

XXXVI.—*A Revision of the Fishes of the American Cichlid Genus Cichlosoma and of the Allied Genera.* By C. TATE REGAN, B.A.

[Continued from p. 243.]

Section 9.

Two species from Central America agree in most respects with those of the preceding section, but differ in the somewhat fewer teeth, which are more distinctly enlarged anteriorly. Dorsal XVI–XVII 11–12. Anal VII 8–9.

38. *Cichlosoma margaritiferum*.

Heros margaritifer, Günth. Cat. Fish. iv. p. 287 (1862), and Trans. Zool. Soc. vi. 1869, p. 450, pl. lxxi. fig. 2.

Cichlasoma margaritiferum, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1519; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 211 (1904).

Depth of body $2\frac{1}{5}$ in the length, length of head 3. Snout slightly longer than postorbital part of head. Diameter of eye $4\frac{1}{4}$ in the length of head, interorbital width 3. Depth of præorbital $1\frac{1}{3}$ the diameter of eye. Maxillary not extending to the vertical from anterior margin of eye; præmaxillary processes not extending to above eye; jaws equal anteriorly; fold of the lower lip slightly interrupted; cheek with 5 series of scales; 12 gill-rakers on the lower part of anterior arch. Scales $31\frac{6}{13}$, 3 between lateral line and base of anterior rays of soft dorsal. Dorsal XVII 11, commencing above the opercular cleft, the spines subequal from the sixth, the last less than $\frac{1}{2}$ the length of head; the soft fin, when laid back, extending to the anterior part of caudal. Anal VII 9. Pectoral a little shorter than the head, extending to the third or fourth anal spine; ventral extending to second anal spine. Caudal slightly emarginate, with rounded lobes. Caudal peduncle deeper than long. Brownish, with 6 or 7 dark cross-bars and a dark spot at the base of caudal; each scale of the side of the body with a white pearl-like spot; fins, except the pectoral, dusky, the dorsal with some oblique stripes, the caudal with clear spots.

Guatemala.

1. (164 mm.) type of the species. Guatemala. O. Salvin, Esq.

39. *Cichlosoma citrinellum*.

Heros citrinellus, Günth. Proc. Zool. Soc. 1864, p. 153, and Trans. Zool. Soc. vi. 1869, p. 458, pl. lxxi. fig. 1; Jord. & Everm. Bull. U.S. Nat.

Mus. xlvii. 1898, p. 1534; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 237 (1904).

Heros lobochilus (part.), Günth. Trans. Zool. Soc. vi. 1869, p. 457.

Heros basilaris, Gill & Bransford, Proc. Ac. Philad. 1877, p. 182; Pellegr. t. c. p. 238.

Cichlasoma basilare, Jord. & Everm. t. c. p. 1532.

Depth of body $2-2\frac{1}{4}$ in the length, length of head $2\frac{1}{5}-3$. Snout a little shorter than postorbital part of head. Diameter of eye $3\frac{3}{4}-4\frac{1}{4}$ in the length of head, interorbital width $2\frac{2}{5}-3$. Depth of præorbital about equal to the diameter of eye. Maxillary not extending to below the eye; præmaxillary processes extending to above anterior margin of eye; jaws equal anteriorly; fold of the lower lip continuous or subcontinuous; cheek with 4 or 5 series of scales; 9 or 10 gill-rakers on the lower part of anterior arch. Scales $31-33 \frac{6-7}{12-14}$, $2\frac{1}{2}-3\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVI-XVII 11-12, commencing above the opercular cleft, the spines subequal from the sixth to the fourteenth, thence increasing to the last, which is $\frac{1}{2}$ the length of head; soft fin, when laid back, extending to the middle of caudal or beyond. Anal VII 8-9. Pectoral as long as the head, extending to above the third or fourth anal spine; ventral extending beyond the origin of anal. Caudal rounded. Caudal peduncle $\frac{3}{5}-\frac{4}{5}$ as long as deep. Olivaceous or yellowish, the back darker, the dark colour sometimes extending as cross-bars on the sides of the body; sometimes a dark blotch on the middle of the side and a dark spot at the base of the caudal. Fins pale yellow or wholly or partly dark, sometimes spotted or barred.

Nicaragua.

1-3. (175-189 mm.) types of the species.	Lake Nicaragua.	O. Salvin, Esq.
4. (190 mm.)	Lake Managua.	Capt. J. M. Dow.
5. (180 mm.) one of the types of <i>H. basilaris</i> .	Lake Nicaragua.	Smithsonian Inst.
6. (138 mm.)	Lake Nicaragua.	Smithsonian Inst.

Section 10.

Three species from Nicaragua have the general form of those of the two preceding sections and are evidently closely allied to *C. citrinellum*, from which they differ in the exceptionally thick lips and in the dentition. Upper jaw with the anterior pair of teeth strongly enlarged; lower jaw with the two anterior pairs strong, subequal. Dorsal XVII 11-12. Anal VII-VIII 8-9. Caudal rounded or subtruncate.

40. *Cichlosoma erythræum*.

Heros erythræus, Günth. Trans. Zool. Soc. vi. 1869, p. 457, pl. lxxv. fig. 2; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1531; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 239 (1904).

Depth of body $2\frac{1}{4}$ in the length, length of head $2\frac{4}{5}$. Snout as long as postorbital part of head. Diameter of eye $4\frac{1}{3}$ in the length of head, interorbital width 3. Depth of præorbital equal to diameter of eye. Maxillary not extending to below the eye; præmaxillary processes extending to above anterior $\frac{1}{4}$ of eye; jaws equal anteriorly; lips thick, the lower with a continuous fold; cheek with 5 series of scales; 8 gill-rakers on the lower part of anterior arch. Scales $31\frac{7}{15}$, 3 between lateral line and base of anterior rays of soft dorsal. Dorsal XVII 12, commencing above the opercular cleft, the spines subequal from the sixth to the fifteenth, thence increasing to the last, which is a little more than $\frac{1}{3}$ the length of head. Anal VII 8. Pectoral nearly as long as the head, extending to above the fourth anal spine; ventral extending beyond origin of anal. Caudal peduncle $\frac{2}{3}$ as long as deep. Brownish, obscurely marbled with darker, and with some dark spots on the posterior part of the body; fins pale yellow.

Lake Managua, Nicaragua.

1. (180 mm.) type of the species. Lake Managua. Capt. J. M. Dow.

41. *Cichlosoma lobochilus*.

Heros lobochilus (part.), Günth. Trans. Zool. Soc. vi. 1869, p. 457, pl. lxxv. fig. 1; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1530; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 240 (1904).

Depth of body $2\frac{1}{4}$ in the length, length of head nearly 3. Snout as long as postorbital part of head. Diameter of eye $4\frac{1}{4}$ in the length of head, interorbital width 3. Depth of præorbital equal to diameter of eye. Maxillary not extending to below the eye; præmaxillary processes extending to above anterior $\frac{1}{3}$ of eye; jaws equal anteriorly; upper and lower lip each forming a large fleshy triangular flap; cheek with 5 series of scales; 9 gill-rakers on the lower part of anterior arch. Scales $31\frac{7}{13}$, $2\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVII 11, commencing above the opercular cleft, the spines subequal from the seventh to the fourteenth, thence increasing in length to the last, which is $\frac{1}{2}$ the length of head; soft fin, when laid back, extending to middle of caudal. Anal VII 9. Pectoral nearly as long as the head, extending to above third anal

spine; ventral extending to middle of anal. Caudal rounded. Caudal peduncle $\frac{5}{7}$ as long as deep. Olivaceous, with 7 dark cross-bars, the fourth bearing a darker blotch below the lateral line; a dark spot on the upper $\frac{1}{2}$ of base of caudal; vertical fins dusky, the soft dorsal with obscure darker spots.

Lake Managua, Nicaragua.

1. (196 mm.) type of the species. Lake Managua. Capt. J. M. Dow.

42. *Cichlosoma labiatum*.

Heros labiatus, Günth. Proc. Zool. Soc. 1864, p. 27, pl. iv. fig. 1, and Trans. Zool. Soc. vi. 1869, p. 456; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1530; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 239 (1904).

Depth of body $2\frac{1}{3}$ in the length, length of head $2\frac{1}{2}$ – $2\frac{3}{5}$. Snout as long as or longer than postorbital part of head. Diameter of eye $4\frac{1}{3}$ – $4\frac{2}{3}$ in the length of head, interorbital width 3 – $3\frac{2}{5}$. Depth of præorbital equal to or a little more than diameter of eye. Maxillary not extending to below the eye; præmaxillary processes extending to above anterior $\frac{1}{3}$ of eye; jaws equal anteriorly; upper and lower lip each forming a large fleshy triangular flap; 4 or 5 series of scales on the cheek; 11 or 12 gill-rakers on the lower part of anterior arch. Scales $30\frac{6}{13-14}$, 3 between lateral line and base of anterior rays of soft dorsal. Dorsal XVII 11–12, commencing above the opercular cleft, the spines subequal from the seventh to the fourteenth, thence increasing to the last, which is $\frac{1}{3}$ – $\frac{3}{8}$ the length of head; soft fin, when laid back, extending to posterior part of caudal. Anal VII–VIII 8–9. Pectoral $\frac{4}{5}$ the length of head, extending to above the fourth or fifth anal spine; ventral extending beyond origin or nearly to middle of anal. Caudal rounded or subtruncate. Caudal peduncle $\frac{3}{4}$ – $\frac{4}{5}$ as long as deep. Some specimens uniformly pale yellow, others brownish with obscure darker cross-bars and dark spots on the vertical fins.

Nicaragua.

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| 1–3. (178–190 mm.) types of | Lake Nicaragua. | Capt. J. M. Dow. |
| the species. | | |
| 4–5. (162 and 178 mm.) | Lake Managua. | Dr. P. L. Sclater. |

Section 11 (*Thorichthys*).

Body deep or moderately elongate (depth 2 – $2\frac{2}{3}$ in the length). Upper profile of snout straight, oblique. Scales of the lateral line of the same size as those above and below

it; scales of thoracic region considerably smaller than those on the side of the body. Mouth moderate, moderately protractile; maxillary slightly exposed; teeth of the outer series small or moderate, in the upper jaw moderately increasing in size anteriorly, in the lower with 4 or 5 anterior teeth on each side distinctly enlarged. Dorsal XV-XVII 8-12. Anal VI-IX 6-9. Dorsal and anal fins entirely scaleless. Caudal slightly emarginate, with pointed lobes.

Three species from Mexico and Central America are allied to *C. macracanthus* &c., but differ from all other members of the genus in the scaleless dorsal and anal fins and in the form of the caudal.

43. *Cichlosoma aureum*.

Heros aureus, Günth. Cat. Fish. iv. p. 292 (1862), and Trans. Zool. Soc. vi. 1869, p. 455, pl. lxxiii. fig. 2; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1533; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 238 (1904).

Heros Helli, Steind. Denkschr. Ak. Wien, xxiii. 1864, p. 64, pl. iv. fig. 1.

Heros maculipinnis, Steind. t. c. p. 69, pl. iv. fig. 2; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1530; Pellegr. t. c. p. 240.

Cichlasoma Helli, Jord. & Everm. t. c. p. 1521; Pellegr. t. c. p. 220.

Thorichthys Helli, Meek, Zool. Pub. Columbian Mus. v. 1904, p. 223.

Thorichthys Elli, Meek, l. c. fig. 72.

Depth of body $2-2\frac{2}{3}$ in the length, length of head $2\frac{2}{3}-3$. Snout straight, as long as postorbital part of head. Diameter of eye $2\frac{2}{3}-3\frac{1}{2}$ in the length of head, interorbital width $3-3\frac{1}{2}$. Depth of præorbital equal to the diameter of eye or less. Maxillary not quite extending to below the eye; præmaxillary processes extending to above anterior $\frac{1}{4}$ of eye; jaws equal anteriorly; fold of the lower lip continuous or not; cheek with 4-6 series of scales; 9 or 10 gill-rakers on the lower part of anterior arch. Scales $29-32\frac{5-6}{12-15}$, 2 or 3 between lateral line and base of anterior rays of soft dorsal. Dorsal XV-XVII 9-12, commencing above the opercular cleft, the spines subequal from the sixth, the last about $\frac{1}{2}$ the length of head; soft fin, when laid back, extending to anterior $\frac{1}{3}$ or middle of caudal. Anal VII-VIII 7-8 (VI-IX 6-9). Pectoral as long as the head, extending to above middle anal spines; ventral extending beyond origin of anal. Caudal slightly emarginate with pointed lobes. Caudal peduncle a little deeper than long. Olivaceous, with 6 dark cross-bars, the third bearing a blackish blotch on or below the lateral line; suboperculum usually blackish; head and anterior part

of the body with blue spots; vertical fins dusky, often with clear spots.

Guatemala; Southern Mexico.

1. (108 mm.) type of the species.	Lake Yzabal.	O. Salvin, Esq.
2. (95 mm.)	R. Motagua.	O. Salvin, Esq.
3. (44 mm.)	Mexico.	M. Sallé.
4. (126 mm.)	R. de Sarabia.	Dr. A. C. Buller.
5. (92 mm.)	San Domingo de Guzman.	Dr. A. C. Buller.
6-9. (83-113 mm.)	Motzorongo.	Dr. H. Gadow.
10-11. (80 and 109 mm.)	R. Tonto.	Dr. H. Gadow.

44. *Cichlosoma affine*.

Heros affinis, Gunth. Cat. Fish. iv. p. 292 (1862), and Trans. Zool. Soc. vi. 1869, p. 455, pl. lxxix. fig. 1; Jord. & Everm. Bull. U.S. Nat. Mus. xvii. 1898, p. 1529; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 241 (1904).

Depth of body about $2\frac{1}{4}$ in the length, length of head $2\frac{3}{5}$ - $2\frac{3}{4}$. Snout longer than postorbital part of head. Diameter of eye $3\frac{1}{4}$ - $3\frac{2}{3}$ in the length of head, interorbital width $3\frac{1}{2}$ - $3\frac{2}{3}$. Depth of præorbital $1-1\frac{1}{3}$ the diameter of eye. Maxillary not extending to the vertical from anterior margin of eye; præmaxillary processes not extending to above the eye; lower jaw projecting; fold of the lower lip continuous or not; cheek with 4 or 5 series of scales; 11 or 12 gill-rakers on the lower part of anterior arch. Scales $27-29\frac{5}{11}$, 2 between lateral line and base of anterior rays of soft dorsal. Dorsal XVI-XVII 8-9, commencing above the opercular cleft, the spines subequal from the fifth, the last nearly $\frac{1}{2}$ the length of head; the soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal. Anal VIII-IX 7-8. Pectoral as long as the head, extending to first soft ray of anal; ventral extending beyond origin of anal. Caudal slightly emarginate, with pointed lobes. Caudal peduncle a little deeper than long. Olivaceous, with 6 dark cross-bars, the third bearing a large blackish blotch on the lateral line; suboperculum usually blackish; blue spots on the head and anterior part of body; fins, except the pectoral, dusky, the unpaired ones with light bluish spots enclosed in dark rings.

Guatemala; British Honduras.

1-4. (98-130 mm.) types of the species.	Lake Peten.	O. Salvin, Esq.
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45. *Cichlosoma callolepis*.

Heros callolepis, Regan, Ann. & Mag. Nat. Hist. (7) xiii. 1904, p. 258; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 238 (1904).

Depth of body about $2\frac{2}{3}$ in the length, length of head 3.

Snout longer than postorbital part of head. Diameter of eye $3\frac{1}{2}$ in the length of head and equal to the interorbital width. Depth of præorbital equal to diameter of eye. Maxillary not extending to below the eye; præmaxillary processes extending to above anterior margin of eye; jaws equal anteriorly; fold of the lower lip continuous or not; cheek with 4 or 5 series of scales; 10 gill-rakers on the lower part of anterior arch. Scales 28-29 $\frac{4\frac{1}{2}}{12}$, $1\frac{1}{2}$ or 2 between lateral line and base of anterior rays of soft dorsal. Dorsal XV 9-10, commencing above or behind axil of pectoral, the spines subequal from the fifth, the last $\frac{2}{5}$ the length of head or less; the soft fin, when laid back, extending to anterior $\frac{1}{4}$ of caudal. Anal VI-VII 7-8. Pectoral $\frac{3}{4}$ the length of head, extending to above origin of anal; ventral extending beyond origin of anal. Caudal slightly emarginate, with pointed lobes. Caudal peduncle as long as deep. Brownish, with faint traces of darker cross-bars and with a dark blotch on the lateral line below the last dorsal spines; small light blue spots on the head and at the base of each scale on the body; fins, except the pectoral, dusky.

San Domingo de Guzman, Mexico.

1-2. (93 and 100 mm.) San Domingo de Guzman. Dr. A. C. Buller. types of the species.

Section 12 (*Heros*).

Body deep. Scales of the lateral line of the same size as those below it, but rather larger than those above it; scales of thoracic region considerably smaller than those on the side of the body. Mouth rather small, moderately protractile; maxillary slightly exposed; teeth of the outer series moderate, distinctly increasing in size anteriorly. Dorsal XV-XVII 13-14, the soft fin scaly at the base. Anal VII-VIII 12-14. Pectoral extending beyond origin of anal. Caudal subtruncate.

The single species, from Brazil and Guiana, is probably derived from the type represented by *C. facetum*. It leads to the genera *Symphysodon* and *Pterophyllum*.

46. *Cichlosoma severum*.

Heros severus, Heck. Ann. Mus. Wien, ii. 1840, p. 362.

Heros coryphæus, Heck. t. c. p. 364.

Heros modestus, Heck. t. c. p. 366.

Heros spurius, Heck. t. c. p. 368; Günth. Cat. Fish. iv. p. 293 (1862); Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 236 (1904).

Heros efasciatus, Heck. t. c. p. 372; Günth. t. c. p. 294.

Chromys appendiculata, Casteln. Anim. Am. Sud, Poiss. p. 15, pl. vii. fig. 3 (1855).

Chromys fasciata, Casteln. o. c. p. 17, pl. ix. fig. 2.

Uaru centrarchoides, Cope, Proc. Ac. Philad. 1872, p. 253, pl. xi. fig. 2.

Acara (Heros) spuria, Steind. Sitzb. Ak. Wien, lxx. 1874, p. 507, pl. iv., and lxxi. 1875, p. 83.

Astronotus (Cichlasoma) severus, Eigenm. & Bray, Ann. Ac. N. York, vii. 1894, p. 619.

Depth of body $1\frac{3}{5}$ – $1\frac{4}{5}$ in the length, length of head $2\frac{3}{4}$ –3. Snout longer than postorbital part of head. Diameter of eye 3 – $3\frac{1}{2}$ in the length of head, interorbital width $2\frac{2}{3}$. Depth of præorbital $\frac{3}{4}$ – $1\frac{1}{3}$ the diameter of eye. Maxillary not extending to below the eye; præmaxillary processes not extending to above the eye (in the adult); jaws equal anteriorly; fold of the lower lip continuous, somewhat produced; cheek with 5 or 6 series of scales; 9–11 gill-rakers on the lower part of anterior arch. Scales 36–42 $\frac{7-8}{13-16}$, 28–30 in a longitudinal series below the lateral line, 4 or 5 between lateral line and base of anterior rays of soft dorsal. Dorsal (XV) XVI–XVII 13–14, commencing above the opercular cleft, the spines subequal from the seventh or slightly increasing in length to the last, which is $\frac{1}{2}$ – $\frac{3}{5}$ the length of head; soft fin, when laid back, extending to posterior part of caudal. Anal VII–VIII 12–13 (14). Pectoral as long as the head, extending to above the fifth anal spine; ventral extending to middle of anal. Caudal subtruncate. Caudal peduncle $\frac{1}{3}$ – $\frac{2}{5}$ as long as deep. Olivaceous, with obscure darker cross-bars; a blackish bar from soft dorsal to posterior part of anal, and sometimes another on the base of caudal; head and body with spots or vermiculations; vertical fins with dark stripes or series of spots.

Brazil; Guiana.

1–2. (89 and 158 mm.)	Rio Cupai.	
3. (163 mm.)	Guiana.	Sir R. Schomburgk.
4. (131 mm.)		Zoological Society.
5–6. (174 and 192 mm.)	Teffé.	Prof. A. Agassiz.
7–8. (81 and 111 mm.)	Teffé.	Dr. J. Bach.
9. (190 mm.)	Teffé.	Paris Museum.

Section 13 (*Hoplarchus*).

Body ovate. Scales of the lateral line larger than those above and below it. Dorsal XV 12–13. Anal V 8–10.

The single species, from South America, appears to be related to *C. severum*. It leads to the genus *Uaru*.

47. *Cichlosoma psittacum*.

Heros psittacus, Heck. Ann. Wien Mus. ii. 1840, p. 369; Gunth. Cat. Fish. iv. p. 290 (1862); Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 242 (1904).

Pomotis fasciatus, Schomb. Fish. Guiana, ii. p. 169, pl. xvii. (1843).

Hoplarchus pentacanthus, Kaup, Arch. Nat. 1860, p. 129, pl. vi. fig. 1.

Acara (Heros) psittacus, Steind. Sitzb. Ak. Wien, lxxi. 1875, p. 87.

Depth of body about 2 in the length, length of head about $2\frac{3}{4}$. Diameter of eye 3-4 in the length of head and nearly equal to the interorbital width. Depth of præorbital equal to diameter of eye. Maxillary not extending to below the eye; fold of the lower lip continuous; cheek with 10-14 series of scales; 7 gill-rakers on the lower part of anterior arch. Scales 44-48 (probably more if counted above the lateral line) $\frac{10-11}{18-20}$. Dorsal XV 12-13, the spines increasing in length to the last, which is $\frac{1}{2}$ the length of head. Anal V 8-10. Pectoral nearly as long as the head. Caudal rounded. Caudal peduncle deeper than long. Yellowish or reddish, with a dark longitudinal band from eye to base of caudal, where it forms a spot.

R. Amazon; R. Orinoco.

Heckel's type measures 130 mm. in total length.

PARAPETENIA, subgen. nov.

Typically with larger, more oblique and more protractile mouth than in other groups of *Cichlosoma* and usually with maxillary more distinctly exposed distally; but none of these features are constant. Upper jaw with the anterior pair of teeth slightly enlarged in the more generalized forms, strongly enlarged in the more specialized ones. Lower jaw with the 3 anterior teeth on each side more or less canine-like, with the anterior pair somewhat smaller than the others (corresponding to the enlargement of the anterior pair in the upper jaw) in the more generalized forms. The anterior pair wanting, the next pair strong, and the third pair forming very strong canines in the more specialized forms. Scales of lateral line of the same size as those below it on the side of the body; scales of the thoracic region much smaller than those on the side of the body. Dorsal XV-XIX 8-13; posterior part of spinous dorsal and soft fin with a scaly sheath at the base and with short series of scales on the interradi al membranes. Anal IV-X 7-10. Caudal rounded or subtruncate.

48. *Cichlosoma adpersum*.

Acara adpersa, Günth. Cat. Fish. iv. p. 282 (1862).

Heros adpersus, Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 227 (1904).

Depth of body $2\frac{2}{5}$ in the length, length of head $2\frac{4}{5}$. Snout

as long as postorbital part of head. Diameter of eye $5\frac{1}{3}$ in the length of the head, interorbital width $3\frac{1}{2}$. Depth of præorbital $1\frac{2}{5}$ the diameter of eye. Maxillary slightly exposed, extending nearly to below the eye; præmaxillary processes extending to above anterior $\frac{1}{4}$ of eye; jaws equal anteriorly, the anterior pair of teeth in the upper jaw the largest and in the lower jaw somewhat smaller than the next 2 on each side, which are slightly enlarged; fold of the lower lip continuous; cheek with 7 series of scales; 9 gill-rakers on the lower part of anterior arch. Scales $31\frac{6}{15}$, $3\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XV 12, the spines subequal from the sixth to the twelfth, thence increasing to the last, which is a little more than $\frac{1}{3}$ the length of head; soft fin, when laid back, extending to middle of caudal. Anal IV 10. Pectoral less than $\frac{2}{3}$ the length of head, not extending to above the anal; ventral extending to origin of anal. Caudal rounded. Caudal peduncle nearly as long as deep. Olivaceous, with numerous small blackish spots on head, body, and dorsal and caudal fins.

Barbadoes.

1. (218 mm.) type of the Barbadoes. Sir R. Schomburgk.
species.

49. *Cichlosoma tetracanthus*.

Centrarchus tetracanthus, Cuv. & Val. Hist. Nat. Poiss. vii. p. 460 (1831).

Chromis fuscomaculatus, Guichen. Hist. Cuba, Poiss. p. 78, pl. ii. fig. 3 (1853).

Acara fuscomaculata, Günth. Cat. Fish. iv. p. 282 (1862).

Acara tetracanthus, Steind. Denkschr. Ak. Wien, xxiii. 1864, p. 60.

Heros tetracanthus, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1539; Eigenm. Bull. U.S. Fish. Comm. 1902, p. 230, figs. 12 & 13.

Heros fuscomaculatus, Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 227 (1904).

Heros tetracanthus torralbasi, Eigenm. *l. c.* fig. 11.

Heros tetracanthus griseus, Eigenm. *t. c.* p. 233, fig. 14.

Heros tetracanthus latus, Eigenm. *t. c.* p. 234, fig. 15.

Heros tetracanthus cinctus, Eigenm. *l. c.* fig. 16.

Heros nigricans, Eigenm. *t. c.* p. 235, fig. 17.

Depth of body $2-2\frac{3}{5}$ in the length, length of head $2\frac{1}{2}-3$. Snout shorter than postorbital part of head. Diameter of eye $3-4\frac{1}{3}$ in the length of head, interorbital width $3\frac{1}{3}-3\frac{3}{4}$. Depth of præorbital $\frac{2}{5}-\frac{4}{5}$ the diameter of eye. Maxillary slightly exposed, extending to below anterior margin of eye; præmaxillary processes extending to above anterior $\frac{1}{3}$ of eye; jaws equal anteriorly, or the lower slightly projecting; anterior

pair of teeth in the upper jaw and 2-3 on each side in the lower enlarged, forming weak canines; fold of the lower lip continuous; cheek with 7-10 series of scales; 8-10 gill-rakers on the lower part of anterior arch. Scales 28-31 $\frac{6-7}{13-15}$, 3 or 4 between lateral line and base of anterior rays of soft dorsal. Dorsal XV-XVI 10-12, the spines slightly increasing in length to the last, which is $\frac{1}{3}-\frac{2}{5}$ the length of head, or sometimes the middle spines subequal; soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal. Anal* IV 8-10. Pectoral $\frac{3}{5}-\frac{3}{4}$ the length of head, usually not extending to above the anal; ventral not extending to origin of anal. Caudal subtruncate or rounded. Caudal peduncle $\frac{3}{5}-\frac{3}{4}$ as long as deep. Olivaceous, with dark spots on head, body, and vertical fins; sometimes dark cross-bars on the body and a dark spot below the origin of the lateral line, another on the middle of the side, and a third on the base of the caudal.

Cuba.

1. (151 mm.)	Cuba.	Zoological Society.
2. (86 mm.)	Puiar del Rio.	Prof. C. H. Eigenmann.
3-4. (80 and 97 mm.)	Calabazar.	Prof. C. H. Eigenmann.
5-6. (98 and 118 mm.)	San Antonio.	Prof. C. H. Eigenmann.
7-12. (102-154 mm.)	Palacios.	Prof. C. H. Eigenmann.
13-27. (64-121 mm.)	San Cristobal.	Prof. C. H. Eigenmann.

50. *Cichlosoma istlanum*.

? *Cichlasoma Steindachneri*, Jord. & Snyder, Bull. U.S. Fish. Comm. xix. 1899, p. 143, fig. 20; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1900, p. 3173; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 206 (1904); Meek, Zool. Pub. Columbian Mus. v. 1904, p. 211, fig. 67.

Heros istlanus, Jord. & Snyder, *t. c.* p. 144; Jord. & Everm. *t. c.* p. 3174; Pellegr. *t. c.* p. 228.

Cichlasoma istlanum, Meek, *t. c.* p. 213, fig. 69.

Depth of body $2\frac{3}{5}-2\frac{2}{3}$ in the length, length of head $2\frac{3}{4}-2\frac{4}{5}$. Snout as long as postorbital part of head. Diameter of eye $4\frac{1}{4}$ in the length of head, interorbital width $3\frac{1}{3}-3\frac{1}{2}$. Depth of præorbital a little less than the diameter of eye. Maxillary slightly exposed, not extending to below the eye; præmaxillary processes extending nearly to above middle of eye; jaws equal anteriorly; fold of the lower lip subcontinuous; upper jaw with the 2 anterior teeth of the outer series more or less distinctly differentiated as a pair of canines; lower jaw with 2 or 3 pairs of rather weak canines;

* Two specimens from San Cristobal have curiously malformed anal fins. In each case the posterior part of the fin is wanting; in one there are 10 spines and no soft rays, in the other 8 spines and 3 soft rays.

cheek with 6 series of scales ; 8 gill-rakers on the lower part of the anterior arch. Scales 30-31 $\frac{5\frac{1}{2}-6}{14-15}$, $2\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVI 10, the spines subequal from about the sixth to the thirteenth, thence increasing to the last, which is $\frac{2}{5}$ the length of head ; soft fin, when laid back, extending to middle of caudal. Anal V 8. Pectoral $\frac{2}{3}$ the length of head or more, not extending to above the anal ; ventral extending to origin of anal or a little beyond. Caudal rounded. Caudal peduncle as long as deep. Olivaceous, each scale with a small dark spot at the base ; obscure traces of dark cross-bars ; a dark spot below the origin of the lateral line and another on the middle of the side ; vertical fins with small dark spots.

Rio Ixtla, Mexico.

1-2. (137 and 143 mm.) co-types Rio Ixtla. Dr. D. S. Jordan.
of the species.

With these I have compared several small examples (30-40 mm.), co-types of *C. Steindachneri* from the Rio Verde, which appear to me to present all the characters which might be expected in young specimens of *C. istlanum*. The general form of the body and the number of scales and fin-rays seem to be the same. The larger eye, shorter snout, smaller mouth, less produced soft dorsal and anal fins, &c. are differences due to size. There are several dark cross-bars on the body and an interrupted longitudinal band bearing a dark blotch on the middle of the side. The lower lip has the same structure as in the larger specimens named *C. istlanum*. I have retained the name *C. istlanum* until actual comparison of adult fish from the two rivers has been made.

51. *Cichlosoma Bartoni*.

Acara Bartoni, Bean, Proc. U.S. Nat. Mus. 1892, p. 286, pl. xliv. fig. 3.
Cichlasoma Bartoni, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1515, fig. 587 ; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 206 (1904) ; Meek, Zool. Pub. Columbian Mus. v. 1904, p. 211, fig. 68.
* *Heros (Cichlasoma) labridens*, Pellegr. Bull. Mus. Paris, 1903, p. 122.
Cichlasoma labridens, Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 207, pl. vi. fig. 1 (1904).

Depth of body $2\frac{1}{5}$ - $2\frac{2}{5}$ in the length, length of head $2\frac{3}{4}$ -3. Snout nearly as long as postorbital part of head. Diameter of eye $4\frac{1}{2}$ - $5\frac{1}{2}$ in the length of head. Depth of præorbital greater than diameter of eye. Maxillary not extending to below the eye ; lower jaw projecting ; fold of the lower lip

* In placing *Heros labridens* in the synonymy of *C. Bartoni*, I follow Dr. Meek, who has examined a number of specimens.

not continuous; anterior teeth forming canines; cheek with 5 or 6 series of scales; 7 gill-rakers on the lower part of anterior arch. Scales about $30 \frac{5\frac{1}{2}}{12-13}$. Dorsal XV-XVI 10-11, the spines increasing in length to the last, which is $\frac{1}{3}$ the length of head; soft fin extending a little beyond base of caudal. Anal V (IV-VI) 8-9. Pectoral $\frac{2}{3}$ the length of head, not extending to above the anal; ventral extending to the vent. Caudal rounded. Caudal peduncle as long as deep. Brownish, with about 6 indistinct cross-bars on the sides; a dark spot at the base of caudal.

Rio Panuco and its tributaries, Mexico.

The types of the species measure from 90-180 mm. in total length, those of *C. labridens* 200-220 mm.

52. *Cichlosoma Beani*.

Heros Beani, Jord. Proc. U.S. Nat. Mus. 1888, p. 332, and Proc. Cal. Ac. Sci. 1895, p. 473; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1538; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 230 (1904). *Cichlasoma Beani*, Meek, Zool. Pub. Columbian Mus. v. 1904, p. 210.

Depth of body $2-2\frac{1}{3}$ in the length, length of head $2\frac{3}{4}-3$. Snout more than $\frac{1}{3}$ the length of head (in the adult), less in the young. Diameter of eye $3\frac{1}{2}-5$ in the length of head, interorbital width $3-3\frac{1}{2}$. Depth of præorbital a little greater than diameter of eye (adult), $\frac{2}{3}$ diameter of eye (young). Maxillary slightly exposed, not extending to below the eye; præmaxillary processes extending nearly to above middle of eye; lower jaw slightly projecting; fold of the lower lip continuous; upper jaw with the 2 anterior teeth of the outer series more or less distinctly differentiated as a pair of canines; lower jaw with the 2 or 3 anterior teeth on each side forming more or less distinct canines; cheek with 6 or 7 series of scales; 8 or 9 gill-rakers on the lower part of anterior arch. Scales $30-31 \frac{4\frac{1}{2}-5\frac{1}{2}}{13-14}$, 3 between lateral line and base of anterior rays of soft dorsal. Dorsal XVI 11-12, the spines slightly increasing in length to the last, which is about $\frac{2}{5}$ the length of head, or the middle spines sometimes subequal; soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal or beyond. Anal V 8-10. Pectoral nearly $\frac{3}{4}$ the length of head, not extending to above origin of anal; ventral extending to origin of anal. Caudal subtruncate or rounded. Caudal peduncle about $\frac{2}{3}$ as long as deep. Olivaceous, each scale with a brown spot; a dark spot on the lateral line below the posterior dorsal spines and another on the upper part of the base of caudal; about 8 dark cross-bars in the young; vertical fins with small dark spots.

Rivers of Sinaloa and Jalisco, Mexico.

- | | | |
|--|---------------|-------------------|
| 1. (67 mm.) co-type of
the species. | Rio Presidio. | Dr. D. S. Jordan. |
| 2-4. (104-180 mm.) | Rio Presidio. | Herr A. Forrer. |

53. *Cichlosoma mento*.

Heros mento, Vaill. & Pellegr. Bull. Mus. Paris, 1902, p. 83; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 229 (1904).

Cichlasoma mento, Meek, Zool. Pub. Columbian Mus. v. 1904, p. 207.

Depth of body $2\frac{1}{2}$ - $2\frac{4}{5}$ in the length, length of head $2\frac{4}{5}$ -3. Snout shorter than postorbital part of head. Diameter of eye $4-4\frac{1}{2}$ in the length of head and $1\frac{1}{2}$ in the interorbital width. Maxillary not extending to below the eye; lower jaw projecting; anterior teeth forming canines; fold of the lower lip continuous; cheek with 6-8 series of scales; 8 gill-rakers on the lower part of anterior arch. Scales $29-30 \frac{6\frac{1}{2}}{14-15}$. Dorsal XVI 10, the spines only slightly increasing in length after the fifth, the last $\frac{1}{3}$ the length of head. Anal V 7-8. Pectoral $\frac{2}{3}$ the length of head. Caudal rounded. Caudal peduncle as long as deep. Violaceous; soft vertical fins spotted.

Southern Mexico.

The types, from the Rio Negro, measure from 98 to 180 mm.

54. *Cichlosoma Festæ*.

Heros Festæ, Bouleng. Boll. Mus. Torin. xiv. 1899, No. 335, p. 6; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 230 (1904).

Depth of body $2\frac{2}{5}$ in the length, length of head $2\frac{5}{7}$. Snout nearly $\frac{1}{2}$ the length of head. Diameter of eye $5\frac{1}{4}$ in the length of head, interorbital width 3. Depth of præorbital $1\frac{1}{2}$ the diameter of eye. Maxillary exposed distally, not extending to below the eye; præmaxillary processes extending to above anterior $\frac{1}{3}$ of eye; lower jaw slightly projecting; fold of the lower lip continuous; upper jaw with the 2 anterior teeth of the outer series differentiated as a pair of canines; lower jaw with the anterior 2 or 3 teeth on each side forming distinct canines; cheek with 5 or 6 series of scales, with a naked area between the lowest series and præoperculum (probably covered in the young with 1 or 2 additional series of scales); 9 gill-rakers on the lower part of anterior arch. Scales $30 \frac{5\frac{1}{2}}{12}$, $3\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVI (11) 12, the spines subequal from the sixth to the fourteenth, thence

increasing to the last, which is $\frac{3}{8}$ the length of head; the soft fin, when laid back, extending nearly to middle of caudal. Anal V (8) 9. Pectoral $\frac{5}{7}$ the length of head, extending to above origin of anal; ventral extending to origin of anal. Caudal rounded. Caudal peduncle a little more than $\frac{2}{3}$ as long as deep. Brownish, with 8 blackish cross-bars; a blackish ocellated spot on the upper $\frac{1}{2}$ of base of caudal; vertical fins dusky, the soft dorsal with some indistinct light spots.

W. Ecuador.

1. (255 mm.) one of the types Rio Guayas, Guayaquil. Dr. H. Festa.
of the species.

55. *Cichlosoma ornatum*, sp. n.

Depth of body $2\frac{1}{3}$ (young)– $2\frac{7}{8}$ (adult) in the length, length of head $2\frac{4}{5}$ – $2\frac{7}{8}$. Snout nearly $\frac{1}{2}$ the length of head (in the adult). Diameter of eye $3\frac{3}{4}$ –6 in the length of head, interorbital width 3– $3\frac{1}{2}$. Depth of præorbital $\frac{5}{6}$ – $1\frac{2}{3}$ the diameter of eye. Maxillary slightly exposed, not extending to below the eye; premaxillary processes extending to above anterior $\frac{1}{4}$ of eye (adult) or a little beyond (young); jaws nearly equal anteriorly (in the young), or the lower a little shorter than the upper (in the adult); fold of the lower lip continuous; upper jaw with the 2 anterior teeth of the outer series differentiated as a pair of canines; lower jaw with the 2 or 3 anterior teeth on each side forming canines; cheek with 6 series of scales, the lowest deciduous in the adult; 8 or 9 gill-rakers on the lower part of anterior arch. Scales 30–32 $\frac{5}{11}$, $2\frac{1}{2}$ –3 between lateral line and base of anterior rays of soft dorsal. Dorsal XV–XVI 12–13, the spines subequal from the sixth or seventh to the twelfth to fourteenth, thence increasing to the last, which is about $\frac{1}{3}$ the length of head ($\frac{3}{8}$ in the young, $\frac{2}{7}$ in the adult), the soft fin, when laid back, extending nearly to middle of caudal. Anal V 9. Pectoral $\frac{3}{4}$ – $\frac{5}{6}$ the length of head, extending nearly to above origin of anal; ventral extending to origin of anal. Caudal rounded. Caudal peduncle as long or nearly as long as deep. Olivaceous, with some blackish cross-bars on the sides of the body; sides of the head with light blue spots; each scale with a light blue spot, the spots of the lower part of the body larger and almost white; a blackish spot at the base of pectoral and another on the upper $\frac{1}{2}$ of the base of caudal; 3 large blackish spots on the basal part of the dorsal fin, the first at the base of the 9th to 11th spines (absent in one specimen), the second at

the base of the last 2 spines and the first soft ray, the third on the posterior soft rays; vertical fins with light spots.

N.W. Ecuador.

- | | | |
|---------------------------------|--------------|----------------|
| 1-3. (118-300 mm.) types of the | Rio Durango. | Mr. Rosenberg. |
| species. | | |
| 4. (119 mm.) | St. Javier. | Mr. Rosenberg. |

In the adult examples the teeth are obtuse, many ending in a flat circular surface. On dissection the stomach was found to be full of broken shells.

These specimens had been referred by Boulenger to *C. Festæ*, but they differ considerably from that species in coloration and in the more slender caudal peduncle. Moreover, in *C. Festæ*, when the mouth is closed, the anterior canines of the upper jaw fit in between the anterior teeth of the lower jaw; in *C. ornatum*, on the contrary, the anterior teeth of the upper jaw are external to those of the lower when the mouth is closed, this being especially marked in the adult fish. In *C. Festæ* the occipital region is more elevated and convex, and this difference is due neither to age, sex, nor method of preservation, for the largest specimen of *C. ornatum* is a male, and in both cases the occipital crest can be felt just beneath the skin. Young examples of *C. ornatum* (118 to 119 mm. in total length) resemble the adult of *C. Festæ* in so far as they have a deeper body and longer dorsal spines than have the adult specimens of their own species, but the differences between adult examples of the two species will be evident from the following measurements:—

	<i>C. Festæ</i> (♂).	<i>C. ornatum</i> (♂).
	mm.	mm.
Length to base of caudal	205	245
Depth of body	86	86
Length of head	76	87
Length of caudal peduncle	22	30
Depth of caudal peduncle	30	30
Last dorsal spine	28	25

56. *Cichlosoma octofasciatum*.

Heros octofasciatus, Regan, Revue Suisse Zool. xi. 1903, p. 417, pl. xiii. fig. 1; Ann. & Mag. Nat. Hist. (7) xiii. 1904, p. 258.

Cichlasoma octofasciatum, Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 223 (1904); Meek, Zool. Pub. Columbian Mus. v. 1904, p. 218.

Cichlasoma Hedricki, Meek. t. c. p. 208, fig. 66.

Depth of body 2-2 $\frac{2}{5}$ in the length, length of head 2 $\frac{2}{3}$ -3. Snout shorter than postorbital part of head. Diameter of eye 3-4 $\frac{1}{3}$ in the length of head, interorbital width about 3.

Depth of præorbital $\frac{1}{2}$ – $\frac{4}{5}$ the diameter of eye. Maxillary scarcely exposed, extending to below the anterior margin of eye; præmaxillary processes extending to above anterior margin of eye or a little beyond; jaws equal anteriorly or the lower slightly projecting; fold of the lower lip interrupted or subcontinuous; upper jaw with the 2 anterior teeth of the outer series more or less distinctly differentiated as a pair of canines; lower jaw with the 3 anterior teeth on each side forming more or less distinct canines; cheek with 5 or 6 series of scales; 7 or 8 gill-rakers on the lower part of anterior arch. Scales 28–31 $\frac{4\frac{1}{2}-5\frac{1}{2}}{12-14}$, $3\frac{1}{2}$ or 4 between lateral line and base of anterior rays of soft dorsal. Dorsal XVII–XIX 8–10, the spines subequal from about the sixth to the fourteenth, thence increasing to the last, which is about $\frac{2}{5}$ the length of head; soft fin, when laid back, extending to middle of caudal or beyond. Anal VIII–X 7–8. Pectoral $\frac{3}{4}$ – $\frac{4}{5}$ the length of head, extending to above third anal spine; ventral extending well beyond origin of anal. Caudal rounded. Caudal peduncle $\frac{1}{2}$ – $\frac{2}{3}$ as long as deep. Body with about 8 dark cross-bars, which become obscure in the adult, the third bearing a blackish blotch below the lateral line; sometimes a longitudinal band from eye to lateral blotch; usually some light blue spots on the head and one on each scale of the side of the body; a dark spot, often ocellated, on the upper part of the base of caudal; vertical fins with series of dark spots.

Southern Mexico; British Honduras (? Jamaica).

1–14, 15–18. (61–130 mm.)	British Honduras.	Rev. J. Robertson.
19–22. (81–107 mm.)	Rio de Sarabia.	Dr. A. C. Buller.

57. *Cichlosoma urophthalmus*.

Heros urophthalmus, Günth. Cat. Fish. iv. p. 291 (1862), and Trans. Zool. Soc. vi. 1869, p. 454, pl. lxxii. fig. 1; Steind. Denkschr. Ak. Wien, xxiii. 1864, p. 66, pl. v. fig. 3; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1537; Everm. & Goldsborough, Bull. U.S. Fish. Comm. xxi. 1902, p. 157, fig.; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 233 (1904).

Heros Troscheli, Steind. Sitzb. Ak. Wien, lv. 1867, p. 524, pl. iv.; Jord. & Everm. *l. c.*; Pellegr. *l. c.*

Depth of body 2 – $2\frac{2}{5}$ in the length, length of head $2\frac{2}{3}$ – $2\frac{7}{8}$. Snout as long as eye, the diameter of which is $3\frac{1}{3}$ – $3\frac{3}{4}$ in the length of head, interorbital width 3 – $3\frac{1}{4}$. Depth of præorbital $\frac{2}{3}$ – $\frac{7}{8}$ the diameter of eye. Maxillary more or less exposed distally, extending to below anterior margin of eye; præmaxillary processes extending to above anterior $\frac{1}{3}$ of eye or slightly beyond; lower jaw slightly projecting; fold

of the lower lip continuous; upper jaw with the anterior pair of teeth distinctly differentiated as canines; lower jaw with the 2 or 3 anterior teeth on each side forming similar canines; cheek with 6 series of scales; 8–10 gill-rakers on the lower part of anterior arch. Scales 28–31 $\frac{4\frac{1}{2}-5\frac{1}{2}}{12-13}$, $2\frac{1}{2}$ or 3 between lateral line and base of anterior rays of soft dorsal. Dorsal XV–XVII 10–12, the spines subequal from the sixth, or else slightly decreasing from the sixth to the fourteenth and increasing again to the last, which is nearly $\frac{1}{2}$ the length of head; the soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal or beyond. Anal VI 8–9. Pectoral $\frac{4}{5}$ – $\frac{5}{6}$ the length of head, extending to above origin of anal or anterior anal spines; ventral extending to origin of anal. Caudal rounded. Caudal peduncle about $\frac{2}{3}$ as long as deep. Olivaceous, with 6 or 7 blackish cross-bars; a blackish ocellated spot on the upper half of the base of caudal; vertical fins dusky.

Guatemala; British Honduras; Yucatan.

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|---|-------------------|--------------------|
| 1–4. (121–171 mm.) types
of the species. | Lake Peten. | O. Salvin, Esq. |
| 5. (92 mm.) | British Honduras. | Rev. J. Robertson. |

58. *Cichlosoma trimaculatum*.

Heros trimaculatus, Günth. Trans. Zool. Soc. vi. 1869, p. 461, pl. lxxvi.;
Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1529; Pellegr.
Mém. Soc. Zool. France, xvi. 1903, p. 239 (1904).

Depth of body $1\frac{5}{6}$ (adult)– $2\frac{1}{3}$ (young) in the length, length of head $2\frac{1}{2}$ –3. Snout shorter than postorbital part of head. Diameter of eye $3\frac{1}{4}$ – $4\frac{3}{4}$ in the length of head, interorbital width $2\frac{1}{2}$ – $3\frac{1}{2}$. Depth of præorbital equal to (adult) or $\frac{1}{2}$ (young) the diameter of eye. Maxillary exposed distally, extending to below anterior margin of eye; præmaxillary processes extending to above middle of eye or beyond; lower jaw slightly projecting; upper jaw with the 2 anterior teeth of the outer series differentiated as a pair of canines; lower jaw with the anterior 2 or 3 teeth on each side the strongest, forming canines; cheek with 5 or 6 series of scales; 8 or 9 gill-rakers on the lower part of anterior arch. Scales 30–31 $\frac{5-5\frac{1}{2}}{14}$, $2\frac{1}{2}$ or 3 between lateral line and base of anterior rays of soft dorsal. Dorsal XVI–XVII 11–12, the spines subequal from about the sixth to the fourteenth, thence increasing to the last, which is $\frac{1}{2}$ or nearly $\frac{1}{2}$ the length of head; soft fin, when laid back, extending to middle (young) or posterior end (adult) of caudal. Anal VI–VIII 8–9. Pectoral $\frac{3}{4}$ – $\frac{7}{8}$ the length of head, extending

to above origin of anal; ventral extending a little beyond origin of anal. Caudal rounded. Caudal peduncle nearly $\frac{1}{2}$ as long as deep. Olivaceous, with a blackish spot above the origin of the lateral line, another on the middle of the side, and a third on the upper part of the base of caudal; vertical fins dusky.

Guatemala; Southern Mexico.

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|-----------------------------------|------------|-----------------|
| 1. (280 mm.) type of the species. | Chiapas. | O. Salvin, Esq. |
| 2-4. (68-225 mm.) | Huamuchal. | O. Salvin, Esq. |

59. *Cichlosoma Salvini*.

Heros Salvini, Günth. Cat. Fish. iv. p. 294 (1864), and Trans. Zool. Soc. vi. 1869, p. 460, pl. lxxiii. fig. 3; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 241 (1904).

Heros triagramma, Steind. Denkschr. Ak. Wien, xxiii. 1864, p. 70, pl. iii. fig. 2.

Cichlasoma Salvini, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1528; Meek, Zool. Pub. Columbian Mus. v. 1904, p. 207.

Cichlasoma mojarra, Meek, t. c. p. 217, fig. 71.

Depth of body $2\frac{1}{5}$ – $2\frac{2}{5}$ in the length, length of head $2\frac{3}{4}$ – $2\frac{5}{6}$. Snout as long as postorbital part of head (in the adult). Diameter of eye 3–4 in the length of head, interorbital width 3– $3\frac{2}{3}$. Depth of præorbital $\frac{3}{5}$ – $\frac{7}{8}$ the diameter of eye. Maxillary exposed distally, extending about to below anterior margin of eye; præmaxillary processes extending to above middle of eye or beyond; lower jaw projecting; fold of the lower lip continuous; upper jaw with the 2 anterior teeth of the outer series forming a strong pair of canines; lower jaw with 2 pairs of strong canines; cheek with 5 series of scales; 8 or 9 gill-rakers on the lower part of anterior arch. Scales 28–31 $\frac{4\frac{1}{2}-5\frac{1}{2}}{10-12}$, 2 or $2\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal * XVI–XVII 9–12, the spines subequal from the sixth to the fourteenth, thence increasing in length to the last, which is $\frac{1}{2}$ or nearly $\frac{1}{2}$ the length of head; the soft fin, when laid back, extending about to middle of caudal. Anal † VIII–IX 7–9. Pectoral $\frac{3}{4}$ the length of head, extending to above anterior anal spines; ventral extending beyond origin of anal. Caudal rounded. Caudal peduncle $\frac{1}{2}$ – $\frac{3}{5}$ as long as deep. Brownish, with darker cross-bands which form a series of blackish blotches along the base of the dorsal and another series below the lateral line, the latter usually confluent in the adult to form a longitudinal band from eye to caudal; blue spots on the

* Dorsal with 16 spines in 1 specimen only.

† Anal with 9 spines in 2 specimens only.

cheeks ; sometimes a blackish spot on suboperculum ; vertical fins often with small dark spots.

Young specimens have the cross-bars more prominent and the blotches less distinct, except for one on the middle of the side and another on the base of the caudal.

Guatemala ; Southern Mexico ; British Honduras.

1-3. (86-115 mm.) types of the species.	Rio de Santa Isabel.	O. Salvin, Esq.
4-7. (83-120 mm.)	Lake Peten.	O. Salvin, Esq.
8-10. (139-153 mm.)	Nr. Cajabon.	F. C. Sarg, Esq.
11-14. (70-92 mm.)	British Honduras.	Rev. J. Robertson.

Cichlasoma mojarra, Meek, is founded on a very small specimen with malformed spinous dorsal. I have carefully compared the smallest examples in the British Museum Collection with Dr. Meek's figure, and I am quite certain as to the identity of *C. mojarra* with *C. Salvini*.

60. *Cichlosoma multifasciatum*, sp. n.

Heros Friedrichstahli (part.), Günth. Trans. Zool. Soc. vi. 1869, p. 459.

Depth of body $2\frac{1}{4}$ - $2\frac{1}{3}$ in the length, length of head $2\frac{3}{5}$ - $2\frac{4}{5}$. Snout as long as or shorter than eye, the diameter of which is $3-3\frac{2}{3}$ in the length of head, interorbital width $3\frac{1}{2}$ - $3\frac{2}{3}$. Depth of præorbital $\frac{1}{3}$ - $\frac{1}{2}$ the diameter of eye. Maxillary exposed distally, extending to below anterior $\frac{1}{4}$ of eye ; præmaxillary processes extending to above posterior $\frac{1}{3}$ of eye ; lower jaw projecting ; fold of the lower lip continuous ; upper jaw with a pair of strong canines situated close together ; lower jaw with 1-2 pairs of canines, which are well-separated ; cheek with 7 series of scales ; 8 gill-rakers on the lower part of anterior arch. Scales $30-31 \frac{4-4\frac{1}{2}}{12-13}$, 2 or $2\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVIII 10, the spines slightly increasing in length to the last, which is $\frac{2}{5}$ the length of head or a little more ; the soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal or beyond. Anal VII-VIII 8-9. Pectoral $\frac{3}{4}$ the length of head, extending to above anterior anal spines ; ventral extending beyond origin of anal. Caudal rounded. Caudal peduncle $\frac{1}{2}$ - $\frac{3}{5}$ as long as deep. Olivaceous, with about 10 blackish cross-bars ; a more or less distinct dark stripe from upper part of eye to operculum and another from lower part of eye to suboperculum ; cheeks and opercular bones, lower part of body and vertical fins with dark spots.

Guatemala ; British Honduras.

- 1 2. (91 and 134 mm.) types Lake Peten. O. Salvin, Esq.
of the species.
3. (68 mm.) Stann Creek, British Honduras. Rev. J. Robertson.

61. *Cichlosoma Friedrichstahli*.

Heros Friedrichstahli, Heck. Ann. Mus. Wien, ii. 1840, p. 381; Günth. Cat. Fish. iv. p. 294 (1862).

Heros Friedrichstahli (part.), Günth. Trans. Zool. Soc. vi. 1869, p. 459.

Heros motaguensis (part.), Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 234 (1904).

Depth of body $2\frac{1}{2}$ – $2\frac{3}{5}$ in the length, length of head $2\frac{3}{5}$ – $2\frac{2}{3}$. Snout only a little longer than eye, the diameter of which is nearly 4 in the length of head, and equal to the interorbital width. Depth of præorbital $\frac{1}{2}$ – $\frac{3}{5}$ diameter of eye. Maxillary exposed distally, extending to below anterior margin of eye; præmaxillary processes extending to above posterior $\frac{1}{3}$ of eye; lower jaw projecting; fold of the lower lip continuous; upper jaw with a pair of strong canines situated close together; lower jaw with 2 pairs of canines, which are well-separated; cheek with 7 series of scales; 6 or 7 gill-rakers, sometimes preceded by 2–3 rudiments, on the lower part of anterior arch. Scales $30\frac{4\frac{1}{2}}{13}$, $2\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVIII 9–10, the spines slightly increasing in length to the last, which is a little more than $\frac{1}{3}$ the length of head; the soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal. Anal VII–VIII 8. Pectoral $\frac{2}{3}$ the length of head, extending to above origin of anal; ventral extending to origin of anal. Caudal rounded. Caudal peduncle $\frac{3}{5}$ as long as deep. Olivaceous, with 7 or 8 irregular dark cross-bars forming a series of blotches below the lateral line; a dark stripe from upper part of eye to operculum, and another from lower part of eye to suboperculum; cheeks, opercular bones, and lower part of body with dark spots; vertical fins with dark spots.

Lake Peten, Guatemala.

- 1–2. (121 and 129 mm.) Lake Peten. O. Salvin, Esq.

62. *Cichlosoma motaguense*.

Heros motaguensis, Günth. Trans. Zool. Soc. vi. 1869, p. 462, pl. lxxvii. fig. 2; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1534.

Heros motaguensis (part.), Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 234 (1904).

Depth of body $2\frac{2}{5}$ – $2\frac{2}{3}$ in the length, length of head $2\frac{3}{4}$ –3.

Snout longer than eye, the diameter of which is 4–5 in the length of head, interorbital width $3\frac{2}{5}$ – $3\frac{4}{5}$. Depth of præorbital $\frac{2}{3}$ the diameter of eye (young) or equal to it (adult). Maxillary more or less exposed distally, extending to below anterior margin or anterior $\frac{1}{4}$ of eye; præmaxillary processes extending to above posterior $\frac{1}{3}$ of eye; lower jaw projecting; fold of the lower lip continuous; upper jaw with a pair of strong canines, situated close together; lower jaw with 1 or 2 pairs of canines, which are well-separated; cheek with 7 or 8 series of scales; 7 or 8 gill-rakers on the lower part of anterior arch. Scales $32\frac{4\frac{1}{2}}{12-13}$, 2 or $2\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVII–XVIII 10–11, the spines slightly increasing in length to the last, which is $\frac{1}{3}$ the length of head; the soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal or beyond. Anal VII–VIII 8–9. Pectoral rather more than $\frac{2}{3}$ the length of head, extending nearly to above origin of anal in the young, but not in the adult; ventral extending to origin of anal or beyond. Caudal rounded. Caudal peduncle $\frac{2}{3}$ – $\frac{4}{5}$ as long as deep. Olivaceous, with dark cross-bands forming a series of blotches, which may unite to form a continuous longitudinal band, below the lateral line; a dark stripe from upper part of eye to operculum, and another from lower part of eye to suboperculum; cheeks, opercular bones, lower part of body, and vertical fins usually with dark spots.

Guatemala.

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| 1, 2–4. (115–240 mm.) types
of the species. | Rio Motagua. | O. Salvin, Esq. |
| 5. (137 mm.) | Pacific Slope of Cen-
tral America. | Smithsonian Inst. |

63. *Cichlosoma managuense*.

Heros managuensis, Günth. Trans. Zool. Soc. vi. 1869, p. 463, pl. lxxvii. fig. 3; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1533.

Heros motaguensis (part.), Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 234 (1904).

Depth of body $2\frac{1}{2}$ in the length, length of head $2\frac{3}{4}$. Snout only a little longer than eye, the diameter of which is $4\frac{1}{2}$ – $4\frac{3}{4}$ in the length of head, interorbital width $3\frac{1}{3}$ – $3\frac{1}{2}$. Depth of præorbital $\frac{2}{5}$ – $\frac{1}{2}$ the diameter of eye. Maxillary scarcely exposed distally, extending to below middle of eye; præmaxillary processes extending to above posterior margin of eye; lower jaw projecting; fold of the lower lip continuous; upper jaw with a pair of rather strong canines situated

close together; lower with 1 or 2 pairs of canines, which are well-separated; cheek with 8 or 9 series of scales; 8 gill-rakers and 2 rudiments on the lower part of anterior arch. Scales 33-34 $\frac{4\frac{1}{2}}{13}$, $2\frac{1}{2}$ or 3 between lateral line and base of anterior part of soft dorsal. Dorsal XVIII 10-11, the spines slightly increasing in length to the last, which is $\frac{1}{3}$ the length of head; the soft fin, when laid back, extending to anterior $\frac{1}{3}$ of caudal. Anal VII 8. Pectoral $\frac{2}{3}$ the length of head or a little more, extending to above origin of anal; ventral extending to origin of anal. Caudal rounded. Caudal peduncle $\frac{3}{5}$ - $\frac{2}{3}$ as long as deep. Olivaceous, with 7 irregular dark brown cross-bars forming a series of blotches below the lateral line; a dark stripe from upper part of eye to operculum, and another from lower part of eye to suboperculum; vertical fins with dark spots.

Lakes Managua and Nicaragua.

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|-----------------------------------|-----------------|-------------------|
| 1. (187 mm.) type of the species. | Lake Managua. | Capt. J. M. Dow. |
| 2. (195 mm.) | Lake Nicaragua. | Smithsonian Inst. |

64. *Cichlosoma Dovii*.

Heros Dovii, Günth. Proc. Zool. Soc. 1864, p. 154, and Trans. Zool. Soc. vi. 1869, p. 461, pl. lxxiii. fig. 4; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 1535; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 234 (1904).

Depth of body equal to length of head, $2\frac{3}{5}$ in the length. Snout longer than eye, the diameter of which is $4-4\frac{1}{3}$ in the length of head and greater than the interorbital width. Depth of præorbital $\frac{2}{3}$ - $\frac{3}{4}$ diameter of eye. Maxillary exposed distally, extending to below anterior $\frac{1}{3}$ of eye; præmaxillary processes extending to above posterior margin of eye; lower jaw projecting; fold of the lower lip continuous; upper jaw with a pair of strong canines situated close together; lower jaw with 1 or 2 pairs of canines, which are well separated; cheek with 10 series of scales; 8 gill-rakers on the lower part of anterior arch. Scales 34-35 $\frac{5\frac{1}{2}}{14}$, $3\frac{1}{2}$ between lateral line and base of anterior rays of soft dorsal. Dorsal XVIII 12, the spines increasing in length to the last, which is $\frac{1}{3}$ the length of head; the soft fin, when laid back, extending to anterior $\frac{1}{4}$ of caudal. Anal VI 9-10. Pectoral $\frac{2}{3}$ the length of head, extending nearly to above origin of anal; ventral extending to origin of anal. Caudal rounded. Caudal peduncle $\frac{4}{5}$ - $\frac{7}{8}$ as long as deep. Brownish, with darker cross-bars forming a series of blotches below the lateral line; a dark stripe from upper part of eye to

operculum, and another from lower part of eye to suboperculum; vertical fins obscurely spotted.

Lake Nicaragua.

1-2. (140 and 144 mm.) types of the species. Lake Nicaragua. O. Salvin, Esq.

65. *Cichlosoma spectabile*.

Petenia spectabilis, Steind. Sitzb. Ak. Wien, lxxi. 1875, p. 96, pl. iv. Eigenm. & Bray, Ann. Ac. N. York, vii. 1894, p. 615; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 244 (1904).

Depth of body $1\frac{5}{6}$ -2 in the length, length of head $2\frac{3}{5}$ - $2\frac{2}{3}$. Snout as long as eye, the diameter of which is $3\frac{1}{2}$ -4 in the length of head and equal to the interorbital width. Depth of præorbital $\frac{1}{2}$ the diameter of eye. Maxillary exposed, extending to below the middle of eye; præmaxillary processes extending about to above posterior margin of eye; lower jaw projecting; anterior canines strong; cheek with 7 or 8 series of scales. Scales $30\frac{5-6}{11-12}$. Dorsal XV 12-13, the last spine $\frac{1}{2}$ the length of head, the soft fin in great part covered with small scales. Anal VI 9-10. Pectoral nearly as long as the head. Caudal rounded. Caudal peduncle about $\frac{2}{3}$ as long as deep. A large dark spot on the middle of the side, a smaller one on the upper part of the base of caudal.

R. Amazon.

The types measure up to about 160 mm. in total length.

This species is closely allied to *C. managuense* and *C. Dovii*, and must certainly be regarded as congeneric with them.

66. *Cichlosoma Kraussi*.

Petenia Kraussi, Steind. Denkschr. Ak. Wien, xxxix. 1879, p. 28, pl. ii.; Eigenm. & Bray, Ann. Ac. N. York, vii. 1894, p. 615; Pellegr. Mém. Soc. Zool. France, xvi. 1903, p. 244 (1904).

Depth of body $2\frac{1}{5}$ - $2\frac{1}{3}$ in the length, length of head $2\frac{3}{5}$ - $2\frac{2}{3}$. Snout a little longer than eye, the diameter of which is $3\frac{3}{4}$ - $4\frac{1}{4}$ in the length of head, interorbital width $3\frac{1}{2}$ -4. Depth of præorbital $\frac{1}{2}$ the diameter of eye. Lower jaw projecting; maxillary exposed, extending to below middle of eye; præmaxillary processes extending to above the anterior part of operculum; anterior canines strong. Cheek with 7 or 8 series of scales; 10 or 11 gill-rakers on the lower part of anterior arch. Scales above the lateral line smaller than those below it, about 42 in a longitudinal series above, about 30 below the lateral line; scales in a transverse

series $\frac{6\frac{1}{2}-7\frac{1}{2}}{13}$. Dorsal (XV) XVI (10) 11, the last spine a little less than $\frac{1}{2}$ the length of head, the soft fin scaly at the base. Anal VI (8) 9. Pectoral nearly as long as the head. Caudal rounded. Caudal peduncle about $\frac{2}{3}$ as long as deep. Body with obscure dark cross-bars; a dark spot on the origin of the lateral line, another on the operculum, a third on the middle of the side, and a fourth on the upper part of the base of caudal; vertical fins with dark spots.

Colombia; Venezuela.

1-2. (128 and 188 mm.) Baranquilla, Colombia. Kay Thomson, Esq.

[To be continued.]

XXXVII.—*On new Species of Histeridæ and Notices of others.*
By G. LEWIS, F.L.S.

[Plate X.]

THE object of this paper—the twenty-fifth of the series—is to make a few observations on the ‘Catalogue of the Histeridæ’ published last March, to describe a few species of interest, and to explain the contents of the Plate now published.

In the ‘Catalogue’ I did not include the “catalogue-names” of Dejean or Marseul. Marseul gave over fifty duplicate names to species in his Catalogue of 1862, because he considered that no two species of the same family should bear similar names; but this rule only obtains generally as regards genera. The names of Dejean and Marseul are entered in the Munich Catalogue. Some authors, again, have given varietal names to specimens, often unique, and therefore names of individuals, not of races; these names were treated as synonymic.

I think that Marseul did not always attach sufficient importance in his arrangement of the genera to the form of the mesosternum in the Histeridæ; he placed, for instance, *Pachycærus* and *Phelister*, which have a projecting mesosternum, between *Platysoma* and *Omalodes*, in which the mesosternum is emarginate; but by associating the two former genera with *Probolosternus* and *Monoplius*, as I have done, the species seem to occupy a more natural position.

When we find an emargination in the mesosternum of a species of this family we see an insect with a different mode of life to those in which the mesosternum is acuminate or bisinuous, and we can understand the several advantages



Regan, C. Tate. 1905. "XXXVI.—A Revision of the Fishes of the American Cichlid Genus *Cichlosoma* and of the Allied Genera." *The Annals and magazine of natural history; zoology, botany, and geology* 16, 316–340.

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