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A REVIEW OF THE ERYTHRININÆ.

BY CARL H. EIGENMANN AND ROSA S. EIGENMANN.

(With Plate I.)

The Erythrininæ is a sub-family of the Characinidæ. It has usually been separated from the remaining sub-families on account of the absence of an adipose fin. This absence of the adipose fin, when isolated from other characters, seems to us to be of little value in classification. The genera of this sub-family are more closely related to the Anostomatinæ than they are to the Curimatinæ, with which they have usually been associated.

The species of this sub-family are, with two exceptions, confined to the eastern slopes of South America and the adjacent islands.

The specimens examined belong to the Museum of Comparative Zoölogy at Cambridge, Mass.

ERYTHRININÆ.

Adipose fin none. Gill opening wide, the membranes slightly united, free from the isthmus. Nares approximated. Teeth well developed, at least in the jaws; pharyngeal teeth villiform. Cheeks covered by the suborbital bones. Brain case entirely enclosed above. Body elongate, slender, fusiform or sub-fusiform. Back not greatly arched, belly rounded. Dorsal short, of 8 to 15 rays. Intestines short. Carnivorous.

ANALYSIS OF THE GENERA.

a. Dorsal in advance of the anal, usually over or little behind the ventrals. A. 10–13.

b. Gape very wide, little oblique, maxillary reaching at least middle of orbit. Intermaxillaries and dentaries with strong canines; maxillary with fine pectinate teeth; palatines dentiferous. Caudal rounded; dorsal over ventrals. Lateral line developed.

c. Walls of the air bladder normal. Outer series of palatine teeth enlarged and removed from the villiform teeth; a detached patch of teeth in front of the palatines. Dentary with canines anteriorly and laterally. Maxillary with a canine anteriorly; all teeth pointed. Dentary process joined to the dentary at the symphysis, within the lateral canines and merging into the dentiferous ridge midway between symphysis and posterior angle of dentary; the pit formed behind the larger canine and the one behind the lateral canines filled with numerous short conical teeth which lie concealed in the muscles; a deep pit in the intermaxillary for the reception of the larger dentary canine. Snout pointed; maxillary and mandible extending beyond the orbit. Supratemporal plate single. D. 12-15; A. 11. Lat. l. 39-44 (fig. 1). *Macrodon* 1.

cc. Walls of the anterior portion of the posterior air bladder cellular. Palatine teeth all villiform, in a single patch on the sides of the palate. Maxillary with pectinate teeth only, no canines. Dentary with short conical teeth; two canines near the symphysis the outer of which is the larger; no lateral canines. All the teeth blunt. Dentary process joined for its whole length to the dentiferous ridge. Intermaxillary without a pit. Snout decurved, rounded. Supratemporal plate double. D. 11-12; A. 11; Lat. l. about 33 (fig. 2). *Erythrinus* 2.

bb. Gape oblique, not reaching beyond middle of orbit, usually shorter. Maxillary with a few slender teeth, no canines. Palate edentulous or slightly roughened in *Lebiasina;* caudal forked or emarginate. Lateral line obsolete or developed on a few scales only.

d. Walls of the air bladder normal. Teeth all conical; intermaxillary teeth in one or two series; dentary teeth in two series; maxillary teeth in a single series; mouth very oblique; maxillary not reaching orbit. Cypriniform. Species with a black spot on dorsal (fig. 3). *Pyrrhulina* 3.

dd. Walls of the anterior portion of the posterior air bladder cellular. Intermaxillary, maxillary and outer series of the dentary teeth tricuspid; dentary with an inner series of much finer conical teeth separated from the outer series by a deep groove; supratemporal plate double (fig. 5). *Lebiasina* 4.

aa. Dorsal over the anal. A. 20-31; V. 6. Opercle terminating in a spine or filament. Teeth compressed, with multicuspid crowns, the median cusp longest, in two rows on intermaxillary, in a single row on mandible; palate toothless. Caudal deeply forked; lat. l. present. Body subfusiform, compressed. Mouth moderate, oblique. *Stevardia* 5.

I. Macrodon.

Macrodon Müller '42a* 308 (*trahira*).

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* See Bibliography at end of paper.

Type: *Macrodon trahira* Spix.

This genus is composed of two species inhabiting respectively the east and west slopes of South America. The head is more elongate, the snout more pointed and the dentition more formidable than in the other genera of the *Erythrininæ*.

ANALYSIS OF THE SPECIES.

a. Eleven series of scales across the back of the tail from one lateral line to the other. Lat. l. 43-44; D. 14; A. 11. Sides mottled with light and dark brown. *microlepis* 1.

aa. Nine series of scales across the back of the tail from one lateral line to the other. Lat. l. 39-43; D. 12-15; A. 10-11. Sides plain or mottled; young usually with a dark lateral band. *malabaricus* 2.

1. Macrodon microlepis.

Macrodon microlepis Gthr. '64, 282 (Chagres River; Western Ecuador).
Macrodon tahira microlepis Steind. '80a, 49 (Guayaquil)).
Habitat: Western slopes of South America from Guayaquil to Panama.

Two specimens .05 and .365 m. from near Obispo and from the Rio Chagres near Gorgona. The smaller specimen is somewhat more slender and has an indistinct dusky area along the lateral line, the fins are higher and less profusely spotted; the pectoral is plain with an aggregation of dark dots at its base. There are thirteen series of scales across the back before the dorsal fin in both specimens.

The larger specimen has the vertical fins profusely spotted and barred, the bars on the caudal and anal leaving only narrow light bars of the ground color. Tongue with a few granular patches at its base.

2. Macrodon malabaricus.

Haimuri; Haimara; Huri; Canhui; Tari-ira; Trahira.
Tareira Maregrave, 1648, 157.
Esox malabaricus Bloch. 1794, pt. 8, 149, pl. 392 (Tranquebar.)
Synodus malabaricus Bl. & Schn. 1801, "397."
Synodus tareira Bl. & Schn. 1801, "398, pl. 79."
Macrodon tareira C. & V. xix. '46, 508 (Bahia; San Francisco; Amazon; Maracaibo).
Erythrinus trahira Spix. '29, pl. 18; Cast. '55, 56 (Bahia).
Macrodon trahira M. & T. '48a, 632 (all streams, especially near cascades); Gthr. '64a (Demerara; Essequibo; Rio Capin, Para; Rio

Capai; Bahia); Lütk. '75a, 184 (Rio das Velhas); Gthr. '68a, 239 (Huallaga); Steind. '74a, 26 (Orinoco; Essequibo; Amazon; Rio Plata; Rio San Francisco; Rio Una); Cope, '78a, 694 (Peruvian Amazon); Steind. '78a, 31 (Rio Magdalena); Steind. '80a, 14 (Cauca); Steind. '82a, 11 (Huallaga).

Erythrinus macrodon Agassiz '29, 43, pl. xviii. (Almada, Prov. Bahia; San Francisco); Schomb. '41, 41a (all rivers of Guiana).

Erythrinus microcephalus Ag. '29, 44 (San Francisco).

Erythrinus brasiliensis Spix. '29, 45, pl. xx. (Peruaguacu); M. & T. 48a, 633 (all streams); Cast. '55a (Carandahy, Rio das Mortes, Minas Geraes.)

Macrodon guavina Val. '33, 179, pl. 48, fig. 1; C. & V. xix. 527 (Lake Tacarigua).

Macrodon auritus C. & V. xix. 519 (Montevideo); Steind. '69b, 12 (Montevideo).

Macrodon teres C. & V. xix. 521 (Lake Maracaibo).

Macrodon patana C. & V. xix. 522 (Cayenne).

Macrodon aimara C. & V. xix. 523, pl. 586 (Cayenne).

Macrodon ferox Gill '58a, 51 (Trinidad).

Macrodon intermedius Gthr. '64, 282 (Cipo River); id. '80a (La Plata).

Habitat: Eastern slope of South America from La Plata to Rio Magdalena and Huallaga.

Valenciennes united the species mentioned by Agassiz and Spix with the *Tareira* of Marcgrave, but separates numerous other species from it on slight differences. Steindachner, in his papers on the Fishes of the Magdalena and on the Fishes of Southeastern Brazil, has given his reasons for uniting all these species with the *tareira*. Bloch gives an easily recognizable figure of this species, but represents it as coming from Tranquebar.

We have been enabled to examine about 400 specimens, .035–.46 m., from 61 different localities: Para; Gurupa; Villa Bella; Avary; Montalegre; Arary; Porto do Moz; Obidos; Lago Alexo; Tonantins; Manaos; Tapajos; Santarem; Cudajas; Hyanuary; Manacapuru; Rio Negro; Silva, Lake Saraca; Teffé; Hyavary; Rio Negro, near Lago Alexo; Itabapuana; Tabatinga; Jutahy; Lago Maximo; Içа; Tajapuru; Maues; Jatuarana; Lago Iuparana; Serpa; Lago Alexo; Campos; Barra de Pirahy; Rio Parahyba; Paraguay; Ueranduba; Surinam; Rio das Velhas; Rio San

Francisco; Bon Jardin, R. S. F.; Rio Doce; Bahia; Santa Cruz; Santa Clara; Rio Mucury; Sao Matheos; Rio San Antonio; Rio Janeiro; Goyaz; San Gonçallo; Jequitinhonha; Rio Puty; Buenos Ayres; Rio Grande; Porto Alegre; Rio Arassuahy, Minas Geraes; Muriahe; Guiana; Rio Ipojuco, Province Pernambuco.

This seems to be one of the commonest food fishes of all the rivers east of the Andes. It is found in the whole course of these streams, occurring in the Amazons between Para and the Rio Huallaga.

The coloration varies considerably with the localities and with age, the different localities regulating the degree of light or darkness. In specimens .06 m. long there is a conspicuous dark lateral band from the tip of the snout to the base of the caudal; in larger specimens portions of the band become broadened to form blotches while the remaining portions are margined by a dark line and bordered by a light or silvery area; with age the band, and afterwards the blotches disappear; in the largest specimens the dorsal surface is thickly covered with small spots. The fin rays of the vertical fins are spotted and the spots frequently extend on the membrane to form bands. The pectoral and ventral fins are occasionally dusky without distinct spots. The belly is white, occasionally spotted; the chin frequently crossed by purplish bars; there is usually a round dark spot at the upper posterior angle of the caudal peduncle.

The scales are uniformly larger in this species than in *microlepis*. In a specimen .39 m. collected by Mr. Wheatland at Buenos Ayres there are 12, 11, 11, 9 series of scales from one lateral line to the other in respectively the first, second, third and fourth series behind the dorsal; this is due however to the splitting of the median scales of the back. Several other specimens present similar conditions. The scales of the lateral line vary from 39–43.

The size of the canine teeth and the lingual patches of teeth vary considerably. We have been unable to detect

any uniformity of variation, one organ varying indiscriminately of another.

The food of this species consists at least partly of other fishes.

II. Erythrinus.

Erythrinus Gronow 1763, 114 (based on *Cyprinus cylindricus* L.=*C. cepholus* L. in part=*salmoneus*); Müller '42a, 308 (sp.); Müller & Troschel '45a, 5 (sp.); Gthr. '64, 283 (*unitæniatus*, *gronovii*).

Hetererythrinus Gthr. '64, 283 (salmoneus).

Type: *Erythrinus salmoneus* Gronow.

The *Erythrinus* of Cuvier, Müller and Günther is not the *Erythrinus* of Gronow. The latter has *salmoneus* for its type, and is identical with Gunther's *Hetererythrinus*.

The species of this genus are smaller and less widely distributed than those of *Macrodon*.

ANALYSIS OF THE SPECIES.

a. Pterygoids with teeth; dorsal rounded.

b. Caudal blackish; body usually with a dark lateral band; young without a humeral spot. *unitæniatus* 1.

bb. Caudal with four or five cross-bars of spots; sometimes a blackish spot near caudal; posterior portion of the body with vertical dark streaks. *salvus* 2.

aa. Pterygoids without teeth; dorsal fin angular or pointed, some of the posterior rays being prolonged.

c. Ventrals not reaching beyond origin of anal. *erythrinus* 3.

cc. Ventrals reaching far beyond origin of anal; posterior dorsal rays longer than the head; upper parts and all the fins blackish; crown of the head with black dots (Günther). *longipinnis* 4.

1. Erythrinus unitæniatus.

Huri; Canhui; Wauben.

Maturaque Marcgrave, 1648, 169 (in standing water).

? Synodontis palustris Bloch & Schneider 1801, 398 (Brazil).

Erythrinus unitæniatus Spix. '29, 42, pl. 19 (San Francisco); M. & T. '45a, 5, pl. iii, fig. 1 (Brazil; Guiana); C. & V. '46, 486 (Mana; Cayenne; Bahia); M. & T. 48a, 632 (Canaku mountain streams); Gthr. '64, 283 (Demerara; Surinam; Es-equibo; River Capin, Para; River Capai; Bahia); Gthr. 68a, 239 (Trinidad); Steind. '74a, 28 (Rio Parahyba; Victoria; Bahia; Santarem; Villa Bella; Porto do

Moz; Obidos; Cudajas; Curupira; Tabatinga; Arary; Maues; Lago Jose Assu); Steind. '82a, 11 (Rio Amazonas; Iquitos).
Erythrinus vittatus C. & V., xix '46, 499, pl. 585 (Cayenne; Surinam; Brazil).
Erythrinus cinereus Gill. 58a, 53 (Trinidad).
Erythrinus kessleri Steind. 76b, 38 (Bahia).
Habitat: Rio Parahyba to Guiana and Peru; Trinidad.

The young of this species is sometimes uniform dusky, without spots on the fins. This is doubtless the condition figured by Marcgrave.

Dr. Gunther identified ('64, 283) *Erythrinus vittatus* C. & V., with *E. unitæniatus*. He also ('68a, 239) pronounces specimens from Trinidad, presumably the *cinereus* of Gill, identical with *unitæniatus*.

Dr. Steindachner ('76b, 38) described his *kessleri* from three specimens 2″ 8‴–4″ 6‴ long, collected at Bahia. We have examined two of these specimens and also a number of others from the same locality, and have found teeth on the pterygoids in very narrow patches. On comparison with the smallest specimens from other localities, which were larger however, the pterygoid patches of teeth were a little wider. There cannot be the least doubt that the *kessleri* of Steind. is the young of *unitæniatus*.

We have examined 90 specimens .07–.31 m. from Sao Matheos; Rio Doce; Bahia; Para; Cudajas; Obidos; Villa Bella; Serpa; Santarem; Silva, Lake Saraca; Hyanuary; Maues; Porto do Moz; Curupera; Tabatinga; Lake José Assu; Goyaz.

The typical specimens have a dark lateral band, which when present is most marked in specimens .20 m. long. This band is sometimes absent in specimens otherwise like those with the band. There are three dark bands extending from the eye to the edge of the opercle; these are also sometimes wanting. The dark opercular blotch can be seen in all specimens. Specimens .20 m. long from Sao Matheos are uniform dark-brown, the fins of a similar color, without any spots. Other specimens from the same

locality have the dorsal and anal spotted, and a dark spot at the base of each scale, and another has the dark lateral band. Two specimens, .09 m., from Goyaz, have the bands of the head and opercular spot quite marked, and the sides with more or less interrupted vertical streaks. In these specimens no pterygoid teeth could be detected—a condition which may be explained by their age.

In the young the pterygoid teeth are minute and in seemingly but a single series, or entirely wanting; in the old the patches are almost as wide as the palatine patches, and contiguous. The young of this species can be readily distinguished from that of *salmoneus* by the color.

2. Erythrinus salvus.

Erythrinus salvus Agassiz '29, 41 (San Francisco); M. & T. '48a, 632 (Forest Streams and Ponds).

Erythrinus gronovii C. & V. xix, '46, 500 (Cayenne); Gthr. '64, 284 (copied); Peters. '77a, 472 (Calobozo).

Habitat: San Francisco; Guiana; Orinoco.

The species *salvus* and *gronovii* both differ from *unitæniatus* in the color of the caudal. The first was based on a specimen taken from the stomach of *Macrodon*. The difference in the localities seems to be the chief reason for separating the species.

3. Erythrinus erythrinus.

Cyprinus cylindricus L. Mus. Ad. Fred. 77, pl. 30, 1754.

Cyprinus cephalus L. 1758, 322; 1766, 527 (in part).

Erythrinus Gronow. 1754, ii. 6, No. 154, pl. 7, fig 6 & 1763, 114.

Synodus erythrinus Bloch & Schn. 1801, 397.

Erythrinus salmoneus Gronow '54a, 170 (Surinam); Gthr. '64, 284 (Surinam; Rio Cupai); Steind. '76b, 39 (Gurupa; Santarem; Tabatinga; Cudajas; Ueranduba; Tajapuru; Lago Alexo; Manacapuru); Cope '78a, 694 (Peruvian Amazon).

Erythrinus brevicauda Gthr. '64, 285 (hab.?); Cope, '78a, 693 (Peruvian Amazon).

Habitat: Rio Janeiro to Surinam and Peru.

Dr. Steindachner gives a good description of this species and identifies both the *longipinnis* and *brevicauda* with it.

As we have not been able to find any specimens with fins approaching the length described for *longipinnis* we have kept that species distinct.

Sixty-six specimens, .055–.175 m. Surinam; British Guiana; Gurupa; Tajapuru; Porto do Moz; Santarem; Cudajas; Lago Alexo; Manacapuru; Teffé; Tabatinga; Rio Janeiro; Ueranduba.

In the specimens examined the ventrals were never found to extend beyond the origin of the anal, and the longest dorsal ray is always shorter than the head. The young of this species can readily be distinguished by the large caudal and humeral spots; the sides of the young are usually marked with dark cross shades.

4. Erythrinus longipinnis.

Erythrinus longipinnis Gthr. '64, 285 (Essequibo).
Habitat: Essequibo.

III. Pyrrhulina.

Pyrrhulina C. & V. xix. '46, 535 (*filamentosa*).
Holotaxis Cope. '70a, 563 (*melanostomus*).*
Type: *Pyrrhulina filamentosa* C. & V.

This genus embraces all the smaller *Erythrininæ*. The largest scarcely exceed .10 m. in length.

ANALYSIS OF THE SPECIES.

a. A black band through the opercle and orbit around the edge of the premaxillary, another around edge of mandible; brownish above, yellow below; lateral scales with orange base and brown edges, forming longitudinal lines. D. 9; A. I. 10; Lat. l. 25 (Cope). *melanostoma* 1.

aa. Band if present not extending around premaxillary.

b. A large black saddle below and in front of dorsal; eye $3\frac{1}{3}$ in head; chin very prominent; maxillary teeth as large as those of the premaxillaries; distance of origin of dorsal fin from snout $\frac{1}{2}$ longer than its distance from caudal. Pectorals reaching ventrals; ventrals filamentous, reaching anal. Median dorsal and longest caudal rays filamentous. Scales orange at base with broad blackish margins. Mandible black edged. Head 4; depth 4; D. 10; A. 10; Lat. l. 26, tr. 5. *læta* 2.

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*The type of *Holotaxis* very probably has but a single series of teeth in the upper jaw, in which case the genus *Holotaxis* may be retained distinct.

bb. Back without a saddle-shaped spot.

c. Intermaxillary with two series of teeth.

d. Lat. l. 25-26 (30 according to C. & V.); a black band from edge of opercle around snout, the margin of the mandible being black; origin of dorsal equidistant from base of middle caudal rays and base of pectoral. D. 9; A. 10. *filamentosa* 3.

dd. Lat. l. 23–25; a black band from end of opercle around snout and lower jaw, continued on anterior portion of body; sides otherwise light brown. Head 4–4¼; depth 3⅖; D. 10; A. 9-11. *semifasciata* 4.

ddd. Lat. l. 20–21.

e. Caudal peduncle little if any longer than snout and eye; female light brown; male with a dark lateral band and the ventrals margined with black. Dorsal low, rounded, its spot indistinct, confined to the middle of the anterior rays, origin of dorsal about equidistant from base of middle caudal rays and base of pectoral. Caudal lobes equal. Head 3⅔–4; depth 3⅔; D. 10; A. 11–12. *brevis* 5.

ee. Caudal peduncle little shorter than the head; height of dorsal much greater than length of head, the spot large and distinct reaching to tip of the anterior rays, origin of dorsal equidistant from caudal and posterior margin of orbit. Head 4⅖; depth 4¼; D. 10; A. 10. *maxima* 6.

cc. Intermaxillary with a single series of teeth.

f. Origin of dorsal behind origin of ventrals.

g. Lat. l. 20; caudal peduncle equal to the head in length; dorsal short and high, its highest rays sometimes reaching caudal; origin of dorsal equidistant between bases of ventral and caudal or nearer base of caudal. Upper caudal lobe much longer than the lower. Dorsal spot margined with white below; a black spot at base of lower caudal rays. Head 4-4¼; depth 4½–6; D. 10; A. 11. *nattereri* 7.

gg. Lat. l. 23–24; caudal peduncle about equal to the head without opercle; dorsal comparatively low, its highest ray reaching little if any more than half way to base of caudal; origin of dorsal equidistant from caudal and anterior half of eye. Upper caudal lobe not much longer than lower. A dusky humeral spot; lateral scales with a bright silvery basal spot. Caudal and anal faintly barred. Head 4; depth 3⅔-3⅘; D. 10; A. 11. *guttata* 8.

ff. Origin of dorsal over origin of ventrals, equidistant from base of upper caudal rays and anterior margin of orbit. Eye 3 in head. Olivaceous, a silvery spot at base of each scale; sides of head silvery. Head 4⅛; depth 4⅛; D. I, 9; A. I, 9; Lat. l. 25 (Cope). *argyrops* 9.

1. Pyrrhulina melanostoma.

Holotaxis melanostomus Cope. '70a, 563 (Pebas).

Habitat: Marañon.

This species is known from the type only. The two bands of the snout distinguish it.

2. Pyrrhulina læta.

Holotaxis læta Cope. '72a, 257 (Ambyiacu).

Habitat: Ambyiacu.

3. Pyrrhulina filamentosa.

Pyrrhulina filamentosa C. & V. xix. '46, 535, pl. 589(Surinam); Gthr. '64, 286 (Essequibo); Steind. '75a, 2 (Cayenne).

Habitat: The Guianas.

The type of this species is said to possess 30 scales in a longitudinal series. If this is so the specimens mentioned by Drs. Günther and Steindachner are distinct from it, as they have but 25-26 scales.

4. Pyrrhulina semifasciata.

Pyrrhulina semifasciata Steind. '75a, 2. pl. 1, fig. 1–2a (Stagnant water near Barra do Rio Negro; Cudajas; Gurupa; Tabatinga).

Habitat: Amazons from Gurupa to Tabatinga.

About two hundred specimens, the largest 09 m.

Tabatinga; Cudajas; Obidos; Hyanuary; Jose Fernandez; Manacapuru; Jutahy; Curupira; Santarem; Silva, Lake Saraca; Villa Bella; Gurupa.

Teeth of the outer dentary series decidedly longer and stronger at the side of the jaw; teeth of the outer intermaxillary band strongest at the middle of the mouth. Usually very light brown. Adult with a band extending from the symphysis about half way to the caudal. In the male a dusky area below this band. Sometimes one or two accessory bands similar to the median band. In the young this band extends little beyond the first scale behind the head. A dusky area at the occiput, another some distance in front of the dorsal, an orange streak between them. The dorsal spot is margined below by a slightly lighter area; the caudal is frequently indistinctly barred; the outer or anterior rays of the fins frequently white.

Ventrals sometimes reaching anal, usually falling far short of the anal.

5. Pyrrhulina brevis.

Pyrrhulina brevis Steind., '75a, 6, pl. 1, fig. 3-4 (Mouth of Rio Negro; Cudajas; Tabatinga; Rio Negro, near Manaos).

Over twenty specimens, the largest .065 m.

Tabatinga; Lago Alexo; Cudajas; Manaos; Montalegre; Obidos; Villa Bella.

This species is closely related to *semifasciata* and *guttata*. In the female the sides are plain with sometimes lighter spots at the base of the scales, as in *guttata*. There is usually a dark band on the side of the head. In the males there is a dusky line along the head and the sides, regions below the level of this line in the adult are also dusky. The fins in the male are also slightly margined with dark. The dorsal spot is indistinct. In three specimens .028 m. long, from Tabatinga, there is a conspicuous dark serrate-margined band from the caudal to the head, and a narrower smooth-margined one on the head. The dorsal spots in these specimens are much more marked than in the larger. Four specimens from Montalegre, the smallest .03 m., have the sides plain, and two male specimens from Cudajas, .055 m., have a dark blotch behind the head. The fins are much better developed in the male than in the female. The ventrals in the male reach to the anal, and the anal to the caudal. The longest ray of the dorsal is little longer than the head.

Our specimens do not agree with Dr. Steindachner's figures in the position of the dorsal and anal.

6. Pyrrhulina maxima sp. n.

Type No. 6343; one specimen. .08 m. to base of caudal. Tabatinga. Bourget.

This species is closely related to *P. brevis* and *P. nattereri*. Its color and dentition distinguish it from *nattereri*, while its long caudal peduncle, the position of the dorsal and color serve to distinguish it from *brevis*. The scales are

partly lost, so an exact count is impossible. As already stated, Dr. Steindachner's figures of *P. brevis* do not agree with the specimens examined by us. The comparisons made in the key are based on the specimens examined.

7. Pyrrhulina nattereri.

Pyrrhulina nattereri Steind. '75a, 8, pl. ii, fig. 5-5a (mouth of Rio Negro; Obidos).

Habitat: Amazons from Obidos to Cudajas.

One hundred and sixty specimens, the largest .055 m. Rio Trombetas; Villa Bella; Manaos; Silva, Lake Saraca; Hyanuary; Cudajas; Jatuarana; Obidos.

This is the most slender species of Pyrrhulina. It can easily be recognized by the color. Each scale has a silvery center and dusky margin. In some specimens the color markings of the lower half of the sides are obliterated by a dusky lateral band, the region above it being lighter than usual. The fins vary greatly in height. In the largest specimen the height of the dorsal is little less than half the length, and the ventrals reach beyond the base of the anal. Usually the dorsal does not reach to the caudal, and the ventrals not to the anal.

8. Pyrrhulina guttata.

Pyrrhulina guttata Steind. '75a, 10, pl. ii, fig. 6-6a (Obidos; Cudajas; Tabatinga; Rio Negro).

Habitat: Amazons from Gurupa to Tabatinga, Rio Negro.

The relative abundance of this species may be seen from the number of specimens from each locality.

Gurupa, 3 specimens; Tajapuru, 11; Villa Bella, 6; Obidos, 399; Santarem, 1; Manacapuru, 24; Cudajas, 8; Tabatinga, 31; Curupira, 2.

The largest specimen is from Cudajas, and measures .098 m. The color varies greatly, the markings are more constant. The specimens from Cudajas are light straw colored; those from Obidos dark brown, lighter below. There is usually a silvery white spot at the base of each scale of the sides; they are sometimes found on the median scales of the tail

only, and sometimes entirely wanting. The sides of the head and snout are always plain. The dorsal spot varies in size and intensity of color; the middle caudal rays have three faint dusky cross-bars; the middle of the last anal ray is usually milky white, the white being bordered above and below by dusky areas; tips of the outer ventral rays usually milky white.

Fins always low, the ventrals not nearly reaching the vent.

9. Pyrrhulina argyrops.

Pyrrhulina argyrops Cope '78a, 694 (Peruvian Amazon).

Habitat: Marañon.

This species is known only from the types; it may be distinguished by the relative position of its dorsal.

IV. Lebiasina.

Lebiasina C. & V. xix, '46, 531 (*bimaculata*).

Type: *Lebiasina bimaculata* C. & V.

The single species of this genus is found in the western streams of Peru and Ecuador.

1. Lebiasina bimaculata.

Lebiasina bimaculata C. & V. xix, '46, 531, pl. 587 (Remac, near Lima); Gthr. '64, 286 (Bay of Callao; Western Andes of Ecuador); Steind. '79a, 22 (Rio Remac, near Callao and Lima; Rio Jurumilla; Pascamayo).

Habitat: Western slopes of Peru and Ecuador; Callao Bay.

Sixty-two specimens, .05–.19 m. Rio Remac, near Callao and Lima.

In the general shape this species resembles the species of *Macrodon* and *Erythrinus*. Sides with a faint band; a conspicuous black spot at base of middle caudal rays; a fainter one behind the head.

D. 10; A. 11. Lat. l. 25.

V. Stevardia.

Stevardia Gill, '58a, 63 (*albipinnis*).

Corynopoma Gill, '58a, 65 (*riisei*); Gthr., '64, 287 (sp.).

Nematopoma Gill, '58a, 68 (*searlesii*).

Type: *Stevardia albipinnis* Gill.

As far as known, the members of this genus, four in number, are confined to the Island of Trinidad. The species were at first described under three generic names. We have followed Dr. Günther in uniting them. The name *Stevardia*, however, has priority over *Corynopoma*.

ANALYSIS OF THE SPECIES.

a. Anal rays decreasing in height backward; caudal lobes subequal.

b. Opercle with a triangular, spiniform dilation behind. Eye $3\frac{1}{3}$ in head, 1 in interorbital. Dorsal $\frac{1}{3}$ higher than long. D. 10; A. 20; l.l. 40; tail with a dark lateral stripe; fins white. (*Stevardia*.) *albipinnis* 1.

bb. Opercle with a posterior triangular dilation, continued in a more or less long and slender compressed process; last two or three anal rays produced. (*Corynopoma*.)

c. D. 8; A. 27. Anal three times as long as the dorsal; opercular process deflected, advancing but little beyond the inner angle of the base of the pectoral; color as in *albipinnis*. *riisei* 2.

cc. D. 9; A. 31. Dorsal more than twice as high as long; opercular process deflected at its base, then advancing upward with a curve and terminating on a line with the base of the ventral; color as above. *veedonii* 3.

aa. Anal rays increasing in height posteriorly; lower caudal lobe much longer than upper; opercular process continued in a filament which extends beyond the dorsal. D. 10; A. 26–29; Lat. l. 42. Eye less than 3 in head, more than 1 in interorbital. Highest dorsal ray five times the length of the base of the dorsal. Base of anal $3\frac{1}{2}$ that of the dorsal, its height not much more than half that of the dorsal. Pectorals extending as far as the ventrals, beyond the origin of the anal. *searlesii* 4.

1. **Stevardia albipinnis.**

Stevardia albipinnis Gill '58a, 65 (Trinidad).

Corynopoma albipinne Gthr. '64, 287 (copied).

2. **Stevardia riisei.**

Corynopoma riisei Gill '58a, 66 (Trinidad); Gthr. '64, 287 (copied). Lütk. '74a, 224.

3. **Stevardia veedonii.**

Corynopoma veedonii Gill '58a, 67 (Trinidad); Gthr. '64, 287 (copied).

4. **Stevardia searlesii.**

Nematopoma searlesii Gill '58a, 69 (Trinidad).

Corynopoma searlesii Gthr. '64, 288 (copied); Lütk. '74a, 222 with fig. (Trinidad).

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EXPLANATION OF THE FIGURES.

pr.—premaxillary.

mx.—maxillary.

m.—mandible, side view.

m'—mandible, viewed from above.

1.—*Macrodon malabaricus* Bloch.

2.—*Erythrinus unitæniatus* Spix.

3.—*Pyrrhulina guttata* Steindachner, × 4.

4.—*Pyrrhulina maxima* sp. nov.

5.—*Lebiasina bimaculata* C. & V., × 4.