

those from the Mediterranean. The differences are such as might result from the habitat or place of attachment of the shells. All the Californian specimens have the larger valve flat, with faint ridges radiating from the umbo and becoming obsolete before reaching the margin. The hæmal (or dorsal) valve is convex, and the foramen is often anteriorly angulated, though sometimes round. In all the specimens the part of the foramen included in the hæmal valve is larger than that included in the neural valve. The apophyses are similar to those of Mediterranean specimens. I have from the Caribbean Sea a specimen similarly radiated, and for this form perhaps we may apply the varietal name *radiata*.

The special interest attaching to these little brachiopods arises from the fact that this is the first time they have been reported from the Pacific. The San Diego specimens were evidently from the beach; though perfect, they were a little bleached. The single specimen from Todos Santos Bay, though dry, contained the remains of the soft parts. D.]

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NOTES ON A COLLECTION OF FISHES FROM FLORIDA, WITH DESCRIPTIONS OF NEW OR LITTLE KNOWN SPECIES.

By O. P. HAY.

The fishes forming the subject of the present paper were contained in a small collection made in Florida and sent to me by Messrs. H. T. Mann and D. M. Davison. A part of the collection was made in Western Florida, at Chaffin, on the Yellow Water River, and at Westville, near the Choctawhatchee River; but the greater part in the eastern portion of the State, principally at Saint Augustine. The work was done during the month of April of the present year and under very unfavorable circumstances. However, in this paper I describe *Gobionellus smaragdus* (C. & V.) Grd., obtained for the first time on our coast; *Zygonectes notti* Ag., not before identified since it was originally described; *Z. auroguttatus*, and *Etheostoma (Uloccntra) davisoni*, which are believed to be new species. Notes on *Mugil albula* L. and *Labidesthes sicculus* Cope are incorporated.

1. *Gobionellus smaragdus* (C. & V.) Grd.

Among the fishes collected at Saint Augustine there occurs a species of Goby that must be placed under Girard's genus *Gobionellus*. The single specimen which was captured having been submitted to Prof. D. S. Jordan's inspection, has been identified by him as the *Gobius smaragdus* of Cuvier and Valenciennes. Dr. Gunther in his "Catalogue of the Fishes of the British Museum" gives the name of this species without any description except that it is related to *Gobius lanceolatus*. As it

has not hitherto been announced as occurring on our coast, I proceed to give a detailed description of it.

Form elongated, head blunt, and caudal fin long and lanceolate.

Head rather large in all its dimensions; its length in the body to caudal fin 4 times; broadest at the corners of the mouth. This dimension equal to the depth of the head and contained in length of head  $1\frac{1}{2}$  times. Mouth large and somewhat oblique, the maxillary extending back to a vertical from the posterior border of the pupil. No barbels. Skin of upper and lower lips ample. Premaxillary freely protractile. Snout broadly rounded and rapidly decurved. Teeth of the outer series of the upper jaw enlarged and recurved. The teeth of the outer series of the lower jaw are of moderate size and movable; while those of the inner row, about 8 on each side, are enlarged and firmly fixed. Lower jaw broad and thin. Nasal openings of each pair wide apart. Eyes small, in length of head 5, high up; interorbital space equal to the diameter of the eye. Snout a little greater than the diameter of the eye. Cheeks flat and nearly perpendicular. Head wholly devoid of scales. No tentacle above the orbit, and no crest on the back of the head or neck. Body somewhat compressed, the depth in length 6 times. Scales strongly ctenoid, small in front, becoming larger posteriorly; very irregularly arranged; about 52 rows from operculum to base of caudal fin, and about 16 longitudinal rows between the origins of the anal and soft dorsal. Rays of fins as follows: D. VI-11; A. 12; dorsals well separated. Spines of first dorsal ending in filaments, that of the third spine being longest. Pectorals rather large, no rays silky. Ventrals united to form a sucking disk that is free from the belly. Caudal nearly half as long as the body and lanceolate.

Color of body yellowish olive. Along the sides are five or six dusky blotches, the one at the middle of the length the largest and most distinct. One of these forms a caudal spot. Another spot lies just above and behind the opercle. Above the rows of spots and between them are numerous splotches of dusky. Along the sides are several circular spots about the size of the pupil, apparently, in life of a bright yellow color, and each encircled with a dusky ring. Belly apparently of a livid blue. Head yellowish and dusky, mottled above and on the sides. Snout, upper and lower lips, and streak back from symphysis of mandibles, livid blue. Cheeks each with about six or eight yellow ocellated spots. One or two similar spots on each operculum. Dorsal fins mottled and barred with dusky; the filaments of the spinous dorsal yellow. Caudal dusky; a few of the upper rays white, or in life possibly yellow; the lower edge of the caudal nearly black. Anal and the united ventrals blue-black. Pectorals barred with dusky.

Total length of specimen  $4\frac{5}{8}$  inches; length, exclusive of caudal,  $3\frac{1}{4}$  inches.

To the writer it appears that, until the osteology of the various forms

of *Gobiidae* have been studied, *Gobionellus* must be separated from *Gobius*, if at all, on the characters furnished by the teeth. The body may be short or long, as illustrated by the species *G. oceanicus* and *G. stigmaticus*; the head naked or scaly above, the scales of the lateral line many or few. The outer lower teeth of *G. smaragdus* can hardly be regarded as "setaceous."

2. *Etheostoma davisoni*, n. sp. Subgenus *Ulocentra*, Jordan.

Founded on a single specimen seined in the Yellow River, near Chaffin, in Santa Rosa County, Florida. Length to base of caudal fin,  $1\frac{3}{8}$  inches. Named in honor of Mr. D. M. Davison, one of its collectors. Body elongate, slender, considerably compressed. Head long, narrow, rather pointed, the snout not being rapidly decurved as in other species of *Ulocentra* and in *Vaillantia camura*. Depth in length to base of caudal  $6\frac{1}{2}$ . Head in length  $4\frac{1}{5}$ . Eye in the head 3. Snout about three-fourths the diameter of the eye. Interorbital space narrow. Horizontal diameter of the head through the pupils equal to two-thirds the perpendicular diameter at the same point. Mouth large, horizontal, terminal, the maxillary extending back to a perpendicular from the pupil; cleft of the mouth one-fourth the length of the head. Jaws about equal; the premaxillary freely protractile; the maxillary not adnate to the preorbital. Cheeks and opercles densely scaly; the opercular spine well developed. Gill-membranes narrowly connected. Vomerine teeth apparently present.

Body covered with scales except on the chest. Scale formula 5-50-7. Lateral line incomplete, pores being developed on about 30 scales. Dorsals IX-10, well separated. A. II-6. Base of the spinous dorsal in the length of body  $4\frac{1}{2}$ ; its height in same distance 7 times. Base of second dorsal in the body 7 times; its height about the same. Its origin about midway between the snout and the tips of the caudal rays. Anal spines well developed, the first rather stronger. Base of anal in length of body  $8\frac{1}{2}$ , its height  $7\frac{1}{2}$  times. Pectorals extending back to the eighth dorsal spine, the ventrals falling short of the tips of the pectorals. Body not contracted at the vent as it is in *Vaillantia camura*. Caudal peduncle compressed, tapering gradually to the caudal fin, its length (from anal) in body,  $3\frac{3}{4}$  times. Distance from the vent to the base of the caudal fin equal to the distance from the vent to the posterior border of the orbit. In *V. camura* the distance from the vent to caudal reaches only from the vent to the base of the opercular spine.

General color olivaceous. Many of the scales, each with a dark blotch, which blotches unite to form zigzag and W-shaped markings, especially above the lateral line. Along the sides there are about 10 larger nearly square spots; of which the largest are on the caudal peduncle. Belly and chest under a lens are seen to be thickly sprinkled with black dots. A black streak downward from the eye and another forward to the snout. Fins dusky. Both dorsals with a row of dusky spots lying between the rays. Caudal barred.

This species seems to resemble *U. stigmata* Jor., as the latter is described in the Synopsis of Fishes of North America. It differs, however, from *U. stigmata* in the fin-formula, in having the premaxillaries freely protractile, and in having the cleft of the mouth extending behind the anterior border of the eye. Professor Jordan's species is also described as having the head obliquely truncate in profile.

### 3. *Labidesthes sicculus* Cope.

A single specimen of this fish was obtained at Westville, in Holmes County. Its color is a dark olive-green instead of the pale-olive green that characterizes our northern specimens. This species was originally described by Professor Cope from specimens found in Michigan. In 1881, in Bulletin U. S. Fish Commission, Vol. II, 64, I noted the occurrence of this fish at several points in the State of Mississippi. I have now succeeded in tracing its distribution to the Gulf.

### 4. *Mugil albula* L.

Several specimens of these were obtained at Saint Augustine. I find nothing noteworthy about them except that their caudal fins are squamated nearly to the tips. Other fins scaleless or nearly so.

### 5. *Heterandria ommata* Jordan.

*Zygonectes manni*, n. sp., Hay, MS.\*

This species is described from two specimens, the largest of which is but seven-eighths of an inch in length from the snout to the tip of the caudal fin. The smaller specimen, on being subjected to autopsy, proved to be a female with well-developed ova. The species may, therefore, contend with *Girardinus formosus* for the honor of being the smallest known vertebrate.

The fish is fusiform in outline, slender, and somewhat compressed. The depth is contained in the length to the base of the caudal  $5\frac{1}{2}$  times. The head in the same distance, 4 times. The premaxillary is extremely protractile. The mouth is very small, the cleft almost perpendicular, descending scarcely to the level of the center of the pupil. The ventral surface of the lower jaw looks almost directly forward, so that the anterior end of the fish is truncated. The teeth are pointed; but whether in one row or more I have not been able to determine with certainty. The eye is large and circular, twice the length of the snout, and contained in the head  $2\frac{1}{2}$  times. The upper surface of the head is flat, and the interorbital space about equal to the diameter of the eye. The gill-membranes are narrowly connected and free from the isthmus.

Scales covering the body rather large, in about 30 transverse and 9 longitudinal rows. Rays of fins as follows: D. 7, A. 10. The anal slightly in advance of the dorsal. The beginning of the dorsal is midway between the hinder border of the opercle and the base of the cau-

\* A comparison of Prof. Hay's proposed new species with the types of *Heterandria ommata* shows that the two are identical. The statement in the original description relative to the position of the dorsal is incorrect.—T. H. BEAN.

dal. The anal has its first ray situated midway between the posterior border of the orbit and the base of the caudal. Pectorals and ventrals small. The former have a length about equal to one and a half times the diameter of the eye. The tips of the ventrals reach the first anal ray. The caudal fin is ovate and equal to the length of the head. The caudal peduncle is broad and compressed. As in other members of the family there is no lateral line.

The ground color is pale straw. The upper surface, for a distance of about three scales length on each side of the middle line, is dusky, rendered so by numerous microscopic punctulations. There is also a narrow dark vertebral line anterior to the dorsal fin. On the side, just in front of the origin of the anal fin and nearer the ventral than the dorsal line, there is a jet black spot about as large as the pupil; and just in front of the base of the caudal there is a similar, but somewhat larger, spot. Beginning at the anterior spot there is a dark band, formed of minute punctulations, that runs backward nearly to the caudal spot. Just before reaching the spot the band widens and at length divides, sending one branch upward and another downward. The latter passes below the spot, unites with a dark streak along the lower edge of the caudal peduncle, and is thus carried upward at the base of the caudal until it unites with the dusky band on the dorsal surface of the caudal peduncle. The caudal spot is therefore surrounded by a ring of the ground color, which ring at its upper edge joins with a band of the same color lying between the dark lateral and the dusky dorsal bands. A dark streak starts at the bases of the ventrals and passes backward on each side of the anal, where it is most conspicuous, to the base of the caudal. Top of the head dark. A narrow dark streak runs forward from the eye and spreads over the whole lower jaw. There is no dark streak below the eye. Beginning at the hinder border of the orbit there is an indistinct dusky band, produced by scattered punctulations, that runs backward nearly to the lateral black spot. Just before reaching the spot it widens and divides into two short branches, an upper and a lower. Thus the latter spot is less completely ocellated than is the caudal.

Male unknown. That the species does not belong to the genus *Girardinus* is indicated by the fact that the intestine is not longer than the body. It is possible that it is a *Gambusia*; but I do not think this probable.

6. *Zygonectes auroguttatus*,\* n. sp.

Depth in length  $4\frac{1}{3}$ ; head  $3\frac{1}{2}$ ; Fins: D. 8 or 9; A. 10; scales 32-12. Body rather elongate and compressed. Depth contained in the length to the caudal from  $4\frac{1}{4}$  to  $4\frac{1}{3}$  times. Caudal peduncle short and deep; its length in that of the body 4 to  $4\frac{1}{2}$  times; its depth nearly two-thirds

\* This species is almost certainly identical with *Z. rubrifrons*, Jor., which, moreover, is apparently the same as *Z. kenshalli*, Jor.—T. H. BEAN.

its length. Head broad and flat above. Interorbital space in the head  $2\frac{1}{3}$  times. Eye in head  $3\frac{1}{2}$  to 4, overhung slightly by the supra-orbitals. Snout obtuse, equal to the eye. Cheeks nearly perpendicular, so that the head is not narrowed below as in some species of *Zygonectes*. Mouth small, rather oblique, the lower jaw heavy and projecting beyond the upper. Teeth in a broad band in each jaw, the outer enlarged. First ray of dorsal placed directly over, or slightly behind, the first of anal. Distance from first ray of dorsal to insertion of the caudal falling behind the edge of the operculum. Both dorsal and anal larger in male than female. The posterior rays of anal of male the longest. Pectorals of males reaching the base of the ventrals. Ventral tips reaching the vent. Both shorter in the females. Caudal broad and fan-shaped. Color dark olive, paler below from lower jaw to caudal. Males with about 12 or 14 distinct transverse stripes, which are narrower than the interspaces. These occupy the whole side from the base of the caudal to the insertion of the pectorals, but are most distinct posteriorly. In fresh specimens each scale has in its center an orange or bronzy spot. Along the sides these form distinct longitudinal rows. In the females the transverse bands are indistinct on the anterior half of the body, but distinct posteriorly. All the scales have black edges which give the fish a cross-hatched appearance. Sides of the female, also, with numerous spots of bronze and a rather conspicuous row of dark spots along the place of the lateral line. The vertical fins all with dusky tips; otherwise plain.

Eight specimens obtained at Westville. Length of longest male  $1\frac{1}{2}$  inches; of longest female nearly 2 inches.

#### 7. *Zygonectes nottii*, Agassiz.

In the American Journal of Science and Arts for 1854, on page 353, Prof. L. Agassiz described in a brief manner several species of *Zygonectes*, among which is *Z. nottii*. I quote so much of his language as is applicable to this species.

“The species of the genus *Zygonectes* may be arranged in two groups: 1, those in which there are several more or less distinctly dotted lines along the sides of the body and in which a broad black band extends across the eye and cheek. To this group belong: *Z. nottii*, Agass. The darker longitudinal lines alternate with fainter interrupted ones. Males with distinct transverse bands. Dark olive above, fading upon the sides, silvery below. Operculum, throat, and space in advance of the eye light orange color. Mobile, Ala. Collected there with Dr. Nott. Mississippi: Colonel Deas.—*Z. lineolatus* Agass. Longitudinal lines broader and undulated or serrated, the transverse bands of the male very distinct and broader than the longitudinal ones; olive colored, darker along the back and fading upon the sides, lower parts silvery. Discovered by Dr. W. I. Burnett at Augusta, Ga.”

In referring to these species of Professor Agassiz, Messrs. Jordan and

Gilbert, in their Synopsis of the Fishes of North America, say: "Professor Agassiz (Amer. Jour. Sci. Arts, 1854, 353) mentions three more species of this genus, which have not since been recognized, besides two (*Z. lateralis* and *Z. zonatus*) which are evidently identical with *Z. notatus*, and another, *Z. lincolatus*, which Professor Putnam informs us is identical with *Z. nottii*."

Among the fishes collected at Westville, Holmes County, Florida, there are two specimens of a *Zygonectes* that agree so well with Professor Agassiz's description of *Z. nottii* that I have no hesitation in assigning them to that species. I proceed to give a detailed description of the more characteristic specimen in my possession.

Length of largest specimen, apparently a male,  $1\frac{1}{2}$  inches to base of caudal. Head in length  $3\frac{2}{3}$ ; depth in  $4\frac{1}{2}$ ; dorsal 7 or 8; anal 9 or 10; scales 36-10. Form of body much like *Z. dispar* Ag., compressed behind; head broad and somewhat concave above, narrow below; interorbital space fully one-half the length of the head,  $1\frac{1}{3}$  the diameter of the eye; snout obtuse, shorter than the eye; outer row of teeth, above and below, enlarged and recurved; eye large, its diameter in the head  $2\frac{2}{3}$  times.

Pectoral fin two-thirds the length of the head; ventrals slightly shorter, attaining the vent; dorsal and anal low, little higher than one-half the length of the head. First ray of dorsal situated slightly behind the first anal ray, and over about the 17th scale in the longitudinal series. The distance from the snout to the first dorsal ray passing beyond the tips of the caudal rays. The distance from the first dorsal ray to the base of the caudal reaching forward to the insertion of the pectoral.

*Color*.—Belly and ground color on lower half of body silvery. Sides with six narrow longitudinal black stripes running from the head to the tail. These stripes a little narrower than the interspaces and perfectly distinct even on the caudal peduncle, the upper stripe rather faint and succeeded higher up by one or two other obsolete stripes. The interspaces of the stripes are occupied, especially above, each by a row of black dots forming the fainter interrupted stripes of Professor Agassiz's description. On the back these rows of dots are rather more distinct than the continuous stripes. There is a median dorsal stripe; about 10 transverse bars of the width of the longitudinal stripe, but fainter, and placed about two scales width apart, occupy the posterior half of the body. Lower surface of caudal peduncle dotted with black, a black streak behind the edge of the opercle. Upper surface of the head dusky and also the snout and tip of lower jaw. A broad black mask covering the eyes and extending downward over the cheeks; upper half of the operculum, the space in front of the eye and most of the lower jaw, orange red; lower half of the operculum and anterior half of breast yellowish orange.

As compared with *Z. craticula* Goode and Bean (Proc. U. S. Nat. Mus., 1882, 433), the species now under consideration appears to differ in the following respects: The interorbital space is wider, the snout shorter, the caudal peduncle shorter, thus bringing the insertion of the dorsal relatively further back; there are rows of dots in the spaces between the longitudinal stripes, and the fish has orange, instead of "brilliant white," cheeks. It is possible, however, that *Z. craticula* will prove to be a synonym of *Z. nottii*.

BUTLER UNIVERSITY, *Irvington, Ind., July 1, 1885.*

DESCRIPTION OF AN APPARENTLY NEW SPECIES OF DROMOCOCYX FROM BRITISH GUIANA.

By ROBERT RIDGWAY.

*Dromococcyx gracilis*, sp. nov.

SP. CHAR.—Smaller than *D. phasianellus* (Spix), with much slenderer bill, narrower rectrices, and different coloration. *Adult* (No. 81,853, U. S. Nat. Mus., Demerara, British Guiana; O. Lugger, coll.). Pileum dull ferruginous, the concealed central and basal portion of the feathers dusky, the lengthened occipital feathers brighter rusty at ends; auriculars dull ferruginous; rest of head, including superciliary stripe, and also the chin, throat, jugulum, and cheeks, deep ochraceous (paler on the chin and throat), wholly free from markings. Upper parts blackish, the feathers broadly margined with ash-gray, the terminal margin of the wing-coverts, broadly, dull buffy white; upper tail-coverts each with a terminal small rhomboidal spot of white. Rectrices dull brownish slate on upper surface, each broadly tipped (for about .30 of an inch) with dull white; under surface brownish gray, with white shafts, the white tip on each feather preceded by a subterminal bar of dull black, about .30 of an inch (more or less) in width. Lower parts (from jugulum back, including lining of wing) immaculate dull white. Wing, 5.50; tail, 6.80 (the intermediæ projecting 1.75 beyond tips of the longest upper coverts); culmen, .95; bill from frontal apices, .70; greatest depth, .20; tarsus, 1.10.

This species may possibly be the same as von Pelzeln's *D. pavoninus* (Orn. Bras., p. 270), from Southern Brazil; but the description of the latter is so meager as to render the name practically a *nomen nudum*.