

NOTES ON TWO RARE CALIFORNIA FISHES, *RIMICOLA*
EIGENMANNI AND *PLAGIOGRAMMUS HOPKINSI*.

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The following notes are offered as an addition to what is known concerning two rare California shore fishes, *Rimicola eigenmanni* and *Plagiogrammus hopkinsi*.

RIMICOLA EIGENMANNI (Gilbert).

An interesting little cling fish, *Gobiesox eigenmanni*, was described in 1890 by Doctor Gilbert ^a from a specimen about an inch long taken at Point Loma near San Diego, California, together with several others from San Cristobal Bay. A second species, *G. muscarum*, was later described and figured by Meek and Pierson ^b from two small specimens dredged at a depth of 10 fathoms in Monterey Bay. Jordan and Evermann ^c then placed the two species in a new genus, *Rimicola*, and in the same paper presented a figure of *R. eigenmanni*. Other references have been made to these species, but the above is a brief outline of their history.

Several years ago, early in the month of January, Doctor Harold Heath collected a number of specimens of a species of *Rimicola* in a large tide pool near Pacific Grove. He found them depositing their eggs on the leaves of the great bladder kelp *Nereocystis*. The small fishes strongly resembled in color the brownish kelp, and clinging closely to it they almost escaped observation. They were considerably lighter beneath, however, and this character led to their discovery, the whitish ventral surfaces showing through the thin leaves of the plant. In the preservation of the specimens, the dark color disappeared, the skin becoming a pale pinkish yellow, without spots or other marks. These were lately examined by the writer and found to resemble *R. eigenmanni* in every particular, a small example of

^a Proc. U. S. Nat. Mus., XIII, 1890, p. 96.

^b Proc. Cal. Acad. Sci., 1895, p. 571, with plate.

^c Idem., 1896, p. 231. (The figure of *Rimicola eigenmanni* here given is evidently not of the type, as it shows 5 dorsal and 6 anal rays, while the specimen illustrated is said to have come from Todos Santos Bay.)

that species from La Jolla serving for comparison. It was also noted that they did not differ in any structural detail from *R. muscarum*, the type of which was available for study. It was apparent, therefore, that the two species were identical, but to make the matter certain, the writer sent two of Doctor Heath's specimens to the U. S. National Museum, at the same time asking Mr. B. A. Bean to compare them with the type of *R. eigenmanni*. This Mr. Bean kindly did, with the following observations:

Mr. McKnew and I have examined the specimens of *Rimicola* in this Museum and find that the type of *R. eigenmanni* has but four rays in the dorsal fin; in the only additional specimen of *R. eigenmanni* preserved here there are five rays in the dorsal. This fish, which is about the size of the type, was taken in 1898 off Point Loma, California. The cotype of *R. muscarum* seems to have but five rays in the dorsal fin; the count, however, is uncertain, owing to the mutilated condition of the fin. One of the specimens recently received from you has six rays, but the smaller one of the two has five. We think with you that *R. muscarum* and *R. eigenmanni* are identical, the smaller specimens having fewer developed rays in the dorsal. Otherwise the specimens look alike to us.

In reading the original descriptions of *R. eigenmanni* and *R. muscarum* it will be noted that the species differ in color, in the number of dorsal rays, and perhaps in minor details. The color of *R. muscarum* was described and figured from an alcoholic specimen, and differs from that of *R. eigenmanni* (which is said to be uniform light olive green) in having a yellowish body with small, reddish spots and a lateral stripe of the same color. That the color pattern is variable is shown by the cotype of *R. muscarum*, which has spots on the head only, while the lateral stripe is imperfectly developed. The light body color has been accounted for. A parallel case of color change is found in two species of *Aspasma*, a related genus from Japan, where specimens change from brownish to pinkish yellow in the preservative, while in some individuals pinkish spots and a lateral stripe appear. Regarding the dorsal rays, of which *R. eigenmanni* is said to have 4 and *R. muscarum* 6, a reference to the appended table will show that among 8 specimens from Pacific Grove they vary from 4 to 5. In each case the first dorsal ray has been regarded as single, when if closely examined it will be found to consist of a slender, spine-like ray closely attached to a larger, branched one. The rays in the type of *R. muscarum* have been thus separated and counted as 6. The body grows more robust and heavy with age, the smaller individuals being comparatively slender. The length of the head, diameter of eye, height of fins, and other characters vary somewhat as shown by the table of measurements. The anterior nostril has a tube the posterior edge of which is prolonged, forming a tentacle equal in height to half the diameter of eye. There is a conspicuous anal papilla.

Rimicola eigenmanni as here defined is known to range from Todos Santos Bay, Lower California, northward to Pacific Grove, California.

Measurements^a of 8 specimens of Rimicola eigenmanni.

Length of body..... mm.	54	50	49	47	46	44	41	40
Length head.....	0.27	0.27	0.26	0.26	0.25	0.25	0.27	0.24
Depth body.....	.17	.15	.15	.14	.13	.14	.13	.12
Depth caudal peduncle.....	.08	.08	.075	.06	.055	.05	.05	.05
Length snout.....	.10	.10	.10	.09	.09	.08	.10	.10
Diameter eye.....	.03	.03	.03	.035	.035	.035	.04	.04
Interorbital width.....	.12	.12	.105	.10	.10	.10	.11	.10
Depth head.....	.13	.12	.13	.11	.10	.10	.12	.10
Snout to dorsal.....	.71	.74	.72	.74	.75	.745	.74	.73
Snout to anal.....	.68	.70	.70	.71	.72	.73	.72	.72
Height dorsal.....	.10	.09	.10	.095	.075	.09	.08	.08
Height anal.....	.08	.09	.10	.09	.07	.085	.08	.08
Length pectoral.....	.13	.12	.12	.12	.12	.12	.12	.13
Length caudal.....	.11	.13	.13	.125	.12	.135	.14	.13
Dorsal rays.....	5	4	5	5	4	5	5	5
Anal rays.....	6	5	6	6	5	6	5	6

^a Recorded in hundredths of length.

PLAGIOGRAMMUS HOPKINSI Bean.

This species has been known heretofore from only a single individual which was described and figured by Dr. Tarleton H. Bean^a in 1893. It was caught along with other species in the tide pools near Pacific Grove by students of the Hopkins Seaside Laboratory and given to the representatives of the U. S. Fish Commission, who were then making a collection for the World's Columbian Exposition. Last summer, late in July, the writer obtained six specimens varying in length from 65 to 190 mm. from the outlying pools at low tide, opposite the light-house near Pacific Grove, perhaps not far from where the species was first taken.

The skin of the head is rather thick and soft, and when shrunken by the preserving fluid lies in wrinkles and folds, forming a slight supraocular rim and partly concealing a low crest which extends from the interorbital region forward on the snout. There are 6 branchiostegals. The dorsal spines number from 37 to 41, the anal rays (spines 2) 26 to 29. The membranes of the fins are very thick, and the rays of the pectorals, ventrals, and anal are considerably broadened and thickened toward the tips. There are 43 vertebrae. The specimens in hand show no "subpentagonal plate-like bodies" on the ventral surface, but there are 9 or 10 areas inclosed by branches of the lateral lines, which differ in no way from other parts of the body surface. The "abdominal ridge" (a median line of mucous pores), also mentioned in the original description, leads one to think

^a T. H. Bean, Proc. U. S. Nat. Mus., XVI, 1893, p. 699, and Jordan and Evermann, Bull. 47, U. S. Nat. Mus., p. 2428; "Monterey, California; a few specimens dredged among the rocks" is evidently a mistake.

that an unusual amount of shrinkage and hardening of the tissues had taken place in the type-specimen, thus causing the appearance of plates and a ridge. In the figure the anal opening is represented as located below the tip of the pectoral fin, an evident error, it being close to the origin of the anal, below the eleventh dorsal spine, as described.

There is a large, oval, blackish spot just above the gill opening, conspicuous in light-colored examples, but not so plainly seen in the darker ones. The pectorals, anal, and caudal are broadly edged with white, the light color being made prominent by a subterminal blackish band.