

NOTES ON NEMATOGNATHOUS FISHES.

BY HENRY W. FOWLER.

The present account comprises an annotated list, with descriptions of several new species, belonging to the Ostariophysian order Nematognathi, contained in the collection of the Academy.

SILURIDÆ.

TACHYSURINÆ.

Felichthys pinnimaculatus (Steindachner).

One from Panama.

Felichthys marinus (Mitchill).

Harvey Cedars, Great Egg Harbor, Corson's Inlet, Sea Isle City, New Jersey; Wounta Haulover, Nicaragua.

Galeichthys felis (Linnæus).

Bayport and Big Pine Key, Florida.

Selenaspis herzbergii (Bloch).

One example 137 mm. long from Dutch Guiana (Dr. C. Hering). This closely resembles *Hexanematichthys hymenorrhinus* Bleeker¹ from "Guatemala," a species not included in Regan's work on Central American fishes, and usually merged with the present as a synonym. My specimen agrees largely with Bleeker's figure of *H. hymenorrhinus*, though he does not show the lateral line with subequal, short, backwardly directed branches along its lower edge. The teeth are shown differently on the palatines, as in my specimen they are in enlarged and more approximate areas. My example shows the internasal cutaneous ridge incomplete or only developed at the sides, and the gill-rakers 8+15, while Eigenmann and Eigenmann give but 6+10 for *S. herzbergii*.

Another example, young, from Paramaribo, Dutch Guiana (Dr. C. Hering), representing *Netuma dubia* Bleeker. It has a distinct cutaneous ridge uniting the hind nostrils, a character not shown in Bleeker's figure.² The maxillary barbels are also shorter, and do not quite reach to the ventrals.

¹ Mém. Soc. Holl. Sci. Harlem, 1864, p. 57, Pl. 11, fig. 2, Pl. 13, fig. 4.

² L.c., p. 63, Pl. 13, fig. 5, Pl. 15, fig. 2.

Netuma thalassina (Rüppell).

Two from Padang, Sumatra.

Netuma aulometopon sp. nov. Fig. 1.

Head $3\frac{3}{4}$; depth $5\frac{1}{4}$; D. I, 7; A. VI, 13; P. I, 10; V. I, 6; head width $1\frac{1}{3}$ in its length; head depth at occiput $1\frac{4}{5}$; snout $3\frac{1}{6}$; eye 5; maxillary $3\frac{1}{8}$; mouth width $2\frac{1}{2}$; interorbital 3; antero-internasal 4; dorsal spine $1\frac{3}{5}$; first branched anal ray $1\frac{7}{8}$; least depth of caudal peduncle $3\frac{2}{5}$; pectoral spine $1\frac{1}{2}$; ventral fin $2\frac{1}{6}$.

Body compressed, rather slender, deepest at dorsal origin, and edges all convex. Caudal peduncle well compressed, least depth about half its length.

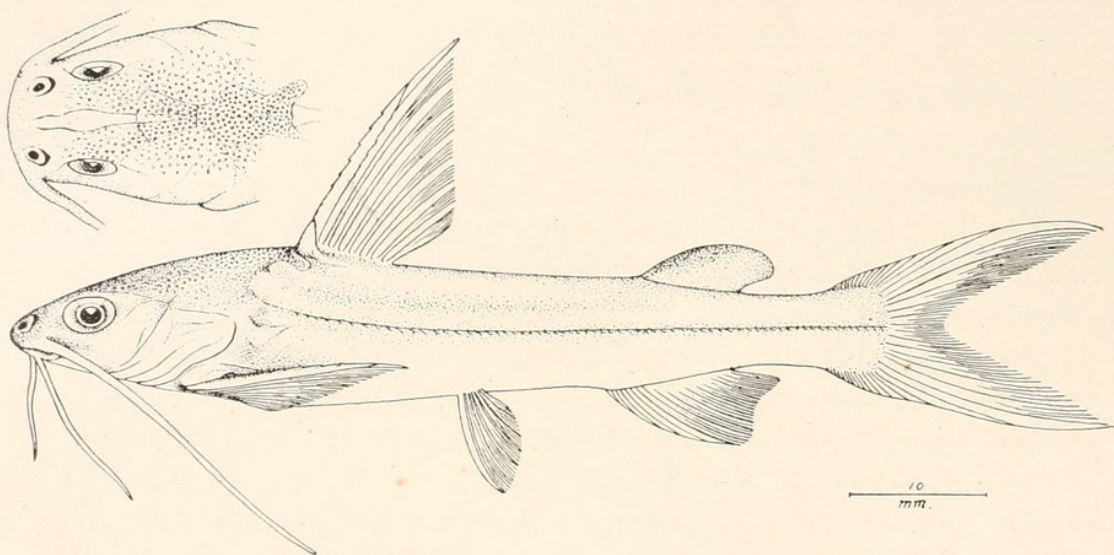


Fig. 1.—*Netuma aulometopon* Fowler. (Type.)

Head convex above, flattened below, and upper profile slightly convex from snout tip to dorsal origin. Snout wide, moderately convex over surface and length about half its greatest width. Eye ellipsoid, near upper profile and center near first $\frac{2}{5}$ in head length. Edges of eye mostly free, scarcely adipose-like. Mouth moderate, broadly transverse, and upper jaw well protruded. Band of rather coarse, simple, sharp-pointed teeth in each jaw, and bands similar. Vomerine-palatine teeth similar to those on maxillary, and in continuous band concurrent with maxillary. Tongue wide, thick, fleshy, depressed, not free. Maxillary barbel long, extends back about far as tip of depressed pectoral. Outer mental barbel extends slightly beyond origin of pectoral and inner $\frac{2}{3}$ as long. Internasal areas about equal. Nostrils together, frenum about midway in snout length, and posterior nearly covered by broad cutaneous flap in front.

Interorbital broad, depressed. Fontanel well developed, broad in front where it begins opposite hind nostrils and continues to occipital plate, or about half space between snout tip and dorsal origin. Occipital, parietal and predorsal plate more or less rugose. Humeral process extends not quite to middle of pectoral spine, smooth and mostly swollen in front. Opercle broadly triangular, smooth.

Gill-opening extends forward nearly opposite hind pupil edge. Rakers 4+13, firm, lanceolate, simple, about $\frac{2}{3}$ of filaments, and latter $\frac{2}{3}$ of eye. No pseudobranchiæ. Branchiostegals 6, slender.

Body covered with smooth skin. Head rugose, as previously described. Spines mostly with fine lengthwise keels or striæ. L. 1. slopes down from shoulder till midway along side, mostly simple or with many pores all along its lower extent. Back and sides also with vertical series of pores. Axillary pore of pectoral distinct.

Dorsal origin at first third in combined head and trunk length, spine serrate along both edges and nearly straight, and first branched ray longest. Adipose fin inserted little nearer caudal base than origin of dorsal, large. Anal inserted little before dorsal, or at first third between ventral origin and caudal base, first branched ray longest. Caudal well forked, slender lobes pointed, equal head. Pectoral reaches $\frac{4}{5}$ to ventral, spine nearly straight and both edges serrated. Ventral inserted slightly nearer caudal base than snout tip, and fin extends $\frac{4}{5}$ to anal. Vent slightly closer to anal than ventral origins.

Color in alcohol light brownish generally, slightly paler below, and most of body with more or less silvery tinge. Fins mostly pale brownish, and edges of ventrals and anal somewhat whitish. Iris silvery. Maxillary barbels pale brown, others whitish.

Length 87 mm.

Type, No. 8,372, A. N. S. P. Dutch Guiana. Dr. Constantine Hering.

Nos. 8,373 to 8,375, A. N. S. P., paratypes, same data. They show: Head $3\frac{3}{4}$ to $3\frac{7}{8}$; depth $5\frac{2}{5}$ to $6\frac{1}{8}$; A. VI, 11 to VI, 14; snout $2\frac{4}{5}$ to 3; length 82 to 84 mm.

This species is related to *Netuma upsulonophorus* (Eigenmann and Eigenmann) from Rio Grande do Sul, in having the vomerine patches of teeth united, though the palatine patches are of greatly different design. The Brazilian species also differs in having the front edge of the dorsal spine with granules.

(*Ἀὐλός*, groove; *μετωπὸν*, forehead; with reference to the occipital fontanel.)

Netuma barbatus (Lacépède).

Two from Rio Janeiro, Brazil.

CALLOPHYSINÆ.

Callophysus macropterus (Lichtenstein).

Two from Peru, one having been secured between the mouth of the Rio Negro and Peru.

ICTALURINÆ.

Ictalurus furcatus (Le Sueur).

Pimelodus affinis Baird and Girard, Proc. Acad. Nat. Sci. Phila., 1854, p. 26.
Rio Grande.

No. 8,460, A. N. S. P., cotype of *P. affinis* Baird and Girard. Brownsville, Texas. J. H. Clark. Smithsonian Institution (No. 838).

Ictalurus punetatus (Rafinesque).

Pimelodus notatus Abbott, Proc. Acad. Nat. Sci. Phila., 1860, p. 509. Fort Riley, Kansas.

Pimelodus hammondi Abbott, *l.c.* Fort Riley.

No. 8,449, A. N. S. P., type of *P. notatus* Abbott. Fort Riley, Kansas. Dr. W. A. Hammond.

Nos. 22,065 and 66, A. N. S. P., cotypes of *P. hammondi* Abbott. Same data.

Also many examples from Lake Erie, Battle Creek of the upper Missouri, Pennsylvania (Erie, Kiskiminitas and Beaver Rivers), Virginia (Sinking Creek), Indiana (Wabash River), Minnesota (Mankato), Kansas (Leavenworth), Iowa (Hornick and Ottumwa), Missouri (Brownsville and St. Louis), Arkansas (Judsonia and Greenway), Texas (Little Wichita River, Fort Worth and Del Rio).

Ictalurus anguilla Evermann and Kendall.

Two from the Creek Country (Dr. S. W. Woodhouse). These were obtained many years before the species was described.

Ameiurus catus (Linnaeus).

Amiurus lophius Cope, Proc. Amer. Philos. Soc. Phila., XI, 1870, p. 487.
Washington, D. C.

Amiurus niveiventris Cope, *l.c.*, p. 488. Neuse River, North Carolina.

Nos. 8,461 and 62, A. N. S. P., cotypes of *A. lophius* Cope. Potomac River. E. D. Cope.

Nos. 8,466 and 67, A. N. S. P., cotypes of *A. niveiventris* Cope. Neuse River, North Carolina. E. D. Cope.

Also a large series from New Jersey (Duck and Newbold's Islands), Pennsylvania (Holmesburg, Philadelphia, Chester County, Sus-

quehanna River), Delaware (Wilmington, Mispillion Creek, Laurel), Maryland (Elk Neck, Chestertown), District of Columbia (Potomac River, Washington), Virginia (lower James River), North Carolina, Florida (Bayport), Texas (Helotis).

Ameiurus catus okeechobeensis (Heilprin).

Ictalurus okeechobeensis Heilprin, Trans. Wagner Inst. Sci., I, 1887, p. 18.
Kissimee River, Lake Okeechobee, Florida.

Nos. 8,442 and 43, A. N. S. P., cotypes of *I. okeechobeensis* Heilprin.
Kissimee River, Lake Okeechobee, Florida. 1886. Prof. Angelo Heilprin.

Ameiurus dugesi (T. H. Bean).

Guadalajara market and river outlet of Lake Chapala, Mexico.

Ameiurus natalis (Le Sueur).

Amiurus bolli Cope, Bull. U. S. Nat. Mus., No. 20, 1880, p. 35. Little
Wichita River, Texas.

Amiurus prosthisti Cope, Proc. Acad. Nat. Sci. Phila., 1883, p. 132. Batsto
River, New Jersey.

Nos. 20,512 and 13, A. N. S. P., cotypes of *A. bolli* Cope. Little
Wichita River, Texas. E. D. Cope.

Nos. 20,546 to 49, A. N. S. P., cotypes of *A. prosthisti* Cope.
Batsto River, New Jersey. E. D. Cope.

Also a large series from New York (Westport), Pennsylvania (Erie), New Jersey (Pool Tolsoms, Newton's Bridge, Tuckahoe River), Delaware (Millsboro), South Carolina (Manning), Michigan (Oakland), Kansas (Leavenworth), Iowa (Brook River), Missouri (Marshfield).

Ameiurus vulgaris (Thompson).

Lake George, New York.

Ameiurus nebulosus (Le Sueur).

Amiurus mispilliensis Cope, Proc. Amer. Philos. Soc. Phila., XI, 1870, p. 486.
Mispillion Creek, Delaware.

No. 8,536, A. N. S. P., type of *A. mispilliensis* Cope. Mispillion
Creek, Delaware. E. D. Cope.

Large series from Maine (Mt. Desert), New York (Lakes George and Champlain, Poughkeepsie), New Jersey (Passaic, Lake Hopatcong, Bass River, May's Landing, Petersburg Bridge, Sumner, Turnersville, Repaupo, Camden, Pensauken, Merchantville, Duck Island, Trenton), Pennsylvania (many localities already noted elsewhere), Delaware (Rehoboth), Maryland (Willards, Chestertown), District of Columbia (Washington and Potomac River), Virginia (lower James River), North Carolina (Catawba River), Ohio (Hicks-

ville), Illinois, Missouri (Paw Paw), Texas (San Diego and Wichita River).

Two examples from the Hardy River in northern Lower California show four white mental barbels and the membranes between the fin-rays dusky.

Ameiurus nigrilabris (Cope).

Gronias nigrilabris Cope, Proc. Acad. Nat. Sci. Phila., 1861, p. 231. Conestoga Creek, Pennsylvania.

Nos. 22,082 and 83, A. N. S. P., cotypes of *G. nigrilabris* Cope.

Ameiurus melas (Rafinesque).

Amiurus brachyacanthus Cope, Bull. U. S. Nat. Mus., No. 20, 1880, p. 35. Upper Medina River, Texas.

Nos. 20,527 and 28, A. N. S. P., cotypes of *A. brachyacanthus* Cope.

Many examples from Pennsylvania (Erie, Kiskiminitas River), Ohio (Hicksville), Indiana (Miami River), Minnesota (Lake Whittlesee), Iowa (Ottumwa, Silver Lake), Missouri (St. Joseph).

Ameiurus platycephalus (Girard).

Pimelodus platycephalus Girard, Proc. Acad. Nat. Sci. Phila., 1859, p. 161. Anderson, South Carolina.

No. 8,473, A. N. S. P., cotype of *A. platycephalus* Cope. Anderson, South Carolina. Smithsonian Institution (No. 1,434).

Also example from Catawba River, North Carolina.

Leptops olivaris (Rafinesque).

Pennsylvania (Youghiogheny River), Virginia (Sinking Creek), Texas (Fort Worth).

Noturus flavus Rafinesque.

Pennsylvania (Erie, Two Lick Creek, Cherry Run, Youghiogheny River), Indiana (Miami River), Michigan (Genesee County), Iowa (Chariton, Brook River), Missouri (Clinton).

Schilbeodes gyrinus (Mitchill).

New Jersey (Lake Hopatcong, Elmer, Pitman, Newton's Bridge, Pensauken, Florence, Trenton), Pennsylvania (Edison, Bristol, Holmesburg, Torresdale), Delaware, Minnesota (Minneapolis), Iowa (Brook River). In 1899 Mr. S. N. Rhoads secured five examples at Miami, Florida, the most southern point at which this species has been observed.

Schilbeodes insignis (Richardson).

Noturus marginatus (Baird) Cope, Journ. Acad. Nat. Sci. Phila., (2) VI, 1868, p. 237. Pennsylvania.

Nos. 8,431 and 32, A. N. S. P., cotypes of *N. marginatus* (Baird) Cope. Carlisle, Pennsylvania. S. F. Baird.

New Jersey (Assanpink Creek, Trenton), Pennsylvania (Millanville, Dingman's Ferry, Delaware Water Gap, Schuylkill River, Holmesburg, Susquehanna River, Conestoga Creek, Lopez, Paradise, Altoona), Maryland (Conowingo, Gynn Oak), Virginia (Sinking Creek), North Carolina (Yadkin and Catawba Rivers), Missouri (Carthage).

Schilbeodes exilis (E. W. Nelson).

Brook River, Iowa.

PIMELODINÆ.

Zungaro zungaro (Humboldt).

Peruvian Amazon.

Rhamdia sebæ (Valenciennes).

Surinam and Peruvian Amazon.

Rhamdia vilsoni (Gill).

Trinidad, British West Indies.

Rhamdia riojæ sp. nov. Fig. 2.

Pimelodus humilis (non Günther) Cope, Proc. Amer. Philos. Soc. Phila., XVII, 1878, p. 674. Rioja, near Moyabamba.

Head $4\frac{1}{5}$; depth $5\frac{1}{2}$; D. I, 6; A. v, 7; P. I, 8; V. i, 5; head width $1\frac{1}{4}$ in its length; head depth at occiput $1\frac{3}{5}$; snout 3; eye 7; maxillary $3\frac{1}{4}$; mouth width $2\frac{2}{5}$; interorbital $2\frac{2}{3}$; dorsal spine 2; first branched anal ray $2\frac{4}{7}$; least depth of caudal peduncle $2\frac{1}{5}$; pectoral $1\frac{2}{3}$; ventral $1\frac{3}{4}$.

Body compressed, elongate, rather slender, deepest at dorsal origin, and edges all convex. Caudal peduncle well compressed, least depth equals its length.

Head depressed, broadly convex above, more or less flattened below, profiles mostly similar. Snout wide, broadly convex over surface, length $\frac{4}{7}$ its greatest width. Eye ellipsoid, close to upper profile and its hind edge little anterior in head length. Eyelids free, not adipose-like. Mouth broad, transverse, and upper jaw slightly protruded. Teeth in villiform bands in jaws, simple, sharply pointed, and bands continuous medianly. No vomerine teeth, though all vomerine and palatine regions with wide-spaced minute papillæ. Tongue wide, thick, fleshy, depressed, not free. Maxillary barbel extends to ventral origin. Outer mental barbel reaches tip of depressed pectoral spine, and inner extends $\frac{7}{8}$ to pectoral origin. Posterior internasal area slightly less than anterior. Anterior nostrils near snout edge, in short tubes. Posterior nostril about first $\frac{2}{5}$ in snout length, with low cutaneous edge. Interorbital

broadly depressed. Fontanel moderate, not extending back beyond hind eye edges. Occipital process extends only for first fourth in space to dorsal origin. Humeral process smooth, extends $\frac{2}{3}$ length of pectoral spine. Opercle broadly triangular, with a few slight radiating striae.

Gill-opening extends forward about first third in head. Rakers 3+8, firm, lanceolate, simple, about $\frac{4}{7}$ of filaments, and latter equal eye. No pseudobranchiae. Branchiostegals 6, slender.

Body covered with smooth skin. Head smooth. Spines smooth. L. 1. slopes down from shoulder till midway along side. Axillary pore moderate.

Dorsal origin slightly nearer anal origin than snout tip, spine short, slightly curved, smooth and pungent, and first three rays subequally longest. Anal inserted nearly midway between depressed pectoral

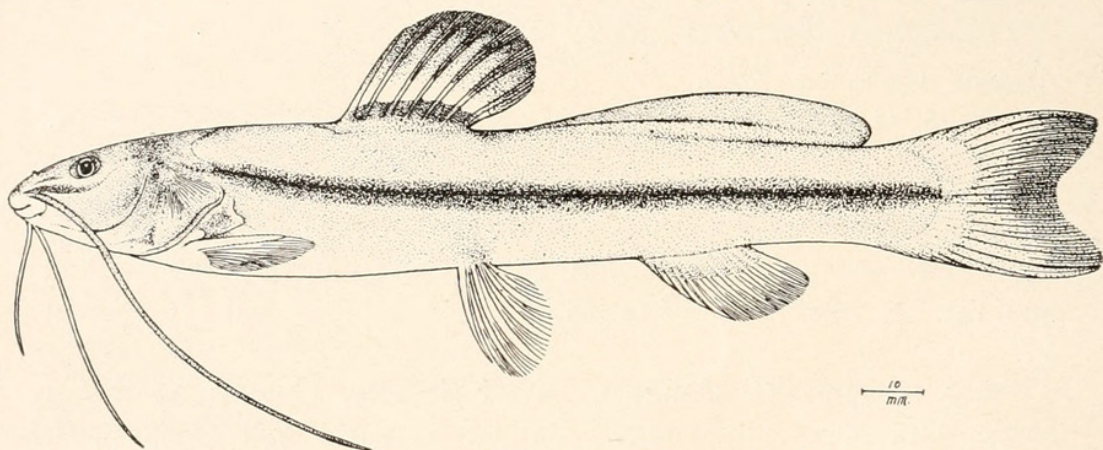


Fig. 2.—*Rhamdia riojae* Fowler. (Type.)

tip and caudal base, fin small, and median rays longest. Adipose dorsal long, its length about $2\frac{2}{3}$ in combined head and trunk length. Caudal moderately forked, lobes (damaged) apparently equal, and length about $\frac{4}{5}$ of head. Pectoral not quite half way to ventral, spine firm, smooth, outer edge with few weak antrorse serrae terminally, and few obsolete serrae also on inner edge. Ventral inserted about midway between snout tip and caudal base, fin $1\frac{2}{5}$ to anal origin. Vent about opposite middle of depressed ventrals.

Color in alcohol largely dark brown, belly and lower surface of head paler or whitish. Fins all dusky-brown, though ventrals and anal paler. Iris brownish. Barbels pale brownish.

Length 184 mm.

Type, No. 21,101, A. N. S. P. Rioja, near Moyabamba and Baka

Puerto, on or near the lower course of the Huallagua River, Peru. 1873. James Orton. Presented by E. D. Cope.

This species seems representative of *Rhamdia quelen* (Quoy and Gaimard) from eastern Brazil and the La Plata, and agrees largely in its long adipose fin. From *R. humilis* (Günther) from Venezuela, with which it was formerly identified, it differs in the longer adipose fin. It also differs from *R. cinerascens* (Günther) from western Ecuador and *R. pentlandi* (Valenciennes) from the Peruvian Andes in similar fashion.

Rhamdia mounseyi Regan,³ from the Ucayali River, has the occipital process extending $\frac{3}{5}$ to the dorsal origin, the gill-rakers 2 or 3+5 on lower part of arch, and the maxillary barbels extending beyond the anal fin.

(Named for Rioja, the type locality.)

Rhamdia ortonii sp. nov. Fig. 3.

Head $3\frac{4}{5}$; depth $6\frac{1}{5}$; D. I, 6; A. IV, 8; P. I, 8?; V. I, 6; head width $1\frac{1}{2}$ in its length; head depth at occiput 2; snout $2\frac{4}{5}$; eye $5\frac{1}{5}$; maxillary $4\frac{1}{5}$; interorbital $2\frac{7}{8}$; dorsal spine $2\frac{1}{4}$; third dorsal ray $1\frac{2}{5}$; least depth of caudal peduncle $2\frac{2}{3}$; ventral $1\frac{1}{2}$.

Body compressed, elongate, slender, deepest at dorsal origin, and edges all convex. Caudal peduncle well compressed, least depth about $\frac{4}{5}$ its length.

Head depressed, moderately broad, convex above and below, profiles similar. Snout wide, broadly convex over surface, length $\frac{2}{3}$ its greatest width. Eye ellipsoid, close to upper profile and hind edge near middle in length of head. Eyelids free, not adipose-like. Mouth broad, transverse, and lower jaw very slightly protrudes. Teeth fine, villiform, in rather narrow bands in jaws, which contiguous. No vomerine or palatine teeth. Tongue wide, thick, fleshy, depressed, not free. Maxillary barbel extends to ventral origin. Outer mental barbel extends nearly far back as tip of depressed pectoral, inner mental barbel to pectoral origin. Posterior internasal area slightly greater than anterior, and all nostrils simple pores. Interorbital broadly convex. Fontanel large, extends back opposite hind pupil edges. Occipital process extends $\frac{1}{5}$ to dorsal origin. Humeral process rather short. Opercle broadly triangular, with numerous radiating striæ.

Gill-opening extends forward about first fourth in head. Rakers 2+7, firm, lanceolate, several of larger with several denticles, about

³ Ann. Mag. Nat. Hist., London, (8), XIII, 1913, p. 281.

$\frac{2}{3}$ of filaments and latter $1\frac{3}{5}$ in eye. No pseudobranchiæ. Branchios-
tegalis 5, slender.

Body covered with smooth skin. Head smooth, and small rounded fontanel close before base of occipital process. Spines smooth. L. 1. slopes down from shoulder till midway along side. Axillary pore moderate.

Dorsal origin slightly nearer anal origin than snout tip, spine slender, but slightly pungent, shorter than median rays and fin rounded. Anal inserted about last third in space between front eye edge and caudal base, fin small, and median rays longest. Adipose fin moderate, $2\frac{1}{2}$ in combined head and trunk length. Caudal damaged, though evidently forked. Pectoral damaged, spine with lengthwise striæ and not serrated. Ventral inserted about midway

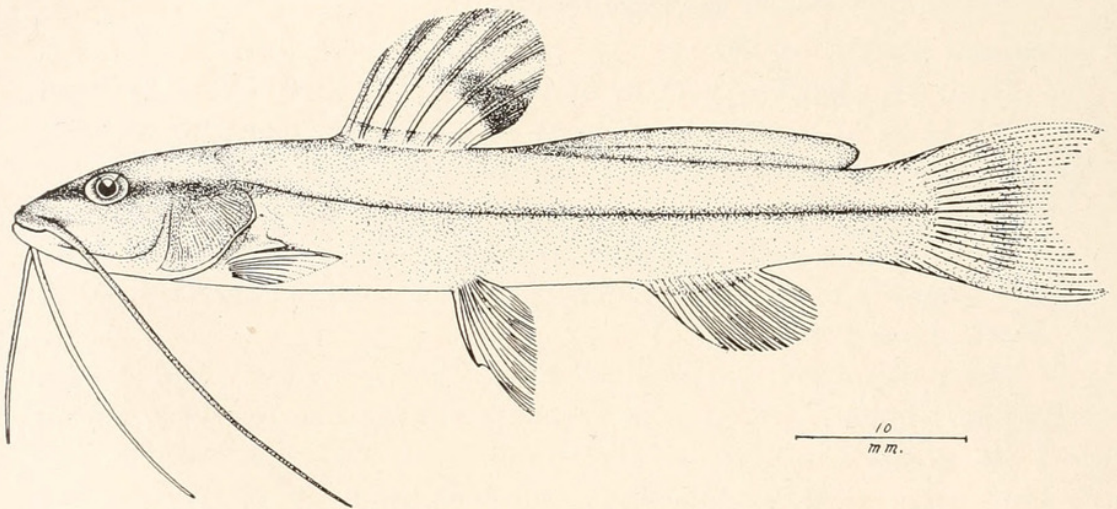


Fig. 3.—*Rhamdia ortonii* Fowler. (Type.)

between snout tip and caudal base, fin $1\frac{1}{4}$ to anal origin. Vent about opposite middle of depressed ventrals.

Color in alcohol largely dull brownish, scarcely paler on belly and lower surface. A dusky streak along side of head, extending from side of snout behind eye, though apparently not continued along side of trunk. Fins brownish, dorsal with ill-defined dusky blotch on posterior portion medianly. Iris grayish. Barbels brownish, though mental ones all paler.

Length 60 mm. (to tip of damaged caudal).

Type, No. 21,928, A. N. S. P. Peruvian Amazon. J. Orton. Presented by E. D. Cope.

Only the above example known. It is evidently closely related to *Rhamdia riojae*, though differs in several characters, so that it

does not seem likely to be the young of that species. From *R. riojæ* it differs principally in the slightly protruding mandible, reversed width of the internasal areas, the slightly longer adipose fin, and the coloration.

(Named for Prof. James Orton, who made collections in Peru many years ago.)

Rhamdia sapo (Valenciennes).

Rio Jacuhy and Sao Joao to Rio Negro and Chapada, Brazil.

Rhamdia brachyptera (Cope).

Pimelodus (Rhamdia) brachypterus Cope, Trans. Amer. Philos. Soc., (3) XIII, 1866, p. 404. Orizaba, Mexico.

No. 16,471, A. N. S. P., type of *P. (R.) brachypterus* Cope. F. Sumichrast. Orizaba, Mexico. Regan says,⁴ "the original description of *P. brachypterus* Cope, from Orizaba, is insufficient, but Fowler's redescription of the type shows that this species is probably not distinct from *P. guatemalensis*." However, according to Regan's key, it cannot fall with any of the species he includes under his first division with *R. guatemalensis*. It is likely somewhat near *R. managuensis*, though the occipital process extends only one-fourth the space from its base to the dorsal origin, and the interorbital width is $2\frac{1}{2}$ in the head.

Rhamdella bathyurus (Cope).

Pimelodus bathyurus Cope, Proc. Amer. Philos. Soc., XVII, 1878, p. 674. Peruvian Amazon.

Nos. 21,437 and 38, A. N. S. P., cotypes of *P. bathyurus* Cope. Peruvian Amazon. J. Orton. Presented by E. D. Cope. This species differs from *Rhamdella parryi* and *R. minuta* in coloration.

Rhamdella nicaraguensis (Günther).

One from Nicaragua (J. F. Bransford). Regan figures this species,⁵ but the barbels are shown as not quite reaching opposite dorsal origin. He says they extend to the origin of the adipose fin, according to Günther, and that "both barbels are now broken off in the type, the longest reaching the middle of the dorsal." My example shows the maxillary barbels reaching a little beyond ends of depressed ventrals.

Rhamdella straminea Cope.

Rhamdella straminea Cope, Proc. Amer. Philos. Soc., XXXIII, 1894, p. 93, Pl. 8, fig. 10. Rio Jacuhy, Brazil.

Nos. 21,581 to 84, and 21,604, A. N. S. P., cotypes. Rio Jacuhy, Brazil. H. H. Smith. Presented by E. D. Cope. No. 23,216, without data, is also identical (likely with the same data?).

⁴ Biol. Cent. Am. Pisc., 1906-8, p. 128.

⁵ L.c., p. 131, Pl. 20, fig. 2.

Pimelodus maculatus Lacépède.

Pseudorhamdia piscatrix Cope, Proc. Amer. Philos. Soc., XI, 1870, p. 569.
Pebas, Ecuador.

No. 8,387, A. N. S. P., type of *P. piscatrix* Cope. Pebas, Ecuador.
J. Hauxwell.

Also examples from Demarara, Surinam, Ambyiacu River, and between the mouth of the Rio Negro and the Peruvian Amazon.

Pimelodus valenciennis Lütken.

Rio Jacuhy, Brazil.

Pimelodella cristata (Müller and Troschel).

Pimelodus ophthalmicus Cope, Proc. Amer. Philos. Soc., XVII, 1878, p. 675.
Peruvian Amazon.

No. 21,102, A. N. S. P., cotypes of *P. ophthalmicus* Cope. Peruvian Amazon. J. Orton. 1873. Presented by E. D. Cope.

Pimelodella peruense sp. nov. Fig. 4.

Head $4\frac{1}{4}$; depth $4\frac{2}{3}$; D. I, 6; A. v, 9; P. I, 11; V. I, 6; head width $1\frac{1}{3}$ in its length; head depth at occiput $1\frac{1}{2}$; snout 3; eye $3\frac{1}{2}$; maxillary about 4; interorbital $3\frac{1}{8}$; dorsal spine 2; second branched dorsal ray $1\frac{1}{4}$; least depth of caudal peduncle $2\frac{1}{5}$; pectoral fin $1\frac{1}{3}$; ventral $1\frac{4}{5}$.

Body compressed, moderately elongate, somewhat slender, deepest at dorsal origin, and edges all convex. Caudal peduncle well compressed, and length about $\frac{3}{4}$ its least depth.

Head about wide as deep at occiput, sides convexly approximated above and broad or somewhat flattened below. Snout convex over surface, length about half its greatest width. Eye large, near upper profile, and about midway in head length. Eyelids little free, not adipose-like. Mouth broad, transverse, and upper jaw slightly protrudes. Teeth fine, villiform, in rather broad contiguous bands in jaws. No vomerine or palatine teeth. Tongue broad, thick, depressed, not free. Maxillary barbel reaches origin of ventral. Outer mental barbel extends about first eighth in depressed pectoral, and inner mental barbel about $\frac{3}{4}$ to pectoral origin. Posterior internasal area slightly greater than anterior, and anterior nostrils in short tubes, posterior simple pores. Interorbital slightly convex. Fontanel large, continued to base of occipital process without interruption. Humeral process $\frac{3}{5}$ length of depressed pectoral spine. Occipital process elongate, slender, extends $\frac{3}{5}$ to dorsal plate. Opercle broad, smooth.

Gill-opening extends forward opposite front pupil edge. Rakers 3+8, firm, lanceolate, simple, little less than half of filaments,

and latter nearly $\frac{2}{3}$ of eye. No pseudobranchiæ. Branchiostegals 5, slender.

Body covered with smooth skin. Head smooth. Spines all more or less smooth. L. 1. slopes down from shoulder, till midway along side, simple. Axillary pore moderate.

Dorsal origin about midway between front eye edge and anal origin, spine slender, nearly straight, edges apparently entire. Anal inserted slightly nearer caudal base than pectoral origin, first branched ray (damaged) apparently longest. Adipose fin moderate, $2\frac{4}{5}$ in combined head and trunk length. Caudal damaged. Pectoral moderate, reaches $\frac{2}{3}$ to ventral, spine smooth on outer edge and inner with about nine large serræ, of which longest at least little

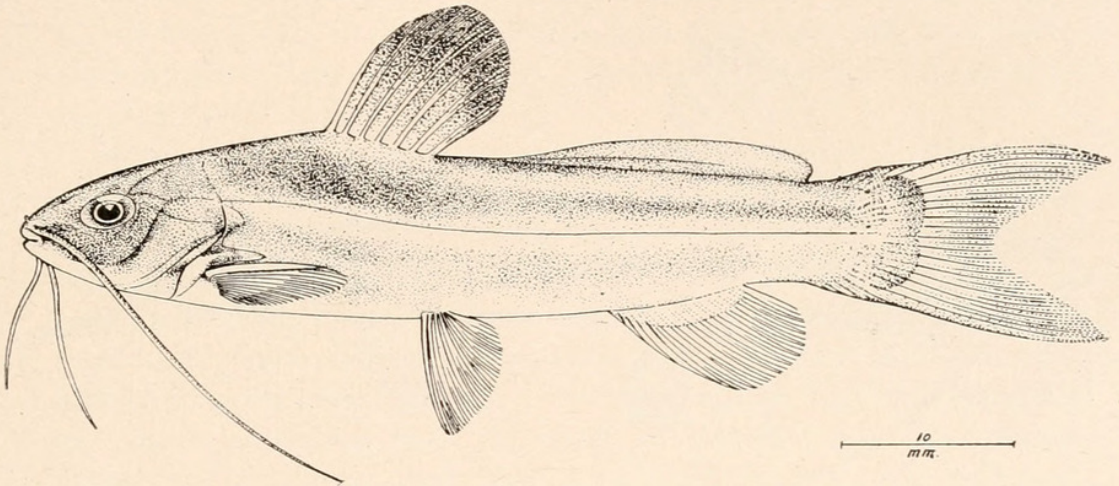


Fig. 4.—*Pimelodella peruense* Fowler. (Type.)

more than half greatest width of spine. Ventral inserted slightly nearer snout tip than caudal base, or below last dorsal rays, and fin extends $\frac{2}{3}$ to anal origin. Vent at first $\frac{2}{5}$ in depressed ventral length. Genital aperture well posterior, or slightly before depressed ventral tip, and papilla long and conic.

Color in alcohol largely brownish, under a lens seen to be made up of very close-set small dots. Lower surface of head, belly and sides paler, and on last extending up to lateral line. Fins all pale brownish, outer portion of dorsal dusky. Iris slaty. Maxillary barbels brownish and mental barbels whitish.

Length 52 mm. (caudal tips damaged).

Type, No. 21,932, A. N. S. P. Peruvian Amazon. Received many years ago from J. Orton or J. Hauxwell. Presented by E. D. Cope.

This species closely resembles *Pimelodella lateristriga* (Müller and

Troschel), though it differs in having the occipital process reaching the dorsal plate, maxillary barbel extending to tip of ventral fin, base of adipose fin 3 to 4 in length, ventral scarcely extending more than half way to anal and inserted little behind vertical from last dorsal ray, depth $6\frac{1}{2}$ to 7, and A. 12.⁶ My example shows no trace of a dark lateral band, this region being entirely paler.

(Named for Peru.)

Pimelodella copei sp. nov. Fig. 5.

Pimelodus lateristriga (non Müller and Troschel) Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 270. Ambyiacu River.

Head $4\frac{7}{8}$; depth 5; D. I, 6; A. IV, 8, I; P. I, 8; V. I, 5; head width $1\frac{2}{5}$ in its length; head depth at occiput $1\frac{4}{7}$; snout $2\frac{1}{3}$; eye $4\frac{1}{8}$; maxillary $4\frac{2}{3}$; mouth width $2\frac{7}{8}$; interorbital 4; dorsal spine $1\frac{1}{4}$;

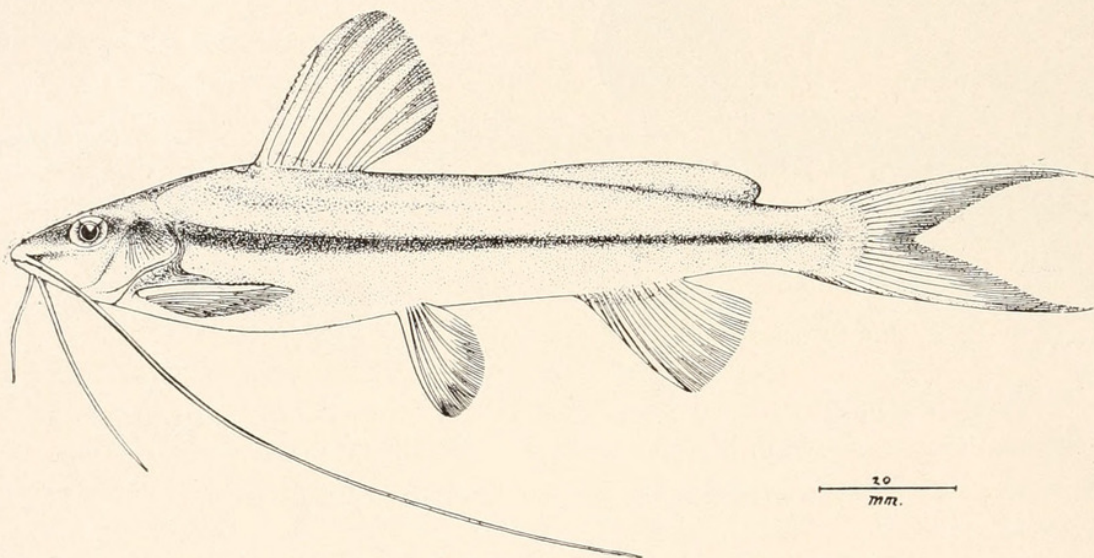


Fig. 5.—*Pimelodella copei* Fowler. (Type.)

first branched anal ray $1\frac{2}{5}$; least depth of caudal peduncle $2\frac{4}{5}$; pectoral $1\frac{1}{5}$; ventral $1\frac{3}{7}$.

Body elongate, moderately compressed, deepest at dorsal origin, contour rather slender, and edges all convexly rounded. Caudal peduncle compressed, least depth $1\frac{1}{4}$ in its length.

Head not much compressed, sides sloping gradually to form broad area above, and lower surface flattened, profiles similar. Snout broad, somewhat depressed, length $\frac{3}{4}$ its greatest width. Eye high, ellipsoid, midway in head length. Eyelids free, not adipose-like. Mouth large, broad, transversely terminal, with short commissure, and upper jaw slightly longer. Teeth conic, in moderately

⁶ Eigenmann and Eigenmann, Occas. Papers Cal. Acad., I, 1890, p. 156.

wide contiguous bands in jaws. No vomerine or palatine teeth. Tongue broad, depressed, smooth, little free around front edges. Maxillary barbels long, extend back till midway in length of hind anal ray. Outer mental barbel extends back $\frac{7}{8}$ in pectoral spine, inner reaches origin of pectoral. Rictal fissure deep, extending back from below hind end of maxillary to below narrow preorbital. Nostrils well separated, anterior in short tubes, and posterior simple pores. Interorbital depressed and flattened. Occipital process extends to dorsal plate, its length $1\frac{2}{5}$ to dorsal origin, and of even width most its length. Occipital fontanel slender, long, slightly constricted within interorbital, and reaches occipital process. Opercle broad, with rather numerous radiating striæ.

Gill-opening extends forward about last fourth in snout length. Gill-rakers 2+6, lanceolate, firm, about $\frac{4}{5}$ of filaments, and latter slightly more than half of eye. No pseudobranchiæ. Branchiostegals 6, outer rather large.

Skin smooth. Spines smooth. Humeral process striate, its length slightly more than half of pectoral spine. Dorsal and pectoral spines mostly with smooth surfaces. L. 1. continuous, simple, little elevated at first, midway along side. Axillary pore moderate.

Dorsal origin about midway between snout tip and depressed ventral tip, spine slender, slightly curved, front edge with 11 antrorse serræ along its terminal half, hind edge entire, and depressed fin not quite extending back to origin of adipose fin. Anal origin nearer ventral origin than caudal base by snout length, and first branched ray longest. Adipose fin moderate, its length $3\frac{1}{6}$ in combined head and trunk length. Caudal well forked, lobes long, slender and pointed, about equal apparently (damaged) and caudal fin about equals space between snout tip and dorsal origin. Pectoral extends $\frac{3}{5}$ to ventral, spine about $\frac{7}{8}$ length of fin, slightly curved, outer edge very finely roughened basally and terminal half with about ten antrorse serræ. Inner edge of pectoral spine slightly roughened medianly. Ventral origin slightly behind last dorsal ray base, and fin extends $\frac{2}{3}$ to anal origin. Vent and genital aperture rather near, former about first third in depressed ventral and latter about last $\frac{2}{5}$.

Color in alcohol pale brownish, lower surface of head and belly paler or somewhat whitish. A rather narrow darker brownish streak extends along side of snout to eye, and continued from hind edge of latter runs along upper side of abdomen to l. 1., which it embraces below hind rays of dorsal, and then continues to caudal

base. Fins all pale brownish. Iris brownish. Maxillary barbels brownish, and others whitish.

Length 160 mm.

Type, No. 8,362, A. N. S. P. Ambyiacu River, near Pebas, Ecuador. John Hauxwell.

Paratype, No. 8,363, A. N. S. P., same data. Head $4\frac{4}{5}$; depth $5\frac{3}{4}$; D. I, 5; A. IV, 8, 1; snout $2\frac{2}{5}$ in head; eye 4; maxillary $4\frac{1}{5}$; interorbital $3\frac{3}{4}$; dorsal spine $1\frac{1}{3}$; pectoral spine $1\frac{1}{4}$; length 152 mm.

This species was originally identified with *Pimelodus lateristrigus* Müller and Troschel by Cope, though at the time he pointed out that it differed somewhat "in the longer beards and one soft ray less in dorsal and anal fin." Eigenmann and Eigenmann state⁷ that the maxillary barbels reach the ventral tips and the origin of the adipose dorsal, the gill-rakers 3+8, depth $6\frac{1}{2}$ to 7, and pectoral spine with unusually strong and sharp retrose hooks along the inner edge.

(Named for Prof. Edward D. Cope, who first pointed out its characters.)

Pimelodella cyanostigma (Cope).

Rhamdia cyanostigma Cope, Proc. Amer. Philos. Soc., XI, 1870, p. 569. Pebas, Ecuador.

Nos. 8,381 to 83, A. N. S. P., cotypes of *R. cyanostigma* Cope. Pebas, Ecuador. J. Hauxwell. Eigenmann and Eigenmann state,⁸ "we are unable to tell to which genus this species belongs. Dr. Cope says that this species is allied to *Pimelodus ophthalmicus* = *Pimelodella cristatus*. But *cristatus* is generically different from *Rhamdia*, and was generally considered so when the statement was made." However, it is evident that Cope was correct in placing *cyanostigma* in *Pimelodus*, as *Pimelodella* (= *Pseudorhamdia* Steindachner) was not proposed until 1888.

Phractocephalus hemiopterus (Schneider).

Peruvian Amazon.

Brachyplatystoma vaillanti (Valenciennes).

Surinam.

Hemisorubim platyrhynchos (Valenciennes).

Peruvian Amazon.

Pseudoplatystoma fasciatum (Linnæus).

Nauta, Ecuador, and Surinam. The larger Nauta example has maxillary barbel slightly shorter than depressed dorsal tip, though in the Surinam example it is about even. A. v, 8, 1 and v, 9, 1.

⁷ Occas. Papers Cal. Acad. Sci., I, 1890, p. 156.

⁸ L.c., p. 164.

Pseudoplatystoma tigrinum (Valenciennes).

Large dried skin, without data.

Sorubim lima (Schneider).

Peru, Ambyiacu River in Ecuador, and Hyavary in Brazil.

SILURINÆ.

Eilurus glanis Linnæus.

One from southern Europe.

Eutropius depressirostris (Peters).

Three from the Shebeli River in East Africa.

Eutropius seraui Boulenger.

Ann. Mag. Nat. Hist. London, (8) VI, 1910, p. 556. Angola, West Africa.

No. 37,956, A. N. S. P., paratype, from the Luculla River, 365 kilometers from Lounda. Dr. J. V. Ansorge.

Schilbe mystus (Linnæus).

Nile? (Bonaparte Collection No. 368).

Physalia villiersi Boulenger.

Ann. Mus. Congo, (1) II, 1912, p. 17, Pl. 17, fig. 6. Angola, West Africa.

Nos. 38,756 to 58, A. N. S. P., paratypes. Luculla River in Chiloango. Dr. Ansorge.

Ansorgia vittata Boulenger.

L.c., Pl. 19, fig. 2. Angola, West Africa.

Nos. 38,734 and 35, A. N. S. P., paratypes. N'Kutu, Loango River. Dr. Ansorge.

Pterocryptis gangeticus Peters.

Two examples in very poor condition, obtained in the Ganges River, India, many years ago by Dr. M. Burrough.

PORCINÆ.

Porcus bajad (Forskål).

Nile.

Chrysichthys acutirostris Günther.

Bango River in Cabira, Angola (Dr. Ansorge).

Chrysichthys walkeri (Günther).

Chiloango River at Chiloango, Angola (Dr. Ansorge).

Chrysichthys ansorgii Boulenger.

Ann. Mag. Nat. Hist. London, (8) VI, 1910, p. 558. Angola, West Africa.

No. 37,906, A. N. S. P., paratype. Manzo River at Dondo. Dr. Ansorge.

Hemibagrus tengara (Hamilton-Buchanan).

Five from the Ganges River, India. Day's figure of an Assam example is not in agreement with his description, as the adipose fin is shown to begin close behind the base of the last dorsal ray, and the length of the fin would be contained in the combined head and trunk $3\frac{1}{4}$ times.⁹

Hypselobagrus cavasius (Hamilton-Buchanan).

Head $4\frac{2}{5}$; depth about 5; snout $2\frac{2}{3}$ in head; eye 3; interorbital $3\frac{1}{4}$. Upper jaw slightly protrudes. Outer mental barbel slightly longer than head. Occipital fontanel reaches base of occipital process. Dorsal spine entire on outer edge, several slight weak barbs on terminal hind edge. Adipose-fin length $2\frac{2}{3}$ in combined head and trunk length. Length 110 mm. (caudal damaged). Ganges River, India.

Hypselobagrus micracanthus (Bleeker).

Two from Padang, Sumatra.

Hypselobagrus nigriceps (Valenciennes).

Borneo.

Bagroides melapterus Bleeker.

Borneo.

Glyptothorax platypogon (Valenciennes).

Batu Sangkhar in Tanah Datar, Sumatra.

Glyptothorax platypogonoides (Bleeker).

Batu Sangkhar.

DORADINÆ.

Physopyxis lyra Cope.

Proc. Acad. Nat. Sci. Phila., 1871, p. 273, Pl. 5, figs. 1-c. Ambyiacu River, Ecuador.

No. 8,282, A. N. S. P., type. Ambyiacu River. J. Hauxwell.

Doras dorsalis Valenciennes.

Para, Brazil.

Doras granulatus Valenciennes.

One poorly preserved example from Surinam.

Doras costatus (Linnæus).

Dried skin without data, and two examples recently recorded from the Rupununi. As the larger of the latter examples differs markedly in its armature, attention is here called to it. The process of the dorsal plate embraces only the first two spinescent lateral

⁹ Fishes of India, III, 1877, Pl. 101, fig. 5.

scutes, whereas in the smaller example and the dried skin the first three spinescent lateral scutes are embraced. The Rupununi specimens also show the humeral plate extending a little further back.

Doras brachiatus Cope.

Proc. Acad. Nat. Sci. Phila., 1871 (1872), pp. 270, 292. Marañon River.

No. 8,342, A. N. S. P., type. Between the mouth of the Rio Negro and the Peruvian Amazon. R. Perkins.

Doras cataphractus (Linnæus).

Surinam.

Doras weddelli Castelnau.

Doras gryphus Cope, *l.c.*, p. 270, Pl. 15, figs. 1-1a. Ambyiacu River, Ecuador.

Nos. 8,345 and 16,460, A. N. S. P., cotypes of *D. gryphus* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Doras pectinifrons Cope.

Proc. Amer. Philos. Soc. Phila., XI, 1870, p. 568. Pebas, Ecuador.

No. 8,346, A. N. S. P., type. Pebas, Ecuador. J. Hauxwell.

Doras monitor (Cope).

Zathorax monitor Cope, Proc. Acad. Nat. Sci. Phila., 1871 (1872), p. 272, Pl. 4, fig. 1. Ambyiacu River, Ecuador.

Nos. 8,276 and 77, A. N. S. P., cotypes of *Z. monitor* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Doras nauticus (Cope).

Zathorax nauticus Cope, Proc. Acad. Nat. Sci. Phila., 1874, p. 133. Nauta, Ecuador.

Nos. 21,390 to 95, A. N. S. P., cotypes of *Z. nauticus* Cope. Nauta, Ecuador. J. Orton.

Oxydoras niger (Valenciennes).

Rhinodoras prionomus Cope, Proc. Acad. Nat. Sci. Phila., 1874, p. 134. Nauta, Ecuador.

No. 21,203, A. N. S. P., type of *R. prionomus* Cope. Nauta, Ecuador. J. Orton.

Also two examples from the Marañon between mouth of Rio Negro and Peru.

AUCHENIPTERINÆ.

Centromochlus heckelii (Filippi).

One from Peruvian Amazon. Also six from Manaus harbor, Brazil, in April, 1913 (E. A. Smith), where known as "Caratay."

Trachycorystes isacanthus (Cope).

Auchenipterus isacanthus Cope, Proc. Amer. Philos. Soc., XVII, 1878, p. 677. Peruvian Amazon.

Nos. 21,444 and 45, A. N. S. P., cotypes of *A. isacanthus* Cope. Peruvian Amazon. J. Orton.

Trachycorystes galeatus (Linnæus).

Two examples from Surinam agree with my Rupununi River example in every respect. They also agree with Regan's figure of *Pseudauchenipterus guppyi* and his description of *Parauchenipterus pascæ*.¹⁰

Trachycorystes brevibarbus (Cope).

Auchenipterus brevibarbus Cope, Proc. Amer. Philos. Soc., XVII, 1878, p. 676. Peruvian Amazon.

No. 21,519, A. N. S. P., type of *A. brevibarbus* Cope. Peruvian Amazon. J. Orton. The ventrals are I, 5, not 7 as stated by Cope. Maxillary barbels not reaching middle of pectoral spine, but now only to about $\frac{1}{3}$ its length (tip broken). This species is close to *T. galeatus*, but differs in the broader predorsal plate, rougher casque and spines.

Pseudauchenipterus nodosus (Bloch).

Surinam.

Epapterus dispilurus Cope.

Proc. Amer. Philos. Soc., XVII, 1878, p. 677. Peruvian Amazon.

Nos. 21,353 and 54, A. N. S. P., cotypes. Peruvian Amazon. E. D. Cope.

Auchenipterus nuchalis (Agassiz).

Peruvian Amazon.

Auchenipterus ambyiacus sp. nov. Fig. 6.

Head $4\frac{2}{3}$; depth $4\frac{1}{4}$; D. I, 6, 1; A. III, 41, 1; P. I, 10; V. I, 14; head width $1\frac{1}{2}$ in its length; head depth at occiput $1\frac{3}{5}$; snout 3; eye $3\frac{2}{5}$; mouth width 3; interorbital $2\frac{1}{8}$; least depth of caudal peduncle $2\frac{1}{8}$; pectoral spine $1\frac{1}{3}$; ventral fin $1\frac{1}{4}$; third simple anal ray $2\frac{1}{8}$.

Body elongate, greatly compressed, contour elongately fusiform with greatest depth about midway in length of head and trunk. Caudal peduncle compressed, least depth $1\frac{1}{4}$ in its length.

Head small, about wide as high at occiput, profiles similar. Snout broad, convex over surface, length about $\frac{2}{5}$ its greatest width. Pre-orbital width slightly swollen. Eye large, slightly low, center at first $\frac{2}{5}$ in head length, and orbit well extended on lower side of head.

¹⁰ Proc. Zool. Soc. London, 1906, p. 387.

Adipose eyelid covers eye completely. Mouth broad, crescentic as viewed below, and jaws about even. A band of sparse villiform teeth in jaws, narrow, continuous, though slightly expanded at each end. Sparse villiform teeth in mandible, areas becoming wider at symphysis, where separated by narrow naked median area. Roof of mouth without teeth. Inner buccal folds moderate. Tongue thick, depressed, smooth, little free. Barbels slender, maxillary reaching $\frac{2}{3}$ in pectoral spine. Mental barbels equally spaced, all extend back about opposite pectoral origin. Anterior internasal space slightly greater than posterior, nostrils all simple pores, anterior also very close to snout edge, and posterior little nearer eye than snout tip. Occipital fontanel broad, extends up till little beyond hind eye edge. Supraoccipital process extends to dorsal plate, though both covered with thin skin and smooth. Opercle wide, smooth.

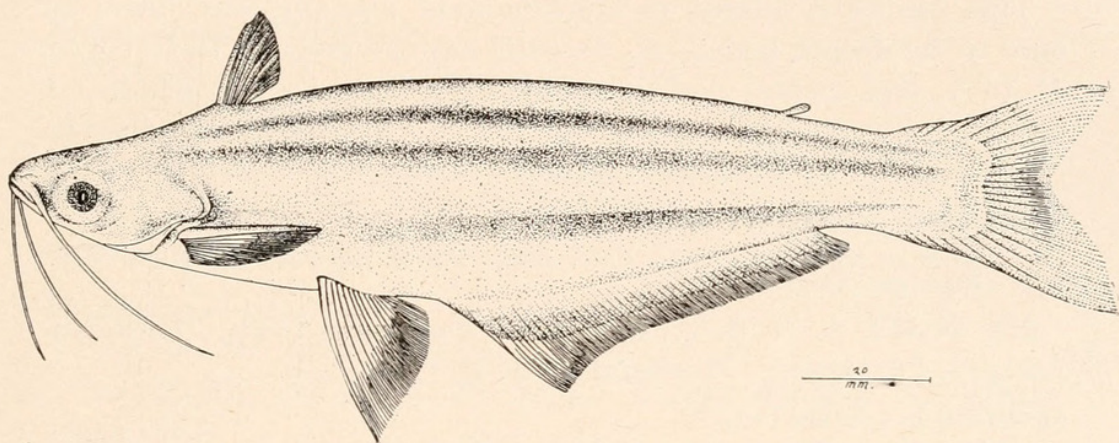


Fig. 6.—*Auchenipterus ambyiacus* Fowler. (Type.)

Gill-opening extends forward about first third in postorbital region of head. Gill-rakers about 10+23, slender, pointed, about $\frac{4}{5}$ length of filaments, and latter about $1\frac{1}{5}$ in eye. No pseudobranchiæ. Branchiostegals slender.

Skin smooth, no rugose areas. Shoulder-girdle at base of pectoral spine slightly swollen. Humeral process short, pointed, slender, covered with skin, and extends about first third in length of depressed pectoral spine. Axillary pore not evident. L. l. obsolete at present, apparently continuous along side indicated by vertebral centra.

Dorsal small, well anterior, inserted slightly nearer anal origin than snout tip, spine slender, nearly straight, front edge smooth and hind edge slightly serrated. Adipose fin small, inserted about last fourth in space between dorsal origin and caudal base, fin about

two in eye. Anal with long, straight base, anterior branched rays slightly longer, and base of fin $2\frac{2}{5}$ in combined length of head and trunk. Caudal (damaged) broad, and apparently forked. Pectoral with long and nearly straight spine, its surface with fine lengthwise striae, its outer edge smooth and its inner edge serrated, when depressed extending nearly to ventral. Latter broad, first ray straight. Vent about midway in length of ventral.

Color in alcohol dull brownish generally, with grayish shade on back and upper portions. Lower portions of body slightly paler than upper. From shoulder towards middle of upper caudal lobe pale dusky-gray streak, and another below and parallel from ventral origin. Barbels brownish, also eyes. Fins all brownish.

Length 163 mm. (caudal tips damaged).

Type, No. 21,484, A. N. S. P., Ambyiacu River, Ecuador. J. Hauxwell. Presented by E. D. Cope.

This species is related to *Auchenipterus nuchalis*, but differs at once in its deeper body. *A. nuchalis* has the greatest body depth $4\frac{3}{4}$ to 5, and mental barbels extending a little beyond middle of pectorals.

(Named for the Ambyiacu River.)

Auchenipterus brachyurus (Cope).

Euanemus brachyurus Cope, Proc. Amer. Philos. Soc., XVII, 1878, p. 676. Peruvian Amazon.

No. 21,552, A. N. S. P., type of *E. brachyurus* Cope. Peruvian Amazon. J. Orton. Presented by E. D. Cope.

Ageneiosus porphyreus Cope.

Trans. Amer. Philos. Soc., (2) XIII, 1867, p. 404. Surinam.

No. 8,389, A. N. S. P., type. Surinam. Also a small example from same locality. Likely *A. guianensis* Eigenmann from Wismar in British Guiana may be found identical.

Ageneiosus brevifilis Valenciennes.

One example from the Peruvian Amazon in rather poor condition. If marked as described by Bleeker, scarcely any traces of the color-pattern remain. Dr. Steindachner next¹¹ figures the species from Rio Purus, with the pectoral not reaching the ventral. His examples were from Surinam, the Amazon and Paraguay, measuring 175 to 341 mm. Bleeker's examples were 236 to 275 mm. Eigenmann¹² had an example 445 mm. from Lama Stop-off in British Guiana, and

¹¹ Annal. Naturh. Hofmus. Wien, 1910, p. 403, Pl. 8.

¹² Mem. Carnegie Mus., V, 1912, p. 205.

states that the pectorals reach the first or fifth ventral ray. Though he also gives the anal rays 34, possibly this may include some of the rudimentary ones, as most writers mention 32 branched. My Peruvian example is damaged somewhat, though now measures 200 mm., has the A. iv, 32, and the pectorals (damaged) do not appear to reach the ventral. *A. ogilviei* is very close and, like *A. marmoratus*, may be found identical.

TORPEDININÆ.

Torpedo electricus (Gmelin).

Two from Liberia and one from the Lebuži River at Kuka Munro, West Africa.

ASPREDINIDÆ.

Aspredo aspredo (Linnæus).

Brazil and Surinam.

Platystacus cotylephorus Bloch.

Surinam.

Dysichthys coracoideus Cope.

Proc. Acad. Nat. Sci. Phila., 1874, p. 133. Nauta.

Nos. 21,212 to 15, A. N. S. P., cotypes. Nauta, Ecuador. J. Orton. Presented by E. D. Cope.

Bunocephalus melas Cope.

L.c., p. 132. Nauta.

No. 21,235, A. N. S. P., type. Nauta, Ecuador. J. Orton. From Cope.

Bunocephalus aleuropsis Cope.

Proc. Amer. Philos. Soc. Phila., XI, 1870, p. 568. Pebas, Ecuador.

Nos. 8,286 to 88, A. N. S. P., cotypes. Pebas, Ecuador. J. Hauxwell. From Cope.

PLOTOSIDÆ.

Plotosus anguillaris (Bloch).

Padang, Sumatra; Singapore, Malacca; Apia, Samoa; Bacon, Philippine Islands. The Padang examples are without whitish lengthwise streaks. All others smaller and show the whitish streaks clearly, even the very young.

CLARIIDÆ.

Clarias senegalensis (Valenciennes).

Senegal.

Clarias mossambicus Peters.

Shebeli River, East Africa. Günther says, "Two small specimens of *Clarias* collected on the Shebeli River are not in sufficiently good condition to be determined. The form of the vomerine band is very different from that of the fish described as *C. smithii*." These examples show the hind edge of the vomerine band slightly double-convex, evidently an individual character, as they are in all other respects similar to the present species and to which they undoubtedly belong.

Clarias batrachus (Linnæus).

Padang and Batu Sangkar, Sumatra.

Clarias angolensis Steindachner.

West Africa, also the Luali River at Lundo.

Clarias duchaillui sp. nov. Fig. 7.

Head $4\frac{1}{2}$; depth at anal origin $6\frac{1}{4}$; D. 76; A. 57; P. I, 10; V. I, 5; head width $1\frac{1}{4}$ in its length; head depth at occiput $1\frac{4}{5}$; snout $2\frac{2}{3}$; eye 8; mouth width 2; interorbital $1\frac{7}{8}$; least depth of caudal peduncle $3\frac{1}{3}$; caudal $1\frac{2}{5}$; pectoral $1\frac{4}{7}$; ventral $2\frac{1}{4}$.

Body elongate, sides and trunk well compressed, deepest at dorsal origin, and profiles mostly similar. Caudal peduncle entirely free, well compressed.

Head broad, depressed, upper surface slightly more convex behind, and profiles similar. Snout broad, depressed, slightly protrudes beyond mandible, and length about half its greatest width. Eye small, rounded, superior, and placed near first $\frac{2}{5}$ in head length. Eyelids free. Mouth wide, with very short commissure. Teeth fine, villose, in moderately broad similar bands in jaws, upper area simple and lower ends in narrow angle behind. Vomerine teeth similar in size and area to outer or maxillary band. Tongue broad, depressed, free around edges, without teeth. Upper and lower buccal folds well developed, similar. Anterior nostrils in short simple tubes near edge of snout, much closer than posterior. Latter close before eye, and simple slits just behind base of nasal barbel, which reaches back opposite tip of occipital process. Maxillary barbel extends back beyond depressed pectoral about midway between tip of latter and ventral origin. Outer mental barbel extends back beyond pectoral spine tip, though not quite to tip of depressed fin. Inner mental barbel reaches pectoral origin. Interorbital space broadly convex. Fontanel shaped like a plumb-bob, within the interorbital region. Occipital fontanel close to base of

occipital process, moderate. Occipital process triangular, extends about first fourth in predorsal space.

Gill-openings large, extend forward about first $\frac{2}{3}$ in head. Gill-rakers 1+9, lanceolate, about equal filaments or eye in length. Shoulder-girdle, within gill-opening, with a well-developed process opposite origin of pectoral spine. Branchiostegals moderate.

Body covered with smooth skin. L. l. simple, slopes from shoulder till midway along side of trunk, though not continued beyond caudal peduncle.

Dorsal inserted slightly behind first third in combined head and trunk length, free from caudal behind. Anal origin nearer caudal base than snout tip, also free from caudal behind. Caudal elongate, rounded behind. Pectoral $1\frac{2}{3}$ to ventral, spine with rough serræ

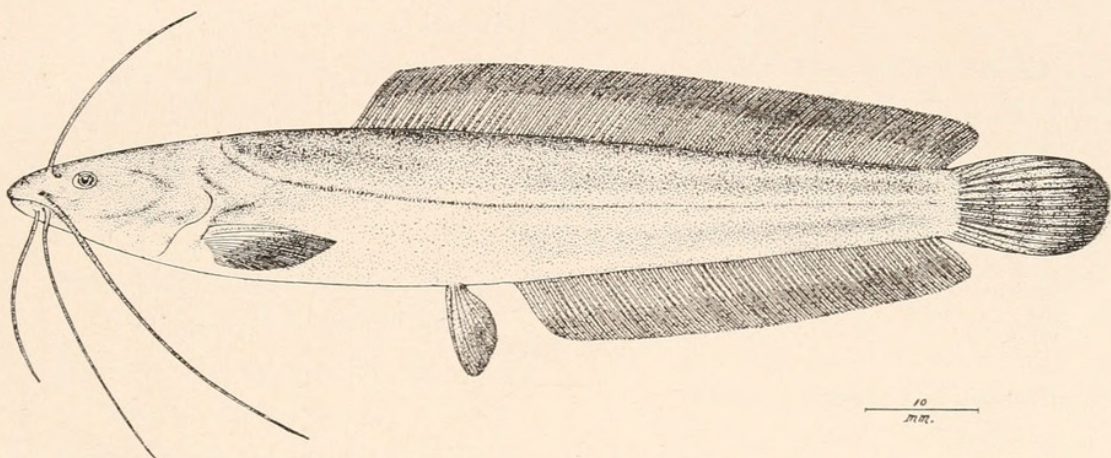


Fig. 7.—*Clarias duchailloi* Fowler. (Type.)

along both edges, anterior retrorse, and posterior only on terminal portion of edge. Ventral small, inserted well back, and reaches slightly beyond anal origin. Vent close before anal.

Color in alcohol uniform dull brownish, fins and lower surface of head all paler. Iris dull slaty. Barbels brownish.

Length 97 mm.

Type, No. 8,568, A. N. S. P. Gaboon Country, West Africa. P. B. Du Chaillu.

Also Nos. 8,569 to 8,574, A. N. S. P., paratypes, same data. These show: Head $4\frac{2}{3}$ to $4\frac{3}{4}$; depth $6\frac{1}{2}$ to $6\frac{4}{5}$; D. 70 to 78; A. 56 to 62; snout $2\frac{1}{2}$ to $2\frac{4}{5}$ in head; eye 7 to 8; mouth width 2 to $2\frac{1}{8}$; inter-orbital $1\frac{2}{3}$ to $1\frac{7}{8}$; length 76 to 92 mm.

This species is apparently allied with *Clarias submarginatus*

Peters,¹³ from Cameroon, agreeing in the few gill-rakers, concealed clavicles, dorsal rays, and width of the head. It differs, however, in the much longer barbels, fewer anal rays, longer pectoral and caudal fins, and in the caudal showing traces of about three somewhat irregular darker transverse bars.

(Named for Paul B. Du Chaillu, who many years ago collected fishes in the Gaboon Country.)

Phagorus nieuhofii (Valenciennes).

One from Borneo.

Channallabes apus (Günther).

Two from Lubuzi River at Kuka Muno in Chiloango, West Africa.

Saccobranchus fossilis (Bloch).

Ganges River, India.

HOLOGENEIDÆ.

Hologenes marmoratus (Günther).

Holmia, British Guiana.

HYPOPTHALMIDÆ.

Hypophthalmus edentatus (Agassiz).

Peruvian Amazon.

PYGIDIIDÆ.

CETOPSINÆ.

Hemicetopsis candiru (Agassiz).

Peruvian Amazon.

Cetopsis cœcutiens (Lichtenstein).

Ambyiacu River, and Amazon between mouth of Rio Negro and Peru.

PYGIDIINÆ.

Hatcheria areolata (Valenciennes).

Arroyo Comajo, Neuquen, Argentina.

Pygidium rivulatum (Valenciennes).

Trichomycterus pardus Cope, Proc. Acad. Nat. Sci. Phila., 1874, p. 132.
Upper Amazon.

Nos. 21,180 to 202, A. N. S. P., cotypes of *T. pardus* Cope. Jequetepeque, Peru. J. Orton.

Also many examples from Lake Titicaca, Tinta, sources of the Ucayali at Urubamba, and the Rio Urubamba at Urubamba, Peru.

¹³ Sitz. Ges. Naturf. Fr. Berlin, 1882, p. 74.

Pygidium poeyanum (Cope).

Trichomycterus poeyanus Cope, Proc. Amer. Philos. Soc., XVII, 1877, p. 47
(on *T. rivulatus* Cope).

Trichomycterus rivulatus (non Valenciennes) Cope, Proc. Acad. Nat. Sci. Phila., 1874, p. 132. Arequipa, Peru.

Nos. 21,382 and 83, A. N. S. P., cotypes of *T. poeyanus* Cope. Arequipa, Peru. J. Orton. This species is close to *P. rivulatum*, differing in its large, dark blotches.

Pygidium dispar Tschudi.

One example, which Cope refers to as "a large specimen of the *T. pardus*, which, according to the label, came from Callao Bay." At present, however, it is labelled as having been secured at Tinta.

Pareiodon microps Kner.

Amazon between mouth of Rio Negro to Peru.

CALLICHTHYIDÆ.**Callichthys callichthys** (Linnæus).

Surinam, Nauta, Pebas, Ambyiacu River and Rio Jacuhy. This large series shows considerable variation. Adults and young have variably long or short pectoral spines, which may reach the ventral or only half as far. Plates on caudal base in two clusters, which may vary 3 or 4, though usually 4 in each.

Hoplosternum littorale (Hancock).

Trinidad and Venezuela.

Hoplosternum thoracatum (Valenciennes).

Nauta, Ecuador.

Hoplosternum oronocoi sp. nov. Fig. 8.

Hoplosternum thoracatum (non Valenciennes) Fowler, Proc. Acad. Nat. Sci. Phila., 1911, p. 436. La Pedrita, Venezuela.

Head $3\frac{2}{3}$; depth $3\frac{1}{2}$; D. I, 7; A. I, 5; P. I, 8; V. I, 5; lateral plates 25 above, 23 below, to caudal base; snout $2\frac{1}{10}$ in head; eye 7; mouth width $3\frac{1}{2}$; interorbital $1\frac{3}{5}$; dorsal spine 2; adipose spine $3\frac{1}{2}$; pectoral spine $1\frac{2}{5}$; anal spine $2\frac{1}{2}$; least depth of caudal peduncle $1\frac{3}{4}$; caudal 1; ventral $1\frac{2}{5}$.

Body moderately long, well compressed, deepest at dorsal origin, and edges all convex. Caudal peduncle greatly compressed, as measured to last anal ray, base about half as long as deep.

Head moderate, depressed, upper profile little more inclined, surfaces all convex. Snout broad, depressed, and length about $\frac{3}{5}$ its greatest width. Eye small, rounded, laterally superior, hind edge about midway in length of head. Mouth moderate, upper jaw very slightly protruding. Teeth minute, in broad bands in

each jaw, though upper of shorter extent. Inner buccal folds both wide. Lower lip wide, with slight notch at symphysis. Outer barbel reaches about first sixth in pectoral spine, and inner barbel extends very slightly beyond tip of pectoral fin. Anterior nostril in short tube about midway in snout length, and posterior simple pore close behind and a little superior. Interorbital broadly convex. Fontanel within interorbital, and its length about equals eye.

Gill-opening extends forward to last third in head. Gill-rakers $1+8$ short and rather blunt firm points, about $\frac{2}{5}$ length of filaments, and latter equal eye. Isthmus wide.

Bony plates on trunk each with minute denticulations along hind edges, also on spines of fins completely over their outer or lateral surfaces and humeral process. Plates on head and predorsal

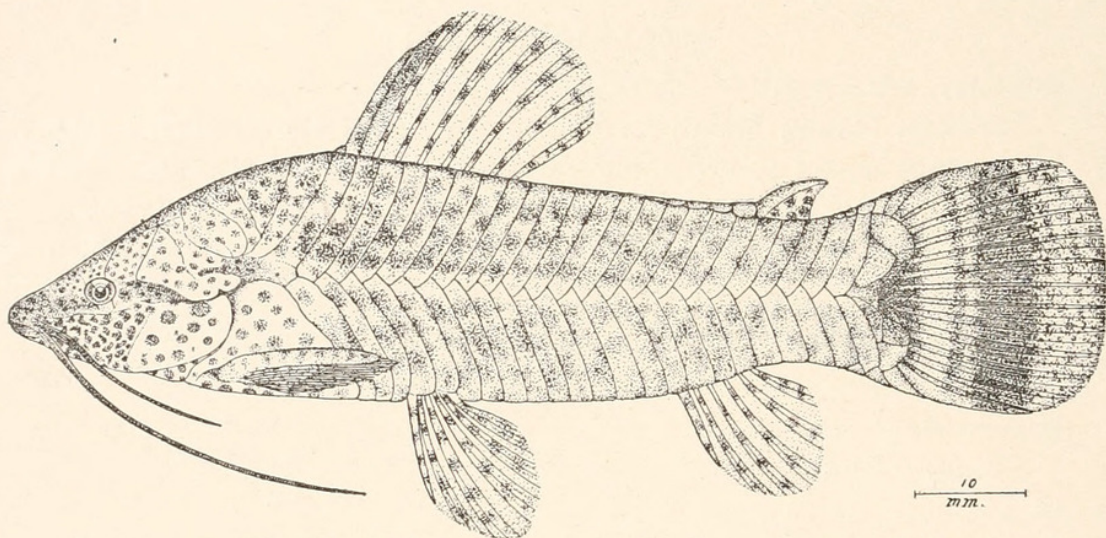


Fig. 8.—*Hoplosternum oronocoi* Fowler. (Type.)

region all finely striate. Coracoid plates greatly exposed, or length of each about equals pectoral fin, and meeting at their anterior edges. Outer half of snout, lower surface of head, and belly behind pectoral plates, naked. From adipose fin 7 plates on median line of back extend forward. Rudimentary caudal rays with small plates. Base of each caudal lobe with 2 plates. Humeral process extends back $\frac{2}{3}$ in depressed pectoral spine.

Dorsal origin little nearer snout tip than origin of adipose fin, spine depressed and about $\frac{3}{4}$ height of fin. Adipose fin inserted about last third in space between last dorsal ray base and caudal base, spine about 2 in interorbital. Caudal rounded. Anal inserted about last third in space between ventral origin and caudal base, depressed fin extending slightly beyond latter, and spine a little

shorter than longest ray. Pectoral with strong, curved spine, reaches ventral. Latter inserted little nearer snout tip than caudal base, fin extending $\frac{3}{5}$ to anal. Vent well anterior, or close behind ventral bases.

Color in alcohol largely dark brownish, trunk more or less mottled with paler areas or blotches, and smaller dusky spots of irregular and often obscure definition on scutes. On head, breast and belly many close-set, small blackish spots, though becoming larger and fewer on belly. All fins with obscure dusky spots, though on caudal mostly united to form median broad blackish transverse band, in extent nearly half length of fin. Hind edge of caudal also dusky. Iris slaty. Barbels dusky.

Length 102 mm.

Type, No. 37,895, A. N. S. P. La Pedrita, Cano Uracoa, Venezuela. February 16, 1911. F. E. Bond and Stewardson Brown.

Only the above example. It is related to *Callichthys pectoralis* Boulenger,¹⁴ which has been identified by Eigenmann with *C. melampterus* Cope, a species certainly distinct. *C. pectoralis* is evidently a *Hoplosternum*, however, and differs from the present species in its depth $3\frac{1}{3}$ to $3\frac{1}{2}$, large eye (though this may be due to age), inner barbels half total length, and lateral plates 23 above and 22 below, while in other respects it agrees. No description of the caudal coloration or other details have been given for *C. pectoralis*, so that its identity is uncertain. *H. schreineri* Ribeiro I have been unable to consult.

(Named for the Orinoco River, in the delta country of which the type was secured.)

CATAPHRACTOPS subgen. nov.

Type *Callichthys melampterus* Cope.

Lower jaw without barbels, though two at each rictus. Coracoid but slightly exposed below, and ventral surface largely naked. Dorsal spine low and flat. Pectoral spine finely serrated on inner edge, outer bristly. Supraoccipital plate truncate behind, so that narrow median naked predorsal strip extends before dorsal plate.

Differs from subgenus *Hoplosternum* in the naked predorsal region and truncate hind edge of supraoccipital process, together with the slightly exposed coracoid processes.

(*Cataphractus*, an old generic name for the plated nematognaths; ♂♀, appearance.)

¹⁴ Proc. Zool. Soc. London, 1895, p. 525. Monte Sociedad, Paraguayan Chaco.

Hoplosternum melampterus (Cope).

Callichthys melampterus Cope, Proc. Acad. Nat. Sci. Phila., 1871, p. 275.
Ambyiacu River.

Nos. 8,318 to 28, A. N. S. P., cotypes of *C. melampterus* Cope. Ambyiacu River, Ecuador. J. Hauxwell. Also two examples without definite locality, from Cope.

Dianema longibarbis Cope.

L.c., p. 276, Pl. 7, figs. 1-1b. Ambyiacu River.

Nos. 21,540 and 8,285, A. N. S. P., cotypes. Ambyiacu River, Ecuador. J. Hauxwell.

Chænothorax semiscutatus (Cope).

Corydorus semiscutatus Cope, *l.c.*, p. 280, Pl. 6, fig. 1. Ambyiacu River.

No. 8,289, A. N. S. P., type of *C. semiscutatus* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Chænothorax bicarinatus Cope.

Proc. Amer. Philos. Soc., XVII, 1878, p. 679. Peruvian Amazon.

No. 21,447, A. N. S. P., type. Peruvian Amazon. J. Orton.

Brochis cæruleus Cope.

Proc. Acad. Nat. Sci. Phila., 1871, p. 277, Pl. 7, fig. 2, Pl. 9, fig. 3. Ambyiacu River.

Nos. 8,231 to 37, A. N. S. P., cotypes. Ambyiacu River, Ecuador. J. Hauxwell.

Corydorus acutus Cope.

L.c., p. 281. Ambyiacu River.

Nos. 8,292 and 93, A. N. S. P., cotypes. Ambyiacu River, Ecuador. J. Hauxwell. These examples in very poor condition. Possibly they may be found identical with *C. punctatus* (Bloch).

Corydorus ambiacus Cope.

L.c., p. 280. Ambyiacu River.

Corydorus trilineatus Cope, *l.c.*, p. 281, Pl. 6, fig. 2. Ambyiacu River.

No. 8,291, A. N. S. P., type of *C. ambiacus* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Nos. 8,294 and 95, A. N. S. P., cotypes of *C. trilineatus* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Also four examples from Peru, received from J. Orton. *C. ambiacus* Cope has been identified with *C. punctatus*, though is here allowed distinct until further studies can be made. *C. amphibelus* may also be another synonym, and is only provisionally admitted here.

Corydorus amphibelus Cope.

L.c., p. 282. Ambyiacu River.

No. 8,291, A. N. S. P., type. Ambyiacu River, Ecuador. J. Hauxwell.

Corydorus paleatus (Jenyns).

Many from the Rio Jacuhy, Brazil.

LORICARIIDÆ.

PLECOSTOMINÆ.

Plecostomus plecostomus (Linnaeus).

One from Surinam (Hering). A large example (418 mm. long without caudal), no data, is evidently identical.

Plecostomus commersonnii (Valenciennes).

Rio Jacuhy.

Plecostomus aspilogaster Cope.

Proc. Amer. Philos. Soc. Phila., XXXIII, 1894, p. 100, Pl. 8, fig. 14. Rio Jacuhy, Brazil.

Nos. 21,781 to 84, A. N. S. P., cotypes. Rio Jacuhy, Brazil. H. H. Smith. This is evidently a distinct species, and not at all to be confused with *P. commersonnii*, as questioned by Regan.¹⁵ It would clearly fall with the species *P. verres*, *P. carinatus* and *P. vaillanti*, according to Regan's key, where the character shared in common is "supraoccipital bordered posteriorly by a median scute, and by one or more on each side." It differs from all three of these species in having the l. l. 30, and the lateral keels weak.

Plecostomus emarginatus (Valenciennes).

Plecostomus scopularius Cope, Proc. Acad. Nat. Sci. Phila., 1871, p. 55.

Amazon above mouth of Rio Negro.

Plecostomus biseriatus Cope, *l.c.*, p. 285, Pl. 16. Amazon.

Plecostomus virescens Cope, *l.c.*, 1874, p. 137. Upper Amazon.

No. 8,081, A. N. S. P., type of *P. scopularius* Cope. Amazon above mouth of Rio Negro. R. Perkins.

No. 8,279, A. N. S. P., type of *P. biseriatus* Cope. Amazon. R. Perkins.

Nos. 21,280 to 83, A. N. S. P., cotypes of *P. virescens* Cope. Peruvian Amazon. J. Orton.

Also small example from Peru obtained by Orton.

Pterygoplichthys multiradiatus (Hancock).

Liposarcus varius Cope, Proc. Acad. Nat. Sci. Phila., 1871, p. 284. Ambyiacu River.

Liposarcus jeanesianus Cope, *l.c.*, 1874, p. 135. Nauta.

No. 21,931, A. N. S. P., type of *L. varius* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Nos. 21,925 and 26, A. N. S. P., paratypes. Amazon from mouth of Rio Negro to Peru. R. Perkins.

¹⁵ Trans. Zool. Soc. London, XVII, pt. 3, 1904, p. 206.

Nos. 8,241 and 42, A. N. S. P., cotypes of *L. jeanesianus* Cope. Nauta. J. Orton.

Also other examples from the above localities.

Chaetostomus sericeus Cope.

L.c., 1871, p. 288. Ambyiacu River.

No. 22,005, A. N. S. P., type. Ambyiacu River, Ecuador. J. Hauxwell. It is not a species of *Xenocara*, as suggested with question by Regan,¹⁶ though closely related to his *C. maculatus*.¹⁷

Ancistrus dolichopteryx Kner.

Two from Pebas, Peru, received from Cope. They agree with Kner's account and figure, though are a little larger. They are also rougher and the spines more or less spinescent. The fins are spotted with blackish.

Ancistrus alga (Cope).

Chaetostomus alga Cope, Proc. Acad. Nat. Sci. Phila., 1871, p. 287, Pl. 15, fig. Ambyiacu River.

Chaetostomus malacops Cope, *l.c.* Ambyiacu River.

Chaetostomus tectirostris Cope, *l.c.*, p. 288. Ambyiacu River.

Nos. 16,461 and 62, A. N. S. P., cotypes of *C. alga* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

No. 8,299, A. N. S. P., cotype of *C. malacops* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Nos. 8,298 and 8,300, A. N. S. P., cotypes of *C. tectirostris* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

This species is allowed distinct and closely related to *A. hoplogenyis* (Günther), which is described as having but 8 or 9 interopercular spines. I have two examples, of nearly similar size, of *A. hoplogenyis* from the Rupununi which agree in this character. Further, they are also white-dotted. The types of *C. alga* show the interopercular spines as 11 to 13, which appear to exceed any variation found in *A. hoplogenyis*. Cope's figure of *C. alga* does not indicate all the interopercular spines. The types of *C. tectirostris* show the D. I, 7, rarely I, 6, and the interopercular spines 11 or 12.

Ancistrus cirrhosus (Valenciennes).

Chaetostomus variolus Cope, Proc. Acad. Nat. Sci. Phila., 1871, p. 288. Ambyiacu River.

Nos. 21,284 and 85, A. N. S. P., cotypes of *C. variolus* Cope. Ambyiacu River, Ecuador. J. Hauxwell.

Also four others with same data.

¹⁶ Trans. Zool. Soc. London, XVII, 1904, p. 252.

¹⁷ *L.c.*, p. 246, Pl. 14, fig. 4. Rozmani, Upper Peru.

Lithoxus lithoides Eigenmann.

Mem. Carnegie Mus., V, 1912, p. 242, Pl. 29, figs. 1-4. (Warraputa) British Guiana.

No. 39,121, A. N. S. P., paratype. Warraputa, British Guiana. In exchange with Carnegie Museum.

HYPOPTOPOMINÆ.

Hypoptopoma thoracatum Günther.

Hypoptopoma bilobatum Cope, Proc. Amer. Philos. Soc. Phila., XI, 1870, p. 566, 2 figs. Pebas, Ecuador.

Nos. 8,280 and 81, A. N. S. P., cotypes of *H. bilobatum* Cope. Pebas, Ecuador. J. Hauxwell. These agree with *H. thoracatum* in their ventral armature. In the smaller example the median series of scutes do not approximate those on each side.

Also an example from the Peruvian Amazon.

Hypoptopoma psilogaster sp. nov. Fig. 9.

Hypoptopoma bilobatum (part) Cope, Proc. Amer. Philos. Soc. Phila., XVII 1878, p. 679. Peruvian Amazon.

Head 4; depth $6\frac{2}{3}$; D. I, 7; A. I, 5; P. I, 6; V. I, 5; 26 plates in lateral series, of which last on caudal base; 3 predorsal plates; head width $1\frac{2}{7}$ in its length; head depth at occiput 2; snout $1\frac{3}{5}$; eye $4\frac{2}{5}$; mouth width $3\frac{1}{2}$; interorbital $1\frac{3}{5}$; least depth of caudal peduncle $3\frac{2}{3}$; pectoral spine $1\frac{1}{5}$.

Body long, slender in lateral profile, depressed as viewed from above, deepest at dorsal origin, and edges all smoothly convex. Caudal peduncle rather robust, becoming compressed behind, and its least depth about $\frac{1}{3}$ its length measured to rudimentary adipose fin-spine.

Head short, well depressed, and profiles similar. Snout broad, depressed, its length $\frac{3}{4}$ its basal width. Eye moderate, lateral, and its center about last fourth in head. Eyelids free. Mouth rather broad, transverse, and placed about first $\frac{2}{5}$ in snout. Disk rounded, apparently with entire edges, and surface with a few papillæ on lower lip. Teeth slender, simple, uniserial, long, and slightly bent, compressed tips blunt. Inner buccal folds apparently broad. Tongue broad, fleshy, little distinct at present. Each lateral corner of buccal disk with short triangular fleshy barbel, apparently less than half of eye in length. Nostrils together, simple pore within depression on top of head just before front edge of eye, extent of depression each less than half of eye, and bony internasal region trifle more than eye. Interorbital broadly and slightly convex. Occipital process broadly triangular. Opercle large and very porous.

Gill-openings small, inferiorly lateral, extend forward about opposite hind edge of eye. Isthmus moderately broad, width $1\frac{2}{3}$ in snout.

Body almost everywhere minutely spinose. Scales without distinct keels. Eight plates between dorsal and adipose fin. Snout all more or less roughened, especially along sides. Lower surface of head and abdomen entirely naked, only interrupted by striate osseous exposures of coracoids. Fin spines all spinulose. L. 1. scarcely distinct.

Dorsal origin placed little nearer origin of adipose fin than snout tip, spine (damaged) slightly enlarged and evidently longest of fin

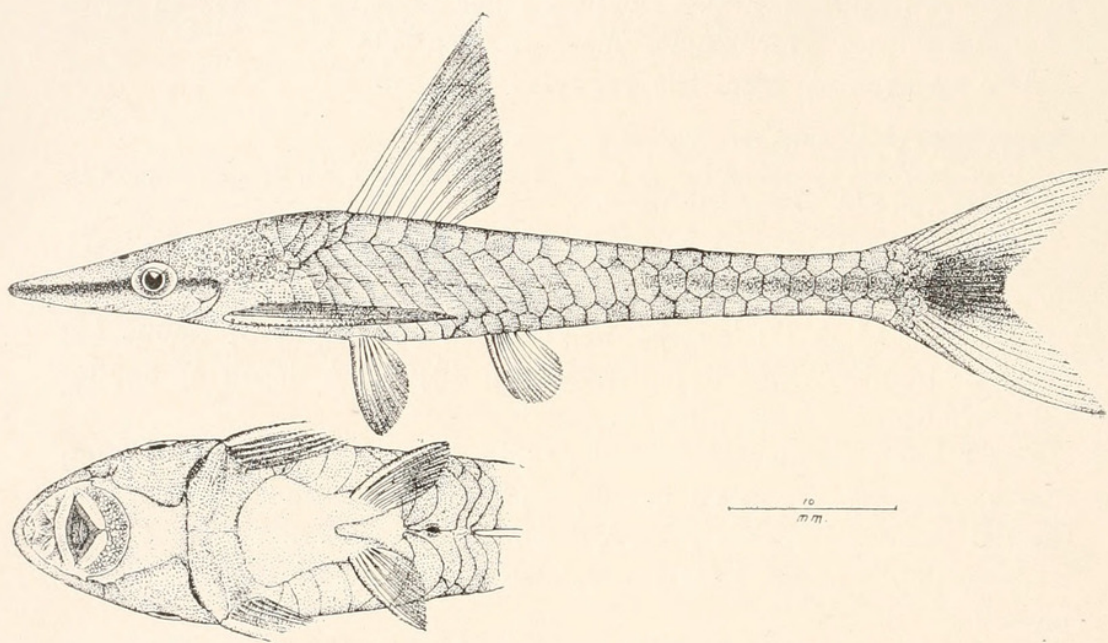


Fig. 9.—*Hypoptopoma psilogaster* Fowler. (Type.)

radii. Adipose fin reduced to a simple depressed little plate, inserted slightly nearer dorsal origin than caudal base. Anal inserted behind base of depressed dorsal. Caudal (damaged) with lower lobe apparently longer?. Pectoral with long, slender and slightly curved spine, its outer edge with minute asperities and spinules, and inner edge antorsely serrate, also extends about $\frac{2}{3}$ in depressed ventral. Latter not reaching anal. Vent about midway in postventral region.

Color in alcohol largely dull brownish (with greenish tint doubtless due to having been preserved originally in a copper vessel). Snout and side of head with dusky dots. A narrow streak of dark brown also along side of snout, and continued behind eye to shoulder. Median caudal rays dusky. Iris brownish.

Length 56 mm. (caudal damaged).

Type, No. 21,922, A. N. S. P. Peruvian Amazon. 1873. J. Orton. Received from E. D. Cope.

The above example was formerly identified with the preceding species, but is here allowed distinct provisionally, for if simply a variant is quite anomalous. The type of *H. psilogaster* is larger than the smallest example of *H. thoracatum*, and it has but two rows of ventral scutes, the space between being naked.

(Ψιλόδς, naked; γαστήρ, stomach.)

DIAPELTOPLITES subgen. nov.

Type *Hypoptopoma gulare* Cope.

Differs from the subgenus *Hypoptopoma* Günther, as here understood, in the ventral armature consisting largely of two series of plates, though a single plate interposed between the first pair.

The species embraced in this subgenus are *H. gulare* Cope, *H. joberti* (Vaillant) and *H. steindachneri* Boulenger. The subgenus *Hypoptopoma* contains only *H. thoracatum* Günther and *H. psilogaster*, described previously.

(Διά, divided; πέλτη, shield; ὀπλίτης, armed; with reference to the double series of shields on the belly.)

***Hypoptopoma gulare* Cope.**

Proc. Amer. Philos. Soc. Phila., XVII, 1878, p. 679. Peruvian Amazon.

No. 21,477, A. N. S. P., type. Peruvian Amazon. J. Orton.

***Otocinclus vestitus* Cope.**

Proc. Acad. Nat. Sci. Phila., 1871, p. 83, Pl. 4, fig. 2. Tributary of Ambyiacu River.

Nos. 8,283 and 84, A. N. S. P., cotypes. Tributary of Ambyiacu River, Ecuador. J. Hauxwell.

***Otocinclus flexilis* Cope.**

Proc. Amer. Philos. Soc. Phila., XXXIII, 1894, p. 97, Pl. 8, figs. 13a-b. Rio Jacuhy.

Otocinclus fimbriatus Cope, l.c., p. 98, Pl. 9, figs. 16a-b. Rio Jacuhy.

Nos. 21,622 to 26, A. N. S. P., cotypes of *O. flexilis* Cope. Rio Jacuhy, Brazil. H. H. Smith.

Nos. 21,752 to 55, A. N. S. P., cotypes of *O. fimbriatus* Cope. Same data. This nominal form appears to be a condition of greater age.

***Microlepidogaster nigricauda* (Boulenger).**

Rio Jacuhy, Brazil.

Microlepidogaster lævior (Cope).

Hisonotus lævior Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894, p. 95, Pl. 7, fig. 12. Rio Jacuhy.

No. 21,563, A. N. S. P., type of *H. lævior* Cope. Rio Jacuhy, Brazil. H. H. Smith. Both this and the following species have been merged with the preceding, though they appear to me distinct.

Microlepidogaster leptochilus (Cope).

Hisonotus leptochilus Cope, Proc. Amer. Philos. Soc. Phila., XXXIII, 1894, p. 96, Pl. 7, fig. 11. Rio Jacuhy.

No. 21,564, A. N. S. P., type of *H. leptochilus* Cope. Rio Jacuhy, Brazil. H. H. Smith.

LORICARIINÆ.

Rhineloricaria cadeæ Hensel.

Rio Jacuhy, Brazil.

Loricariichthys typus (Bleeker).

Two examples, 208 and 224 mm. (caudal tips slightly damaged), from Surinam. They agree with Bleeker's account¹⁸ in having 14 caudal scutes, though Regan gives¹⁹ but 10 or 11, which is in agreement with Steindachner's figure of *Loricaria stubelii*.²⁰ The interorbital space, in my specimens, is flat, with the eye nearly impinging on the upper profile of the head. In Bleeker's figure the interorbital space is shown as elevated. My examples agree with *L. stubelii* in their occipital armament, though ventrally they have at least four rows of plates. In *L. stubelii* the figure shows the median ventral plates absent in one case. Traces of dark spots are also evident on the fins.

Loricariichthys hauxwelli sp. nov. Fig. 10.

Loricaria acuta (non Valenciennes) Cope, Proc. Acad. Nat. Sci. Phila., 1871, p. 289. Ambyiacu River.

Head $4\frac{1}{2}$; depth $9\frac{1}{3}$; D. I, 7; A. I, 5; P. I, 6; V. I, 5; scales 30 in lateral series to caudal base, lateral keels united or approximated after 16 scales; 20 scales behind dorsal; 3 predorsal scales; head width $1\frac{2}{3}$ in its length; head depth at occiput $2\frac{3}{5}$; snout $1\frac{2}{3}$; eye 5; mouth width $4\frac{1}{8}$; interorbital $4\frac{1}{2}$; dorsal spine $1\frac{1}{6}$; anal spine $1\frac{1}{4}$; pectoral spine $1\frac{3}{5}$; ventral spine $1\frac{1}{6}$.

Body slender in profile, deepest at ventral origin, and well depressed. Caudal peduncle well depressed, long, and surfaces about equally and broadly convex above and below.

¹⁸ Nat. Verh. Holl. Maats. (Descr. Silur. Suriname), XX, 1864, p. 20, Pl. 6, fig. 1, Pl. 13, fig. 1.

¹⁹ Trans. Zool. Soc., London, XVII, 1904, p. 286.

²⁰ Denk. Ak. Wiss. Wien, XLVI, 1882, p. 7, Pl. 3, fig. 2.

Head elongate, depressed, broadly convex above and more or less flattened below. Snout depressed, somewhat acuminate, length about equals greatest width, and upper profile slightly concave in front. Eye moderate, with eye socket well notched behind, general form ellipsoid, and center falls about last third in head length. Mouth anterior or slightly before middle in snout length, transverse, and jaws firm. Teeth apparently few, minute, close-set and uniserial. Buccal disk (damaged) apparently more or less rounded? Tongue broad, depressed, scarcely free. Nostrils together within an aperture about half length of orbital aperture, to which close before in lateral profile, and hind edge of aperture slopes up gradually.

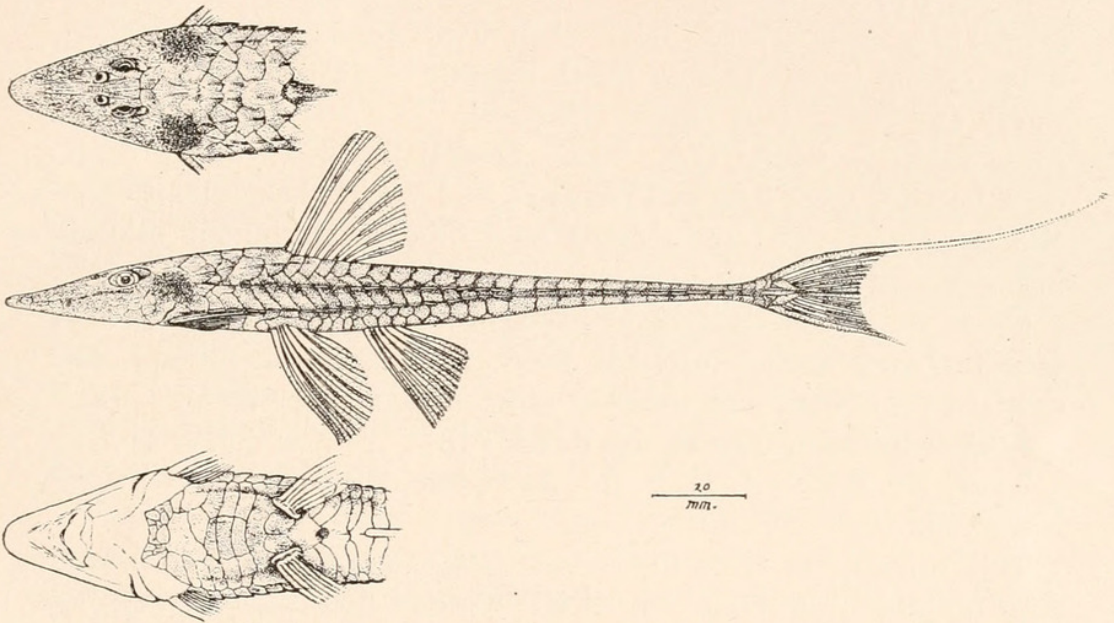


Fig. 10.—*Loricariichthys huxwelli* Fowler. (Type.)

Internasal space slightly less than half of interorbital. Cheeks very slightly concave, and interorbital similar. Opercle large, porous. Supraoccipital process broad basally, though forms narrow point about $\frac{3}{5}$ basal width.

Gill-openings lateral, extend forward about opposite eye center. Gill-rakers 4+8 ? short firm points, much less than filaments and latter little less than eye. Branchiostegals with outer broad.

Scales, or scutes, all more or less minutely spinescent. Predorsal region with 3 scutes to occipital. Three series of scutes transversely across middle of belly, with inner series broad. Anteriorly, or on breast, scutes smaller or more numerous. Two scutes between ventrals. Anterior 2 predorsal scales each with strong keel on each

side, and scales on each side with keel, which becomes obliterated after second scale along dorsal base, and posteriorly till near middle in length of caudal peduncle it forms only slight convexity on each scale. Lateral keels on each side made up of minute serræ, straight in their arrangement, and graduated longer to last, which largest. Each lateral scale of belly with rather obsolete keel. Head all more or less roughened with minute asperities, though slightly more conspicuous along lower edge of snout. All fin spines and outer rays of caudal finely spinescent.

Dorsal origin falls behind first third in length about an eye-diameter, spine slender and not larger than longer rays. Anal inserted well behind dorsal base, or slightly nearer snout tip than caudal base, spine scarcely larger than rays, and depressed fin extends $2\frac{4}{5}$ to caudal base. Caudal small, median rays short, and outer or upper and lower ones slightly enlarged. Pectoral reaches ventral, spine flexuous, longer than rays. Ventral inserted slightly before dorsal origin, spine long and flexuous, and reaches back about opposite middle of third scale along anal base. Vent about midway between ventral and anal origins.

Color in alcohol largely uniform brownish, apparently greatly faded. Lower surface of body pale. Fins all pale, uniform, and caudal with several pale irregular cross streaks. Iris dark.

Length 180 mm. (caudal tips damaged).

Type, No. 8,301, A. N. S. P. Ambyiacu River, Ecuador. John Hauxwell.

This example is close to *Loricariichthys maculatus* (Bloch), and may ultimately be found identical. Bloch's poor figure²¹ does not show much detail fit for comparison, and the synonymous *Loricaria amazonica* Castelnau²² is not much better. The snout, in both cases, is shown as more obtuse, similar to my examples of *Loricariichthys typus*. From Regan's description, my specimen differs in the longer snout and the abdomen with but a single series of plates between the lateral series. The carinate anterior plates are also characteristic, as his specimens are given at 190 mm. in length, and said to have all the predorsal plates weakly carinate in the young and without distinct keels in the adult.

(Named for John Hauxwell, who collected fishes in the Ambyiacu River many years ago.)

²¹ *Loricaria maculata* Bloch, Naturg. Ausl. Fische, VIII, 1794, p. 73, Pl. 375, fig. 1.

²² Anim. Amer. Sud, 1855, p. 46, Pl. 23, fig. 2.

Loricariichthys anus (Valenciennes).

Rio Jacuhy, Brazil. One of the smallest examples, 210 mm. long, differs in having the lateral scutes 25+9, which is more in accordance with the characters distinguishing *Loricaria spixii* Steindachner. In other respects it agrees with the present species.

Loricaria cataphracta Linnaeus.

One from Surinam, 228 mm. long (caudal tips damaged). Head width $1\frac{1}{3}$ in its length. Internasal region slightly elevated convexly. No lengthwise keels on interorbital and anterior occipital region. Ventral plates medianly in 3 or 4 irregular series. Lower naked surface of head extends rather well back on clavicle region.

Loricaria carinata Castelnau.

One from the Rio Maranon, 185 mm. long (caudal tips damaged). Head width $1\frac{1}{4}$ in its length. Internasal region not elevated. Two low lengthwise keels within interorbital space, approximating behind, where they continue closer as better marked supraoccipital keels. Ventral plates medianly in 4 or 5 irregular series. Naked surface of head below not extending on clavicles, which covered with many small plates. This specimen agrees with Eigenmann's photograph. The species is apparently not previously known from the Maranon, Cope having confused it with *L. cataphracta*.

Harttia platystoma (Günther).

Warraputa Falls, British Guiana.

Sturisoma guentheri (Regan).

Peru. This example agrees with Regan's figure and account. Scutes 20+16. Sutures on predorsal shield weak, so that it appears as rather large single plate, preceded by 2 more plates to supraoccipital process. Dorsal with traces of faint spots on fin-rays. Caudal with uppermost and lowermost rays produced (tips damaged), and with several dark spots, arranged mostly as transverse bands.

CYCLOPIIDÆ.**Cyclopium sabalo** (Valenciennes).

Rio Urubamba, Peru.

Cyclopium chimborazoi sp. nov. Fig. 11.

Head 3; depth 4; D. I, 5; A. I, 6; P. I, 10; V. I, 8; head trifle longer than wide; snout 2 in head length; eye about 12; mouth width about 3; interorbital about $5\frac{1}{2}$; dorsal spine $1\frac{2}{3}$; anal spine $1\frac{2}{3}$; pectoral nearly 1; ventral $1\frac{1}{3}$.

Body moderately long, compressed, deepest at dorsal origin. Caudal peduncle deep, compressed.

Head depressed slightly. Snout long, depressed. Eye high, midway in head length, without distinct eyelids. Mouth broad, transverse, slightly crescentic, falls little before first third in snout length. Buccal disk broad, especially lower lip, which extends back opposite front edge of pupil, and its surface finely papillose. Lateral barbel emanates about midway in snout length, and extends back about opposite hind eye edge. Teeth moderate, most of upper simple, pointed and with slender acuminate tips. Lower teeth bifid, and lateral prong smaller, otherwise like upper. Nostrils moderate, little closer than eyes are to one another, together, and placed about first third in snout length. Interorbital slightly convex.

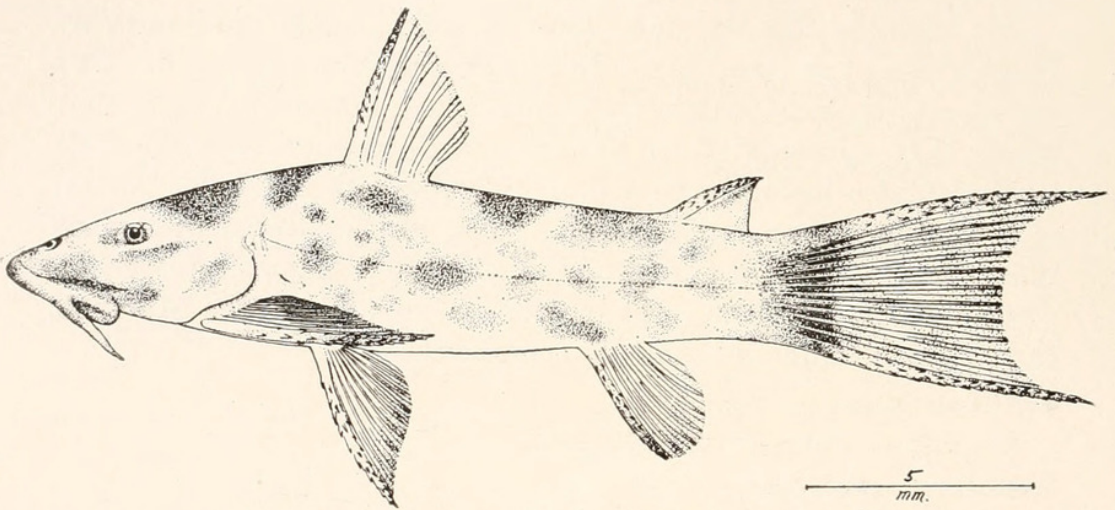


Fig. 11.—*Cyclopium chimborazoi* Fowler. (Type.)

Gill-opening lateral, mostly above insertion of pectoral.

Enlarged rays of fins all with small denticles or spinescent, body otherwise smooth. Humeral process unarmed, smooth, extends back about midway in pectoral fin.

Dorsal inserted little nearer snout tip than caudal base, spine rather flexible terminally, longest of radii, and extends back little over half way to adipose fin. Latter rather large, placed mostly behind anal. Anal base entirely before adipose fin, and origin nearly midway between last dorsal ray base and caudal base. Caudal deeply emarginate, median rays much shorter than outer, so that hind edge lunate. Pectoral low, extends back slightly beyond dorsal base. Ventral inserted slightly before dorsal, reaches $\frac{2}{3}$ to anal.

Color in alcohol pale brownish, clouded with darker irregularly. Fins mostly pale. Iris pale slaty.

Length 24 mm.

Type No. 43,523, A. N. S. P. Junction of the Chanchan River and Chiguancay River, Province of Chimborazo, Ecuador. March, 1911. S. N. Rhoads. Purchased.

Only the type known. Since the appearance of Regan's work in 1904 a number of species have been described and referred to the genus *Cyclopium*.²³ Possibly the nearest approach to the present is *C. cirratum* (Regan)²⁴ from southwestern Columbia, which, however, would differ in having the ventrals nearly reaching the anal, the pectoral reaching to the ventral base, a smaller head, and a black bar on the caudal fin medianly.

(Named for the Province of Chimborazo, in which the type was secured.)

²³ Pellegrin, Arc Mérid. Équator., IX (2), 1912, pp. 1-15, Pl. 1. Eigenmann Indiana Univ. Studies, X, No. 8, September, 1912, pp. 13-16.

²⁴ *Arges cirratus* Regan, Proc. Z. Soc. London, 1912, p. 670.



Fowler, Henry W. 1915. "Notes on nematognathous fishes." *Proceedings of the Academy of Natural Sciences of Philadelphia* 67, 203–243.

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