



SMITHSONIAN INSTITUTION.

UNITED STATES NATIONAL MUSEUM.

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 47.

THE FISHES

OF

NORTH AND MIDDLE AMERICA:

DESCRIPTIVE CATALOGUE OF THE SPECIES OF FISH-LIKE VERTEBRATES FOUND IN
THE WATERS OF NORTH AMERICA, NORTH OF THE ISTHMUS OF PANAMA.

BY

DAVID STARR JORDAN, Ph. D.,

PRESIDENT OF THE LELAND STANFORD JUNIOR UNIVERSITY AND OF THE
CALIFORNIA ACADEMY OF SCIENCES,

AND

BARTON WARREN EVERMANN, Ph. D.,

ICHTHYOLOGIST OF THE UNITED STATES FISH COMMISSION.

PART IV.

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1900.

P R E F A C E.

This volume is fourth and last of a descriptive catalogue of the fishes and fish-like vertebrates of North and Middle America. Part I, *Branchiostomatidae* to *Priscanthidae* inclusive (pp. 1 to 1240), was published October 3, 1896; Part II, *Lutjanidae* to *Cephalicanthidae* inclusive (pp. 1241 to 2183), was published October 3, 1898; Part III, *Callionymidae* to *Ogcocephalidae* inclusive, including also "Addenda," an "Artificial Key to the Families of the True Fishes," a "Glossary of Technical Terms," and an "Index" complete for Parts I, II, and III (pp. 2183a to 3156), was published November 28, 1898; and Part IV, the present volume, appears on June 26, 1900.

Since the publication of Part III, investigations by Dr. Jordan, in Mexico, and by Dr. Evermann, in Puerto Rico, have added greatly to our knowledge of the fishes of those regions, and have made it desirable to incorporate in the present volume still further addenda.

Recent studies by Dr. Günther, of certain Linnean types, show that some changes in nomenclature are necessary, which are also included.

DAVID STAER JORDAN.

BARTON WARREN EVERMANN.

LELAND STANFORD JUNIOR UNIVERSITY,
PALO ALTO, SANTA CLARA COUNTY, CALIFORNIA.

March 15, 1900.

obtained were procured at a depth of about 200 feet. While it is a brightly colored fish, it lacks some of the iridescent hues of *S. gairdneri crescentis*, and consequently is less attractive in appearance. It is known as the long-nose, or long-headed trout." (Meek.)

Length nearly 2 feet.

Known only from Crescent Lake, Washington, where two specimens were obtained in 1898 by Prof. D. G. Elliot.

Salmo bathvector, MEEK, Notes on a collection of cold-blooded Vertebrates from the Olympic Mountains: Field Columbian Museum Publication 31, Zoological Series, Vol. I, No. 12, 227, February, 1896, Crescent Lake, Washington. (Type, No. 2035, Field Columbian Museum.)

Page 572. *Myctophum gracilis* (Lütken) is reported by Lütken from Denmark Strait, west of Iceland.

Page 583. Before *Farrella*, Goode & Bean, insert the following:

875 (a). *CYCLOTHONE MEGALOPS*, Lütken.

Together with a great number of *Cyclothone microdon* captured at station 12—64° 38' lat. N., 82° 37' long. W., 1,040 fathoms—there occurred a single specimen of a length of 70 mm., habitually looking much like the said species, but differing by the eyes not being particularly small, and by totally wanting the light glands or "photospheres." It can, therefore, apparently, hardly be referred to the same genus. The dorsal and anal fins are very like those of *C. microdon*, though with the difference that the dorsal fin begins somewhat before the anal fin, while this, on the other hand, ends somewhat farther back than the dorsal fin. Quite black. A somewhat larger specimen (105 mm.) from station 9—64° 18' lat. N., and 27° long. W., 295 fathoms—is so badly preserved that it gives only the information that the eyes are not small and that both jaws are armed with small teeth directed obliquely backward, with a few longer ones in the foremost part of the lower jaw and the foremost part of the palate or the intermaxillary. The nearer determination of this specimen must be reserved for a future discovery.

It seems evident that these specimens belong to species else unknown, but as the material is so scanty I shall limit myself to the short preliminary notes made above. (Lütken.)

Cyclothone (?) megalops, LÜTKEN, Ichth. Results Danish *Jugolf* Exped., Vol. II, 10, 1898, west of Iceland.

Page 617. *Macdonaldia rostrata* was taken in 1895 by the *Jugolf* expedition west of Iceland.

Page 669. After *Characodon variatus*, Bean, insert:

983 (a). *CHARACODON ENCAUSTES*, Jordan & Snyder.

Head 4; depth 3½; depth of caudal peduncle 8; eye 3 in head; snout 4; interorbital space 3½; height of dorsal 4½ in length; anal 6½; length of pectoral 5½; ventral 6½; caudal 4½; D. 16; A. 15; scales 35, 13 transverse series counting upward and forward from origin of anal, 9 on caudal

peduncle. Body deep, compressed, dorsal outline almost straight from snout to origin of dorsal, concave from the latter point to base of caudal; ventral outline evenly curved from snout to posterior part of base of anal; eye very large, nearer snout than to posterior edge of opercle by a distance equal to longitudinal diameter of pupil; mouth small, its width equal to $\frac{1}{2}$ diameter of pupil; maxillary protractile; lower jaw projecting; teeth in 2 series, the outer series small, bicuspid, in a single row, rather firmly attached; inner series minute, in small patches; gill-opening restricted, not extending above base of pectoral fin; gill-rakers slender, equal in length to $\frac{1}{2}$ diameter of pupil. Alimentary canal short; air-bladder large, extending posteriorly to a point above origin of anal; dorsal fin inserted halfway between tip of snout and base of caudal, length of base a little less than height of fin; anal inserted below middle of dorsal, its edge rounded; pectoral extending to base of ventrals; ventrals extending to vent. Scales on body large; upper posterior part of head and a narrow space below and posterior to eye with scales; other parts of head naked; small scales on basal part of caudal fin; a row of large pores above eye and at lower edge of suborbital patch of scales; no lateral line. Color in alcohol light, yellowish olive; 9 short and narrow vertical bands on median part of body, the first above base of pectoral, the ninth at base of caudal; scales on dorsal region of body edged with black dots; upper part of head dark; upper half of orbit black; opercles silvery; dorsal fin with a little dusky; other fins without dark color.

This species somewhat resembles *C. ciseni* in appearance. It differs in having more rays in the dorsal and anal fins, smaller scales, a more compressed body, and less dark color on the body. (Jordan & Snyder.)

Known only from Laguna de Chapala, near Ocotlan, Jalisco, Mexico, where J. O. Snyder collected the type, a female, No. 6163, L. S. Jr. Univ. Mus. (*εγκανδύτος*, branded.)

Characodon encaustus, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 126, Laguna de Chapala, Mexico.

Page 685. After *Gooden atripinnis*, Jordan, insert:

313 (a). **XENENDUM**, Jordan & Snyder.

Xenendum, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 127 (*callente*).

Body deep, not much compressed; males and females of about the same size. Eye normal; mouth vertical, lower jaw projecting; teeth loosely attached, in 2 series, the first series flat, bicuspid, in 2 or 3 rows on each jaw; the second series minute, in villiform bands, sometimes absent; gill opening not restricted, extending above the pectoral fin a distance equal to the diameter of pupil. Alimentary canal long, with many convolutions; air-bladder present, large. Scales large; no lateral line. Dorsal and anal inserted posteriorly, the one directly over the other, their bases short; anal very slightly modified in male, first rays shorter, edge double-convex—the notch being between smaller and larger groups of rays; ventral fins present; caudal rounded, and not modified in male.

Xenendum differs notably from *Characodon* in having the bicuspid teeth loosely attached and in more than one series. *Characodon* has the bicuspid

teeth firmly attached and in a single series. Its actual affinities are with the genus *Goodea*, and it belongs to the subfamily *Goodeinae*, which has the general characters of the *Paciliinae*, but with bifurcate or trifurcate teeth, and no great differences between the sexes. (ξενός, strange; ἐνδόν, within.)

1008 (b). XENENDUM CALIENTE, Jordan & Snyder.

Head $3\frac{1}{2}$; depth $2\frac{2}{3}$; depth of caudal peduncle $5\frac{2}{3}$; eye 4 in head; snout $3\frac{1}{2}$; interorbital space 2; height of dorsal $5\frac{1}{2}$ in length; anal $6\frac{1}{2}$; length of pectoral 5; ventral $7\frac{2}{3}$; caudal 5; D. 13; A. 14; scales 36, in transverse series counting upward and forward from origin of anal, 14; on caudal peduncle, 9. Body large and thick set, deepest at tip of pectoral; width $4\frac{1}{2}$ times in length; head pointed; interorbital space broad, slightly convex; length of snout about equal to diameter of orbit; mouth vertical, its width equal to length of snout; maxillary very protractile; teeth loosely attached, in 2 series, those of the first series larger, flat, and notched, in 2 rows on upper jaw, 3 rows on lower, the individual teeth of each row alternating in position with those of the next, those of the second series very minute, in a villiform band; gill-opening not restricted, extending above the pectoral a distance equal to diameter of pupil; gill-rakers long, slender, and close together, 40 on first arch. Alimentary canal long (in one specimen $4\frac{1}{2}$ times the length of body), coiled many times; peritoneum black; genital opening close to base of anal, covered by a thick, notched pad. Dorsal fin inserted posteriorly, rounded, the base short, its length less than height of fin; anal inserted under dorsal, first 5 rays crowded together and shortened; edge of fin double-convex, the notch being between the shorter and longer sets of rays; pectorals and ventrals with rounded edges; caudal evenly rounded; body and head everywhere, except jaws and preorbital area, with scales; no lateral line. Color light olive, growing darker above; medium dorsal area blackish, each scale with a dark, angular band, those of the sixth series below the dorsal darker, making an indistinct, narrow lateral band; all the fins, except ventrals, dusky.

The females differ but slightly from the males. The body is more thick set, the caudal peduncle a little less deep, the fins a little lower, and the anal evenly rounded. The young are somewhat mottled in color.

Xenendum caliente differs from *X. luitpoldii* in having fewer scales in the lateral and transverse series and on the caudal peduncle, and in a similar way from *X. saliscone*, besides having villiform teeth, which are absent in *X. saliscone*. (Jordan & Snyder.)

Known only from Rio Verde, near Aguas Calientes, Mexico. (Type, a female, No. 6147, L. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

Xenendum caliente, JORDAN & SNYDER, Bull U. S. Fish Com. 1899 (1900), 127, Rio Verde, near Aguas Calientes, Mexico.

Characodon luitpoldii, Steindachner (p. 2832) belongs to this new genus, and should stand as

1008 (b). XENENDUM LUITPOLDII (Steindachner).

1008 (a). XENENTUM XALISCOE, Jordan & Snyder.

Head 4; depth $3\frac{1}{2}$; depth of caudal peduncle 6; eye $3\frac{1}{2}$ in head; snout 2; interorbital space 1; height of dorsal $6\frac{1}{2}$ in length; anal 9; length of pectoral 5; ventral $7\frac{1}{2}$; caudal 5; D. 13; A. 14; scales 42, transverse series, counting upward and forward from origin of anal, 17; on caudal peduncle 12. Body thick set, deepest at origin of ventrals, widest at bases of pectorals; caudal peduncle deep and long; head large and pointed; interorbital space broad, slightly convex; mouth vertical, its width equal to length of snout; maxillary very protractile; teeth loosely attached, broader at distal ends than at bases, bicuspid, in two rows on each jaw; no villiform teeth present; gill openings extending above base of pectorals a distance about equal to diameter of pupil; gill-rakers long, flat, very close together, 56 on first arch. Alimentary canal long, in many folds; peritoneum black. Dorsal fin inserted posteriorly, first ray simple, closely attached to second; edge of fin rounded; anal inserted on a vertical passing through the base of fourth dorsal ray, similar to dorsal in shape; pectoral and ventral fins rounded; edge of caudal a little convex; basal fourth with scales. Scales large, everywhere on body and head, except lower jaw and preorbital area; no lateral line. Color plain, dark above, light below, the dark color leaving off rather abruptly on the head along a line passing through lower edge of eye; on the body, along a line passing from lower edge of base of pectoral to caudal, leaving lower one-fifth of caudal peduncle light; faint traces of a dark spot at base of each scale on dorsal region of body; all the fins, except ventrals, dusky. Laguna de Chapala, Mexico.

One male individual was taken. It resembles the female in general appearance. The anal fin is not advanced nor modified into an intromittent organ. Although it is injured, it shows that the first 5 or 6 rays were close together and shortened.

Xenentum xaliscoe differs from *X. celicote* in not having villiform teeth, in having more scales in the lateral and transverse series, and on the caudal peduncle. It differs from *X. luitpoldii* (Steindachner), which is the third known species of the genus, in having a much longer snout, a more pointed head, and in not having villiform teeth. (Jordan & Snyder.)

Known only from Laguna de Chapala, near Ocotlan, Jalisco, Mexico. (Type, a female, No. 6148, U. S. Jr. Univ. Mus. Coll. J. O. Snyder.)

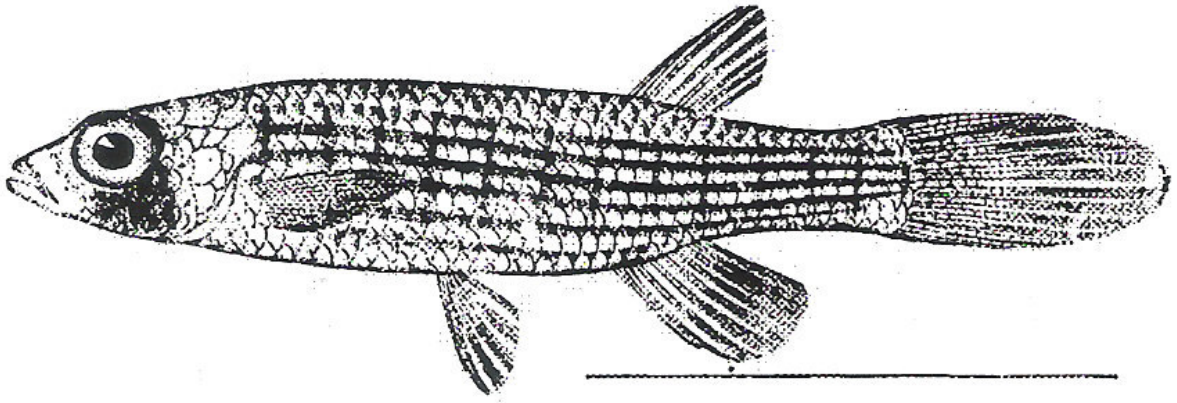
(Name from Jalisco, the type locality.)

Xenentum xaliscoe, JORDAN & SNYDER, Bull. U. S. Fish Com. 1899 (1900), 129, Laguna de Chapala, Mexico.

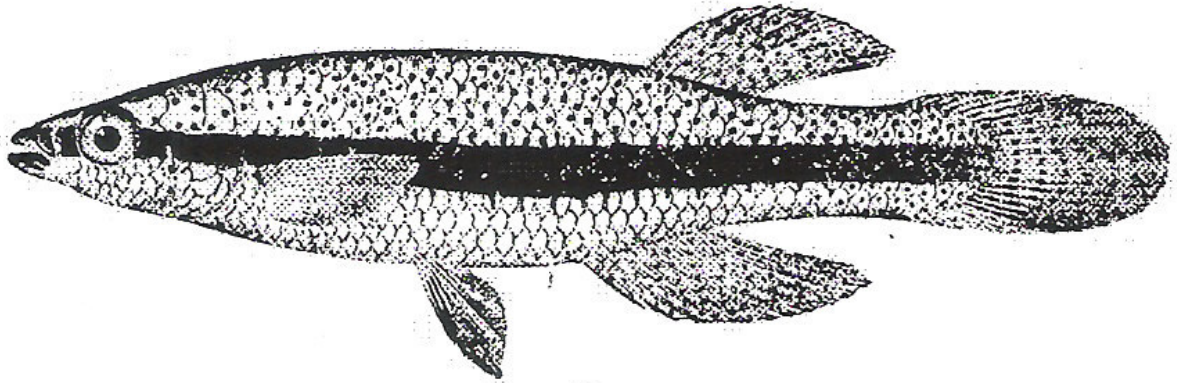
Page 698. Before *Mollienisia*, Le Sueur, insert:

1037 (a). POECILIA LIMANTOURI, Jordan & Snyder.

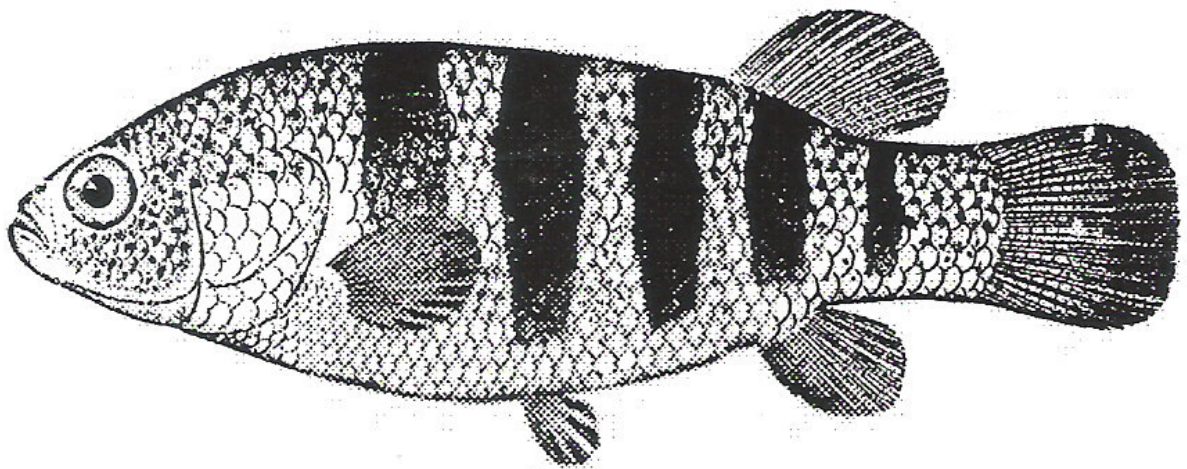
Head $3\frac{1}{2}$ in length; depth 3; depth of caudal peduncle $4\frac{1}{2}$; eye $3\frac{1}{2}$ in head; snout 3; interorbital space 2; height of dorsal $5\frac{1}{2}$ in length; anal 4; length of pectoral $4\frac{1}{2}$; ventral 6; caudal $3\frac{1}{2}$; D. 9; A. 8; scales 26-9, 8 on caudal peduncle. Body rather deep and compressed; dorsal outline angular, its highest point at insertion of dorsal; lowest point of



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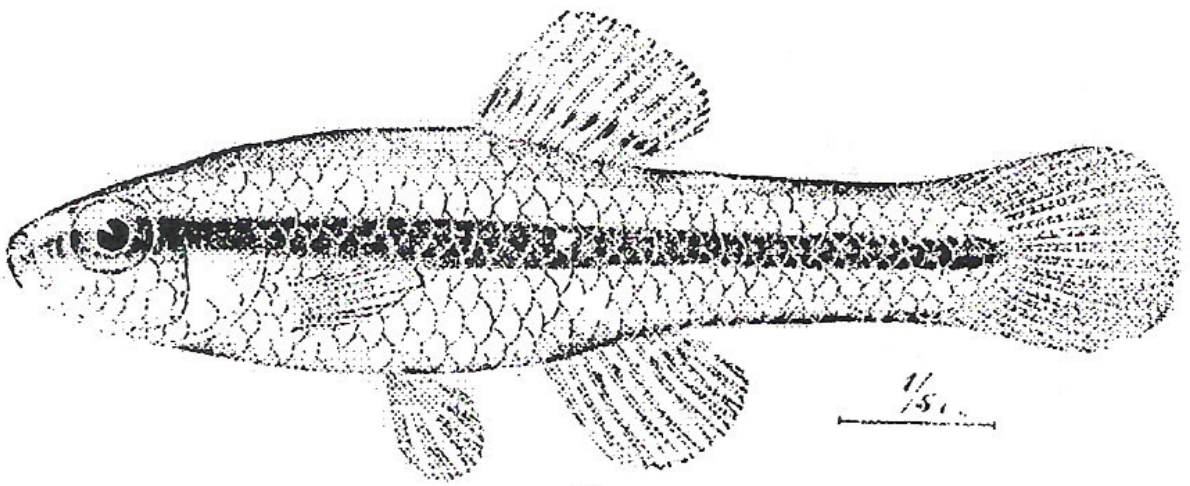


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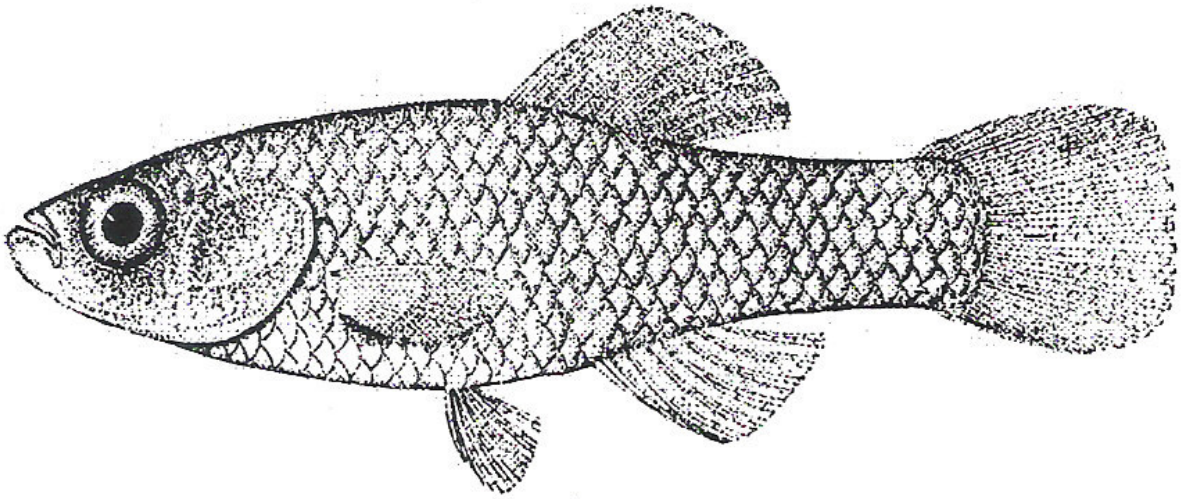


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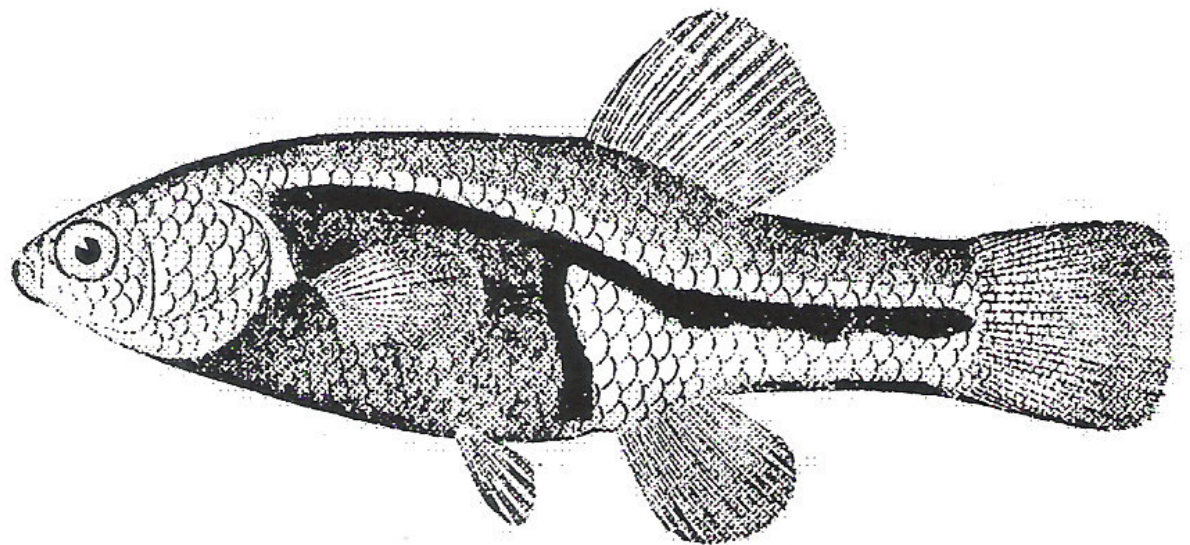
288. *FUNDULUS NOTTII*. (P. 656.)
289. *FUNDULUS NOTATUS*. (P. 659.)
290. *ADINIA DUGESII*. (P. 661.)



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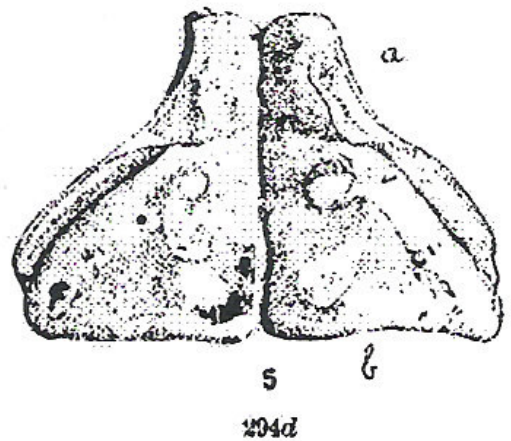
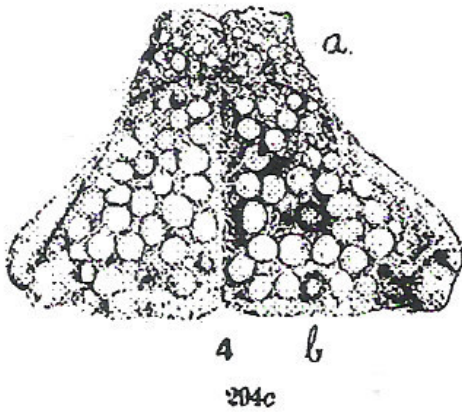
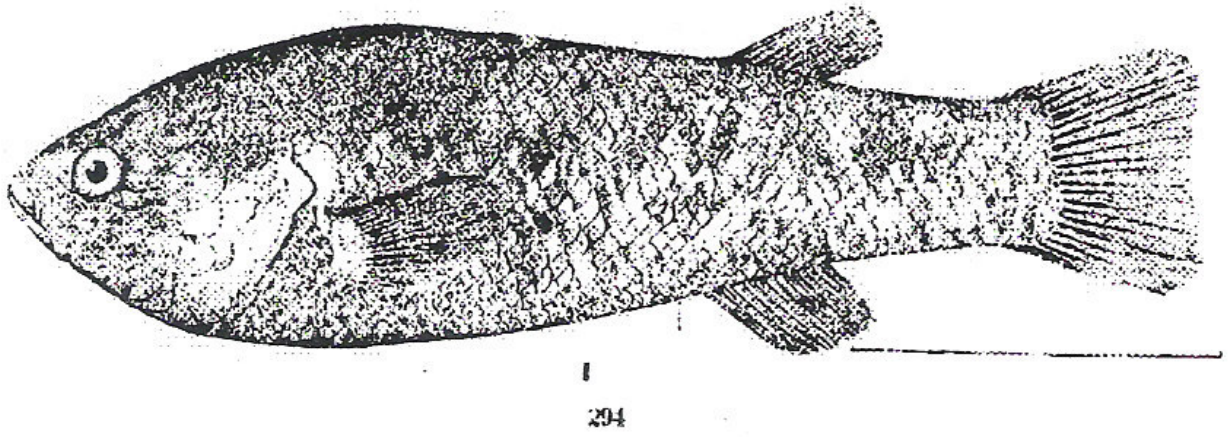
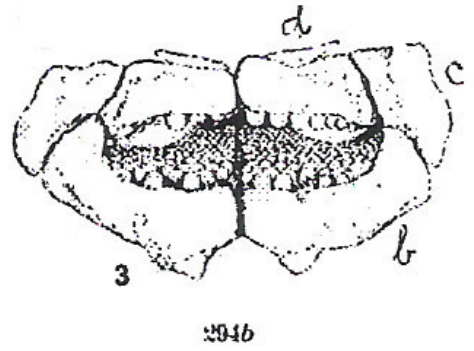
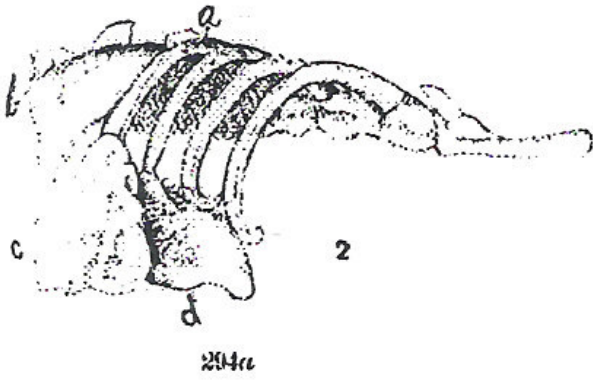


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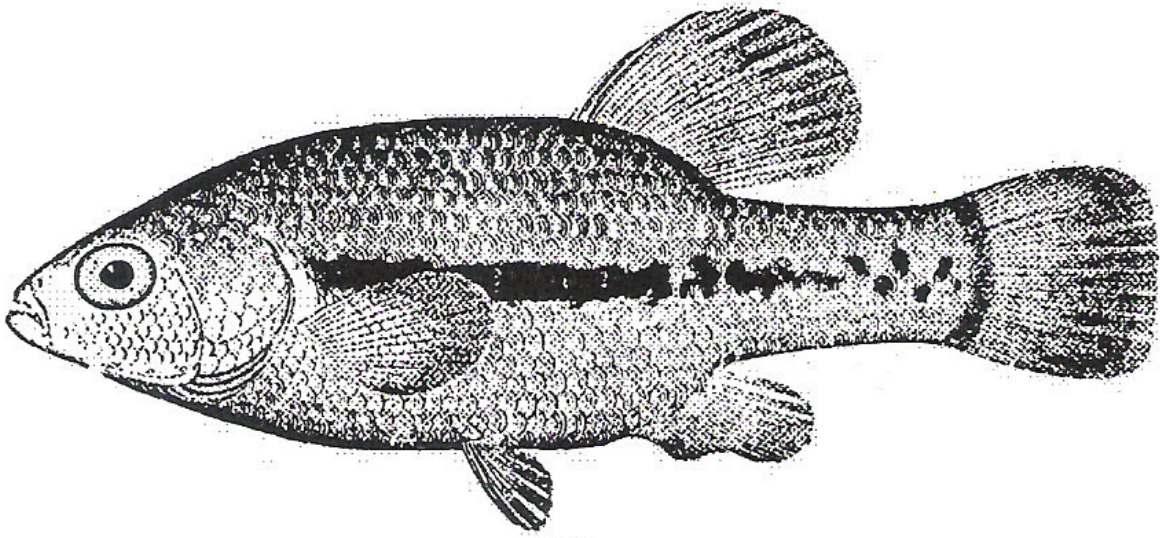


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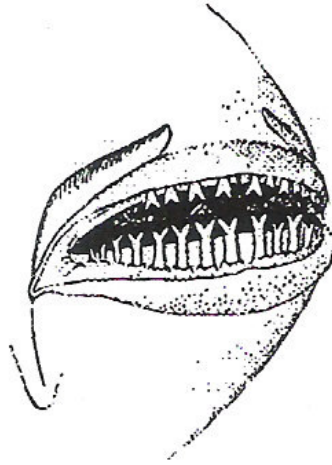
291. *FUNDULUS GODEL*. (Pp. 664, 2831.)
292. *LUCANIA PARVA*. (P. 665.)
293. *CHARACODON BILINEATUS*. (P. 668.)



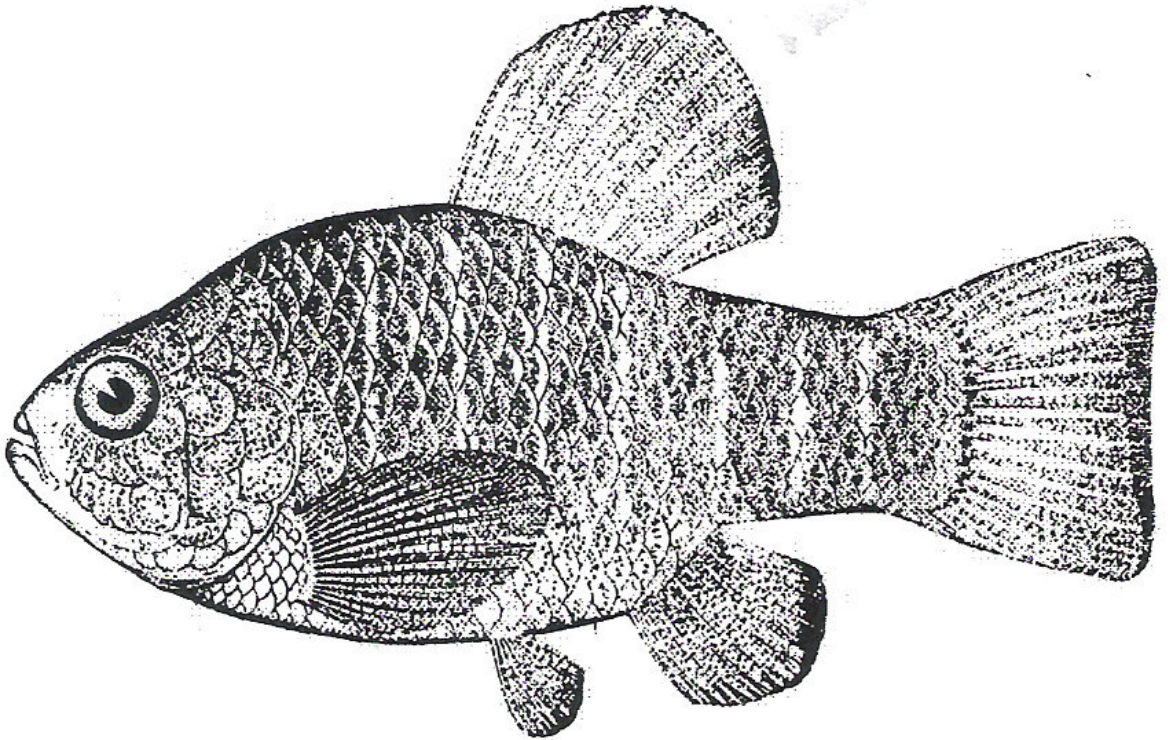
294, 294a, 294b, 294c, 294d. EMPETRICHTHYS MERRIAMII. (P. 667.)



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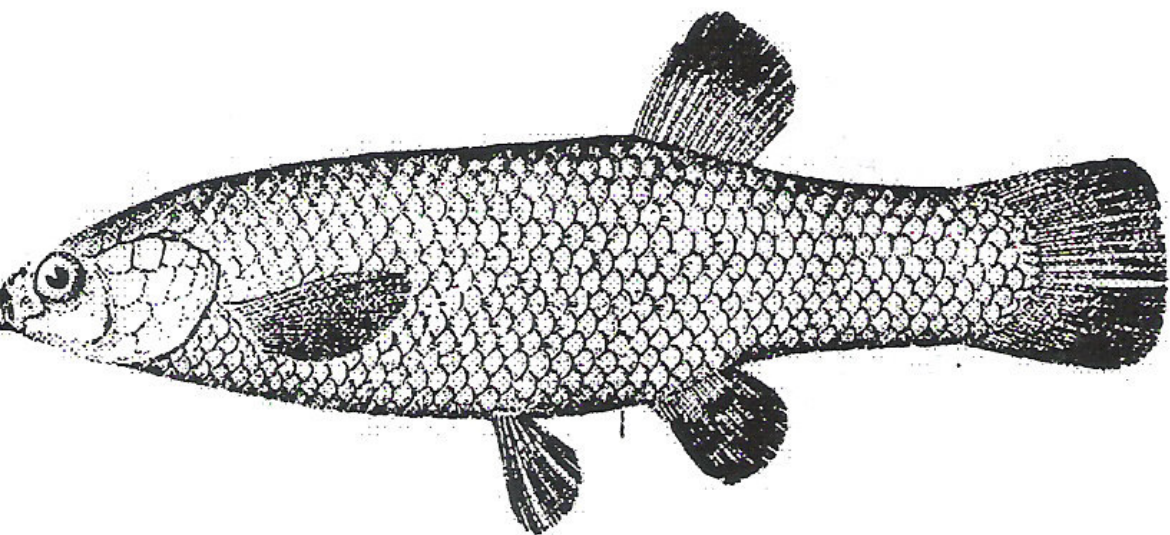


295a

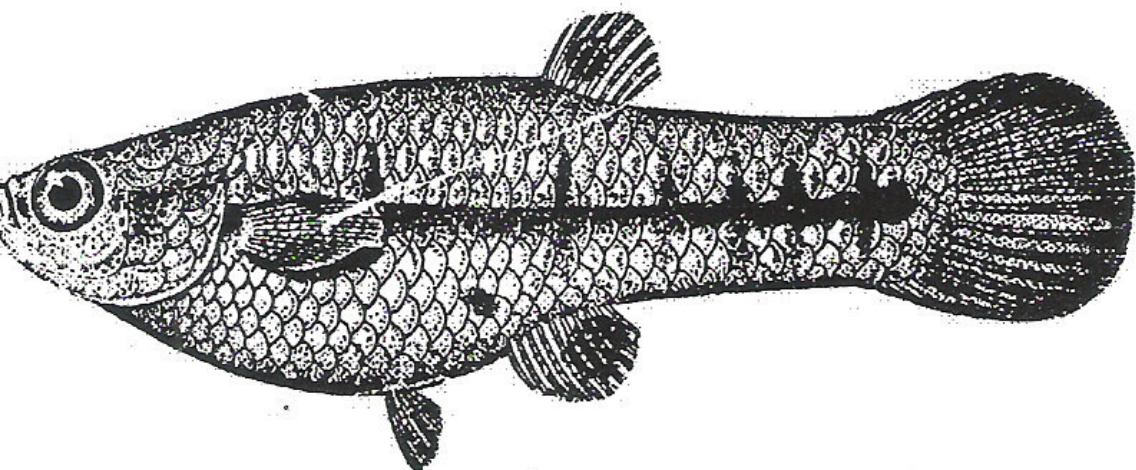


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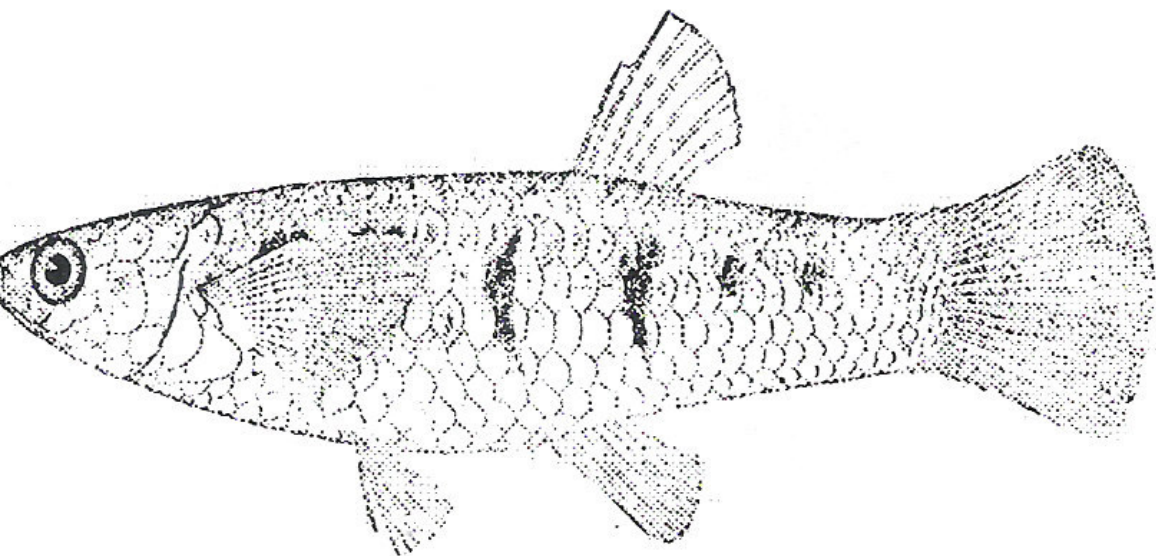
295. CHARACODON VARIATUS. (P. 669.)
295a. TEETH OF CHARACODON VARIATUS. (P. 669.)
296. CYPRINODON VARIEGATUS. (P. 671.)



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301. *GOODEA ATRIPINNIS*. (P. 685.)
 302. *HETERANDRIA FORMOSA*. (P. 687.)
 303. *PECILIA PRESIDIONIS*; female. (P. 697.)