

Chelura terebrans—(Continued.)

138, fig. 250, 1855.—Bate, Report British Assoc. Adv. Sci., 1855, p. 59, pl. 13, fig. 3 (antenna), pl. 17, fig. 10 (integument), 1856; Annals and Magazine Nat. Hist., II, xix, p. 150 (1857); Catalogue Amphip. Crust. British Museum, p. 285, pl. 48, fig. 1, 1862.—Bate and Westwood, British sessile-eyed Crust., i, p. 503 (woodcut), 1863.—Heller, Beiträge zur näheren Kenntniss der Amphipoden des Adriatischen Meeres (Denkschriften Math.-Naturwissensch. Classe Kaiserliche Akad. Wissenschaften, Wien, xxvi), pp. 52, 61, 1866.—Boeck, Crust. Amphipoda borealia et arctica (Christiania Videnskab.-Selskabs Forhandling for 1870), p. 173 (253), 1870; Skandinaviske og Arktiske Amphipoder, p. 647, 1876.—Metzger, Jahresbericht der Comm. zur wissenschaftl. Untersuchung der deutschen Meere für 1872-1873, Nordsee, p. 278, 1875.

Nemertes nesoides Leach, White, List Crust. British Museum, p. 90, 1847 (teste White, Catalogue British Crust., p. 56, 1850).

Chelura destructor Allman, loc. cit., p. 362, 1847 [provisionally proposed in case the Irish specimens prove distinct from Philippi's species].

Limnoria xylophaga Hesse, Annales des Sci. nat., Zoologie, V, x, p. 101, pl. 9, 1868.

Chelura pontica Czerniavski, Materialia ad zoographiam Ponticam comparatam, p. 95, pl. 7, figs. 1-18, 1868.

NEW HAVEN, October 16, 1879.

DESCRIPTION OF NEW SPECIES OF NORTH AMERICAN FISHES.

By **DAVID S. JORDAN.**

1. **BOLEOSOMA VEXILLARE**, sp. nov.

Allied to *Boleosoma effulgens*. Body rather short and stout; caudal peduncle not contracted; head moderate, the muzzle somewhat decurved; eye moderate; gill membranes scarcely connected; cheeks and breast naked; opercles scaly; a naked strip in front of the dorsal fin; opercular spine moderately developed; *second dorsal very short and high*, higher than long; pectorals and ventrals not reaching to anal.

Coloration olivaceous, the sides with traces of vertical bars, probably greenish in life; male with the first dorsal, ventral, and anal black; second dorsal and caudal strongly barred with black and white in fine pattern; head black; female not seen, but probably without black. Lateral line complete. Scales very large, 4-35-6.

Head 4 in length to base of caudal; depth $4\frac{2}{3}$.

Fin rays. Dorsal VIII-10; A. I., 7.

Length of type $2\frac{1}{2}$ inches.

This species differs from its relatives in the larger scales and the much shorter and higher second dorsal. (D. IX-13 in *B. effulgens*.)

The type was taken in the Rappahannock River at Warrenton, Va., by a correspondent of "Forest and Stream," and forwarded to me for identification by the editor of that journal, Mr. Charles Hallock.

2. NANOSTOMA VINCTIPES, sp. nov.

Allied to *Nanostoma zonale* (*Pæcilichthys zonalis*, Cope). Body fusiform, little compressed; head short, the snout strongly deurved; eye large, longer than snout, nearly 3 in head; mouth small, horizontal, the lower jaw included; teeth small, not distinguishable on the vomer and palatines; cheeks, opercles, neck, and throat closely sealed; opercular spine well developed; gill membranes broadly connected across the breast.

First dorsal rather low, with slender spines; second dorsal shorter and rather higher; the two well separated. Anal spines high, the first much the higher. Caudal moderate, subtruncate. Ventrals pointed, not reaching to the vent. Pectorals moderate, reaching rather beyond tips of ventrals.

Lateral line complete, with 45 scales in its course.

Color olivaceous, with about 8 obscure darker lateral shades or bars, with narrow paler interspaces. These bars meet around the body behind the vent, but not anteriorly; back with 6 darker quadrate shades. A dark streak downward and forward from eye, and some black markings in front of opercle. Fins all strongly cross-banded with darker, the pectorals and *ventrals* especially so; spinous dorsal reddish at base, with a blackish edging.

Fin rays, D. X-11; A. II, 7. Length of types about $2\frac{1}{2}$ inches.

This species differs from *N. zonale* in its less compressed body and in coloration. In the latter species the ventrals are plain and the lateral bars encircle the belly.

The types of this species, five in number, were taken in a tributary of Illinois River, at Naperville, Ill., by Dr. Ernest R. Copeland. One of these is in the U. S. National Museum, numbered 23454.

3. PÆCILICHTHYS VIRGATUS, sp. nov.

A slender species, resembling an *Etheostoma*, not closely related to any of the species thus far made known.

Body moderately elongate, subfusiform, compressed; the back somewhat elevated, the caudal peduncle rather deep; head long and rather pointed, little compressed, rather slender; the snout but little deurved; mouth rather large, somewhat oblique, the maxillary reaching to the pupil, the lower jaw scarcely shorter than the upper; teeth small, even, in several rows; eye rather large; gill membranes not connected. *Cheeks, opercles, neck, and breast wholly naked. Humeral region with an enlarged black scale-like process as in P. punctulatus, Ag., and in the species of Etheostoma.* Posterior border of preopercle obtusely but distinctly crenate-dentate. Scales rather large—53 in a longitudinal series, the lateral line distinct on about 20 of them.

Color greenish, each scale with a small blackish spot, these forming conspicuous lateral stripes as in *Etheostoma lineolatum*. Back and sides

with cross-blotches. Vertical fins faintly barred. Humeral scale large and black.

Head $3\frac{3}{8}$ in length without caudal; depth 5.

Fin rays, D. IX-10; A. II, 8.

Length of types 2 to $2\frac{1}{2}$ inches.

This species differs from its congeners in its form and coloration. From all except *P. lepidus*, B. and G., it is separated by its naked head. From all but *P. punctulatus*, Ag., by the black humeral process.

The numerous typical examples were taken by me in the Rock Castle River, at Livingston, Ky. Their resemblance to *Etheostoma flabellare* caused them to be overlooked until lately. One of these is in the U. S. National Museum (No. 23456). Another has been forwarded to the British Museum.

4. ZYGONECTES RUBRIFRONS, sp. nov.

Body moderately stout, little compressed, not elevated, the caudal peduncle deep; head rather long, broad between the eyes, flat above; eyes large, $3\frac{1}{2}$ in head, their range horizontal; mouth rather large. *Teeth small, nearly even, in a narrow band.* Scales moderate. Dorsal fin very short and small, placed a little behind the anal or about even with it, its position in the males rather more posterior; anal short, high in the males; ventrals very small; pectorals small.

Color, males dark olivaceous, with a dark, bronze-orange spot on each scale posteriorly, much as in *Xenisma catenatum*. Below these spots are bright orange. Faint orange, narrow vertical bars along the lower and posterior part of the body. Vertical fins with orange spots. Jaws and space in front of eyes bright orange-red; paired fins dusky. Females almost uniform brassy-olivaceous, without evident spots or red markings.

Head $3\frac{1}{2}$ in length to base of caudal; depth $3\frac{3}{8}$. D. 7 or 8; A. 8 or 9; lat. 1. 32; L. transv. 11 or 12; B. 5; L. $2\frac{1}{2}$ to 3 inches.

St. Sebastian River, Florida, the numerous types collected by Dr. J. A. Henshall. A larger species than most in the genus, and with the dorsal fin less posterior.

Some of these in the U. S. National Museum are numbered 23450.

5. ZYGONECTES HENSHALLI, sp. nov.

Body rather stout, deep and compressed, the profile nearly straight, the back little elevated, and the caudal peduncle short and deep; head moderate; mouth rather small; *jaws each with a series of long and rather slender canine-like teeth, followed by a band of small teeth*; the canines larger in the lower jaw; eye large; scales rather large; dorsal fin short and high, inserted slightly behind the anal in the males, exactly opposite it in the females; caudal large; anal fin larger and rather lower than dorsal; ventrals quite small; pectorals moderate.

General color olivaceous; sides covered, especially posteriorly, with rather large, irregularly placed orange spots, which also extend on the

vertical fins; dorsal dusky, with a dark bar; head without red; caudal and anal more or less yellow; females obscurely marked; young with diffuse greenish vertical bars.

Head $3\frac{1}{2}$ in length to base of caudal; depth $3\frac{1}{2}$. B. 5; D. 7 or 8; A. 10 or 11; lat. l. 33; L. transv. 10; L. 3 to $3\frac{3}{4}$.

San Sebastian River, Florida, where it is abundant, in company with *Jordanella floridae*, *Zygonectes rubrifrons*, and other *Cyprinodonts*, the numerous types collected by Dr. J. A. Henshall. Some of these in the U. S. National Museum are numbered 23449. The largest species of the genus strongly resembling the preceding, from which it may be known by its dentition, its larger size, and the different coloration.

6. CERATICHTHYS LUCENS, sp. nov.

Allied to *Ceraticthys biguttatus* (Kirt.).

Body elongate, compressed, the back somewhat elevated from the occiput to the base of dorsal, thence rapidly declined to the long and slender caudal peduncle. Head short, compressed, the cheeks nearly vertical; interorbital space rather broad and flat, somewhat grooved; eye very large, circular, high up, placed nearly midway of the length of the head; its diameter about equal to the length of the snout, and scarcely greater than the width of the interorbital space. Preorbital bone large, oblong, conspicuous and silvery; suborbital bones rather narrow.

Mouth rather small, horizontal, the lower jaw included, the edge of the premaxillary below the level of the eye; the maxillary not reaching to the vertical from the front of the orbit. Barbel quite small. Snout boldly and abruptly decurved much as in *C. amblops* (Raf.), the tip of the snout thickened, forming a sort of pad.

Scales moderate, thin, and brightly silvery. Lateral line decurved in front, thence nearly straight; about 16 scales in front of the dorsal, 42 in the course of the lateral line; 5 series above and 4 below. Rows of scales along the back converging behind the dorsal where the upper series run out, as in *Luxilus cornutus*.

Fins rather higher and more falcate than in *Ceraticthys biguttatus*; the dorsal fin inserted well forward, directly over or slightly in advance of base of ventrals. Pectoral fins pointed, not reaching ventrals, the ventrals not reaching the vent.

Teeth 4-4, hooked, without grinding surface.

Color translucent greenish above; sides and below brilliantly silvery; eye white; cheeks and opercles with a bright silvery lustre; upper fins yellowish; lower unspotted; a slight plumbeous lateral shade, but no distinct markings anywhere either in large or small specimens.

Length of head contained $4\frac{1}{3}$ times in total length to base of caudal; greatest depth 4 times.

Dorsal rays, I, 8; anal I, 8.

Length of largest of typical examples $5\frac{1}{8}$ inches.

This species is described from three examples taken at the Falls of the Ohio. Two of these are now in my own collection; the third in the U. S. National Museum is numbered 23462.

This species is larger than the others of the genus except *C. biguttatus* and the Californian *C. symmetricus*, (Grd.). In coloration it differs widely from *C. biguttatus*, which species is wholly destitute of silvery lustre. Its head is likewise shorter and blunter, and the mouth smaller. The form of the body very different. From *C. amblops*, *C. rubrifrons*, etc., it differs in the number of teeth and in the smaller scales.

7. LUXILUS ZONISTIUS, sp. nov.

(*Codoma curystoma* JORDAN & BRAYTON, Bull. U. S. Nat. Mus. xii, 42, 52; not *Photogenis curystomus* JORDAN, Ann. Lyc. Nat. Hist. N. Y., 356, 1877.)

Allied to *Luxilus coccogenis*, Cope. Body rather stout, compressed, the back elevated at the base of the dorsal fin, thence rapidly declined, the caudal peduncle rather short and slender. Head short and rather thick; interorbital space broad and flat; cheeks nearly vertical. Length of head about equal to greatest depth of body, about 4 times in length to base of caudal. Eye large, longer than snout, about 3 in head, its diameter about equal to the interorbital space. Mouth comparatively large, oblique; in size intermediate between *L. coccogenis* and *L. cornutus*. Jaws about equal in the closed mouth. Premaxillary on the level of the pupil; maxillary reaching to opposite the front of the eye. Pre-orbital short and deep; suborbitals narrow.

Scales large, 6-43-3, closely imbricated on the sides of the body where they are much higher than long. Lateral line strongly decurved.

Fins moderate. Dorsal fin inserted somewhat behind the line of the ventrals, I, 8, not much elevated. Anal longer than in the related species, I, 10. Pectorals scarcely reaching ventrals; the ventrals reaching past the vent.

Teeth 2, 4-4, 2, hooked, with narrow grinding surface.

Color steel-blue above; sides somewhat silvery; dorsal fin with a conspicuous jet black cross-bar about half way up; a distinct round black spot at base of caudal, rather smaller than the eye, behind this a cream-colored area, a curved black bar at the shoulder behind and above the opercle; top of head and base of pectorals with dusky punctulations. Females and young specimens have these dark markings obscure. Males in spring have the dorsal cross-bar scarlet and more or less dull ferruginous; red on the head and caudal fin. The snout is covered with small tubercles in spring.

The types of this species, about 20 in number, ranging from 2 to 4½ inches in length, were taken in Suwannee Creek, a tributary of the Chattahoochee River in Northern Georgia.

A few young specimens of this species were mixed with the types of "*Photogenis*" *curystomus*, Jor., a species which the present one somewhat resembles. The specimens referred to by Jordan and Brayton (l. c.) as *Codoma curystoma* are the types of the present species. *Photogenis leu-*

copus Jordan & Brayton, Bull. U. S. Nat. Mus., XII, 41, is, I think, identical with "*Photogenis*" *eurystomus*. The teeth of genuine examples of the latter species are always 1, 4-4, 1. Those with the teeth 2, 4, all belong to *Luxilus zonistius*.

One of the typical examples of this species is numbered 23452 in the U. S. National Museum.

8. LUCANIA GOODEI, sp. nov.

Allied to *Lucania parva* (*Cyprinodon parvus*, Baird and Girard). Body elliptical, rather elongate, the back considerably elevated to a point just in front of the origin of the dorsal fin; the caudal peduncle rather deep and compressed; greatest depth contained 4 to $4\frac{1}{4}$ times in length to base of caudal. Head short, comparatively narrow, and bluntly pointed, its length contained $3\frac{3}{4}$ to $4\frac{1}{4}$ times in length of body. Mouth small, terminal, both jaws with rather large conical canine-like teeth, apparently in a single series. Eye large, near the middle of the side of the head, its diameter contained $2\frac{1}{2}$ to $2\frac{3}{4}$ times in the length of the head, about equal to the width of the interorbital space. Scales large, their exposed surfaces higher than long, in about 30 (29 to 32) longitudinal and 7 vertical series. Humeral scale like the others.

Fins large, especially in the males. Dorsal rays 9. Anal 9. Origin of dorsal about midway between snout and base of caudal, conspicuously in advance of anal. Height of dorsal fin in the males two-thirds the length of the head, about equal to the length of the base of the fin. In females a little lower. Anal fin similar and nearly as high and long, beginning nearly under the middle of the dorsal. Caudal moderate subtruncate. Ventrals long; in the males reaching the front of the anal; in the females reaching the vent. Pectorals reaching past front of ventrals in both sexes.

Color olivaceous, the scales with dark edgings. A very distinct black band in both sexes running through eye and snout straight to the base of the caudal, where it ends in a round black spot. This band is about as wide as a series of scales, although developed on parts of two series. A conspicuous black band in both sexes along the lower edge of the caudal peduncle, from the root of the caudal to the vent, dividing and passing on each side of the anal fin. Fins in the female plain. In the male basal half of dorsal and anal jet black, outer half pale with a black edge. Pectorals and especially ventrals also dark-edged. Caudal fin faintly mottled. Vertical fins with more or less red in life (*vide* Goode).

The typical specimens, about 30 in number, ranging from $\frac{3}{4}$ to $1\frac{1}{4}$ inches in length, were obtained in Arlington River, Florida, a tributary of the St. John's, by Prof. G. Brown Goode, in company with *Girardinus formosus*, *Zygonectes* (*Gambusia*) *arlingtonensis*. These are numbered 23505 on the register of the U. S. National Museum. The species is well separated from its congeners *venusta* and *parva* by its black lateral band and colored fins. From the former the fewer dorsal rays also distinguish it.

9. XIPHISTER, gen. nov. (Fam. *Xiphisteridae*).

(*Xiphidion* Girard, U. S. Pac. R. R. Expl. Fishes, 119; preoccupied in Orthoptera; *Xiphidium*, Serv.)

As the name *Xiphidion* or *Xiphidium* is preoccupied for a genus of Orthoptera, the name *Xiphister*, of similar etymology, is proposed as a substitute. The typical species *Xiphidion mucosum*, Girard, may be known as *Xiphister mucosus*.

ON THE MIGRATIONS AND NESTING HABITS OF WEST-COAST BIRDS.

By J. G. COOPER, M. D.

Uniformity in the dates of arrival of birds and laying eggs has usually been considered among the "constants of nature" in the temperate zone. Where the distinction of seasons is well marked, these events are among the most reliable phenomena connected with the climate, and exceptional dates are noted down with particular interest.

It has, however, been ascertained that there is much less uniformity in the habits of the same species within the tropics. There being no changes of temperature, the division into wet and dry seasons, where existing, can alone influence them. It does so by regulating the flowering and fruiting of trees, etc., on which the food of birds directly or indirectly depends (except in the case of aquatic species), the rapacious kinds following the vegetivorous in their search for food.

Even on the border of the temperate zone, in Arizona and Florida (probably also in Texas), an approach to the irregularity of tropical habits has been observed, some species laying eggs in autumn, at the end of the rainy season, and many abandoning the migratory habits seen northward.

In California we might expect to find similar conditions, because of the mildness of the winters in the less elevated regions, giving us an almost subtropical climate. But it can only have an effect south of latitude 34°, in the lower part of the Colorado Valley, if anywhere, sufficiently marked to cause the birds to lay in autumn, though its influence is seen to some extent in the wintering of several species farther north than on the east coast.

As far south as frost extends, which is south of San Diego and perhaps to Fort Yuma, the habits of the temperate zone prevail. At Tucson, Arizona, however, where Captain Bendire noticed eggs laid in autumn, the advantage of being about thirty miles south of Fort Yuma is compensated for by the elevation being 748 feet greater. The more barren, almost desert character of the country near Fort Yuma is probably the reason why such habits among the birds are not noticed, perhaps also because no observers have looked for them at the right season. The only peculiar climatic influence observable in California is therefore