NOTES ON THE TIDE-POOL FISHES OF CALIFORNIA, WITH A DESCRIPTION OF FOUR NEW SPECIES.

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This paper is based on collections made on several trips along the coast of California from San Francisco Bay to Point Sur, in Monterey County, in 1897 and 1898. The fishes were taken exclusively in the tide-pools exposed at low water and were captured with small hand nets. Calcium hypochlorite or ordinary chloride of lime (bleaching powder) was used with excellent effect for stupefying the fishes in small, isolated tide-pools. The fishes were taken out as soon as they came to the surface and were killed in dilute alcohol or formalin.

The following new species were obtained: *Eximia rubellio*, *Rusciculus rimensis*, *Dialarchus snyderi*, and *Blennicottus recalvus*, three of them representing new genera, *Rusciculus*, *Eximia*, and *Dialarchus*. One of these species, *Dialarchus snyderi*, is mentioned in the addenda of Jordan & Evermann's Fishes of North and Middle America as *Oligocottus snyderi*, but it is now made the type of a new genus and is fully described and figured for the first time. The group of tide-pool cottoids, the allies of *Oligocottus*, are here subjected to a critical revision, in view of the confused state of the literature concerning them.

The group of *Cottidæ* of the type *Oligocottus*, comprising the genera *Oligocottus*, *Blennicottus*, *Clinocottus*, and *Oxycottus*, and the new genera *Eximia*, *Rusciculus*, and *Dialarchus*, is distinguished from the rest of the family by the separation of the gill membranes from the isthmus, the presence of palatine teeth, and either the entire nakedness of the body or the presence of only rudimentary, prickly scales. They are all strictly tide-pool fishes of the Pacific coast, ranging from Bering Sea to Lower California and never wandering far from shore. Each species inhabits, with surprising regularity, only certain kinds of tide-pools, its distribution depending almost entirely upon the character of the rocks and the kind of algæ present. They all imitate very closely the color of their surroundings, and two or three species show parallel color phases, each copying after a certain kind of alga. Thus, depending on these conditions of rock and plant life, there are along almost any part of the coast two or three zones of vertical distribution, one species inhabiting the deeper tide-pools, another the shallower, and so on, as will be seen by reference to the descriptions. *Clinocottus analis* offers a marked exception to these generalizations, however, as it is found in every kind of tide-pool within its range.

The first known species of this group were described by Girard as follows: *Oligocottus maculosus* in 1856, *O. analis* in 1857, and *O. globiceps* in 1858. These last two species were made types of new genera by Gill in 1861, giving them the names *Clinocottus* and *Blennicottus*. These two genera of Gill were not recognized by Jordan &

Gilbert in their Synopsis of 1883, the genus *Oligocottus* being made to include all three species; but they were finally restored in Jordan & Evermann's Check-List of 1896. To the genus *Oligocottus* there have been since added the species *acuticeps* (Gilbert, 1893), *embryum* (Jordan & Starks, 1895), and *borealis* (Jordan & Snyder, 1896); to *Blennicottus* the variety *B. globiceps bryosus* (Jordan & Starks, 1896). The status of these species has remained unchanged, except that Jordan & Evermann, in The Fishes of North and Middle America, have considered *Oligocottus acuticeps* the type of a new genus, *Oxycottus*, to which they have transferred also *Oligocottus embryum*. This nomenclature is here adopted, except in the genera *Oligocottus* and *Blennicottus*, where confusion in specific identification has taken place and a reassignment of specific names is necessary. Girard's original species, *Oligocottus maculosus* and *Blennicottus globiceps*, were described respectively from Tomales Bay, north of San Francisco, and from the Farallon Islands, off San Francisco. Both are now shown to be forms of northerly distribution, the type locality being, in each case, near the southernmost limit of the range. Southward along the coast each is replaced by a distinct species, both of which are abundant at Monterey Bay. Recent authors have, unfortunately, identified Girard's names with specimens from Monterey Bay, while the northern species to which his names should apply have been rechristened *Oligocottus borealis* and *Blennicottus globiceps bryosus*. Therefore these two names are now abolished, the species becoming *Oligocottus maculosus* and *Blennicottus globiceps*, and the southern forms are described as new species, *Dialarchus snyderi* and *Blennicottus recalvus*, the former being also made the type of a new genus.

The different species of this group resemble each other to a remarkable degree in external appearance, yet most of them are separated by characters which we now consider of generic importance. The characters are all remarkably constant except that of color, which varies greatly with the surroundings and can not be described with great exactness. The color descriptions given in this paper are all from life, and have been made broad enough to cover all the specimens examined. The character and arrangement of the cirri afford perhaps the best specific distinguishing features, and not the slightest variation from the adult plan has ever been discovered in these species. The features of generic importance in this group are the character of the preopercular spines, the presence or absence of scales, the shape and size of the head and mouth, and the nature of the first three or four anal rays of the male. There may be one, two, or several rays enlarged, or they may be all of normal size, the number of modified rays and the amount of enlargement always remaining the same in any one species; furthermore, these enlarged rays may or may not be separated from the rest of the fin. I have used the form and size of the preopercular spines for the primary divisions of the key, and this arrangement brings together the species nearest alike in geographical range and external appearance. The presence or absence of scales can not be considered a mark of less importance, however, and the two together stand out distinctly as dividing the species into natural groups. All of these species have a slit behind the last gill except *Blennicottus embryum* and *Rusciculus rimensis*. This seems to be an important character in determining the relationships of the species.

The tables accompanying the descriptions give the various dimensions of the body in hundredths of the total length to base of caudal.

The author is under deep obligations to Dr. Charles H. Gilbert, in whose laboratory and under whose direction the work was carried on, and to President David Starr Jordan, whose suggestions and advice have been of great help.

Key to Genera and Species allied to Oligocottus.

I. Preopercular spine simple, not forked or branched.

a. Scales none; no enlarged anal rays in the male; anal papilla present in the male.

b. Blennicottus. Head very wide and blunt; mouth terminal, mainly transverse.

c. Cirri of head few, none on interorbital space, two regular rows above the eyes, and a few on sides of head; preopercular spine scarcely appreciable ..... B. RECALVUS.

cc. Cirri of head numerous, entirely covering the occiput and interorbital space, a thick bunch above preopercular spine and opercular flap; preopercular spine nearly half diameter of eye, curved upward ..... B. GLOBICEPS.

bb. Oxycottus. Head pointed; mouth extending laterally below eye.

d. Cirri of head mossy or joined at base; four occipital bunches; dorsal fins separate. O. EMBRYUM.

dd. Cirri of head single or double; three occipital bunches; dorsal fins slightly joined at base; anal papilla of male very large, situated between ventrals ..... O. ACUTICEPS.

aa. Rusciculus. Dorsal half of body closely scaled; first two anal rays of male enlarged; no anal papilla; cirri of head small, single, or rarely doubled; one supraorbital, three occipital, one nasal, one maxillary, and two or three preopercular cirri; lower margin of preopercle bluntly toothed ..... R. RIMENSIS.

II. Preopercular spine forked at tip.

e. Scales none; one or more anal rays enlarged in the male; anal papilla inconspicuous.

f. Dialarchus. First anal ray of male enlarged, joined to second, the two widely separated from rest of fin; cirri of head joined at base, two supraorbital bunches, three on occipital, a thick preopercular bunch, an opercular one, and a few on sides of head; a row of cirri along the dorsal fin close to its base ..... D. SNYDERI.

ff. Oligocottus. Three or four anterior anal rays of male enlarged, not separated from rest of fin and becoming progressively smaller posteriorly; cirri of head irregular, usually one supraorbital and three or four occipital bunches in which all the cirri are joined at base; no cirri along dorsal fin, except in the young or one or two scattering ones in the old; maxillary reaching a vertical below center of pupil ..... O. MACULOSUS.

ee. Clinocottus. Scales present, sometimes obscure in adults; no enlarged anal rays; anal papilla present, large; cirri scattered irregularly over top of head in four irregular occipital rows, and in old individuals extending back on body along nearly entire length of dorsal fin, and down over anterior and dorsal half of body, none below lateral line, no scales on anterior half of body in the old; a fringe of cirri on preopercle, a thick bunch on opercle, and five or six cirri on maxillary ..... C. ANALIS.

III. *Eximia.* Preopercular spine three-pointed. Scales none; eye and nasal spines large; first anal rays of male enlarged, second slightly elongated, not separated from fin; anal papilla inconspicuous; cirri not joined at base, three supraorbital and three occipital pairs of bunches of two or three each; a maxillary bunch, a preopercular row, and an opercular bunch of cirri, and a few scattered ones on side of head; a row along dorsal fin bending downward at end of spinous dorsal; scattered cirri between the dorsal row and lateral line, and below lateral line behind pectoral fins ..... E. RUBELLIO.

LIST OF FISHES.

Blennicottus recalvus Greeley, new species. Fig. 1.

Centridermichthys globiceps Günther, Cat., II, 171, 1860.

Oligocottus globiceps Jordan & Gilbert, Synopsis, 718, 1883.

Blennicottus globiceps Jordan & Starks, Proc. Cal. Ac. Sci. 1895, 808; Jordan & Evermann, Fishes of North and Middle America, II, 2017, 1898; not *Oligocottus globiceps* Girard.

Head 3.66; eye 4.75 in head; snout 3; D. IX, 15 or 16; A. II, 12; P. 14.

Body short, stout, broad anteriorly; head very broad, short and blunt; snout obtuse; interorbital space five-sixths of eye, grooved, the groove leading into a depressed space behind eyes; mouth distinctly terminal, maxillary reaching a vertical below anterior edge of orbit, lower jaw included; minute conical teeth on jaws, vomer, and palatines; nasal spines very small; no preopercular spine apparent in adults; edge of preopercle rounded; opercle ending in a rounded flap; branchiostegals 6, membranes broadly united, free from isthmus; gills 3½, a slit behind last gill.

Dorsal fins very long, slightly joined at base, origin of first dorsal directly over tip of opercle, that of soft dorsal in advance of origin of anal; first dorsal slightly rounded, middle ray longest; pectorals reaching origin of anal, membranes of first seven rays deeply emarginated; ventrals reaching vent; anal papilla of male very large; anal low, membranes of all the rays except last three deeply emarginated, none of rays enlarged in male; caudal short, slightly rounded.

Cirri few and small, those of top of head joined at base in conspicuous bunches, two irregular occipital rows, a few below these on sides of head and on margins of preopercle and opercle; a few above origin of pectoral, and a weak row along anterior third of lateral line.

Color of body light brown, vermiculated with white, and marked dorsally with four or five wedge-shaped spots of dark brown, edged with white, and more distinct posteriorly; two pinkish spots on dorsal side of caudal peduncle, and a faint shading of same color on sides of head and along anterior fourth of lateral line; entire undersurface dull brown, tinged with olive; fins indistinctly barred with grayish-white; tail faintly tinged with pink. In some specimens the color is an almost uniform dull brown, while in others light markings are prominent. Some young individuals from among green algæ are uniform light green.

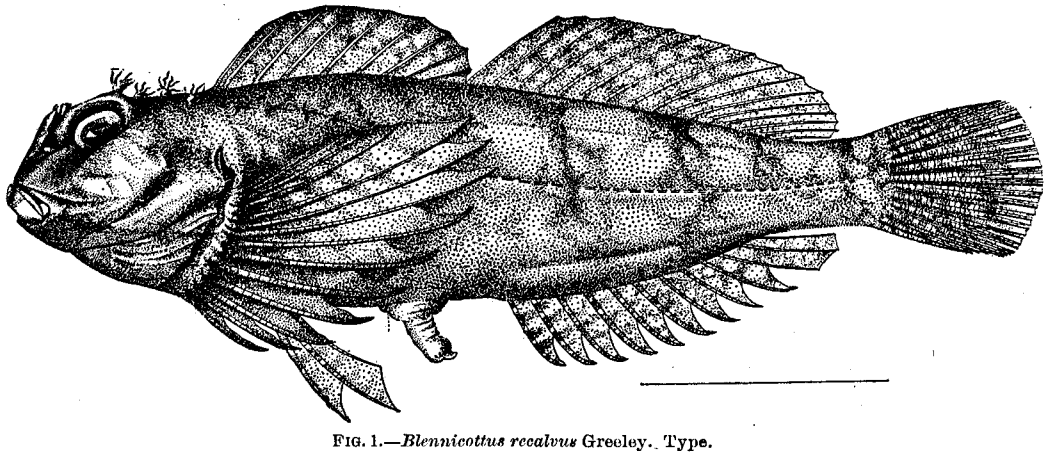

FIG. 1.—*Blennicottus recalvus* Greeley. Type.

Comparative measurements of five specimens of Blennicottus recalvus.

Measurements.	Collectors and localities.				
	Pacific Grove, L. S. Jr. U. M. (4245).	Greeley & Cowles, Pacific Grove.	Greeley & Spaulding, Santa Cruz.	Greeley & Spaulding, Santa Cruz.	Greeley & Spaulding, Santa Cruz.
Extreme length in millimeters	85	92	80	75	72
Greatest height of body	26	25	28	27	26
Least height of caudal peduncle	9	9	10	10	10
Length of caudal peduncle	17	16	16	18	17
Length of head	29	29	28	28	29
Width of head	25	26	24	24	24
Width of interorbital space	4	5	5	5	5
Height of head at pupil	17	18	17	18	18
Length of snout	9	9	9	8	9
Diameter of orbit	6	6	5	5	6
Distance from snout to spinous dorsal	24	26	25	24	25
Length of spinous dorsal at base	27	27	33	25	28
Height of spinous dorsal	10	9	9	9	11
Length of soft dorsal at base	41	40	39	42	41
Height of soft dorsal	12	12	15	12	13
Distance from snout to anal	60	56	55	56	57
Height of longest anal ray	14	12	14	14	15
Length of caudal	19	17	20	19	24
Distance from snout to pectoral	30	30	28	28	30
Length of pectoral	33	29	31	29	34
Distance from snout to ventral	34	32	29	31	31
Length of ventral	21	19	21	21	22
Number of dorsal spines	9	9	9	9	9
Number of dorsal rays	16	16	15	16	16
Number of anal rays	12	12	12	11	11
Number of pectoral rays	14	14	14	14	14

The bluntness of snout and preopercular spines, and the terminal mouth make *B. recalvus* easily distinguishable from all related forms except *B. globiceps*, from which it is separated by the shape and size of its preopercular and nasal spines, the number of its cirri, 12, and size of its mouth. The adults of these two species can be readily distinguished, but the young of *B. recalvus* is very similar to young of *B. globiceps*, indicating that *B. globiceps* is probably the ancestral form. Girard's old description of *Oligocottus globiceps* has been erroneously associated with this fish, which does not extend so far north as the type locality of *O. globiceps*. *B. recalvus* is distributed from San Diego to Santa Cruz, where it is immediately succeeded by *B. globiceps* on the north. No specimens of *B. recalvus* have been taken north of the region of Santa Cruz. On the other hand several specimens of *B. globiceps* have been collected on the coast of Monterey County south of Monterey Bay, therefore within the range of *B. recalvus*. The relations between the two species where their ranges overlap is still to be made out. *B. recalvus* is quite common throughout its range and everywhere inhabits deep-shaded tide-pools, near low-water mark, where a large number will often be found in a single pool. Here described from a specimen collected at Pacific Grove by Greeley & Cowles. (Type, No. 6068, L. S. Jr. Univ. Museum.)

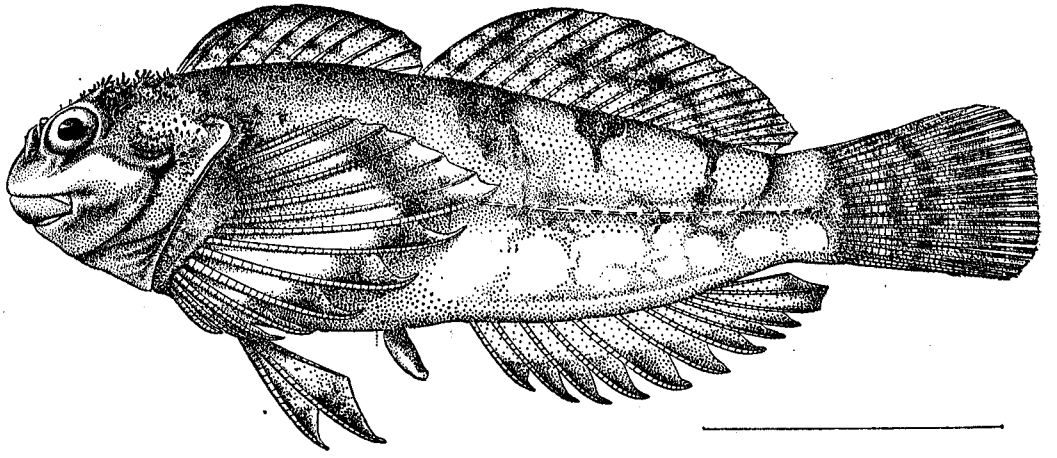

FIG. 2.—*Blennicottus globiceps* (Girard).

Blennicottus globiceps (Girard). Fig. 2.

Oligocottus globiceps Girard, U. S. Pac. R. R. Surv., Fish., 58, 1858, South Farallones.

Blennicottus globiceps bryosus Jordan & Starks, Proc. Cal. Ac. Sci. 1895, 808, Point Orchard, near Seattle; Jordan & Evermann, Fishes of North and Middle America, II, 2017, 1898.

Girard's original description of this fish has been erroneously associated with the very closely related species *B. recalvus*, which replaces it south of Santa Cruz. *B. globiceps bryosus* was based upon this northern form, the typical *globiceps*, and to it the original name is now restored.

Head 3.66; eye 4.75; snout 3; D. IX, 16 or 17; A. 11 or 12; P. 13 or 14.

Body short, stout; head deep, blunt, with a short decurved snout; interorbital space five-sixths of eye, deeply grooved; mouth nearly terminal and transverse, with slight lateral cleft, the maxillary reaching a vertical through the center of orbit; lower jaw included. Preopercular spine single, curved upward, nearly half diameter of orbit; nasal spines prominent, nearly half diameter of eye; opercle ending in a rounded flap. Dorsal fins long, slightly joined at base; no anal rays enlarged in male; anal papilla large.

Cirri very numerous on top and sides of head, extending through the interorbital groove to nasal spines, two rows of prominent joined cirri on top of head, others between these, still others on sides of head; a large bunch above preopercular spine and on dorsal margin of opercle, a V-shaped row above pectorals, and a thick row along anterior half of lateral line.

Color, light plumbeous brown, with traces of four or five more or less distinct black transverse bands, the whole body more or less vermiculated with white; some specimens largely streaked with white vermiculations, others nearly uniform brown; under parts dull white tinged with brown on under lip, and with yellow posteriorly; fins barred with yellow. The northern form of this species

lighter in color; young individuals frequently uniform plumbeous black with a conspicuous transverse band of silvery white on anterior part of body. Four to 5 inches long, specimens from Puget Sound 7 inches.

Very close to *B. recalvus*, which is its southern representative. Known from Puget Sound to Pigeon Point, San Mateo Co., Cal., where it stops abruptly, *B. recalvus* succeeding it immediately to the south. A few specimens have been taken, however, immediately south of Monterey Bay, within the range of *B. recalvus*. Its occurrence to the south needs further investigation.

Comparative measurements of six specimens of Blennicottus globiceps.

Measurements.	Collectors and localities.					
	E. C. Starks, Neah Bay, Washington, L. S. Jr. U. M. (3404).	E. C. Starks, Neah Bay, Washington, L. S. Jr. U.M.(3404).	Greeley & Cowles, Pillar Point.	Greeley & Cowles, Pillar Point.	Greeley & Spaulding, Pigeon Point.	Greeley & Spaulding, Pigeon Point.
Extreme length in millimeters	144	77	63	61	73	71
Greatest height of body	31	28	28	30	28	28
Least height of caudal peduncle	9	10	10	10	10	10
Length of caudal peduncle	15	16	16	16	16	17
Length of head	26	28	28	29	29	27
Width of head	23	23	24	24	25	24
Width of interorbital space	5	5	5	5	5	5
Height of head at pupil	17	18	17	18	17	17
Length of snout	9	9	8	9	9	9
Diameter of orbit	5	6	6	6	6	6
Distance from snout to spinous dorsal	22	25	25	25	24	24
Length of spinous dorsal at base	32	31	27	29	28	27
Height of spinous dorsal	10	9	9	10	10	9
Length of soft dorsal at base	41	43	42	41	42	44
Height of soft dorsal	13	11	14	14	12	13
Distance from snout to anal	57	55	55	55	56	55
Height of longest anal ray	14	14	16	16	15	14
Length of caudal	19	22	25	24	19	21
Distance from snout to pectoral	26	28	30	30	29	29
Length of pectoral	32	31	33	31	32	31
Distance from snout to ventral	28	31	34	31	31	30
Length of ventral	21	22	24	23	22	21
Number of dorsal spines	9	9	9	9	9	9
Number of dorsal rays	16	17	16	16	17	16
Number of anal rays	11	11	11	11	12	11
Number of pectoral rays	14	14	14	13	14	14

Oxycottus acuticeps (Gilbert).

Oligocottus acuticeps Gilbert, Rept. U. S. Fish Comm. 1893 (1896), 432, Unalaska; Vancouver Island. (Coll. *Albatross.*)

Oxycottus acuticeps Jordan & Evermann, Fishes of North and Middle America, II, 2015, 1898. Vancouver Island to Unalaska, Alaska; Bean & Bean, Proc. U. S. Nat. Mus., vol. 21, 1898, 665.

This fish has been reported also from Prince William Sound (coll. A. W. Greeley), from Kadiak Island (coll. C. Rutter), and from Sitka and Kadiak by Dr. Bean.

Oxycottus embryum (Jordan & Starks).

Oligocottus embryum Jordan & Starks, Proc. Cal. Ac. Sci. 1895, 808, pl. 82, Neah Bay, Washington (type, No. 3128, L. S. Jr. University Museum. Coll. E. C. Starks).

Oxycottus embryum Jordan & Evermann, Fishes of North and Middle America, II, 2016, 1898.

Several additional specimens of this interesting and apparently rare species were obtained at Point Lobos. Color, dull lavender, marked dorsally with five or six indented spots of black; irregular vermiculations of same color on sides of body, which is bounded below by a band of reddish-brown, containing many conspicuous white spots; a reddish-brown spot on top of head indented and edged posteriorly with white; two reddish-brown bands running downward from eye; pectoral pinkish, barred with olive; dorsals, anal, and caudal barred with brown; throat and under side of thorax silvery-white; belly pale-greenish. Distinguished from the species of *Blennicottus* by the sharpness of the snout and preopercular spines, and the lateral extension of mouth.

This is one of the rarest and most beautiful of the tide-pool cottoids. The prevailing lavender tint in its coloration imitates closely the *Corallina*, among which it lives in the deeper tide-pools. It is recorded only from Point Lobos, Monterey County, Cal., from Puget Sound, and from Sitka and Karluk, Alaska.

Comparative measurements of five specimens of Oxycottus embryum.

Measurements.	Starks, Neah Bay, Washington (type), L. S. Jr. U. M. (3128).	Starks, Neah Bay, Washington, L. S. Jr. U. M. (3128).	Snyder, Point Lobos, L. S. Jr. U. M. (3428).	Greeley & Cowles, Point Lobos, March, 1898.	Greeley, Point Lobos, June, 1898.
Extreme length in millimeters	55	51	49	36	41
Greatest height of body	24	23	23	22	23
Least height of caudal peduncle	8	8	8	8	8
Length of caudal peduncle	18	19	19	18	18
Length of head	28	27	29	28	29
Width of head	21	21	21	20	21
Width of interorbital space	6	6	5	6	6
Height of pupil	14	14	14	14	14
Length of snout	8	8	8	9	8
Diameter of orbit	6	7	6	7	7
Distance from snout to spinous dorsal	24	25	25	26	25
Length of spinous dorsal at base	31	30	28	25	27
Greatest height of spinous dorsal	10	10	11	12	10
Length of soft dorsal at base	37	37	35	36	37
Height of longest ray of soft dorsal	14	14	14	14	15
Distance from snout to anal	52	51	52	58	50
Height of longest anal ray	14	15	14	14	15
Length of caudal	20	20	19	19	20
Distance from snout to pectoral	29	28	30	31	29
Length of pectoral	35	36	37	36	31
Distance from snout to ventral	30	30	34	37	30
Length of ventral	22	23	23	23	22
Number of dorsal spines	9	9	9	9	9
Number of dorsal rays	16	16	15	15	15
Number of anal rays	11	11	10	10	10
Number of pectoral rays	14	14	14	14	14

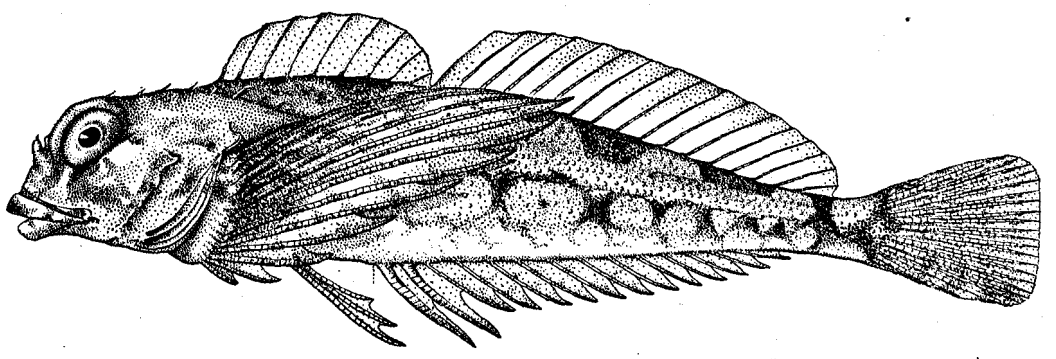

FIG. 3.—*Rusciculus rimensis* Greeley, type.

RUSCICULUS Greeley, new genus.

This genus is allied to *Oxycottus*, differing in the presence of minute prickly scales, which cover dorsal half of body. Preopercular spine simple, sharp. No slit behind the last gill.

Rusciculus rimensis Greeley, new species. Fig. 3.

Head 3¼; eye 4 in head; snout 3⅓ in head; D. IX, 17 or 18; A. 14; P. 14; V. 1, 3.

Body compressed, very slender, caudal peduncle especially so; head depressed, flat; snout pointed; interorbital space ⅔ eye, grooved; top of head flat and slightly concave; nasal spines large and blunt, snout abruptly decurved below them. Dorsal half of body covered with minute, imbedded, prickly scales partially arranged in obscure oblique rows, none below lateral line. Minute pointed teeth on jaws, vomer, and palatines; jaws subequal, mouth horizontal, maxillary reaching a vertical below anterior edge of pupil. Margin of preopercle armed with one sharp spine curved upward, below which are one and sometimes two very short blunt processes; margin of opercle ending dorsally in a pointed flap. Branchiostegals 6, the membranes broadly united, free from isthmus; no slit behind last gill. Dorsal fins scarcely joined, soft dorsal very large; first dorsal beginning slightly in advance of opercular flap, upper edge much rounded, fifth spine longest; origin of soft dorsal just in front of origin of anal in female, directly above it in male, fin very long; pectorals large, reaching a vertical below ninth ray of soft dorsal; origin of ventrals posterior to a point midway between anal

and base of pectorals in male, anterior to it in female, the difference caused by enlargement of first two anal rays in male; anal fin small, rays slender, membranes of all deeply emarginated; first two anal rays of male greatly enlarged, joined by membrane to each other and to rest of fin; posterior edge of tail nearly straight; anal papilla inconspicuous. Cirri small and scarce, always occurring singly, never in bunches or joined at the base, except a few pairs along anterior third of lateral line, one above each orbit, two rows of three each behind these on top of head, one cirrus on inside of each nasal spine; a cirrus on end of maxillary, two or three on margin of preopercle below preopercular spine, and a row along anterior half of lateral line.

Color, light olive or reddish brown tinged with lavender, marked dorsally with four or five wedge-shaped indented spots of black, a broken band of same color along lateral line, sometimes sending branches below it, which show a tendency to inclose round spots; a more or less distinct spot of black on top of head; a faint postocular line, a spot below eye, and a preocular line running from eye to snout, all of same color; pectorals and caudal indistinctly barred with brown, anal tinged with it, and dorsal covered with fine brown or black spots, sometimes very faint; throat and belly pale yellowish-white, unspotted.

This species is most closely related to *Oxycottus embryum*, with which it agrees in general coloration, but differs decidedly in the presence of scales, the slenderer body, the larger number of soft dorsal and anal rays, the serrated margin of the preopercle, and the arrangement of the cirri.

Described from two specimens taken at Point Lobos, Monterey County, Cal., by A. W. Greeley. (Type, No. 6067, L. S. Jr. Univ. Museum.) Rare; only two other specimens from Point Lobos are known. It inhabits tide-pools lined with corallines, and in coloration imitates very closely these algæ. Length, 40 mm. The smallest of our tide-pool fishes.

Comparative measurements of two specimens of Rusciculus rimensis.

Measurements.	Collectors and localities.	
	Greeley, Point Lobos (type), June, 1898.	Greeley, Point Lobos, June, 1898.
Extreme length, in millimeters	40	39
Greatest height of body	20	22
Least height of caudal peduncle	6	7
Length of caudal peduncle	17	16
Length of head	29	28
Width of head	23	23
Width of interorbital space	7	7
Height at pupil	15	16
Length of snout	9	9
Diameter of orbit	7	7
Distance from snout to spinous dorsal	28	28
Length of spinous dorsal at base	24	27
Greatest height of spinous dorsal	10	9
Length of soft dorsal at base	48	47
Height of longest ray of soft dorsal	15	15
Distance from snout to anal	43	48
Height of longest anal ray	15	14
Length of caudal	19	19
Distance from snout to pectoral	30	27
Length of pectoral	39	38
Distance from snout to ventral	32	32
Length of ventral	18	18
Number of dorsal spines	9	9
Number of dorsal rays	17	18
Number of anal rays	14	14
Number of pectoral rays	14	14
Length of first anal ray (male)	21	.....

DIALARCHUS Greeley, new genus.

Preopercular spine forked at tip; scales none; first anal ray of male enlarged, joined to second, the two widely separated from rest of fin. Closely allied to *Oligocottus*, differing only in character of anal rays of male.

Dialarchus snyderi Greeley, new species. Fig. 4.

Centridermichthys maculosus Günther, Cat. Fishes, II, 171, 1860; not *Oligocottus maculosus* Girard.

Oligocottus maculosus Jordan & Gilbert, Synopsis, 718, 1883; Jordan & Evermann, Fishes of North and Middle America, II, 2013, 1898.

Oligocottus snyderi Greeley, in Jordan & Evermann, Fishes North and Mid. Amer., III, 2871, 1898.

Head 3¼; eye 4¼ in head; snout 3½; D. VIII, 18 or 19; A. 13 to 15; P. 13 to 15; V. 1, 3.

Body elongate, slender; snout pointed, compressed; minute conical teeth on jaws, vomer, and front of palatines; jaws equal; mouth horizontal, maxillary 3 in head, reaching a vertical below anterior edge of pupil. Interorbital space five-sixths of eye, shallowly grooved, the groove leading into a depressed space between occipital ridges; nasal spines large. Margin of preopercle armed with a strong spine, half as long as eye, from upper border of which at base extends a second spine pointing abruptly upward and inward; both spines covered with skin in life; margin of opercle ending in a pointed flap, entirely unarmed. Branchiostegals 6, the membranes broadly united, free from isthmus. Gills 3½, a slit behind last gill.

Dorsal fins large, separated by half diameter of eye, whole length equaling that from caudal to base of pectoral; first dorsal beginning slightly in advance of margin of opercle, upper edge nearly straight, curving abruptly downward from sixth spine; origin of soft dorsal in advance of anal; pectorals large, reaching well beyond origin of anal; ventrals almost midway between base of pectorals and anal; anal fin small, rays all feeble in female, in male the first ray only greatly enlarged, joined to second, the two distinctly separated from rest of fin, membranes of all except last three or four rays deeply emarginated. Anal papilla small, present in male only. Cirri very numerous, usually occurring in bunches of three or four, those of head joined at base, forming a comb; two pairs of bunches above orbits, with rudiments of a third bunch in front of these, three on top of head, behind orbits, two or three bunches just below these on sides of head, two or three single cirri on margin of preopercle, a thick bunch above preopercular spines, four or five on lower margin of opercle, with a thick bunch on its upper margin; a short row above base of pectorals; a row of bunched cirri along

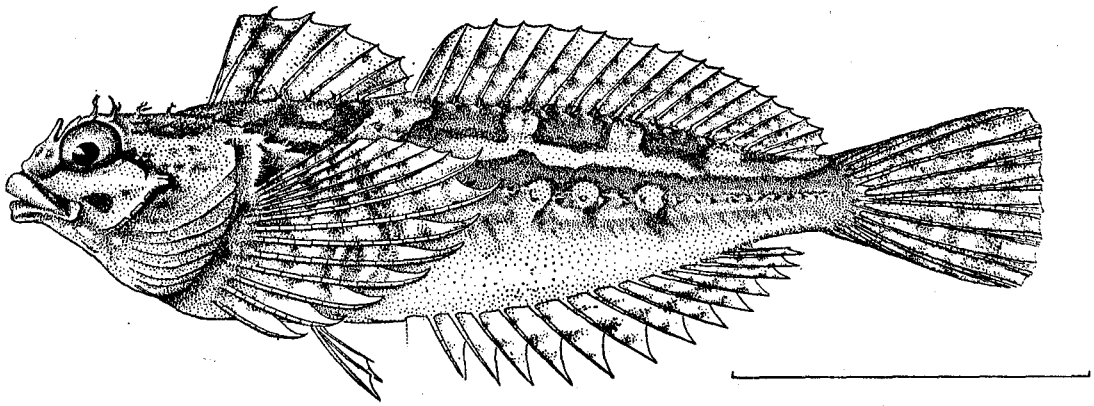

FIG. 4.—*Dialarchus snyderi* Greeley. Type.

anterior two-thirds of lateral line, another well-defined row along dorsal fin from third spine to sixteenth or seventeenth ray of soft dorsal, this row containing a bunch at base of each spine and ray, with the occasional exception of the first ray; five or six scattered bunches between dorsal and lateral rows on each side of the body; a cirrus at tip of each dorsal spine.

Color, light reddish-brown, sometimes almost pink, thickly spotted with fine indistinct white spots; four or five irregular dark-brown spots along base of dorsal, a band of same color along lateral line, sometimes very much broken and extending ventrally, shading into uniform reddish-brown below, and including three or four round pinkish spots; a dark-brown postocular line, another running forward from eye, a patch of same color on top of head, another on sides of head, and two or three on edge of opercle; throat reddish-brown, with several distinct white spots; belly bluish-green; a silvery white patch between bases of pectorals; dorsal fins pale reddish-brown, with black and clear spots; pectorals crossed irregularly with white; anal fin pale pink, crossed with dark brown. There are two or three perfectly distinct types of coloration, as follows: Some specimens from pools containing green algæ are pure light green; others from coralline pools are tinged with lavender, as *B. embryum*.

This species resembles most closely *O. maculosus*, which name has been erroneously applied to it, but it differs markedly in its slenderer body, more pointed snout, the arrangement of its cirri, and the perfectly distinct coloration, also in greater length of dorsal fins, the enlargement of only one anal ray in male, and shortness of maxillary.

Here described from a specimen taken at Pacific Grove, by Greeley & Maddren. (Type, No. 5846, L. S. Jr. Univ. Museum.) Five cotypes were taken at the same time. Specimens are at hand from Crescent City, Bolinas Bay, Half Moon Bay, Monterey Bay, and San Luis Obispo, Cal. Found in all kinds of pools from San Francisco to Monterey Bay, but nowhere common. Length, 60 mm. The most beautiful and active of the tide-pool fishes, extremely variable in color.

Comparative measurements of eleven specimens of Dialarchus snyderi.

Measurements.	Collectors and localities.										
	McGregor, Monterey, L. S. Jr. U. M. (4048).	Albatross, Monterey, L. S. Jr. U. M. (3642).	Snyder, Pillar Point.	Greeley & Maddren, Pac. Grove (cotype).	Greeley & Cowles, Pacific Grove.	Greeley & Cowles, Pacific Grove.	Greeley & Maddren, Pac. Grove (type).	Greeley & Cowles, Pillar Point.	Greeley & Spaulding, Santa Cruz.	Greeley & Spaulding, Santa Cruz.	Greeley & Spaulding, Santa Cruz.
Extreme length in millimeters	58	64	59	56	61	54	60	36	65	65	62
Greatest height of body	26	24	24	23	25	23	24	26	28	24	25
Least height of caudal peduncle	8	8	8	7	8	8	7	8	8	8	8
Length of caudal peduncle	17	17	17	17	17	15	15	18	16	18	17
Length of head	33	31	31	32	31	31	32	34	31	31	30
Width of head	26	24	23	24	23	24	25	26	22	22	23
Width of interorbital space	5	5	5	6	5	6	5	6	6	5	5
Height of head at pupil	14	14	14	15	15	15	15	16	15	15	15
Length of snout	9	9	9	9	8	9	9	9	9	8	9
Diameter of orbit	6	6	5	6	6	6	6	6	6	6	6
Distance from snout to spinous dorsal	30	29	27	27	26	29	29	30	28	27	28
Length of spinous dorsal at base	23	25	23	21	25	22	23	21	26	24	25
Greatest height of spinous dorsal	10	10	10	10	11	10	9	9	9	9	10
Length of soft dorsal at base	44	45	44	43	44	43	43	43	44	43	42
Height of longest ray of spinous dorsal	12	13	13	14	13	16	13	17	12	12	14
Distance from snout to anal	43	50	44	50	48	45	50	50	45	43	47
Height of longest anal ray	14	13	13	13	13	13	12	13	13	13	13
Length of caudal	22	21	21	21	22	21	20	22	18	20	20
Distance from snout to pectoral	32	32	30	31	29	32	32	33	29	29	29
Length of pectoral	34	33	31	31	31	34	32	34	32	36	35
Distance from snout to ventral	32	31	32	32	29	33	33	32	27	29	29
Length of ventral	17	17	17	17	18	17	17	17	17	17	17
Number of dorsal spines	8	8	8	8	8	8	8	8	8	8	8
Number of dorsal rays	19	19	19	18	18	19	19	18	19	18	19
Number of anal rays	14	14	15	14	13	14	14	14	15	13	14
Number of pectoral rays	14	14	14	14	13	14	14	14	14	14	15
Length of first anal ray, male	24	...	22	....	....	23	....	....	....	23	.....

Oligocottus maculosus (Girard).

Oligocottus maculosus Girard, Proc. Ac. Nat. Sci. Phila. 1856, 153; Girard, U. S. Pac. R. R. Sur., x, Fishes, 56, 1858.

Oligocottus borealis Jordan & Snyder, Proc. Cal. Ac. Sci., series 2, vol. VI, 1896, 225, Neah Bay (coll. E. C. Starks, type, No. 3396, L. S. Jr. Univ. Museum); Jordan & Evermann, Fishes of North and Middle America, II, 2014, 1898.

This species was described by Girard in 1856, from specimens taken at Tomales Bay, but this account was erroneously associated with another fish, now recorded as *Dialarchus snyderi*. It was rediscovered and described as a new species, *O. borealis*, by Jordan & Snyder, from a large series of specimens taken at Puget Sound; but Girard's original name is now restored, as there is no doubt that this is Girard's species. In this opinion Professors Jordan and Gilbert and Mr. Snyder fully concur. A series taken by Dr. Jordan at Sitka and a specimen collected by me at Prince William Sound extend the range northward to the latter point. It is the most common tide-pool fish at Crescent City, Del Norte County, Cal., and also at Half Moon Bay, where the shallow open tide-pools with little algæ suit the species very well. South of Half Moon Bay it gradually becomes scarcer, but extends as far as Pigeon Point. None was taken at Santa Cruz or Pacific Grove. The absence of this species south of Pigeon Point is probably due to a change in the character of the tide-pools. Below Pigeon Point the coast is made up of great shelving ledges of very hard sandstone, with few pools. North of Pigeon Point the rocks are much softer and contain shallow pools. Wherever found, this species inhabits all kinds of tide-pools, but especially those with dull surroundings, either bare rocks or rocks covered with Fucus, the brown seaweed.

Young individuals occasionally have a few cirri along the dorsal fin, on the opercle, and above the pectoral fins, probably showing a reversion to a type resembling *Dialarchus snyderi*.

Color, light brown, a very soft gray in some specimens, varying from almost olive to a dull brown in others; marked dorsally with fine white spots, which become larger below and shade into the pale olive of belly; some specimens tinged with milk-white or lavender, with a series of spots of same color along lateral line; fine dark-brown transverse bands, varying greatly in distinctness, extend downward from dorsal fin, first two reaching the belly, last three interrupted; a white spot at base of tail, usually one on dorsal side of caudal peduncle; head uniform with body, but more or less vermiculated with white or olive; throat olive, spotted with white, the ground color becoming pale on belly and along the sides of the anal; fins light olive, barred with brown.

Comparative measurements of nine specimens of Oligocottus maculosus.

Measurements.	Collectors and localities.								
	Jordan, Sitka, L. S. Jr. U. M. (5658).	Jordan, Sitka, L. S. Jr. U. M. (5658).	Starks, Port Ludlow, L. S. Jr. U. M. (5027).	Snyder, Crescent City.	Snyder, Crescent City.	Greeley & Cowles, Pillar Point.	Greeley & Cowles, Pillar Point.	Greeley & Spaulding, Pigeon Point.	Greeley & Spaulding, Pigeon Point.
Extreme length in millimeters	54	44	56	59	61	58	61	58	59
Greatest height of body	14	22	26	26	24	26	23	27	24
Least height of caudal peduncle	8	8	10	10	9	9	9	9	9
Length of caudal peduncle	16	19	18	17	17	16	17	17	16
Length of head	31	32	34	35	33	34	32	34	33
Width of head	24	22	27	24	26	24	24	25	25
Width of interorbital space	5	6	5	5	6	5	5	5	5
Height of head at pupil	16	16	15	15	15	15	14	16	15
Length of snout	9	9	9	9	9	9	9	9	9
Diameter of orbit	6	6	6	7	7	7	6	7	6
Distance from snout to spinous dorsal	30	32	31	32	32	31	30	31	31
Length of spinous dorsal at base	25	24	28	28	24	25	22	26	24
Height of spinous dorsal	10	10	10	13	10	9	10	11	11
Length of soft dorsal at base	42	42	40	44	43	41	42	40	43
Height of soft dorsal	14	14	14	14	14	13	16	14	15
Distance from snout to anal	46	45	50	47	46	57	53	51	48
Height of anal	14	15	15	16	15	14	14	13	13
Length of caudal	23	23	22	24	26	22	23	21	21
Distance from snout to pectoral	33	31	32	34	33	32	32	33	32
Length of pectoral	37	33	34	36	36	34	36	34	35
Distance from snout to ventral	31	30	30	32	32	32	35	32	31
Length of ventral	18	20	19	19	20	19	19	19	18
Number of dorsal spines	8	8	8	8	8	8	8	8	8
Number of dorsal rays	16	17	16	17	17	17	17	16	16
Number of anal rays	13	13	13	13	13	13	13	13	13
Number of pectoral rays	14	14	14	14	14	14	14	14	14
Length of first anal ray, male	17	17	.....	20	19	.....	17	.....	18

Clinocottus analis (Girard).

Oligocottus analis Girard, Proc. Ac. Nat. Sci. Phila. 1857, 201, Monterey; Girard, U. S. Pac. R. R. Sur., x, Fishes, 57, 1858; Jordan & Gilbert, Synopsis, 718, 1883.

Cottus criniger Günther, Cat., II, 522, 1860, Monterey.

Centridermichthys analis Günther, Cat., II, 171, 1860.

Clinocottus analis Jordan & Evermann, Fishes of North and Middle America, II, 2012, 1898.

Body light brown, crossed by seven or eight irregular dark bands, broken anteriorly and covered everywhere with fine white, yellow, and pink spots, occasionally olive in some specimens, and in others uniform white, which may be united in irregular blotches; a faint reddish spot on dorsal fin, another on dorsal side of caudal peduncle; head, dull black, shaded with light brown, and thickly spotted as body; top of head lighter, throat silvery white, with irregular dark-brown and black spots; belly light yellow or white, pectorals and tail barred with broad bands of olive green, and sometimes edged with yellow or red; soft dorsal olive, rays spotted with white and black, and whole fin of breeding males edged with a row of red spots varying greatly in extent, but always conspicuous. Some young specimens have a distinctly reddish tinge over head and dorsal part of body, others are or

a uniform green color, broken only by dark markings, and agree closely in color with the green algæ (*Ulva*), among which specimens exhibiting this type of coloration live.

This is the largest and most common cottoid in the pools of Monterey Bay, and is found everywhere about the bay from low to high water mark, but especially in the shallow exposed pools high up on the coast, which contain almost no algae. Its dull, almost uniform, color agrees very well with the bare rocks and sand. It is much less common at Pillar Point, San Mateo County, where its place is partly taken by *Oligocottus maculosus*. The young have much larger scales proportionally than the adults, and the scales extend forward as far as the origin of the spinous dorsal, while in old individuals these anterior scales have entirely disappeared, and their place is taken by cirri as far back as the soft dorsal, while the posterior scales are greatly obscured.

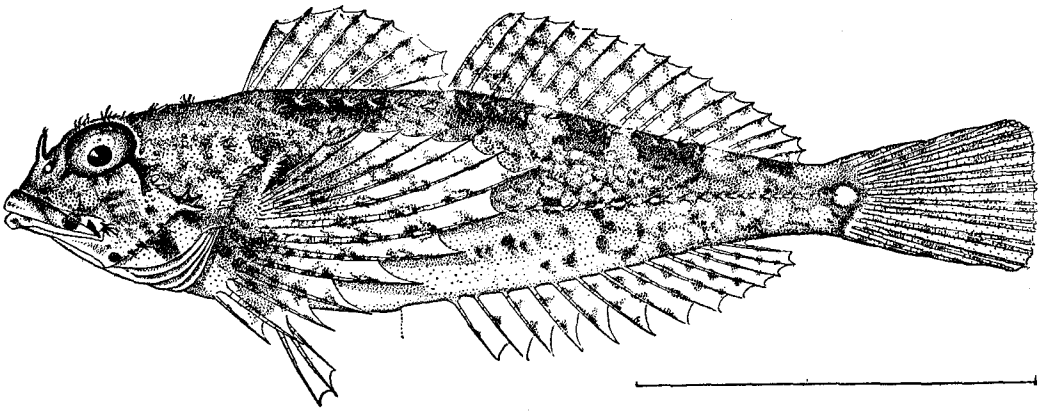

FIG. 5.—*Eximia rubellio* Greeley. Type.

EXIMIA Greeley, new genus.

Allied to *Oligocottus*, but differing in the presence of a large three-pointed preopercular spine instead of the simple forked spine of *Oligocottus*. Skin smooth. A slit behind last gill.

Eximia rubellio Greeley, new species. Fig. 5.

Head 2.83; eye 3.75 in head; snout 3.75; D. VII or VIII, 15 or 16; A. 12 or 13; P. 13 or 14; V. I, 3.

Body compressed, snout pointed and compressed, head deep, occiput narrow, slightly concave; interorbital space narrow, half the large eye, shallowly grooved. Nasal spines prominent, very large, and pointed. Teeth small, pointed, on jaws, vomer, and palatines; jaws equal, mouth horizontal, maxillary 3 in head, reaching a vertical below anterior edge of pupil. Margin of preopercle armed with a very strong spine as long as eye, extending backward and downward, bearing on its upper surface a second and third spine, both pointing back and up; all the spines covered with skin in life; opercle ending in a rounded flap. Branchiostegals 6, not united to isthmus; gills 3½, a slit behind last gill. Anal papilla inconspicuous. Dorsal fins not joined; first dorsal beginning in advance of margin of opercle, first two spines short, upper margin slightly rounded, soft dorsal beginning in advance of origin of the anal; all rays and spines very slender; pectorals reaching well beyond origin of anal; anal fin small, rays slender, membranes emarginated between each ray; in males the first ray enlarged, the second slightly elongated, the two united, and not separated from rest of fin, as in *Dialarchus snyderi;* ventrals situated below upper edge of base of pectorals, just reaching anus. Cirri all distinct, never joined at base in a comb as in *Dialarchus snyderi;* three pairs of bunches of two or three cirri each above orbits, first bunch directly above nasal spines, three pairs on top of head behind orbits, a few scattered cirri below these on sides of head, a bunch of two or three on end of maxillary, a row on lower margin of preopercle, a large bunch above the preopercular spines, and several scattered cirri on margin of opercle; a row of bunched cirri along anterior half of lateral line, a row along base of dorsal, including a bunch of three or four for each spine and ray, the row bending downward at last spine of first dorsal, leaving a space between cirri and base of dorsal spines; a few scattered cirri between dorsal and lateral rows and below lateral line behind pectoral fins.

Color light brown to all shades of light red, pink, or lavender, spotted everywhere with white spots extremely minute on dorsal half of body, but more conspicuous ventrally; five wedge-shaped spots of dark brown along dorsal side of body; head dark brown, sometimes blotched with red or

green, becoming lighter on sides, leaving a dark postocular line extending from eye to preopercular spine and a dark spot on lower margin of preopercle, everywhere very finely marked with white and blue; a white spot with a brown center just in front of first dorsal; throat and belly a very light bluish-green, shading into a faint yellow behind pectorals, and a brownish-green on each side of anal; all the fins, except ventrals, light brownish-green barred with dark brown; caudal light reddish-brown, anal and tip of pectorals tinged with pinkish. A young example is lighter and more brilliantly colored. This species is most closely allied to *Dialarchus snyderi*, from which it differs in presence of a third preopercular spine, greater depth and comparative length of head, larger eye and nasal spines, and arrangement of cirri. Many specimens taken at Monterey Bay, but not recorded from any other locality. The most brilliantly colored of the tide-pool fishes, inhabiting only deep pools rich in plant life.

Comparative measurements of six specimens of Eximia rubellio.

Measurements.	Collectors and localities.					
	Albatross, Monterey, L. S. Jr. U. M. (3642).	McGregor, Monterey, L. S. Jr. U. M. (4048).	McGregor, Monterey, L. S. Jr. U. M. (4048).	Greeley & Maddren, Pac. Gr. (type).	Greeley & Cowles, Pac. Gr.	Greeley & Cowles, Pac. Gr.
Extreme length in millimeters	53	53	52	53	55	45
Greatest height of body	30	28	25	27	27	27
Least height of caudal peduncle	7	7	8	7	8	8
Length of caudal peduncle	16	17	15	14	15	15
Length of head	37	35	36	37	37	37
Width of head	25	28	28	26	28	27
Width of interorbital space	5	6	6	7	6	6
Height of head at pupil	19	18	18	19	20	20
Length of snout	10	10	10	10	10	10
Diameter of orbit	9	8	9	8	8	8
Distance from snout to spinous dorsal	32	32	32	31	33	33
Length of spinous dorsal at base	21	22	24	25	20	22
Height of spinous dorsal	10	11	10	12	10	10
Length of soft dorsal at base	37	41	41	37	39	39
Height of soft dorsal	16	15	15	16	17	16
Distance from snout to anal	57	57	52	54	55	54
Height of longest anal ray	15	15	15	13	13	14
Length of caudal	21	21	21	21	21	21
Distance from snout to pectoral	35	35	34	34	36	36
Length of pectoral	32	32	32	34	34	34
Distance from snout to ventral	36	37	32	32	37	37
Length of ventral	17	18	17	18	18	18
Number of dorsal spines	7	8	8	8	8	8
Number of dorsal rays	15	15	16	16	16	15
Number of anal rays	12	13	13	13	13	12
Number of pectoral rays	13	13	13	14	14	14
Length of first anal ray, male	.....	.....	.....	.....	.....	18

Artedius lateralis (Girard).

Scorpænichthys lateralis Girard, Proc. Ac. Nat. Sci. Phila. 1854, 145, San Luis Obispo and San Francisco.

Artedius lateralis Girard, Proc. Ac. Nat. Sci. Phila. 1856, 134; Girard, U. S. Pac. R. R. Surv., x, Fishes, 70, pl. 229, figs. 5 and 6, 1858; Günther, Cat., II, 174, 1860; Jordan & Evermann, Fishes of North and Middle America, II, 1902, 1898.

Ground color brown, tinged with olive and broken by many white spots below, lower row shading into yellow of ventral side, leaving a scalloped margin; body crossed by several lavender bands, the extent of which is extremely variable, depending on color of algæ; usually a broad band extending from just behind eyes to the middle of first dorsal, and reaching edge of opercle on sides, with two or three less distinct bands behind this; a spot of same color at end of soft dorsal, continued on the two sides; another more distinct spot on base of caudal at end of lateral line; three or four smaller spots along lateral line which embrace a corresponding number of broad lamellæ-shaped cirri, much larger than the rest; a blotch of pink at base of pectorals, with very fine vermiculations of same color on soft dorsal; spinous dorsal reddish; soft dorsal brown, shaded with red and irregularly spotted with

white; under side of throat brown, with fine light spots shading into white posteriorly, and shaded with green, which extends about the inside of the mouth, back of pectorals, and down middle line of belly; sides of belly and ventral side of body on each side of anal yellow.

The most brilliant and sluggish of the tide-pool cottoids, usually lying close to the rocks and rarely moving rapidly. Distinguished from *A. asperulus* by the shape and depth of head and length of the band of scales, and not by number of rows in the band. A number of my specimens have nine rows, and are identical in this respect with *A. asperulus*. *A. lateralis* occurs in all kinds of tide-pools, high or low, but is usually found singly, and never are there many in the same pool. These solitary habits differ very noticeably from those of the other tide-pool cottoids in their strikingly social manner of life.

Caularchus mæandricus Girard.

Lepidogaster reticulatus Girard, Proc. Ac. Nat. Sci. Phila. 1854, 155, San Luis Obispo, Cal.; name preoccupied.

Lepidogaster mæandricus Girard, Pacific R. R. Surv., x, Fishes, 130, 1858, San Luis Obispo, Cal.; substitute for *reticulatus*, preoccupied in *Ledadogaster;* Günther, Cat., iii, 505, 1861.

Gobiesox reticulatus Jordan & Gilbert Synopsis, 749, 1883.

Caularchus mæandricus Jordan & Evermann, Fishes of North and Middle America, iii, 2328, 1898.

Color yellowish green, with faint vermiculations of brown, and spots of clear yellow more apparent on top of head; a distinct interorbital line of same color; tip of snout tinged with black; dorsal, anal, and caudal light-brown, edged with bluish-white.

The only fish of this family (*Gobiesocidæ*) found in tide-pools of Monterey Bay and northward.

Gibbonsia elegans (Cooper).

Myxodes elegans Cooper, Proc. Cal. Ac. Sci., iii, 109, 1864, San Diego and Santa Barbara.

Clinus ocellifer Mocquard, Bull. Soc. Philom. Paris, 1886, 44, California.

Clinus evides Rosa Smith, Proc. U. S. Nat. Museum 1883, 235, specimens from Todos Santos: not of Jordan & Gilbert.

Gibbonsia elegans Jordan & Evermann, Fishes of North and Middle America, iii, 2353, 1898.

Originally described from Point Loma and its geographical range given as from Point Concepcion south to Todos Santos. In 1883 Jordan & Gilbert described *G. evides*, ranging from Point Concepcion northward. The two nominal species were distinguished as follows by Jordan & Evermann:

G. evides: Dorsal v-xxxi, 10; anal ii, 26; soft dorsal low; coloration comparatively plain, the soft dorsal without pellucid area.

G. elegans: Dorsal v-xxviii, 7; anal ii, 24; soft dorsal high; coloration more or less variegated, soft dorsal with a high pellucid blotch posteriorly.

My collection from Monterey Bay contains some specimens which are undoubtedly *G. elegans*, thus extending the range of that form to Monterey Bay. Others are exactly intermediate between the two species, with some of the characteristics of one and some of the other, thus indicating that these two species are not really distinct. The characters of these intermediate forms are:

Dorsal v-xxx, 9; anal ii, 26; a small pellucid spot on soft dorsal; coloration brilliant black with longitudinal yellow bands.

Dorsal v-xxx, 8; anal ii, 27; a large pellucid spot on soft dorsal; color light reddish-brown, crossed by narrow bands of dark brown; fins yellowish, barred with brown.

Dorsal v-xxix, 8; anal ii, 25; a large pellucid spot on soft dorsal; coloration perfectly plain.

Dorsal v-xxx, 9; anal ii, 28; small pellucid spot on soft dorsal; coloration perfectly plain.

I find similar intergradations in specimens from San Diego. It appears that the two forms can not be distinguished at any point throughout their range. The number of fin rays and the coloration will not serve to separate the species; therefore *G. evides* must be identical with *G. elegans*, which has the priority of description.