

DESCRIPTIONS OF NEW GENERA AND SPECIES OF FISHES FROM PUERTO RICO.

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In December, 1898, the Commissioner of Fish and Fisheries sent the Fish Commission steamer *Fish Hawk* to Puerto Rico for the purpose of making investigations regarding the aquatic life of that island. The investigations extended over a period of two months. The island was circumnavigated and work was done at practically all places where safe anchorages are found, and several trips were made by members of the scientific staff to points in the interior of the island, where the fresh-water streams were examined. The itinerary of the vessel when working about the island was, briefly, as follows:

Jan. 2 to 17, at and about San Juan.
Jan. 18, at Aguadilla.
Jan. 19 to 24, at and about Mayagüez.
Jan. 25, at Ensenada del Boqueron.
Jan. 26 and 27, about Puerto Real.
Jan. 28 and 29, in Guanica Bay.
Jan. 30 to Feb. 2, at Ponce.
Feb. 3 and 4, at Arroyo.
Feb. 5, at St. Thomas.

Feb. 6, running a line of dredgings between St. Thomas and Vieques Island.
Feb. 7, at Isabel Segunda, Vieques Island.
Feb. 8, dredging between Vieques and Culebra islands.
Feb. 9 to 12, about Culebra Island.
Feb. 13 to 15, about Hucares.
Feb. 16 to 18, about Fajardo.
Feb. 19, at St. Thomas, coaling.
Feb. 20 to 22, at San Juan.

Land trips to the fresh-water streams of the island were made by one or more members of the party as follows:

Jan. 8 to 10, to Caguas, where collecting was done in the Rio Grande and the Rio de Caguaita.
Jan. 12, to Bayamon, where the Bayamon River was examined.
Jan. 15 and 16, to Arecibo.
Jan. 22 and 23, from Mayagüez to Aguadilla.

Jan. 29, from Guanica, via Yauco, to Ponce.
Feb. 2 and 3, from Ponce, via Coamo, Aibonito, Cayey, and Guayama, to Arroyo.
Feb. 16, from Hucares, via Ceiba, to Fajardo.
Feb. 18 to 21, from Fajardo, via El Yunque Mountain, Rio Grande, and La Carolina, to San Juan.

Large collections of fishes, mollusks, crustaceans, and other aquatic animals were made. These are now being studied by specialists in the various groups and the results will be published in the detailed report upon the work of the expedition, which is now in preparation and which will soon be ready for publication.

Among the fishes obtained are 3 new genera and at least 20 new species, of which preliminary descriptions are given in the present paper. In the detailed report upon the investigations of the *Fish Hawk* in Puerto Rico will be found illustrations of most of these species.

1. *Lycodontis jordani* Evermann & Marsh, new species.

Head 7 in total length; depth about 14; eye 8 in head; snout 5; gape 2.2; interorbital a little less than snout. Teeth uniserial, strong, sharp, not close-set, all entire and without basal lobes; tail considerably longer than rest of body; gill-opening smaller than eye; snout rather pointed, lower jaw the shorter, the mouth capable of being completely closed. Dorsal fin high, much higher than anal; nasal tube long, about 3 in eye.

Color: Tawny ochraceous, paler below; upper jaw gray; iris blue; longitudinal brown stripes on side of head in front of gill-opening; head and body covered with numerous small, round, white spots, those on head smallest; a series of larger ones along upper part of side, and 1 or 2 irregular series of large ones on side of belly; between these on the middle of side the spots are smaller; dorsal with an irregular series of small white spots along the base, and another series of about 16 much larger, more quadrate spots of same color along edge of fin, some of the spots cutting the border, which is black; anal similarly spotted and with black border. In alcohol the general color is grayish-black, yellowish below, the tawny ochraceous or yellow becoming darker, almost black, and the white spots on body becoming yellowish.

This species seems to be related to *L. obscuratus* (Poey), but differs markedly from it in color. Only the type (No. 49358, U. S. N. M.), a specimen about 15 inches long, was obtained. This was collected at Mayagüez, January 20, 1899.

Named for Dr. David Starr Jordan.

2. *Stolephorus gilberti* Evermann & Marsh, new species.

Head 3.25; depth 3.4; eye 4; snout 6; maxillary 1.7; mandible 1.7; interorbital 4.9; D. 15; A. 23; pectoral 2.1; ventral 3.5; caudal 1.3; scales 42-9.

Body comparatively deep and strongly compressed, the belly trenchant, without serrations; snout thick, much projecting; maxillary reaching nearly to root of mandible, scarcely serrate; eye moderate; tip of lower jaw reaching vertical from front of eye; distance from lower posterior angle of cheek to vertical from posterior margin of opercle much less than from same point to eye; dorsal inserted far in advance of anal, just behind insertion of ventrals, midway between anterior edge of eye and base of caudal.

Color in spirits: Back light olivaceous with dark punctulations; rest of body below a line from shoulder to upper base of caudal silvery; faint traces of golden behind eye; no lateral band.

This species is very close to *Stolephorus garmani*, differing chiefly in the much smaller eye, the more uniform color of the back, the somewhat more sharply compressed belly, and the more nearly entire maxillary. One specimen, the type (No. 49359, U. S. N. M.), 4.5 inches long, collected at Palo Seco, near San Juan, January 13, 1899, associated with *S. productus*, with which species both *S. gilberti* and *S. garmani* Evermann & Marsh are allied.

Named for Dr. Charles Henry Gilbert, of Stanford University.

3. *Stolephorus garmani* Evermann & Marsh, new species.

Head 3.2; depth 3.3; eye 3.5; snout 5.5; maxillary 1.7; mandible 1.7; interorbital 5; D. 14; A. 23; pectoral 2; ventral 3.5; caudal 1.3; scales 42-9.

Body comparatively deep and strongly compressed; the belly not strongly trenchant, without serrulations; snout thick, much projecting; maxillary reaching nearly to root of mandible, very finely and weakly serrate; eye large; tip of lower jaw reaching vertical from front of eye; distance from lower posterior angle of cheek to vertical from posterior margin of opercle much less than from same point to eye; dorsal inserted far in advance of anal, just behind insertion of ventrals, midway between anterior edge of pupil and base of caudal.

Color in spirits: Back dark near the median line, below this somewhat reddish; rest of body below a line from shoulder to upper base of caudal silvery; some golden on snout and behind eye; no lateral band.

This species has a general resemblance to *Stolephorus productus*, but is unquestionably distinct from it; the anal is much shorter and inserted farther back, the body

is deeper, the eye larger, and the snout longer. It is very close to *Stolephorus gilberti* Evermann & Marsh, differing chiefly in the larger eye, in the color of the back, and the somewhat less sharply compressed belly. One specimen, the type (No. 49360, U. S. N. M.), 4.5 inches long, collected at Puerto Real, January 27, 1899.

Named for Prof. Samuel Garman, of the Museum of Comparative Zoology.

4. *Prionodes baldwini* Evermann & Marsh, new species.

Head 2.5; depth 3.2; eye 4; snout 4.6; maxillary 2.4; mandible 2; interorbital 7; D. x, 12; A. III, 7; pectoral 1.4; ventral 1.3; caudal 1.7; scales 4-42-12.

Body elongate, moderately compressed, not elevated, covered with ctenoid scales; dorsal and ventral outlines alike; head moderate, pointed, naked above and below; eye large, greater than length of snout, high in position; mouth terminal, slightly oblique, the maxillary reaching middle of eye or somewhat beyond; gillrakers short, 6 developed on lower limb; teeth small, conical, and sharp, on vomer and palatines and in several series in each jaw, with weak canines in front and a few canine-like teeth on middle of side of lower jaw; cheek with about 7 rows of scales; preopercle finely serrate; opercle ending in 3 sharp, flat spines, the middle one largest, a membranous pointed flap projecting beyond; fins all naked, the dorsal continuous, with a slight emargination, the spines slender and pungent, the first 4 or 5 graduated, the rest subequal, 3.2 in head, lower than the soft rays which are contained about 2.5 in head; anal fin short, the second spine longest and strongest, 3 in head, the soft part high, the fifth or sixth ray longest, reaching almost to front of anal, 2 in head; ventral with second ray produced, reaching vent; caudal truncate, or with middle rays very slightly shorter, making the margin slightly concave.

Color in life: Dorsal half of head and trunk and all of caudal peduncle scarlet, ventral portion pale blue, almost white; a yellow longitudinal band, nearly as wide as pupil, from preopercular margin straight across opercle and along body to lateral line under last dorsal rays; 4 quadrate or oblong black blotches just under this band, the first about under middle of spinous dorsal, second under last spines, third under first rays, fourth under last rays; from each of the first three of these blotches a square, well-defined yellow shade extends downward to belly or base of anal, a similar one from base of pectoral to ventral; 4 smaller black blotches at base of caudal, two others, somewhat larger than the last, just in front of them on caudal peduncle; a row of 9 black, round dots on each side at base of dorsal fin, the first one smallest, opposite membrane of first spine, the other 8 separated somewhat obscurely into pairs, the first pair under middle spines, second under last spines, third under first rays, fourth under last rays; 2 or 3 very small black dots on upper edge of caudal peduncle; 2 or 3 more in front of dorsal on median line, each accompanied by a similar one on either side; in some specimens a few scattering ones on top of head behind eyes, sometimes regularly arranged; a few dark-brown spots behind eye; various dark markings on side of head, without very definite pattern, but usually 2 oblique stripes on cheek, a heavy black blotch on interopercle and 2 on the ramus of the mandible, which, with their fellows of the other side, make distinct cross-bars on lower side of head usually extending across maxillary; chin and lower part of opercle with dark spots; lateral line white, with a few broken spots, comparatively faint, just below it; iris red, with an inner ring of white surrounding the pupil; spinous dorsal pale, the edge of the membrane black, this color bordered below with faint yellow; soft dorsal pale, spotted throughout with light orange, with a marginal band of the same, outside of which is a very narrow pale-blue edge; ventral very pale-blue, the produced ray somewhat yellow; anal pale-blue with some light orange on last rays; pectoral and caudal uniform pale-reddish, unmarked.

In spirits all the red and yellow markings disappear, the dark persists, and additional markings are brought out, as follows: Along the anterior and upper part of trunk and crossing the lateral line are dark-brown vertical bars, diffuse and running together, or separated and broken into round or quadrate blotches; in the middle part of the course of the yellow longitudinal band appears a row of very small black points; spots on soft dorsal dusky; dark mottlings on caudal; upper and lower base of pectoral, and sometimes axil, dusky.

A beautiful and strongly marked species; 2 specimens dredged and 33 others, ranging in size from 0.55 to 2 inches, caught in the tangle, off Culebra and Vieques islands, from coral bottom, in depths of 15 and 16 fathoms; the type (No. 49361, U. S. N. M.), 2 inches long, taken in the tangle at *Fish Hawk* station 6093, off Culebra Island, 5.25 miles southwest of Culebritas light-house, February 8, 1899, in 15 fathoms.

This species is named for Mr. Albertus H. Baldwin, the artist of the expedition, in recognition of his excellent drawings and paintings of American fishes.

5. *Calamus kendalli* Evermann & Marsh, new species. "Pluma."

Head 3.1; depth 2.1; eye 3.5; snout 1.5; maxillary 2.4; interorbital 3.5; preorbital 2.1; D. XII, 12; A. III, 10; pectoral 1; ventral 1.8; caudal 1.3; scales 7-53-16.

Body deep, back strongly elevated, more so than in *C. bajonado*, but less than in *C. calamus* or *C. proridens*, the anterior profile a nearly regular curve, lacking the abrupt nuchal elevation of those species; eye large, larger than in *C. proridens*; 7 or 8 rows of scales on cheek; teeth about as in *C. proridens*; molars in 2 or more rows on sides, those of inner row much the largest, those in front becoming more numerous and merging into cardiform teeth, the most anterior of which, in each jaw, are somewhat enlarged; in front of upper jaw are 2 much enlarged antrorse canines, curved slightly upward; highest dorsal spine 2.7 in head, second anal spine 4.6.

Color in spirits: Silvery, sides with bluish longitudinal lines following the rows of scales, plainest above; a pale-blue line bordering the orbit below; some blue lines on preorbital, not evidently reticulated and not as numerous as in *C. proridens*; iris yellow; otherwise as in *C. proridens*, to which this species is very close.

Type No. 49362, U. S. N. M., 10.5 inches long, collected at Mayagüez, January 20, 1899; 2 others, each 8.5 inches long, from Mayagüez and Arroyo, are more slender (depth 2.3 and 2.45 in length), but not differing in any other character.

Named for Dr. William Converse Kendall, scientific assistant, U. S. Fish Commission.

6. *Doratonotus decoris* Evermann & Marsh, new species.

Head 2.6; depth 3.4; eye 4; snout 3.5; maxillary 4; interorbital 4.6; D. IX, 10; A. III, 9; pectoral 1.6; ventral 2.2; caudal 1.6; scales 1-26-6. Body moderately elongate, compressed throughout; the back a little elevated, the caudal peduncle deep and rather long; dorsal and ventral outlines nearly alike, the dorsal somewhat more strongly arched; anterior profile not trenchant, almost straight from snout to front of dorsal, very slightly convex in front of dorsal and very slightly concave between eye and tip of snout; head pointed, interorbital space broad and flat; eye large, high in position, middle of pupil nearer tip of snout than end of opercle; snout long, somewhat longer than diameter of eye, moderately produced, the lips broad in front, characteristically labroid; mouth not large, the maxillary not reaching front of orbit, the jaws equal, armed with strong sharp teeth, about 4 canines in front of upper jaw, 2 in front of lower; teeth on sides of jaws also canine-like, smaller than those in front, but not distinctly different from them; a few smaller teeth behind the main row of large ones; vomer and palatines toothless; soft dorsal and anal each with a basal sheath of about two rows of large scales, that of dorsal extending over half the fin or more, that of anal lower, the fins otherwise naked; dorsal fin continuous, with a shallow notch, the spines slender and pungent, the second longer than the first, the following ones graduated to the fifth, which is shortest, thence increasing in length to the ninth, which is longest, 2.3 in head; soft dorsal with its middle rays highest, 2.2 in head; anal with three slender, sharp, graduated spines, the third longest, 2.2 in head; the soft part similar to soft dorsal, longest rays 2.3 in head; pectoral large, symmetrical, of 11 rays, the middle ones longest, reaching past tip of ventral nearly to vent; ventral moderate, pointed, reaching half way to vent; caudal rounded; scales large, cycloid, the lateral line on second row below the dorsal, interrupted near the end of dorsal and beginning again on the row below, on caudal peduncle.

Color in life: Body chiefly green, darker green on back, lighter below; lower parts of head and breast light yellow; a broad white bar from eye obliquely across

cheek and opercle, bordered above by an undulating maroon line and below by a similar, but fainter line; a brown bar from eye to snout; 4 dusky spots near base of dorsal extending as fainter shades downward and slightly forward to or beyond lateral line, 1 from in front of dorsal, 2 under spinous dorsal, and 1 under soft rays; short pale-blue bars or spots on breast and about pectoral; iris blue, a pinkish border surrounding pupil; dorsal greenish, the soft part with yellow shade, a pale-blue edging to the whole fin, a maroon border to the green color posteriorly just inside the pale-blue edge, a small dark spot on membrane between seventh and eighth rays and a blue spot on membrane of first spine; anal colored like soft dorsal, the maroon border extending from first spine to last ray inside the pale edging, the dark spot between sixth and seventh rays; ventral green near base, pale blue outwardly, the green color bordered by maroon spots; pectoral plain, pale green; caudal very pale transparent blue, a wedge-shaped maroon spot on the 2 upper rays near tip and a corresponding one on the 2 lower rays, the base of the wedge on outer ray; base of caudal with a pale undulate vertical bar bordered in front by a black line. In spirits, pale green, the maroon markings faintly persistent, becoming dusky.

One specimen, the type (No. 49363, U. S. N. M.) 1.45 inches long, taken in the seine at Ponce, January 30, 1899.

Deoris, beautiful.

7. *Sicydium caguitæ* Evermann & Marsh, new species.

Head 4.4; depth 4.8; eye 5.75; snout 2.5; maxillary 2; mandible 2.75; interorbital width 3; preorbital 3.5; D. VI-1, 10; A. I, 9; scales 83-25; longest dorsal spine 1.5 in head, longest ray 2; longest anal spine 2 in head, longest ray 2; pectoral 1.1; ventral disc 1.75; caudal 1.

Body rather stout, heavy forward; head large, broad; mouth large, its width 1.5 in head; lips very thick; maxillary not greatly produced; teeth simple, flexible; a median cleft in upper lip; pectoral somewhat shorter than head; dorsal spines without filaments, the longest about 1.5 in depth of body; space between dorsals about equal to orbit; soft rays of dorsal and anal scarcely reaching base of caudal; ventrals united, forming a cup-shaped disc, only about two-fifths posterior edge free from belly; caudal rounded. Scales very small, ctenoid, densely covering entire body except a broad strip on belly; posterior portion of nape with very fine scales; entire head naked.

Color: Dark brown or olivaceous on head, sides, and back; under parts pale; fins all pale, the anal with a narrow darkish margin; caudal somewhat dark; no dark vertical bars on body and none at base of pectoral; no H-shaped figure at base of caudal.

This species is close to *S. plumieri*, from which it differs chiefly in the color, the more complete squamation, the shorter pectoral, and the non-filamentous character of the dorsal spines.

A single specimen (type No. 49364, U. S. N. M.), 3.63 inches long, obtained in the Rio de Caguaita at Caguas, January 9, 1899.

8. *Gobius bayamonensis* Evermann & Marsh, new species.

Head 4.8; depth 6.4; eye 5; snout 3.2; maxillary 1.8; mandible 1.9; interorbital 7.6; preorbital 4.6; scales 71-19, about 29 before dorsal; D. IV-14, the longest spine about 0.7 in head, the longest ray 1.5; A. 15, the longest ray 1.5; pectoral 1.1; ventrals 1.1; caudal very long and pointed. Body very long and slender; head long; caudal peduncle long; mouth very large, oblique; maxillary long, reaching past posterior border of orbit.

Color as in *G. oceanicus*, which this species closely resembles. The smaller (71 instead of 63 to 65), almost cycloid scales, the longer head, larger mouth, longer maxillary, and the longer and more slender body are differences which we can not reconcile with the descriptions of that species or with the numerous specimens of it which we have from Puerto Rico.

This description is based on a single specimen 9 inches in length, No. 49365, U. S. N. M., bought in the San Juan market, January 14. It probably came from near the mouth of Bayamon River at Palo Seco, for which stream the species is named.

9. *Bollmannia boqueronensis* Evermann & Marsh, new species.

Head 4; depth 5.5; eye 3.5; snout 4.4; maxillary 2.2; mandible 2.5; interorbital width 3 in eye; preorbital 6; scales 27-8; D. VII-13, the longest spine 1.5 in head, the longest ray 1.2; A. 12, the longest ray 1.25 in head; pectoral 1; ventrals 1.1; caudal 0.4.

Body long, slender, tapering; head short; snout blunt; mouth large, oblique; jaws subequal, maxillary reaching posterior border of pupil; isthmus narrow, the gill-openings reaching forward to below preopercle; eyes large, high, close together, the interorbital very narrow and without median keel; no fleshy process on inner edge of shoulder girdle; teeth on jaws in narrow bands, those of outer series somewhat enlarged; opercle short, about 3 in head. Fins moderate; origin of spinous dorsal slightly behind base of pectoral, its spines 7 in number, not filamentous; interspace between dorsals less than diameter of eye; soft rays of dorsal and anal reaching, when depressed, beyond base of caudal; caudal long and pointed, as in *Gobius oceanicus*; pectoral pointed, reaching beyond origin of anal; ventral disc moderate, free from belly, the longest rays barely reaching origin of anal. Scales very large, weakly ctenoid; nape, cheeks, and breast scaled, the scales somewhat smaller than on body, about 9 scales before the dorsal.

Color: Pale olivaceous or straw color, back and upper part of head with profuse fine dark punctulations; under parts pale, breast somewhat dusky; dorsal fins barred with white and dark, a large jet-black ocellus on posterior part of spinous dorsal; other fins pale, the ventral disc somewhat dusky in front. Length, 2.75 inches.

Known only from the type and 4 cotypes dredged by the *Fish Hawk* at station 6074, off Puerto Real, in 8.5 fathoms, January 25, 1899. Type No 49366, U. S. N. M.

This interesting little fish belongs to a genus hitherto known only from the Pacific, from which 4 species have been described, the type species (*B. chlamydes* Jordan) from the coast of Colombia, and three others (*B. ocellata* Gilbert, *B. macropoma* Gilbert, and *B. stigmatura* Gilbert) from the Gulf of California.

Named from Ensenada del Boqueron, near which the type was obtained.

10. *Microgobius meeki* Evermann & Marsh, new species.

Head 3.75; depth 6; eye 3.5; snout 5.5; interorbital 7; maxillary 2; mandible 1.5; scales 55-12; D. VII-17; A. 16.

Body slender, greatly compressed, tapering regularly from pectorals to caudal; head moderately heavy, interorbital space very narrow; eye large, high; mouth large, oblique; maxillary reaching posterior border of orbit; lower jaw projecting; teeth in bands in each jaw, the outer series greatly enlarged and strongly recurved, those of lower jaw largest; isthmus rather narrow, the gill-openings continuing forward.

Body densely scaled, the scales strongly ctenoid, those anteriorly somewhat reduced; nape, breast, and entire head naked. Origin of spinous dorsal from snout 3.5 in length; dorsals very close together; spines of first dorsal filamentous, exceeding head in length; soft dorsal and anal long, their bases about equal, about 2.5 in body, their last rays reaching past base of caudal when depressed; caudal pointed, its longest rays about equal to head; pectoral about equal to head, reaching origin of anal; ventrals united, almost reaching origin of anal.

Color: Light-olivaceous, dusted over uniformly with fine dark punctulations; a large dark shoulder-spot between the base of pectoral and origin of spinous dorsal; a few indistinct dark areas on side of head; lower jaw dark at tip; an obscure dark blotch at base of caudal; fins all rather pale except ventrals, which are dark, perhaps bluish in life; caudal somewhat dusky; anal dark-edged. Length 1.5 inches.

This species seems related to *M. eulepis* Eigenmann & Eigenmann, described from Fortress Monroe, Va., but differs in the smaller and strongly ctenoid scales, greatly compressed body, and in the coloration.

Described from a single specimen, 1.5 inches in length (No. 49367, U. S. N. M.), collected at *Fish Hawk* station 6087, in 15.25 fathoms, between Culebra and Vieques islands.

Named for Dr. S. E. Meek, assistant curator of zoology, Field Columbian Museum.

GILLIAS Evermann & Marsh, new genus.

Gillias Evermann & Marsh, new genus of *Blenniidae* (*jordani*).

Body short and stout, tapering rapidly from the short, broad head to the short, compressed caudal peduncle; scales large, rough-ctenoid; lateral line complete, or nearly so, broken under last spines of middle dorsal; a broad, double-pointed tentacle above eye; dorsal fin divided into 3 parts, the first of 3 short spines, the second of 11 longer spines, and the third of 7 rays.

This genus is closely related to *Enneaneotes* Jordan & Evermann, from which it differs in the presence of the orbital tentacle, the more complete development of the lateral line, and the larger scales.

Named for Dr. Theodore Gill.

11. *Gillias jordani* Evermann & Marsh, new species.

Head 3.5; depth 4.3; eye 2.5; snout 3.5; maxillary 2.4; mandible 1.9; scales 2-30-7; D. III-XII-7; A. II, 15; longest dorsal spine 1.8 in head, longest ray 1.6; longest anal ray 2.3; pectoral 0.8; ventral 1.3; caudal 1.3.

Body short and stout, tapering rapidly to the short, compressed caudal peduncle; head short; snout short, blunt, concave in front of eyes; mouth small, slightly oblique, jaws equal; eye large, high up, interorbital width very narrow; a broad bifid orbital tentacle, none on nape. Scales very large and rough-ctenoid; opercles and entire head rough; lateral line nearly complete, beginning immediately above base of pectoral at upper end of gill-opening and extending parallel with back to posterior part of middle dorsal fin (or for 12 scales) where there is a break, the line dropping down 3 scales, then continuing with one or two interruptions to base of caudal; belly and breast scaled; dorsals 3, the first of 3 short, flexible spines, close to the second, which has 12 longer, rather stiffer, spines, separated from the third by a space one-third diameter of eye; anal long and low, the membranes deeply notched between the rays; pectoral of 15 rays, broad and short, reaching posterior end of second dorsal; ventral 2, slender.

Color in alcohol: Brown, body crossed by 4 broad blackish bars, one at the origin of second dorsal, one under last spines of same fin, the third between second and third dorsals, and the fourth under third dorsal; an inky-black bar across caudal peduncle at base of caudal fin; head and under parts rusty; fins all barred with light and dark; caudal with a narrow light bar at base, then a black one, then a broader white one, followed by a much broader dark bar containing some white areas, the fin finally tipped with white.

Two specimens of this well-marked and interesting species were obtained, the type, 1.5 inches long (No. 49368, U. S. N. M.), taken on the Cardona Light-House Reef, at Ponce, February 1, 1899, and another specimen of about the same size taken at the same place the preceding day.

Named for Dr. David Starr Jordan.

12. *Malacoctenus culebræ* Evermann & Marsh, new species.

Head 3.35; depth 5; eye 4.2; snout 4.5; maxillary 2.2; mandible 1.8; interorbital 6.5; scales 2-35-11; D. XXI, 8; A. II, 18; pectoral 1.3; ventral 1.3; caudal 1.4.

Body slender, compressed; head rather long, pointed, upper profile convex; mouth large, the maxillary nearly reaching posterior border of orbit; lips thick, jaws equal; teeth very small, conical, a single row in each jaw; a single nasal, ocular, and nuchal filament; dorsal fin moderately high, originating above the origin of lateral line, a shallow notch in front of last two dorsal spines, the membrane free from caudal; anal origin under about tenth dorsal spine; caudal somewhat pointed; pectoral large, reaching anal; ventrals moderate, not reaching anus, of two rays, no spine evident; lateral line distinct throughout, running high anteriorly, where it is slightly curved, turning abruptly downward over the origin of anal, thence median to base of caudal.

Color in spirits: Body everywhere mottled with dark brown, in somewhat regularly arranged blotches, a series of about nine of these at the base of dorsal, barely extending upon the fin; a similar series of much smaller ones at base of anal, not

evident on all specimens; below the series at base of dorsal are two other series of the same blotches less deep in color and not so well defined, extending the length of body and sometimes forming, with the upper series, more or less broken vertical bars; between the blotches a lighter shade of brown is interwoven with pale streaks of ground color; head nearly pale below, save some dark on chin and isthmus; two wide streaks from eye across cheek; opercle dark brown; top of head with the color of body; lips with brown and pale stripes; posterior half of maxillary pale; dorsal rather dark; caudal uniform gray or faintly barred; anal similar to dorsal in color; the rays with pale tips forming a white edge; pectoral like caudal; ventrals pale.

A rather plainly marked species of different aspect from other Puerto Rican species of *Malacoctenus*, but not differing widely in any important character. It seems most closely related to *M. lugubris*. Three specimens of about the same size; the type, No. 49369, U. S. N. M., 1.38 inches in length, from the reefs outside the harbor of Culebra, February 9, 1899.

13. *Malacoctenus moorei* Evermann & Marsh, new species.

Head 3.6; depth 3.7; eye 3.5; snout 3.4; maxillary 4.5; mandible 4.5; interorbital 4; scales 3-45-5; D. XXII, 11; A. II, 20; pectoral 1 in head; ventral 1.2; caudal 1.2; longest dorsal spine 1.5; ray 1.2; longest anal ray 1.5.

Body short, rather stout, compressed; head short, snout short, but pointed; mouth rather small, little oblique, the gape scarcely reaching orbit; teeth in each jaw in a single series; gill-membranes broadly united across the isthmus; eye small, interorbital space wide; dorsal outline rising abruptly to above eye, thence gently curved to origin of dorsal fin, and from there nearly straight to base of caudal fin; ventral outline regularly convex.

Color in alcohol: Light olivaceous, the body crossed by about 9 or 10 dark broad vertical bars, which extend upon dorsal fin, these usually broadest above, the pale interspaces therefore broadest on lower half of body; the fourth from last is a narrow dark line, the one following it is a double spot, the next narrow and indistinct, the last, at base of caudal, more distinct, followed by 3 small irregular white spots; top of head brown; side of head with fine punctulations; a dark line running forward from eye, a dark spot below eye, 2 or 3 dark blotches on anterior edge of opercle; under surface of head crossed by 3 or 4 irregular, indistinct dark lines; caudal and anal with fine dusky punctulations; pectoral and ventrals pale.

This species is close to *M. gilli*, from which it may be distinguished by the larger dorsal and anal fins, the greater depth, wider interorbital, and the coloration.

Known only from one specimen, 1.4 inches long, type No. 49370, U. S. N. M., collected at Culebra Island, February 11, 1899.

Named for Dr. H. F. Moore, naturalist on the U. S. Fish Commission steamer *Albatross*.

14. *Malacoctenus puertoricensis* Evermann & Marsh, new species.

Head 3.4; depth 3.4; eye 4; snout 3.5; maxillary 3.4; mandible 2.6; interorbital 7; preorbital 8; scales 4-44-8. D. XX, 10; A. II, 19; P. 14; V. 2; C. 13.

Body short, stout, compressed; head rather long, snout long and pointed; mouth small, little oblique, the maxillary scarcely reaching front of orbit; teeth in a single row in each jaw; gill-membranes broadly united, free from the isthmus; eyes high up, interorbital narrow; caudal peduncle short, compressed, its least depth about 3 in head. Fins rather large; origin of dorsal over upper end of gill-opening, first spine slightly shorter than second, which is somewhat longer than the third, whose length is about 2.2 in head; no notch behind third and fourth spines, all the spines from third to fifteenth being about equal in length, the sixteenth and seventeenth being somewhat shorter, the remaining three progressively longer; soft dorsal higher, its longest ray about 1.7 in head; longest anal ray 1.7; pectoral broad, 1.25 in head, reaching anal; ventral barely reaching origin of anal; a pair of slender ocular cirri, a small supraocular one, a short, slender, nasal cirrus and a few very slender ones at the nape; scales large, not crowded anteriorly; lateral line well arched above the pectoral.

Color in alcohol: Brown, much spotted and vermiculated with darker; top of head brown, sides and under parts pale, crossed by about 5 broad, irregular brown bars; side of body with about 5 or 6 broad, dark crossbars, broader than the paler interspaces, broadest and darkest above and extending upon dorsal fin; under parts of body paler, more speckled; spinous dorsal with numerous small brown specks, a large black ocellus on base of 3 anterior spines, and a larger one on base of last 4 dorsal spines, being chiefly on body; soft dorsal, caudal, and anal each crossed by several series of small brown spots; pectoral and ventrals pale, the pectoral with a few brown spots at base.

The above description from the type, a female, 2.5 inches long, No. 49371, U. S. N. M., obtained at Hucares, February 14. Three female cotypes gotten at Fajardo, February 17, and one at Culebra, February 9, agree closely with the type; 2 of these, however, show faint traces of narrow horizontal lines along lower part of side.

A male, 2.5 inches long, from Culebra, February 11, taken as one of the cotypes, may be described as follows: Head 3.5; depth 3.7; eye 3.8; snout 3.2; maxillary 3.1; mandible 2.4; interorbital 7; preorbital 6.2; scales 3-45-9; D. xx, 10; A. II, 19; P. 14; V. 2; C. 13; longest dorsal spine 2 in head, longest ray 1.4; longest anal ray 1.5; pectoral 1; ventral 1.1; caudal 1.1. Color in alcohol, tolerably uniform brown; crossbars on side very faint; longitudinal lines more evident than in the female; throat and under parts of head mottled with white and light brown; fins less speckled than in female, the soft dorsal and anal pale, almost without spots.

Another male, 2.25 inches long, from Culebra, February 11, agrees with the large specimen just described, except that the crossbars on body are more distinct.

This species most closely resembles *M. bimaculatus* Steindachner, from which it differs in the larger head, greater depth, smaller mouth, narrower interorbital, and in the color. The tips of the anal rays are not white, the soft dorsal is spotted like the caudal and anal, and there are no white spots on base of pectoral, as is said to be the case in *M. bimaculatus*.

The collection contains 7 specimens of this species, as indicated above.

AUCHENISTIUS Evermann & Marsh, new genus.

Auchenistius Evermann & Marsh, new genus of *Blenniidae* (*stahli*).

This genus has the form of *Auchenopterus* and suggests that genus strongly. It differs in the absence of a lateral line, in the much smaller scales, in the absence of a notch at the front of the dorsal fin, and in the union of the membrane of the anal fin with that of the caudal.

αὐχὴν, nape; ἰστῖον, sail or fin.

15. Auchenistius stahli Evermann & Marsh, new species.

Head 5; depth 6.5; eyes 4.8; snout 6; maxillary 2.8; scales about 58, about 12 in transverse series; D. xli or xlii; A. II, 23 or 24; pectoral 2.5; ventral 2.2; caudal 1.3.

Body elongate, somewhat compressed, especially posteriorly, the dorsal and ventral outlines alike; head small, upper profile straight and descending; snout moderate, pointed; mouth large, the maxillary reaching to or beyond middle of eye; the jaws equal, heavy and projecting; teeth in lower jaw conical, short and strong, slightly recurved, in one row; teeth in upper jaw similar to those in lower, but a small patch of smaller teeth in front of jaw behind the main row; teeth on vomer; gill-membranes joined to the isthmus; nostrils with short tubes, a single flap above each eye and one on each side of nape; dorsal fin long, of spines only; last four spines somewhat longer than the preceding, forming a shallow notch, a feature lacking in the other examples; anal origin about midway between tip of snout and tip of caudal, the fin similar to dorsal in shape, but somewhat lower; membrane of dorsal and anal joined to caudal; caudal small, pointed; pectoral small, of 8 rays; ventral small, of 2 rays.

Color in spirits: Body everywhere with a very slight yellowish tinge, in some specimens a faded gray; one specimen has traces of 10 or 12 dark crossbars; fins all pale, in one case with the dorsal and anal dark-edged.

The type, 1.2 inches long, No. 49372, U. S. N. M., from Ponce, February 1, 1899; 13 cotypes, 8 from the coral and algae on the reefs at mouth of Culebra harbor, February 11, and 5 from Puerto Real.

Named for Dr. A. Stahl, of Bayamon, Puerto Rico, who, under many difficulties put in his way by Spanish authorities, made considerable collections of natural-history objects of Puerto Rico.

16. *Auchenopterus albicaudus* Evermann & Marsh, new species.

Head 3.2; depth 4; eye 4; snout 4.1; maxillary 2.2; mandible 1.6; interorbital 5.3; D. xxx, 1; A. II, 17; pectoral 1.4; ventral 1.5; caudal 1.6; branchiostegals 6; scales 1-34-6.

Body rather short, compressed; dorsal outline not elevated; head moderate, not broad; snout short, pointed; mouth large, oblique, maxillary extending to below middle of eye; lips broad, prominent; a band of conical teeth on each jaw, those on side somewhat enlarged and recurved; a patch of teeth on vomer, none on palatines; gill-membranes broadly united, free from isthmus; eye large, high up; nasal, supra-ocular, and nuchal regions with fringed tuft-like cirri; a considerable notch between fourth and fifth dorsal spines, but not reaching base of membrane; longest anterior spine scarcely as long as those of the posterior portion; scales large, reduced anteriorly; lateral line anteriorly separated from the dorsal fin by only one scale; head naked.

Color: Uniform dark brown on head and body, no dark crossbars; dorsal brown, mottled with lighter, narrowly edged with white; a black spot upon anterior 3 or 4 spines and a large black ocellus upon posterior portion of fin between twenty-second and twenty-fourth spines; anal rather darker, with narrow white edge; caudal peduncle black, the fin abruptly white at base, the entire fin being clear white, entirely without specks; pectoral black at base, then barred with white and dark; ventral black at base, the outer two-thirds barred with black and white.

This species seems to be related to the Pacific Coast species, *Auchenopterus integripinnis*, which it closely resembles, but differs from that species in the larger scales, the deeper body, and the coloration.

One specimen, 1.5 inches long, from Arroyo, February 4, 1899. Type No. 49373, U. S. N. M.

Albus, white; *cauda*, tail.

17. *Auchenopterus rubescens* Evermann & Marsh, new species.

Head 3.4; depth 5; eye 5; snout 3.8; maxillary 2.6; interorbital 5.8; scales 2-32-8; D. xxx, 1; A. II, 18; pectoral 1.5; ventral 2; caudal 1.4.

Body slender and compressed; head moderate, somewhat compressed above; snout pointed; mouth moderate, the jaws equal, the maxillary about reaching front of pupil; lips, especially the upper, prominent; teeth small, conical, and sharp, in both jaws, in a numerous patch on front of upper jaw, fewer on sides; in lower jaw less numerous in front, a long single row of somewhat stronger teeth on sides; eye not large; a small nasal flap, and a 3 or 4 branched tentacle over eye and one at nape; scales rather large and regularly arranged; dorsal fin with a notch behind third spine, and with one unbranched soft ray at its end, the membrane joined to caudal; origin of anal under eleventh dorsal spine; lateral line as usual in *Auchenopterus*.

Color in spirits: Everywhere a nearly uniform faded pink, save breast and lower side of head, which are paler; a small, inconspicuous dark round spot on dorsal fin, at twenty-third and twenty-fourth spines, a little nearer base than margin, and made up of very small black punctulations; indications of a yellow tinge on front of dorsal and base of anal in life; fins otherwise all pale.

The type, No. 49374, U. S. N. M., 1.3 inches in length, the only specimen, from Puerto Real, January 27, 1899.

Rubescens, reddening.

18. *Auchenopterus cingulatus* Evermann & Marsh, new species.

Head 3; depth 4.4; eye 5; snout 4.2; maxillary 2.2; interorbital 6; scales 2-29-7; D. IV-XXIV, the longest spines 3 in head; A. II, 16, the longest ray 2.25 in head; pectoral 1.3; ventral 1.8; caudal 1.6. Body rather long and slender, strongly compressed; head large, little compressed; snout moderately sharp; mouth large, maxillary reaching posterior border of eye, the lips heavy, the jaws subequal or the lower very slightly projecting; teeth conical and sharp, in more than one row in each jaw, most numerous in front; a patch on vomer; a nasal filament, a 3 or 4-branched supraocular tentacle, and a 4-branched nuchal tentacle, the branches of the latter each with a dark dot on their anterior surface. Dorsal originating over edge of preopercle, of spines only, the second slightly longer than first; second, third, and fourth graduated, the fourth comparatively short, thus forming a notch partly separating the first 4 spines from rest of fin; dorsal membrane joined low with caudal; anal free from caudal, about as high as dorsal, its thirteenth and fourteenth rays longest; first anal spine under tenth or eleventh dorsal spine; caudal rounded, shorter than head, of about 13 rays; pectoral large, reaching anal, of 12 rays; ventrals moderate, of 2 rays, the spine not evident. Lateral line running high to eleventh dorsal spine, here abruptly decurved two rows of scales, thence median to base of caudal.

Color in spirits: Body and head pale yellow; body with 4 heavy dark-brown vertical bars, each about 4 rows of scales wide, extending on the vertical fins; membrane of anterior dorsal spines, opercle, occipital, and scapular region, blotched with the same color; a dark bar backward and downward from eye across cheek, rather more than one-half width of eye; top of head between and behind eyes darkened; preorbital, maxillary, lips, and under part of head thickly punctulate with dark; dorsal and anal barred with the extensions of the wide dark body bars, and with the alternating narrower pale interspaces; caudal mottled or irregularly barred with grayish, its base with the plain pale-yellow ground color which is sharply separated from rest of fin by a curved dark line; posterior half of pectorals with dark bars formed of dots on the rays, the first bar plainest; basal half of pectoral pale; ventral with basal portion dark, the rest barred like pectoral.

A pretty and strongly marked blenny; four specimens obtained from the coral reefs at Ponce, and one at Puerto Real. The type, No. 49375, U. S. N. M., from Ponce, is 0.8 inches long, and none of the cotypes exceeds 1 inch.

Cingulatus, banded, from the conspicuous vertical bars.

19. *Auchenopterus fajardo* Evermann & Marsh, new species.

Head 3.25; depth 4.8; eye 4.2; snout 4.8; maxillary 1.7; mandible 1.5; interorbital 5.5; scales 2-37-8; D. XXIX, 1, the longest spine 2.3 in head; A. II, 17; pectoral 1.4; ventral 1.7; caudal 1.4. Body elongate, strongly compressed posteriorly; head moderate, little compressed; mouth large, the long and slender maxillary reaching beyond the posterior border of orbit; jaws subequal; teeth of upper jaw conical and sharp, in a patch in front, becoming one row posteriorly; teeth in lower jaw similar, but fewer and weaker; vomerine teeth in two series. Nasal, ocular, and nuchal tentacles present, all but the nasal about 5-branched. Dorsal origin over edge of preopercle, the first 4 spines graduated, the fourth shortest, thus forming a notch; dorsal ending with an unbranched soft ray, the joints visible under a strong lens; membrane of dorsal joined low to caudal; anal origin under eleventh dorsal spine and the decurved portion of lateral line; pectoral reaching past front of anal; ventral moderate, of 3 rays, the innermost shorter and slenderer.

Color in spirits: Body and head light reddish, becoming a little paler posteriorly; body with traces of 6 or 8 dark vertical bars extending on the fins, their margins ill-defined; breast pale, 2 dark reddish bars downward and backward from eye across upper and lower edge of cheek to opercle; maxillary blotched with dark; upper lip and tips of both jaws dark; lower part of head spotted with dark; a row of about 5 small dark spots on edge of preopercle; iris pink; dorsal and anal fins gray, except for the extensions of the dark bars of the body and a few white spots

on the dorsal; a distinct ocellus on the twenty-second, twenty-third, and twenty-fourth dorsal spines and their membranes; base of caudal gray, like the ground color of dorsal and anal; posterior part of caudal with gray mottlings on the rays only, this portion separated from the basal part by a space without pigment on rays or membrane, making a distinct vertical bar; pectorals and ventrals mottled.

A handsomely-colored blenny, of which the collection contains but one specimen, the type, No. 49376, U. S. N. M., 1.63 inches long, taken at Fajardo, February 17, 1899. Named for Fajardo, the type locality.

CORALLIOZETUS Evermann & Marsh, new genus.

Coralliozetus Evermann & Marsh, new genus of *Blenniidae* (*cardonæ*).

Body slender and strongly compressed, without scales; head large, subcylindrical, bluntly pointed; mouth large; teeth not hooked, about eight enlarged conical ones in front of each jaw, smaller ones behind; vomer with teeth; dorsal fin with a notch between the rays and spines, the membrane connected with caudal; caudal fin rounded; pectoral large, ventrals small and inserted slightly in advance of pectorals. A strongly marked genus, conspicuous in appearance by its heavy head and thin body, probably related to *Ophioblennius*, from which it is technically separated by the absence of hooked canine teeth, the convex caudal, and the entire absence of a lateral line.

κοράλλιον, coral; *ζητέω*, to seek.

20. *Coralliozetus cardonæ* Evermann & Marsh, new species.

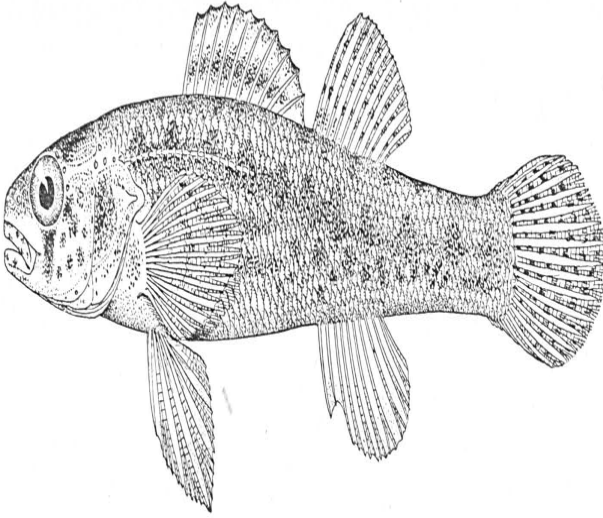
Head 4; depth 5.6; eye 5; snout 4; maxillary 2; D. xvii, 11; A. 21; pectoral 1.3; ventral 1.8; caudal 1.4.

Body scaleless, slender, much compressed; head large and heavy, not compressed nor depressed; snout very short and blunt; mouth large, horizontal, low in position, the maxillary reaching far beyond the eye; eyes small, close together, placed high and well forward; teeth conical, in a patch on the front of each jaw, an outer row of about 8 teeth (4 on a side) in each jaw, much enlarged; a single row of smaller teeth on sides of each jaw; teeth on vomer; a small flap at the nostril and two short filaments above eye, one much the smaller; no appendages at the nape. Dorsal fin long and high, of slender, flexible spines, and longer, soft rays, a notch between the soft and spinous portions; anal longer and lower than soft dorsal; anal and dorsal free from caudal; caudal rounded; pectoral large, wide as body, reaching anal or beyond; ventral small, inserted before pectoral, of 3 rays, the innermost very slender.

Color in spirits: Body dark red, much paler in one specimen; head everywhere bluish-black, this color dusted upon the body, particularly on the anterior portion; a pale-gray bar downward and backward across cheek; fins pale, except ventrals and front of dorsal, which have color of head; a row of small rosy spots along bases of anal rays, seemingly in the flesh; sometimes a similar fainter row along base of dorsal.

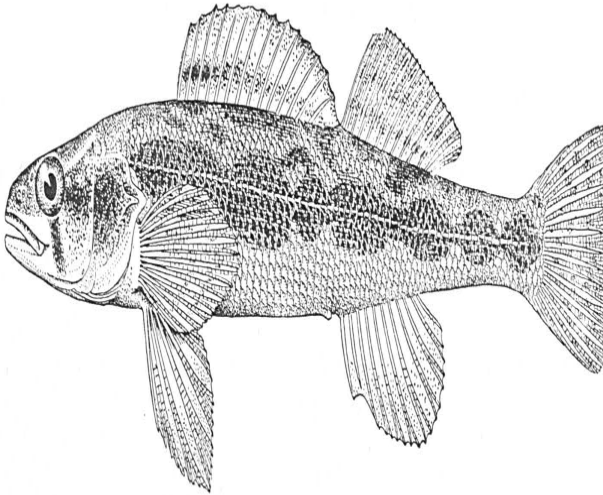
Three specimens, from 0.87 to 1 inch in length, taken on the coral reefs at Ponce on three successive days; the type, No. 49377, U. S. N. M., 1 inch long, collected February 1, 1899.

Named for Cardona, a little islet off Playa de Ponce, on the reef of which the type was collected.



ETHEOSTOMA AUBEENAUBEI Evermann. Type

About twice natural size.



HADROPTERUS MAXINKUCKIENSIS Evermann. Type

Slightly greater than natural size.