—Based on the holotype and paratypes. Measurements, expressed in hundredths of the standard length, are recorded for the holotype followed by those for three paratypes in parentheses. Standard length (in mm.) 61.2 (61.5; 50.2; 54.4); total length (in mm.) 81.6 (81.7; 69.1; 75.5); sex ♂ (♂; ♀; ♀).

Length of head from tip of snout to rear edge of temporal plate 36.8 (40.6; 37.1; 36.6); length of head to posterior tip of supraoccipital plate 36.1 (39.7; 35.7; 35.3); width of head at base of pectorals 32.7 (32.0; 33.1; 32.6); postorbital length of head 10.6 (9.92; 9.77; 10.3); greatest depth of body 17.0 (18.7; 20.9; 19.3); length of snout 22.6 (23.7; 21.9; 20.6); distance from eye to middorsal tip of bony area of snout 12.6 (13.3; 18.9; 19.1); diameter of eye (fleshy) 5.23 (5.20; 5.98;

6.25); width of preorbital bony space 1.96 (2.60; 8.17; 8.09); width of fleshy interorbital space 15.8 (15.5; 17.1; 15.6); length of ramus of lower jaw 6.70 (6.34; 6.37; 5.33); length of longest spine on interopercle 8.50 (9.76; 7.17; 7.35); distance from eye to bony edge of nostril 3.60 (4.06; 4.98; 3.86); greatest width of lower lip 6.50 (5.53; 5.98; 7.17); length of caudal peduncle (distance from base of last anal ray to base of midcaudal fin rays) 28.9 (26.8; 28.5; 28.1); least depth of caudal peduncle 11.4 (11.2; 12.3; 11.2); length of depressed dorsal 42.5 (40.8; 43.8; 42.3); length of depressed anal 10.6 (10.6; 10.6; 10.8); length of base of dorsal fin 23.7 (22.0; 25.1; 23.9); length of dorsal spine 25.8 (26.2; 30.1; 29.4); length of last dorsal fin ray 20.4 (20.7; 23.3; 19.3); length of adipose spine 8.66 (8.94; 9.16; 8.09); length of pectoral spine 36.3 (33.3; 36.3; 35.1); length of anal spine 8.50 (9.76; 9.56; 9.38); length of pelvic spine 26.5 (26.7; 30.1; 27.6); length of upper ray of caudal fin 26.8 (25.2; 29.1; —); length of lower ray of caudal fin 35.0 (33.7; 36.9; 40.3); distance from snout to origin of dorsal 45.3 (50.4; 46.8; 45.1); distance from snout to adipose 82.5 (84.6; 82.7; 80.5); distance from snout to anal 69.5 (73.2; 70.1; 70.8); distance from snout to insertion of pelvics 49.0 (54.4; 52.0; 49.8).

The following counts were made, respectively: Dorsal rays I, 7 (I, 7; I, 7; I, 7); anal I, 3 (I, 4; I, 4; I, 4); pectoral always I, 6 and pelvic always I, 5; number of scutes in lower lateral series 24 (24; 23; 24); plates from dorsal origin to adipose 5 (5; 5; 5); plates from base of anal to base of midcaudal fin rays 12 (12; 11; 12); plates in front of dorsal fin 4 (4; 4; 4); spines on interopercle 16 (17; 14; 9 and 12); number of tentacles at corner of mouth plus marginal series plus those at corner of mouth 6+8+6 (5+8+6; 4+9+5; 3+7+3); for additional counts see table 18.

Head depressed, snout with the anterior portion fleshy, this area much wider in males than in females; the dermal cirri on adult males multifid, especially those in the Y-shaped group near the middorsal line; the marginal series of cirri developed in females; the preopercular spines are hooked and contained $1\frac{1}{2}$ to 2 times in the interorbital space; the three plates behind the supraoccipital are not divided in the center; depressed dorsal fin reaches a little beyond the base of the long spine of adipose fin; none of the plates keeled; belly naked; breast naked; teeth small, very numerous and bifid; lips papillate; a small barbel at the corners of the mouth; pectoral spines reach to opposite end of first third of pelvic spine; caudal fin on young a little concave, but in adults somewhat convex, the lower lobe longest; posterior margin of dorsal a little convex.

Color.—When alive this species was dark brown to blackish and covered with dull-yellow or light-brown spots; the tips of the rays of the upper and lower lobes of the caudal fin were yellowish orange, as were the tips of the first rays of the dorsal fin. Body and head

everywhere dark brown to blackish with the dorsal surface anteriorly in front of dorsal fin with numerous round pale spots; these spots are oblong and larger on the belly, occurring as far back as the anal fin; on the young the belly is plain blackish; none of the spots join each other; a black spot occurs at base of membrane of dorsal fin between the spine and first soft ray; all of the fins are very dark, and with four or five bars; tips of first rays of dorsal pale; tips of rays of upper and lower lobes of caudal fin pale; a pale bar across base of caudal fin rays on caudal peduncle; pectoral fins barred, pelvics barred.

Remarks.—This new subspecies is related to *A. triradiatus martini*, new subspecies, but differs in certain counts. It is closer to *A. brevifilis brevifilis* Eigenmann in regard to counts. However, *brevifilis* lacks a black spot at base of dorsal between the spine and first soft ray; in addition, *bodenhameri* does not have faint darker spots about size of eye in front of the dorsal and the belly is not uniform in color as in *brevifilis*.

Named *bodenhameri* in honor of Raymond L. Bodenhamer, of the Lago Petroleum Corporation, who aided me greatly in regard to transportation while I was in Venezuela.

Genus LITHOXUS Eigenmann

Lithoxus EIGENMANN, Mem. Carnegie Mus., vol. 5, 242, pl. 29, figs. 1 to 4, 1912. (Type, *Lithoxus lithoides* Eigenmann.)

LITHOXUS FIMBRIATUS (Steindachner)

Pseudacanthicus (Lithoxus) fimbriatus STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 93, p. 92, pl. 10, figs. 1-3, 1917 (Río Coquenan, tributary to Río Caroní, Venezuela).

This species may be recognized by its barblets around front of snout and around margin of lower lips, along with three teeth on each premaxillary ramus and six [probably a few more] on each ramus of lower jaw. Dorsal I, 7; pectoral I, 5; anal I, 5; pelvic I, 5; lateral scutes 26; 6 plates between dorsal base and adipose fin; 12 from anal base to midcaudal fin base.

Genus PANAQUE Eigenmann and Eigenmann

Panaque EIGENMANN and EIGENMANN, Proc. California Acad. Sci., ser. 2, vol. 2, p. 44, 1889. (Type, *Chaetostomus nigrolineatus* Peters.)

KEY TO THE SPECIES OF PANAQUE FROM VENEZUELA AND FROM THE RÍO CAUCA

1a. Length of spines on interopercle about equal to diameter of eye; several brown stripes on sides of body extending lengthwise; depth $3\frac{1}{2}$, head $2\frac{1}{2}$ in standard length; eye $7\frac{1}{2}$, interorbital $1\frac{1}{2}$, and snout $1\frac{1}{2}$ in head; least depth of caudal peduncle 2 in its length; caudal fin truncate.

Panaque nigrolineatus (Peters)

1b. Length of spines on interopercle $\frac{1}{4}$ to $\frac{2}{3}$ length of head except in young; no lengthwise dark brown stripes on body, color uniformly grayish.

- 2a. Evertible spines on adults on interopercle about $\frac{1}{3}$ length of head; depth $4\frac{1}{2}$, head $2\frac{3}{4}$ in standard length; eye 9, interorbital space 2, and snout $1\frac{1}{2}$ in head; least depth of caudal peduncle 3 to $3\frac{1}{4}$ in its length; plates not carinate anteriorly.....**Panaque gibbosus** (Steindachner)³⁰
- 2b. Evertible spines on interopercle $\frac{1}{2}$ to $\frac{1}{4}$ length of head in adults; depth $3\frac{3}{4}$ to 4, head $2\frac{1}{2}$ to $2\frac{1}{2}$ in standard length; eye $10\frac{1}{4}$ to 12, interorbital $1\frac{1}{4}$ to $1\frac{1}{10}$, and snout $1\frac{1}{2}$ to $1\frac{1}{2}$ in length of head; least depth of caudal peduncle $2\frac{1}{2}$ to $2\frac{1}{2}$ in its length; base of dorsal fin a little longer than length of caudal peduncle; plates strongly carinate on body.

Panaque suttoni, new species

PANAQUE NIGROLINEATUS (Peters)

PANAQUE

Chaetostomus nigrolineatus PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 471 (Calabozo, Venezuela).—STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 44, p. 7, 1882 (Orinoco River, at Ciudad Bolívar).—RÖHL, Fauna descriptiva de Venezuela, p. 377, fig. 188, 1942 (Orinoco).

PANAQUE SUTTONI, new species

PANAQUE

PLATE 10, B

Holotype.—U.S.N.M. No. 121033, a specimen 280 mm. in standard length, taken by Leonard P. Schultz on March 2, 1942, in the Río Negro below the mouth of the Río Yasa, Maracaibo Basin.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121075, 1 specimen, 53 mm. in standard length, taken along with the holotype and bearing the same data; U.S.N.M. No. 121035, 3 specimens, 197, 265, and 31 mm. in standard length, from the Río Motatán, at the bridge 22 km. north of Motatán, Maracaibo Basin, March 17, 1942; U.S.N.M. No. 121034, a specimen 224 mm., same data.

Description.—Based on the holotype and three paratypes. All measurements are expressed in hundredths of the standard length, those for the holotype first, followed by those for the paratypes in parentheses (the Río Negro specimens are given first), respectively. Standard length (in mm.) 280 (224; 197; 265); total length (in mm.) 373 (—; 275; 350).

Length of head from tip of snout to rear edge of temporal plate 41.0 (42.0; 42.2; 40.0); length of head from tip of snout to posterior edge of supraoccipital plate 41.4 (42.8; 42.6; 40.4); tip of snout to upper edge of gill opening 24.6 (28.6; 26.4; 26.4); width of head at

³⁰ *Chaetostomus cochliodon* (sive *gibbosus*) Steindachner, Sitzb. Akad. Wiss. Wien, vol. 80, p. (60), 185, 1879 (Río Cauca). Not from Maracaibo Basin, but closely related to the form collected in that basin and described as new.

coracoids or in front of base of pectoral spine 35.7 (33.9; 33.8; 33.2); greatest depth of body 25.7 (27.2; 25.4; 25.7); length of snout 28.6 (30.3; 29.5; 27.6); width of fleshy interorbital space 23.4 (22.8; 22.3; 21.5); diameter of eye 3.93 (3.57; 4.06; 3.77); postorbital length of head 10.9 (11.2; 10.4; 10.2); length of longest spine on interopercle 27.5 (29.0; 26.9; 30.4); length of caudal peduncle or the distance from base of last anal ray to base of middle caudal fin rays 25.7 (25.4; 26.8; 28.3); least depth of caudal peduncle 9.82 (10.3; 10.2; 10.2); length of base of dorsal fin 26.4 (25.9; 25.4; 25.7); length of bony dorsal spine 29.1 (26.3; 27.2; 27.6); length of bony pectoral spine 36.4 (37.9; 38.1; 35.5); length of anal spine 16.8 (15.6; 15.2; 15.1); length of pelvic spine 26.1 (25.9; 25.9; 24.5); length of upper ray of caudal fin 30.4 (regenerating on holotype) (43.3; 42.2; 36.8); length of lower ray of caudal 35.4 (—; 35.0; 33.6); length of shortest midcaudal rays 22.8 (22.3; 20.3; 21.5); distance from snout to origin of dorsal fin 47.5 (51.3; 51.8; 49.0); snout to origin of adipose fin 83.2 (82.1; 84.3; 84.5); snout to origin of anal fin 70.3 (68.7; 69.0; 68.7).

The following counts were made, respectively: Dorsal rays always I,7; anal rays always I,4; pectorals always I,6; pelvics always I,5; teeth in ramus of upper jaw then of lower jaw on one side 8-9 (8-8; 8-8; 8-9); number of plates in lower lateral series 25 (25; 26; 25); pores in lateral line 25 (25; 26; 25); plates from base of anal fin to midbase of caudal 13 (13; 13; 12); plates from anal base to origin of adipose 6 (5; 5; 6); always three plates before dorsal fin.

Front of head depressed, contour from eyes forward almost straight, the supraoccipital arched but no median keel posteriorly; flattish shelf from eye to nostrils, the space between nostrils convex, this continuing to tip of snout; eye in rear two-thirds length of head; the posterior margin of the supraoccipital plate is gently convex, all of the scutes from head posteriorly are carinate with one to three or four prominent spines; spines on interopercle long, with the tips hooked outward, and the longest spine reaching to middle of second plate of lower lateral series; pectoral spine long, heavy, with numerous long spines on its dorsal surface posteriorly; the pectoral spine reaches a little beyond the middle of the pelvic spine and the latter reaches almost to opposite rear base of anal fin; caudal peduncle a little compressed, its least depth about $2\frac{1}{2}$ in its length; origin of anal fin a little behind a vertical through rear base of dorsal fin; belly and underside of head completely covered over with rough platelets; no naked area at tip of snout; intestine much coiled; upper ray of caudal fin elongate on the two smaller paratypes, extending considerably behind the other rays.

Color.—Uniformly grayish; peritoneum dusky. My 31-mm. specimen has the basal two-thirds of the paired fins black, and the tips of these fins white; the posterior margin of dorsal is white, a narrow white bar across caudal peduncle, middle of caudal fin white then some black blotches; the tips of the rays are white.

Remarks.—This new species is closely related to *Panaque gibbosus* (Steindachner) but differs in having a more robust body. The greatest depth at origin of dorsal fin is contained $3\frac{3}{4}$ to 4 in the standard length, and the least depth of the caudal peduncle is $2\frac{1}{2}$ to $2\frac{3}{4}$ in its length in *P. suttoni*, but in *P. gibbosus* it is $4\frac{1}{2}$ and 3 to $3\frac{1}{4}$, respectively. Other differences are given in the key.

Named *suttoni* in honor of Dr. and Mrs. Frederick A. Sutton, who were very kind to me while I stayed at the camp of the Lago Petroleum Corporation in Maracaibo.

Genus COCHLIODON Heckel

Cochliodon HECKEL, in Günther, Catalogue of fishes in the British Museum, vol. 5, pp. 231, 238, 1864. (Type, *Hypostomus cochliodon* Kner.)

Cheiridodus EIGENMANN, Mem. Carnegie Mus., vol. 9, No. 1, p. 70, 1922. (Type, *Plecostomus hondae* Regan.)

Eigenmann in describing the genus *Cheiridodus* separated it from *Cochliodon* by the presence of a "small lobe on the outer edge of the base of each tooth." I am able to find such a lobe on small specimens up to a standard length of about 60 mm. from the Maracaibo Basin, but the little lobe disappears with age and the tooth wears down until it becomes cup-shaped. It is possible that *Cheiridodus hondae* (Regan) is very close to *Cochliodon plecostomoides* Eigenmann, neither of which I have seen. The relationship of these two genera needs investigation.

KEY TO THE SPECIES OF COCHLIODON REPORTED FROM VENEZUELA

- 1a. Usually 7 or 8 strongly cup-shaped teeth on ramus of each jaw.
Cochliodon cochliodon (Kner)
- 1b. From 11 to 16 spoon-shaped teeth on ramus of each jaw.
- 2a. Teeth 11 or 12 on each ramus; depth 4.5, head 3.1, in standard length; eye 8.5 in head; least depth of caudal peduncle 3 in its length.
Cochliodon plecostomoides Eigenmann
- 2b. Teeth 13 to 16 on each ramus of jaws. — *Cochliodon pospisili*, new species

COCHLIODON COCHLIODON (Kner)

PANAQUE

Hypostomus cochliodon KNER, Denkschr. Akad. Wiss. Wien, vol. 7, p. 265, pl. 2, fig. 1, 1854 (Río Cujaba).

Plecostomus cochliodon PELLEGRIN, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 158, 1899 (Río Apure, Venezuela).

COCHLIODON PLECIOSOMOIDES Eigenmann

Cochliodon pleciosomoides EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 7, 1920 (Río Bue, Maracay, Venezuela) (*nomen nudum*); Mem. Carnegie Mus., vol. 9, No. 1, p. 225, pl. 11, fig. 1, 2, 3, 1922 (type from Quebrada Cramalote, Villavicencio, Colombia; Río Bue at Maracay, Valencia Basin).

COCHLIODON POSPISILI, new species

PLATE 11, C, D

Cheiridodus hondae MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 100, 1942 (Río Menay, 35 km. north of Trujillo, Motatán system, Venezuela).

Holotype.—U.S.N.M. No. 121003, a specimen 66.6 mm. in standard length, taken by Leonard P. Schultz on February 21, 1942, in the Río Palmar near Totuma about 100 km. southwest of Maracaibo.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121010, 13 specimens, 25.2 to 66 mm. in standard length, taken with the holotype and bearing the same data; U.S.N.M. No. 121008, 24 specimens, 15 to 62.6 mm. from the Río Machango about 20 km. above the bridge south of Lagunillas, Maracaibo Basin, March 21, 1942; U.S.N.M. No. 121006, a specimen 14 mm. long from the Río Machango at the bridge, March 16, 1942; U.S.N.M. No. 121009, a specimen 27 mm. in length taken March 6, 1942, in the Río Palmar at the bridge 70 km. southwest of Maracaibo; U.S.N.M. No. 121005, one fish 36.6 mm. in standard length, taken March 25, 1942, in the Río Motatán, 4 km. above Motatán; U.S.N.M. No. 121011, 11 specimens, 21 to 35 mm. long, taken on March 24, 1942, in the Río Motatán, 8 km. below Motatán; U.S.N.M. No. 121007, 46 specimens, 16 to 47 mm., from the Río Motatán at bridge 22 km. north of Motatán, March 17, 1942. All localities in the Maracaibo Basin. In addition, U.S.N.M. No. 121004, 6 specimens, 15 to 19 mm. in standard length that I am not certain are this species because of their small size. They were collected in the Río Socuy 3 km. above its mouth on February 24, 1942.

Description.—Based on the holotype and the numerous paratypes listed above. All measurements are expressed in hundredths of the standard length, those for the holotype first, followed by those for the paratypes in parentheses. Standard length (in mm.) 66.6 (62.6; 56.6); total length (in mm.) 101.6 (95.6; 83.7).

Length of head from tip of snout to rear edge of temporal plate 34.7 (32.8; 36.7); length of head from tip of snout to posterior edge of supraoccipital plate 34.5 (35.6; 37.1); tip of snout to upper edge of gill opening 26.0 (25.9; 26.8); width of head at coracoids or in front of base of pectorals 29.3 (29.7; 29.2); greatest depth of body 22.8 (24.1; 21.2); length of snout 21.9 (20.8; 23.7); width of fleshy inter-orbital space 16.5 (17.4; 17.3); diameter of eye 6.16 (6.70; 6.39); postorbital length of head 9.31 (10.4; 10.8); length of caudal peduncle (distance from base of last anal ray to base of midcaudal fin rays)

32.3 (31.3; 30.2); least depth of caudal peduncle 9.76 (9.26; 9.36); length of base of dorsal fin 25.5 (27.8; 26.7); length of bony dorsal spine 33.9 (36.7; 36.7); length of bony pectoral spine 30.3 (33.7; 32.0); length of anal spine 14.0 (—; 15.0); length of bony pelvic spine 29.3 (29.2; 28.4); length of upper ray of caudal fin 47.4 (—; 45.0); length of lower ray of caudal fin 51.1 (53.2; —); length of shortest midcaudal rays 23.7 (24.4; 24.6); distance from snout to origin of dorsal fin 42.1 (42.8; 44.5); snout to origin of adipose 79.6 (80.0; 83.2); snout to origin of anal 64.7 (64.2; 65.6).

The following counts were made, respectively. Dorsal rays always I, 7; anal always I, 4; pectoral always I, 6; and pelvic I, 5; teeth in ramus of upper jaw on one side 15 (16; 15); and ramus of lower jaw 16 (15; 16); number of scutes in lower lateral series 28 (28; 28); pores in lateral line 29 (29; 29); plates from dorsal to origin of adipose fin 7 (8; 7); plates from last ray of anal to base of midcaudal fin rays 15 (15; 14); always three plates in front of dorsal fin.

Head somewhat depressed, its contour from supraoccipital forward almost straight; supraoccipital convex or arched, the posterior tip extending backward into the plate; the area of the interorbital space above eyes flattish, but the middle two-thirds, convex; the series of lateral plates above and below the lateral line carinate the other scutes on body weakly carinate; no spines on opercle or interopercle; depressed dorsal fin reaching almost to origin of adipose; pectoral spine about one-third the way out the pelvic spine, the latter reaching a little beyond middle of anal fin; belly covered with small platelets, the area of breast in front of bases of pectorals mostly naked (this may become plated on adults however); dorsal fin truncate; caudal fin deeply forked, the lower lobe with the longest ray, although this is variable; caudal peduncle slender, about $\frac{3}{4}$ in its length; intestine much coiled, peritoneum blackish.

Color.—Brownish everywhere, with numerous blackish spots nearly the size of the pupil, except on head where they are very small and more numerous; these large spots occur on fins and on the belly.

Remarks.—This new species is closely related to *Cochliodon plecostomoides* Eigenmann and *Plecostomus hondae* Regan but differs in the number of teeth. *C. pospisili* has 13 to 16 teeth on each ramus of the jaws and *plecostomoides* and *hondae* only 9 to 12.

Named *pospisili* for Frank J. Pospisil, of the Lago Petroleum Corporation, who made it possible for me to collect fishes in the Rio Machango and also in the Andes of Venezuela.

Genus LASIANCISTRUS Regan

Lasiancistrus REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 224, 1904.
(Type, *Chaetostomus heteracanthus* Günther.)

KEY TO THE SPECIES OF LASIANCISTRUS REPORTED FROM VENEZUELA

1a. Lower lobe of caudal fin blackish; posterior margin of caudal fin pale.

Lasiancistrus mystacinus (Kner)

1b. Caudal fin barred and without a pale edge posteriorly.

Lasiancistrus maracaiboensis, new species

LASIANCISTRUS MYSTACINUS (Kner)

Ancistrus mystacinus KNER, Denkschr. Akad. Wiss. Wien, vol. 7, p. 276, 1854 (Caracas, Venezuela) (ref. copied).—REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 238, 1904 (Caracas).

Hemiancistrus mystacinus EIGENMANN and EIGENMANN, Occ. Papers California Acad. Sci., vol. 1, p. 420, 1890 (Caracas).

Lasiancistrus mystacinus EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 7, 1920 (no specimens collected).

Chaetostomus mystacinus GÜNTHER, Catalogue of the fishes in the British Museum, vol. 5, p. 244, 1864 (Caracas).

LASIANCISTRUS MARACAIBOENSIS, new species

PLATE 11, A, B

Because certain characters are not mentioned in the descriptions of species referred to this genus, it has been difficult, if not impossible, to come to definite conclusions as to the exact differences between this new species and those supposed to be closely related to it. If material were available for examination of each species, I would be more satisfied, but the war prohibits the sending of specimens at present; it is thought best, therefore, to describe this form as a new species, and later, when the genus is revised, the validity of this new species and of others can be determined.

Holotype.—U.S.N.M. No. 121038, a specimen 119 mm. in standard length (the largest one collected) taken by Leonard P. Schultz in the Río Socuy, 3 km. above its mouth on February 24, 1942.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121049, 8 specimens, 65.6 to 111 mm. in standard length, taken along with the holotype and bearing the same data; U.S.N.M. No. 121043, 2 specimens, 37.3 and 46 mm., taken March 2, 1942, in the Río Negro below the mouth of Río Yasa, Maracaibo Basin; U.S.N.M. No. 121039, 17 specimens, 23.5 to 73 mm., taken February 21, 1942, in the Río Palmar near Totuna, about 100 km. west of Maracaibo; U.S.N.M. No. 121041, 2 specimens, 27.5 and 66.5 mm., taken March 6, 1942, in the Río Palmar at the bridge 70 km. southwest of Maracaibo; U.S.N.M. No. 121046, 1 specimen, 20 mm., collected March 21, 1942, in a creek close by a hot spring tributary to Río Machango, about 20 km. above the bridge south of Lagunillas; U.S.N.M. No. 121044, 3 specimens, 33.5 to 41 mm., taken March 21, 1942, in the Río Machango 20 km. above the bridge south of Lagunillas; U.S.N.M. No. 121048, 34 specimens, 26.5 to 92 mm. collected March 25, 1942, in the Río Motatán, 4 km. above Motatán, Maracaibo Basin;

U.S.N.M. No. 121047, 85 specimens, 14.5 to 49 mm., collected March 24, 1942, in the Río Motatán, 8 km. below Motatán; U. S. N.M. No. 121045, 91 specimens, 14.5 to 70 mm., taken March 17, 1942, in the Río Motatán, at the bridge 22 km. north of Motatán; U.S.N.M. No. 121040, 49 specimens, 14.4 to 73 mm., collected March 24, 1942, in the Río Jimelles, 12 km. east of Motatán, tributary of Río Motatán; U.S.N.M. No. 121050, 11 specimens, 24.2 to 90.5 mm., taken March 20, 1942, in the Río San Pedro, a tributary of the Río Motatán, at the bridge south of Mene Grande; U.S.N.M. No. 121042, 36 specimens 18.5 to 70 mm., collected March 17–20, 1942, in the Río San Juan near the bridge south of Mene Grande, tributary of Río Motatán.

Description.—Based on the holotype and paratypes listed above. Detailed measurements are expressed in hundredths of the standard length, those for the holotype first, followed by those for the paratypes in parentheses, respectively. Standard length (in mm.) 119 (92; 80.7; 62.5; 45.6); total length 156 (122.8; 99; 86.3; 63.6) mm.

Length of head from tip of snout to rear edge of temporal plate 40.7 (38.3; 37.5; 38.4; 38.1); length from tip of snout to posterior tip of supraoccipital 38.7; (37.8; 37.3; 37.9; 38.6); width of head at base of pectoral spine 33.2 (29.8; 31.2; 32.3; 31.1); postorbital length of head 14.2 (12.3; 12.4; 12.0; 12.1); greatest depth of body 19.9 (14.9; 18.6; 17.1; 15.3); length of snout 22.7 (23.9; 22.3; 23.0; 21.9); width of fleshy interorbital space 18.1 (16.4; 17.3; 16.8; 17.1); distance from eye to bony edge of nostril 6.80 (5.10; 5.95; 5.60; 5.92); longest spine of interopercle 13.9 (11.4; 15.5; 13.6; 10.3); diameter of eye 5.46 (5.10; 5.08; 5.76; 6.58); length of ramus of lower jaw 5.12 (5.87; 4.83; 6.72; 6.68); greatest width of lower lip 5.55 (5.87; 5.70; 6.72; 6.58); length of caudal peduncle (distance from base of last anal ray to base of midcaudal fin rays 27.5 (28.5; 29.2; 29.6; 27.2); least depth of caudal peduncle 10.1 (10.0; 9.82; 10.1; 9.42); length of depressed dorsal fin 36.9 (37.1; 35.0; 35.2; 36.2); length of anal fin 13.0 (12.5; 12.4; 13.9; 12.1); length of base of dorsal fin 21.8 (20.8; 20.4; 21.0; 20.6); length of dorsal spine 26.0 (27.2; 26.0; 24.3; 26.3); length of adipose spine 7.56 (9.13; 8.18; 7.36; 9.65); length of pectoral spine 33.8 (36.5 31.7; 33.1; 30.7); length of pelvic spine 25.6 (26.4; 26.0; 27.2; 26.5); length of anal spine 11.7 (11.5; 10.2; 11.7; 9.42); length of upper ray of caudal fin 29.5 (30.5; 30.5; 30.4; 33.3); length of lower ray of caudal fin — (34.1; 36.0; 35.2; 36.0); distance from snout to origin of dorsal fin 46.7 (46.2; 45.6; 48.0; 45.2); snout to origin of adipose fin 84.0 (81.2; 81.8; 82.7; 85.6); snout to origin of anal fin 70.3 (67.0; 68.2; 70.7; 70.2); snout to insertion of pelvic fin 48.5 (47.8; 49.2; 48.3; 49.4).

The following counts were made, respectively: Dorsal rays always I, 7; anal rays always I, 5; pectoral rays always I, 6, and pelvic I, 5; number of plates in lower lateral series 25 (24; 24; 24; 24); plates

from base of anal to base of midcaudal fin rays 12 (12; 12; 12; 12); plates in front of dorsal fin 4 (4; 4; 4; 4); plates from dorsal to origin of adipose fin 6 (6; 6; 6; 6); number of spines and bristles on the interopercle about 22+22 (23+14; 20+15; 21+12; 22+18); for additional counts see table 20.

Head depressed, the interorbital flat, a slightly convex ridge on middorsal line of snout; snout prickly all over except a small naked area near tip; rarely absent in large adults; width of head at base of pectorals equal to snout and $1\frac{1}{4}$ to $1\frac{3}{4}$ eye diameters; the depressed dorsal extends to origin of adipose or falls short of it by one plate; caudal fin very deeply forked; the shortest middle rays of young one-half length of lower caudal fin ray, which is longest; posterior margin of dorsal fin slightly convex; belly naked to origin of anal fin; pectoral spines extending about one-third the way along the pelvic spines, a little longer in males than in females; barbel at corners of mouth, shorter than pupil; posterior margin of lower lip finely papillate and without lappets; length of bony ramus of lower jaw $2\frac{1}{2}$ in interorbital space; the interopercle has a rosette of about 20 to 25 spines, and around the outer anterior margin of these there are usually 10 to 20 long hairlike bristles; each spine and bristle is enclosed basally in a thick dermal sheath that may be expanded distally to enclose the entire spine except its tip; the interopercular spines can be folded down and most of them under the opercle; bristles do not appear to be present in the young, and the number of bristles increases with size; teeth in jaws bifid, very small and numerous; plates on body not keeled, but they are covered with tiny spinules; the first ray of all the fins is enlarged and covered with spinules; intestine coiled.

Color.—The general color is grayish, or brownish to blackish brown, with the upper and lower surfaces everywhere with faint pale spots, smaller on the head than posteriorly; these pale spots are absent in the young and sometimes rather obscure in certain adults; no black spots along base of dorsal fin; all fins, except anal and adipose, are barred, the ground color of the fins dark, with the pale spots on the fin rays and not in the membranes between the rays; the number of bars on the fins increases with age, varying from three or four to about six or seven. In some of the smaller specimens there are four or five obscure darkish saddles across the back, one in front of dorsal, the second through front of dorsal fin, third behind base of dorsal, fourth in front of adipose fin and the last under rear of adipose fin; these saddles more or less join to form a dark streak along midsides; lateral line pores white.

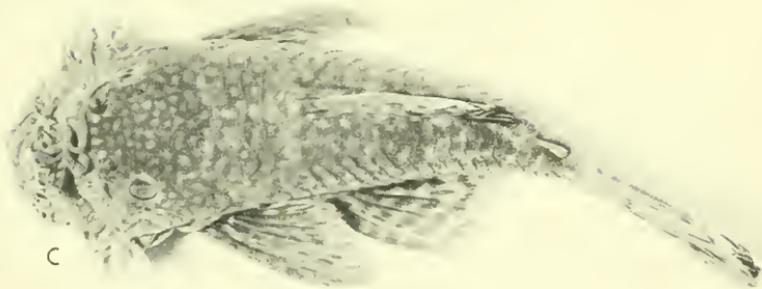
Remarks.—This new species can be distinguished from all other species with I,5 anal rays referred to the genus *Lasiacistrus* by its numerous (20 to 25) spines on the interopercle, except from *L. mystacinus* Kner, *L. caucanus* Eigenmann, *L. mayoloi* Eigenmann, and *L.*



A



B

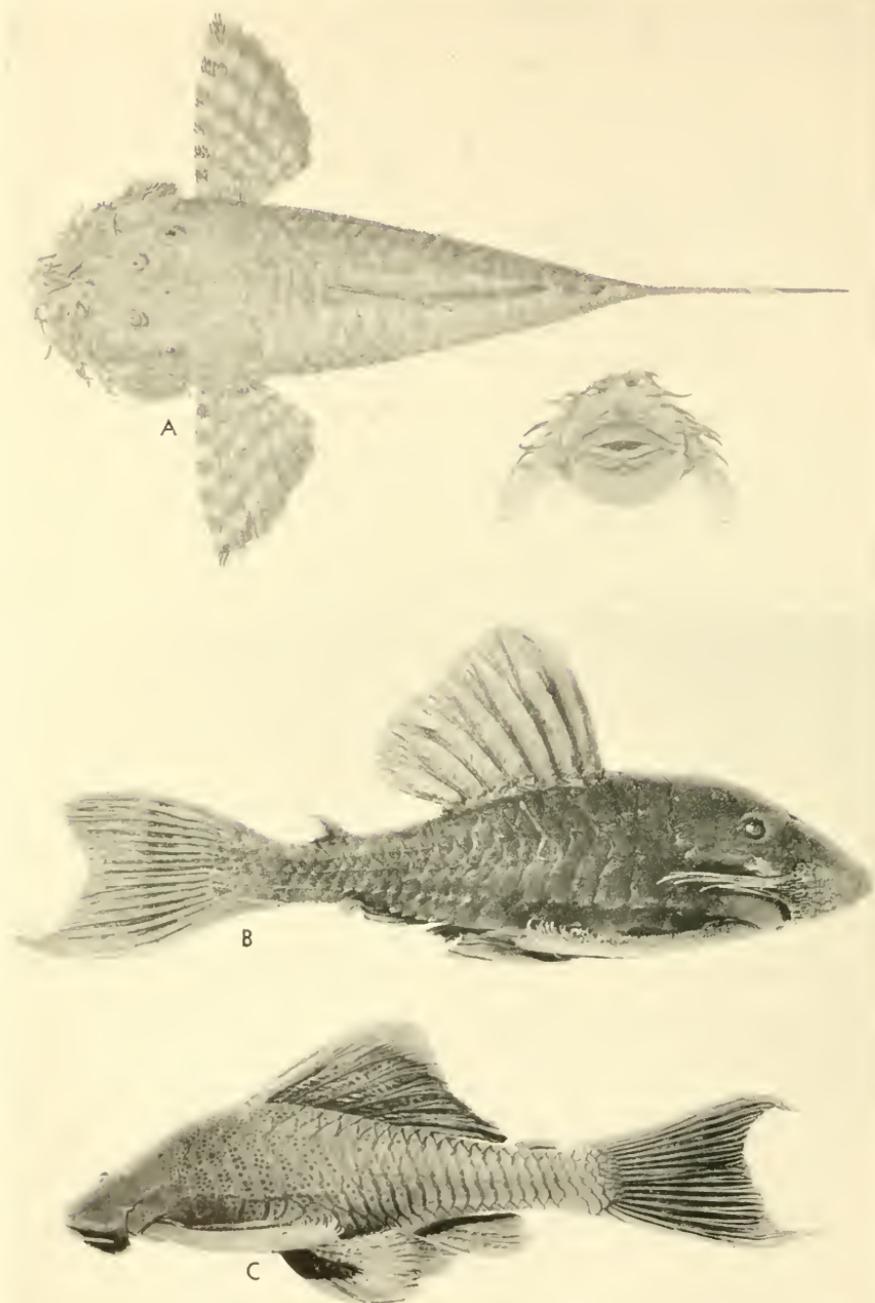


C

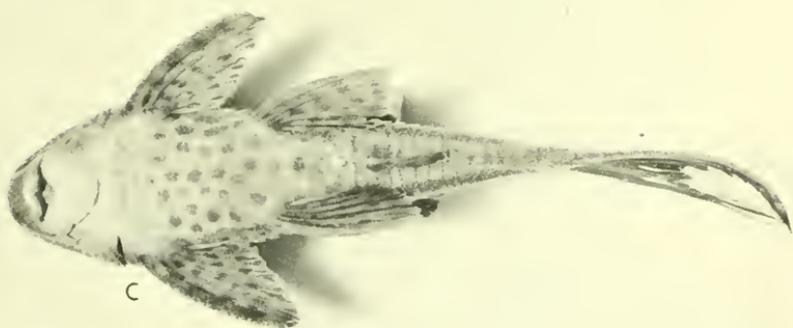
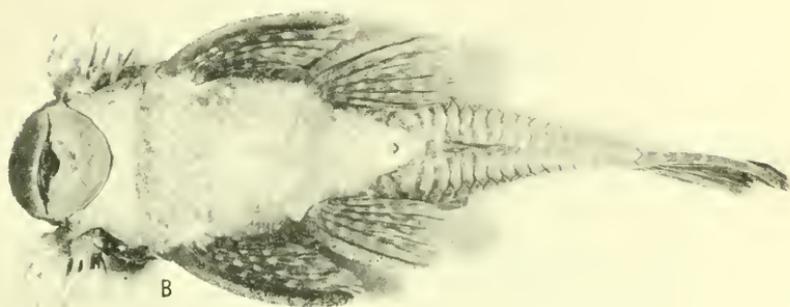


D

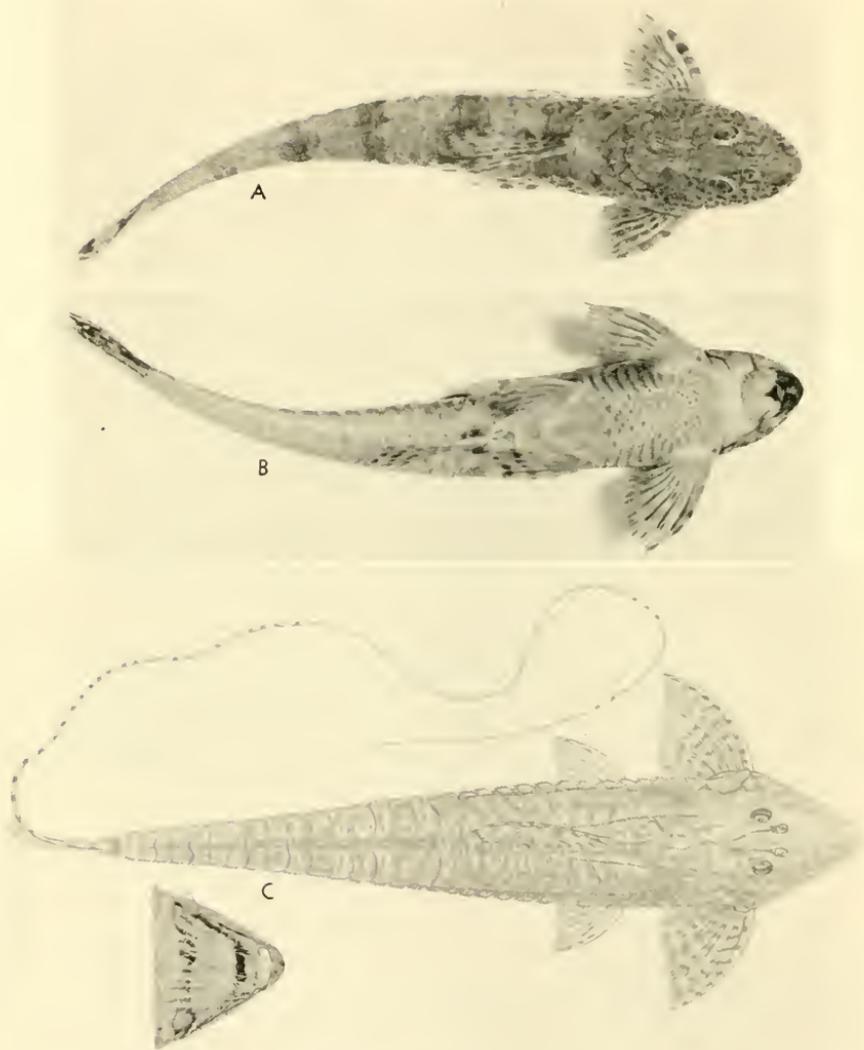
A, B, *Pseudancistrus pediculatus cobrensis*, new subspecies: Holotype (U.S.N.M. No. 121036), 78.6 mm. in standard length; C, D, *Ancistrus triradiatus martini*, new subspecies: Holotype (U.S.N.M. No. 121064), 81.5 mm. Photographs.



A, *Ancistrus brevifilis bodenhameri*, new subspecies: Holotype (U.S.N.M. No. 121066), 61.2 mm. in standard length; B, *Panaque suttoni*, new species: Holotype (U.S.N.M. No. 121033), 280 mm.; C, *Hemiancistrus maracaiboensis*, new species; Holotype (U.S.N.M. No. 121012), 285 mm. A, drawing; B and C, photographs.



A, B, *Lasiancistrus maracaiboensis*, new species: Holotype (U.S.N.M. No. 121038), 119 mm. in standard length; C, D, *Cochliodon pospisili*, new species: Holotype (U.S.N.M. No. 121003), 66.6 mm. Photographs.



A, B, *Loricaria uracantha rupestre*, new subspecies: Holotype (U.S.N.M. No. 121102), 79 mm. in standard length; C, *L. variegata venezuelae*, new subspecies: Holotype (U.S.N.M. No. 121108), 161 mm. A, B, photographs; C, drawing.

planiceps (Meek and Hildebrand). *L. mystacinus* has the lower lobe of the caudal blackish, but in *L. maracaiboensis* the lower lobe of the caudal is the same as rest of the fin, barred and without a pale posterior edge; *L. caucanus* has only 10 or 11 plates from the anal to the caudal fin base, 7 plates from dorsal to adipose origin, while the new species has 12 or 13 and 5 or 6, respectively; *L. planiceps* has seven scutes from dorsal to adipose, and pale spots on the membranes between the rays of the dorsal, while in *maracaiboensis* there are five or six plates and no pale spots on the membranes of any of the fins, the pale spots occurring on the rays instead; *L. mayoloi* appears to be closely related to *maracaiboensis* in regard to number of spines and plates, but the new species has the lateral line pores conspicuously white not shown on drawings or mentioned in descriptions of *mayoloi* or any other species of *Lasiancistrus*.

Named *maracaiboensis* for the basin in which it was taken in many localities.

TABLE 20.—Counts recorded for species of *Lasiancistrus*

Species	Number of fin rays		Number of plates													
	Dorsal	Anal	In lower lateral series				From dorsal fin to origin of adipose fin				From anal to midbase of caudal fin					
			1, 7	1, 5	24	25	26	27	5	6	7	8	10	11	12	13
<i>caucanus</i>	1	1		1	1					1		1				
<i>mayoloi</i>	1	1	1	1					1						1	
<i>planiceps</i>	1	1	1	1						1			1	1		
<i>mystacinus</i>	1	1	1							1					1	
<i>maracaiboensis</i> ...	13	13	28	12				3	34						32	6

Genus HEMIANCISTRUS Bleeker

Hemiancistrus BLEEKER, Nederl. Tijdschr. Dierk., vol. 1, p. 78, 1863. (Type *Ancistrus medians* Kner.)

HEMIANCISTRUS MARACAIBOENSIS, new species

CAJALO

PLATE 10, C

Holotype.—U.S.N.M. No. 121012, a specimen, 285 mm. in standard length, collected by Leonard P. Schultz near the mouth of the Río Concha in Lago Maracaibo on May 2, 1942.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121014, a specimen 200 mm. in standard length, from an isolated muddy pool

of the Río San Ignacio, 25 km. south of Rosario, Maracaibo Basin, on February 26, 1942; U.S.N.M. No. 121013, 2 specimens, 85.7 and 210 mm., from a caño, half a mile west of Sinamaica, Maracaibo Basin, March 11, 1942.

The holotype and paratypes when captured were all living on muddy bottoms and in shallow water.

Description.—Based on the holotype and three paratypes. Detailed measurements and counts are presented in table 21.

Bony ramus of upper and lower jaws about equal in length, the teeth bifid, the inner lobe much the largest, teeth numbering about 27 to 32 above and 26 to 31 below; barbel at corner of mouth $1\frac{1}{2}$ to $2\frac{1}{4}$ in the interorbital space; supraoccipital with a rounded keel in the middorsal line posteriorly and bounded posteriorly by a single median plate in the adult, but in the small specimen this plate has not yet fused in the middorsal line to form a single plate; the next dorsal plate is double, but the first plate in front of the dorsal fin origin is a single plate with expanded wings; interorbital space convex, rims of orbits dorsally a little elevated, especially so in the young; snout with prickles to its tip and no naked area present; breast and belly with platelets, rough in the young; the interopercle is movable, but the spine on it is not concealed by the opercle; interopercle and opercle not so freely movable as in other related genera; most of the plates of the body are keeled, especially in the young, these plates becoming smoother with age; body robust, its greatest depth at origin of dorsal, 3.8 to 4.0 in the standard length, width of body at coracoids 3.0 to 3.4 and head 2.9 to 3.3; ramus of lower jaw 3.0 to 3.6 in interorbital space; eye 4.0 to 6.9, in snout, and 7 to 12 times in the head; the least depth of the caudal peduncle is contained 2.4 to 3.3 in its length; the pectoral spine, very spiny in the adults, reaches past middle of the pelvic spine; the depressed dorsal fin on the adult does not quite reach the origin of the dorsal, falling short by one plate, but in the young it reaches to opposite the base of the caudal fin; the caudal fin with outer upper and lower rays exerted is less deeply forked in the large specimens; the depressed anal fin reaches to opposite the middle of the adipose; in the small specimen a keel extends backward from upper part of eye, but in the adult the ridges on the head are obsolete; the interopercle has one spine, hooked at its tip, and several very short small points or spines around it, but on the young the hooked spine is undeveloped.

Color.—Ground color of body brownish to blackish, the upper parts of head with very numerous small black spots, larger in the young; sides of body anteriorly with numerous larger black spots, these absent on the caudal peduncle; but present on the belly and under-sides of the head; in the young the spots are much larger and less

numerous; all the fins except the caudal with rows of black spots, those on the dorsal membranes in two rows and numbering about 10 to 12, in the young but 9; caudal fin plain blackish, anus white; peritoneum more or less dusky.

Named *maracaiboensis* in reference to the Maracaibo Basin, where the species was collected.

TABLE 21.—Measurements, expressed in hundredths of the standard length, and counts made on four specimens of *Hemiancistrus maracaiboensis*

Character	Paratype	Paratype	Paratype	Holotype
Standard length (in mm.)	85.7	210	200	285
Total length (in mm.)	139	322	295	425
Head—tip of snout to posterior edge temporal plate	36.7	31.2	32.7	31.2
Greatest depth	26.3	25.1	24.8	26.9
Length of snout	20.5	17.9	18.0	19.9
Width of interorbital space	16.5	13.9	13.5	12.3
Diameter of eye	5.25	3.29	3.25	2.63
Postorbital length of head	11.1	10.5	10.8	10.3
Tip of snout to rear of supraoccipital	36.9	31.4	31.3	30.5
Distance nostril to eye	4.20	4.29	3.85	4.25
Length of maxillary barbel	5.95	7.62	6.75	6.84
Length of ramus of lower jaw (bony)	4.67	3.82	4.50	4.21
Width of head at coracoids	33.3	29.8	30.8	30.2
Least depth of caudal peduncle	10.8	10.1	11.4	10.6
Length of caudal peduncle	30.6	33.4	28.5	28.9
Length of dorsal spine		36.8	38.1	37.2
Length of anal spine	22.2	20.0	19.8	18.6
Length of pectoral spine	38.5	37.2	36.6	39.3
Length of adipose spine	7.59	7.14	7.40	7.26
Length of pelvic spine	33.3	28.1	30.0	28.6
Length of depressed dorsal	68.8	47.4	49.8	50.5
Length of depressed anal	23.9	20.0	20.8	21.9
Distance from snout to origin of dorsal	43.4	40.1	43.7	40.0
Distance from snout to origin of adipose	82.9	84.8	87.5	86.0
Distance from snout to origin of anal	64.4	65.7	68.0	67.0
Length of longest interopercular spine		0.95	3.80	2.63
Length of base of dorsal	35.2	32.1	31.7	33.0
Length of longest upper ray of caudal	64.8		47.9	44.8
Length of longest lower ray of caudal		50.2	47.5	47.5
Length of shortest middle ray of caudal	23.8	24.2	20.8	29.3
Dorsal rays	I, 7	I, 7	I, 7	I, 7
Anal rays	I, 4	I, 4	I, 4	I, 4
Pelvic rays	I, 5	I, 5	I, 5	I, 5
Pectoral rays	I, 6	I, 6	I, 6	I, 6
Number of plates in lower lateral series	26	26	26	26
Number of plates anal base to caudal fin base	13	13	13	13
Number of plates dorsal to adipose	7	7	7	7
Number of plates before dorsal	3	3	3	3
Number of pores in the lateral line	27	27	27	27
Number of teeth in jaws	27/26	30/28	32/31	30/28

Remarks.—Considerable uncertainty as to the limits of some of the species of *Hemiancistrus* already described for northern South America makes it difficult to distinguish the species. It appears from my material and that figured by Eigenmann that in some characters the species referred to this genus must vary considerably with age, such

as fusion in the middorsal line of the plate behind the supraoccipital to form a single plate in large specimens; the dorsal fin becomes less high and when depressed does not extend so far back in the adults as in those less than 100 mm. in standard length; the spines on the interopercle and distal part of the pectoral spine develop with age, while the spiny keels on the plates of head and body are reduced with age, almost obsolete on the head. *H. maracaiboensis* differs from the following species in northern South America: *H. landoni* Eigenmann, *H. annectens* (Regan), *H. holostictus* Regan, *H. wilsoni* Eigenmann, *H. schomburgkii* (Günther), and *H. braueri* Eigenmann, in a more robust body and head, depth 3.8 to 4.0 instead of 4.75 to 8 times in the species listed above. The single short hooked spine on the interopercle among other characters helps to distinguish this species. *H. megacephalus* (Günther) has a smooth lower surface on body, rough in the new species.

Genus HYPOSTOMUS Lacepède

Hypostomus LACEPÈDE, Histoire naturelle des poissons, vol. 5, p. 144, 1803.
(Type, *Hypostomus guacari* Lacepède = *Loricaria plecostomus* Linnaeus.)

KEY TO GENUS HYPOSTOMUS, AFTER EIGENMANN (1912)

- 1a. Supraoccipital bone bordered posteriorly by a single nuchal plate; plates along sides 25 or 26; ramus of lower jaw 3 times in interorbital space.
Hypostomus plecostomus (Linnaeus)
- 1b. Supraoccipital bone bordered posteriorly by a median plate and 1 or 2 or more at each side; plates along lower sides 28 to 30.
- 2a. Caudal peduncle normally formed, scutes of fourth series not strongly angulated; ramus of lower jaw 2.8 to 3.2 in interorbital space.
Hypostomus watwata Hancock
- 2b. Caudal peduncle broad and flat below, scutes of fourth series strongly angulated; ramus of lower jaw 3 to 4 in interorbital space.
Hypostomus emarginatus Cuvier and Valenciennes

HYPOSTOMUS PLECASTOMUS (Linnaeus)

PANAQUE

- Acipenser plecostomus* LINNAEUS, Systema naturae, ed. 10, p. 258, 1758 (ref. copied).
- Plecostomus guacari* LACEPÈDE, REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 206, 1904 (River Amazon, Guiana, Venezuela, Trinidad); Proc. Zool. Soc. London, 1906, vol. 1, p. 389 (Paraguay to Venezuela, Trinidad).
- Plecostomus bicirrhosus* GÜNTHER, Catalogue of the fishes in the British Museum, vol. 5, p. 231, 1864 (Venezuela).
- Plecostomus plecostomus* (Linnaeus) RIBEIRO, Arch. Mus. Nac. Rio de Janeiro, vol. 16, No. 4, p. 47, 1911 (Venezuela).—EIGENMANN, Indiana Univ. Studies, vol. 7, p. 44, 1920 (Concejo, Río Tuy, and Río Tiquirito; Isla del Buro; Maracay, Río Bue; Venezuela).—PEARSE, Univ. Wisconsin Studies, No. 1, p. 23, 1920 (Isla del Buro, Lago Valencia, Venezuela).—EIGENMANN, Mem. Carnegie Mus., vol. 9, No. 1, p. 223, 1922 (Lago Valencia, Río Tuy, Venezuela).—RIBEIRO, Rev. Mus. Paulista, vol. 10, p. 713, 1918 (Río Cabriale, Venezuela).

HYPOSTOMUS WATWATA Hancock

ARMADILLO DE RÍO

- Hypostomus watwata* HANCOCK, Zool. Journ., vol. 4, p. 245, 1828 (Georgetown) (ref. copied).
- Hypostomus plecostomus* (not of Linnaeus) CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 489, 1840 (Laguna de Maracaibo).
- Plecostomus verres* (Valenciennes) REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 209, 1904 (Venezuela, Guiana, Marajo Island).—FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 63, p. 436, 1911 (Pedernales, Venezuela).
- Plecostomus watwata* (Hancock) FOWLER, Proc. Acad. Nat. Sci. Philadelphia, vol. 83, p. 408, 1931 (Caño Guanoco; Yarapa River at Yarapa; stream at La Soledad, Yarapa; Punta Tigre, at mouth St. Juan River, Venezuela).

Collections made by Leonard P. Schultz in the Maracaibo Basin of Venezuela in 1942:

U.S.N.M. No. 121019, Río Apón, about 35 km. south of Rosario, February 26, 1 specimen, 405 mm.

U.S.N.M. No. 121020, Río Socuy, about 3 km. above mouth, February 24, 3 specimens, 204, 232, and 450 mm.

U.S.N.M. No. 121297, 7 larvae with yolk sac may belong to this species, from Río Socuy. Same data.

U.S.N.M. No. 121021, Río Negro, below mouth of Río Yasa, 75 km. south of Rosario, March 2, 1 specimen, 365 mm.

U.S.N.M. No. 121022, Ciénaga del Guanavana, 10 km. north of Sinamaica, March 11, 1 specimen, 490 mm.

U.S.N.M. No. 121023, Río Palmar at bridge 70 km. southwest of Maracaibo, March 6, 3 specimens, 15 to 37 mm.

U.S.N.M. No. 121024, Río Socuy, 3 km. above mouth, February 24, 9 specimens, 14.5 to 40 mm.

U.S.N.M. No. 121025, Ciénaga del Guanavana, about 10 km. north of Sinamaica, March 11, 11 specimens, 14 to 16 mm.

U.S.N.M. No. 121026, Río Motatán, 8 km. below Motatán, March 24, 3 specimens, 15 to 18 mm.

U.S.N.M. No. 121027, Río Palmar near Totuma, about 100 km. southwest of Maracaibo, February 21, 9 specimens, 29 to 60 mm. and one 225 mm.

U.S.N.M. No. 121028, Río Apón about 35 km. south of Rosario, February 26, 24 specimens, 14.5 to 59.5 mm.

U.S.N.M. No. 121029, Río Motatán at bridge 22 km. north of Motatán, March 17, 60 specimens, 19 to 67 mm.

U.S.N.M. No. 121030, Lago Maracaibo, 1 km. off Pueblo Viejo, April 7-9, 1 specimen, 188 mm.

U.S.N.M. No. 121031, Lago Maracaibo, near mouth of Río Concha, May 2, 2 specimens, 181 and 290 mm.

U.S.N.M. No. 121032, caño half a mile west of Sinamaica, March 11, 9 specimens, 53 to 177 mm.

This species is one of the commonest fishes in the lowland waters of the Maracaibo Basin and occurs in the market at Maracaibo in large numbers on certain days. It is taken most frequently over muddy bottoms of swamps and of the rivers as well as in Lago Maracaibo. The measurements in table 22 indicate the general change in shape of the body with age.

TABLE 22.—Measurements and counts made on 5 specimens of *Plecostomus watwata* Hancock from the Maracaibo Basin

Characters	1	2	3	4	5
Standard length (In mm.)	73	171	181	290	450
Depth in standard length	5½	5	5½	6	7¼
Head in standard length	2½	3¼	3¼	3¼	3¾
Width head in standard length	3½	3½	3¾	4½	4¾
Width head in its length	1¼	1¾	1¾	1¼	1¼
Snout in head	1¾	1½	2	1½	1½
Eye in head	5¼	7½	8½	9	11½
Interorbital in head	2½	2½	2½	2½	2½
Ramus lower jaw in interorbital	2½	3	3½	2¾	3¼
Depth caudal peduncle in its length	3½	4	3¾	5	5¾
Scutes in lower lateral series	28	28	28	28	28
Scutes dorsal to adipose fin	7	8	7	7	8
Scutes anal to caudal fin base	15	15	15	15	15
Number of teeth	2½ ₈	2½ ₆	2½ ₈	2½ ₃	3½ ₂

There is considerable variation in the fusion of the plates bordering the supraoccipital; in the young the plate at the apex of the supraoccipital is in two parts, but on the large specimens 300 to nearly 490 mm. these plates appear to be fused into a single plate.

When alive, this species is yellowish brown, with numerous black spots all over its body and fins.

HYPOSTOMUS EMARGINATUS Cuvier and Valenciennes

PANAQUE

Hypostomus emarginatus CUVIER and VALENCIENNES, Histoire naturelle des poissons, vol. 15, p. 500, 1840 (Brazil).

Plecostomus emarginatus REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 210, 1904 (Brazil to Colombia).—RIBEIRO, Arch. Mus. Nac. Rio de Janeiro, vol. 16, No. 4 p. 42, pl. 24, fig. 1, 1911 (Venezuela).

Plecostomus villarsii LÜTKEN, Vid. Medd. Naturh. Foren. Kjøbenhavn, pts. 12–16, p. 211, 1874 (Caracas, Venezuela).—EIGENMANN and EIGENMANN, Occ. Pap. California Acad. Sci., vol. 1, p. 408, 1890 (Caracas).

Plecostomus horridus PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 471 (Cala-boza, Venezuela).

Genus LORICARIA Linnaeus

Loricaria LINNAEUS, Systema naturae, ed. 10, p. 307, 1758. (Type, *Loricaria dura* Linnaeus=*Loricaria cataphracta* Linnaeus.)

KEY TO THE SPECIES OF LORICARIA¹¹ REPORTED FROM VENEZUELA

- 1a. Upper lip narrow with a single row of barbels around its margin, and without or with not more than a single row of rudimentary papillae between row of barbels and rami of upper jaw, the latter protrusible and bearing 7 to 13 small bilobed teeth; barbel at corner of mouth not reaching gill opening.

¹¹ Pellegrin, Bull. Mus. Hist. Nat. Paris, vol. 5, p. 153, 1899, reports *Loricaria maculata* Bloch from the Apure River. Cuvier and Valenciennes, Histoire naturelle des poissons, vol. 15, p. 479, 1840 (Orinoco), and Günther, Catalogue of the fishes in the British Museum, vol. 5, p. 260, 1864, both mention *Loricaria brunnea* from the Orinoco. I have not included these species in the key because of the uncertainty of just what forms they might be.

2a. Barbels in front of rami of upper jaw not larger or stouter than those at each side of rami; plates in front of dorsal smooth or with traces of low ridges, but not sharply keeled; belly covered with plates, even on those specimens only 40 mm. in standard length; two black blotches at each side of a pale median area on upper lips or underside of snout; a blackish blotch near base of barbel at corner of mouth, then a pale area forward; preanal plate bounded anteriorly with 3 plates; tip of snout with a small naked area.

3a. Three plates across belly between fourth ventrolateral plates in front of insertion of pelvics; 15 or 16 + 14 or 15 plates in lower lateral series along sides.....*Loricaria magdalenae* Steindachner

3b. Five to seven, usually six, plates on belly between fourth ventrolateral plates in front of pelvic insertions; 13 to 17 + 12 to 16 plates along sides of body.....(*Loricaria uracantha* Kner and Steindachner)

4a. Plates anteriorly along midsides with the two keels widely spaced numbering 12 to 17 (usually 14 or 15), and posterior plates with the keels close together numbering 12 to 16 (usually 14); barbels on margin of lower lip usually 17 to 22; width of body at anal origin in length of caudal peduncle 3.2 to 5.5 (usually 3.9 to 5.2), the males are broader and shorter; no black pigment on naked area of body at front base of anal fin (Río Chagres, Panama).

Loricaria uracantha uracantha Kner and Steindachner

4b. Plates anteriorly along midsides with the keels widely spaced numbering 15 to 17 (usually 16), and posterior plates with the keels close together numbering 12 to 14 (usually 13 or 14); barbels along margin of lower lip numbering 13 or 20 (usually 15 to 19); width of body at anal origin 3.1 to 4.0 (usually 3.2 to 3.7); along each side of anterior part of base of anal fin occurs black pigment areas on the naked area of the body except in certain small specimens (Maracaibo Basin).....*Loricaria uracantha rupestre*, new subspecies

2b. Four enlarged fleshy barbels in front of rami of upper jaw, a few times longer than those at each side; plates along sides 18 to 21 + 9 to 13; about 21 to 30 barbels along margin of lower lip; plates in front of dorsal keeled; membrane between thick portions of lower lip and whitish barbel at corner of mouth, blackish, rest of lower lips whitish; spiny ray of pelvics produced beyond tips of branched rays.

Loricaria filamentosa Steindachner

1b. Upper lip wider, with 2 or more well-developed rows of elongate barbels and papillae in front of mouth; all plates in front of dorsal keeled.

5a. Lower lip with short tentacles and lower lip with barbels, those along rear margin reaching to gill opening and one at corner of lip reaching past gill opening; front of mouth inside rami of upper jaw with a pair of median tentacles followed by a pair of lateral ones.

6a. Belly plated, about 6 plates across belly, between fourth ventrolateral plates in front of pelvic insertion; none of barbels along margin of lower lip bearing numerous short tentacles; plates along sides 18 to 20+13 to 16.....*Loricaria cataphracta* Linnaeus

6b. Belly with a median series of plates, each side of which is a naked area; 13 to 16 barbels along rear margin of lower lip that bear several papillae and short tentacles; plates along sides 13 to 16+15 to 19.

(*Loricaria variegata* Steindachner)

7a. First two plates along front of base of dorsal with serrated keels and occasionally the third plate having a low keel, all ending in small

spines; width of plate through origin of anal fin contained 3.2 to 3.4 in adults and 3.8 times in young in distance from anal fin base to caudal fin base; keels on dorsal surface anteriorly all with small serrations; underside of body white. (Maracaibo Basin.)

Loricaria variegata venezuelae, new subspecies

- 7b. Only first plate at each side of front of base of dorsal fin with a keel, second plate having an obsolete smooth keel only rarely; width of body at origin of anal fin contained 3.8 to 4.1 in adults and nearly 5 times in young in distance from base of anal fin to base of caudal fin; keels on dorsal surface anteriorly lower and smoother; underside of body posteriorly with brown splotches.

Loricaria variegata variegata Steindachner

- 5b. Lower lip with papillae and a fringe of short barbels along its posterior margin; none of barbels or tentacles reaching gill opening; inside of mouth with short papillae not much longer than papillae on lower lips; plates usually 18 to 21 + 10 to 13.

(*Loricaria gymnogaster* Eigenmann and Eigenmann)

- 8a. Widely spaced keels on lateral plates anteriorly numbering 19 to 21 (usually 20) and those plates posteriorly on sides of caudal peduncle with keels all close together numbering 10 to 13 (usually 11). (Maracaibo Basin)---*Loricaria gymnogaster lagoichthys*, new subspecies
- 8b. Widely spaced keels on lateral plates anteriorly 18 or 19 (usually 18) and keels uniformly close together posteriorly about 12 or 13 (usually 13).

Loricaria gymnogaster gymnogaster Eigenmann and Vance

LORICARIA MAGDALENAE Steindachner

Loricaria magdalena STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 39, p. 74, 1878; vol. 41, pl. 7, figs. 2, 2a, 3; 3a, 3b, 1879 (Río Magdalena).

Two of Eigenmann's specimens of *L. jubata* from Istimina, Colombia (U.S.N.M. No. 79242), do not appear to agree in the number of plates across the midventral region of the belly as indicated by him in his key (Mem. Carnegie Mus., vol. 9, p. 88, 1922) for this species. There is not enough material available to enable me to work out the relationships between *jubata*, *magdalena*, and the form in the Maracaibo Basin, but from the material at hand the Maracaibo form appears to be a little more robust, and perhaps when an adequate study is made this will be considered as a distinct subspecies.

The following collections were made by Leonard P. Schultz in the Maracaibo Basin of Venezuela in 1942:

U.S.N.M. No. 121113, 8 specimens, 57 to 116 mm. in standard length, from a caño half a mile west of Sinamaica, March 11.

U.S.N.M. No. 121114, 7 specimens, 54 to 203 mm., from the Río San Ignacio in a pool left by drying up of river during dry season, about 20 km. south of Rosario, February 26.

U.S.N.M. No. 121117, a specimen 42.5 mm., taken in the Río Machango at the bridge south of Lagunillas, March 16.

U.S.N.M. No. 121116, a specimen 47 mm., from the Río San Juan, 12 km. south of Rosario, Estado de Zulia, February 26.

U.S.N.M. No. 121115, a specimen 78 mm. from Lago Tulé, about 80 km. west of Maracaibo, 5 km. from Río Socuy, March 1.

LORICARIA URACANTHA RUPESTRE, new subspecies

PLATE 12, A, B

Holotype.—U.S.N.M. No. 121102, a male specimen 79 mm. in standard length, taken by Leonard P. Schultz, March 20, 1942, in the Río San Pedro at the bridge south of Mene Grande, Motatán system, Maracaibo Basin.

Paratypes (all taken by L. P. Schultz).—U.S.N.M. No. 121104, 39 specimens, 45 to 85 mm. in standard length, taken along with the holotype and bearing the same data; U.S.N.M. No. 121105, 67 specimens, 27 to 91 mm., collected March 17–20, 1942, in the Río San Juan above the bridge south of Mene Grande, Motatán system; U.S.N.M. No. 121103, 4 specimens, 20 to 78 mm., collected March 25, 1942, from the Río Motatán, 4 km. above Motatán; U.S.N.M. No. 121106, 3 specimens, 38 to 90 mm., taken April 1, 1942, in the Río Táchira 7 km. north of San Antonio, Catatumbo system, Maracaibo Basin; U.S.N.M. No. 121107, 2 specimens, 24 and 28 mm., taken March 24, 1942, in the Río Motatán 8 km. below Motatán.

The above listed specimens were taken in rapidly to slow flowing water among small stones and rubble; none was seen over muddy bottom.

Description.—Based on the holotype and paratypes listed above. In table 24 are recorded certain measurements for the holotype and two paratypes, as well as for a specimen of *Loricaria uracantha uracantha* from the Río Chagres, Panama.

The following counts were made on the holotype and paratypes, respectively: Dorsal rays I, 7, I, 7, I, 7; anal I, 5; I, 5; I, 5; pectoral always I, 6; pelvic always I, 5; caudal fin rays always $i+10+i$; plates along midsides 17+13; 15+14; 16+12; plates from last ray of anal fin (including the plate in which last ray occurs) to base of caudal fin 18; 17; 17; teeth in ramus of upper jaw 8; 8; 9; and in lower jaw 9; 10; 9; barbels 20; 16; 20; 6 or 7 plates across middle of belly between the fourth plates in front of pelvic fin base.

Body greatly depressed, covered all over with bony plates, those along sides with keels that end in a spine; supraoccipital with a pair of low keels diverging posteriorly; next two median plates behind supraoccipital with a pair of low keels, but the plate in front of the origin of the dorsal fin without keels; orbital rims a little elevated, the interorbital space concave, area between nostrils convex, this convexity extending to tip of snout; eye with a notch posteriorly; adult males with bristles along checks and on top of head and body from between eyes to second plate in front of dorsal fin; all fins rather short, the upper ray of caudal fin filamentous, this about half standard length on some specimens; upper surface of pectoral rays of males spiny; first ray of each fin a little produced except on adult males;

lips papillate, but the papillae are larger and fewer than in other species and usually with tiny papillae between the large ones; barbel at corner of mouth not nearly reaching to gill opening; margin of lower lip with barbels, but the upper lip has only papillae, about 20 to 30, along its outer margin; tip of snout with a small naked area; usually six or seven plates across middle of belly between the fourth plate in front of pelvics; preanal plate bordered by three plates; axil of pectoral naked; pectorals reach to base of pelvics, and the latter a little beyond the origin of the anal; pelvics inserted under origin of dorsal; depressed dorsal $1\frac{1}{2}$ to $2\frac{1}{2}$ times in snout to anus (dorsal longer in females than males); ovaries of adult females contain numerous large eggs about 2 mm. in diameter.

TABLE 24.—Measurements in hundredths of the standard length, for two subspecies of *Loricaria uracantha*

Characters	<i>rupestre</i>		<i>uracantha</i>	
	Río San Pedro	Río San Juan	Río Táchira	Río Chagres, Panama
	Holotype	Paratype		
Standard length (in mm.).....	79	75.4	87.9	91.7
Length head to tip supraorbital.....	22.5	22.1	22.1	20.9
Length head to end of opercle.....	16.6	16.6	16.5	17.3
Length head to end of post-temporal plate.....	22.9	22.7	21.6	21.3
Width of head at base of pectorals.....	16.6	16.6	17.3	15.5
Length of snout.....	11.0	10.9	10.2	11.0
Diameter of eye (not including notch).....	4.18	3.71	3.47	3.49
Least width of bony interorbital.....	5.57	5.70	5.12	5.45
Greatest depth of body.....	9.75	11.5	9.67	8.18
Width of body at anal origin.....	12.0	13.3	12.3	11.0
Postorbital length of head.....	8.23	8.09	8.08	7.09
Least depth of caudal peduncle.....	1.52	1.59	1.36	1.53
Least width of caudal peduncle.....	2.66	2.78	2.50	3.16
Length of caudal peduncle.....	49.4	48.4	48.2	50.8
Length of last ray of pectoral.....	8.23	8.36	9.67	8.40
Length of last ray of pelvic.....	11.4	10.2	11.6	8.62
Length of last ray of anal.....	11.0	12.6	11.0	9.16
Length of last ray of dorsal.....	8.86	8.62	9.33	8.29
Length of spine of dorsal.....	22.9	21.9	22.8	18.7
Length of spine of anal.....	20.0	20.6	20.5	15.8
Length of spine of pelvic.....	17.3	18.8	18.2	15.0
Length of spine of pectoral.....	19.1	20.6	19.3	16.9
Tip of snout to origin of dorsal.....	33.5	34.0	34.6	30.9
Tip of snout to origin of anal.....	47.0	47.4	48.4	44.2
Tip of snout to insertion of pelvic.....	32.2	32.6	33.9	30.8
Tip of snout to insertion of pectoral.....	17.1	17.2	16.2	17.7
Distance from anus to anal origin.....	8.10	8.49	8.99	8.18
Length of upper ray of caudal fin.....	50.6	46.4	-----	-----

Color.—Brownish above, yellowish or pale below; five black bars across dorsal surface, the first through front of dorsal fin base, the second under tips of depressed dorsal fin, then three on caudal peduncle; base of branched rays of caudal fin blackish; all fins barred;

black blotch on body on upper base of pelvic fins; one or two black blotches on naked area of body at each side of front of anal fin, sometimes lacking in young specimens; often black pigment areas on under sides of lateral plates; black blotch around bases of last dorsal rays; blackish blotch in middle of first plate in front of dorsal fin; peritoneum dusky.

Remarks.—This new subspecies differs from *L. uracantha uracantha* Kner and Steindachner in having a wider body, a shorter caudal peduncle^s (see table 24 and key), the plates along midsides with keels widely spaced numbering 15 to 17 (average 16), and the plates with keels approximated numbering 12 to 14 (usually 13 or 14) instead of 13 to 17 (average 14 or 15) and 12 to 16 (usually 14 or 15), respectively. The black spots each side of anal fin base on naked area at front of anal are lacking in *L. uracantha uracantha*.

Named *rupestre* in reference to its habitat among rocks and stones on the stream bottom.

LORICARIA FILAMENTOSA Steindachner

ARMADILLO MACHETE

Loricaria filamentosa STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 39, p. 45, pl. 9, 1878 (Magdalena River).

Loricaria fimbriata EIGENMANN and VANCE, Indiana Univ. Studies, No. 16, p. 12, 1912 (Boca de Certegui).—MEEK and HILDEBRAND, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, No. 15, p. 260, 1916 (Río Capeti, tributary to Río Tuyra).

Loricaria filamentosa latiura EIGENMANN and VANCE, Indiana Univ. Studies, No. 16, p. 13, 1912 (Boca de Certegui, Colombia).—MEEK and HILDEBRAND, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, No. 15, p. 257, 1916.

Loricaria tuyrensis MEEK and HILDEBRAND, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, No. 8, p. 81, 1913 (Tuyra Basin).

After examining a series of paratypes of the species described by Eigenmann and Vance, Meek and Hildebrand, and the figure by Steindachner, then making comparisons with my material from the Maracaibo Basin, I conclude that *L. fimbriata* is the young of this species and has a naked abdomen until it reaches a length of about 100 mm. when the plates begin to form; at a length of 114 mm. (see Eigenmann's fig. 1, pl. 15, in Mem. Carnegie Mus., vol. 9, 1922) some plates have formed along midventral region and at sides. Steindachner's figure of *filamentosa* and Eigenmann's figure 3, plate 15 (*loc. cit.*), of *latiura* represent the abdomen as almost completely plated except an area from the anus to the base of pelvis, this condition being found in specimens about 200 to 250 mm. in standard length. Specimens of larger sizes up to 355 mm. have been described as *tuyrensis* and *latiura*.

The form from the Magdalena system appears to be slenderer than the specimens before me from the Maracaibo Basin. I hesitate to describe these from the Maracaibo Basin as a new subspecies because

I lack comparable sizes from the Magdalena system. However, the greater width of the body through the anal origin on 200-mm. specimens from the Maracaibo Basin is $3\frac{1}{2}$ in the length of the caudal peduncle as compared to 4 to 6 in examples from Panama and the Magdalena regions. It also appears possible that the lateral plates, including the ones close together, average greater in number for the Maracaibo Basin than for Colombia and Panama.

The following collections were made in 1942 by Leonard P. Schultz in the Maracaibo Basin of Venezuela.

U.S.N.M. No. 121085, 6 specimens, 27 to 89 mm. and 246 to 295 mm. in standard length, from a caño half a mile west of Sinamaica, March 11.

U.S.N.M. No. 121084, 3 specimens, 273 to 335 mm., from Río de Los Pajaros, 3 km. above Lago Maracaibo, April 30.

U.S.N.M. No. 121086, a specimen 283 mm. from the Río Agua Caliente, 2 to 3 km. above Lago Maracaibo, May 1.

U.S.N.M. No. 121089, a specimen 89 mm. from the Río Palmar at the bridge 70 km. southwest of Maracaibo, March 6.

U.S.N.M. No. 121088, 9 specimens, 28 to 67 mm., from the Río Negro below mouth of Río Yasa, March 2.

U.S.N.M. No. 121087, 3 specimens, 88 to 244 mm., taken in the Ciénaga del Guanavana, about 10 km. north of Sinamaica, March 11.

U.S.N.M. No. 121090, a specimen, 184 mm. from Lago Tulé about 80 km. west of Maracaibo, 5 km. from the Río Socuy, March 1.

The smaller specimens of this species were taken in the rivers, but the largest specimens came from the slightly brackish waters up the mouths of the Río de Los Pajaros and Río Agua Caliente, as well as the caño west of Sinamaica.

LORICARIA CATAPHRACTA Linnaeus

Loricaria cataphracta LINNAEUS, *Systema naturae*, ed. 10, p. 307, 1758.—PETERS, *Monatsb. Akad. Wiss. Berlin*, 1877, p. 471 (Calabozo, Venezuela).—PELLEGRIN, *Bull. Mus. Hist. Nat. Paris*, vol. 5, p. 158, 1899 (Apure River, Venezuela).

LORICARIA VARIEGATA VENEZUELAE, new subspecies

PLATE 12, C

Holotype.—U.S.N.M. No. 121108, a specimen 161 mm. in standard length, collected by Leonard P. Schultz in the Río Palmar at the bridge about 70 km. southwest of Maracaibo, on March 6, 1942.

Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121109, 50 specimens, 33 to 167 mm. in standard length, collected along with the holotype and bearing the same data; U.S.N.M. No. 121110, 73 specimens, 46 to 170 mm., taken in the Río Socuy 3 km. above its mouth, north of Maracaibo, February 24, 1942; U.S.N.M. No. 121112, 27 specimens, 25 to 143 mm. collected in the Río Apón about 35 km. south of Rosario, Maracaibo Basin, February 26, 1942; U.S.N.M. No. 121108, 8 specimens, 27 to 153 mm., taken in the Río Negro below mouth of Río Yasa, Maracaibo Basin, March 2, 1942.

The above listed specimens occurred mostly over sandy to fine gravelly bottoms in a moderately flowing current.

Description.—Based on the holotype and the paratypes. Detailed measurements were made on two of the types of *Loricaria variegata venezuelae* and on two of *L. v. variegata* and those measurements are recorded in table 25.

The following counts were made: Dorsal rays, I, 7, rarely I, 8; anal and pelvic always I, 5; pectoral always I, 6; caudal fin rays always $i + 10 + i$; teeth are from 4 to 6 on the upper ramus and 6 or 7 on the lower ramus of jaws; there are 3 plates in front of dorsal fin and 19 plates from anal fin to base of caudal fin rays, and usually 14 barbels on the posterior margin of the lower lip between the maxillary barbels at each corner of the mouth.

TABLE 25.—Measurements (expressed in hundredths of the standard length) of two subspecies of *Loricaria variegata*

Characters	<i>venezuelensis</i>		<i>variegata</i>	
	Holotype	Paratype	U.S.N.M. No. 78360	U.S.N.M. No. 79144
Standard length (in mm.)	161	150.5	226.5	230
Length of head to tip of supraoccipital	23.0	22.2	20.4	21.4
Length of head to end of opercle	18.3	18.1	16.1	16.8
Length of head to end of temporal plate	25.2	25.2	22.5	23.5
Width of head at base of pectorals	20.0	19.8	17.5	18.7
Greatest depth of body	10.9	7.24	8.47	7.65
Width of body at plate that crosses anal origin	14.6	14.7	12.7	12.9
Length of snout	12.7	12.7	11.6	11.8
Diameter of eye (not including notch)	3.73	3.65	2.87	2.70
Bony interorbital space (rear of notch)	4.91	4.32	3.66	3.57
Postorbital length of head	9.00	9.10	8.43	8.57
Least depth of caudal peduncle	1.55	1.53	1.46	1.52
Width of caudal peduncle in front of caudal fin	3.42	3.45	3.18	3.26
Length of caudal peduncle	47.9	48.7	50.8	49.0
Length of spine of dorsal fin	20.8	19.6	20.3	17.8
Length of spine of anal fin	15.8	15.6	16.1	16.4
Length of spine of pectoral fin	19.5	17.6	17.3	17.4
Length of spine of pelvic fin	16.5	16.3	16.4	16.2
Length of last ray of pelvic fin	8.38	8.30	7.86	7.78
Length of last ray of pectoral fin	8.72	8.70	8.25	7.48
Length of last ray of anal fin	10.0	11.4	9.93	9.22
Length of last ray of dorsal fin	9.13	8.37	7.24	7.09
Tip of snout to origin of dorsal fin	32.9	33.2	30.4	31.8
Tip of snout to origin of anal fin	46.6	47.8	44.0	46.8
Tip of snout to base of pelvic fin	31.4	31.7	30.0	32.9
Tip of snout to base of pectoral fin	18.6	18.2	15.7	17.2
Distance from center of anus to anal origin	9.07	10.4	9.27	10.2

The body of this species is much depressed throughout its length; its greatest depth at origin of dorsal is about one-half its width at base of pectorals and only twice the width of the interorbital space; the belly is only partially covered with plates; there is a series of plates along the midventral line from anus to over pectoral girdle

where it joins a group extending between the pectoral bases; a series of plates extends from front of pelvics forward to pectoral base, and the space between the midventral series and ventral lateral series is naked; no naked area behind the base of pectorals; the upper and lower lips are filamentous, and their margins have numerous branched barbels, the only place without barbels being a small space on the upper lip in front of the teeth of upper jaw; in the mouth behind teeth of upper jaw are two barbels in the midline with a pair behind them; area around teeth of lower jaw without barbels; usually 14 barbels on margin of lower lip between maxillary barbels, the latter long, extending a little past gill opening; teeth small, a little cupped in shape, with a smaller lobe on their outer side; outer ray of pelvic a little produced, reaching a little past the anal origin; outer ray of pectoral longest and reaching a little past the base of pelvics; first ray of dorsal longer than second, the posterior margin of this fin truncate; middle rays of anal longest, the margin rounded; posterior margin of pectoral a little concave; orbital rims elevated, interorbital space concave, the center of which, however, is convex; supraoccipital with a double keel converging and then diverging a little near rear of that bone; plate in front of dorsal with a single keel, then the next two forward with two keels; gill opening in front of base of pectoral fin; tip of snout bony; this bony snout in front of naked area around mouth is equal to bony area between the nostrils; one or two plates in front of the anus, three series of plates from anus to anal origin.

Color.—Pale or white below, speckled above with darker brown on a lighter brown background; all fins mottled except the anal, which is usually plain white, about 9 to 14 black spots on the first ray of dorsal.

Remarks.—This new subspecies may be distinguished from *Loricaria variegata variegata* by its wider body and by the extra keeled plate along front of dorsal fin. That *variegata* is a more elongate subspecies than *venezuelae* is obvious by comparing the measurements recorded in table 25.

Named *venezuelae* in honor of the country in which it was collected and in recognition of the courtesy shown me while collecting specimens there.

LORICARIA GYMNOGASTER LAGOICHTHYS, new subspecies

PLATE 13

Holotype.—U.S.N.M. No. 121092, a specimen 305 mm. in standard length, collected in the Río Palmar near Totuma, about 100 km. southwest of Maracaibo, by Leonard P. Schultz on February 21, 1942.

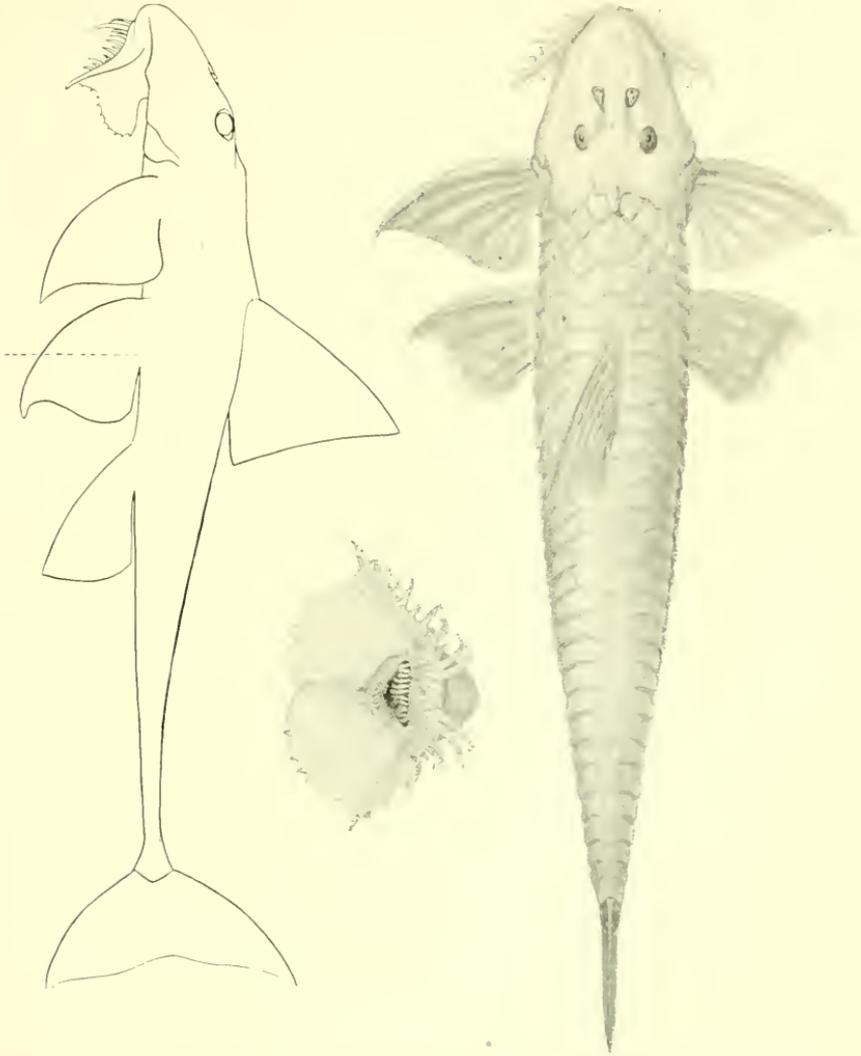
Paratypes (all collected by L. P. Schultz).—U.S.N.M. No. 121096, 18 specimens, 53 to 272 mm. in standard length, collected along with the holotype and bearing the same data; U.S.N.M. No. 121098, 433

specimens, 21 to 138 mm., taken March 17, 1942, in the Río Motatán at the bridge 22 km. north of Motatán; U.S.N.M. No. 121097, 43 specimens, 53 to 260 mm., collected February 24, 1942, in the Río Socuy 3 km. above its mouth; U.S.N.M. No. 121100, 3 specimens, 62 to 139 mm., taken March 2, 1942, in the Río Negro below mouth of Río Yasa; U.S.N.M. No. 121101, 13 specimens, 22 to 139 mm., taken March 6, 1942, in the Río Palmar at the bridge 70 km. southwest of Maracaibo; U.S.N.M. No. 121094, 15 specimens, 57 to 100 mm., collected March 24, 1942, in the Río Jimelles 12 km. east of Motatán, tributary of the Río Motatán; U.S.N.M. No. 121095, 41 specimens, 19 to 81.5 mm., collected March 24, 1942, in the Río Motatán, 8 km. below Motatán; U.S.N.M. No. 121099, 4 paratypes, 67 to 105 mm., taken February 26, 1942, in the Río Apón, about 35 km. south of Rosario, Estado de Zulia; U.S.N.M. No. 121093, 3 specimens, 73 to 122 mm., taken March 11, 1942, in a caño half a mile west of Sinamaica.

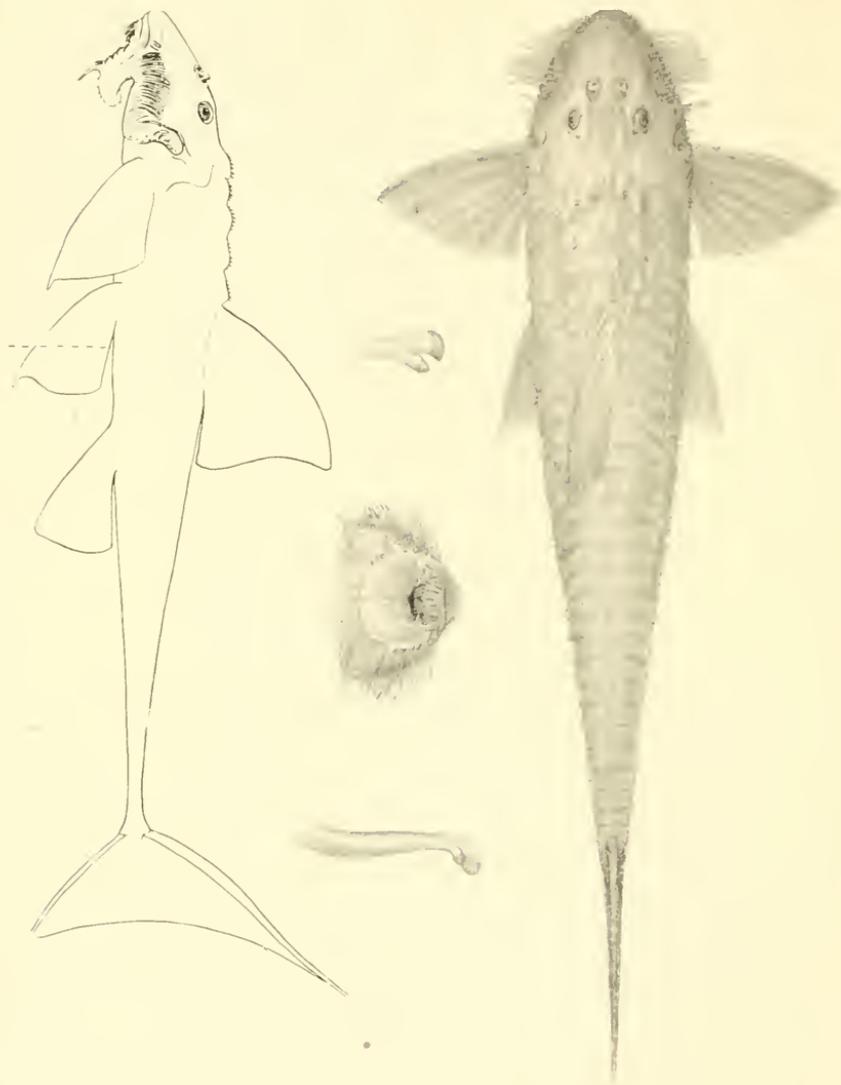
The above-listed specimens occurred mostly over sandy to gravelly bottoms, as well as over firm mud in a moderate current and in quiet water.

TABLE 26.—Measurements (expressed in hundredths of the standard length) of two subspecies of *Loricaria gymnogaster*

Characters	<i>lagoichthys</i>			<i>gymno-</i> <i>gaster</i>
	Holotype	Paratype	Paratype	U.S.N.M. No. 79218
Standard length (in mm.).....	305	139	77.6	80
Length of head to tip of supraoccipital.....	23.9	21.9	24.0	22.5
Length of head to end of opercle.....	20.1	18.1	18.2	17.6
Length of head to end of temporal plate.....	24.4	22.7	24.1	22.4
Width of head at base of pectorals.....	18.6	17.7	18.6	17.7
Greatest depth of body.....	12.2	11.9	11.7	8.87
Width of body at plate through anal origin.....	15.9	14.9	13.0	11.6
Length of snout.....	14.6	12.4	12.4	11.9
Diameter of eye (not including notch).....	3.11	4.68	4.25	3.25
Bony interorbital space (least width).....	5.57	5.11	5.28	5.25
Postorbital length of head.....	8.55	7.05	7.99	7.13
Least depth of caudal peduncle.....	1.80	1.58	1.42	1.50
Width of caudal peduncle in front of caudal fin.....	4.26	3.31	3.22	2.62
Length of caudal peduncle.....	45.1	49.4	47.7	52.7
Length of spine of dorsal fin.....	22.2	22.0	22.9	19.0
Length of spine of anal fin.....	19.5	18.7	19.6	18.1
Length of spine of pectoral fin.....	22.6	21.2	21.9	20.6
Length of spine of pelvic fin.....	23.0	19.9	21.9	22.2
Length of last ray of pelvic fin.....	10.3	3.63	8.61	10.0
Length of last ray of pectoral fin.....	7.87	6.98	7.73	8.88
Length of last ray of anal fin.....	11.4	11.2	10.8	10.0
Length of last ray of dorsal fin.....	8.40	8.64	9.67	8.88
Tip of snout to origin of dorsal fin.....	35.9	32.8	33.3	30.1
Tip of snout to origin of anal fin.....	51.0	45.3	46.5	43.2
Tip of snout to origin of pectoral fin.....	19.9	17.6	19.1	16.9
Tip of snout to origin of pelvic fin.....	34.5	31.4	31.2	30.1
Distance from center of anus to anal origin.....	10.8	9.72	10.3	8.25



Loricaria gymnogaster lagoichthys, new subspecies: Holotype (U.S.N.M. No. 121092), 305 mm. in standard length. Drawing.



Spatuloricaria phelpsi, new genus and species: Holotype (U.S.N.M. No. 121121), 338 mm. in standard length. Drawing.

In addition to the paratypes, I refer with some uncertainty U.S.N.M. No. 121091, a specimen 275 mm. from Lago Maracaibo 1 km. off Pueblo Viejo, caught by L. P. Schultz in a gill net, April 7-9, 1942, but before it was removed crabs ate most of the underside of the head, thus rendering identification almost impossible.

Description.—Based on the holotype and the paratypes listed above. Detailed measurements were made on the holotype and two paratypes and on one paratype of *L. gymnogaster gymnogaster* from Girardot, Colombia. These data are expressed in hundredths of the standard length and recorded in table 26.

The following counts were made: Dorsal rays always I, 7; both anal and pelvic always I, 5; pectoral I, 6; caudal fin rays $i+10+i$; plates along sides 18 to 21+10 to 13 totaling 30 to 32; plates from anal fin base to base of caudal fin (counting as first the plate containing last anal ray) 17 or 18; teeth 3 to 5 on ramus of upper jaw and 4 or 5 on ramus of lower jaw; barbels on margin of lower lip 24 to 32 usually about 26 to 28.

The body is greatly depressed throughout its length, and the greatest depth occurs at origin of dorsal fin, about 8 or 9 times and greatest width at base of pectorals about 5 to $5\frac{1}{2}$ times, all in standard length; there is a shallow notch at rear of orbit; the interorbital space is concave, the rims of the orbits are elevated; the nostrils lie more or less in a depression, the space between them convex and extending to the tip of the snout as a ridge; tip of supraoccipital with a serrated keel, then a pair of small keeled plates, followed by two median plates, each with two keels, the plate in front of the dorsal with one keel; all the plates along lower sides of body keeled, these keels spiny; temporal plate with a low, spiny keel, followed by six keeled plates, the last the base of the fourth branched ray of dorsal fin; belly naked in young, but in specimens 150 to 200 mm. small platelets begin to form in front of the anus and along the sides of the belly; in large adults 275 to 305 mm. in length the belly is partially covered with tiny platelets along its sides and between the bases of the pectoral fins; a space behind pectoral fin naked; the teeth are bilobed, the outer lobe is small and sharp pointed, and the inner lobe elongate with a rounded tip; the lips have a fringe of barbels; the lower lip is papillate, and its rear margin with 24 to 32 barbels; the maxillary barbel, also papillate, does not quite reach to the gill opening; the upper lip has numerous papillate barbels, the longest ones at front of lip equal to greatest diameter of the eye; at each inner corner of the lips is a pair of elongate barbels; two median barbels between the rami of upper jaws, and a pair of lateral barbels

inside of front of mouth; first ray of all fins longest, the pelvics and pectorals lanceolate; posterior margin of dorsal concave; intestine coiled.

Color.—Pale brownish to brownish with more or less evident bars in front of dorsal fin, then five distinct blackish bars, first through base of dorsal, second under tips of depressed dorsal fin, then three on caudal peduncle; base of caudal fin with a black bar and distal three-fourths of that fin more or less coarsely barred in young, but whole fin evenly dark colored in large specimens; undersides pale yellowish; pelvic fins with blackish blotches or pigment in the middle third; pectorals dark in their distal two-thirds; all the fins are more or less darkish in the large adults; peritoneum pale.

SPATULORICARIA, new genus

This new genus of the subfamily Loricarinae is a *Loricaria* with spoon-shaped teeth (spatula) just as *Cochliodon* is a *Plecostomus* with spoon-shaped teeth. However, the teeth of *Spatuloricaria* are bilobed, and each lobe is spoon-shaped, the inner lobe several times larger than the outer lobe, all teeth long and slender except expanded tips; at the rear of the eye, dorsally, is a notch, the supraoccipital ends in an elevated, spiny keel behind, on the side of which is a pair of small, keeled plates, followed by two median plates, each with a pair of keels, the next median plate in front of base of first dorsal spine with a single short keel; all the plates along the sides with serrated keels; the first five plates in the series behind the posttemporal are keeled, the last two at sides of base of dorsal fin. The belly is covered with numerous very small platelets, and the young of this species may have naked bellies as in certain species of *Loricaria*, but the belly of the large adult is plated; sides of head with numerous (about 125) stiff setiform bristles longer than width of interorbital space, these bristles not depressible; upper surface of pectorals also spiny; lips papillate, lower with barbels or dermal lappets along its margin, and upper lip with a series of barbels along its anterior margin but in the form of a double row in front of gape of mouth; barbel at corner of mouth not reaching to gill opening; interorbital space concave; space between nostrils convex; snout bony, no naked area near its tip; rear margin of dorsal fin concave, the first rays longest and that of anal rounded; spine of pelvic fins produced a little beyond the soft rays, the similar spine of pelvics and anal about the same length as next branched ray; intestine coiled. The upper ray of caudal fin is elongate and about one-third the standard length; the lower ray is long, too, but shorter than the upper ray.

Named *Spatuloricaria* in reference to the spoon-shaped teeth that separate it from the only genus, *Loricaria*, with which it is closely related.

Genotype.—*Spatuloricaria phelpsi*, new species.

SPATULORICARIA PHELPSI, new species

PLATE 14

Holotype.—U.S.N.M. No. 121121, the only known specimen, 338 mm. in standard length, was collected by Leonard P. Schultz, February 24, 1942, in the Río Socuy 3 km. above its mouth, Maracaibo Basin, Venezuela.

Description.—Based on the holotype, all measurements expressed in hundredths of the standard length, which is 338 mm.

Length of head to tip of supraoccipital 23.3; length of head to end of opercle 18.8; length of head to rear edge of the posttemporal plate 23.8; width of head at base of pectorals 19.5; length of snout 13.1; diameter of eye 3.50; least width of bony interorbital space 5.59; greatest depth of body at origin of dorsal fin 13.6; width of body across anal fin origin 16.7; postorbital (from notch in eye) length of head (to end of posttemporal plate) 8.90; least depth of caudal peduncle 1.80; width of caudal peduncle (third from last plate) 4.88; length of caudal peduncle or distance from base of last anal ray to midbase of caudal fin 4.76; length of last ray of pectoral 9.26; length of last ray of pelvics 10.5; length of last ray of anal 11.9; length of last ray of dorsal 10.4; length of spine of dorsal fin 25.6; length of spine of anal fin 17.9; length of pelvic spine 17.9; length of pectoral spine 20.3; distance from tip of snout to origin of dorsal fin 34.2; tip of snout to origin of anal 48.2; tip of snout to insertion of pelvics 32.6; tip of snout to insertion of pectorals 18.8; distance from anus to anal origin 9.32.

The following counts were made: Dorsal rays I, 7; anal I, 5; pectoral I, 6; pelvic I, 5; caudal $i+10+i$; plates along sides $19+12$, totaling 31; 18 plates behind anal fin base, counting as number one the plate containing last anal ray; teeth $4/5$ and $6/6$ on each ramus of jaws; about 26 barbels on margin of lower lip.

Color in alcohol pale brownish gray, yellowish on lower sides; all fins evenly brownish in color, except the caudal fin which shows some traces of bars; distally the fins are darker in color; peritoneum pale, almost without pigment.

Remarks.—This new genus and species differs from all other members of the related genus *Loricaria* in its spoon-shaped teeth, four to six in number.

Named *phelpsi* in honor of William H. Phelps, Jr., president of the Sociedad Venezolana de Ciencias Naturales of Caracas, a leader in the biological sciences of Venezuela, in appreciation of his aid while I was in Caracas.

Genus FARLOWELLA Eigenmann and Eigenmann

Farlowella EIGENMANN and EIGENMANN, Proc. California Acad. Sci., ser. 2, vol. 2, p. 32, 1889. (Type *Acestra acus* Kner.)

KEY TO THE SPECIES OF FARLOWELLA REPORTED FROM VENEZUELA

(See tables 27 and 28)

- 1a. Produced part of bony snout measured from anterior edge of naked area containing mouth to tip of snout 4 to 4-1/2 times in distance from middle of anal depression (anus) to tip of snout.....*Farlowella acus* (Kner)
- 1b. Produced part of bony snout in front of mouth depression 3.3 to 3.6 times in distance from anus to tip of snout.....*Farlowella vittata* Myers
- 1c. Produced part of bony snout 9.3 to 10 times in distance from anus to tip of snout.....*Farlowella curtirostra* Myers

FARLOWELLA ACUS (Kner)

Acestra acus KNER, Denkschr. Akad. Wiss. Wien, vol. 6, p. 93, pl. 8, fig. 1, 1853 (ref. copied).—GÜNTHER, Catalogue of the fishes in the British Museum, vol. 5, p. 261, 1864 (Caracas).

Farlowella acus REGAN, Trans. Zool. Soc. London, vol. 17, pt. 3, p. 304, 1904 (Venezuela).—EIGENMANN, Indiana Univ. Studies, vol. 7, No. 44, p. 9, 1920 (El Concejo, Río Tiquirito, Venezuela).—MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 102, 1942 (Río Amaná, 6 km. east of Santa Barbara, Monagas, in the Río Guanipa drainage, Venezuela).—EIGENMANN and EIGENMANN, Occas. Pap. California Acad. Sci., vol. 1, p. 358, 1890 (Caracas, Venezuela).—RIBEIRO, Rev. Mus. Paulista, vol. 10, p. 717, 1918 (Río Cabriale, Venezuela).

FARLOWELLA VITTATA Myers

Farlowella vittata MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 103, fig. 12, 1942 (Río Uribanto, from San Cristobol to the Llanos, Venezuela).

U. S. N. M. No. 121083, Río Guárico and tributaries, between San Sebastián and San Casimiro, Estado de Aragua, Venezuela, L. P. Schultz, G. Zuloaga, Roger Sherman, and William Phelps, Jr., May 12, 1942, 5 specimens.

FARLOWELLA CURTIROSTRA Myers

Farlowella curtirostra MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 102, fig. 11, 1942 (Quebrada Tabor, tributary to Motatán system, 30 km. north of Trujillo, Venezuela).

U. S. N. M. No. 121081, Río San Pedro at bridge, Motatán system, L. P. Schultz, March 20, 1942, 4 specimen, 52.7 to 112.5 mm.

U. S. N. M. No. 121082, Río San Juan at bridge, Motatán system, L. P. Schultz, March 20, 1942, 2 specimens, 49.2 and 87.6 mm.

Genus STURISOMA Swainson

Sturisoma SWAINSON, The natural history and classification of fishes, etc., vol. 1, pp. 333, 335, 337; vol. 2, pp. 189, 304, 1838. (Type, *Loricaria rostrata* Agassiz.)

KEY TO THE SPECIES OF STURISOMA REPORTED FROM VENEZUELA

- 1a. Number of plates along midsides 18+16; head 4½ in standard length; width of head at base of pectorals 1⅔; snout 1⅓; dorsal fin 1⅓; pectoral 1½; pelvics 1¼ in length of head; width of body at anal 6⅓ times in distance from anal to caudal base (Río Meta)....*Sturisoma tenuirostris* (Steindachner)
- 1b. Plates ?+10 to 13 totaling 33 to 37 (according to Regan and to Ribeiro); head 4½ in standard length; width of head 2, snout 1½, eye 8, all in length of head; width of body at anal origin 5 in length of caudal peduncle.

Sturisoma rostrata (Agassiz)

- 1c. Plates 14 or 15 + 17 to 19; all fins with first rays elongate and filamentous, the upper and lower rays of caudal fin sometimes as long as standard length; produced part of bony snout $10\frac{1}{2}$ to $12\frac{1}{2}$ times in the distance from tip of snout to anus; head 4.9 to 5.2 in standard length; width of head 1.4 to 1.5 and interorbital 2.6 to 2.7 in head; width of body at anal origin $6\frac{1}{2}$ times in distance from anal base to caudal fin base (Maracaibo Basin).

Sturisoma festivum Myers

TABLE 27.—Detailed measurements of two specimens of *Sturisoma festivum* and a specimen of *Farlowella curtirostra*, expressed in hundredths of the standard length

Character	<i>Sturisoma festivum</i>		<i>Farlowella curtirostra</i>
Standard length (in mm.)	96.0	104.1	112.5
Head (tip of snout to end of opercle)	16.0	16.9	17.3
Head (tip of snout to rear supraoccipital)	18.7	19.8	20.4
Greatest depth	9.7	11.6	4.89
Snout (eye to tip of snout)	11.5	12.6	13.7
Interorbital space (fleshy)	6.56	7.24	5.06
Diameter of eye	2.92	2.90	1.78
Eye to rear edge of post-temporal plate	5.42	5.90	5.06
Length of caudal peduncle	60.9	58.0	53.3
Least depth of caudal peduncle	1.15	1.16	0.98
Least width of caudal peduncle	2.50	2.61	1.33
Width of head at base of pectorals	12.5	13.0	7.91
Tip snout to anus	31.8	34.1	36.2
Anus to anal origin	3.65	4.03	7.20
Length oral depression (to rear edge naked area)	8.96	10.2	3.44
Distance supraoccipital to dorsal	9.15	10.1	21.9
Length ramus upper jaw		2.70	1.78
Length ramus lower jaw		2.41	1.69
Length longest first ray of pectoral	31.8	30.4	12.0
Length longest first ray of pelvic	19.5	19.0	7.82
Length longest first ray of dorsal	36.2	34.9	14.2
Length longest first ray of anal	30.7	28.5	13.1
Tip of snout to origin of dorsal	27.3	30.1	42.3
Tip of snout to origin of anal	35.4	38.2	43.6
Tip of snout to insertion of pectorals	16.1	17.1	17.1
Tip of snout to insertion of pelvics	26.5	28.6	30.5

TABLE 28.—Counts made on species of *Sturisoma* and *Farlowella*

Species	Number of fin rays						Number of teeth in ramus of jaws								Number of plates along sides to base of caudal fin					
	Dorsal		An-al	Pelvic		Upper				Lower				32	33	34	35	36	37	
	I, 6	I, 7	I, 5	I, 4	I, 5	20	25	30	35	15	20	25	30							
						24	29	34	39	19	24	29	34							
<i>Sturisoma festivum</i>		3	3		3			1	2			1	2	1	3					
<i>Farlowella:</i>																				
<i>curtirostra</i>	4	1	5	2	4	3				3								2		2
<i>vittata</i>	3		3		3			1				1						1		

STURISOMA TENUIROSTRIS (Steindachner)

Oxyloricaria tenuirostris STEINDACHNER, Anz. Akad. Wiss. Wien, vol. 47, p. 410, 1910 (Río Meta, Venezuela).

Steindachner gives an abbreviated description of this species, and I have included in the key for *festivum* the same characters even though they may not be very diagnostic.

STURISOMA ROSTRATA (Agassiz)

Loricaria rostrata AGASSIZ, in Spix, Selecta genera et species piscium . . . Brasiliam . . ., vol. 5, pl. 3, fig. 1, 2, 1829.—PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 471 (Calabozo, Venezuela).—EIGENMANN and EIGENMANN, Occ. Papers California Acad. Sci., vol. 1, p. 366, 1890 (Calabozo)

STURISOMA FESTIVUM Myers

Sturisoma festivum MYERS, Stanford Ichth. Bull., vol. 2, No. 4, p. 100, figs. 8–10, 1942 (Río Monay, 35 km. north of Trujilla, Motatán system, Venezuela).

Collections from the Maracaibo basin, Venezuela, made by Leonard P. Schultz in 1942:

U.S.N.M. No. 121079, Río Motatán, 8 km. below Motatán, March 24, 3 specimens, 29.1 to 44.3 mm.

U.S.N.M. No. 121078, Río Jimelles, 12 km. east of Motatán, Motatán system, March 24, 2 specimens, 35.7 and 103.5 mm.

U.S.N.M. No. 121077, Río Negro below mouth of Río Yasa, March 2, 3 specimens, 83.5 to 104.1 mm.

U.S.N.M. No. 121076, Río Apón, about 35 km. south of Rosario, February 26, 1 specimen, 50.5 mm.

U.S.N.M. No. 121080, Río Motatán at bridge 22 km. north of Motatán, March 17, 5 specimens, 45 to 128 mm.

Genus HYOPTOPOMA Günther

Hypoptopoma GÜNTHER, Proc. Zool. Soc. London, 1868, p. 234. (Type, *H. thoracatum* Günther.)

HYOPTOPOMA THORACATUM Günther

Hypoptopoma thoracatum GÜNTHER, Proc. Zool. Soc. London, 1868, p. 234, fig. 2.—PETERS, Monatsb. Akad. Wiss. Berlin, 1877, p. 471 (Calabozo, Venezuela).—STEINDACHNER, Denkschr. Akad. Wiss. Wien, vol. 41, p. 47, 1879 (Amazon River at mouth of Río Negro, Calabozo, Venezuela).