



BIOLOGIA
CENTRALI-AMERICANA.

PISCES.

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* Figured on Tab. XIII. fig. 2 as a form of *P. sphenops*.

BIOLOGIA CENTRALI-AMERICANA.

ZOOLOGIA.

Class PISCES.

Sub-class I. TELEOSTOMI.

Order I. TELEOSTEI.

Sub-order I. ACANTHOPTERYGII.

It has been found convenient to commence an account of the Fresh-water Fishes of Mexico and Central America with the Acanthopterygii, which may be recognized by the thoracic or jugular position of the ventral fins, the pelvic bones being directly attached to the clavicles.

The Acanthopterygian fresh-water fishes of Mexico and Central America may be referred to their families by means of the following key:—

- I. Head asymmetrical, with the two eyes on one side; fins without spines . 1. PLEURONECTIDÆ.
- II. Head symmetrical.
 - A. Gill-openings restricted, the gill-membranes attached to the isthmus.
 - Ventral fins widely separated, jugular; dorsal and anal fins short, without spinous rays 2. GOBIESCIDÆ.
 - Ventral fins not widely separated, thoracic; two dorsals or the dorsal fin long 3. GOBIIDÆ.
 - B. Gill-membranes free from the isthmus.
 - 1. Anal fin with 3 spines, 2 of which are detached from the rest of the fin 4. CARANGIDÆ.
 - 2. Anal fin not preceded by free spines.
 - a. A single nostril on each side. Dorsal with XIV-XIX 7-15* rays.
Anal with III-XII 6-12 rays 5. CICHLIDÆ.

* The Roman numerals indicate the number of spines, the Arabic figures the number of articulated rays.

Here described from specimens from Florida, measuring up to 70 mm. in total length.

4. *Cyprinodon macularius*.

Cyprinodon macularius, Baird & Girard, Proc. Ac. Philad. 1853, p. 389¹; Girard, U.S. & Mex. Bound. Surv., Fish. p. 68, t. 37, figs. 8-11 (1859)²; Garm. Mem. Mus. Comp. Zool. xix. 1895, p. 24³; Gilb. N. Amer. Fauna, no. 7, p. 232 (1893)⁴; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 674⁵; Gilb. & Scofield, Proc. U.S. Nat. Mus. 1898, p. 498⁶; Meek, Publ. Columbian Mus., Zool. v. 1904, p. 126⁷.

Cyprinodon californiensis, Girard, Proc. Ac. Philad. 1859, p. 157⁸.

Cyprinodon nevadensis, Eigenm. Proc. Calif. Ae. Sei. (2) i. 1889, p. 270⁹.

Depth of body $2\frac{1}{4}$ to $2\frac{1}{2}$ in the length, length of head 3. Snout a little shorter than eye, the diameter of which is 3 to $3\frac{1}{2}$ in the length of head; interorbital width $2\frac{1}{2}$ in the length of head. 25 or 26 scales in a longitudinal series. Dorsal 10-11; longest rays equal to the base of the fin (σ) or a little less (ρ), $\frac{2}{3}$ (σ) or $\frac{1}{2}$ (ρ) the length of head, scarcely longer than the longest anal rays. Anal 10-11. Pectoral $\frac{4}{5}$ the length of head. Caudal subtruncate. Least depth of caudal peduncle $\frac{2}{3}$ the length of head. Body with irregular dark cross-bars and an interrupted lateral band, these markings scarcely distinct in males; the caudal fin and sometimes the dorsal and anal with a narrow dark edge (in the males), the dorsal with a small dark spot on the posterior rays (in the females).

Hab. Colorado and Nevada to Sonora and Lower California:

Colorado; Nevada^{4 9}; California^{4 8 9}; Arizona^{1 2}; Sonora^{5 6}.

Here described from five specimens from Colorado (*Eigenmann*) and Lower California, measuring up to 60 mm. in total length.

5. ZOOGONETICUS, Meek, 1902.

Zoogoneticus, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 109.

Viviparous. Anal fin of the male with the anterior five or six rays short, stiff, and subequal, separated by a more or less distinct notch from the rest of the fin. Mouth rather small, with short lateral cleft; rami of the lower jaw firmly united; minute teeth in bands, with an outer series of enlarged, fixed, conical teeth.

This genus comprises four species, from the Rio Lerma System and the Valley of Mexico. It is very closely related to *Funduli* of the type of *F. punctatus*, *F. pachycephalus*, &c.

Synopsis of the Species.

I. 28 to 30 scales in a longitudinal series.

Dorsal 13-16; origin about equidistant from tip of snout and posterior

end of caudal fin. Anal 13-15 1. *cuitzeoensis*.

Dorsal 17; origin nearer to end of caudal than to tip of snout. Anal 13 . 2. *dugesii*.

II. 32 to 34 scales in a longitudinal series 3. *diazii*.

III. 36 to 39 scales in a longitudinal series 4. *robustus*.

1. *Zoogoneticus cuitzeoensis*.

Platypercilus quitzeoensis, B. A. Bean, Proc. U.S. Nat. Mus. 1898, p. 540, fig. 1¹.

Zoogoneticus cuitzeoensis, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 111, fig. 29².

Depth of body $2\frac{1}{2}$ to $3\frac{1}{2}$ in the length, length of head $3\frac{1}{4}$ - $3\frac{3}{4}$. Snout as long as or shorter than the eye, the diameter of which is 3 to $3\frac{1}{2}$ in the length of head; interorbital width $2\frac{2}{3}$ to 3 in the length of head. Lower jaw projecting. 28 to 30 scales in a longitudinal series. Dorsal 13-16; origin equidistant from eye or operculum and base of caudal. Anal 13-15; origin a little behind that of the dorsal. Pectoral $\frac{2}{3}$ to $\frac{3}{4}$ the length of head. Caudal rounded. Males nearly uniformly coloured, with the vertical fins dusky, the dorsal and anal with pale edges. Females with a series of dark spots or bars on the lower half of the posterior part of the body; a pair of dark spots at the base of the caudal; fins pale, immaculate.

Hab. MEXICO, Rio Lerma System:

Lake Chapala²; Lake Cuitzeo¹.

Here described from specimens from Lake Chapala (*Meek*), measuring up to 65 mm. in total length.

2. *Zoogoneticus dugesii*.

Fundulus dugesii, Bean, Proc. U.S. Nat. Mus. 1887, p. 373, t. 20, fig. 5¹.

Adinia dugesii, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 661².

Zoogoneticus dugesii, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 111, fig. 30³.

Hab. MEXICO, Rio Lerma System:

~~Lagos³; Guanajuato¹; Lake Patzcuaro².~~

This species should be easily distinguished by the coloration, the body being crossed by well-defined vertical bars, and by the short and deep caudal peduncle.

3. *Zoogoneticus diazi*.

Zoogoneticus diazi, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 114, fig. 32¹.

Zoogoneticus miniatus, Meek, t. c. p. 115, fig. 33².

Depth of body 3- $3\frac{1}{2}$ in the length, length of head $3\frac{1}{5}$ to $3\frac{2}{5}$. Snout nearly as long as or shorter than eye, the diameter of which is $2\frac{3}{4}$ to $3\frac{2}{3}$ in the length of head; interorbital width $2\frac{2}{3}$ to 3 in the length of head. Lower jaw a little projecting. 32 to 34 scales in a longitudinal series. Dorsal 16-18; origin equidistant from head and base of caudal (♀) or a little nearer the former (♂). Anal 12-15; origin below or a little behind that of the dorsal. Pectoral $\frac{2}{3}$ the length of head. Caudal subtruncate. A lateral series of irregular dark spots or vertical bars; fins immaculate.

Hab. MEXICO, Rio Lerma System and Valley of Mexico:

Lake Patzcuaro¹; Lake Zirahuen¹; Lake Chalco².

Here described from specimens from Lake Patzcuaro (*Meek*) measuring up to 80 mm. in total length.

4. *Zoogoneticus robustus*.

Fundulus robustus, Bean, Proc. U.S. Nat. Mus. 1892, p. 285, t. 44, fig. 2¹; Jord. & Everm. Bull.

U.S. Nat. Mus. xlvii. 1896, p. 644².

Zoogoneticus robustus, Meek, Publ. Columbian Mus., Zool. iii. 1902, p. 92^s, and v. 1904, p. 113, fig. 31⁴.

Zoogoneticus maculatus, Regan, Ann. Mag. N. H. (7) xiii. 1904, p. 256³.

Depth of body 3 to $3\frac{3}{4}$ in the length, length of head 3 to $3\frac{1}{2}$. Snout as long as or longer than eye, the diameter of which is 4 to 5 in the length of head; interorbital width $2\frac{1}{2}$ to $2\frac{2}{3}$ in the length of head. Lower jaw projecting. 36 to 39 scales in a longitudinal series. Dorsal 13-14; origin nearly equidistant from præoperculum and base of caudal. Anal 14-16; origin a little behind that of the dorsal. Pectoral $\frac{2}{3}$ to $\frac{2}{5}$ the length of head. Caudal subtruncate. Body usually with irregular dark spots; fins immaculate.

Hab. MEXICO, Rio Lerma System:

Guanajuato¹; Rio Grande de Santiago⁵ (*Buller*); Lake Chapala^{3 4}; Lake Cuitzeo^{3 4}; Lake Patzcuaro^{3 4}; Zirahuen^{3 4}.

Here described from several specimens from the Rio Grande de Santiago, Lake Chapala, and Lake Patzcuaro, measuring up to 145 mm. in total length.

6. LIMNURGUS, Günth., 1866.

Limnurgus, Günth. Cat. Fish. vi. p. 309 (1866).

Girardinichthys, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 666.

Viviparous. Anal fin of the male with the anterior five or six rays short, stiff, and subequal, separated by a more or less distinct notch from the rest of the fin. Mouth small, with short lateral cleft; rami of the lower jaw firmly united; minute teeth in bands, with an outer series of enlarged fixed teeth which are usually spear-shaped, but may have their apices truncate or even notched.

A single species from the Valley of Mexico.

1. *Limnurgus innominatus*. (Tab. XII. fig. 1.)

Lucania sp., Girard, Proc. Ac. Philad. 1859, p. 118¹.

Girardinichthys innominatus, Bleek. Cyprin. p. 484 (1860)²; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 666³; Meek, Publ. Columbian Mus., Zool. v. 1904, p. 116⁴.

Limnurgus variegatus, Günth. Cat. Fish. vi. p. 309 (1866)⁵.

Characodon geddesi, Regan, Ann. Mag. N. H. (7) xiii. 1904, p. 257⁶.

Depth of body $2\frac{1}{2}$ to $3\frac{1}{2}$ in the length, length of head $3\frac{3}{4}$ to 4. Snout as long as eye, the diameter of which is 4 to $4\frac{1}{2}$ in the length of head; interorbital width $2\frac{1}{2}$ to $2\frac{2}{3}$ in the length of head. 39 to 43 scales in a longitudinal series. Dorsal 18-23; origin equidistant from eye (♂) or operculum (♀) and base of caudal. Anal 20-26; origin a little behind that of the dorsal. Pectoral $\frac{2}{3}$ the length of head. Caudal subtruncate. Body with irregular dark spots or narrow vertical bars.

Hab. MEXICO, Valley of Mexico:

City of Mexico¹; Lake Chalco⁴ (*Meek*); Lake Tezcoco⁶ (*Geddes*); Xochimilco⁴.

Here described from several specimens, measuring up to 75 mm. in total length.

7. CHARACODON, Günth., 1866.

Characodon, Günth. Cat. Fish. vi. p. 308 (1866); Jord. & Everm. Bull. U.S. Nat. Mus. xvii. 1896, p. 667.

Characodon and *Chapalichthys*, Meek, Publ. Columbian Mus., Zool. v. 1904, pp. 118 & 123.

Viviparous. Anal fin of the male with the anterior five or six rays short, stiff, and subequal, separated by a more or less distinct notch from the rest of the fin. Mouth rather small, with short lateral cleft; rami of lower jaw firmly united; minute teeth in bands, with an outer series of enlarged, fixed, bienspid teeth.

Hab. Mexico and Lower California.

Synopsis of the Species.

- I. Dorsal and anal fins each with more than 25 rays 1. *multiradiatus*.
- II. Dorsal and anal fins each with less than 20 rays.
- A. 32 to 36 scales in a longitudinal series.
- Origin of anal below middle of dorsal; origin of dorsal equidistant from tip of snout and base of caudal or a little nearer the latter 2. *encaustus*.
- Origin of anal below anterior part of dorsal; origin of dorsal about equidistant from tip of snout and posterior end of caudal fin 3. *variatus*.
- Origin of anal a little in advance of that of the dorsal, which is equidistant from posterior part of head and posterior end of caudal fin 4. *lateralis*.
- B. 50 to 55 scales in a longitudinal series 5. *furcidens*.

1. *Characodon multiradiatus*. (Tab. XII. figg. 3, 4.)

Characodon multiradiatus, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 119¹.

Depth of body $2\frac{2}{3}$ to $3\frac{1}{3}$ in the length, length of head $3\frac{3}{4}$ to 4. Snout a little shorter than eye, the diameter of which is 3 to $3\frac{1}{2}$ in the length of head; interorbital width 2 to $2\frac{1}{2}$ in the length of head. About 40 scales in a longitudinal series*. Dorsal 28-33; origin nearer to tip of snout than to base of caudal (♂) or nearer to the caudal (♀). Anal 29-32; origin below the anterior part of the dorsal. Pectoral $\frac{2}{3}$ to $\frac{3}{4}$ the length of head. Caudal subtruncate. Olivaceous, with irregular dark cross-bars; vertical fins, in the males, with blackish edges.

Hab. MEXICO, Rio Lerma System, Lerma¹:

Here described from four specimens, measuring up to 45 mm. in total length, from Lerma (*Meek*).

2. *Characodon encaustus*.

Characodon encaustus, Jord. & Snyder, Bull. U.S. Fish. Comm. xix. 1899, p. 126, fig. 7 (1900)¹.

Chapalichthys encaustus, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 123, fig. 36².

Depth of body 3 to $3\frac{2}{3}$ in the length, length of head $3\frac{1}{2}$ to 4. Snout as long as or shorter than eye, the diameter of which is 3 to $3\frac{1}{2}$ in the length of head; interorbital width $2\frac{1}{2}$ to 3 in the length of head.

* When the scales are regularly arranged I count not more than 40 in a longitudinal series. Sometimes they are irregular, two scales from series above and below meeting to exclude a scale from contact with what should be the next one in its longitudinal series; in one specimen this occurs to such an extent that more than 45 may be counted from above the pectoral to the caudal.

33 to 36 scales in a longitudinal series. Dorsal 15-18; origin equidistant from tip of snout and base of caudal or a little nearer the latter. Anal 15-17; origin below the middle of dorsal. Pectoral nearly $\frac{3}{4}$ the length of head, extending beyond the base of ventral. Caudal truncate. Olivaceous; a series of 7 to 10 dark brown spots or short vertical bars along the middle of the side.

Hab. MEXICO, Lake Chapala^{1 2}.

Here described from several specimens, measuring up to 75 mm. in total length.

3. *Characodon variatus*.

Characodon variatus, Bean, Proc. U.S. Nat. Mus. 1887, p. 370, t. 20. fig. 1¹; Jord. & Everm. Bull.

U.S. Nat. Mus. xlvii. 1896, p. 669²; Meek, Publ. Columbian Mus., Zool. v. 1904, p. 120³.

Characodon ferrugineus, Bean, t. c. p. 372, t. 20. figs. 3 & 4¹.

Characodon eiseni, Rutter, Proc. Calif. Ac. Sci. (2) vi. 1896, p. 266³; Jord. & Everm. t. c. 1898, p. 2831⁶; Meek, t. c. p. 119⁷.

Depth of body about 3 in the length, length of head $3\frac{1}{4}$ to $3\frac{1}{2}$. Snout as long as eye, the diameter of which is $3\frac{1}{2}$ to 4 in the length of head; interorbital width $2\frac{1}{2}$ in the length of head. 32 to 35 scales in a longitudinal series. Dorsal 12-14; origin equidistant from tip of snout and end of caudal fin. Anal 14-17; origin behind that of the dorsal. Pectoral $\frac{2}{3}$ to $\frac{3}{4}$ the length of head. Caudal subtruncate. Males with a blackish longitudinal band; dorsal and caudal fins blackish, with a narrow light edge. Females with the lateral band broken up into a series of spots or bars; body with numerous irregular spots; fins pale.

Hab. MEXICO, Rio Lerma System:

Aguas Calientes³; Tepic⁵; Lagos³; Guanajuato^{1 4}; Ocotlan³; Celaya³; Salamanca³; Huingo³.

Here described from a number of specimens, measuring up to 75 mm. in total length, from Aguas Calientes (*Jordan, Meek*) and Salamanca (*Woolman*).

4. *Characodon lateralis*.

Characodon lateralis, Günth. Cat. Fish. vi. p. 308 (1866)¹, and Trans. Zool. Soc. vi. 1868, p. 480, t. 82. fig. 2²; Garm. Mem. Mus. Comp. Zool. xix. 1895, p. 36²; Meek, Publ. Columbian Mus., Zool. v. 1904, p. 121⁴.

*Characodon garmani**, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1898, p. 2831⁵; Meek, l. c.⁶.

Depth of body $2\frac{1}{2}$ to 3 in the length, length of head 3 to $3\frac{1}{4}$. Snout as long as or shorter than eye, the diameter of which is $3\frac{1}{2}$ to $4\frac{1}{4}$ in the length of head; interorbital width 2 to $2\frac{1}{4}$ in the length of head. 32 to 35 scales in a longitudinal series. Dorsal 11-14; origin equidistant from preoperculum or operculum and end of caudal. Anal 13-16; origin a little in advance of that of the dorsal. Pectoral $\frac{3}{4}$ the length of head. Caudal rounded or subtruncate. Males dark brownish, with a more or less distinct blackish lateral band; vertical fins each with a blackish intramarginal band. Females olivaceous, with the dark lateral band more or less broken up into spots or bars.

* Jordan & Evermann (Bull. U.S. Nat. Mus. xlvii. 1898, p. 2831) proposed the name *Characodon garmani* for the specimens from Parras, Coahuila, described by Garman (Mem. Mus. Comp. Zool. xix. 1895, p. 36) under the name *Characodon lateralis*. Garman's description appears about equally applicable to *C. lateralis* and *C. variatus*, species which he does not recognize as distinct from each other. Specimens collected by Dr. Meek at Durango and sent as *C. garmani* are identical with *C. lateralis*.

Hab. MEXICO, Coahuila, Durango, and Jalisco :

Parras in Coahuila³; Durango and Labor in Durango⁶; Jalisco⁴.

Here described from several specimens, measuring up to 65 mm. in total length, the types of the species (described as from Central America, without particulars as to the exact locality) and a series from Durango (*Meek*).

5. *Characodon furcoidens*. (Tab. XII. fig. 2.)

Characodon furcoidens, Jord. & Gilb. Proc. U.S. Nat. Mus. 1882, p. 354¹; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1892, p. 670².

Depth of body $3\frac{1}{2}$ in the length, length of head 4. Snout as long as eye, the diameter of which is $3\frac{1}{2}$ in the length of head; interorbital width 2 in the length of head. 53 scales in a longitudinal series. Dorsal 16; origin equidistant from base of pectoral and base of caudal. Anal 12; origin posterior to that of the dorsal. Pectoral $\frac{2}{3}$ the length of head. Caudal truncate. Brownish above, yellowish below; upper part of the body with traces of darker spots.

Hab. Lower California and Jalisco :

Cape San Lucas or lagoons near La Paz¹; Rio de Mascota in Jalisco (*Buller*); Colima².

Here described from a specimen of 80 mm. from the Rio de Mascota (*Buller*).

8. GOODEA, Jord., 1879.

Goodea, Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 685.

Xenendum, Jord. & Snyder. Bull. U.S. Fish. Comm. xix. 1899, p. 127 (1900).

Goodea and *Skiffia*, Meek, Publ. Columbian Mus., Zool. v. 1904, pp. 136 and 141.

Viviparous. Anal fin of the male with the anterior five or six rays short, stiff, and subequal, separated by a more or less distinct notch from the rest of the fin. Mouth small, transverse; rami of lower jaw weakly connected; minute teeth in bands, with an outer series of larger, movable, bicuspid teeth.

Hab. MEXICO.

Synopsis of the Species.

- | | |
|---|---------------------------|
| I. Origin of anal well in advance of that of the dorsal; 38 to 45 scales in a longitudinal series | 1. <i>toweri</i> . |
| II. Origin of anal below or slightly in advance of that of the dorsal. | |
| 39 to 44 scales in a longitudinal series | 2. <i>atripinnis</i> . |
| 34 to 38 scales in a longitudinal series | 3. <i>calientis</i> . |
| III. Origin of anal a little behind that of the dorsal; 32 scales in a longitudinal series | 4. <i>bilineata</i> . |
| IV. Origin of anal considerably behind that of the dorsal. | |
| A. 48 to 55 scales in a longitudinal series | 5. <i>whitii</i> . |
| B. 32 to 38 scales in a longitudinal series. | |
| Dorsal with 12-15 rays | 6. <i>lermae</i> . |
| Dorsal with 16-18 rays | 7. <i>multipunctata</i> . |

1. *Goodea toweri*.

Goodea toweri, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 138, fig. 41¹.

Depth of body 2 to $2\frac{1}{2}$ in the length, length of head $3\frac{3}{4}$. Snout shorter than eye, the diameter of which is $2\frac{3}{4}$ in the length of head; interorbital width equal to the distance from posterior margin of pupil to free edge of operculum. 38 to 42 (45) scales in a longitudinal series. Dorsal 11-12; origin equidistant from præoperculum or operculum and posterior end of caudal. Anal 12-13; origin in advance of that of the dorsal. Pectoral $\frac{3}{4}$ the length of head. Caudal truncate. Brownish above, lighter below; fins plain.

Hab. MEXICO, Upper tributaries of the Rio Panuco:

Rio Verde in San Luis Potosi¹.

Here described from two specimens of 70 mm. from the Rio Verde (*Meek*).

2. *Goodea atripinnis*.

Goodea atripinnis, Jord. Proc. U.S. Nat. Mus. 1879, p. 299¹; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 685², and 1900, fig. 301.

Characodon luitpoldi, Steind. Denkschr. Ak. Wien, lxii. 1895, p. 528, t. 2. fig. 3².

Goodea luitpoldi, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 139, fig. 42⁴.

Xenendum xaliscone, Jord. & Snyder. Bull. U.S. Fish. Comm. xix. 1899, p. 128, fig. 9 (1900)⁵.

Depth of body 3 to $3\frac{2}{3}$ in the length, length of head 4 to 5. Snout as long as eye, the diameter of which is $3\frac{1}{2}$ to 4 in the length of head; interorbital width equal to the distance from middle of eye to free edge of operculum. 39 to 44 scales in a longitudinal series. Dorsal 13-15; origin equidistant from eye and posterior end of caudal fin. Anal 15-16; origin below or a little in advance of that of the dorsal. Pectoral a little shorter than the head. Caudal rounded or subtruncate. Caudal peduncle $1\frac{1}{3}$ - $1\frac{2}{3}$ as long as deep. Brownish; vertical fins dusky.

Hab. MEXICO, Rio Lerma System:

Leon in Guanajuato¹; Lake Chapala^{4 5}; Lake Patzcuaro³.

Here described from five specimens, measuring up to 180 mm. in total length, from Lakes Chapala (*Buller*) and Patzcuaro (*Meek*).

3. *Goodea calientis*.

Xenendum caliente, Jord. & Snyder. Bull. U.S. Fish. Comm. xix. 1899, p. 127, fig. 8¹.

Goodea atripinnis, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 140, fig. 43².

Depth of body $2\frac{2}{3}$ to $3\frac{1}{3}$ in the length, length of head 4. Snout about as long as eye, the diameter of which is $3\frac{1}{2}$ to $4\frac{1}{2}$ in the length of head; interorbital width equal to the distance from posterior margin of pupil to free edge of operculum. 34 to 38 scales in a longitudinal series. Dorsal 13-15; origin equidistant from operculum and posterior end of caudal fin. Anal 15-16; origin below or a little in advance of that of the dorsal. Pectoral a little shorter than the head. Caudal rounded or subtruncate. Caudal peduncle as long as or a little longer than deep. Brownish; young with irregular darker spots; fins plain.

Hab. MEXICO, Rio Lerma and upper tributaries of the Rio Panuco:

Aguas Calientes^{1 2}; Lagos²; Celaya²; Acambaro²; San Juan del Rio²; Huingo²; Lake Patzcuaro².

Here described from a number of specimens from Aguas Calientes (*Jordan, Meek*), San Juan del Rio (*Meek*), Huingo (*Meek*), and Patzcuaro (*Mexico Mus.*).

4. *Goodea bilineata*.

Characodon bilineatus, Bean, Proc. U.S. Nat. Mus. 1887, p. 371, t. 20, fig. 2¹.

Skiffia bilineata, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 144, fig. 45².

Hab. MEXICO, Rio Lerma System :

Leon in Guanajuato¹; Huingo².

This species agrees with *G. multipunctata* in the number of scales and fin-rays, but has the dorsal fin placed further back, whilst the markings are quite different.

5. *Goodea whitii*.

Goodea whitei, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 137, fig. 40¹.

Depth of body 3 to 4 in the length, length of head 4. Snout as long as or shorter than eye, the diameter of which is 3 to 3½ in the length of head; interorbital width equal to the distance from posterior margin of pupil to free edge of operculum. 48 to 55 scales in a longitudinal series. Dorsal 14-17; origin equidistant from tip of snout and posterior end of caudal fin. Anal 12-14; origin posterior to that of the dorsal. Pectoral about ¾ the length of head. Caudal truncate, the upper angle sometimes a little produced. Brownish above, yellowish below; each scale of the upper part of the body with a dark spot; usually a blackish lateral stripe; vertical fins dusky, more or less distinctly spotted, sometimes with a pale edge and dark intramarginal stripe.

Hab. MEXICO, upper tributaries of the Rio Balsas :

Yautepec¹; Cuautla¹.

Here described from several specimens, measuring up to 90 mm. in total length, from Yautepec and Cuautla (*Meek*).

6. *Goodea lermæ*.

Skiffia lermæ, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 142, t. 8¹.

Skiffia variegata, Meek, t. c. p. 143, fig. 44².

Depth of body 2½ to 3½ in the length, length of head 4. Snout shorter than eye, the diameter of which is 3 in the length of head; interorbital width equal to or a little more than the postorbital part of head. 34 to 38 scales in a longitudinal series. Dorsal 12-15; origin equidistant from snout and base of caudal (♂) or nearer the latter (♀). Anal 13-15; origin posterior to that of the dorsal. Pectoral ¾-⅝ the length of head. Caudal truncate. Males dark brownish; females olivaceous, with irregular darker spots; sometimes an indistinct dark lateral stripe and a spot or bar at the base of caudal; fins plain.

Hab. MEXICO, Rio Lerma System and Valley of Mexico :

Celaya¹; Lake Patzcuaro¹; Lake Zirahuen²; Lake Chalco².

Here described from a number of specimens, measuring up to 65 mm. in total length, from Lakes Patzcuaro and Zirahuen (*Meek*). I am unable to detect any differences between the examples from these two lakes, sent as *S. lermæ* and *S. variegata* respectively.

7. *Goodea multipunctata*. (Tab. XII. figg. 5, 6.)

Xenendrum multipunctatum, Pellegr. Bull. Mus. Paris, 1901, p. 205¹.

Skiffia multipunctata, Meek, Publ. Columbian Mus., Zool. v. 1904, p. 141².

Depth of body 2½ to 2¾ in the length, length of head 4. Snout shorter than eye, the diameter of which is 3

in the length of head; interorbital width equal to or a little longer than the postorbital part of head. 32 to 35 scales in a longitudinal series. Dorsal 16–18; origin equidistant from snout and base of caudal (σ) or nearer the latter (ρ). Anal 14–16; origin posterior to that of the dorsal. Pectoral $\frac{3}{4}$ – $\frac{4}{5}$ the length of head. Caudal truncate or subtruncate. Olivaceous; a dark spot on each scale of the upper and posterior parts of the body; a dark vertical bar at the base of the caudal fin; dorsal and caudal fins with dark spots.

Hab. MEXICO, Rio Lerma System:
Jalisco¹; Lake Chapala².

Here described from four specimens, measuring up to 50 mm. in total length, from Ocotlan (*Meek*).

9. BELONESOX, Kner, 1860.

Belonesox, Günth. Cat. Fish. vi. p. 333 (1866); Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 684.

Viviparous. Anal fin, in the male, advanced and modified into an intromittent organ. Mouth large, with extended lateral cleft; teeth in bands, slender, pointed, depressible.

This genus comprises a single species, quite unlike any other member of the family.

1. *Belonesox belizanus*.

Belonesox belizanus, Kner, Sitzungsber. Ak. Wien, xl. 1860, p. 419, fig.¹; Günth. Cat. Fish. vi. p. 333 (1866)²; Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 684³; Meek, Publ. Columbian Mus., Zool. v. 1904, p. 135⁴.

Depth of body 4 to 6 in the length, length of head nearly 3. Snout $2\frac{1}{2}$ to $3\frac{1}{4}$ as long as eye, the diameter of which is 5 to 6 in the length of head. Lower jaw more than $\frac{1}{2}$ the length of head. 55 to 65 scales in a longitudinal series. Dorsal 9–10. Anal 10–12, in advance of the dorsal. Caudal rounded. A small dark spot on each scale of the upper part of the body; a blackish spot at the base of the caudal.

Hab. MEXICO, Boca del Rio⁴, Otopa⁴, El Hule⁴, Obispo⁴, and Perez⁴ in Vera Cruz; BRITISH HONDURAS, Belize¹; GUATEMALA, Lake Peten².

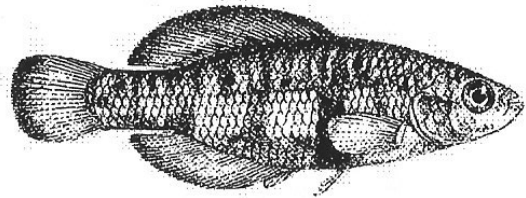
Here described from eight specimens, measuring up to 200 mm. in total length, from Perez (*Meek*), Lake Peten (*Salvin*), and Belize. The largest males measure 90 mm.

10. GAMBUSIA, Poey, 1855.

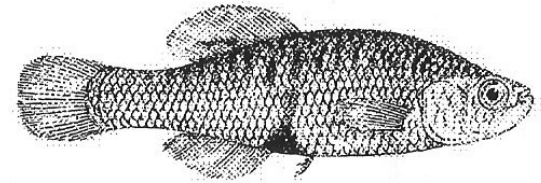
Pseudoxiphophorus and *Gambusia*, Günth. Cat. Fish. vi. pp. 332 and 333 (1866); Jord. & Everm. Bull. U.S. Nat. Mus. xlvii. 1896, p. 678.

Viviparous. Anal fin, in the male, advanced and modified into an intromittent organ. Mouth small or moderate; rami of lower jaw firmly united; small teeth in bands, with an outer series of more or less enlarged, conical, fixed teeth.

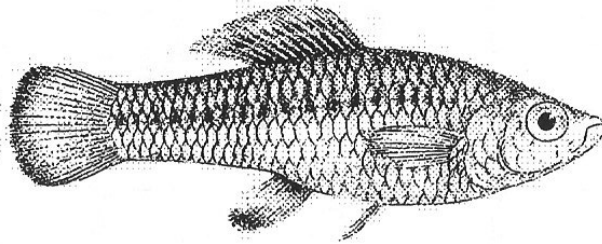
This genus comprises ten species from the Southern United States, Mexico, and Central America, and three or four from Cuba and Jamaica.



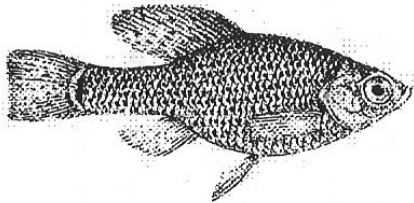
3.♂.



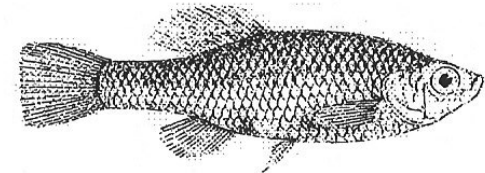
4.♀.



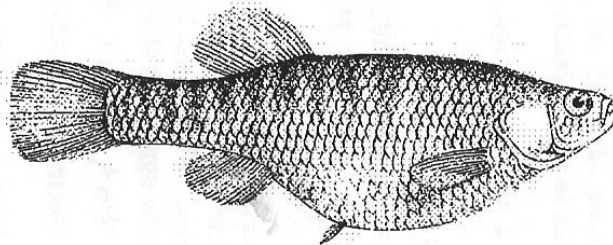
7.



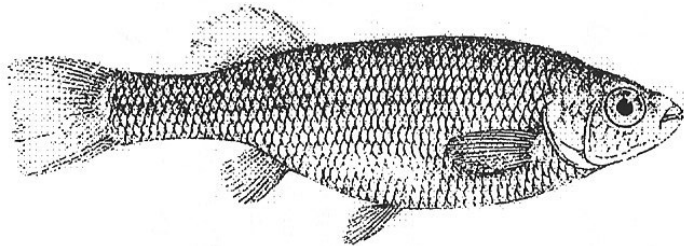
5.♂.



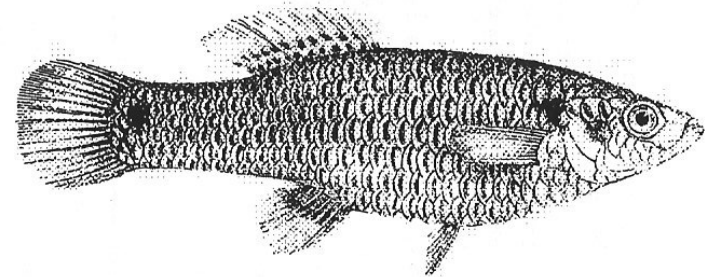
6.♀.



1.



2.



8.

1. LIMNURGUS INNOMINATUS. 2. CHARACODON FURCIDENS. 3, 4. C. MULTIRADIATUS. 5, 6. GOODEA MULTIPUNCTATA.
7. GAMBUSIA TERRABENSIS. 8. G. JONESII.

