
THE FISH FAUNA OF THE TORTUGAS ARCHIPELAGO.

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The Tortugas Archipelago consists of a group of seven small, sandy islands and a large reef plateau so situated as partially to form a lagoon of about 50 square miles. Two of the islands are inhabited. On Garden Key is Fort Jefferson, now converted into a United States naval station, and on Loggerhead Key is a light-house. Pure deep ocean water surrounds the islands, and there are none of the extensive mud flats and mangrove-covered shores so characteristic of the keys along the main land of Florida.

The northern edge of the Gulf Stream lies from 25 to 30 miles south of the Tortugas, but a strong southerly breeze is sufficient to drive the surface waters, unaccompanied by the current, upon the islands, and under these conditions quantities of gulf weed are cast upon the shores. Vast numbers of floating animals also are borne along upon the surface of the Gulf Stream, drawn into it by winds and currents from the adjacent tropical regions of the Atlantic, and thus pelagic fish from all over the Gulf of Mexico and West Indies may be drifted past the Tortugas. The temperature of the surface waters in the immediate vicinity is remarkably high, being about 74 to 77° F. in winter and 80 to 86° F. in summer, the average for the whole year being about 78° F.

About ten square miles of shallow reef flats surround the islands, and these support a fauna which, according to Dr. A. G. Mayer, for variety and abundance, appears to be unsurpassed by that of any locality on the Atlantic coast of the United States. At present 218 species of fishes are known to occur at the Tortugas. All of these have been taken in reef collecting or at moderate depths with the line. When a thorough investigation can be made in the region, a very great number of additional forms will doubtless be found. Heretofore Tortugas was the type locality for 6 species; the last year's collecting has increased this number to 14, the following new species having been discovered by Dr. Thompson: *Holocentrus tortugæ*, *Eviota personata*, *Rhinogobius tortugæ*, *Gnatholepis thompsoni*, *Elacatinus oceanops*, *Erieteis kalisheræ*, *Eæcestides egregius*, *Gnathypops aurifrons*.

This paper is based on a collection made by the junior author while on duty as surgeon at the United States Naval Station on Garden Key. Duplicate series have been sent to the United States National Museum, to the United States Bureau of Fisheries, and to the Museum of Stanford University. Several species of interest have been treated in a previous paper, sent to press before the receipt of the full collection. Field notes by Dr. Thompson in the present article are signed "T."

Family GINGLYMOSTOMIDÆ.

1. *Ginglymostoma cirratum* (Gmelin).

This shark may be observed daily almost anywhere about the islands, though it is reported by the local fishermen to come in greatest numbers in the fall. Individuals are often seen burrowing under a coral mass in search of fish and crustaceans, so busily engaged that they can be approached and struck with an oar without being disturbed. A small one, 21.25 inches long, was caught by the tail when thus occupied; while being carried to the laboratory in a bucket it devoured four specimens of *Acteis moorei*. (T.)

Family CARCHARIIDÆ.

2. *Carcharias lamia* (Rafinesque).

Reported from the Tortugas by Dr. J. A. Henshall.

3. *Scoliodon terræ-novæ* (Richardson).

A foetal specimen in the collection of Dr. Thompson.

Family SPHYRNIDÆ.

4. *Sphyrna tiburo* (Linnaeus).

This species can be taken throughout the year with the hook and line. It very frequently follows fishing boats, attracted by the bait, and will snap from the line fish that have been hooked.

5. *Sphyrna zygaena* (Linnaeus).

Occasionally caught by the local fishermen; none taken by Dr. Thompson.

Family MYLIOBATIDÆ.

6. *Stoasodon narinari* (Euphrasen).

Observed by Dr. Thompson. These fishes often travel in pairs, swimming a few feet below the surface in a long, straight course.

Family MOBULIDÆ.

7. *Manta birostris* Walbaum.

Reported by fishermen.

Family ELOPIDÆ.

8. *Tarpon atlanticus* (Cuvier & Valenciennes).

Every season a few tarpons are taken in the main channel southeast of Garden Key. None very large. (T.)

9. *Elops saurus* Linnaeus.

One specimen about 1 inch long taken in a seine along the southwest shore of Garden Key in eel grass and in 3 feet of water. Adult fish have not been taken by the fishermen in the immediate vicinity. (T.)

Family ALBULIDÆ.

10. *Albula vulpes* (Linnaeus).

Fish of this species are caught by almost every fishing party. None over 18 inches long was seen. The fish apparently do not come into shoal water, 3 fathoms being the shallowest in which they were taken. (T.)

Family DUSSUMIERIIDÆ.

11. *Jenkinsia stolifera* (Jordan & Gilbert).

A number were taken in January on the shoal to the west of Garden Key, in about a fathom of water, their length ranging from 1.73 to 1.87 inches. Two specimens in the collection. (T.)

Family CLUPEIDÆ.

12. *Harengula sardina* ^a (Poey).

Very abundant at times. (T.)

13. *Harengula macrophthalma* (Ranzani).

On October 1, 1902, an enormous school of this species was seen along the northern moat wall of Garden Key. The only specimen saved is now deposited in the reserve series of the Bureau of Fisheries. (T.)

14. *Harengula humeralis* (Cuvier & Valenciennes).

This is the commonest species of sardine at the Tortugas, and is caught by the local fishermen for live bait. (T.)

Family ENGRAULIDÆ.

15. *Anchovia perfasciata* (Poey).

A few specimens taken in January, 1902, in 6 fathoms of water in the west channel, and during the same week a few under coral heads in a fathom of water near the west shore to the west of Garden Key. (T.)

16. *Anchovia brownii* (Gmelin).

A few specimens found in the moat at Garden Key in September, 1902. (T.)

Family SYNODONTIDÆ.

17. *Synodus foetens* (Linnæus).

These fish, when resting on the bottom, lie with the head and shoulder girdle well elevated, then suddenly by a curious rocking and groveling motion settle down until only the top of the head is visible. When frightened they dart off a few yards, then settle down again by a repetition of this peculiar motion. Two specimens were seen, and one, 10 inches long, was taken in a cast net. It was deposited in the Brooklyn Institute of Arts and Sciences. (T.)

18. *Trachinocephalus myops* (Forster).

Reported by Dr. Bean from Garden Key in 1883.

Family MYRIDÆ.

19. *Ahlia egmontis* (Jordan).

One specimen taken among the eel grass on the flat southwest of Garden Key in 3 feet of water. It was swimming a few inches from the bottom, slowly worming its way among the blades. The life color is a uniform yellow orange, except on the abdomen, which is silver. This specimen was deposited in the reserve series of the Bureau of Fisheries. Two other specimens are known, the type, taken at Egmont Key, and one in the collection of H. Maxwell Lefroy, from Bridgetown, Barbados, West Indies, described by Barton A. Bean (Proc. U. S. N. M., vol. 26, 1903). (T.)

Family OPHICHTHYIDÆ.

20. *Myrichthys acuminatus* (Gronow).

One specimen taken on a solid coral bottom on the east shore of Garden Key in about 18 inches of water. Body of brownish yellow, head and tail being a little lighter; spots on body cream colored, many with yellow centers; spots on head yellow, the more forward ones somewhat deeper; abdomen white; ventral surface of tail cream colored; tip of tail brick-red; nasal tube white; iris canary yellow, orange spot before and behind pupil; pectoral with an orange spot on posterior surface. (T.)

^a The generic name *Sardinella* Cuvier & Valenciennes seems to have been intended for a true sardine, the group later called *Sardinia* by Poey.

Family MURÆNIDÆ.

21. *Gymnothorax moringa* (Cuvier).

This species lives under coral heads and in rock piles. It is usually seen with the anterior third of the body protruding from the crevice. When fearing attack it will open its mouth in the most threatening manner, draw back a little, and assume a very hostile attitude. If thrust through the body with a spear, it almost invariably escapes by tearing away. The large fish are capable of inflicting a very painful wound, and sometimes attack human beings. About a dozen specimens were seen during the season, none over 4 feet long. (T.)

22. *Gymnothorax funebris* (Ranzani).

This fish is not quite so common as the preceding species. One was taken in the vicinity of Bush Key among the small shallow tide pools. (T.)

Family BELONIDÆ.

23. *Tylosurus raphidoma* (Ranzani).

On a calm day a few of these fish may be seen basking on the surface, usually quite motionless. They prey upon sardines, which they capture by darting into a school and frightening them. After catching one they manipulate it very ingeniously with their jaws until it is pointed "head on" toward the throat before any endeavor is made to swallow it. They are themselves ruthlessly hunted by the barracuda, which sometimes bites its victim in two and swallows one half, leaving the other portion, which is actively wriggling about, to be devoured by another barracuda. (T.)

Family HEMIRAMPHIDÆ.

24. *Hemiramphus brasiliensis* (Linnæus).

Only two specimens were seen in this region. They were about 14 inches long and were caught west of Bird Key with hook and line. In the vicinity of the light-house on Rebecca Shoals this species is to be seen by the hundreds, and can be easily caught with a little piece of dough for bait. Over 50 per cent of the fish have a parasitic crustacean attached to the tongue, which the local fishermen claim causes death in time by completely filling the mouth cavity. (T.)

25. *Hyporhamphus unifasciatus* (Ranzani).

Reported by Dr. Henshall in 1889.

Family EXOCÆTIDÆ.

26. *Parexocætus orbignianus* (Cuvier & Valenciennes).

On February 7, 1902, a very large mass of sargassum weed drifted into the neighborhood of Tortugas from the edges of the Gulf Stream, the result of a strong southerly gale which had been blowing for the previous two days. This weed brought with it nearly a dozen species of fishes not hitherto taken, among them 9 specimens of *Parexocætus orbignianus* ranging from 0.47 to 1.33 inches. When of this size the fish is unable to fly, but is capable of leaping a few inches out of the water. It almost invariably jumps out of a net spread beneath it. It may be readily caught with the hand from above, however. (T.)

It is doubtful whether this is the *Exocætus mesogaster* of Bloch; we may therefore take the name next in date.

27. *Cypselurus furcatus* (Le Sueur).

A number of very young individuals, each with two black barbels at the chin.

Family AULOSTOMIDÆ.

28. *Aulostomus chinensis* (Linnæus).

Recorded by Porter and Moore from Fort Jefferson; not seen by Dr. Thompson.

Family FISTULARIIDÆ.

29. *Fistularia serrata* Cuvier.

One specimen 6.13 inches long taken in a seine inside of Long Key. Another that had lost its caudal filament was seen basking among sargassum weed; it escaped capture. (T.)

Family SYNGNATHIDÆ.

30. *Syngnathus elucens* Poey.

Many specimens from Garden Key.

31. *Syngnathus mackayi* Swain & Meek.

Many specimens from Garden Key.

32. *Syngnathus brachycephalus* Poey.

A few specimens, apparently of this species, in eel grass. Brown, yellow-brown below; body and tail with conspicuous gray bands, between those on dorsum and on side 3 to 4 diamond-shaped patches, gray outlined; head lighter than body, cheeks almost yellow-ochre with conspicuous gray lines, iris yellow; forehead and top of head quite gray; side of snout brown; yellow-brown on abdomen rings, sutures gray, caudal pale edged; entire body, head, and tail much mottled with fine gray specks and blotches, these denser on back. New to the United States fauna. (T.)

33. *Syngnathus scovelli* (Evermann & Kendall).

Collected in 1889 by Dr. Henshall.

34. *Corythoichthys albirostris* (Heckel).

Two specimens.

35. *Corythoichthys cayorum* Evermann & Kendall.

Recorded by Dr. Thompson.

36. *Hippocampus hudsonius* De Kay.

The only specimen was a dried one washed ashore on Middle Key. Rings 11+34. (T.)

37. *Hippocampus stylifer* Jordan & Gilbert.

One specimen 1.33 inches long taken with a seine in the eel grass on the shoal southwest of the West Channel. Several others sent in the later collection. (T.)

38. *Hippocampus punctulatus* Guichenot.

A single specimen 1.19 inches long taken in a seine inside of the west end of Bush Key. (T.)

Family ATHERINIDÆ.

39. *Atherina laticeps* (Poey).

This species can be taken any day in the year in moderate numbers in the shoal water about these islands. (T.) It is probably identical with *Atherina stipes*, which species was reported by Garman in 1896.

Family MUGILIDÆ.

40. *Mugil curema* Cuvier & Valenciennes.

A few individuals taken in the cast net along the north beach of Bird Key. (T.)

41. *Mugil cephalus* (Linnaeus).

Fairly common in the winter months, at times congregating in uncountable numbers on the shoal north of Garden Key, where they spend hours swimming around in a huge vortex. This movement is sometimes interrupted by sharks or barracudas, when portions of the school will become detached and form separate gyrating masses. (T.)

42. *Querimana gyrans* (Jordan & Gilbert).

Several small schools were seen in February, swimming at the surface, very close to the stone jetties on the southern side of Garden Key. (T.) It is not certain, however, that these little fish are not the young of *Mugil*.

Family SPHYRÆNIDÆ.

43. *Sphyræna barracuda* (Walbaum).

Specimens have been taken ranging from 1.5 inches long to more than 5 feet. The large fish can be seen almost any calm day in the shoal water inside of Bush Key. They rarely, if ever, take the hook, but can be captured easily by approaching them quietly in a boat and using a harpoon. The meat is not good, being coarse and very tough. (T.)

Family HOLOCENTRIDÆ.

44. *Holocentrus ascensionis* (Osbeck).

This species has been reported from the Tortugas by other collectors, and is well known to local fishermen, but none was seen by Dr. Thompson.

45. *Holocentrus siccifer* (Cope).

Heretofore known only by one specimen taken in the Bahamas. The species lives in the most secluded crevices and nooks at the base of coral heads. The only way that it can be captured, apparently, is by the use of dynamite. Several specimens taken. (T.)

This species may be the same as *H. vexillarius* Poey, but the latter is said to have a slenderer form and somewhat different coloration. In *H. siccifer* the membrane of the dorsal fin is dusky, with paler spots above and below, the membranes of the first three spines usually nearly black, axil with a black spot.

46. *Holocentrus tortugæ* Jordan & Thompson, new species. Figure 1.

Head 3.30 in length to base of caudal; depth 3.5 (4.10 to tip of caudal); eye 2.75 in head; maxillary 2.20 in head; D. XI, 13; A. IV, 8; scales 4-42-7. Fourth dorsal spine 2.05 in head; soft dorsal rays 2 in head; third anal spine 2.10; caudal lobes 1.50 in head; pectoral 1.55; ventrals 1.50.

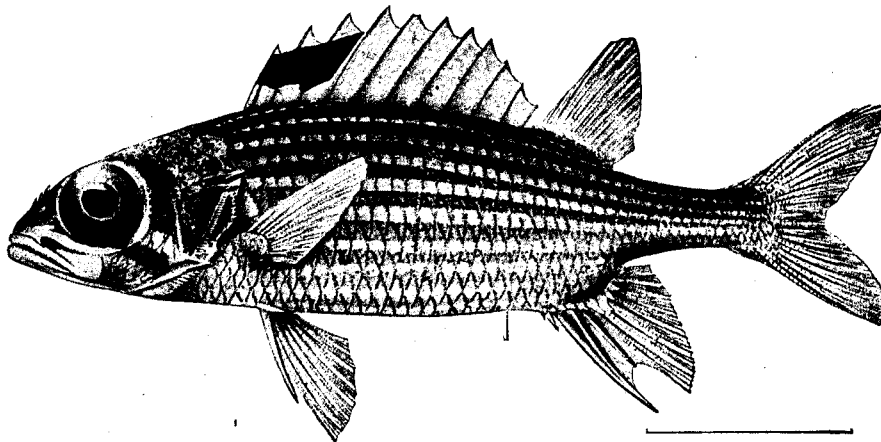


FIG. 1.—*Holocentrus tortugæ* Jordan & Thompson, new species. Type.

Body elliptical-elongate, more slender than in any other West Indian species, the dorsal outline very even; head rather pointed; mouth small, the jaws subequal, the maxillary extending a little past middle of eye; eye very large; preorbital serrated, and with a small spine anteriorly; preopercular spine short, 3 in eye; opercular spines moderate, the upper small and close appressed to the second, which is rather long, the third shorter and slenderer; dorsal spines rather high; soft dorsal elevated; caudal lobes equal; third anal spine much longer than fourth, not reaching near the end of the long and slender caudal peduncle; pectorals moderate; scales rather small, moderately rough.

Color in spirits, grayish, silvery below, the snout, head, and upper parts much dotted with black; a silvery streak along each row of scales, this narrower and more distinct above, 10 such streaks evident; a dark streak downward and backward from eye, with a pale streak above and below it; fins

all pale except a jet black, elongate area occupying membranes of first, second, and third spines, ceasing abruptly at fourth spine.

One specimen, 4.2 inches long (No. 8412, Museum Stanford University), was taken by Dr. Thompson on the reef at Garden Key. The only species similarly colored is *H. riparius* Poey, said to have a depth 3.5 times in the total length.

Family SCOMBRIDÆ.

47. *Scomberomorus maculatus* (Mitchill).
Taken at Garden Key.
48. *Scomberomorus cavalla* (Cuvier).
Often taken by trolling in the deep water southeast of Loggerhead Key.

Family CARANGIDÆ.

49. *Oligoplites saurus* (Bloch & Schneider).
Taken at Garden Key by Whitehurst and Baker.
50. *Seriola lalandi* Cuvier & Valenciennes.
Reported by fishermen.
51. *Seriola dumerili* Cuvier & Valenciennes.
Reported by fishermen; very young examples in Dr. Thompson's collection.
52. *Seriola fasciata* (Bloch).
Young examples in collection.
53. *Elagatis bipinnulatus* (Quoy & Gaimard).
Reported by fishermen.
54. *Decapterus punctatus* (Agassiz).
Taken with dynamite.
55. *Caranx hippos* (Linnaeus).
Recorded by Dr. Thompson.
56. *Caranx chrysos* (Mitchill).
Bird Key.
57. *Caranx latus* Agassiz.
Reported by Professor Nutting from the Tortugas.
58. *Caranx bartholomæi* Cuvier & Valenciennes.
One specimen seen among coral heads, southwest shoal. (T.)
59. *Alectis ciliaris* (Bloch).
Recorded by Porter & Moore from Fort Jefferson.
60. *Selene vomer* (Linnaeus).
Young taken on north shore of the Tortugas.
61. *Chloroscombrus chrysurus* (Linnaeus).
Taken by Whitehurst in 1883.
62. *Trachinotus palometa* Regan. (*Chatodon glaucus* Bloch, not *Scomber glaucus* Linnaeus, also a *Trachinotus*.)
West shore of Tortugas; a specimen 15.13 inches long.
63. *Trachinotus falcatus* (Linnaeus).
Specimen sent by Dr. Thompson.

64. *Trachinotus goodei* Jordan & Evermann.

South beach of Tortugas.

65. *Trachinotus carolinus* (Linnaeus).

Rather common. Individuals 0.75 of an inch long or less are of a deep coppery brown, the dorsal and anal deep orange red; the color changes suddenly to light gray when the fish is frightened. When the coppery color comes back it appears in blotches, on the upper parts first.

Family STROMATEIDÆ.

66. *Gobiomorus gronovii* (Gmelin).

These fish appear in midwinter and are to be found until early spring. In 1903 the first one seen was on January 18 in deep water west of East Key. From one to half a dozen specimens, occasionally more, may be found taking refuge under the tentacles of a Portuguese man-of-war. When the host is stranded on the beach they do not abandon it until the last comber lands it high and dry, then they hasten off in search of shelter, orienting themselves under twigs, grass, etc., for an instant, but soon finding their error and searching for another jelly-fish. (T.)

67. *Psenes cyanophrys* Cuvier & Valenciennes.

Length 2.63 inches. Color greenish bronze, dark above; above and below lateral line several lines formed of more or less coalesced dots parallel to dorsal curve; below lateral line many similarly formed horizontal lines; snout yellowish green; dorsal, anal, and ventral dark; pectoral yellowish tinged; caudal of body color. Body at times with many large irregular dark blotches. (T.)

Another specimen of *Psenes* 1 inch long shows the following characters: Color: Body yellowish gray-green, with large irregular blotches on back, arranged as follows: First, anterior to spinous dorsal; second, below last two-thirds of spinous dorsal; third, small and round, below origin of soft dorsal; fourth, largest, below second quarter of soft dorsal; fifth, a round spot below middle of soft dorsal; sixth, like fourth, below posterior part of soft dorsal; seventh, a round spot on side of body at origin of caudal peduncle. At base of caudal peduncle a wide band; extreme tip pale, body colored, spots here light olive green; below eye, cheek, and lower part of body many finely speckled minute brown dots; spinous dorsal dark, like blotches; soft dorsal pale like body color, with blotches at base which are extensions of adjacent body blotches; caudal very pale, with the merest trace of a blotch on each fork; pectorals colorless; ventral webs the color of blotches, rays pale; anal like soft dorsal; iris body-colored, a blotch above and below pupil; snout yellower than head. On body posterior to and below pectoral a large blotch; a small round one posterior to this and below the fifth on back; two spots above anal, posterior one contiguous to sixth dorsal blotch. (T.)

Family CORYPHÆNIDÆ.

68. *Coryphæna hippurus* Linnaeus.

The very young have the dorsal fin inserted behind the head. The color is as follows: Top of head carmine gray; body above black, with pink-gray stripes; body below sooty black; dorsal pink-gray, with bands corresponding to body bands; pectoral a faint yellowish, hyaline; ventral dark yellow margined; anal dark; outer angles of lobes of caudal hyaline, base and center with pigment, upper third pinkish, lower part like body; gills and chest with a golden green sheen. This example vomited a shrimp.

On the afternoon of February 7, 1903, a dozen specimens were taken in the sargassum weed, after a south wind which prevailed for two days. The next morning only one specimen was found, and that early; all the weed had remained in place, but the edge of the mass was frequently visited by schools of snappers, jacks, and needle-fish, which probably devoured all stragglers. (T.)

Family PEMPHERIDÆ.

69. *Pempheris mulleri* Poey.

These are probably nocturnal, and hide very carefully. Two specimens were obtained by the use of dynamite on Loggerhead Shoal, northwest of light-house, 100 yards from shore, among coral heads at a depth of one fathom.

Color in life of a specimen 5.13 inches long, almost uniform coppery bronze; a dark area along base of anal; dorsal darker than body; dorsal and ventral without spots, a few little smoky blotches on each web. (T.) Species not previously recorded from the United States.

Family APOGONICHTHYIDÆ.

70. *Amia americana* (Castelnau.)

Color plain red with black dots, in life, with a pinkish silvery sheen, each scale with a gray spot, microscopically composed of fine radiating lines, between these spots black dots with a bright red spot; top of head with a silvery green sheen, snout very dusky; pectoral pinkish; ventral white; anal pinkish, scales at base a trifle pink; caudal with body pink, upper and lower margin black, rays spotted; second dorsal with some rays spotted; first dorsal spines much darker and with spotted webs; spot at base of caudal 0.83 inch in diameter, solid color; an oblong spot on opercle from lower and posterior border of eye to gill-margin, not quite as wide as pupil at beginning, wider below, sides straight. Belly white, lower jaw dark like snout, nape profusely speckled. (T.)

71. *Amia sellicauda* (Evermann & Marsh).

Many specimens, agreeing closely with the original description, except that in the latter the bilobed caudal fin is figured as truncate. Color in life, red; a blackish blotch at base of second dorsal; a blackish saddle on caudal peduncle; blackish mark on opercle, also a golden tinge; rays of all fins a darker red than body; iris black; minute black dots about orbit and snout. In some specimens there is a blackish line at the base of the second dorsal, where the fin joins the body; tip of anal sooty; caudal sooty rimmed. (T.) New to the fauna of the United States.

72. *Mionorus puncticulatus* (Poey.)

One example. Scales in lateral line 26. It is probable that *Apogonichthys alutus* is identical with this species.

Color, very light pink with a strong silvery sheen; an area of minute black dots below eye and another behind it. Dots most numerous above lateral line, and densest forward. Length 1.5 inches. Taken in West Channel, with dynamite, at depth of 35 feet. (T.)

Of the genera related to *Amia* Gronow (= *Apogon* Lacépède), but differing in having both limbs of the preopercle entire, *Apogonichthys-Powleria* (*auritus*) is distinguished by the absence of palatine teeth, *Foa* Jordan and Evermann (*brachygramma*) by its incomplete lateral line, and *Mionorus* (*lunatus*) by having palatine teeth, and the lateral line complete.

Family OXYLABRACIDÆ.

73. *Oxylabrax undecimalis* (Bloch).

Two specimens taken. The genus *Centropomus* of Lacépède was based originally on *Perca lucioperca* of Europe.

Family SERRANIDÆ.

74. *Cephalopholis fulvus* (Linnæus).

Recorded by Garman; not seen by Dr. Thompson.

75. *Cephalopholis cruentatus* (Lacépède).

Recorded by Dr. Henshall, 1889, from the Tortugas.

76. *Epinephelus adscensionis* (Osbeck).

Seen swimming slowly in and out of rock crevices; observed for two weeks, probably the same individual.

Spinous dorsal dusky over greater part, this coextensive with much paler blue area on body; maxillary and lower lip dusky; snout below nostril and cheek below eye deeper blue than rest of body; pectoral hyaline, rays dusky; ventral, anal, and caudal dusky; abdomen grayish blue, shading and evanescent; nape gray-blue at times; tip of caudal peduncle darkest. (T.)

77. *Epinephelus maculosus* (Cuvier & Valenciennes).

Loggerhead Shoals, west of light-house. (T.)

78. *Epinephelus striatus* Bloch.

Common.

79. *Epinephelus morio* (Cuvier & Valenciennes).

Hospital Key.

80. *Promicrops guttata* (Linnaeus).

One example, 7 feet 6 inches long.

81. *Mycteroperca venenosa apua* (Bloch).

Reported by Dr. Henshall from Garden Key.

82. *Hypoplectrus unicolor* (Walbaum).

Specimen 3.69 inches long; color, black-brown on top of head, back and spinous dorsal, shading below mid-line to a dark chrome yellow. On area swept by pectoral the scales have each a conspicuous light-gray spot; caudal peduncle with a dark-brown saddle; soft dorsal yellow, with submarginal dusky band; each web with 4 to 6 blue bands; caudal lighter below than body, blue dots on webs; a yellow-margined band of light gray-blue; ventral yellow, with dusky-blue margins; pectoral with plain yellow rays, web quite clear; upper limb of gill-slit with a blue spot; iris brown, with yellow margin, without the slightest trace of blue cross lines.

Specimen 4.33 inches long; much browner, body stripes not conspicuous.

Specimen 3.87 inches long; light olive brown; dorsal, caudal, pectoral, and anal transparent and of yellowish tinge; a pale blue blotch on body between bases of first, second, and third spines of dorsal; two pale streaks across body from below soft dorsal; pale blotch across anterior half of caudal peduncle; pale blotch anterior to pectoral; ventral gray-green above, green below; anterior margin bright blue; on body about 18 azure blue or brown vertical lines, on borders of light areas these lines very pale blue; upper lip with a median and a lateral dot, these coalescing; snout with 9 blue dots hanging over eye in a blue mark ζ ; margin of preopercle blue; posterior to this on opercle another but broader and paler line, which begins on nape; 3 interrupted lines anterior to vertical of first spine of dorsal; caudal very yellow with reddish tinge at tips, dorsal yellow, dusky anteriorly, 6 or 7 faint blue squares on each web, these placed so that when fin is erect they appear as continuations of the lines on body; ventral plain dusky yellow, with dusky border; pectoral pinkish yellow. The darkest part of the fish is a brown spot at upper posterior part of caudal peduncle; each scale in brown area with faint blue central spot; each scale in blue area, with a very pale spot; all profusely speckled with black. (T.)

83. *Hypoplectrus unicolor nigricans* (Poey).

Color in life, warm brown, with a light band across body behind the pectoral, starting on dorsal between first and second spines, widest below middle line; two starting below soft dorsal, joined by a bar where lateral line crosses; one across beginning of caudal peduncle, dumbbell-shaped; dorsal brown; soft dorsal lighter; caudal very light; ventrals black; iris yellow; two black spots on end of caudal peduncle.

Found under a coral head, inside Bush Key, at a depth of 3 feet. (T.)

84. *Hypoplectrus gemma* Goode & Bean.

Described from Garden Key, probably the same as *H. unicolor*.

85. *Diplectrum formosum* (Linnaeus).

Color, gray; lighter below; a blue line from head to base of first dorsal spine, along base of dorsal, one from head level with top of eye, horizontally back to middle of soft dorsal; one from back of eye through upper extremity of gill-slit to beginning of caudal peduncle, where it meets its fellow and is continued on back of peduncle; one from above angle of gill to tail; below these a dark line, obscure, ending in a marked blotch at base of tail; below this three more, one-eighth inch apart, between them yellow stripes, wider than the blue; head with three transverse blue lines; one back of eye, three joining the body line passing through the upper end of gill-slit; two between eyes, one level with anterior margin of pupil; tip of lip and snout dusky; four blue lines on cheek, one horizontal and ending with a bifurcation; second extending from angle of opercle forward to a level past rim of eye;

third, wavy; fourth, straight; pectoral, colorless; ventral and anal yellow tinged; dorsal yellow, with two blue bands; caudal blue, upper tip yellow, lower tip dusky; round and oval spots on web. (T.)

86. *Rypticus saponaceus* (Bloch & Schneider).

Obtained by Dr. A. G. Mayer.

Family PRIACANTHIDÆ.

87. *Priacanthus cruentatus* (Lacépède).

Not rare. New to the fauna of the United States.

Family LUTIANIDÆ.

88. *Lutianus griseus* (Linnaeus).

Common.

89. *Lutianus jocu* (Bloch & Schneider).

Found south of the Tortugas.

90. *Lutianus apodus* (Bloch & Schneider).

Common.

91. *Lutianus aya* (Bloch).

Reported by fishermen; not seen.

92. *Lutianus analis* (Cuvier & Valenciennes).

Caught in Bird Key channel in 8 fathoms.

93. *Lutianus synagris* (Linnaeus).

Isolated individuals, largely in eel grass. (T.)

94. *Ocyurus chrysurus* (Bloch).

Very common. A specimen taken was 22.5 inches long, weighing 3.5 pounds. (T.)

95. *Etelides aquilionaris* (Goode & Bean), new genus. Figure 2.

The species, named but not described as *Anllias aquilionaris* Goode & Bean, is allied to *Etelis*, as Jordan and Evermann have shown. It belongs to a distinct genus, *Etelides*, and differs from *Etelis* in

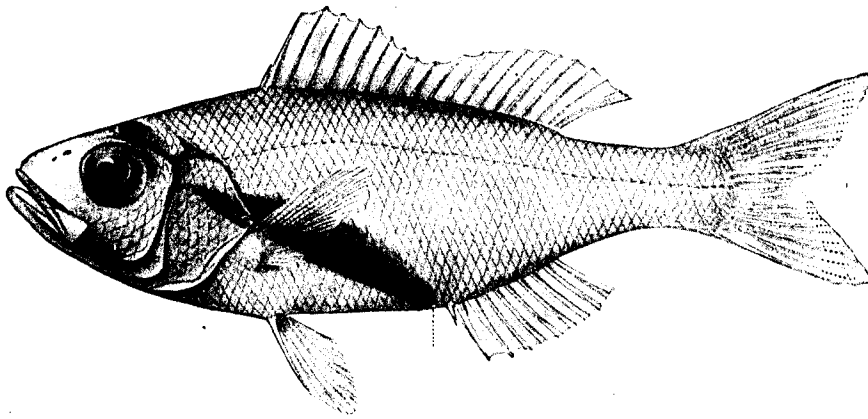


FIG. 2.—*Etelides aquilionaris* (Goode & Bean).

the scaleless jaws, the compressed body, the presence of an opercular spine, and the form of the dorsal fin. Scales ctenoid; gillrakers long and slender, 15 on lower limb of arch; preopercle entire; teeth very small.

The structure of the upper part of the head seems essentially as in *Elelis*, the supra-occipital not encroaching on the convex vertex. Head 2.9 in length; depth 3.10 (3.70 with caudal); D. x, 10; A. III, 7; scales 7-54-13; eye 3.1 in head; maxillary 2.50; third dorsal spine 2; longest soft ray 3; caudal lobes 1.80; second anal spine 3.30; pectoral 1.70; ventral 1.85.

Body oblong, rather strongly compressed; head moderate; mouth oblique; jaws equal, the maxillary reaching front of pupil, its tip scarcely wider than the preorbital; posterior nostrils twice as long as anterior; preopercle with both limbs entire; 5 rows of large scales on cheek; snout and both jaws scaleless; temporal region scaled; opercle and interopercle well scaled; opercle ending in a sharp spine about half diameter of pupil; preorbital entire; scales on body ctenoid, adherent, evenly covering the surface; dorsal deeply notched, the first spine short, the second nearly as long as third; the rest progressively shorter to the ninth and tenth; first rays of soft dorsal progressively lengthened; lateral line slightly curved upward; caudal lobes equal; second anal spine slender, slightly shorter than third, which is about as long as the soft rays; ventral slightly behind axil of pectoral.

Color silvery, doubtless bright red in life, a broad dark shade from interorbital area across temples, opercular spine and axil to vent, well defined on the lower edge, but diffuse above. On the sides the color seems to be below the scales in the peritoneum, but the same marking is continued across the head. Sides below this mark bright silvery.

One specimen 1.87 inches long was obtained by Dr. Thompson in the Gulf Stream toward the Carolina coast.

Family HÆMULIDÆ.

96. *Hæmulon album* Cuvier & Valenciennes.

Said to occur near Bird Key; not seen.

97. *Hæmulon macrostomum* Günther.

Described from Garden Key by Dr. Bean, 1883 (as *Diabasis fremebundus*).

98. *Hæmulon parra* (Desmarest).

Frequently taken.

99. *Hæmulon melanurum* (Linnæus).

Known only from around a group of coral heads, to the southwest of Bush Key; not known to local fishermen. New to United States fauna. (T.)

100. *Hæmulon sciurus* (Shaw).

Bush Key, in eel grass. (T.)

101. *Hæmulon plumieri* (Lacépède).

Everywhere.

102. *Hæmulon flavolineatum* Cuvier & Valenciennes.

Occasional.

103. *Brachygenys chrysargyreus* (Günther).

Frequent.

104. *Bathystoma aurolineatum* (Cuvier & Valenciennes).

Reported by Jordan in 1884.

105. *Bathystoma rimator* (Jordan & Swain).

Extremely abundant. (T.)

106. *Bathystoma striatum* (Linnæus).

Color of an example 2.5 inches long, blue gray above, silvery below; strong brown-black band from snout to peduncle; peduncle spot oblong, wide as pupil, black, long axis horizontal; lateral line dark, continued on head as a brown line. Narrower lines, not so dark, one above each eye and meeting on the forehead, run to end of soft dorsal and continue on top of peduncle; a median line begins on head between eyes and runs to and along base of dorsal. In older examples dorsal and caudal are dusky; in younger ones fins are all plain; front of lower lip dusky. (T.)

107. *Anisotremus surinamensis* (Bloch).

Recorded by Garman from the Tortugas.

108. *Anisotremus virginicus* (Linnaeus).

Around coral heads on reefs. (T.)

Family SPARIDÆ.

109. *Calamus calamus* (Cuvier & Valenciennes).

Occasional.

110. *Calamus bajonado* (Bloch & Schneider).

Reported about the Tortugas.

111. *Calamus arctifrons* Goode & Bean.

Many young seined in the eel grass.

112. *Lagodon rhomboides* (Linnaeus).

Common.

113. *Archosargus probatocephalus* (Walbaum).

Reported to occur.

114. *Diplodus holbrooki* (Bean).

Obtained by Dr. Mayer.

Family GERRIDÆ.

115. *Eucinostomus pseudogula* (Poey).

Several seen. New to the fauna of United States.

116. *Eucinostomus harengulus* Goode & Bean.

Several taken.

117. *Eucinostomus gula* (Cuvier & Valenciennes).

Taken by Dr. Henshall at Garden Key.

118. *Xystæma cinereum* (Walbaum).

In sandy places, a foot or so above the bottom, swimming rapidly, then remaining motionless. Called "narrow shad" by the fishermen. (T.)

Family KYPHOSIDÆ.

119. *Kyphosus incisor* (Cuvier & Valenciennes).

Dorsal XI-14; A. III-13. Lead gray; large, regular silvery-gray blotches; those under chin with a greenish-yellow tinge at edge; those on abdomen and lower sides also margined, but with reddish brown; soft dorsal and caudal straw tinged. When the fish is in the sargassum these markings are pale brown and silvery. (T.) New to the United States fauna.

120. *Kyphosus sectatrix* (Linnaeus).

Frequent.

Family MULLIDÆ.

121. *Pseudupeneus martinicus* (Cuvier & Valenciennes).

In coral heads.

122. *Pseudupeneus maculatus* (Cuvier & Valenciennes).

Occasional. Life colors, upper part of head and back gray-green, uniform when in motion, when at rest mottled with red brown; a dark red-brown line from tip of snout to end of caudal peduncle, in region of eye a little wider than pupil, in middle of body wider, at tip of peduncle narrower than pupil; where this line crosses the iris the latter is red in front and red and brown behind; below this

line whitish with a light-green tinge; at times there occurs in this region a broken band forming a light blotch anterior to line of gill slit, one below first dorsal spine, two between dorsals; first dorsal colorless with occasional narrow spots; second dorsal colorless with two rows of fine, white-gray dots, outer one extending from middle of first spine back and downward to base of last spine; caudal hyaline; anal colorless; pectoral reddish tinged; ventrals whitish-gray tinged; barbels bright yellow, folded in jaw when the fish is at rest; mottlings on head, a dot forward and mesial from each eye, a pair of dots posterior to these; two in median line forward of first dorsal, one at base of fin, one between it and second dorsal; second dorsal mottled at base, two spots between second dorsal and caudal.

Found swimming close to sandy bottom in eel grass on flat west of the Tortugas, at depth of 3 feet. (T.)

Family SCIÆNIDÆ.

123. *Odontoscion dentex* (Cuvier & Valenciennes).

Quite common.

Life colors of an example 2.73 inches long: Back dirty gray with a blue and coppery-yellow sheen; dorsal and caudal yellowish gray with fine black punctations; caudal with one-eighth inch border, quite blackish; pectoral colorless, very black at base; ventral and anal with white-gray punctations; head coppery hue, wart over eye; snout bluish, opercles speckled with gray dots; region below pectoral white, very few black spots; body below lateral line with about 9 nearly horizontal rows of gray spots, which upon close examination seem to be composed of a yellowish-gray spot on each scale with a few black-gray dots about posterior margin. Specimen found in coral head at a depth of 1 fathom, west of Tortugas. (T.)

New to the fauna of the United States.

124. *Menticirrhus americanus* (Linnæus).

Taken by Dr. Henshall at Garden Key in 1889

125. *Menticirrhus littoralis* (Holbrook).

One small specimen.

126. *Eques acuminatus* Cuvier & Valenciennes.

Occasional.

127. *Eques pulcher* Steindachner.

About coral heads and sea urchins; seemingly panic stricken when more than a foot from shelter. (T.) New to the United States fauna.

128. *Eques lanceolatus* Cuvier & Valenciennes.

One specimen, taken in 6 fathoms.

Family POMACENTRIDÆ.

129. *Chromis insolatus* (Cuvier & Valenciennes).

Recorded by Porter & Moore in 1878, from Port Jefferson.

130. *Pomacentrus fuscus* Cuvier & Valenciennes.

One of the commonest species in the group.

Color of an example 1.73 inches long: Body from above pectoral to beginning of peduncle dusky orange, top of head darker; body below, orange; posterior half of soft dorsal, soft anal and caudal and ventral brighter orange; on body distinct brown vertical stripes, the darker edges of scales; spot on back and dorsal fin oblong, as wide as eye, long axis parallel to spines, not ocellated; peduncle spot as a saddle, wide as pupil; axillary spot brown black.

Color of a specimen 2.25 inches long: Body dusky brown, lighter below; caudal peduncle, caudal, posterior part of soft dorsal and anal, and ventral yellow orange; ventral with a faint sooty lower margin; vertical bars most pronounced over middle half of body; dorsal spot shaped as above, but with sapphire blue border; peduncle spot saddle-like, size of pupil; axillary spot brown black.

Specimen 3 inches long: Sooty brown above, lighter below, where lines are visible also on caudal peduncle; caudal yellow brown; posterior part of soft dorsal and anal a lighter brown than rest of fin; ventral spines dusky, nearly yellow brown; dorsal spot barely visible as a black blotch; peduncle spot plain, a trifle wider than pupil; axillary spot black, extending on base of fin as sooty.

All these specimens taken with dynamite at the same explosion, among coral heads at depth of 6 feet.

Specimen 2.45 inches long: Orange buff, same shade over almost entire body; vertical lines plain, of dusky brown; dorsal spot black brown; peduncle spot black; pectoral rays black; axillary spot black on top of axil, dusky slightly over the base of fin. Tip of dorsal and anal orange; caudal and ventral deep orange.

131. *Pomacentrus analis* Poey.

An example 4 inches long was sooty black, paler on abdomen; scales of head, cheek, and upper half of body with a round blacker spot, this surrounded by a paler zone; scales of abdomen with pale central spots; tip of caudal peduncle a trifle pale; dorsal with submarginal pale zone, interspinous web with dusky spot. Caudal upper rays and tip pale and yellow; spot on anal fin grayish blue, faint.

Life color of an example 4.37 inches long: Caudal peduncle scarcely, if any, lighter than body; caudal anterior two-thirds quite yellowish; posterior third duskier, margin somewhat black; anal spot gray blue; upper lobe of caudal three-sixteenths inch longer than lower.

Life colors of an example 3.87 inches long: Pinkish white from above sharp line over and posterior to eye and a little before end of dorsal; dorsal fin to about last five soft spines same color; this on body shades gradually to gray brown.

In another color condition the same fish was very light gray brown; center of each scale fawn colored with dark spot on posterior border; caudal, anal, and soft dorsal margins dusky. Again, entirely pinkish white; body dusky; axillary spot dark. (T.)

132. *Pomacentrus leucostictus* Müller & Henle.

An example 3.93 inches long has the caudal with a fine black rim to top and bottom of outer rays; anal with a fine black rim; peduncle spot conspicuous as is also the axillary.

Another specimen, 3.63 inches long, very yellow below; anal broadly margined, below sooty; dorsal spot visible; none on peduncle; spots on back and head very blue. (T.)

133. *Pomacentrus planifrons* Cuvier & Valenciennes.

Nine examples, agreeing perfectly with the account given by Dr. Günther, were secured. New to the United States.

134. *Abudefduf marginatus* (Bloch).

Very common. (T.)

135. *Abudefduf taurus* Müller & Troschel.

One specimen 2 inches long. Dorsal spines 13; scales 25; opercle very slightly uneven on the edge, suggesting serrature.

Dusky bands fainter than in *Abudefduf marginatus*, twice as broad as the interspaces and growing fainter below; a faint band on caudal peduncle, making 6 dark bands in all; fins all dusky. This species is distinguished from *A. marginatus* by the larger scales, the much broader and fainter cross-bands, of which 6 rather than 5 are distinct, and by the rather broader preorbital. It was hitherto known from two examples only, the type from the Barbados, and the type of *Glyphisodon rudis* from Cuba. *Abudefduf declivifrons* of the Panama fauna is very close to this species.

Life color: Body bands brown, blacker at back; interspaces grayish yellow. This fish is readily distinguished from *A. marginatus*, being very much darker.

One other specimen, 3 inches long, was observed at the Tortugas, at the south jetty, in water 6 feet deep, in company with three specimens of *A. marginatus*; it seems to swim in schools. This individual was watched for nearly an hour.

Locality: Loggerhead Key, low-tide puddles west of light-house. Several seen November 11. (T.)

Another specimen had the head $3\frac{1}{2}$ in length; depth $1\frac{1}{4}$; D. XIII-12; A. II, 12; eye 3 in head; snout 4 in head; scales 4-25, 19 pores.

Color, cross bands brown; abdomen and base of caudal bright yellow, each scale below lateral line pale centered; snout low and blunt; ventrals not reaching front of anal; maxillary reaching below vertical from front of orbit; pectorals reaching beyond tips of ventrals.

This fish has a very characteristic manner of darting with the utmost rapidity from the shelter of one stone to another and hiding there until danger is past; it can be seen in the open only as a yellow and brown striped flash. (T.)

136. *Microspathodon chrysurus* (Cuvier & Valenciennes).

In coral heads, shoal water, clinging closely to rock crevices; one individual was seen almost daily for over a month within a radius of a fathom from a certain nook in the coral.

An example 5 inches long was very black brown; scales of cheek and body region, except by pectoral, lighter brown with darker borders, blending with body color; scales above lateral line some with round sapphire spots, similar spots on nape, top of head, about eye and on scales of dorsal fins; caudal pure bright orange yellow, upper and lower ray brown externally, posterior margin faintly sooty; pectoral clear, rays black; ventral black. (T.)

Young black, with many large sapphire spots on the back; dorsal, anal, and ventral black; caudal and pectoral colorless.

Family LABRIDÆ.

137. *Lachnolaimus maximus* (Walbaum).

Around coral heads.

138. *Thalassoma nitidum* (Günther).

Life color of an example 1.2 inches long: Top of head, nape, back, and top of caudal peduncle dark brown; a clear-cut white line from upper and posterior sector of eye to tip of peduncle, a trifle wider than pupil; below this a broad clear brown line; below this pure white.

As seen at night, top area light brown; first line pale straw; broad band light brown; below this band fine pale spots, giving appearance of breaking band into six; below white, pinkish; snout, broad cheek band, area posterior to eye and axil, carmine.

Life color of an example 1.5 inches long: Head from base of first dorsal, gills and cheeks dull-green blue; body dark yellowish olive green with 6 crossbar blotches, first 2 quite black, third, fourth, and fifth lighter; sixth longer than the rest, extending from one-fourth inch forward of end of dorsal to over caudal peduncle; beyond this dark areas extending over 4 scales, green interspaces over 1, 1½, or 2; body color along back more brownish green; dorsal with a black spot extending over first three webs; pectoral with a dark tip where it lies alongside and over second body blotch; third, fourth, fifth, and sixth blotches ending on level of median line; first blotch reaching to axil, base of pectoral with a crimson line where scales commence, this following a crimson blotch back of eye half as wide; a similar blotch on gill anterior to angle; body colors between first and second blotches decidedly bluish, especially in middle line; base of caudal peduncle dark, dark extending along outer three rays to tip; anal colorless, decidedly bluish scales at base; ventral colorless; belly grayish blue.

Usually seen alone, a very active fish, always apparently hastily searching for something, inspecting many crevices and nooks and then darting away. New to United States fauna. (T.)

139. *Thalassoma bifasciatum* (Bloch).

Occasional. New to the fauna of the United States.

140. *Halichoeres radiatus* (Linnaeus).

Occasional.

141. *Halichoeres bivittatus* (Bloch).

Frequent; variable.

142. *Halichoeres maculipinna* (Müller).

This specimen differs from all descriptions in having a black spot at upper base of caudal, besides the spot on the dorsal and the smaller ones at base of pectoral and last dorsal ray.

143. *Doratonotus megalepis* Günther.

Seventeen specimens of various sizes, seined in the eel grass south and west of Garden Key. These vary considerably in depth of body and height of dorsal spine. They agree well with *Dorato-*

notus decoris Evermann and Marsh, but seem to show that this species, with *Doratonotus thalassinus*, is identical with *Doratonotus megalepis*. Only six specimens of *Doratonotus* were hitherto known.

144. *Novaculichthys rosipes* Jordan & Gilbert.

Three specimens, the smallest less than an inch long, having the first two dorsal spines elevated; one of the larger having no traces of this, but showing the dark cross bars described in the original type. Ventrals short, blackish in spirits.

One specimen 2.31 inches long, pale brown, much mottled with lighter; quite pale beneath; on body 4 brown irregular cross bands, the first extending over first half of second dorsal web, the others extending to contiguous portions of dorsal and anal webs; brown blotch on peduncle, which forks posteriorly and ends in two darker spots on base of caudal; cheek pale; a brown line from eye nearly vertically downward; tip of chin brown; a spot on neck behind this band; ventral dark brown; iris golden, margin greenish brown above and reddish below; dorsal and anal clear, faintly yellow, brownish tinged; center of each scale paler than margin, giving the entire fish a distinctly reticulated appearance. Colored portion of dorsal containing a few pale specks. Along the median line there are patches of brown darker than general color, making diamond-shaped reticulations; lower half of bands at times becomes much darker brown than upper.

Anal broadly margined, brightest anteriorly with orange red. At times a decided pinkish flush spreads over the pale markings, especially on side and top.

Bush Key, in eel grass at depth of 1 to 2 feet. (T.) Previously known from two examples from Key West.

145. *Xyrichthys psittacus* (Linnaeus).

Recorded by Dr. Bean from the Whitehurst collection, from Garden Key.

146. *Cryptotomus beryllinus* Jordan & Swain.

One specimen.

147. *Sparisoma xystrodon* Jordan & Swain.

Frequent.

148. *Sparisoma radians* (Cuvier & Valenciennes).

Two specimens. New to fauna of United States.

149. *Sparisoma hoplomystax* (Cope).

Occasional.

150. *Sparisoma niphobles* Jordan & Bollman.

One specimen, sent to the Bureau of Fisheries. Hitherto known from one example.

151. *Sparisoma distinctum* (Poey).

Recorded by Henshall in 1889 from Garden Key.

152. *Sparisoma abildgaardi* (Bloch).

Rare. New to fauna of United States.

153. *Sparisoma viride* (Bonnaterre).

Frequent. New to United States fauna.

154. *Sparisoma flavescens* (Bloch & Schneider).

Common.

155. *Callyodon punctulatus* (Cuvier & Valenciennes).

Half a dozen examples. New to United States fauna.

156. *Callyodon vetula* (Bloch & Schneider).

Frequent. New to United States fauna.

157. *Callyodon croicensis* (Bloch).

In eel grass.

158. *Callyodon evermanni* (Jordan).

A specimen sent to the Bureau of Fisheries.

159. *Callyodon cœruleus* (Bloch).

Frequent.

160. *Pseudoscarus guacamaia* (Bloch & Schneider).

Reported to occur.

Family ILARCHIDÆ.

161. *Chætodipterus faber* (Linnæus).

Reported to occur.

Family CHÆTODONTIDÆ.

162. *Chætodon ocellatus* Bloch.

Color, black bar not broader than eye, from and including first dorsal spine through eye down cheek to in front of gill slit; spinous dorsal, both ventrals, caudal peduncle, front of ventrals, yellow; soft dorsal, pectorals and tail colorless.

Some times a black band from middle of spinous dorsal to ventral, somewhat angular, the concave side forward; or the body may be mottled, with an oval light spot in front of angle. (T.)

163. *Chætodon capistratus* Linnæus.

Common; some specimens with an additional spot correspond to *Chætodon bracei* Smith, in which species the lower spot, vertically oblong, is in keeping with the existence of the superior one. Both may be remnants of a vertically barred ancestral type, as in *C. ocellatus*, where the fragments of broken and fading bars are more prone to be irregularly oblong than round. (T.)

A very instructive series of specimens was found. One 1.25 inches long shows both spots, the upper bordered with white. Another specimen 1.6 inches long has the upper spot represented by a dusky area not edged with pale. One 1.25 inches showed no trace of the upper spot. The largest is 2.58 inches long.

164. *Pomacanthus arcuatus* (Linnæus).

Frequent.

165. *Pomacanthus paru* (Bloch).

Frequent.

166. *Holacanthus tricolor* (Bloch).

One specimen. New to United States fauna.

167. *Holacanthus ciliaris* (Linnæus).

Frequent. Specimens 2 inches long show the transition from the young to adult coloration. Dorsal and anal widely marked with blue, caudal abruptly yellow; opercle behind the nape stripe, base of pectoral, and abdomen gray-green, scales with paler edges. Three body bands, faint stripes between them.

Family ACANTHURIDÆ

168. *Hepatus cœruleus* (Bloch & Schneider).

Life color, pure and bright canary yellow all over. Rim of dorsal and anal tinged with blue in specimens 2.5 inches long and over.

Found alone as far as companions of its own species are concerned, but always in a school of small grunts and parrot fish. It is a very active and nervous little fish. *Pomacentrus fuscus* often chases it a considerable distance and nips at its tail.

Color of an example 5.79 inches long, light yellowish olive, with undulating lines much lighter; spine yellow; dorsal and anal dusker, margined with blue; blue undulating lines on dorsal, only barely discernible; caudal lighter than body, dusky posterior margin. (T.)

169. *Hepatus hepatus* (Linnæus).

Family BALISTIDÆ.

170. *Balistes carolinensis* Gmelin.

In the sargassum.

171. *Balistes vetula* Linnaeus.

Often taken by the fishing smacks which come from Cuba for groupers. The skin is used for polishing—as sandpaper.

Family MONACANTHIDÆ.

172. *Cantherines pullus* (Ranzani).

Recorded by Porter and Moore from Fort Jefferson.

173. *Monacanthus ciliatus* (Mitchill).

Occasional.

174. *Monacanthus hispidus* (Linnaeus).

Frequent.

175. *Ceratacanthus schoepfi* (Walbaum).

Recorded by Porter and Moore from Tortugas.

Family OSTRACIIDÆ.

176. *Lactophrys triqueter* (Linnaeus).

Recorded by Goode from the Tortugas.

177. *Lactophrys bicaudalis* (Linnaeus).

One seen. New to United States fauna.

178. *Lactophrys trigonus* (Linnaeus).

Occasional, in the sargassum.

179. *Lactophrys tricornis* (Linnaeus).

Frequent, in eel grass.

Family TETRAODONTIDÆ.

180. *Spheroides lævigatus* (Linnaeus).

Recorded by Porter and Moore from the Tortugas.

181. *Spheroides spengleri* (Bloch).

Common, browsing on tops of eel grass. (T.)

182. *Spheroides testudineus* (Linnaeus).

Recorded by Porter and Moore from Fort Jefferson.

Family DIODONTIDÆ.

183. *Diodon hystrix* Linnaeus.

Not seen.

184. *Diodon holacanthus* Linnaeus.

Color of an example 3.87 inches long, yellowish olive brown, spots very black, blotches brown, lighter than over eye; spines inserted in the blotches, a black triangular mark posterior to them, which they nearly but not quite cover when depressed; fins body colored, unspotted; abdomen white, light brown at base and posterior to spines; throat very white. (T.)

185. *Chilomycterus schoepfi* (Walbaum).

Frequent. It is reported that a great school visited the Tortugas several years ago, all of small size. (T.)

Family SCORPÆNIDÆ.

186. *Scorpæna brasiliensis* Cuvier & Valenciennes.

A specimen obtained.

187. *Scorpæna plumieri* Cuvier & Valenciennes.

Recorded by Dr. Bean from Fort Jefferson.

188. *Scorpæna grandicornis* Cuvier & Valenciennes.

Color of a specimen 2.13 inches long, head olivaceous brown, finely speckled with pale; dermal flaps pinkish; a dark brown sector from lower part of eye down and back to lower part of cheek; body dark brown with gray mottling, flaps pink, some whitish; three almost black blotches along middle line of body; belly whitish, above a pink zone with two broken rows of dark brown spots with indistinct light brown zone; ventral very dark maroon, pink spines and pale posterior border; pectoral red brown, brown band at base and one about middle of fin not sharply defined; pectoral base underneath white, brown spotted; dorsal brown like body, spines and margin of web above notches pale, much dotted with white; soft dorsal a trifle dusky, with reddish marginal band, pale mid band; caudal red brown, with pale margin, two pale bands, one at base with a white dermal flap anteriorly. (T.)

Family COTTIDÆ.

189. *Hemitripterus americanus* (Gmelin).

One specimen found inside of Bush Key and deposited in the Brooklyn Institute of Arts and Sciences. This is the most southern record on the Atlantic coast of North America for a member of the sculpin family, Charleston being the limit before noted. (T.)

Family TRIGLIDÆ.

190. *Prionotus roseus* Jordan.

A specimen sent to the Bureau of Fisheries.

Body color, pinkish gray; head a trifle lighter gray, with very small pink-brown blotches; roof of mouth rust-red; behind angle of mouth a pink blotch; on back, opposite fifth to sixth dorsal spines, two brown spots with ill-defined edges from above downward, forming the outer boundary points of a lighter brown square blotch, opposite eighth to ninth dorsal spines a similar marking; opposite fifth web a round brown spot, these spots three-sixteenths inch apart; behind soft dorsal, the two spots so close together as to form a blotch nearly one-eighth inch broad. Throat, abdomen, and under part of tail pure white; body and tail markings border this white region as pinkish blotched oblongs starting obliquely upward; on body a similar row of indistinct pink blotches from axil obliquely upward and backward, ending under second spot below soft dorsal; roughly 15 blotches; feelers cream-colored, with 8 light brown cross-bands, these about parallel when fin is folded to body; under surface of pectoral for anterior two-thirds gray, remainder black gray; dorsal yellow gray, mottled at base; spines white and pink; web of first to fifth spines much darker gray; half of fifth and remainder quite hyaline; soft dorsal rays white; three rows of pink gray spots; tips almost salmon, web hyaline; last two gray and gray black, respectively; caudal spines white, two broad bands of pearly gray, upper margin white and pink gray barred, lower pure pink; tip of all spines and webs except lowest dark gray; anal white, pink blush on last spines and webs; ventral white. (T.) This fish was hitherto known only from spewings of red groupers from the snapper banks off Tampa and Pensacola.

191. *Prionotus tribulus* Cuvier & Valenciennes.

Reported by Garman from Nutting's collection of 1896.

Family CEPHALACANTHIDÆ.

192. *Cephalacanthus volitans* (Linnaeus).

Recorded by Porter and Moore from Fort Jefferson.

Family GOBIIDÆ.

193. *Eviota personata* Jordan & Thompson, new species. Figure 3.

Head 3.9 in length; depth 4.30 (5.30 in total); D. vi-11; A. 11; V. i, 5; scales 9, 27; eye 2.90 in head; maxillary 2.70; longest dorsal spine 2.50; longest soft ray 1.50; caudal 1; pectoral 1.05; ventral 1.10.

Body rather elongate, compressed, the dorsal profile evenly curved; mouth small, oblique, the lower jaw considerably projecting, the narrow maxillary extending a little beyond front of eye; teeth sharp and irregular; lower jaw thin; head naked; preopercle entire; gill-membrane narrowly connected with isthmus; scales large, finely ctenoid; nape, base of pectoral, and breast naked; dorsals well separated, the first low, sixth spine highest; soft dorsal higher; anal rather low; pectoral long, reaching vent; ventrals separate, rays 1, 5; branched in the usual fashion; inner ray also branched and shorter than the others.

Color in spirits, pale, perhaps greenish in life, the dorsals and anal fin with fine black dots; a dark streak along middle line of nape; a dark shade along base of each dorsal and anal; a dark streak along middle line of side; side of head about eye jet black, this color forming with the eye a triangular area,

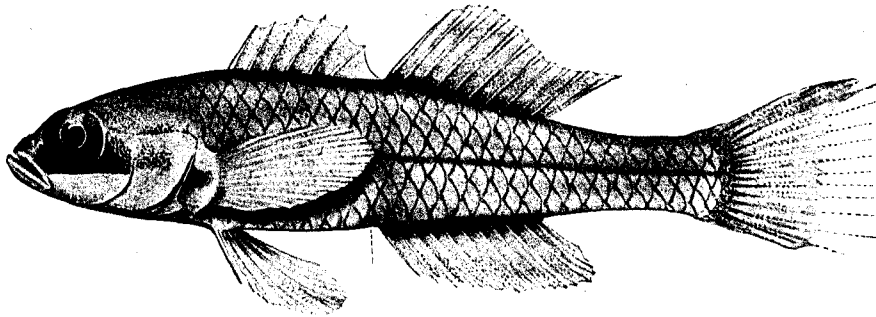


FIG. 3.—*Eviota personata* Jordan & Thompson, new species. Type.

which fades out into dark speckling on snout and is bounded below eye by a definite sharp line which separates the dark area from the silvery of the cheeks; an oblong horizontal black blotch before base of pectoral; an area of black dots on opercle and one above it.

A single specimen of this remarkable little goby was taken by Doctor Thompson on the reef at Garden Key, and is numbered 8410 in Stanford University Museum.

194. *Mapo soporator* Cuvier & Valenciennes. We can not distinguish this species from *Mapo fuscus* (*albopunctatus*) of the Pacific.

Common.

195. *Rhinogobius glaucofrænum* (Gill).

In eel grass.

196. *Rhinogobius tortugæ* (Jordan).

Only one specimen seen.

197. *Gnatholepis thompsoni* Jordan.

Type with about 10 faint dark squares down back, dots in these quincuncially arranged; below these squares a light line; another row of blotches on level of eye, extending to tail; below this another light line; at level of pectoral 6 large blotches, the darkest; the dots in all these blotches follow parallel lines; caudal faintly speckled; dorsal more so; ventral cloudy gray; pectoral color of body, which is coral sand colored; above each pectoral a round fawn-colored spot; anal and lower half of caudal tinged with gray (this portion of body buried in sand when at rest); iris yellow; over eye a

dark brown line as long as eyeball is deep, not as wide as pupil, below eye extending vertically downward, and a trifle broader than above, nearly as broad as pupil.

A bottom species moving very quickly from spot to spot, about 6 inches at a time. Frequently attacked by *Pomacentrus fuscus*. Found about coral heads, Bush Key. (T.)

198. *Elacatinus oceanops* Jordan.

Tortugas, west shoal, among coral heads at depth of 6 feet. Always clinging to brain coral; endeavoring to shelter itself in bottom of groves. When hunted, it goes from one head to another, swimming very curiously, in a zig-zag course, stopping at each turn, moving with great speed between stops and coming to a perfect standstill at each change of course. (T.)

Family OPISTHOGNATHIDÆ.

199. *Opisthognathus macrognathus* Poey.

Reported by Jordan in 1884, from Garden Key, as *Opisthognathus scaphiurus*.

200. *Gnathypops maxillosa* (Poey).

Reported by Bean in 1883, from Garden Key.

201. *Gnathypops aurifrons* Jordan & Thompson, new species. (Fig. 6.)

Head 3.5 in length; depth 3.85 (4.55 with caudal); D. 26; A. 18; P. 18; scales 42, 106; eye 2.90 in head, 2.50 times length of snout; maxillary 1.60; longest dorsal ray 1.50; caudal 1.15; longest anal ray 1.65; pectoral 1.60; ventral 1.15 times length of head.

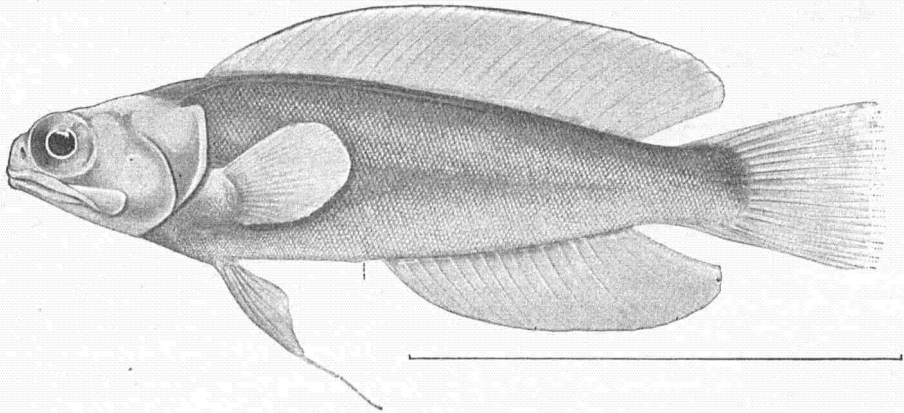


FIG. 4.—*Gnathypops aurifrons* Jordan & Thompson, new species. Type.

Body oblong, moderately compressed, deepest at the ventrals; head moderate, the short snout abruptly decurved; eye large; maxillary moderate, its tip about half the eye's diameter behind the eye; teeth long and sharp, some of the posterior ones on lower jaw curved back; vomer with teeth; lower jaw slightly included. Head naked; body covered with very small scales, the nape naked; lateral line running very high, ceasing just behind the middle of the dorsal; dorsal fin high, its posterior rays highest; no distinct spines; caudal truncate; anal high, similar to dorsal; pectoral moderate, rounded, almost reaching vent. Ventral very long, its second ray ending in a filament as long as the rest of the fin, and reaching well beyond front of anal.

Color in life, according to a sketch by Doctor Thompson, hyaline green; a large golden patch on top of head; fins faintly greenish; a narrow dark edge to the dorsal. In spirits, plain pale olive with the dark streak on the edge of the dorsal fin.

A single specimen not quite two inches long, No. 8413, Stanford University Museum, was taken by Dr. Thompson on the coral reef at Garden Key.

The species is nearest *Gnathypops mystacina*, but differs in the larger number of anal rays, the longer lateral line, the higher rays, and in numerous minor respects.

Family DACTYLOSCOPIDÆ.

200. *Gillellus semicinctus* Gilbert.

One specimen 2.13 inches long, color very light gray, with fine greenish gray cross-bands, faintly margined with black dots, the anterior 4 inclosing a median red dot; bands broadest on back, narrowing suddenly at side before ending above median line; first band through base of anterior dorsal, broad and irregularly rectangular; anterior to this on nape a four-sided blotch, wider at one end, pure gray with green-gray edges; second band under seventh dorsal spine, about half as wide as first; remainder about same width and dividing the body into about four equal sections; between first, second, third and fourth body bands is a pale fawn-colored medianly placed figure extending only a little way each side of dorsal fin; between fourth and fifth a trace only of these marks. (T.)

Family URANOSCOPIDÆ.

203. *Exceestides egregius* Jordan & Thompson, new genus and new species. (Figs. 4 and 5.)

Head 2.15 in length; depth 3.30 (4.05 with caudal); D. 12; A. 17; P. 22; V. 1, 5; eye 4.30 in head; snout 5.30; maxillary 2.30; opercle in head, 2.20; longest dorsal ray 4.10; caudal 2.05; longest anal ray 3; pectoral 1.80; ventral 3.

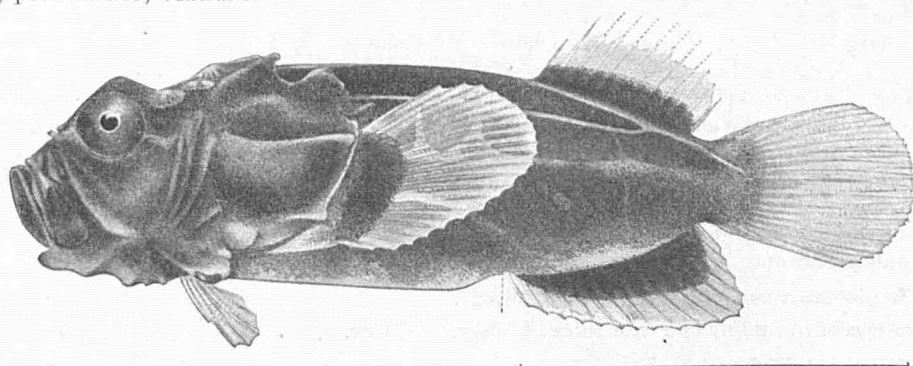


FIG. 5.—*Exceestides egregius* Jordan & Thompson, new species. Type.

Body oblong, not compressed; the head broad and depressed, very large, monstrous in form, the preopercular angle developed as a long flattened wing-like appendage, without spine, its length 2.90 in head; number of blunt ridges radiating from lower part of cheek; mouth moderate, almost vertical, the lower jaw projecting; no appendage on chin; maxillary very broad; teeth small, even. Top of head broad, concave, the interorbital space about twice diameter of eye; top of head a transverse ridge between eyes; a tubercle with radiating ridges on each parietal; 2 blunt ridges at nape; opercle very long, without spine, but with a strong median ridge; a smaller ridge on subopercle. Scales none; lateral line running high, crooked, close to base of soft dorsal posteriorly; no spinous dorsal; soft dorsal small, opposite the anal, which is higher and longer; caudal rounded; pectoral large, reaching past front of anal; ventral small, well forward, inserted under preopercle.

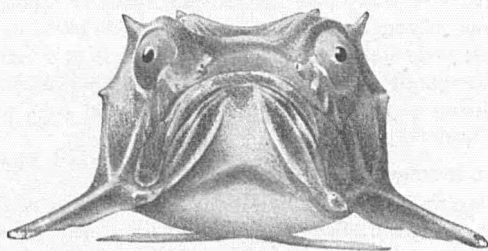


FIG. 6.—*Exceestides egregius* Jordan & Thompson. Type.

Color blackish, made of dark points; fins pale, with a blackish area at base of each; a pale streak along lateral line and one across base of dorsal.

One specimen, No. 8411, Stanford University Museum, 2.3 inches long, was taken by Doctor Thompson on the reef at Garden Key.

It represents a new genus of *Uranoscopidae* allied to *Kathetostoma*, but the armature of the head totally different, notably the expanded preopercle.

Excecestides (*Εξεκεστιδής*) was a citizen of Athens, with a strange and barbarous lineage (Aristophanes).

Family ECHENEIDIDÆ.

204. *Leptecheneis naucrates* (Linnæus).

A single specimen. Often found attached to large jew-fishes. (T.)

Family BLENNIIDÆ.

205. *Acteis macropus* (Poey).

Reported by Garman from the Tortugas.

206. *Acteis moorei* (Evermann & Marsh).

Abundant. Heretofore known only from the type taken in Porto Rico.

Life colors, general color gray white; dorsal hyaline; 8 gray blotches extending over second and third spines, between these white and black dots; soft dorsal with three rows of dots; from eye to snout a dark line, iris light yellow with brown-red squares; 8 dark red-brown bands across body, center of band darker than above or below; cross-bars beginning at colored blotches on dorsal; 1 band on caudal peduncle; top of peduncle whitish; 2 rows of dots on tail; lateral line whitish. On dark bottom this fish is white and black.

A count of the spines and rays in dorsal fin of 43 specimens shows the following variations: XIX, 9, one specimen; XXI, 9, two specimens; XXI, 10, nine specimens; XXI, 11, one specimen; XXII, 8, one specimen; XXII, 9, twenty-three specimens; XXII, 10, six specimens. In 70 per cent the total is 31 fin supports, and in over 50 per cent the formula is XXII, 9. The type for this species has XXI, 11, which figure only occurs once in the Tortugas series. (T.)

207. *Lepisoma nuchipinne* (Quoy & Gaimard).

One specimen captured on west shore of Loggerhead Key.

208. *Ericteis kalisheræ* Jordan.

Shoal water inside of Bush Key. Three specimens known.

209. *Auchenopterus fasciatus* (Steindachner).

Six specimens.

Color, dark brown, abdomen salmon brown; white irregular mark on gill, sharply edged with dark brown; inside of this a pale brown mark smaller and of same general shape, with three pale specks in it; from this mark a series of irregular pale blotches extending three-fourths down body to level of pectoral; body indistinctly banded; dorsal lighter brown than body with seven dark brown bands continued upon it; anal with fine dark brown bands (darker than the dorsal or brown of body), these corresponding to posterior five on dorsal; caudal pale, with 4 or 5 rows of light brown dots, its base very dark brown. (T.)

210. *Blennius favosus* Goode & Bean.

Common; the male recorded by Garman in 1896 as *Blennius pilicornis*.

Color of one specimen: Brown specks and lines principally on spinous dorsal; inner two-thirds of dorsal opaque bluish; nine dark-brown blotches on back; base of spines at these blotches with a darker brown dot; edge of soft dorsal and caudal somewhat orange red; at times body above level of middle of pupil much lighter brown than below, this lighter color extending on forehead and cheek below eye to upper lip, while snout and gills are dark brown; pectoral rays with blue dots beyond the reticulations of base; webs hyaline; rays yellowish-gray brown.

Life color of another specimen, seven shiny blue-white spots alongside, with a tendency to be rectangular; tips of pectoral and caudal orange; pupil emerald; belly from vent to ventral fins silvery blue white; on second dorsal spine a black blotch; at base of spines a dot, occasionally one without dot; eye cirrus branched; upper parts olive brown, head and opercle plain dark brown; a fine speck-

ling of red-brown dots below over entire body and dark brown above middle line, these latter in a row from pectoral to tail; space between base of dorsal spines and top rows on body checkered dark brown and lighter. (T.)

211. *Blennius cristatus* Linnaeus.

Head gray-green, with green blotch from eye to base of dorsal; a light spot at angle of upper and lower lip; one radiating downward and backward toward pectoral, one downward to behind angle of mouth, one toward upper lip halfway between angle and front blotch on cheek; tip of opercular spine dark green; around eye gray-blue dots; lower lip and branchiostegals pale blackish, blotch on front of lower lip; cirri on nape gray with three red bands about each one; tip of each dorsal spine pale, with dark blotches, lower part of webs contiguous to three body blotches; light spot just posterior to origin of spines; on first dorsal web an oblong spot, this changing from gray-blue to steel-blue with a darker and at times a lighter border; on nape and shoulders many gray-blue spots with brick-red centers; pupil golden on inner rim; body same as head, possibly lighter posteriorly; above and on region swept by pectoral greener than the rest; no white spots; region above anal with bluish-white dots, these arranged in oblique forward and downward slanting rows above middle line corresponding to spaces (average of 6 dots each) below middle line, irregularly placed; along middle line twelve ill-defined brown dots, smaller than pupil, these dots grouped in pairs; anal with a dark band and a white spot behind each spine; edges pale; caudal pale at tip, inside this a faint red-brown shade, general color more yellow-green than body; back gives appearance of five brown square blotches, extending one-third distance down sides; base of pectoral with a white blotch below, two above partly covered by posterior part of gill-membrane; base of fin pale, rear part with spots, pale spot in center, another row of dark spots. (T.) Inside of mouth brick-red.

Family FIERASFERIDÆ.

212. *Fierasfer affinis* Günther.

Recorded by Professor Putnam from Würdemann's collection of 1874, from the Tortugas.

Family BROTLIDÆ.

213. *Ogilbia cayorum* Evermann & Kendall.

Color, pale brown, with very fine brown specks.

These fish hide under small stones and bury themselves partly in the sand; when disturbed they swim feebly, like a tadpole, the body kept straight and propelled with a wavy motion from tail to vent and of dorsal and ventral fins. They swim straight backward a little. (T.)

Twelve specimens taken; hitherto known only from the type.

Family REGALECIDÆ.

214. *Regalecus glesne* (Ascanius).

Reported by the keeper of the Loggerhead Light, who furnished a good description of the fish, to have come ashore after a storm. (T.)

Family PLEURONECTIDÆ.

215. *Platophrys ocellatus* (Swainson).

Occasional.

Family ANTENNARIIDÆ.

216. *Pterophryne gibba* (Mitchill).

This species lives in the center of clumps of sargassum. Except for slight movement of the pectoral fins, it remains very quiet. (T.)

In the early part of February, 1902, when there occurred a strong southerly blow, and a great quantity of sargassum weed drifted ashore, these fish were taken in quantity. They rest almost motionless among the branches, which they grasp with their hand-like pectorals. They eat the shrimp and crabs and are also cannibalistic.

When separated from a clump of weed, they swim rather feebly downward and then seek shelter under another mass. When frightened they are capable of swimming a few feet with great rapidity and then coming to a sudden halt. (T.)

217. *Antennarius ocellatus* (Bloch & Schneider).

- Recorded by Goode and Bean in 1896.

218. *Antennarius multiocellatus* (Cuvier & Valenciennes).

Reported by Lieutenant Wright in 1863, from Garden Key. His specimen is the type of *Antennarius annulatus* Gill.

The following 16 species were taken by Dr. Thompson in the Gulf Stream, on the northward cruise of the steamer *Chesapeake*:

Etelides aquilionaris (Goode & Bean).

Hippocampus hudsonius De Kay.

Two specimens: Spines on body all long and relatively sharp, body much mottled and streaked with dark, but without coral markings.

Caranx hippos (Linnaeus).

Caranx bartholomaei (Cuvier & Valenciennes).

Young with about 10 narrow, dark cross bands.

Seriola fasciata (Bloch).

Peprilus paru (Bloch).

Many young with low fins.

Psenes maculatus Lütken.

Two specimens apparently of this species. Body with five black cross bands.

Amia americana (Castelnau).

A very young individual, unspotted, perhaps of this species.

Abudefduf marginatus (Bloch).

Many young.

Tautoglabrus adspersus (Walbaum).

Canthidermis sobaco Poey.

Two small specimens, gray, with 3 diffuse, dark cross bands, and numerous dark spots, 3 black blotches below soft dorsal and one below spinous. In the younger one the bands are fainter, the black spots on middle band more distinct. These specimens correspond to *Canthidermis asperrimus* Cope, but are doubtless the young of *C. sobaco*.

Monacanthus hispidus (Linnaeus)

Several.

Pollachius virens (Linnaeus).

Urophycis tenuis (Mitchill).

One 4 inches long, with many fry.

Pseudopleuronectes americanus (Walbaum).

Pterophryne gibba (Mitchill).