THE FISHES OF PORT-AU-PRINCE BAY, HAITI*

WITH A SUMMARY OF THE KNOWN SPECIES OF MARINE FISH OF THE ISLAND
OF HAITI AND SANTO DOMINGO

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(Figures 1-268 inclusive and Plate A)

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INTRODUCTION

The preparing of this annotated account of the marine fishes of the republic of Haiti was the major problem planned on the Tenth Expedition of the Department of Tropical Research of the New York Zoological Society. As described elsewhere, we operated from a four-masted schooner "The Lieutenant" anchored near shore as a base.

Having learned on numerous expeditions of the value of effort concentrated upon a limited area, we chose a very definite region. This was the southeastern corner of Port-au-Prince Bay, which body of water in turn forms an exceedingly small proximal portion of the great Gulf of Gonave. Even here, with the Bizoton shore and the city of Port-au-Prince forming the eastern and southern sides of our area, we did not go farther afield than Sand Cay and Lamentin Reefs, three miles respectively to the north and the west. The exact physical boundaries of this zone may be considered as lying between the parallels 18° 32' and 35' north latitude, and the meridians 72° 22' and 27' west of Greenwich. While almost all of the species were obtained within this area, a few were purchased at the market from fishermen who had seined them in more distant portions of the bay. The limitation of our zone of activities necessitated the omission of the fresh-water river and lake fish of the families *Cichlidae* and *Poeciliidae*, which we have reserved for separate consideration. This does not apply to the fresh-water representatives occurring within our zone, of dominantly marine families such as the gobies and sciaenids, which are included in the list.

If we roughly estimate the shore line of the republic of Haiti at a minimum of eleven hundred miles, we covered in our collecting only one two-hundred-and-twentieth of this. Nevertheless within a period of less than one hundred days, from February 2nd to May 10th, 1927, we secured 6122 specimens of 270 species

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of Haitian fish, comprising 84 families. This may well be considered as representative of the fish fauna of Haiti.

Until now no adequate list of Haitian fishes has existed. The only comparable modern faunal list of West Indian Fishes is "The Fishes of Porto Rico," by Evermann and Marsh. This was published thirty years ago with a list of 291 species. Dr. Nichols has in preparation a new and up to date list for Porto Rico.

There is no department of fisheries in the present occupational scheme of the Americans in Haiti, so duplicate collections were made for the Service Technique of the Haitian government, and all possible economical information was gathered and put at their disposal.

There is a small open-air fish market in addition to the main fish market at Port-au-Prince, but these cater to only a very small percentage of piscivorous natives. In fact the annual importation of dried, pickled, and canned fish into Haiti amounts annually to fifteen million pounds.

In the gathering of our collection we used every available method, from hook-and-lines to nets, seines, set-traps; air-rifles, harpoons, poisons, dynamite and high explosive bombs dropped from airplanes. On the surface we worked with water buckets and glass-bottomed boats, while diving helmets enabled us to reach an extreme depth of ten fathoms.

Although the present paper is concerned with the marine fishes of the republic of Haiti, yet in ichthyological literature most references refer vaguely to the entire island of Haiti or Santo Domingo. Of this island the Haitian Republic occupies only the western third.

In order to round out the value of our list, we have added a list of all additional marine species recorded from the island as a whole. This brings the total number of marine fish known from the island of Haiti to 324. All of these will, probably, ultimately be taken in the Gulf of Gonave.

The logic of physical distribution demands that, for a moment, we disregard national boundaries and concern ourselves with the location of the island of Haiti. With the exception of Cuba it is the largest of the West Indies and lies between $17^{\circ} 39'$ and 20° north latitude, and $68^{\circ} 20'$ and $74^{\circ} 30'$ west longitude. The Atlantic Ocean bounds it on the north and the Caribbean Sea on the south, and it lies almost exactly between Cuba and Porto Rico, separated from them respectively by the Windward and Mona Passages. Cuba is less than sixty miles distant, with the northern portion of the Bartlett Deep pushing up between to a depth of 1983 fathoms. In the other direction Porto Rico is seventy miles away, connected to Haiti by a bank averaging 250 to 300 fathoms deep.

As to the topography of the restricted area of our operations, it lies almost wholly on the littoral platform which borders much of the coast. The maximum depth of Port-au-Prince Bay is 85 fathoms, but this does not occur nearer than forty miles from our station. Our greatest depth was 20 fathoms, but the whole locality was very irregular in contour, with numerous cays and coral reefs lying awash or occasionally rising above the surface. The senior author, in his study of reef ecology, was able to distinguish eight more or less distinct zones from the shore outward, the enumeration of which, in the present connection, will suffice:

- 1.—Fresh-water streams and springs flowing into the bay.
- 2.—High-tidal, land-locked, salt-water lagoons.
- 3.—Inter-tidal zone of mangroves and mud.
- 4.—Submerged shallows of bare sand and hairy algae.
- 5.—*Thalassia* growth, pure culture and transition.
- 6.—Typical coral reef.
- 7.—Deepes below coral growth.
- 8.—Surface Nekton and Plankton, diurnal and nocturnal.

In the make-up of this paper we have followed a definite arrangement, one which has stood protracted use in the field in connection with the fresh-water fishes of British Guiana and the oceanic collections of the *Arcturus*. The following table shows the sequence of treatment:

Names.
References (The type reference and a good recent account).
Field Characters for identification at sight.
Description, Size and Weight, Color.
General Range.
Occurrence in Port-au-Prince Bay.
Abundance. Method of Capture.
Food. Enemies.
Proportion of Sexes.
Size at Maturity.
Spawning Season.
Eggs. Young.
General Habits.
Study Material—Drawings, Photographs, Specimens.

The republishing of complete descriptions of the species represented in Haiti seemed to be needless, and anyone interested can be connected with the literature of the species through the second reference mentioned under each fish.

We have gone to considerable trouble in providing illustrations of every species, using the same type of outline drawing as Nichols and Breder in their "Marine Fishes of New York," and we have to thank them for the use of 69 of their electrotypes. These illustrations, with the exception of those of new species, are to be regarded as character sketches made as accurately as possible. Owing to their size, fin rays are in most cases only indicated, although whenever possible the correct number has been shown.

During our stay in Haiti the American High Commissioner and his wife, General and Mrs. John H. Russell lost no opportunity to aid our work, and in this they were heartily seconded by President and Madame Borno. A complete list of those who rendered valuable assistance would require a roll-call of the entire American Force of Occupation—aviators, scientists, officers of the marines and heads of all departments. In particular we must mention Commander V. Wood and Dr. George Freeman.

The expedition was made possible by the generosity of the following members of the New York Zoological Society:

A.—Haiti in relation to the West Indies.

B.—Haiti showing localities where collections were made. The black rectangle shows the position and extent of the large map C.

C.—Eastern end of Port-au-Prince Bay showing the localities mentioned in this report.

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We are also indebted to Floyd Crosby for photographs of fishes, to Helen Tee-Van for colored plates made in the field, to Fritz Maximilian of the Service Technique of Haiti, who was assigned to us by Dr. Freeman to assist in making drawings, and to Edith Thane for some of the line drawings.

Additional information as to the general environment, and the activities of the Haitian Expedition may be found in the following publications which have already appeared:

"Beneath Tropic Seas," by William Beebe (Putnams), 1928

"The Haitian Expedition," Zoological Society Bulletin, Vol. XXX, No. 5, September, 1927.

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The following new species are described in this paper:

Anchoviella longipinna
Leptocephalus microphthalmus
Rypticus bornoi
Scorpaenodes russelli
Pomacentrus freemani
Leptophilypnus crocodilus
Gobiosoma macrodon
Labrisomus haitiensis
Labrisomus albigenys
Cremnobates argus
Ophioblennius ferox
Acanthemblemaria arborescens
Acanthemblemaria variegata
Stathmonotus corallicola

KEY TO FAMILIES OF PORT-AU-PRINCE BAY

NOTE.—These keys do not attempt to show relationships and are in the widest sense artificial. In scope they treat only of the locality and species mentioned in this paper, and will not necessarily work in other localities, either for the families or species.

To identify a fish, start at Key A under No. 1 and see which of the two alternatives the specimen fits best. Then go to the number or Key indicated at the end of the proper alternative, and continue the process until a family name is reached.

The keys to the genera and species are slightly different from this key to families, and in these the alternatives are labelled A, AA; B, BB, etc. With these keys choose the alternative A or AA according to which one fits best. Then decide between the pair of alternatives immediately under the chosen one, regardless of what the letter may be,—thus under BB the next pair of alternatives may be D and DD. Continue this until the species is reached. Comparison of the fish with the illustration and the field characters ought to determine whether it is actually that species or whether it represents a form not found by us.

The accompanying diagram and notes illustrate most of the characters used in identification.

Because a fish continues to grow all during its life and does not reach a definite maximum size as a bird or mammal does, absolute measurements as to length, size of head, depth, etc., are of very little value. Because of this, dimensions are stated in terms of proportion. Thus, Head 3.4 means that the length of the head goes into the body length 3.4 times. Depth of body and size of head are compared to the body length, while eye, maxillary and smaller measurements are compared to the head.

Actual measurements of a fish are taken in a straight line, as with a pair of dividers. The standard length is taken from the snout to the base of the caudal fin. When total length is mentioned it includes the caudal fin. Depth is the greatest vertical distance from the upper to the lower contour of the body. The

length of the head is from the snout to the most posterior point of the opercle, exclusive of spines which may project further backward. The diameter of the eye is its greatest diameter. The maxillary is measured from the tip of the snout to the posterior edge of the maxillary. The interorbital space is the least distance from eye to eye, measured across the top of the head. The snout is measured from its tip to the front of the eye.

The pectoral and the pelvic or ventral fins are paired, while all others are single and found only along the midline of the body. The shapes and positions of these fins vary tremendously and one or more may be completely lacking. Thus the dorsal may be a continuous fin or divided so as to form 2 or 3 fins; it may be followed by finlets. The ventral fins occasionally are found beneath the lower jaw. The adipose fin is small, placed on the posterior dorsal surface and contains neither spines nor rays.

The supporting elements of the fins are usually quite constant in number, and their number is often of importance in classification. These elements are of two types—spines, which are rigid, solid and sharp-pointed; and rays, which are segmented, flexible and often branched at their tips. In descriptions the spines are denoted by a Roman numeral and the rays in Arabic.

Gill rakers are bony excrescences found regularly placed along the gill arches in some fishes. The isthmus is the portion of the body extending forward on the ventral side, just between the gill covers. The gill membranes often cover it or are attached to it. The nictitating membrane is a membrane which can be drawn up over the eye—it is found in some of the Haitian sharks.

Key A

- 1.—Fishes with cartilaginous skeletons and with more than one gill opening on each side of the body (Sharks, Rays, Skates, Mantas)
See Key B, p. 23
- Fishes with bony skeletons and with a single external gill-opening on each side.....2
- 2.—Bones of the head fused into a tubular snout, with the jaws at the tip.
See Key C, p. 23
- No tubular snout.....3
- 3.—A sucking disk placed either on the dorsal surface of the head, or on the belly, the latter formed partly or entirely by the ventral fins.
See Key D, p. 24
- No sucking disk on head or belly.....4
- 4.—Body enclosed in a hard bony box, only the fins and the caudal peduncle freely movable; ventral fins absent; dorsal fin single, of soft rays only.
Ostraciidae, p. 261
- Body not enclosed in a bony box and with the above mentioned characters.
5
- 5.—One or both jaws prolonged into a long bill.....See Key E, p. 24
- Jaws not prolonged into a bony bill.....6
- 6.—Pectoral fins enlarged, forming conspicuous "wings"... See Key F, p. 24
- Pectoral fins not forming wings, not especially enlarged or wide.....7
- 7.—Eels: Body very elongate, more or less snake-like; premaxillaries rudimentary or wanting; ventral fins wanting; no spines in the fins; gill openings not especially large.....See Key G, p. 24
- Without the above characters.....8
- 8.—Fishes with the carpal bones greatly elongated, forming an arm, which

- supports the rather broad pectoral fin; gill openings reduced to a small opening situated near the base of the arm.....9
- Fishes without the above series of characters.....10
- 9.—Body more or less compressed, not depressed; mouth large, terminal, nearly vertical.....*Antennariidae*, p. 270
- Body depressed, skin sometimes with bony tubercles or spines; mouth small, usually inferior.....*Ogcocephalidae*, p. 271
- 10.—Fishes which lie flat on one side, with both eyes on the other side; upper side dark, lower side pale.....See Key H, p. 25
- Fishes with one eye on each side of the body.....11
- 11.—Ventral fins present.....12
- Ventral fins absent.....53
- 12.—Ventral fins placed on the abdominal portion of the body.....13
- Ventral fins placed on the thoracic or subjugular part of the body, i. e., placed below, or in front of the base of the pectoral fins.....14
- 13.—Dorsal fin single, composed of rays only, or rarely with a very small spine just anterior to fin.....See Key I, p. 25
- Dorsal fins 2, the anterior composed of spines, the posterior chiefly of soft rays.....See Key J, p. 25
- 14.—Ventral fins with definitely one spine and five rays.....15
- Ventral fins with number of spines and rays not definitely one spine and five rays. (Occasionally the ventral fins may resemble barbels and be found near the chin).....46
- 15.—Lateral line absent; spinous portion of dorsal fin least developed; caudal fin rounded or pointed.....*Eleotridae*, p. 217
- Without the above combination of characters.....16
- 16.—Suborbital with a bony stay extending across the cheek; cheeks sometimes mailed.....17
- No suborbital stay across the cheeks; cheeks not mailed.....18
- 17.—Lowermost rays of pectoral fin detached; head bony and hard..*Triglidae*, p. 191
- Pectoral fins entire, no detached rays; head large, with prominent ridges; body and head often with dermal flaps.....*Scorpaenidae*, p. 185
- 18.—Some or all of the dorsal or anal spines disconnected, the former depressible in a groove.....19
- Dorsal spines, if present, all or nearly all connected by membrane....20
- 19.—Anal fin preceded by two free, rather short spines (sometimes obsolete in the very old and joined by membrane in the very young); oesophagus normal, without teeth; preopercle entire; teeth, if present, moderate; caudal fin broadly forked; often with a series of enlarged scales along the posterior part of the sides.....*Carangidae*, p. 103
- Anal fin long, not preceded by free spines, with 3 or more connected spines; ventral fins sometimes wanting in adults; oesophagus provided with lateral sacs which are toothed internally.....*Stromateidae*, p. 102
- 20.—Dorsal and anal fins followed by a series of detached finlets; anal fin not preceded by free spines; caudal peduncle with a prominent lateral keel;

- caudal fin broadly forked.....21*
- Dorsal and anal fins not followed by finlets.....22
- 21.—More than 20 gill rakers on the lower limb of the 1st gill arch; rather robust fishes with the anterior part of the body in a corselet.
Thunnidae, p. 98
- Fewer than 20 gill rakers on the lower limb of the 1st gill arch; teeth in jaws rather strong, somewhat compressed, sometimes triangular, with sharp cutting edges; no corselet; elongate rather slim fishes.
Scombridae, p. 97
- 22.—Ventral fins broad, very large and black; small fishes growing to 6 or 8 inches long with very conspicuous vertical dark cross bands; found only in the company of Portuguese Man-of-War....*Nomeidae*, p. 103
- Without the above combination of characters.....23
- 23.—Caudal peduncle armed with a strong spine, capable of being turned outward.....*Acanthuridae*, p. 183
- Caudal peduncle not armed with a strong spine.....24
- 24.—Two long unbranched barbels on the lower surface of the under jaw.
Mullidae, p. 171
- Throat without two long barbels.....25
- 25.—A single nostril on each side of the head; lateral line ending under the soft dorsal fin; anal fin with 2 spines.....*Pomacentridae*, p. 192
- Two nostrils on each side of head.....26
- 26.—Lateral line extending to tip of middle rays of caudal fin.....27
- Lateral line not extending onto the caudal fin.....29
- 27.—3 anal spines, the second usually strong; dorsal fins separate.
Centropomidae, p. 121
- One or two anal spines, dorsal fins deeply notched.....28
- 28.—Preopercular margin with a membranous border, never with bony serrae; upper jaw with a pair of very large canines at the tip, these usually curved inward and backward, one of them often obsolete.
Otolithidae, p. 177
- Preopercular margin with bony serrae or at least with one or more spines, or membranous without spines and without large canines at the tip of the lower jaw.....*Sciaenidae*, p. 172
- 29.—Gills $3\frac{1}{2}$ (half of the gill-filaments of the last arch missing) the slit behind the last arch very small or wanting (Parrot-fish and Wrasses)....30
- Gills 4; a long slit behind the last one.....32
- 30.—Teeth in jaws coalesced at the sides, usually forming a continuous cutting edge, and with an evident median suture between the groups of teeth of each side of the jaw.....*Scaridae*, p. 207
- Teeth in the jaws nearly or quite distinct, some of the anterior ones enlarged and forming canines.....31
- 31.—Dorsal fin with 11 to 14 spines.....*Labridae*, p. 200

* Occasionally the dolphins (*Coryphaenidae*) have the dorsal rays broken up into "finlets." This family may be readily separated from the two families mentioned under 21 by having the dorsal fin beginning on the head. Also a few of the *Carangidae* have finlets; this family may be recognized by the two free spines before the anal fin.

- Dorsal fin with 8 to 9 spines.....*Coridae*, p. 202
- 32.—Teeth setiform like the teeth of a brush or at least very slender, movable; body very short and deep; soft fins completely scaled; gill-membranes attached to the isthmus.....33
- Teeth not very slender or bristle-like, usually fixed; gill-membranes free from the isthmus or nearly so.....34
- 33.—Spinous and soft dorsal fins continuous; teeth numerous, slender, bristle-like
Chaetodontidae, p. 179
- Dorsal fins deeply notched or divided; teeth slender, but scarcely bristle-like.....*Ephippidae*, p. 178
- 34.—Upper jaw extremely protractile, the basal process of the premaxillary very long, entering a groove at top of the cranium just underneath the skin; scales large, silvery.....*Gerridae*, p. 167
- Premaxillaries moderately or not at all protractile.....35
- 35.—Dorsal fin very long, beginning on the head, no definite spines; caudal fin widely forked.....*Coryphaenidae*, p. 101
- Dorsal fin shorter, not beginning on the head, the anterior portion with spines, either very weak or well developed.....36
- 36.—Dorsal spines very weak, 6 in number, the spinous dorsal very low and forming but a very small portion of the very long dorsal fin; elongate fishes with conical head furnished with fairly large curved conical teeth; tail crescentic, the tips produced into filaments..*Malacanthidae*, p. 177
- Dorsal spines strong, usually greater in number, in one case less than 6.....37
- 37.—Anal spines 2; dorsal fins well separated; scales large....*Amiidae*, p. 118
- Anal spines 3; dorsal fin continuous or rarely divided.....38
- 38.—Maxillary not or only partly sheathed by the preorbital bone; opercles usually ending in one or two flat spines.....39
- Maxillary slipping for the most part under the preorbital and more or less completely shielded by the latter; opercle without spines.....43
- 39.—Vomer without teeth; dorsal fin continuous; soft dorsal and anal fin large, almost as large as the caudal fin.....*Lobotidae*, p. 145
- Vomer and palatines usually with teeth.....40
- 40.—Anal fin nearly as long as the dorsal and similar to it; head and body everywhere with rough scales; body rather deep, compressed; post-ocular part of head shortened; scarlet fish with large eyes.
Priacanthidae, p. 144
- Anal fin shorter than dorsal; head not everywhere covered with rough scales, body usually quite elongate and generally more or less compressed; postocular part of head not shortened.....41
- 41.—Supplemental maxillary (a small bone found lying along the upper edge of the maxillary) present.....*Epinephilidae*, p. 124
- Supplemental maxillary bone absent.....42
- 42.—Lateral line continuous, parallel more or less with the back.
Serranidae, p. 133
- Lateral line running close to the back, interrupted below center of soft dorsal fin and continued again lower down on the center of the caudal peduncle.....*Pseudochromidae*, p. 143

- 43.—Teeth on jaws not all incisors, canines or molars present; alimentary canal comparatively short; carnivorous fishes.....44
 —Teeth on anterior part of jaws incisors; no molars or canines; alimentary canal very long; herbivorous fishes.....*Kyphosidae*, p. 166
- 44.—Vomer with teeth, these sometimes very small; teeth in jaws usually unequal, some of them more or less canine-like..*Lutianidae*, p. 146
 —Vomer without teeth.....45
- 45.—Teeth on sides of jaws not molar-like, all pointed but with no marked canines; preopercle usually serrate.....*Haemulidae*, p. 154
 —Teeth on sides of jaws molar-like, the anterior teeth conical or more or less incisor-like; preopercle entire.....*Sparidae*, p. 163
- 46.—Ventral fins with more than five rays; body covered with firm, strongly serrated scales; anal fin with 4 strong spines.....*Holocentridae*, p. 78
 —Ventral fin with fewer than five rays.....47
- 47.—Dorsal fin with soft rays only¹.....48
 —Dorsal fin consisting of spines only, or partly of spines or at least of simple unbranched rays.....49
- 48.—Dorsal fin single, continuous around the caudal with the anal fin.
Ophidiidae, p. 251
 —Dorsal fin double, the anterior fin a single ray placed on the posterior part of the head, widely separated from the second dorsal fin; ventral fins long.....*Bregmacerotidae*, p. 73
- 49.—Pectoral fins divided into two parts, the anterior part nearly as long as the head, composed of about six rays, the other part produced, reaching nearly to base of caudal in adult (shorter in young), used as organs of flight.....*Cephalacanthidae*, p. 191
 —Pectoral fins not divided; dorsal spines usually numerous, gill membranes usually more or less united to the isthmus.....50
- 50.—Body with scales.....*Clinidae*, p. 228
 —Body without scales.....51
- 51.—Dorsal fin composed of spines only.....*Chaenopsidae*, p. 249
 —Dorsal fin composed of rays or of spines and rays.....52
- 52.—Top of head not covered with short spines.....*Blennidae*, p. 241
 —Top of head covered, especially anteriorly, with short, forward pointing thick-set spines.....*Emblemariidae*, p. 244
- 53.—Gill membranes free from the isthmus.....54
 —Gill membranes broadly united to the isthmus.....55
- 54.—Body extremely elongate, band shaped, tapering posteriorly; no scales; caudal fin wanting.....*Trichiuridae*, p. 100
 —Body compressed, rather short, rounded, with a caudal fin..*Stromateidae*, p. 102
- 55.—Dorsal fins 2, the anterior of 1 to 3 spines and inserted just behind the cranium, the posterior one separate and composed of soft rays only; body short and deep, much compressed.....56
 —Dorsal fin continuous, composed of soft rays only.....57
- 56.—First dorsal with 3, rarely 2, spines, the first spine very large, the second

¹ The family *Emblemariidae* under No. 52, may at times be judged to fall under this heading.

locking it when erected; scales rather large, bony, forming a coat of mail.

Balistidae, p. 253

- First dorsal fin with a single spine with a rudiment at the base; scales minute, bearing very slender spines making the surface of the body rough velvety.....*Monacanthidae*, p. 254
- 57.—Teeth in each jaw divided by a median suture; body not covered with large bony spines, naked or with small prickles.....58
- Teeth in each jaw undivided, no median suture; body covered with strong bony spines.....*Diodontidae*, p. 267
- 58.—Nostrils without a distinct tube or tentacle; a single opening on each side; back compressed and produced into a short prominence over the pectoral fins.....*Canthigasteridae*, p. 266
- Nostrils with a distinct tube or tentacle back rounded, not compressed.
Tetraodontidae, p. 263

Key B

Sharks, Skates, Rays, etc.

- 1.—Body fusiform in shape, pectoral fins not attached to the head; gill openings at side of body (Sharks).....2
- Head and body depressed and disk-like; gill-openings on under side of body; tail slender, usually with one or more serrated spines (Rays, Stingarees, Skates, Mantas).....5
- 2.—Nictitating membrane absent; nostrils with a naso-oral groove and with a prominent barbel; first dorsal fin inserted over the ventrals.
Orectolobidae, p. 26
- Nictitating membrane present.....3
- 3.—Teeth depressed, paved, several series functioning...*Galeorhinidae*, p. 26
- Teeth more or less compressed, triangular, one or two series functioning..4
- 4.—Head normally shaped, not expanded and hammer-shaped.
Carcharinidae, p. 27
- Head expanded, hammer-shaped; the eyes at the outer extremities of the head.....*Sphyrnidae*, p. 29
- 5.—Disk subcircular, no cephalic appendages.....*Dasyatidae*, p. 30
- Disk broad and angular, the outer tips produced into “wings”.....6
- 6.—Head produced into a rostral process; no cephalic appendages.
Myliobatidae, p. 31
- Head with two long, rather broad, horn-like appendages.
Mobulidae, p. 32

Key C

- 1.—Spinous dorsal fin present; small ctenoid scales present.
Aulostomidae, p. 86
- Spinous dorsal fin absent.....2
- 2.—Middle rays of caudal fin prolonged into a long filament. Body scaleless, but with bony plates on various parts of the body mostly covered with skin.....*Fistularidae*, p. 87

- Middle rays of caudal fin, when present, not produced into a long filament; body hard, leathery, sometimes tubercular, marked off into segments; shaped either slender and with head in line with body (pipe-fishes), or robust with head at right angles to body (sea-horses).

Syngnathidae, p. 83

Key D

- 1.—Sucking disk placed on top of the head and formed of lamellae.
Echeneididae, p. 227
- Sucking disk placed on the belly.....2
- 2.—Sucking disk formed by the ventral fins alone, the fins of the right and left sides connected together as one fin, with a velum across their base, forming a "cup".....*Gobiidae*, p. 220
- Sucking disk formed only partly by the ventral fins, the fins usually confined to the sides of the disk; dorsal fins composed of soft rays only.
Gobiesocidae, p. 251

Key E¹

- 1.—Both jaws equally elongated.....*Belonidae*, p. 63
- Lower jaw only elongated, the upper short.....*Hemirhamphidae*, p. 66

Key F

- 1.—Dorsal fin single, composed of soft rays only and situated quite far back on the body.....*Exocoetidae*, p. 72
- Dorsal fin composed of spines and rays, the former sometimes very slender.
2
- 2.—Ventral fins with 1 spine and 5 rays; 3 lowermost rays of the pectoral fins free and separate, the remainder of the fin sometimes quite long; head bony and rough, but without the exceptionally long spines mentioned below. (These fish do not fly, but they have been included here because of the size of the pectoral fins, which are sometimes quite long.)
Triglidae, p. 191
- Ventral rays fewer than 5; the pectoral fins in two parts, the anterior part nearly as long as the head, composed of about 6 rays, the other part produced and reaching nearly to the caudal in adult, shorter in the young; head bony, a long bony process ending in a sharp spine extending from nape to or beyond the dorsal fin; preopercle extending backward as a long spine .....*Cephalacanthidae*, p. 191

Key G

- 1.—Skin covered with rudimentary scales which are embedded and placed at right angles to each other; mouth terminal, the lower jaw somewhat projecting; teeth in bands on the jaws and vomer.....*Anguillidae*, p. 50
- Scales absent.....2

¹ Some of the flying fishes, *Exocoetidae*, especially the young, occasionally have elongate bills.

- 2.—Gill openings well developed; tongue present; pectoral fins usually present. 3
  - Gill openings very small; pectoral fins absent; tongue absent; skin thick, leathery.....*Muraenidae*, p. 53
- 3.—Tip of tail with distinct fin rays, the dorsal and anal fins usually confluent around it 4
  - Tip of tail without fin rays, the dorsal and anal fins not extending around it, the tip ending in a hard, horny point.....*Ophichthyidae*, p. 52
- 4.—Body fairly robust, not worm-like; posterior nostril situated entirely above the upper lip; tongue rather narrow; vomerine teeth well developed; head conical, somewhat pike-like.....*Muraenesocidae*, p. 51
  - Body slim and very long, worm-like; the posterior nostril situated in the upper lip. ....*Echelidae*, p. 51

Key H

- 1.—Eyes large and well separated; preopercular margin usually distinct and not hidden by skin and scales.....*Bothidae*, p. 73
  - Eyes small, close together; preopercular margin adnate, hidden by skin and scales.....2
- 2.—Body short and ovate; the eyes and color on the right side...*Achiridae*, p. 76
  - Body elongate, more or less lanceolate; the eyes and color on the left side.
Cynoglossidae, p. 77

Key I

- 1.—Adipose fin absent; head not lizard-like.....2
  - Adipose fin present; mouth large; head lizard-like in shape; body more or less cylindrical, tapering from the head backward...*Synodontidae*, p. 60
- 2.—A bony plate between the arms of the lower jaw.....3
  - No bony plate between the arms of the lower jaw.....4
- 3.—Scales very large; lateral line decurved; last ray of the dorsal fin elongate.
Megalopidae, p. 33
  - Scales small; lateral line straight; last ray of the dorsal fin not elongate.
Elopidae, p. 32
- 4.—Lateral line present; tongue and base of skull inside mouth with patches of coarse blunt teeth.....*Albulidae*, p. 37
  - Lateral line wanting; tongue and base of skull without coarse blunt teeth...5
- 5.—Mouth moderate in size, terminal, usually more or less oblique.....6
  - Mouth large, inferior, usually horizontal, the snout overhanging the mouth; mandible long and slender.....*Engraulidae*, p. 45
- 6.—Belly compressed, usually forming a more or less sharp edge along which are serrae.....*Clupeidae*, p. 39
  - Belly rounded, without serrae.....*Dussumieridae*, p. 43

Key J

- 1.—Lower rays of the pectoral fin free and filamentous.....*Polynemidae*, p. 96
  - Lower rays of the pectoral fin not free or filamentous.....2

- 2.—Lateral line present; teeth very large, unequal; jaws long and strong; head long, pike-like. . . . . *Sphyraenidae*, p. 92
—Lateral line absent; head not pike-like or produced; jaws rather weak. . . . 3
3.—Anal fin with a single weak spine; first dorsal fin with 3 to 9 flexible spines. *Atherinidae*, p. 88
—Anal fin with 3 stiff spines (2 in very young); first dorsal with 4 stiff spines. *Mugilidae*, p. 90

ANNOTATED LIST OF FISH OF PORT-AU-PRINCE BAY,
HAITI

Family ORECTOLOBIDAE; NURSE SHARKS

Ginglymostoma Muller and Henle, 1837

Nurse Shark

Ginglymostoma cirratum (Bonnaterre)

REFERENCES: *Squalus cirratus*, Bonnaterre, 1788, Tableau Encyclo. Ichth.,
p. 7.

Ginglymostoma cirratum, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 29.

FIELD CHARACTERS: A large, blunt-headed shark; a fleshy flap in front of the small mouth with a barbel on each side; two large dorsal fins placed far back; brown, the young sometimes spotted.

DESCRIPTION: A young female measured: Total length 692 mm., length to tail notch 496, depth 87, head to last gill-slit 140, eye 6.

SIZE AND WEIGHT: One young specimen 27.25 inches in total length, weighed 4.25 pounds. The species grows to 10 feet.

COLOR: Uniform olive brown above, fading to olive buff below.

GENERAL RANGE: Warm seas of the western hemisphere from Carolina to southern Brazil, and on the west coast of Mexico. A straggler to Rhode Island.

DISTRIBUTION IN PORT-AU-PRINCE BAY: One young individual taken near shore, over shallow bank.

METHOD OF CAPTURE: Caught in net by native fisherman.

FOOD: Two six inch parrot fish (*Sparisoma flavesce*) swallowed entire.

STUDY MATERIALS: Specimens, 1; young female, 692 mm., No. 7094.

Family GALEORHINIDAE; DOGFISH

Galeorhinus Blainville, 1816

Haitian Dogfish

Galeorhinus sp.

NOTE: I include this genus in the list of Haitian fish from the careful scrutiny I was able to give, on two occasions, to parent sharks of small size swimming

slowly about the schooner. The extremely flattened, elongated head and the two large dorsal fins of equal size insure the certainty of generic identification.

One shark, five feet long, swam past on April 3rd, accompanied by two young, each about a third of her length. On May 4th a smaller dogfish circled the schooner, well under five feet in length, and had with her two young, certainly not over twelve inches in length. (W. B.)

Family CARCHARHINIDAE; TRUE SHARKS

Key to Port-au-Prince Bay Genera

- A. Small labial fold on upper and lower jaw at angle of mouth.....*Scoliodon*
- AA. Labial folds wanting; teeth more or less serrate on both margins of the cusp.....*Carcharhinus*

Scoliodon Muller and Henle, 1837

Sharp-nosed Shark
Scoliodon terraenovae (Richardson)

REFERENCES: *Squalus terraenovae*, Richardson, 1836, Fauna Bor. Amer. III, p. 289.

Scoliodon terraenovae, Meek and Hildebrand, 1923, Marine fishes of Panama, I, p. 55.

FIELD CHARACTERS: A small-sized shark, reaching a length of three feet; teeth smooth; upper and lower lips with a labial fold extending from the angle of the jaw forward for less than one-third the length of the jaw.

DESCRIPTION: The following measurements were recorded of the largest and smallest specimens taken:

	No. 7141 Young female	No. 7109 Young male
Total length	405 mm.	668 mm.
Preoral length	33.5 "	46 "
Length to base of 1st dorsal	135.5 "	198 "
Width at nostrils	35 "	46 "
Interorbital area	35 "	51 "
Snout	37 "	52.8 "
Internostril angle from mouth	16 "	21 "
" " " snout	25 "	34 "
Eye to nostril	13.5 "	19 "
Internarial space	24 "	33.5 "
Eye	10.5 "	13.5 "
Width of mouth	32 "	43 "
Preoral into base of 1st dorsal	1.06	1.1
Width nostrils into preoral	1.05	1
Eye greater than nostril width	Yes	Yes
Teeth in outer row in each jaw	21	23
Upper labial fold		12 mm.

SIZE AND WEIGHT: A 15 inch female weighed 610 grams. A 20 inch male weighed 3 pounds.

COLOR: Pale shark gray above, turning to white below; dorsals and caudal edged with black, second dorsal and lower lobe of caudal broadly so. Iris greenish silver.

GENERAL RANGE: Labrador to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Occasionally brought into the market by fishermen.

ABUNDANCE: Fairly common.

METHOD OF CAPTURE: Mainly taken in nets by the natives.

FOOD: Unidentifiable parrot fish.

YOUNG: Three of our specimens, including No. 7141 were of the same brood, the umbilical cord still being in evidence. These were taken April 4th.

STUDY MATERIAL: 6; 405-668 mm. including Nos. 7109, 7141.

Carcharinus Blainville, 1816

Key to Port-au-Prince Bay Species

- A. Teeth slightly serrated, similar in form in the two jaws, narrow, claviform, constricted at base; snout rather sharp; fins edged with black. *limbatus*
- AA. Teeth in both jaws distinctly serrate in adult, serrae on lower teeth smaller; upper teeth rather broad, lower teeth narrower; snout not very acute; color deep blue gray.....*falciformis*

Spot-fin Ground Shark, *Caconeta*
Carcharinus limbatus (Müller and Henle)

REFERENCES: *Carcharias limbatus*, Müller and Henle, 1841, Plagiostomen, 49, Pl. XIX, fig. 9 (Martinique).

Carcharhinus limbatus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 41.

NOTE: I include this species on the fact that when I started my deepest dive of sixty feet on March 23, 1927 over the schooner's side, several fathoms below the surface a shark over nine feet in length, attended by a single young about three feet long, passed slowly by me. The only feature which remains in mind is the extensive and intense black tips of at least three fins, the two dorsals and the anal. They appeared much blacker than I have ever observed in sharks of this species after being drawn from the water. (W. B.)

Scythe-shaped Shark
Carcharinus falciformis (Bibron)

REFERENCES: *Carcharhinus falciformis*, Bibron, 1838, in Müller and Henle's Plagiostomen, p. 47:
Carcharhinus falciformis, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 62.

FIELD CHARACTERS: Large sized blue grey shark. Upper teeth much broader than lower and deeply notched on the outer margin; snout to mouth not greater than width of mouth; no sharp lobe to nasal flap; second dorsal and anal fins subequal.

DESCRIPTION: The female specimen captured showed the following measurements:

Total length	1093 mm.
Length to base of caudal fin	838 "
Snout to first gill opening	213 "
Length of caudal from pit	292 "
Length of pectoral	150 "
Snout to mouth	83 "
Width of mouth	83 "
Snout to origin of dorsal	401 "
Origin of dorsal to caudal pit	448 "

SIZE AND WEIGHT: Reaches a length of 10 feet. Our 43 inch fish weighed 13 pounds.

COLOR: Dark shark grey.

GENERAL RANGE: West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: The small specimens were taken over the deeper fishing reefs.

METHOD OF CAPTURE: Taken on set line by native fishermen.

FOOD: Two fish hooks and eight inches of line on each were found in the stomach of the young female, together with a small piece of fish, probably bait.

STUDY MATERIAL: Specimens, 2; young female, 3 feet 7 inches long, No. 6940; young male, 3 feet long, No. 7137.

Family SPHYRNIDAE; HAMMERHEAD SHARKS

Sphyrna Rafinesque, 1810

Hammerhead Shark

Sphyrna zygaena (Linnaeus)

REFERENCES: *Squalus zygaena*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 234.
Cestracion zygaena, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 58.

FIELD CHARACTERS: A large shark with the head depressed and greatly expanded from side to side, the eyes being placed on the forward part of the lateral expansions.

NOTE: No specimens taken. A hammerhead shark, about nine feet long, swam close about the schooner all the afternoon of March 10th. It was pale grey with the posterior edges of the fins black.

SIZE: The species grows to a length of 17 feet.

Family DASYATIDAE; STING RAYS

Urobatis Garman, 1913

Round Sting Ray

Urobatis sloani (Blainville)

REFERENCES: *Leiobatus sloani*, Blainville, 1816, Bull. Soc. Philom., p. 121.

Urolophus jamaicensis, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 81.

FIELD CHARACTERS: Flattened disk-like ray with rayed caudal fin, the disk ovate, longer than broad and slightly longer than tail; brown sprinkled with yellow or orange dots, sometimes forming ocelli.

DESCRIPTION: Measurements of two specimens:

Length total	304 mm.	145 mm.
Length disk	176 "	76.5 "
Width disk	152 "	76 "
Length caudal spine	41 "	13 "

It can be seen from the measurements that the smaller fish has a disk that is almost round and that the tail is almost as long as the disk. The upper surface of the smaller is nearly smooth.

SIZE: The largest specimen obtained by us had a disk length of 190 mm. and a total length of 340 mm.

COLOR: In the larger preserved specimen the round yellow or orange spots are smallest on the mid-line, becoming larger on the periphery of the disk and on the caudal fin. This is also true to a certain extent in the smaller specimen (76.5 disk length) except that on the outer edges of the disk the darker color which surrounds the lighter spots has broken up, so that the color of this part of the fish could be described as a light background with broken reticulations and small spots of dark color.

GENERAL RANGE: West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found on the bottom, rather widely distributed, especially over muddy and sandy bottoms.

ABUNDANCE: Rather common. Seen two or three times a week at the market.

METHOD OF CAPTURE: Taken in wire traps baited with chicken remains and set on the bottom at fifty feet. Also captured by hooks and lines by native fishermen and by small seines along shore.

FOOD: The 190 mm. ray contained the remains of four shrimps, *Peneus brasiliensis*. The smaller fish contained comminuted bottom detritus.

SIZE AT MATURITY: The 190 mm. male was in breeding condition on March 22, 1927.

STUDY MATERIAL: Photographs, 3731, 4126; Specimens, 4; 76.5 to 190 mm. disk length, including Nos. 6853 and 7164.

Family MYLIOBATIDAE; EAGLE RAYS

Aetobatus Blainville, 1816

Eagle Ray

Aetobatus narinari (Euphrasen)

REFERENCES: *Raja narinari*, Euphrasen, 1790, Handl. K. Sven. Vet. Akad., XI, p. 217, pl. X.

Aetobatus narinari, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 89.

FIELD CHARACTERS: Flattened rays with pointed wings; head elevated, compact; tail long and lash-like with two serrated spines at the base; upper surface with numerous, round, whitish spots.

SIZE AND WEIGHT: Grows to 12 feet long, 7.5 feet wide, and an estimated weight of 450 pounds.

COLOR: A 30-inch specimen is clear green blue grey above, the numerous spots being pearly white, each surrounded by a broad, dark ring; those near the posterior edge of the wings and on the pelvic fins have a large dark center. The spots average 15 mm. in diameter and about the same distance apart; those on the snout merge into bands converging toward center of snout; under surface ivory white, immaculate; pupil vertical, iris silvery.

GENERAL RANGE: Tropical parts of the Atlantic and the eastern Pacific.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Seen near surface, over fairly deep fishing reefs.

ABUNDANCE: Fairly common, according to native fishermen.

METHOD OF CAPTURE: Taken in seines.

STUDY MATERIAL: Photographs, 3919, 4154, 4155, 4156, 4157; Specimens, 3, 300-750 mm., including No. 6953.

Family MOBULIDAE; GIANT DEVILFISH

Manta Bancroft, 1829 **Giant Devil Fish; Great Manta***Manta birostris* (Walbaum)REFERENCES: *Raja birostris*, Walbaum, 1792, Artedi Piscium, p. 535.*Manta birostris*, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 94.

FIELD CHARACTERS: A flattened ray growing to great size; with pointed and curved wings; two large fleshy cephalic fins; a short whip-like tail; black above.

GENERAL RANGE: Tropical waters on both coasts of America, straggling to New York.

NOTE: No specimen taken, but a medium-sized one observed on January 6, 1927, half way between Port-au-Prince and Gonave Island. On January 12th, one about 6 feet across seen partly cut up at the fish-market.

Family ELOPIDAE; THE TEN POUNDERS

Elops Linnaeus, 1766 **Big-eyed Herring***Elops saurus* LinnaeusREFERENCES: *Elops saurus*, Linnaeus, 1766, Syst. Nat., Ed. XII, p. 518 (Carolina).*Elops saurus*, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 175.

FIELD CHARACTERS: A slender, elongate fish with a large normal mouth, a single, soft-rayed dorsal fin in middle of back; very large adipose eyelid; scales small and absent on the head. Uniform bluish above, silvery on sides and below.

SIZE AND WEIGHT: A specimen 10½ inches long weighed 92 grams.
GENERAL RANGE: Atlantic coast from Massachusetts to Brazil.
ABUNDANCE: Apparently rather rare, not seen at the market during our stay.
A small female seined April 18, 1927.
FOOD: Our single specimen contained one shrimp, *Peneus brasiliensis*, and the heads of two small fish of its own species.
STUDY MATERIAL: Photographs, Specimens, 1; 258 mm., No. 7172.

Family MEGALOPIDAE; TARPONS
Tarpon Jordan and Evermann, 1896

Tarpon
Tarpon atlanticus (Cuvier and Valenciennes)

REFERENCES: *Megalops atlanticus*, Cuvier and Valenciennes, 1846, Hist. Nat. Poiss., XIX, p. 398.
Tarpon atlanticus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 174.
FIELD CHARACTERS: Large, silvery, compressed fish with a large mouth and undershot lower jaw; a single soft-rayed dorsal fin in middle of back, the last ray of which is long and filamentous; scales very large and heavy.
DIMENSIONS: The measurements of five arbitrarily chosen individuals are given below:

	<i>a</i>		<i>b</i>		<i>c</i>		<i>d</i>		<i>e</i>
Length	78	mm.	122	mm.	128	mm.	188	mm.	1060 mm.
Depth	20	"	30	"	33	"	46.5	"	257 "
Head	22	"	30	"	34	"	48	"	239 "
Eye	6	"	9	"	10	"	11	"	43 "
Snout	5.8	"	8	"	8	"	12	"	
Maxillary	13	"	19.5	"	20	"	30	"	148 "
Length pectoral	15	"	25	"	26	"	36	"	
Length last dorsal ray	8	"	22	"	28	"	42	"	287 "
Dorsal rays, number	14		14		14		14		14
Anal rays, number	22		22		22		22		22
Weight	5 grams						65 gr.		36 lbs.

Taking the largest specimen and calling each of its measurements 100% we find that the percentages of size of the smaller individuals *a* and *d* are as follows:

	<i>a</i>	<i>d</i>	<i>e</i>
Length	7.4%	17.7%	100%
Depth	7.8"	18 "	100 "
Head	9.2"	20 "	100 "
Eye	14 "	25.5 "	100 "
Maxillary	8.7"	20 "	100 "
Length, last dorsal ray.	2.7"	14.6 "	100 "

It is of interest to observe in this table that the eye is of greater size pro-

portionately and changes least in comparative size,—a character which might be expected in the development of the fish; and that the last dorsal ray is relatively small in smaller fish.

SIZE AND WEIGHT: Three individuals taken during the expedition gave the following weights:

Length	78 mm.	or	3 inches,	weight	5 grams
"	188	"	8	"	65
"	1060	"	40	"	36 pounds

The world's record for size, at this date, is 8 feet 2 inches long with an estimated weight of 350 pounds.

COLOR: The thirty-six pound fish had a black dorsal fin with a broad golden edge.

GENERAL RANGE: Atlantic coast, from Massachusetts to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Adults were rather rare and found mostly near coral reefs and along shore. The young were found in abundance in February in a land-locked lagoon at Source Matelas, approximately 15 miles northwest of Port-au-Prince.

Samples of water from the lagoon where these fishes were captured were submitted to Mr. N. McKaig, Jr., Assistant Chemist of the Service Technique of Haiti. A portion of his preliminary report is given here, "I have started analysis of the water of the Tarpon Lagoon and have found it to be rather interesting. It has a density of 1.0374 and contains 54,000 parts per million total solids, which, as you see, is much denser than ordinary sea water. The hydrogen sulphide content is low, about 5 parts per million in the sample which I received."

METHOD OF CAPTURE: In large seines. Not known to take a hook in Haitian waters according to local fishermen. Two members of our party trolled industriously with various types of tarpon gear and failed to raise a fish. Whether this was the result of its being the wrong time of the year is not known, but as far as we could gather this seems to be the experience of the Haitian sportsmen, also.

The young were taken in small bait seines dragged through the shallow waters of their lagoon.

EGGS: The 40-inch fish contained an estimated 891,000 eggs.

YOUNG: An account of the capture of young individuals of this species has been published by William Beebe in the Bulletin of the New York Zoological Society, September–October, 1927, Vol. XXX, No. 5, page 141, under the title of "A Tarpon Nursery in Haiti." Part of this article is republished in the following paragraphs:—

"About fifteen miles west of Port-au-Prince, Haiti, along the shore of the gulf itself, I located two, interconnected, land-locked lagoons known as Source Matelas.

"The more western of the lagoons was a rounded body of water about one hundred yards across, on a marshy promontory backed by low, rolling hills. These were covered with the usual semi-arid vegetation, consisting of cactus, cereus and acacias. From the waters of the gulf the lagoon is separated only by a narrow dyke built up apparently by the action of the storm waves at high water.

"In mid-January I walked into the mud at the edge of one of the lagoons and out

to the center. There I found half a foot of mud and about eighteen inches of water. This was green and muddy but not slimy. It was impregnated with sulphur and the odor of this element rose strongly from the disturbed mud. A few miles away was a constantly flowing sulphur spring, used to bathe in by the natives, and this lagoon has apparently some connection with the same source of supply. This unprepossessing liquid was filled with innumerable small insects which, upon examination, proved to be water-boatmen (*Corixidae*), both adults, with handsomely variegated, yellow elytra, and young which looked at first glance amazingly like copepods. These have been identified as *Trichocorixa reticulata* (Guerin).

"I saw no signs of fish and was about to return to shore when something nipped my ankle. This happened again, and I called for the seine. We had hardly commenced to draw it when small fish began leaping high to escape it. Closing the net I secured a considerable number, and when we examined our catch on the shore I found thirty-six tarpon, *Tarpon atlanticus* (Cuvier and Valenciennes), ranging from two to eight inches. When I recovered from my first astonishment at seeing these clean-scaled, virile fish living in this sulphurous, stagnant pool, I examined the smallest for any hint of the leptocephalus stage through which it is assumed they must pass early in life. Neither this, nor a later, much more thorough examination showed in these young fish any hint of such phase—even the smallest was as normal and perfectly formed as any six-foot giant of the Florida waters. This may mean only that the leptocephalid characters disappear when the fish are still smaller.

"My next visit to Source Matelas was on January twenty-third, when I made a haul with the seine in the same place and secured a heavy load of tarpon. When we counted our catch on shore, we found one hundred and fifty-four of the young fish, from three to seven inches in length. One individual measured thirteen inches. It was a pure culture of tarpon, except for three small snook, *Centropomus undecimalis* (Bloch). Several times as many tarpon as we took escaped by leaping over the top of the seine as we were pulling it, some of them rising three feet clear of the surface. We threw back all but the few which we wished to keep as specimens.

"My third visit was two months later, after heavy storms had set in, on the twenty-first of March.

"I found the lagoon dyke broken through, and the tide pouring into a three-foot sluiceway. A thorough seining of the first lagoon netted six tarpon, measuring from four and a half to seven inches, together with a two-inch snook. Ultimate hauls failed to secure another fish of any kind. A seine haul in the second lagoon yielded four small mojarras, *Eucinostomus californiensis* (Gill), recent emigrants from the open water outside. The water-boatmen were as abundant, and the sulphur smell quite as strong as ever, in spite of the infiltration of the water from the gulf.

"The most interesting development of this last haul of young tarpon was that when we examined five of the fish in aquariums on the schooner, we found that there was something the matter with their eyes—a grey, translucent film clouding the tissue of the lens or the humor behind it, the aspect being wholly unlike the appearance of the eyes of the fish taken two months before. They seemed to be quite blind. Whether this affliction was connected with their remaining in the lagoon after the hundreds or thousands of their fellows had escaped to the open gulf can be only surmised. It could hardly have interfered with their feeding, as the water-boatmen were present in uncounted millions, and a single scoop with a quart jar would secure large numbers.

"The only other mention of an actual nursery of tarpon is in Evermann and Marsh's "Fishes of Porto Rico," page 80, where we find the following note: "Common about Porto Rico where it evidently breeds, as numerous immature individuals were taken at Hucares and Fajardo. The four examples from Hucares are from 7.5 to 11.5 inches long and were seined in a small brackish pool of dark-colored water, not over five feet deep, in the corner of a mangrove swamp, and at that time (February) entirely separated from the ocean by a narrow strip of land scarcely 25 feet wide. The thirteen others are nearly all very young, of 2.25 to 3.25 inches, collected at Fajardo." A few tarpon, from six to eight inches long, have been taken on the north shore of the Gulf of Mexico in Florida, and L. L. Babcock in his

excellent monograph of the tarpon, records a three-inch specimen taken in a cast net on the coast of Texas. He also gives the world's record tarpon as eight feet, three inches, with an estimated weight of three hundred and fifty pounds. This was taken in a net by Florida fishermen.

"My discovery of young tarpon in a land-locked lagoon in Haiti suggests that the Porto Rican record is not a casual accident, but a usual phenomenon in the life of these fish. On account of the shallowness and the muddiness of the Haitian lagoon, it would be impossible for an adult tarpon of any size to enter it and deposit her eggs. We can only surmise that the eggs are scattered out in the waters of the gulf, sink to the bottom and hatch, and that the young, either as leptocephalids or as very small larval fish, make their way into the lagoon before the season when it becomes cut off from the gulf. Here they live and thrive, with an abundance of food, sheltered from voracious fish and other dangers of the open sea, having to guard only against the keen eyes and sharp beaks of the larger herons, and such unthinkable catastrophes as visiting scientists.

"One of my Haitian fishermen took two good-sized tarpon in his seine not far off shore from Source Matelas. These were thirty-six pounders, more than forty-one inches in length. When diving on Lamentin Reef, several miles across the gulf, I saw a large tarpon again and again. For a number of days in succession this great silver fish would swim toward me on my first submersion, and pass slowly within eight or ten feet, looking me over. When I learned that this would probably happen every time I went down, I devoted all my attention to estimating his exact length. Once he swam past two very tall tube sponges, and I could see distinctly that he overlapped the distance between them in actual body length, not including his tail. I measured this distance and found it six feet, three inches. So even ignoring the slight overlap, he was a full six feet in length of body. He showed no fear, only a gentle curiosity, rolling his great eye about as he passed. His scales reflected the light, even at a depth of twenty-five feet, as a dazzling sheet of bluish silver.

"I could learn of no tarpon being caught on a hook in Haiti, although anglers have made many attempts. The native fishermen were familiar with them, and, as I have said, occasionally found them in their seines.

"The food of the young tarpon consisted entirely of the aquatic hemiptera which filled the waters of the lagoon, a five-inch fish having the remains of sixty-eight of these insects in its stomach. The relative increase in various body measurements from a three-inch, through an eight-inch, to a forty-inch individual, is remarkably uniform, the average of the characters of length, depth, head and eye being 9.6%, and 19.8%, as compared with an arbitrary 100% of the largest fish. The elongated, thread-like, posterior ray of the dorsal fin is developed relatively late in life, the percentages of this character in the same three individuals being 2.7%, 14.6% and 100%. In weight, the relations between the three sizes of fish are tremendously disproportionate. The actual weights are as follows: the three-inch fish, five grams; the eight-inch fish, sixty-five grams; and the forty-inch fish, thirty-six pounds. This makes the percentages:

"Five-inch = .00031% or $\frac{1}{3246}$ of the large fish.

"Eight-inch = .4% or $\frac{1}{250}$ of the large fish."

STUDY MATERIAL: Photographs, 4009, 4018, 4024, 4026, 4010, 4009, 4025; Specimens, 11; 78-1060 mm., all but the largest from Source Matelas; the largest from Port-au-Prince Bay.

Family ALBULIDAE; THE BONE FISHES

Albula Gronow, 1763**Bone-fish; Lady Fish***Albula vulpes* (Linnaeus)

REFERENCES: *Esox vulpes*, Linnaeus, 1758, Syst. Nat., Ed. x, p. 313 (Bahamas, based on *Vulpes bahamensis* of Catesby).

Albula vulpes, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 178; Weber, 1913, Fishes Indo Australian Archipelago, II, p. 7.

FIELD CHARACTERS: Adult: Cylindrical fishes with small mouth placed well back of the projecting pig-like snout; a single soft rayed dorsal fin in the middle of the back; scales rather small. Brilliant silver. Leptocephalid larvae: Teeth 30; transparent except for pigment line along ventral surface; dorsal fin 17, anal fin 8.

SIZE AND WEIGHT: Grows to 31 inches and a weight of 14 pounds. Our 17-inch fish weighed a little over 3 pounds.

COLOR: Brilliant silver, the scales, especially above, with greenish tinge. Top of head greenish. Series of dark lines following the line of the scales, especially prominent above the lateral line. Tips of the dorsal rays, tips of the caudal rays, anterior portion of the anal, and the ventral rays spotted with dusky. A dusky spot at the base of the pectorals superiorly.

GENERAL RANGE: Cosmopolitan in tropical seas.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Adults taken occasionally by native fishermen. The leptocephalid larvae were common at night at the surface during our stay. They were attracted to our lights. Adult fishes about a foot in length also seen at night about light, one on April 22nd and two on the 28th.

ABUNDANCE: Uncommon. Seen occasionally at the fish market, but not especially useful for food.

METHOD OF CAPTURE: Adults taken in seines; larvae taken in scoop nets at surface.

FOOD: Bivalve mollusks and small squids formed the food of a 12-inch fish.

YOUNG: *Leptocephalus larva*; From February 26th to April 30th, in the course of thirty-four evenings of study of the positively phototropic surface organisms at the gang-way of the schooner, the larvae of *Albula vulpes* were absent on only two occasions, while on seventeen nights they were very abundant. They swam by slight, lateral undulations and gathered in numbers, swimming around the submerged light.

No radical change or growth was observed during these two months, although one hundred and forty were preserved, and several thousand examined. The extremes of length were 45 and 60 mm.

Description of a Typical Larva taken at 2000 candle power light
9:00 P. M., February 26. No. 6965

Length	55 mm.	Length of Pectoral	1.4 mm.
Depth	5.7 "	Length of Ventral	.75 "
Head	4.1 "	Length base dorsal	2.3 "
Snout	1.1 "	Length base anal	1 "
Eye	1 "		

Measurement Percentages of Larvae and Adult stages

	Adult	Larva No. 6965
Length	100%	30%
Depth	100%	14%
Snout	100%	5%
Head	100%	.8%
Eye	100%	.9%

There are sixty-four myomeres, the dorsal fin beginning at the fiftieth.

The only pigmentation besides the eye-ball is a very narrow, black line, between the lower edge of the myomeres and the alimentary canal. Anteriorly this is broken into two, short, stitch-like lines to each myomere, but posteriorly the line becomes more connected. There are a few rounded, black pigment cells at the base of the caudal rays, and a scattering of the black stitches along the longest, outer, caudal rays.

The eye-ball is bluish black, with a cap of black pigment, draped in strands like moss or hair over the top of each eye-ball.

The nostrils are very large, double, .4 of a millimeter from the tip of the snout, and occupying .45 of the total length of the snout. The anterior one is round, the posterior one constricted in its lower half.

There are two long, straight, downwardly directed incisors, close together at the symphysis of the upper jaw; then a space, followed by fourteen short teeth, decreasing in length backward, directed almost straight downward. At the point of the lower jaw are two long, needle-like incisors, originating outside and beneath the edge of the jaw, and growing obliquely forward and upward, followed by ten teeth, much longer and more slender than those in the upper jaw, and slanted acutely forward. The upper jaw shows almost no overhang.

The dorsal fin, with the seventeen rays of the adult fish, is well differentiated. The middle rays are the longest, curving rapidly down anteriorly, much less so posteriorly. In front of the dorsal is a short, homogeneous membrane-fin, and behind, another which rises gradually into a low arc and again dies out just in front of the base of the caudal. This fin is granular on the proximal, hyaline on the distal portion.

The anal fin shows the ultimate eight rays. It is close to the caudal, in fact is suspended and extends obliquely out from the body along the outer edge of the hyaline membrane-fin joining the lower caudal rays to the body. The anal fin is immediately preceded by the anus, and anterior to this is a very long, low, hyaline membrane-fin.

The caudal contains twenty-two rays, symmetrically arranged, although the

heterocercal character of this fin is clearly marked. This fin adds 3.4 mm. to the length, making the total 58.4 mm.

The pectorals are well developed, 1.4 mm. in length, and paddle-shaped. The ventrals are much smaller, .75 long, arising at the thirtieth myomere. There is no indication of the axillary scales of the adult.

The vertebrae are clearly distinguishable for the posterior sixteen myomeres, averaging three to a myomere. From the forty-eighth myomere to the base of the urostyle are fifty-two vertebrae, the last six being abruptly narrow, unlike the rest.

Variations: In an individual of 47 mm. the dorsal begins at the fifty-second myomere, but the average is the fiftieth myomere. The extremes of myomeres are 62 and 68.

Extremes of development: In the largest larva taken (No. 7152), with a length of 60 mm., the ventrals are large and distinct, and the anal fin has broken wholly away from the membrane base of the caudal, and lies flat along the body. Although the largest, this is also the most developed, which agrees neither with the figures of Gilbert,¹ nor the description of Meek and Hildebrand.²

STUDY MATERIAL: Photographs, 3936; Specimens—adults, 3; 182–390 mm., including Nos. 7009, 7130; leptocephalid stages, 140; 45–60 mm., No. 6965.

Family CLUPEIDAE; THE HERRINGS

Key to Port-au-Prince Bay Genera

- A. Anal fin with less than thirty rays.
- B. Last ray of the dorsal fin not prolonged into a long filament.
- C. Gill rakers very numerous (105 in our single specimen).....*Clupanodon*
- CC. Gill rakers moderate in number, about 25 to 35.....*Sardinella*
- BB. Last ray of the dorsal fin prolonged into a long filament...*Opisthonema*
- AA. Anal fin with more than thirty rays; jaws with canines...*Chirocentron*

Clupanodon Lacepede, 1803

False Spanish Sardine

Clupanodon pseudohispanicus (Poey)

REFERENCES: *Sardinia pseudo-hispanica*, Poey, 1861, *Memorias*, II, p. 311.

Clupanodon pseudohispanicus, Meek and Hildebrand, 1923, *Marine Fishes of Panama*, I, p. 180.

FIELD CHARACTERS: Small, compressed silvery fishes with weak scutes along belly, small mouth, weak jaws, and with numerous gill-rakers, in our specimen 105.

¹ In Weber and Beaufort's, 1913, "The Fishes of the Indo-Australian Archipelago," II, p. 7

² Meek and Hildebrand, 1923, "The Marine Fishes of Panama," I, p. 179.

DIMENSIONS:

Length	122.5 mm.	Dorsal fin	17
Depth	33 (3.7)	Anal fin	18
Head	30 (4.1)	Scales	50
Eye	7.5 (4)	Scutes	15-13
Snout	8.8 (3.7)	Gill-rakers	105
Maxillary	12 (2.5)		

DISCUSSION: There is considerable likelihood that this represents a new species, but the present lack of knowledge as to exact structural details and comparative osteology of related forms compels us to call it *pseudohispanicus*.

To take the gill-raker count alone we find the following recorded variations:

A—Cuba to Cape Cod ¹	30 to 40 gill-rakers
B—Woods Hole, Mass.	45 “
C—Mass., Cuba, Jamaica	65 “
D—Havana	88 “
E—Dominica	90 “
F—Haiti	105 “

Until re-examination confirms or otherwise explains this extraordinary variation from 30 to 105 gill-rakers, it is useless to try to settle the question of specific identity.

STUDY MATERIAL: Specimens, 1; 122.5 mm., No. 7432.

Sardinella Cuvier and Valenciennes, 1847

Key to Port-au-Prince Bay Species

- A. About 25 gill rakers on lower limb of the first gill arch. . . . . *sardina*.
 AA. About 32 gill rakers on the lower limb of the first gill arch. . . *macrophthalmus*.

Sardine

Sardinella sardina (Poey)

REFERENCES: *Harengula sardina*, Poey, 1861, *Memorias*, II, p. 310.

Sardinella sardina, Meek and Hildebrand, 1923, *Marine Fishes of Panama*, I, page 183.

FIELD CHARACTERS: Small, compressed fishes with adipose eyelid; single, soft-rayed dorsal fin; serrations along belly; small mouth and with about 25 gill rakers. Scales deciduous, those on the sides with vertical striae.

¹ A—Jordan and Evermann, 1896, *Fishes of North and Middle America*, I, p. 424.

B—Kendall and Smith, 1894, *Bull. U. S. Fish Com.*, p. 17.

C—Meek and Hildebrand, 1923, *Marine Fishes of Panama*, I, p. 181.

D—One specimen, No. 3377, American Museum.

E—Three specimens, No. 1528, American Museum.

F—One specimen, No. 7432, Haitian Expedition, Zoological Society.

SIZE AND WEIGHT: Grows to eight inches.

COLOR: Blue above, sides silvery. Alcoholic specimens are amber brown above, larger individuals being silvery on the ventral 3-4 of the body and head. In small fish the silver is confined to the iris and the gill covers.

GENERAL RANGE: Florida and the West Indies to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: In schools along the sandy beaches and at the surface, coming to light at night. Also seen at the surface in daytime, a mile from shore.

ABUNDANCE: Common, much more numerous than *Sardinella macrophthalmus*. Seen in the market quite often.

METHOD OF CAPTURE: Small seines along shore and with scoop nets at night.

FOOD: The young fish near shore fed upon red-eyed copepods. A 4½-inch fish taken in a seine off shore had eaten four medium-sized shrimps.

YOUNG: Young almost without pigment, 17 to 25 mm. were taken close in shore and at the surface a mile from land. In the former case they were in the same schools with larger individuals up to 49 mm.

STUDY MATERIAL: Specimens, 82; 17-116 mm., including Nos. 6847, 70 (, 7027, 7043, 7185 and 7192. Port-au-Prince Bay.

Sardine

Sardinella macrophthalmus (Ranzani)

REFERENCES: *Clupea macrophthalma*, Ranzani, 1842, Nov. Comment. Ac. Sci. Inst. Bonon., V, p. 320.

Sardinella macrophthalmus, Meek and Hildebrand, 1923. Marine Fishes of Panama, I, p. 184.

FIELD CHARACTERS: Small compressed fishes with adipose eyelid; single, soft-rayed dorsal fin; serrations along belly, small mouth and with about 32 gill rakers. Scales fairly firm, not as deciduous as in *sardina*. Scales on sides without evident vertical striae.

SIZE AND WEIGHT: Grows to 6 inches. A 76 mm. individual weighed 7 grams.

GENERAL RANGE: Florida, south to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Seen and taken mainly at light after dark. Some of the night seine fishermen bring these fish to the market.

ABUNDANCE: In schools of hundreds, they often covered the 2000 candle-power submerged light submerged at the gang-way of the schooner, night after night. They were not especially common at the market, however.

METHOD OF CAPTURE: Seines and hand-nets.

STUDY MATERIAL: Specimens, 10; 48-98 mm., including Nos. 7001, 7082, 7150, 7152, 7192, Port-au-Prince Bay.

Opisthonema Gill, 1861 **Atlantic Thread Herring***Opisthonema oglinum* (Le Seur).

REFERENCES: *Clupea thrissa*, Broussonet, 1782, Ichthyologia, fasc. 1.
Megalops oglina, Le Seur, 1817, Journ. Ac. Nat. Sci. Phila.,
 I, p. 359.
Opisthonema oglinum, Meek and Hildebrand, 1923, Marine
 Fishes of Panama, I, p. 187.

FIELD CHARACTERS: Small, compressed, keeled, silvery scale fishes, with toothless mouth, small pectorals and ventrals; last ray of the dorsal fin prolonged into a long filament.

DESCRIPTION: The pectoral fins in many of our specimens do not reach the ventrals and average 1.47 in the head. The stomach is very long and U-shaped.

COLOR: Silvery bluish-green, darker above, the rows of scales with somewhat indistinct dark streaks. Peritoneum black.

SIZE AND WEIGHT: The weights of three individuals were as follows:

Length	Weight
84.5 mm.	9.6 grams
127 "	30.5 "
214 "	201 "

The 214 mm. specimen was the largest seen by us.

GENERAL RANGE: Massachusetts to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found widely distributed through the Bay, and at the surface at night.

ABUNDANCE: A common species, often seen in the market, but a poor food fish.

METHOD OF CAPTURE: Seines and hand nets.

FOOD: Small fish, crabs, and shrimps. The smaller fish feed on zoea and other plankton larvae.

SPAWNING SEASON: Two adult fish showed signs in March and April of an approaching breeding season.

STUDY MATERIAL: Photographs, 3776; Specimens, 56; 63-214 mm. including 6840, 7131, Port-au-Prince Bay.

Chirocentrodon Gunther, 1868

Spiny-toothed Herringlet

Chirocentrodon taeniatus Gunther

REFERENCES: *Chirocentrodon taeniatus*, Gunther, 1868, Cat. Fishes Brit. Mus., VII, p. 463.

Chirocentrodon taeniatus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 435.

FIELD CHARACTERS: Small, elongate, compressed, anchovy-like fishes with single dorsal fin and with strong, canine teeth in both upper and lower jaws.

DIMENSIONS: The measurements of 5 of our specimens are given below:

	a	b	c	d	e
Length	74 mm.	74.5 mm.	71 mm.	74 mm.	73 mm.
Depth	16.5 "	17 "	16 "	17 "	16 "
Head	16.5 "	17 "	16 "	18 "	19 "
Eye	5 "	5 "	5 "	6 "	6 "
Snout	5 "	5.5 "	5 "	6 "	5 "
Pectoral fin rays	—	—	11	11	13
Dorsal rays	15	14	15	14	14
Anal rays	40	40	40	40	40
Gill-rakers	13	—	—	—	15

PROPORTIONATE MEASUREMENTS

	a	b	c	d	e
Depth into length	4.47	4.3	4.43	4.3	4.6
Head into length	4.47	4.3	4.43	4.1	3.8
Eye into head	3.3	3.4	3.2	3	3.15
Snout into head	3.3	3.4	3.2	3	3.8

SIZE AND WEIGHT: A 74 mm. fish weighed 4.5 grams.

GENERAL RANGE: Jamaica, Haiti.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken by us only at the surface at night.

ABUNDANCE: Rare, seen occasionally in the fish markets.

METHOD OF CAPTURE: Taken at light at night, and a few purchased at the markets.

STUDY MATERIAL: Specimens, 6, 63–74 mm., including No. 7102, Port-au-Prince Bay, April 1, 1927.

Family DUSSUMIERIDAE; ROUND HERRINGS

Jenkinsia Jordan and Evermann, 1896

Silver-lined Herringlet

Jenkinsia lamprotaenia Gosse

REFERENCES: *Clupea lamprotaenia*, Gosse, 1851, Naturalist's Sojourn in Jamaica, p. 291, Plate 1, fig. 2.

Jenkinsia lamprotaenia, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 419.

Jenkinsia stolifera, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 419.

FIELD CHARACTERS: Small, elongate herrings with rounded bellies and with a terminal mouth. Anchovy-like in color and consorting with *Anchoviella epsetus*. Pale green with broad band of silver down the side.

DESCRIPTION: Examination of part of our series of specimens, the majority of which were obtained from one school, reveals a certain amount of variation from the original description,—variation which tends to couple this species with *stolifera*.

The dorsal fin count in our specimens ranges from 11 to 13 and the anal from 14 to 17, both counts within the range of either species. The position of the dorsal fin however, is constantly in front of the middle from the snout to the base of the caudal fin,—a character given for *stolifera*. However, the placing of the fin may not always be a valid character. In Jordan and Evermann's "Fishes of North and Middle America" and in the copied description given by Evermann and Marsh in the "Fishes of Porto Rico," *lamprotaenia* is characterized as having the dorsal fin inserted midway between the snout and the base of the caudal. Metzelaar¹ mentions for this same species that the "Front of the dorsal nearer to base of caudal than to tip of snout,"—a character quite the opposite of that given for either *lamprotaenia* or *stolifera*. However, in the figure given by him, the opposite is true, and the drawing illustrates a fish with the origin of the dorsal conspicuously nearer the snout than the base of the caudal! This figure resembles our specimens very closely, although a few of the Haitian fish have slightly shorter snouts. Considering the variation of the fin counts of our specimens, Metzelaar might very well have called his fish *stolifera*.

The Haitian specimens range in depth from 5.9 to 6.1, approximating closer to *lamprotaenia* in this matter. The size of the eye is also closer to *lamprotaenia*, averaging 2.8 to 3.2 instead of the 2.5 of *stolifera*.

The snout in our specimens might be either species, and the same holds true for the position of the maxillary.

In regard to color, either description would fit our fish. Jordan and Gilbert and Jordan and Evermann (original description of *stolifera* and "Fishes of N. and M. America") mention that *stolifera* has a double row of dots along the back before the dorsal fin and a single row along the back posterior to this. Metzelaar (l. c.) mentions "a triple dot line before, a double one behind the dorsal fin." The latter statement applies more fully to our fish, but the first statement could easily apply to some, as the central line of the three frequently disappears and the 2 rear-most lines approach each other sufficiently close at times to be considered as one.

Jordan and Gilbert in the original description of *stolifera*² say that "We

¹ Over Tropisch Atlantische Visschen, 1919, p. 9.

² Proc. U. S. Nat. Mus., 1884, p. 25.

should identify our specimens with *Clupea lamprotaenia* Gosse, from Jamaica, were it not for the difference in fin rays."

Taking into consideration the variation and the intermediate position of some of the characters in our fish, we consider *stolifera* to be a synonym of *lamprotaenia*.

SIZE AND WEIGHT: Specimens from 15 to 55 mm. taken.

COLOR: Pale greenish, translucent, with a wide lateral band of silver. Two or three lines of black pigment dots down back to dorsal, one or two lines posterior to dorsal.

GENERAL RANGE: Key West to Yucatan, Porto Rico, St. Eustatius and Curacao.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found in enormous schools about the outer reefs, especially at Sand Cay.

ABUNDANCE: Very abundant, often forming part of the "whitebait" found at the market.

METHOD OF CAPTURE: Seined by native fishermen. Dynamited on reefs.

ENEMIES: Pelicans take great toll of these as well as of some of the anchovies. Carnivorous fish also feed upon great numbers.

SIZE AT MATURITY: Breeding adults were examined, 25 to 50 mm.

STUDY MATERIAL: Specimens, over 1200, including Nos. 7099, 7169, 7262, 7263, 7264, Port-au-Prince Market and Sand Cay, Port-au-Prince Bay.

Family ENGRAULIDAE; THE ANCHOVIES

Key to Genera of Port-au-Prince Bay

- A. Gill membranes not united across the isthmus. Gill rakers relatively few, 12 to 30 ..... *Anchoviella*
- AA. Gill membranes broadly united across the isthmus (these membranes very easily torn). Gill rakers numerous 52 to 57. Anal fin moderate, of 20 to 25 rays..... *Cetengraulis*

Anchoviella Fowler, 1911

Key to Port-au-Prince Bay Species

- A. Pectoral fins short, the tips not reaching to the base of the ventral fins.
- B. Sides with a distinct silvery band.
- C. Body moderately elongate, depth 4 to 4.75 in the length; eye large, 3.5 in head; gill rakers about $\frac{2}{3}$ the eye, about 20 on the lower limb of the first gill arch; dorsal fin 15, anal fin 20 ..... *epsetus*
- CC. Body more elongate, the depth about 5.25 to 5.75; eye 4.4 in head; gill rakers as long as eye, about 24 on the lower limb of the first arch; dorsal fin 13, anal 23-24..... *choerostoma*
- BB. Sides without a distinct silvery band; depth 6 to 7; dorsal rays 12 to 14, anal rays 18-20..... *lyolepis*
- AA. Pectoral fins very long, the tips of the fins reaching half way between the base of the ventrals and the origin of the anal fin

longipinna new species

Bonnaterre's Anchovy

Anchoiella epsetus (Bonnaterre)

REFERENCES: *Esox epsetus*, Bonnaterre, 1788, Ichthy., p. 175.

Anchovia browni, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 204, Plate xiv, fig. 1.

FIELD CHARACTERS: Small, elongate, compressed fishes with single, soft-rayed dorsal fin, short pectoral fins and projecting, pig-like snout. Gill membranes not united across the isthmus. Gill rakers about 20. Eye large, 3.5 in head. A silvery lateral band.

DESCRIPTION: The Haitian specimens show a small amount of variation from the published descriptions, but the smallness of our specimens, ranging from 38 to 70 mm. standard length, may account for this. Taking into consideration the various descriptions that have been published, mainly those of Jordan and Evermann,¹ Jordan and Seale,² Meek and Hildebrand³ and Metzelaar⁴ the following table can be constructed showing (1) the extreme of variation for the species and (2) the range of variation of the Haitian specimens. From this it can be seen that the variation is fairly small but that a few of the specifications need extending.

	(1)	2 (Haitian material)
Head into length	3.4 to 3.75	3.3 to 3.6
Depth into length	4.2 " 4.9	4.87 " 5.04
Eye into head	3.5 " 4.25	3.4 " 3.85
Snout into head	4.6 " 5	5
Dorsal fin rays	12 " 15	15 " 16
Anal fin rays	19 " 23	21 " 23
Gill rakers	16 " 22	18

The Haitian specimens have the pectoral fin almost reaching the ventral as mentioned in Meek and Hildebrand's description, but not as shown in their plate.

COLOR: The silvery lateral stripe is faint in some of our fish and almost absent in others.

SIZE AND WEIGHT: Grows to 6 inches. A 39 mm. fish weighed 1 gram; a 54 mm. fish weighed 2 grams and a 70 mm. fish weighed 4.5 grams.

GENERAL RANGE: Cape Cod to Uruguay.

DISTRIBUTION IN PORT-AU-PRINCE BAY: The small fish are found along shore over shallow beaches and at the surface off shore at night.

ABUNDANCE: Common, especially at the market, where it is often seen in great numbers, salted and used as whitebait.

¹ Fishes of North and Middle America, 1896.

² Review of the Engraulidae, 1926.

³ Marine Fishes of Panama, 1923.

⁴ Over Tropisch Atlantische Visschen, 1919.

METHOD OF CAPTURE: Seines and scoop nets about submerged lights at night.

FOOD: Copepods and other entomostracans, shrimps, small worms and miscellaneous debris.

ENEMIES: Preyed upon by most of the carnivorous fishes. A 2-inch specimen was taken from the stomach of a snapper, *Lutianus griseus*.

STUDY MATERIAL: Colored plate, H41, No. 6845; Specimens, 15, 38–70 mm., including 6845, 6901, 6920, 6997, 7027, Port-au-Prince Bay.

Hog-mouth Fry

Anchoviella choerostoma (Goode)

REFERENCES: *Engraulis choerostomus*, Goode, 1874, Amer. Journ. Sci., ser. 3, VIII, p. 125.

Stolephorus choerostomus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 444.

FIELD CHARACTERS: Small, elongate, compressed fish with single, soft-rayed dorsal fin, short pectoral fins and projecting, pig-like snout. Gill membranes not united across the isthmus. Gill rakers about 24. Eye moderate, 4.4 in the head. A silvery lateral band.

GENERAL RANGE: Bermudas and southward.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken in shallow water along shore near Bizoton and also in shallow water at Source Matelas.

ABUNDANCE: Fairly common, seen in the markets under the same conditions as *epsetus*.

STUDY MATERIAL: Photographs, 4004; Specimens, 34; 34 to 50 mm. including 7266, 7060, Port-au-Prince Bay.

Spot-cheeked Ghost-Fish

Anchoviella lyolepis (Evermann and Marsh)

REFERENCE: *Stolephorus lyolepis*, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 89.

FIELD CHARACTERS: Small, elongate, compressed fishes with single, soft-rayed dorsal fin, short pectoral fins and slightly projecting snouts. Gill membranes not united across the isthmus. No silvery lateral band, but with small black pigment spots, especially conspicuous on top of head, across opercles and at base of tail.

DESCRIPTION: The Haitian specimens have the dorsal fin 13–16 instead of 12–14.

SIZE: The maximum length is $1\frac{3}{4}$ inches.

COLORS: In life these fish are almost dead-white, rather translucent, and with pigment spots as described by Evermann and Marsh.

GENERAL RANGE: Porto Rico and Haiti.

DISTRIBUTION IN PORT-AU-PRINCE BAY: A few taken on some of the shoals, but the great majority found at surface at night, where they came to our lights.

ABUNDANCE: One of the commonest of fishes to come to our submerged lamps, and present during all of our stay.

METHOD OF CAPTURE: Seines and hand nets about lights.

STUDY MATERIAL: Photographs, 3937; Specimens, 230; varying in length from 17 to 45 mm., including 7105, 7073, 7097a, 7087, 7046, 7243, 7054, 7152, 7033, 7153b, 7030, 7153c, 7284, 7003, 7073a, 7081, 7097a, 7063, 7087, 7026, 7050a, 7286 and 7005, Port-au-Prince Bay.

Long-pectoralled Anchovy

Anchoviella longipinna new species

TYPE: No. 7460. Length 65 mm., Bizoton, Haiti, at night, April 1, 1927.

FIELD CHARACTERS: Small, elongate, compressed fishes with single, rayed dorsal fin and projecting pig-like snout. Pectoral fins long, the tips filamentous, reaching half-way between the base of the ventral fins and the origin of the anal fin.

MEASUREMENTS AND COUNTS OF THE TYPE:

Length	65 mm.		Scales about	35, caducous
Head	18	" (3.6)	Dorsal fin	14
Depth	12	" (5.4)	Anal fin	21
Eye	4	" (4.5)	Gill rakers	20
Snout	4	" (4.5)		
Pectoral length	19			

DESCRIPTION: Vertebrae: 40 in one specimen.

Body: Elongate, compressed, the greatest depth between the opercle and the dorsal fin; ventral portion of the body but slightly compressed. Depth into length varying from 4.8 to 5.3.

Anterior profile: Very slightly decurved immediately in front of the dorsal fin, thence straight to over the upper angle of the gill opening, then gently decurved to the snout.

Head: Conical, 3.4 to 3.8 in length.

Interorbital: Convex, about equal to diameter of eye.

Eye: Small, 4.2 to 4.7 in head.

Snout: Projecting, conical, but broadly rounded at tip; length approximately equal to diameter of eye, 4.3 to 4.7 in head.

Mouth: Large, slightly oblique, anterior end beginning just before the eye.

Maxillary: Long, not quite extending to the gill openings, its posterior end pointed.

Teeth: Very small, present on jaws, vomer, palatines and pterygoids. No canines.

Preopercular margin: Very oblique, making with the maxillary a V-shaped area, the length of which from eye to tip is less than half the head length.

Opercular margin: Smooth.

Gill rakers: 20 to 21, about $\frac{2}{3}$ the eye in length.

Scales: Caducous, about 35.

Dorsal fin: 13 to 15 rays, placed midway or slightly forward of midway between the snout and the base of the caudal fin. The fin arises in one dissected specimen over the 16th vertebrae. Third ray longest, the rays becoming progressively shorter. Last ray longer than preceding one.

Anal fin: 20 to 21 rays, its origin under last ray of the dorsal.

Caudal fin: Forked.

Pectoral fins: Placed low, falcate, the upper ray very long, extending in unbroken specimens, to halfway between the base of the ventral fins and the origin of the anal. The tips in many of our specimens are broken, but clearly show that they extended much further than they now do.

Ventral fins: Short, close together, placed midway between gill opening and origin of anal fin.

COLOR: (In formalin) Hyaline, the caudal fin dusky. A silvery stripe down sides from upper angle of gill-opening to caudal fin, its margins somewhat indistinct, its width about that of the eye.

COMPARISON: This fish is very close to *filifera*, described in 1915 from Trinidad by Fowler. It differs in the following particulars: depth slightly less, averaging 4.8 to 5.4; anal fin rays 21 inclusive instead of 24 to 25; snout considerably blunter; scales considerably deeper, possessing only 3 vertical rows plus a half row at the bottom and a half row at the top across the caudal peduncle.

STUDY MATERIAL: Specimens, 11; the type, No. 7460; and 10 paratypes, 52-64 mm., No. 7461,—8 from light, Bizoton, Haiti, and 2 from Port-au-Prince Market, April 1, 1927.

TYPE NAME AND LOCATION: *longipinna* in reference to the long pectoral fins.

Type in the collection of the Department of Tropical Research of the New York Zoological Society.

Cetengraulis Gunther, 1868

Whalebone Anchovy

Cetengraulis edentulus (Cuvier)

REFERENCES: *Engraulis edentulus*, Cuvier, 1829, Regne Animal, ed. 2, II, p. 323.

Cetengraulis edentulus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 214.

FIELD CHARACTERS: Small compressed fishes with single, soft-rayed dorsal fin, short pectoral fins and projecting pig-like snout. Gill membranes united across the isthmus,—this membrane very easily broken and not visible until the opercles are gently pried open.

SIZE AND WEIGHT: Our largest specimen measured 103 mm. The species grows half again as large. A 98 mm. fish weighed 18 grams.

COLOR: Caudal fin yellow with dusky edges. Iris golden. Dorsal greenish yellow.

GENERAL RANGE: Atlantic Coast of tropical America.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Fairly common in the open Bay.

ABUNDANCE: Common, often seen in the markets.

METHOD OF CAPTURE: Mostly by seining by the native fishermen.

FOOD: Copepods and other planktonic animals. Considerable amount of sand found in the stomachs of 2 fish taken from the stomach of *Scomberomorus maculatus*.

ENEMIES: Two 100 mm. individuals found in the stomach of a Mackerel (*Scomberomorus maculatus*).

STUDY MATERIAL: Photographs, 3900; Specimens, 22; 85–103 mm., including 6868, 7292, Port-au-Prince Bay.

Family ANGUILLIDAE; TRUE EELS

Anguilla Shaw, 1803

Common Eel

Anguilla rostrata (LeSueur)

REFERENCES: *Muraena rostrata*, Le Sueur, 1817, Journ. Acad. Nat. Sci. Phila., I, p. 81, (New York).

Anguilla chrysypa, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 68, plate I.

FIELD CHARACTERS: Elongate eels with rather large mouth, the lower jaw projecting; pectoral fins well developed; skin covered with rudimentary embedded scales, placed at right angles to each other (often difficult to see without magnifying glass); dorsal fin continuous with the anal around the tail.

SIZE AND WEIGHT: Grows to 4 or 5 feet. Our 186 mm. fish weighed 8 grams.

GENERAL RANGE: Atlantic Slope of North America from southern Canada to Panama, West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found by us only at Source Mariani, a small fresh-water pond a little over a mile from the sea, connected with the ocean by a small rocky stream.

ABUNDANCE: Rare, only one seen. Not observed at the markets.

STUDY MATERIAL: Specimens, 1; 186 mm., No. 7178.

Family MURAENESOCIDAE; PIKE-EELS

Muraenesox McClelland, 1844

Pike-Headed Eel

Muraenesox savanna (Cuvier)

REFERENCES: *Muraena savanna*, Cuvier, 1829, Regne Animal, Ed. 2, II, p. 350.

Muraenesox savanna, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 143.

FIELD CHARACTERS: Medium sized eels without scales and with well developed pectoral fins; dorsal and anal fins confluent around the tail; lower jaw shorter than upper; tongue narrow, mostly attached to the floor of the mouth; vomerine teeth large, in three series, the central ones enlarged.

SIZE AND WEIGHT: A 28-inch eel weighed 1.25 pounds.

COLOR: Silvery gray above, silvery white below; dorsal fin dull fleshy bordered with black; anal fin bordered with black.

GENERAL RANGE: West Indies to Brazil

ABUNDANCE: Uncommon, but seen occasionally at the market.

METHOD OF CAPTURE: Seines and spears.

FOOD: The alimentary canal contained the remains of three engraulids.

EGGS: The ovary in the 720 mm. specimen is 173 mm. long, and extends 30 mm. back of the vent. The very numerous eggs are round and average .3 mm. in diameter.

STUDY MATERIAL: Specimens, 2; 720-733 mm., including No. 6969.

Family ECHELIDAE; WORM-EELS

Ahlia Jordan and Davis, 1892

Worm-eel

Ahlia egmontis (Jordan)

REFERENCES: *Myrophis egmontis*, Jordan, 1884, Proc. Acad. Nat. Sciences, Phil. XXXVI, p. 44.

Ahlia egmontis, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 370.

FIELD CHARACTERS: Small, very elongate, worm-like eels with dorsal fin

beginning behind anal fin; posterior nostril placed at edge of mouth; the anterior nostril in a large tube.

DESCRIPTION: Twenty-one fish, 50 to 145 mm. long are grouped under this species. They agree with the figure given by Bean (Proc. U. S. Nat. Mus., XXVI, p. 963), but in general they are considerably slimmer. The anterior nostril is very large, almost doubled by an infolded pointed septum, the nostrils of each side of the head connected by a thin velum. The nostrils lie one on each side of the lower jaw.

SIZE AND WEIGHT: Grows to fifteen inches.

COLOR: Brownish green, the head finely speckled with black dots, becoming larger and rounder on posterior sides of head, and smaller and more dot-like on body.

GENERAL RANGE: Florida, Glover Reef, Swan Island, Haiti and Barbados.

OCCURRENCE IN PORT-AU-PRINCE BAY: Many specimens taken and seen at light at surface at night. Not otherwise seen.

ABUNDANCE: Fairly common.

METHOD OF CAPTURE: Scoop net about submerged lamps.

STUDY MATERIAL: Photographs, 3939, 3943; Specimens, 21; 50-145 mm., including Nos. 6998, 7088, 7097d, 7125, 7185, 7192, 7242, 7243.

Family OPHICHTHYIDAE; SNAKE EELS

Myrichthys Girard, 1859

Key to Port-au-Prince Bay Species

- A. Dark spots on body on a paler background.....*oculatus*
 AA. Pale spots on body on a dark background .....*acuminatus*

Black-spotted Snake Eel

Myrichthys oculatus (Kaup)

REFERENCES: *Pisoodonophis oculatus*, Kaup, 1856, Cat. Apod. Fish Brit. Mus. p. 22. (Curacao).

Myrichthys oculatus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 376.

FIELD CHARACTERS: Medium sized elongate, more or less cylindrical eels with sharp-pointed finless tail; teeth blunt; dorsal fin beginning on the head before the gill opening; a series of 35 or more dark spots on paler background; white below.

SIZE AND WEIGHT: Our 28-inch fish weighed 160 grams.

GENERAL RANGE: Cuba to Brazil, also Cape Verde and Canary Islands.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Our single specimen was taken at the surface, coming to light over a depth of 40 feet of water.

ABUNDANCE: Apparently rather rare, not seen at the markets.
METHOD OF CAPTURE: Hand nets at side of schooner.
STUDY MATERIAL: Specimens, 1; 730 mm., No. 6978.

Yellow-spotted Snake Eel
Myrichthys acuminatus (Gronow)

REFERENCES: *Muraena acuminata*, Gronow, 1854, Fishes Brit. Mus. p. 21.
Myrichthys acuminatus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 376.

FIELD CHARACTERS: Medium sized, elongate cylindrical eels with sharp-pointed finless tail; teeth blunt; dorsal fin beginning on head before gill opening; two series of round, whitish blotches on each side of body; head with small whitish blotches.

DESCRIPTION: Our specimen in life had a series of conspicuous horizontal creases, especially common along the middle of the sides of the trunk, and a series of vertical creases on the sides extending up to the base of the dorsal fin but not extending below the middle of the sides. The combination of these two series of creases formed a series of small square or rectangular areas. These creases may be an aid to easy movement, and the presence of the horizontal creases may be helpful when especially large prey has been swallowed.

COLOR: The white spots mentioned in Jordan and Evermann "on the sides," are present also all over the crown.

GENERAL RANGE: West Indies north to the Florida Keys.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found by us on shallow reefs along shore.

ABUNDANCE: Rare.

METHOD OF CAPTURE: Taken by means of spears.

STUDY MATERIAL: Specimens, 1; 740 mm., No. 6905.

Family MURAENIDAE; MORAY EELS
Gymnothorax Bloch, 1795

Key to Port-au-Prince Bay Species

- A. Color more or less uniform, not conspicuously mottled or reticulated with white or light yellow.
- B. Body plain dark brown, lower parts somewhat paler; teeth on anterior part of jaws more or less distinctly in two series.....*funnebris*
- BB. Body brownish, mottled with dark brown or purplish spots; teeth uni-serial .....*vicinus*

AA. Brownish to purplish brown, conspicuously mottled and reticulated with white or light yellow.....*moringa*

Olive-green Moray Eel

Gymnothorax funebris Ranzani

REFERENCES: *Gymnothorax funebris*, Ranzani, 1840, Novi Comment. Ac. Sci. Inst. Bonon., IV, p. 76.

Gymnothorax funebris, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 163.

FIELD CHARACTERS: Medium to large eels without pectoral fins and with very small gill openings; plain olive green or olive brown.

SIZE AND WEIGHT: Our largest specimen, 41 inches long, weighed 3.5 pounds.

GENERAL RANGE: Florida to Brazil. Also recorded from the Cape Verde Islands.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found generally on reefs.

ABUNDANCE: Fairly common; often seen in the markets.

METHOD OF CAPTURE: Usually by spearing. Often taken in traps.

HABITS: These eels have astonishing viability. One taken out of water one evening was able to move and snap the next morning.

STUDY MATERIAL: Specimens, 2; 800-1040 mm. including No. 7048.

Purple-mouthed Moray Eel

Gymnothorax vicinus (Castelnau)

REFERENCES: *Murenophis vicina*, Castelnau, 1855. Anim. Nouv. Rares Amer. Sud, p. 81, Plate XLII, fig. 4.

Gymnothorax vicinus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 164.

FIELD CHARACTERS: Medium sized eels without pectoral fins and with very small gill openings; brownish mottled with darker brown or purplish spots; anal fin with a pale edge.

GENERAL RANGE: Cuba to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found by us only over the shallower reefs.

ABUNDANCE: Uncommon; seen rarely in the markets.

METHODS OF CAPTURE: Grains and traps

FOOD: One specimen contained a 6-inch *Rhomboplites aurorubens*, a 5-inch *Cetengraulis edentulus* and two 3-inch Yellow-tails, *Ocyurus chrysurus*.

STUDY MATERIAL: Specimens, 3; 573-600 mm., including No. 6903.

**Common Spotted Moray Eel;
Hamlet**

Gymnothorax moringa (Cuvier)

REFERENCES: *Muraena moringa*, Cuvier 1829, Regne Animal, Ed. 2, II, p. 352.

Gymnothorax moringa, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 166.

FIELD CHARACTERS: Medium sized eels without pectoral fins and with very small gill openings; brown or purplish brown with spots and reticulations of white or pale yellow.

SIZE AND WEIGHT: A 24-inch eel weighed half a pound.

COLOR: Field notes were made on color twice, in both cases the lighter color being considered as the ground color, which is the opposite of the usual color descriptions.

A 610 mm. eel was described as follows: Pale yellowish white, mottled and marbled everywhere with raw umber; head with a pinkish white sheen; dorsal fin viridine green; anal fin edged with white; iris silvery white near pupil, mottled toward outer rim with dark brown.

A second eel, somewhat larger, was described thus: General ground color between ivory yellow and colonial buff, becoming whitish on the head and brightest on the dorsal fin. Spots of cameo brown covering the entire body, these being divided into two distinct sizes, the larger being irregular in shape, the smaller more regular.

The variation in color and pattern is enormous.

GENERAL RANGE: Florida to Brazil; Also recorded from St. Helena.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Widely distributed over the coral reefs.

ABUNDANCE: Common, the commonest eel seen on the reefs, usually seen hiding between clumps of coral. Often seen in the markets.

METHOD OF CAPTURE: Spearing and traps.

FOOD: Small fish; one eel had swallowed a small trigger fish (*Monacanthus oppositus*).

STUDY MATERIAL: Color Plate, H9, No. 6889; Photographs, 3783, 3784, 3833, 3834, 3860; Specimens, 11; 400-720 mm., including Nos. 6889, 6924.

LEPTOCEPHALID LARVAE

During the expedition collections were constantly made at night, by the use of dip nets about submerged lights. As a result of this fishing, and in addition to the various juvenile fishes which resembled their adult forms, a

number of young fishes were captured which are wholly unlike their parents. All of these fish in life were transparent, or at least translucent.

The vast majority of these larvae were Lizard-fish (*Synodus foetens*), Snake-fish (*Trachinocephalus myops*), and Lady-fish (*Albula vulpes*), especially the first and third; the remaining ones being typical eel Leptocephalids. The first three mentioned species have been treated under their respective headings, but for ease of identification they have been included in the following key. The eel Leptocephalids have been placed under the *Leptocephalus* form that they most closely resemble, with notes as to how they differ.

Key to Leptocephalid-larval stages

- A. Larval stages with small vertical fins, the dorsal with 11 to 17 rays, the anal with 8 to 11.
- B. Dorsal rays 17, anal rays 8. No conspicuous, black, circular spots along sides.....*Albula vulpes*
- BB. Dorsal rays 11 to 14, anal rays 11 to 16. Lower sides with six conspicuous black circular spots on lower sides, these spots on the gut.
- C. Head long, flattened, lizard-like, coming to a rather sharp point. Eye small, shorter than snout.....*Synodus foetens*
- CC. Head shorter, compressed; eye large, longer than snout.
Trachinocephalus myops
- AA. Larval stages with elongate dorsal and anal fins, the dorsal at least half the length.
- D. Pectoral fins absent; 142 myomeres; origin of dorsal fin far in advance of anal.....*Leptocephalus latus*
- DD. Pectoral fins present.
- E. Myomeres 140; dorsal beginning very slightly in advance of anal; tail rather sharp, the dorsal and anal not continued around it, each of these fins expanded just before caudal; a series of conspicuous wide spaced black dots along alimentary canal...*Leptocephalus mucronatus*
- EE. Myomeres 120 to 126.
- F. Myomeres 125-126.
- G. Myomeres 125; dorsal fin beginning slightly in advance of anal; anterior nostril in a tube, posterior nostril very small; eye large, 4.7 in head
Leptocephalus michael-sarsi
- GG. Myomeres 126; dorsal fin beginning far in advance of anal, near the head; anterior nostril in tube, posterior very large, eye small, 6.8 in head.....*Leptocephalus microphthalmus* new species
- FF. Myomeres 120; dorsal fin beginning slightly in advance of the anal; nostrils remote, the anterior not in a tube.....*Leptocephalus rex*

Leptocephalus latus Eigenmann and Kennedy

REFERENCES: *Leptocephalus latus*, Eigenmann and Kennedy, Bull. U. S. Fish Comm., XXI, 1901, p. 87, figs. 6, 6a, 6b.

DESCRIPTION: A single leptocephalus 83 mm. long, is referred to *latus*. It is intermediate in some ways between *latus* and *gilli*, possessing a head shaped

like *latus*, and with the caudal region shaped more like *gilli*; it also differs in the relations of the myomeres.

No. 7081, 83 mm. Port au Prince Bay at light, March 19, 1927. Body very thin and elevated, widened rather suddenly at the nape, reaching its maximum height before the middle of body, and maintaining the same height for more than $\frac{1}{3}$ the length; tail rounded, but not quite as broad as shown for *latus*; depth 6; head small, 20 in length, lower jaw slightly shorter than upper with a series of 10-11 long fang-like teeth in lower jaw; 12 similar forward pointing teeth in upper jaw; eye 2.1 in snout, 6.7 in head; nostrils remote, pectorals not developed; a series of very small pigment spots at base of dorsal and anal rays, and a few dots obliquely on back of head; myomeres 91 + 51, total 142.

The relation of the caudal and abdominal myomeres is considerably different from *latus*, a character which possibly may be assigned to movement of the anus with growth, but in most other characters the fish is fairly close to Eigenmann's description of that species.

STUDY MATERIAL: Specimen, 1; 83 mm., No. 7081, March 19, 1927.

Leptocephalus mucronatus Eigenmann and Kennedy

REFERENCES: *Leptocephalus mucronatus*, Eigenmann and Kennedy, Bull. U. S. Fish Comm., XXI, p. 90, figs. 11, 11a, and 11b.

DESCRIPTION: Two larvae, 73.5 and 82 mm. long, agree with this form, the longer one especially. Our field notes about this specimen record prominent black marks on each myomere below the lateral line, a character agreeing with Eigenmann and Kennedy's description. In the preserved fish these spots are practically absent, and would never have been noticed except for the field description.

No. 7146, 82 mm. Surface at light, Port-au-Prince Bay, April 4, 1927. Elongate, band-shaped, the body tapering in its anterior fourth, tapering more abruptly posteriorly, depth 11 in length; head rather short, 17.5 in length; eye small, 5.5 in head; snout about 4.7 in head; nostrils closer together than described by Eigenmann and Kennedy; teeth large, strong, triangular; two long slender canines project downward from tip of upper jaw beyond tip of lower; myomeres 61 + 79, total 140; dorsal fin beginning 39 mm. from snout; anal fin 39 mm. from snout; dorsal with 236 rays and anal with 220 rays.

A series of pigment lines down each myacomma a short distance from middle bend; a black dot at base of each dorsal and anal ray; a series of relatively larger spots along alimentary canal, a larger one above and a smaller one below.

This specimen differs somewhat in size of head, snout and eye from *mucronatus*, but agrees fairly well in myomere count, and excellently in form, especially the peculiarly shaped tail, and in pigmentation.

The second specimen, No. 7198, 73.5 mm. surface at light, Port-au-Prince Bay, April 22, 1927, is slightly older and more robust, the depth being 18 in the length. It possesses the same myomere count, peculiar form of posterior dorsal and anal fins, and pigmentation. It differs from the preceeding specimen in having the anterior nostril in a short tube.

STUDY MATERIAL: Specimens, 2; No. 7146, April 4, 1927 and No. 7198, April 22, 1927.

Leptocephalus michael-sarsi Lea

REFERENCES: *Leptocephalus michael-sarsi*, Lea, Muraenoid Larvae, Rep. Sci. Results Michael Sars North Atlantic Deep Sea Expedition, Vol. III, Part 1, p. 28.

DESCRIPTION: Two specimens, 65 and 68 mm. long are placed under this species. Both are considerably further advanced than the single specimen (99 mm.) upon which Lea based his description. They agree in all essential characters, those in which they differ being easily laid to difference in age.

No. 7032, 68 mm., surface, Port-au-Prince Bay at light, March 10, 1927.

Rather robust in form, partly metamorphosed from the flattened ribbon-like form, the depth 14.8 into the length, the body tapering slightly toward the tail. Head conical, fairly robust, 9.7 in total length, the dorsal profile evenly curved; lower jaw shorter than upper, the upper slightly decurved over the lower; anterior nostril in a tube at edge of upper jaw; posterior nostril small, .1 mm. in diameter, anterior to but below the middle of eye; eye fairly large, 4.7 in head length. Myomeres 54 + 71, total 125; dorsal fin beginning a few segments in front of anal.

A lateral line of chromatophores just beneath the central angle of the myomeres, the color cells roughly on alternate muscle segments. Three small black spots (2 in *michael-sarsi* of Lea) on gut anterior to pectoral fins; a row of black dots with large interspaces along alimentary canal, more marked anteriorly; small black spots at base of dorsal, caudal and anal rays.

No. 7390, 65 mm. Surface at light. Port-au-Prince Bay, February 15, 1927.

This specimen does not differ in any essential way. Its coloration is not quite as distinct as the others, and the three spots on the anterior part of the gut are absent, a fact which may be laid to preservative, as the specimen is a reddish brown instead of light yellow typical of most preserved leptocephalids.

Lea's specimen of *michael-sarsi* came from 48° 2' N. and 39° 55' W., West of Flemish Cap in the North Atlantic, a long distance from Haiti, but the agreement of characters which change but little with age, is such that we have little hesitation in identifying our specimens as this form.

STUDY MATERIAL: Specimens, 2; 65 and 68 mm., Nos. 7032, 7390.

Leptocephalus microphthalmus sp. nov.

TYPE: No. 7080, 74 mm. Surface at light, March 19, 1927.

DESCRIPTION: Body elongate, flattened, moderately deep, depth 11.8; dorsal and anal fins rather wide, especially posteriorly; head rather small, conical, 14.5 in length, the lower jaw projecting beyond upper (specimen damaged, so that lower jaw may possibly be equal to upper); eye small, 6.8 in head, its vertical diameter greater than its horizontal; snout rather short, a little less than 3 in head; anterior nostril in a short tube, near upper lip; posterior nostril very large, almost half the horizontal diameter of the eye in width,

and situated anterior to middle of eye; 13 teeth in side of lower jaw,—anterior 8 large, the remaining 5 very small.

Myomeres 65 + 61, total 126; dorsal fin rays, 250, the fin arising at the 18th myomere from the head; anal fin rays 165; pectoral rays 16.

Gut with anlage of liver at 13th myomere from head; from this point onward back to anus a row of small round chromatophores along ventral surface.

Transparent, with a very short vertical pigmented line on each myocomma below central bend of myomere. Dorsal and anal fin posteriorly with a black spot at the base of each ray, these spots faint and most noticeable at posterior end of anal. Small black spots along gut.

Measurements and Counts:

Total length	74	mm.
Depth	6.3	"
Head	5.1	"
Eye	.75	"
Posterior nostril diameter	.32	"
Snout	1.6	"
Pectoral fin length	2	"
Snout to origin of dorsal	13	"
Snout to anus	44	"

COMPARISON: This species runs close to *michael-sarsi*, but specimens of practically equal size differ strikingly in size of posterior nostrils and in relative proportions of the eye and somewhat in color.

STUDY MATERIAL: Specimen 7080. Surface at light, March 19, 1927.

Leptocephalus rex Eigenmann and Kennedy

REFERENCES: *Leptocephalus rex*, Eigenmann and Kennedy, Bull. U. S. Fish Comm., XXI, 1901, p. 86, figs. 3, 3a, 3b.

DESCRIPTION: One specimen is placed under *rex*, agreeing in possessing about 120 myomeres, in the relative proportions and relations of the dorsal and anal fins, form and color, but differing in depth and size of head. Eigenmann and Kennedy in their paper mentioned above were not certain as to whether their *amphioxus* and *rex* were not the same. The Haitian specimen possesses some characters of both.

No. 7003, 87 mm. long. Taken at light, Port-au-Prince Bay, March 6, 1927.

Depth 14.7; head 11; form rather robust, not especially compressed, the head having taken on its adult form, (like illustration of *rex*); snout rounded, lower jaw very slightly shorter than upper; teeth very small; tail long and pointed; dorsal beginning slightly in front of anal; caudal rounded, the continuation of the dorsal and anal fins intermediate in shape between *rex* and *amphioxus*. Small black pigment dots at base of dorsal and anal, most conspicuous near caudal, becoming less marked as they progress forward, those of the anal more marked than those of the caudal. No other pigment spots apparent.

STUDY MATERIAL: Photograph, 3940; Specimen, 1; 87 mm., No. 7003, March 6, 1927.

Family SYNODONTIDAE; THE LIZARD FISHES

Key to Port-au-Prince Bay Genera

- A. Head rather long, flattened, triangular; snout depressed, longer than eye. *Synodus*
 AA. Head compressed; snout short, not depressed, shorter than eye. *Trachinocephalus*

Synodus Scopoli, 1777

Key to Port-au-Prince Bay Species

- A. Scales larger, 48 to 52 in the lateral line.....*intermedius*
 AA. Scales smaller, 58 to 63 in the lateral line.....*foetens*

Agassiz's Lizard-fish
Synodus intermedius Agassiz

REFERENCES: *Synodus intermedius*, Agassiz, 1829, in Spix, Pisc. Brazil, p. 81.
Synodus intermedius, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 217.

FIELD CHARACTERS: Elongate fish with single soft-rayed dorsal fin and small adipose fin, and with flattened, scaled lizard-like head; 48 to 52 scales in the lateral line. Greenish with 8 cross bands of darker, sometimes with indistinct bands between them.

SIZE AND WEIGHT: Grows to 15 inches. A 225 mm. fish weighed 129 grams.

GENERAL RANGE: North Carolina to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found generally along shore.

ABUNDANCE: Fairly common, and often brought to the markets, where it is one of the poorer food fish.

METHOD OF CAPTURE: Mostly with seines.

FOOD: A carnivorous species. Our food records mention fish, especially engraulids and atherinids, and shrimps.

STUDY MATERIAL: Photograph, 4121; Specimens, 6; 216-262 mm., including No. 6860, Port-au-Prince Bay, 1927.

Lizard-fish; Galliwasp; Lagarto
Synodus foetens (Linnaeus)

REFERENCES: *Salmo foetens*, Linnaeus, 1776, Syst. Nat. Ed., XII, p. 513.
Synodus foetens, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 220.

FIELD CHARACTERS: Adults: elongate fish with flattened lizard-like head and with single soft dorsal and small adipose fin; scales 58 to 63; greenish, pale below; Young; elongate, cylindrical, translucent, with 6 black spots on the gut showing through to outside, a blackish patch on the sides at base of caudal fin, continued forward on the lateral line, but not continued onto the dorsal surface.

DESCRIPTION: The single adult taken agrees completely with the published descriptions. Two hundred young specimens, 22 to 41 mm., the majority near the larger size, agree very well with Nichol's description and figure of young *Synodus foetens* (Bull. Amer. Mus. Nat. Hist. XXX, 1911, p. 278). Our fish differ in being slightly deeper, about $10\frac{1}{2}$ instead of $11\frac{1}{2}$, as stated by Nichols. However, his figure when measured, has the same depth as our fish, and is identical with our specimens of similar size. The Haitian fishes of 40 mm., and some of slightly shorter length have the scales well defined, but practically invisible until the fishes are partly dried.

The teeth in a 41 mm. fish are as follows:

Lower jaw: Four sharp incisors in front followed by two long, curved canines. Following these four groups of three teeth each, each group somewhat separate from the rest, the first and second in each group somewhat longer than the others.

Upper jaw: Teeth much more irregular. About 24 on each side, in two rows, the larger in the outer row. Posterior third of jaw has only a single row of teeth.

The proportionate size and placing of the stomach diverticulum in a 40 mm. and the 155 mm. fish is shown in the following diagram.

Synodus foetens

Relative size of stomach diverticulum in adult and young.

A. 155 mm. standard length.

B. 40 mm. standard length.

The curved line at the left hand side of the diagram represents the opercle; the right hand portion of the diagram represents the anus.

The stomach in the larvae is lined with circular folds, broken only at the bottom. These are deep and close together, each .43 mm. deep and 10-12 to the millimeter. The height of the gut, following along the curve of the side, is 1.35 mm.

SIZE: Grows to about 12 inches.

COLOR: Larvae;—Body, translucent white with six pairs of conspicuous, round black spots along the ventral side;—one near the posterior edge of the opercle, one beneath the posterior edge of the pectoral, one half way between insertion and tip of ventral, one at half the length of the ventral beyond the tip of the ventral, one-half way between last mentioned spot and the anus. The position of the second, third and fourth may be shifted considerably forward in relation to the fins. These black pigment spots lie between the gut and the peritoneum, and they are considerably more adhesive to the outer layer of tissue. The spots are upright, broad ellipses with solid edges.

A slightly older fish, 41 mm., is described as follows:

Upper surfaces and upper sides of head with small chromatophores, these color cells extending on the back and sides of the fish, those on the sides in the

form of diamond shaped figures with the axis on the lateral line. Small blotches of chromatophores on the sides between and above the diamond-shaped patches. Chromatophores of the upper side of the body forming vague cross bands. A dark bar on the sides at the base of the lower caudal rays, continued forward slightly along the lateral line. The black spots of the slightly younger larvae still show through the sides.

GENERAL RANGE: North Carolina to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Seen along shore. The young found at the surface at night.

ABUNDANCE: Adults uncommon. Young very common.

METHOD OF CAPTURE: The small specimens were taken mainly with scoop nets as they came to the submerged lights at the side of the schooner. Adults taken with seine.

FOOD: The young individuals are exceedingly voracious, devouring their own brothers and cousins and anything else animal approaching their way. A 35 mm. fish ate a 20 mm. fish of the same species, 11.8 of the 20 mm. fish remaining well forward in the alimentary canal and undigested. A 41 mm. fish had swallowed a 31 mm. specimen of his own kind.

BREEDING: The young were first taken by us on February 28th, and they were present about the schooner in almost the same numbers and differing only slightly in size up to April 30, 1927.

STUDY MATERIAL: Photograph, 3942; Specimens, 201; 22-155 mm., including Nos. 6967, 6995, 7003, 7004, 7007, 7026, 7029, 7046, 7050, 7054, 7063, 7073, 7074, 7081, 7087, 7097, 7107, 7125, 7126, 7152, 7153, 7243 and 7285. February 28 to April 30, 1927, Port-au-Prince Bay.

Trachinocephalus Gill, 1861

Snake-fish

Trachinocephalus myops (Forster)

REFERENCES: *Salmo myops*, Forster, MS., Bloch and Schneider, 1801, Syst. Ichth., p. 421.

Trachinocephalus myops, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 222.

FIELD CHARACTERS: Medium sized fishes with dorsal fin composed of rays only and a small adipose fin; head short, blunt, compressed, the snout shorter than the eye.

DESCRIPTION: Three small fish resembling young *Synodus foetens* in general appearance and color, are assigned to this species. When compared with *foetens* they differ most noticeably in the shape of the head, and size and position of the eye.

SIZE: Grows to 9 inches.

COLOR: The young specimens were translucent with six black spots on the gut (similar to *Synodus foetens*), and one similar spot at the posterior base of the anal. Blackish spots and pattern on other parts of the body as follows:—top of head with scattered chromatophores; a line of chromatophores along middle of sides; a series at the base of the dorsal; 2 spots at upper base of the pectoral; a large spot at base of the adipose fin; a series of spots at base of posterior anal rays; a large blotch at base of caudal, extending upward and forward slightly on the upper surfaces.

GENERAL RANGE: Widely distributed in tropical seas.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Young found at surface only at night.

ABUNDANCE: Rare.

METHOD OF CAPTURE: Scoop nets at night.

STUDY MATERIAL: Photographs, 3942; Specimens, 3; 36–38 mm., including 6995, 7125 and 7126, Port-au-Prince Bay.

Family BELONIDAE;* THE NEEDLEFISHES

Key to Port-au-Prince Bay Genera

- A. Body moderately compressed, the depth not greatly exceeding the width. *Strongylura*
 AA. Body very strongly compressed, more or less ribbon-shaped; the depth more than twice the width..... *Ablennes*

Strongylura Van Hasselt, 1824

Needlefish; Houndfish; Guardfish

Strongylura raphidoma (Ranzani)

REFERENCES: *Belone raphidoma*, Ranzani, 1842, Nov. Comm. Ac. Nat. Sci. Inst. Bonon., V, p. 359, pl. 37, fig. 1.

Tylosurus raphidoma, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 226.

FIELD CHARACTERS: Very elongate and slender fishes, with jaws produced into a long, slender beak; a band of minute teeth and a series of large, wide-set teeth; scales small and thin; lateral line low and fold-like; dorsal and anal opposite and long, elevated anteriorly; gill rakers obsolete; greenish above, silvery below; bones green.

DESCRIPTION: The needlefish we took in Haiti are typical of the present species and the only point of interest worth mentioning is a comparative table of characters from young to adult.

* There is a species of gar living in Etang Saumatre, the inland brackish lake of Haiti. Although we plainly saw two fish about a foot long, we were unable to capture them.

<i>Specimen</i>	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>
Length	30 mm.	50 mm.	166 mm.	740 mm.
	4%	7%	22%	100%
Depth	1.7 mm.	3 mm.	9 mm.	44 mm.
	4%	7%	20%	100%
Head	6.8 mm.	12 mm.	53 mm.	220 mm.
	3%	5%	24%	100%
Eye	1.5 mm.	2 mm.	6 mm.	22 mm.
	7%	10%	27%	100%
Snout	3 mm.	6.3 mm.	32.5 mm.	120 mm.
	2.5%	5%	27%	100%
Average	4%	7%	24%	100%

We see from this that the length, depth and head increase from juvenile to adult rather regularly. The snout is, at first, by far the least developed, being only two and one half percent of the arbitrarily chosen adult; the eye, as is usual in almost all young vertebrates, is ahead of the rest, showing as seven percent in the smallest youngster. In the 166 mm. individual, the eye has slowed down and the snout caught up, and we find all five characters averaging twenty-four percent of those of the full-grown needlefish.

The variation in the dorsal and anal rays is not great, being from 22 to 23 in the former, and 20 to 23 in the latter fin.

SIZE AND WEIGHT: Known to reach a length of 5 feet. Our largest captured specimen weighed $3\frac{3}{4}$ pounds and was 33 inches in length. We saw several which were well over four feet long.

COLOR: Adult: The back is dark green, the sides and belly silvery; on some individuals there are two or three black lines down the back and a silvery band along the sides; the dermal keel on the caudal peduncle is black and the fins dusky.

YOUNG: A typical young of fifty mm. exhibits an inverted pattern very unusual among fishes, being light brown above and brownish black below. After death the pigment of both dorsal and ventral surfaces concentrated into a multiplicity of minute, round, black dots. The pectorals, ventrals, caudal and the anterior portions of the vertical fins are hyaline, but the posterior three-fourths of the anal are slightly spotted, and the dorsal solidly blackened. The lower half of the caudal peduncle is conspicuously black, and the large, lappet-like, jaw flap of skin which is such a consistently juvenile character in this and related families, is jet black.

GENERAL RANGE: From North Carolina to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: The young and occasionally the adults are seen swimming singly at the surface in full sunlight. A few may be seen almost every day in the market. One of medium size was taken at the surface light.

ABUNDANCE: Uncommon. Always seen singly.

METHOD OF CAPTURE: The young were scooped up in hand nets. Adults taken with hook and line and in the seines of the native fishermen.

FOOD: Fish remains were found in several stomachs but too comminuted to be recognized. The beak and teeth of needlefish are too delicate to be used

in the capture of very large fish, and it is probable that they feed chiefly on the vast schools of small fish which swarm at the surface.

PROPORTION OF SEXES: Of eight adult individuals one was a male, and seven were females.

SIZE AT MATURITY: In no individual smaller than 24 inches were the gonads well developed.

SPAWNING SEASON: In March and April the ovaries were well developed, indicating spawning in the next month or two. In these females the ovary averaged about thirty per cent of the length of the fish, and fifty percent of its depth.

EGGS: The eggs were packed closely together in the elongated ovary. In a fish taken in mid-March they measured from one, to two and one quarter mm. in diameter.

YOUNG: Two young fish, 30 and 50 mm. in length, were taken on the 20th and the 11th of March respectively, and at least half a dozen others seen swimming at the surface. All were a mile or more from shore.

GENERAL HABITS: The young must in some way be adapted, by the inverted pattern already described, for concealment at the surface. The eyesight is much more acute than that of the other young fish living under similar conditions, and it was exceedingly difficult to take them with hand nets. In flight, they darted off with short irregular spurts, and never sought shelter beneath the stray strands of sargassum weed or floating debris. The juvenile, fleshy flap extends along the entire length of the lower jaw and on each side near the symphysis is abruptly enlarged into a wide lappet. It is less deeply pigmented in the smaller specimen. In both young fish the teeth are well developed, both the small and the larger series. In addition to the short beak, the most distinctive character of these immature fish is the total absence of any forked appearance of the caudal fin. Instead, it is quite regularly rounded.

Even in needlefish which have reached a length of over six inches the dermal jaw flap is still fully developed, shaped as described in the above paragraph. In the fish of this age the inverted coloration has given place to the more usual pattern of the adult.

STUDY MATERIAL: Color Plates, H548, No. 7195a; Photograph, 4127; Specimens, 11; 30-840 mm., including numbers 6865, 6880, 7051, 7158, 7195a, 7260, 7287.

Ablennes Jordan and Fordice, 1886

Ribbon Needlefish

Ablennes hians (Cuvier and Valenciennes)

REFERENCES: *Belone hians*, Cuvier and Valenciennes, 1846, Hist. Nat. Poiss., XVIII, p. 432.

Ablennes hians, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 231.

FIELD CHARACTERS: Similar to *Strongylurus* but with the body compressed into a band or ribbon shape.

DESCRIPTION: Our specimen is typical except that it has one more dorsal ray than has heretofore been recorded.

Length	654 mm.	Interorbital	18 mm.
Depth	44 "	Postorbital	38 "
Width	20 "	Pectoral length	64 "
Head	185 "	Dorsal rays	26
Eye	19 "	Anal rays	27
Snout	129 "		
Beak	111 "		
$\frac{L}{D} 14.9 \quad \frac{L}{H} 3.5 \quad \frac{H}{E} 9.7 \quad \frac{H}{S} 1.43 \quad \frac{H}{B} 1.65$			

SIZE AND WEIGHT: The species is known to reach a length of 3 feet. Our specimen was 25¾ inches or 654 mm. in length, and weighed 320 grams.

GENERAL RANGE: From Massachusetts to Brazil. Also recorded from the Cape Verde Islands.

OCCURRENCE IN PORT-AU-PRINCE BAY: One specimen taken in seine by native fishermen.

STUDY MATERIAL: Specimen, 1; 654 mm., No. 7134.

Family HEMIRHAMPHIDAE; THE HALF-BEAKS

Key to Port-au-Prince Bay Genera

- A. Body moderately compressed; pectoral fins moderate; shore fishes.
- B. Sides of the body vertical; ventral fins inserted much nearer the base of the caudal than the gill opening.....*Hemirhamphus*
- BB. Sides of body not quite vertical, more or less convex; ventral fins inserted further forward, usually at a point about midway between base of caudal and gill opening.....*Hyporhamphus*
- A. Body slender and compressed, more or less band-like; pectoral fins very long, more than ¼ the length of the body; ventral fins very short, inserted posteriorly; pelagic species.....*Euleptorhamphus*

Hemirhamphus Cuvier, 1817

Orange-tailed Half-beak; Ballyhoo;
Baloa

Hemirhamphus brasiliensis (Linnaeus)

REFERENCES: *Esox brasiliensis*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 314.
Hemirhamphus brasiliensis, Meek and Hildebrand, 1923,
Marine Fishes of Panama, I, p. 234.

FIELD CHARACTERS: Small, elongate fishes with lower jaw prolonged into a long beak; sides vertical; ventral fins inserted nearer base of caudal than gill openings. Upper lobe of caudal fin orange.

DESCRIPTION: Our specimens are typical in almost every respect. The following table illustrates the relative progress of 6 characters from young to adult.

	A			B			C			D		
Length...	35	mm.	16%	38.5	mm.	18%	145	mm.	67%	215	mm.	100%
Depth....	3.8	"	10	5	"	14	25	"	70	36	"	100
Head.....	7.8	"	16	9	"	18	35.2	"	73	48.5	"	100
Eye.....	2.3	"	17	2.6	"	19	9.5	"	70	13.5	"	100
Snout....	1.6	"	10	2.4	"	14	11	"	67	16.5	"	100
Beak.....	10.3	"	17	13.5	"	23	41.5	"	72	58	"	100
Average...	14.3%			17.6%			70%			100%		

The head of the 145 mm. fish is slightly longer than is usually described for this species, averaging 4.1 times into the length instead of 4.35 to 4.63. The specimen agrees, however, in all other characters.

The smaller examples are less deep than in typical measurements given Meek & Hildebrand, the depth into the length being 9.2 in a 35 mm. fish and 7.7 in a 38.5 mm. specimen, and in these the eye is slightly larger,—3.4 and 3.46 in the head, respectively.

SIZE AND WEIGHT: This species is said to reach a length of 15 inches. Our largest example measured 215 mm. in length.

COLOR: This species is conspicuous among the Haitian half-beaks because of the orange upper lobe of the caudal fin.

Adults: Dusky greenish-brown above, silvery on the sides and below. A dark streak along the sides from the upper angle of the gill opening to the base of the caudal, wider and more diffuse posteriorly. Median line of the back with three, dark, narrow lines, often difficult to see, the central one often diffuse. Upper lobe of the caudal fin orange, the lower dusky.

Smaller fish from 35 to 47 mm. in length (alcoholic specimens) have the pigment distributed as follows: Top of head, snout and lower jaw densely covered with chromatophores; the opercles with only a few scattered pigment cells. Edges of the scales on the dorsal surfaces as far down as the center of the sides, densely pigmented. A dark band on the sides beginning at the upper angle of the gill-opening, continuing to the caudal fin, becoming wider and denser posteriorly. Belly and under surfaces with a median narrow band of chromatophores extending from the isthmus to the caudal fin, most intense immediately before and between the ventrals, splitting in two at the anus and continuing as a line of spots on either side of the anal fin to the caudal. A small black spot on the body at the base of the ventral fin, anteriorly and superiorly. Three dark patches on the middle of the sides, two between the anal and dorsal fin, and one above the ventrals. There is a trace of another spot before this one, but it is not sufficiently developed in any of our specimens to be certain as to its actual existence. A few scattered chromatophores are found on the lower sides. Membranes of the posterior part of the dorsal and anal fins blackish. Lower lobe of the caudal dusky. Other fins plain.

The changes in the distribution of the pigment on the dorsal surface is somewhat simpler than in *Hyporhamphus unifasciatus*, although this may be because we lack specimens of *Hemirhamphus* as small as those of the other species. Three characters only are present, and their changes may be shown in the following diagram:

Hemirhamphus brasiliensis

Changes in pigmentation of the dorsal surface with growth.

A.—35 mm. specimen.

C.—47 mm. specimen.

B.—40 mm. specimen.

D.—185 to 215 mm. specimens.

Symbols same as those used under *Hyporhamphus unifasciatus*.

1. Median line.

Present in all individuals, in varying degrees of strength; in some of the larger specimens being wider and more diffuse than in others.

2. Submedian lines.

These appear in our fish of 40 mm. length as a series of dots, which in the 47 mm. specimen have become continuous lines. They are present in all larger specimens.

3. Pigmented scale edges.

These are present and are very conspicuous in our small specimens of 35 to 47 mm. In the older fish the general darkening of the upper surface has completely submerged these patterns.

GENERAL RANGE: Florida south to Bahia, Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: A few at surface light at night.

ABUNDANCE: Rather rare compared with *Hyporhamphus unifasciatus*. We took nine individuals.

METHOD OF CAPTURE: Natives take them in seines at night. All of ours were taken as they came to submerged lights.

FOOD: The stomach of a 215 mm. specimen contained the usual quantity of comminuted algae, also considerable woody tissue of land plants, 2 or 3 blades of grass and several insects, a spider and a small hymenopteron. There was also the remains of a half-digested small fish.

A second individual had eaten large quantities of half-decayed bits of *Thalassia* leaves.

In a third fish, 50 mm. long was a mass of similar material, *Thalassia* and bits of tissue of land plants all quite decolorized.

STUDY MATERIAL: Photographs, 3773; Specimens, 9 (6 small, 3 large); including Nos. 6803, 7043 (2), 7050 (2), 7087a (2),—(2). Port-au-Prince Bay.

Hyporhamphus Gill, 1859

Half-beak; Balao; Balaju; Bally-hoo
Hyporhamphus unifasciatus (Ranzani)

REFERENCES: *Hemirhamphus unifasciatus*, Ranzani, 1842, Novi. Comment. Ac. Sci. Inst. Bonon., V, p. 326.
Hyporhamphus unifasciatus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 237, Plate XVI, fig. 1.

FIELD CHARACTERS: Small, elongate fishes with lower jaw prolonged into a long beak. Sides convex. Ventral fins inserted midway between base of caudal and gill opening.

DESCRIPTION: The 28 specimens taken all conform typically to the descriptions of *unifasciatus*. The extremes in size in our collection are 15 and 147 mm. and the comparative development of six characters is shown in the following table:

	A			B			C			D		
Length...	15.5	mm.	10%	26	mm.	18%	78	mm.	53%	147	mm.	100%
Depth....	1.3	"	8	2.5	"	10	8.5	"	37	23	"	100
Head.....	3	"	9	5	"	15	16	"	50	33	"	100
Eye.....	.95	"	12	1.7	"	22	4.0	"	53	7.5	"	100
Snout.....	.65	"	6	1.3	"	12	5.7	"	52	11	"	100
Beak.....	2	"	8.3	7.8	"	32	20	"	83	24	"	100
Average...	8.6%			18%			55%			100%		

In the smallest fish the snout is least developed, the eye as usual being the most advanced. In specimen C, which is half the length of the adult, the general average of all six characters is 55%, yet the depth still lags, being only 37%, while compensation is found in the beak which has forged ahead to 83%.

SIZE AND WEIGHT: Our largest specimen measured 147 mm. and weighed 27 grams. Grows to a foot.

COLOR: Pale green above, silvery below and on sides. Upper surface of head and mandible blackish, the tip of the latter red. Sides with a plumbeous stripe, widest posteriorly, bordered above with black,—this line present at all ages down to 15.5 mm. long. Back with dusky punctulations following the edges of the scales. The pattern of the dorsal surface varies with age, and the component parts of the pattern and their appearance and disappearance are given below.

In connection with the dorsal pigmentation four characters may be distinguished, as shown in diagram. These characters are similar to a certain extent to those found on *Hemirhamphus brasiliensis*, but they also differ considerably.

Hyporhamphus unifasciatus

Changes with growth in the pigmentation of the dorsal surface.

A.—Artificial diagram showing all the elements present. 1, median dorsal line, 2, sub-median dorsal lines, 3, lateral dorsal spots, 4, pigmented scale edges.

B.—Dorsal surface of 15.5 mm. specimen.

C.—19 mm. specimen.

D.—32 mm. specimen.

E.—52 mm. specimen.

F.—95 mm. specimen.

G.—147 mm. specimen.

Taken one by one the characters appear or disappear with age as follows:

1. Median dorsal line of chromatophores.

In a 15.5 mm. fish this line is absent. Faint indications appear in a 19 mm. fish, the chromatophores being very small and wide apart. In a 28 mm. specimen the chromatophores have increased in number and are consequently closer together. They continue their existence in much the same way in larger specimens, although in a 147 mm. fish they are masked to a considerable extent by the encroaching pigmented scale edges.

2. The sub-median dorsal lines.

These are present in 15.5 mm. and 19 mm. fish as a series of unconnected pigment dots. In 32 mm. specimens these pigment dots have become elongate dashes, and at 52 mm. standard length the dashes have consolidated and the continuous double dorsal stripes so conspicuous in the adult, are developed.

3. Lateral spots.

These spots are present in specimens up to 95 mm. and it is possible that they may persist in larger fish. In the very young they are enormous, apparently formed of a single chromatophore, and dwarfing the chromatophores of the beginning sub-median dorsal lines. With age they become relatively smaller and in practically all of our 85 and 95 mm. specimens they have disappeared entirely. In the smallest specimens these chromatophores join posteriorly to form the black spot on the upper surface of the caudal peduncle.

4. Pigmented scale edges.

In our series these do not appear until 95 mm. standard length has been attained. They are then especially prominent on the rows of scales just outside the submedian line. In still larger specimens they attain greater prominence and form, next to the submedian dorsal lines, the most conspicuous feature of the dorsal coloration of the adult.

GENERAL RANGE: Rhode Island to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Many seen in the markets. Common about our surface lights at night. Medium-sized half-beaks occasionally seen in shallow water near shore, and one small one was taken at the surface in full daylight two miles from shore.

METHOD OF CAPTURE: The native fishermen take these in seines at night. Our specimens were captured with hand nets at the gangway at night.

FOOD: Stomach of a medium sized fish filled with a fine, white, flocculent substance, amorphous except under high power microscope, where remains of partly broken down cells of algae can be made out. We have never seen this species feeding, but both the structure of its jaws and beak and the character of the food indicate a surface feeder.

SIZE AT MATURITY: Female 147 mm. in length (March 5th) had ripe ovaries.

SPAWNING SEASON: The ripe condition of the 147 mm. fish taken on March 5th, would indicate that the spawning season was approaching. The two ovaries were 70 mm. long by 7, the largest eggs measuring 1 mm. in diameter.

GENERAL HABITS: Those which came to our light were wary, and always on guard, and it was not easy to take them with a hand net. None were ever seen to feed; they swam slowly along near the surface, occasionally making a flying leap out of the water at the approach of danger.

STUDY MATERIAL: Specimens, Total number 28, divided as follows,—14, 15 to 70 mm. including 6996 (2), 7006 (2), 7043, 7050 (2), 7087a (3), 7113 (2), 7183 and 7288. 12, medium sized, up to 100 mm., including 7153d, 7243,—(8). 2, large, up to 147 mm.

Euleptorhamphus Gill, 1859

Flying Half-beak

Euleptorhamphus velox Poey

REFERENCES: *Euleptorhamphus velox*, Poey, 1867, Synopsis, 383.

Euleptorhamphus velox, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 724.

FIELD CHARACTERS: Slender, compressed, band-like fishes with lower jaw extended into a long beak; pectoral fins very long, more than one quarter the length of the body.

NOTE: En route to Gonave Island on January 6, I positively identified this species of which 30 or 40 kept rising ahead of the mine-sweeper in which I made the trip. In the afternoon of the same day a pair was seen through the water-glass, as I waded shoulder deep in an outer reef off Point á Galets, Gonave, and both broke water and flew some distance at the approach of a motor boat.

I distinguished every character in the case of the latter pair, but never again saw the species in Haiti. (W. B.)

Family EXOCOETIDAE; THE FLYING-FISHES

Key to Port-au-Prince Bay Genera

- A. Pectoral fins moderate, not reaching beyond middle of base of dorsal fin; base of anal about equal to base of dorsal.....*Parexocoetus*
 AA. Pectoral fins long, usually reaching beyond base of dorsal fin, sometimes nearly to base of caudal; ventral fins long, reaching past middle of base of anal; anal fin short, its base shorter than dorsal fin base.....*Cypselurus*

Parexocoetus Bleeker, 1866 **Short-winged Flyingfish***Parexocoetus mesogaster* (Bloch)

REFERENCES: *Exocoetus mesogaster*, Bloch, 1795, Ichthyologia, p. 399.

Parexocoetus mesogaster, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 728.

FIELD CHARACTERS: Transparent-winged flying-fish; body coppery blue above, silvery below; pectorals reaching half way to end of dorsal, anal equal in length to dorsal; snout short and blunt.

SIZE AND WEIGHT: Reaches 7 inches in length. Our specimen measured 104 mm. and weighed 14.5 grams.

COLOR: Blue above with iridescent lights changing constantly to copper, green and orange; silvery white below, shading to steely purple.

GENERAL RANGE: Cosmopolitan in tropical seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen now and then flying about the Bay. A single specimen taken at the surface light at night on April 20th.

STUDY MATERIAL: Colored Plate, H101, No. 7186; Specimens, 1; 104 mm. No. 7186, Port-au-Prince Bay.

Cypselurus Swainson, 1839 **Dark-winged Flyingfish***Cypselurus bahiensis* (Ranzani)

REFERENCES: *Exocoetus bahiensis*, Ranzani, 1842, Novi. Comment. Ac. Sci. Insti. Bonon. V, p. 362, Pl. XXXVIII.

Exocoetus bahiensis, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 739.

FIELD CHARACTERS: Flying-fish with dusky and brown spotted pectoral fins.

GENERAL RANGE: Tropical seas.

NOTE: No specimen of this flying-fish was taken, but numerous individuals and schools with dusky and brown spotted pectorals were seen flying above the water of the Bay, all of which undoubtedly belonged to this genus, and very probably to the species *bahiensis*.

Family BREGMACEROTIDAE

Bregmaceros Thompson, 1840

Unicorn Fish

Bregmaceros atlanticus Goode and Bean

REFERENCES: *Bregmaceros atlanticus*, Goode and Bean, 1886, Bull. Mus. Comp. Zool., XII, No. 5, p. 165.

Bregmaceros atlanticus, Jordan and Evermann, 1898, Fishes of No. and Mid. America, III, p. 2527.

FIELD CHARACTERS: Very small flesh-colored fish, pigmented above and sometimes on fins; long dorsal and anal fins with undulatory outlines, of forty or more rays each; single elongated spine on head; pelvics with three, very long, flat, separate rays.

SIZE AND WEIGHT: The longest specimen recorded measures 46 mm.

GENERAL RANGE: Atlantic Ocean near the West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Six specimens taken at night, at the surface, at light.

ENEMIES: One taken from the stomach of *Caranx latus*.

STUDY MATERIAL: Colored Plate, H56; Photograph, 3938; Specimens, 6; 25 to 40 mm., including Nos. 7000, 7030, 7055, 7064, and 7289.

Family BOTHIDAE; FLOUNDERS

Key to Port-au-Prince Bay Genera

- A. Lateral line with a distinct arch in front; interorbital space broad; scales small, 75 to 100 or more.....*Platophrys*
- AA. Lateral line without a prominent arch in front.
  - B. Teeth in upper jaw biserial, in lower uniserial; gill-rakers short...*Syacium*
  - BB. Teeth in both jaws uniserial; maxillary more than $\frac{1}{3}$ length of head; gill rakers slender, of moderate length.....*Citharichthys*

Platophrys Swainson, 1810 **Peacock Flounder***Platophrys lunatus* (Linnaeus)

REFERENCES: *Pleuronectes lunatus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 269.

Platophrys lunatus, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2665.

FIELD CHARACTERS: Medium-sized flounders with eyes and color on left side; both pectoral fins present, that of the left side usually filamentous in the male; vomer toothless; lateral line with a strong arch in front; interorbital space very broad; snout projecting, prominent; dark olive, with many rings, curved spots and small round dots of sky blue on body.

SIZE AND WEIGHT: Reaches a length of 18 inches. Our 250 mm. specimen weighed 288 grams.

GENERAL RANGE: Florida and West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Two specimens obtained from market.

STUDY MATERIAL: Color Plate, H113, No. 7239; Specimens, 2; 171 and 250 mm., Nos. 7726, 7239.

Syacium Ranzani, 1842 **Transparent Turbot***Syacium micrurum* Ranzani

REFERENCES: *Syacium micrurum*, Ranzani, 1842, Novi Comment. Ak. Sci. Inst. Bonon., V, p. 20.

Syacium micrurum, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 981.

FIELD CHARACTERS: Small, elliptical flounders with ventral fin of eyed side inserted on abdominal ridge; lateral line nearly straight; maxillary equal to or greater than $\frac{1}{3}$ length of head; teeth in upper jaw biserial; 60 to 68 scales in lateral line; brownish.

SIZE AND WEIGHT: Reaches a length of 175 mm.

COLOR: Adult, brownish with irregular dark blotches and a few ocelli, ringed with grey and black, fins with numerous dark spots. Young, quite transparent.

GENERAL RANGE: Key West, to West Indies and Rio Janeiro, Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Three inch specimen seined by native, smaller one taken at night at surface light.

YOUNG: On the night of March 31st took a small turbot of 23 mm. at the gang-way submerged light. When first seen, and later when examined under the microscope in the laboratory tent, it was absolutely transparent, even bone being perfectly clear and distinct. Only the phosphorescent-like reflective gleam from the two eyes was visible, together with the backing of the eye balls, and six red pigment cells on the gills and anterior dorsal rays. In preservative, the fins have remained clear, but the body is pale opaque yellow. In this specimen the head is relatively small, going into the length five times, instead of the adult average of 3.8. (W. B.)

STUDY MATERIAL: Specimens, 2; 23 and 68.5 mm. Nos. 6990 and 7127. Port-au-Prince Bay.

Citharichthys Bleeker, 1862

Key to Port-au-Prince Bay Species

A. Eye larger, $3\frac{1}{2}$ to $4\frac{1}{2}$ in head; whitish blotches and ocelli present. . . *uhleri*

AA. Eye smaller, 5 to 6 in head; no whitish blotches and ocelli present.

spilopterus

Uhler's Whiff

Citharichthys uhleri Jordan

REFERENCES: *Citharichthys uhleri*, Jordan and Goss, 1889, Rep. U. S. Fish Comm., p. 275.

Citharichthys uhleri, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2684.

FIELD CHARACTERS: Small, oblong flounders with eyes and color on left side; vomer toothless; lateral line without arch in front; teeth in jaws uniserial; maxillary more than $\frac{1}{3}$ of head; gill rakers slender; eye $3\frac{1}{3}$ to $4\frac{1}{2}$ in head; dorsal rays 68, anal rays 52; brown with large ocelli on body and tail.

SIZE AND WEIGHT: A 123 mm. specimen weighed 28 grams.

COLOR: Greenish brown, with numerous large ocelli, pale edged with dark brown centers; a large very distinct ocellus in the center of the caudal rays. Iris bright yellow.

GENERAL RANGE: Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Rarely taken in seines by native fisherman.

STUDY MATERIAL: Specimens, 2; 99 and 123 mm. No. 6850.

Spot-finned Whiff

Citharichthys spilopterus Günther

REFERENCE: *Citharichthys spilopterus*, Günther, 1862, Cat. Fish. Brit. Mus., IV, p. 421.

Citharichthys spilopterus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 988.

FIELD CHARACTERS: Small oblong flounders with eyes and color on left side; vomer toothless; lateral line without arch in front; teeth in jaws uniserial; maxillary more than $\frac{1}{3}$ length of head; gill rakers slender; eye 5 to 6 in head, 45 to 48 scales in lateral line; olive brown, with darker spots and blotches.

DESCRIPTION: Differs from the type description in having the eyes somewhat closer together, and the depth into the length is 2.3 instead of "nearly two."

SIZE AND WEIGHT: Our 133 mm. specimen weighed 37 grams.

GENERAL RANGE: New Jersey, and the West Indies to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: On the bottom in rather shallow water where the native fishermen take them in their seines.

ABUNDANCE: Apparently not rare as we obtained eleven specimens.

STUDY MATERIAL: Photograph, 3777; Specimens, 11; 72-133 mm. No. 6837.

Family ACHIRIDAE; SOLES

Achirus Lacepede, 1803

Lineated Sole

Achirus lineatus (Linné)

REFERENCES: *Pleuronectes lineatus*, Linné, 1758, Syst. Nat., Ed. X, p. 268.

Achirus lineatus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 998.

FIELD CHARACTERS: Small, ovate, scaled soles with caudal fin free from dorsal and anal; eyes and color on right side of body; brown to greyish, with about eight narrow, vertical blackish cross streaks, and often with large blackish blotches.

SIZE AND WEIGHT: Grows to a length of 8 inches. Our 96 mm. specimen weighed 32 grams.

COLOR: Variable, plain dark brown, or mottled or showing six to eight narrow, dark cross lines.

GENERAL RANGE: Florida Keys and West Indies, to Uruguay.

OCCURRENCE IN PORT-AU-PRINCE BAY: Adults living on bottom, the young coming to the surface at night.

ABUNDANCE: Not rare, fourteen taken by us.

METHOD OF CAPTURE: Seined by native fisherman, and taken in hand nets at surface.

YOUNG: On several nights I caught young soles of this species, near the surface, at our submerged light. They swam slowly along and when at the surface elevated the encircling ring of vertical fins, and depressed the body, and in this cupped shape floated with no apparent movement of fins or body. The tips of all the rays could be seen breaking the surface film, but I could see no difference in the level of the enclosed water and that outside. These specimens measured from 17.5 to 25 mm.

The color change in these young soles was more extreme than in any fish I have ever seen. One taken on April 5th was dark green when dipped up, but in a glass dish under full electric light lost all color except a broad fin border of mottled greenish brown. When this individual undulated to the surface and cupped itself, the effect was of a circular ribbon of dark color, surrounding an area of absolute transparency, showing only dimly a network of fine bones. This specimen had only a single eye although in orientation it was quite adult. In past years I have caught 6 or 8 soles and flounders which had each lost an eye, and as this has always been the peripatetic one, it appears as if the astonishing shift through muscle and skull is not accomplished without a certain amount of weakening.

A second baby sole taken at night had a considerable amount of brilliant turquoise blue on the fins. This one likewise became transparent in the light of the laboratory, with the exception of six large, dusky, round spots, three on each side, with a scattering of black pin-pricks of dots. The blue was of the same character as that on the fins of the young, surface-swimming *Halieutichthys*, an interesting fact because of the bottom living nature of the adult fish in each case. (W. B.)

STUDY MATERIAL: Colored Plate, H18, H125a, No. 7190; Photograph, 3962; Specimens, 14; 17.5–96 mm., including Nos. 6841, 7021, 7204, and 7243. Port-au-Prince Bay.

Family CYNOGLOSSIDAE; TONGUE-FISHES

Symphurus Rafinesque, 1810

Tongue Fish

Symphurus plagusia (Bloch and Schneider)

REFERENCES: *Pleuronectes plagusia*, Bloch and Schneider, 1801, Syst. Ichth., p. 162.

Symphurus plagusia, Meek and Hildebrand, 1928, Marine Fishes Panama, III, p. 1005.

FIELD CHARACTERS: Small, elongate, lanceolate soles, with dorsal and anal fins confluent around tail; eyes and color on left side of body; brownish, somewhat mottled.

DESCRIPTION: The two specimens show somewhat intermediate characters between *plagusia* and *plagiusa*, as follows: No. 7257 is *plagiusa* in dorsal ray and in scale count, while 7116 is close to it in anal ray count. In color and all other characters both are typical *plagusia*. It is probable that the two forms will prove to be one species.

SIZE AND WEIGHT: Our 142 mm. specimen weighed 21 grams.

COLOR: Brown with 6 to 7 black cross-bars, vertical fins dusky or black.

GENERAL RANGE: West Indies to Uruguay.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seined by native fisherman near a pebbly beach.

STUDY MATERIAL: Specimens, 2; 91 and 142 mm. Nos. 7116, 7257.

Family HOLOCENTRIDAE; THE SQUIRREL-FISHES

Key to Port-au-Prince Bay Genera

- A. Lower jaw short, the chin not entering the dorsal profile.
- B. No large, preopercular spine, gill rakers long and slender, 21 to 23 on lower limb of first arch.....*Myripristis*
- BB. A large preopercular spine; gill rakers rather long and slender, 8 to 15 developed on lower limb of first arch.....*Holocentrus*
- AA. Lower jaw long, more than half the length of the head; chin projecting considerably beyond upper jaw. Gill rakers short, thick-set, about 9 developed on lower limb of first gill-arch.....*Flammeo**

Myripristis Cuvier, 1829

Candil; Frere-Jacque

Myripristis jacobus Cuvier and Valenciennes

REFERENCES: *Myripristis jacobus*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., III, p. 162.

Myripristis jacobus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 294.

FIELD CHARACTERS: Small, chunky, compressed, large-eyed, scarlet fish without a preopercular spine; with a deep crimson bar across upper half of opercle, extending down and back across base of pectoral.

* The genus *Flammes* merges with *Holocentrus* and is no longer considered valid.

DESCRIPTION:

Length 125 mm.
 Depth 50 (2.5)
 Head 42 (3)
 Eye 19 (2.2)
 Snout 8 (5.2)
 Lateral Line Scales 34
 Dorsal : X-I-14
 Anal : IV-12

SIZE AND WEIGHT: Reaches 12 inches in length; our five-inch specimen weighed 74.5 grams.

COLOR: In life: Scarlet, paling to silvery below; a deep crimson bar across upper half of opercle, and down and back across base of pectoral fin; dorsal fin deep scarlet on distal three-fourths of first two webs, becoming a broad edge on the rest; remainder of webs silvery; ventral fins white; all others deep rose, anterior ray of dorsal and anal and outer caudal rays white, iris scarlet, shot with silvery on outer edge.

GENERAL RANGE: West Indies to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on reefs; rare.

METHOD OF CAPTURE: Taken in trap baited with crab meat at Bizoton Reef.

SIZE AT MATURITY: In breeding condition when five inches long.

SPAWNING SEASON: Female breeding on March 23rd.

EGGS: Ovary 30 x 10 mm. Eggs .68 mm., each containing a single oil globule.

STUDY MATERIAL: Specimen, 1; 125 mm. No. 7092.

Holocentrus Gronow, 1763

Key to Port-au-Prince Bay Species

- A. Thirteen to fifteen gill-rakers developed on lower limb of first gill arch. *ascensionis*
- AA. Eight to nine gill-rakers developed on lower limb of first gill arch.
- B. Black spot confined to the membranes between first and third or first and fourth dorsal spines.....*coruscus*
- BB. Membranes of dorsal fin black in front of each spine, pale behind, the black not extending to the base or to the tip between the first and second and the second and third spines.....*vexillarius*

Common Squirrel-fish; Cartinau

Holocentrus ascensionis (Osbeck)

REFERENCES: *Perca ascensionis*, Osbeck, 1765, Reise nach Ostindien und China, p. 388.

Holocentrus ascensions, Meek and Hildebrand 1923, Marine Fishes of Panama, I, p. 297.

FIELD CHARACTERS: Small to medium-sized, oblong, compressed fishes, with very large eyes, long spine on preopercle; scales strongly serrate; upper lobe of caudal much longer than lower; anterior rays of soft dorsal much elevated; reddish above, with bluish reflections and brownish stripes between the scales; head bright red, iris scarlet.

DESCRIPTION: Our series of specimens agrees with the published descriptions of this species.

SIZE AND WEIGHT: Grows to 2 feet. A 156 mm. fish weighed 85 grams.

GENERAL RANGE: From Florida to Brazil, and known from the Eastern Atlantic.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed over reefs.

ABUNDANCE: A common species, often seen in the markets, but not of great food value.

METHOD OF CAPTURE: Seines, hooks and lines and in traps. Many were taken with the two latter methods, from the schooner anchorage in 40 to 60 feet of water on muddy bottom. A 56 mm. fish was strongly attracted to a red selenium bulb submerged over the side.

GENERAL HABITS: These fish were easily frightened while we were diving. One medium-sized fish had appropriated a small box-like depression in the upper part of a piece of coral, in which it had coiled itself, and was quietly resting.

STUDY MATERIAL: Color Plate, H21, No. 6877; Photographs, 3761, 4012; Specimens, 12; 56-156 mm., No. 6877.

Shining Squirrel-fish

Holocentrus coruscus Poey

REFERENCES: *Holocentrum coruscum*, Poey, 1860, *Memorias*, II, p. 158.

Holocentrus coruscus, Jordan and Evermann, 1896, *The Fishes of Middle and North America*, I, p. 851.

FIELD CHARACTERS: Small, short and thick, compressed fishes with large eye and a long spine on preopercle; an intense black spot on membrane between 1st and 3rd or 1st and 4th dorsal spine.

DESCRIPTION: Three specimens are assigned to this species, their respective lengths being 30, 32 and 85 mm. All three agree in possessing the black spot on the anterior part of the spinous dorsal fin, although in preserved coloration the two small fish are bright silvery, while the larger one is dull yellow, a condition most likely brought about by differences in preservative, the former being in alcohol and the latter in formalin.

The measurements of the three are as follows:

Specimen number	7149B	7149A	7291
Length, actual mm.	30 mm.	32 mm.	85 mm.
Depth	9 (3.3)	10 (3.2)	30 (2.8)
Head	10 (3)	11.2 (2.8)	30 (2.8)
Eye	4 (2.5)	3.7 (3)	12.5 (2.4)
Snout	2.5 (4)	3 (3.7)	7 (4.3)
Scales	41	40	41
Gill-rakers, developed	8	9	8-9
Dorsal fin	XI-1-12	XI-1-12	XI-1-13
Anal fin	IV-9	IV-8	IV-8½

Although there is an appreciable amount of variation between certain proportions it is believed that all three fish are of the same species. The longer head and snout measurements in the smaller specimens is due to the projecting snout characteristic of young Holocentrids.

SIZE AND WEIGHT: Our 85 mm. specimen weighed 16 grams.

COLOR: The following description was made of the 32 mm. fish; Upper surfaces above a line from the center of the eye to middle of caudal peduncle, reddish with a coppery tinge. Remainder of sides silvery with a slight reddish tinge. A series of horizontal, bluish stripes as follows: one from head to base of 4th dorsal spine; one from head to base of last dorsal ray; two from upper edge of opercle to tail; a stripe above and a stripe from below the pectoral fin toward the tail, these bands merging together above the last rays of the anal fin; one band from isthmus below pectoral to above base of anal. A yellowish, rather broad band, along the lateral line from opercle to tail. Upper sides with brownish punctations. Sides and lower surfaces with small red spots. Spinous dorsal pinkish red at base, above which is a rather irregular white band, surmounted by a pinkish band which, in the posterior part of the fin extends to the outer edge. On the membrane between the first five spines the outer edge is white. Membranes immediately in front of the spines, heavily punctate with black, the punctuation more sparse on rest of membranes,—resembling *vexillarius* to a slight degree in this way. A large, intense black spot on membranes between the first and second, second and third, and on the anterior half of space between third and fourth dorsal spines. Pectoral, ventral and anal fins hyaline. Soft dorsal hyaline, the rays reddish. Center of each caudal lobe reddish.

The coloration of the smaller specimen was the same with the exception that the black spot on the anterior portion of the spinous dorsal was confined to the space between the first and third spines, and the reddish tinge was continued to the outer border of the anterior membranes of the dorsal fin.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: On reefs, and young found near surface at night.

ABUNDANCE: Rare, not seen on reefs during expedition.

METHOD OF CAPTURE: Small ones taken with scoop-nets as they came to our light at night.

FOOD: The largest specimen had eaten a shrimp.

STUDY MATERIAL: Specimens, 3; 30, 32 and 85 mm., Nos. 7149b, 7149a and 7291.

Black-barred Squirrel-fish

Holocentrus vexillarius Poey

REFERENCES: *Holocentrum vexillarium*, Poey, 1860, *Memorias*, II, p. 158.
Holocentrus vexillarius, Meek and Hildebrand, 1923, *Marine Fishes of Panama*, I, p. 299.

FIELD CHARACTERS: Small, rather short, compressed fishes with a long spine on preopercle. Dark stripes along rows of scales; membrane in front of each dorsal spine black, and pale behind.

DESCRIPTION: Our specimens agree very well with the long description given by Meek and Hildebrand.

SIZE AND WEIGHT: Our specimens are all of about the same size, the largest measuring 100 mm. and weighing 31 grams.

GENERAL RANGE: Cuba, Porto Rico and Panama.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on small reefs.

METHOD OF CAPTURE: Taken by us only with dynamite.

STUDY MATERIAL: Specimens, 7; 60-100 mm., Nos. 7332, 7321.

Flammeo Jordan and Evermann, 1898

**Large-mouthed Squirrel-fish;
Marian**

Flammeo marianus (Cuvier and Valenciennes)

REFERENCES: *Holocentrum marianum*, Cuvier and Valenciennes, 1829, *Hist. Nat. Poiss.*, III, p. 219.

Holocentrus marianus, Jordan and Evermann, 1896, *Fishes of North and Middle America*, I, p. 852; Part III, 1898, pages 2842 and 2871.

FIELD CHARACTERS: Small, rather deep, compressed, red fishes with projecting chin, large lower jaw and projecting spine on preopercle; spinous dorsal fin with two rows of orange spots; caudal with a deep red bar.

SIZE AND WEIGHT: Grows to at least 170 mm. Our 130 mm. specimen weighed 52 grams.

COLOR: In life, bright red becoming white below, with narrow, yellowish stripes between the rows of scales, the stripes above the lateral line alternately large and small. Upper part of soft dorsal and anterior part of anal rays pinkish. Membrane of spinous dorsal pale bluish-white with irregular orange

spots on upper portion of anterior part of fin. Smaller spots of similar color but paler on basal portion of anterior rays. Caudal fin with a broad bar of deep red, the posterior part of the lobes pale pink.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken near reef by native fishermen.

ABUNDANCE: Rare, only two specimens seen or taken, one of these at market.

EGGS: The larger fish contained numbers of undeveloped eggs, measuring .3 mm. in diameter.

STUDY MATERIAL: Specimens, 2; 85-130 mm., Nos. 7100 and 7320.

Family SYNGNATHIDAE; THE PIPE-FISHES

Key to Port-au-Prince Bay Genera

- A. Head shaped like horse; tail prehensile; body robust.....*Hippocampus*
- AA. Body elongate; tail not prehensile.
- B. Dorsal fin with 40 to 43 rays.....*Doryrhamphus*
- BB. Dorsal fin with fewer than 30 rays.....*Syngnathus*

Hippocampus Rafinesque, 1810; THE SEAHORSES

Dotted Seahorse

Hippocampus punctulatus Guichenot

REFERENCES: *Hippocampus punctulatus*, Guichenot, 1853, in Sagra, Hist. Phys. Polit. Nat. Cuba, IV, Pt. II, p. 174, Pl. V, fig. 2.

Hippocampus punctulatus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 255.

FIELD CHARACTERS: Head shaped like that of horse, at right angles to the body; tail prehensile.

DESCRIPTION: Our specimens are typical in every way. Both have 17 dorsal rays.

SIZE AND WEIGHT: Our 128 mm. seahorse weighed 9 grams.

GENERAL RANGE: Tropical Atlantic from America to Africa.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken rarely in Sargassum weed which the tide brought into the Bay. One small and one large one collected.

STUDY MATERIAL: Specimens, 2; 19-128 mm., including Nos. 6846 and 7195. Port-au-Prince Bay. Sargassum weed.

Doryrhamphus Kaup, 1856

Lineated Pipe-fish

Doryrhamphus lineatus (Valenciennes)

REFERENCES: *Doryichthys lineatus*, Valenciennes, 1856, MS. in Kaup, Cat. Lophobr. Fish, 59.

Doryrhamphus lineatus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 261.

FIELD CHARACTERS: Small, elongate pipe-fishes with long snout; tail shorter than trunk; approximately 40 rays in the dorsal fin.

DESCRIPTION: Our specimens are typical except that the tail fin in specimens up to 80 mm. in length, is longer and not shorter than the post-orbital portion of the head, as shown in the following table:

Length of Specimen in mm.	63.5 mm.	73	76	80	85	142
Length of Post-Orbital Part of Head	3.9	4.2	5	5	6.3	9
Length of Caudal Fin	6.9	5.2	5.9	6	5.5	5.3

GENERAL RANGE: Shores of tropical Atlantic.

OCCURRENCE IN PORT-AU-PRINCE BAY: Of the 11 specimens 3 were taken in a brackish creek at Bizoton and the others at light, from March 5th to April 30th.

STUDY MATERIAL: Specimens: 11; 63 to 147 mm., including numbers 6977 (3) brackish creek, Bizoton; 6996 (3), 7125 (2), 7153d (1), 7243, and 27261, all from light, Port-au-Prince Bay.

Syngnathus Linnaeus, 1758

Key to Port-au-Prince Bay Species

- A. Dorsal longer, with 26 to 30 rays.
- B. Head and snout 6.1 to 6.6 in length; depth (in Haitian specimens) about 22 or less.....mackayi
- BB. Head and snout 7.5 to 8.5 in length; the depth (in Haitian specimens) 25 to 37 in length.....rousseau
- AA. Dorsal shorter, 22 to 24 rays, on 1/2 + 5 or 0 + 6 rings.....elucens

Mackay's Pipefish

Syngnathus mackayi (Swain and Meek)

REFERENCES: *Siphostoma mackayi*, Swain and Meek, 1884, Proc. U. S. Nat. Mus., VII, p. 239.

Syngnathus mackayi, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 257.

FIELD CHARACTERS: Small elongate pipe fishes with 26 to 30 dorsal rays: depth 16 to 22; head and snout very long, 6.1 to 6.6 in length.

DESCRIPTION: Various discrepancies were encountered in the descriptions of

this fish and of the two following species, when the accounts, mainly of Jordan and Evermann, Evermann and Marsh, and Meek and Hildebrand, in addition to the original description of each species, were considered. However, when all the descriptions were merged and the extreme proportions and characters combined, our specimens fall within the limits of these species.

GENERAL RANGE: Florida to Panama.

OCCURRENCE IN PORT-AU-PRINCE BAY: All of our specimens were taken from Sargassum weed in late April, 1927.

ABUNDANCE: Common in sea-weed.

METHOD OF CAPTURE: Taken by searching through sea-weed grappled from surface.

STUDY MATERIAL: Photograph, 4225; Specimens, 7; 77-130 mm., including Nos. 7210 and 7245, Port-au-Prince Bay. April, 1927.

Rousseau's Pipefish

Syngnathus rousseau Kaup

REFERENCES: *Syngnathus rousseau*, Kaup, 1856, Cat. Lophob. Fish, p. 40.
Syngnathus rousseau, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 258.

FIELD CHARACTERS: Small, very elongate pipe-fishes with 26 to 29 dorsal rays; head and snout 7.5 to 8.5 in length; both sexes very slender, the depth 25 to 37, usually, in Haitian specimens, over 30.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Our largest fish was taken close in-shore over muddy bottom. Smaller fish (55-67 mm.) were present at night at the surface from Feb. 26 to April 20th, 1927.

ABUNDANCE: Fairly common, several specimens were to be seen every night.

METHOD OF CAPTURE: Traps and by means of scoop nets at submerged lights.

BREEDING: The male captured February 23, was carrying eggs.

STUDY MATERIAL: Specimens, 9; 55-167 mm., including Nos. 6936, 6963, 7063, 7125, 7153d, 7185, 7300, Port-au-Prince Bay.

Poey's Pipe-fish

Syngnathus elucens Poey

REFERENCES: *Syngnathus elucens*, Poey, 1867, Synopsis, p. 443.

Syngnathus elucens, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 768.

FIELD CHARACTERS: Small pipefish with short dorsal fin, containing 22 to 24 rays; dorsal fin occupying the first six caudal rings or occasionally extending on the last or the two last body rings.

DESCRIPTION: Five small fish, 32 to 35 mm. long, differ considerably from the other Haitian pipe-fishes, and appear to agree more closely with *elucens* than any other described species. They have been compared with a 66 mm. fish from the collections of the Museum of Natural History, identified as this species, and our fish differ in no essential details.

The Haitian fish have 22 (2 spec.) to 24 (3 spec.) dorsal rays, as opposed to 24 or 25 as described for *elucens*. The dorsal fin in 3 Haitian fish is on 0 + 6 rings and in the two others it is on 1 + 5.

Proportions of these five fish are given below:

	7192a	7192b	7301a	7301b	6963
Length	35 mm.	32 mm.	32.5 mm.	32.5 mm.	33 mm.
Depth in Length	23	24	23	23	22
Head in Length	7	7.1	7.2	7	7.5
Snout in Head	2.6	2.6	2.5	2.6	2.7
Post-orbital in Head	2.5	2.3	2.3	2.4	2.46
Eye in Head	5.8	5	5.9	5.2	5.7
Tail in Length	1.6	1.7	1.7	1.7	1.7
Dorsal Rays	22	24	24	22	24
Dorsal Rings	17+32	17+30	16+33	17+32	16+31
Pectoral Length into Head	7.1	7.1	7	6.5	6.7

GENERAL RANGE: Florida, Cuba and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found by us only at surface at night.

ABUNDANCE: Uncommon, 5 specimens seen and taken.

METHOD OF CAPTURE: Scoop nets as the fish came to light.

STUDY MATERIAL: Specimens, 5; 32–55 mm., including Nos. 7192a, 7192b, 7301a, 7301b, 6963. February 26–April 4th, 1927.

Family AULOSTOMIDAE; THE TRUMPET-FISH

Aulostomus Lacépède, 1803

Trumpet-fish

Aulostomus maculatus Valenciennes

REFERENCES: *Aulostoma maculatum*, Valenciennes, about 1845, in Cuvier, Illust. Poiss., plate 92, fig. 2.

Aulostomus maculatus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 754.

FIELD CHARACTERS: Elongate, somewhat compressed fishes, with mouth at end of very long head and snout, scales present; dorsal fin over anal and of same size; preceded by 8–11 spinous finlets.

DESCRIPTION: Three specimens showed unusual variability in several characters. The spinous dorsal rays number from 8 to 11, and the anal rays 24 to 28. The arrangement of the silvery body lines agrees with *maculatus*, but in general body color and in the greater relative length of the postorbital part of the head, specimen C approaches the unique individual known as *cinereus*. It appears probable that this is only a variation of *maculatus*. In comparative measurements the only point of interest is the unusually large size of the eye in the smaller specimens, contrary to Günther's statement. (Cat. Fishes British Museum, Vol. III, p. 536).

	A ♀			B ♀			C ♀		
Length	362	mm.	62%	440	mm.	76%	578	mm.	100%
Depth	29-	"	59.5	35-	"	71.5	49-	"	100
Head	120-	"	62.5	147-	"	77	191-	"	100
Eye	11	"	73.5	14-	"	93.5	15	"	100
Snout	81-	"	62.5	98-	"	75.5	130	"	100
Interorbital	6.5	"	56.5	9	"	78	11.5	"	100
Postorbital	28.2	"	57	36.5	"	74	49.5	"	100
Weight in grams	90		26	160		47	341		100
Average of above eight characters	62%			78%			100%		
Dorsal	X-27			XI-26			IX-26½		
Anal	28			24½			28		

SIZE AND WEIGHT: Our largest trumpet-fish measured 22.5 inches or 578 mm. and weighed 341 grams.

GENERAL RANGE: Caribbean Sea, north to southern Florida.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Observed over reefs, slowly moving in and out among the coral.

ABUNDANCE: Uncommon; rarely brought to the markets.

METHOD OF CAPTURE: Taken by native fishermen in nets, and speared by us on the reefs.

FOOD: The stomach contents of three individuals with their respective length are as follows:

(a) 578 mm. long, contained a 51 mm. *Engraulid*; and a *Pomacentrus*. The measurements of the latter are quite enormous, when the small mouth of the trumpet-fish is considered. The fish measured 71 mm. long with a depth of 29 mm. and a width of 17 mm. It had been swallowed tail first.

The size of the demoiselle and the fact that it had been swallowed tail first, make it likely that it had been swallowed after being killed by one of our dynamite explosions.

(b) 440 mm., contained comminuted fish remains.

(c) 362 mm., contained an *Engraulid*.

BREEDING: The ovaries measured as follows:

(a) 578 mm. in length = $97 \times 10 \times 8$ mm. = the length of the ovary being 16% of the fish's length.

(b) 440 mm. in length = $82 \times 11 \times 7$ mm. = 18% of the length

(c) 362 mm. in length = $88 \times 12 \times 8$ = 24% of the length.

STUDY MATERIAL: Specimens, 4; 362-578 mm., including No. 6941.

Family FISTULARIIDAE; THE CORNET-FISHES

Fistularia Linnaeus, 1758

Cornet-fish

Fistularia tabacaria Linnaeus

REFERENCES: *Fistularia tabacaria*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 312.
Fistularia tabacaria, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 250.

FIELD CHARACTERS: Elongate fishes with small mouth at end of very long snout and head; body without scales; no small finlets on dorsal surface before dorsal fin.

GENERAL RANGE: West Indies and neighboring seas, straggling occasionally to Massachusetts.

NOTE: This species was not taken during the expedition, but individuals belonging unmistakably to the species were seen while diving, once at Sand Cay and twice on Lamentin Reef. One of the latter was observed while close to a large *Aulostomus maculatus*, and the differences between the two genera were easily ascertained.

Family ATHERINIDAE; THE SILVERSIDES

Key to Port-au-Prince Bay Genera

- A. Upper edge of mandibular rami straight or nearly so.....*Hepsetia*
 AA. Upper edge of mandibular rami sharply curved posteriorly..*Atherina*

Hepsetia Bonaparte, 1837

Broad-headed Silverside

Hepsetia stipes (Müller and Troschel)

REFERENCES: *Atherina stipes*, Müller and Troschel, 1848, in Schomburgk, Hist. Barbados, p. 671.

Atherina stipes, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 264.

Hepsetia stipes, Jordan and Hubbs, 1919, Monographic Review of the Family Atherinidae, Studies in Ichthyology, Stanford University Series, p. 34.

FIELD CHARACTERS: Small elongate fishes with two separate, small dorsal fins; greenish with a narrow silvery line down middle of sides. Interorbital space wide. Scales 36 to 38.

SIZE AND WEIGHT: Grows to less than 3 inches. A fish 45 mm. long weighed 2 grams.

GENERAL RANGE: West Indies; shores of Western Atlantic from Florida to Panama.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken only at surface at night with submerged light alongside schooner.

METHOD OF CAPTURE: Scoop-nets at gangway of schooner, with light.

FOOD: Plankton, mainly entomostracans.

STUDY MATERIAL: Specimens, 21; 15 to 44 mm., including Nos. 6997, 6999, 7027, 7050, 7054, 7087a, 7097d, 7125.

Slender Silverside

Atherina harringtonensis araea (Jordan
and Gilbert)

REFERENCES: *Atherina araea*, Jordan and Gilbert, 1884, Proc. U. S. Nat. Mus., VII, p. 27.

Atherina harringtonensis araea, Jordan and Hubbs, 1919, Monographic Review of the Family Atherinidae, Stanford University Publ., University Series, p. 39, Plate III, fig. 9.

Atherina araea, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 264.

FIELD CHARACTERS: Small elongate fish with two separate small dorsal fins; greenish with a silvery line down middle of sides. Interorbital space not very wide, scales 42 to 45. The general appearance in the water seen from above, shows the back of molten silver; the head and the back from the second dorsal to the caudal turquoise green; sides silver with a greenish tinge, a patch of green at base of pectoral; head bluish; eye cold silvery white.

DESCRIPTION: Our specimens are quite typical and show a decided average of difference from a series of *Bermuda harringtonensis harringtonensis* taken by the senior author in September, 1927.

GENERAL RANGE: Florida and West Indies, south to Panama.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed surface fish, near reefs and the shore line. The distribution of the 164 specimens taken was 99 dynamited, 53 caught at the surface light at night and 12 taken at surface near Sand Cay.

ABUNDANCE: In enormous schools of hundreds of thousands near the surface.

METHOD OF CAPTURE: The fishes formed an abundant component of the so called "white bait" in the markets, taken by the native fishermen in seines. We secured many when we were dynamiting for large fish.

FOOD: Plankton, and floating dead organisms such as ants.

ENEMIES: Mackerel and many other large carnivorous fish took heavy toll from the great schools of silversides, while the pelicans pursued them mercilessly whenever they leaped out of the water.

EGGS: Eggs were bursting from a female taken on March 11th at surface light at nine o'clock. The ovaries contained 163 large eggs about 1 mm. in diameter, and about 400 averaging .4 mm. in diameter. The large eggs were clear, with a small dark nucleus surrounded by a few, small fat-cells, while the surface of the egg was covered with a maze of numerous, fine, hair-like lines.

GENERAL HABITS: As our motor-boat passed through one of the large schools, the appearance was of concentrated silvery motes sliding over the water, seldom sinking unless frightened, more than a few inches beneath the surface. The schools extended sometimes for a mile or more. They were closely associated with equal numbers of *Jenkinsia lamprotaenia*.

STUDY MATERIAL: Specimens, 164; including Nos. 6985, 6999, 7027, 7027a, 7087a, 7113, 7150, 7153b, 7183, 7192, 7192a, 7243, 7265, 7302, 7303.

Family MUGILIDAE; THE MULLET

Key to the the Haitian Genera

- A. Palatine teeth absent.....*Mugil*
 AA. Palatine teeth present.....*Agonostomus*

Mugil Linnaeus, 1758

**White Mullet; Blue-back Mullet;
 Liza Blanco**

Mugil curema Cuvier and Valenciennes

REFERENCES: *Mugil curema*, Cuvier and Valenciennes, 1836, Hist. Nat. Poiss., XI, p. 87.

Mugil curema, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 279.

FIELD CHARACTERS: Elongate, cylindrical, round-headed fishes with large adipose eyelids; small mouth with minute teeth. Two dorsal fins, the first of 4 spines, the second of 1 spine and 8 rays; anal fin with 3 spines and 9 rays; young similar with 2 anal spines and 10 rays.

DESCRIPTION: Our specimens fall within the limits of description of typical *curema*, except that we find a maximum count of 43 lateral scales in one large specimen.

Ontogentic Character Averages.

	A	B	C	D	E	F
Length of Specimen in mm.	7.7	21.5	115	158	196	418
Length	1.8%	5.1%	27%	38%	47%	100%
Depth	2.3	5.5	35	44	60	100
Head	2	6	31	47	49	100
Eye	3	7	34	53	53	100
Snout	1.7	6	31	43	50	100
Interorbital	2	6	29	40	42	100
Average	2%	6%	31%	44%	50%	100%
Weight in grams			32	95	165	1020
Average			3%	9.3%	16%	100%

SIZE AND WEIGHT: In a land-locked pool, the source of the Mariani, we secured our largest specimens of this species. They measure respectively 418 and 420 mm. and weigh $2\frac{1}{4}$ pounds each.

COLOR: A 7 mm. specimen shows a reversed coloration, the dorsal surface of the head and body showing only a scattering of pigment dots. This probably is connected with their life at the surface.

GENERAL RANGE: Both coasts of America from Cape Cod to Brazil, and the Gulf of California to Chili; also found in West Africa.

OCCURRENCE IN PORT-AU-PRINCE BAY: Only found at surface light and in inland pools and streams.

ABUNDANCE: Querimanna stage common about surface light; larger ones fairly common in streams. Abundant in market.

METHOD OF CAPTURE: Hand-nets at surface light, and seines in fresh-water pools.

FOOD: Mud, decayed vegetation and bottom debris in the freshwater individuals.

STUDY MATERIAL: Colored Plate, H34, No. 6909; Photograph, 3901; Specimens, 155; from 7 to 420 mm. in length, of which 18 were taken in a fresh-water pool at the source of Mariani: Nos. 7176, 7177, 7307, 7308, 7309, 7310. 136 were in the Querimanna stage, taken at the submerged light; Nos. 6909, 6929, 6930, 6984, 6997, 7010, 7020, 7027, 7043b, 7081, 7185, 7304, 7305, 7306.

Agonostomus Bennett, 1830

Key to Haitian Species

- A. Upper lip very little if at all thickened, body rather robust and deep.
monticola
 AA. Upper lip thick anteriorly, much wider than the lateral portions, body
 elongate and rather slender. . . . . *microps*

Yellow-tailed Fresh-water Mullet

Agonostomus monticola (Bancroft)

REFERENCES: *Mugil monticola*, Bancroft, 1836, Cuvier's Animal Kingdom, (ed. Griffith), p. 367, t. 36.

Agonostomus monticola, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 819, fig. 347.

FIELD CHARACTERS: Small to medium-sized, elongate, somewhat compressed, but robust fishes with small teeth on the palate, and with two separate dorsal fins, the first of four spines. Upper lip thin, not conspicuously thickened anteriorly. Caudal fin yellow, with a conspicuous black spot on the side of the caudal peduncle.

DESCRIPTION: In a great many of the Haitian specimens the interorbital space is almost flat; but these fish grade into those with typical convex interorbital spaces. It is very likely that *percoides* is the same as *monticola*.

SIZE AND WEIGHT: Grows to 9 inches. A 150 mm. fish weighed 82 grams.

COLOR: Sides greenish, becoming dark brown above and white below, the edges of the scales on the upper sides with dark edges. A dark irregular bar through the eye across opercles to base of pectoral fin. Axil black. An intense black spot on the caudal peduncle, in some specimens shaped like a triangle, the longest point of which is directed toward the tail. Caudal yellowish, especially intense on the base of the lobes. Ventral, anal and soft dorsal fins yellowish, the latter with very small black spots at the base. Spinous dorsal yellowish and orange at base, pale distally, and with a few black spots at base. First dorsal spine black.

GENERAL RANGE: Fresh water streams of the West Indies and the east coast of Mexico.

OCCURRENCE IN HAITI: Found widely distributed in fresh-water streams. Found by us in sea-ward flowing streams of the Cul-de-Sac Plain and at Source Mariani.

ABUNDANCE: A common species. In the Grand Riviere they were by far the most abundant species, far out-numbering the cichlids and poecilids.

METHOD OF CAPTURE: Seining.

FOOD: An omnivorous feeder; seeds, berries, insects and mites found in the stomachs of three fish examined.

STUDY MATERIAL: Color Plate, H54; Specimens, 49; 43-188 mm., including Nos. 6972 and 6989, Grand Riviere and Source Mariani.

Thick-lipped Fresh-water Mullet

Agonostomus microps Günther

REFERENCES: *Agonostomus microps*, Günther, 1861, Cat. Fish British Museum, III, p. 462.

Agonostomus microps, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 820.

FIELD CHARACTERS: Small to medium, elongate, compressed fishes with small teeth on the palate, and with two separate dorsal fins, the anterior of four spines. Upper lip thickened anteriorly.

DESCRIPTION: Our single 180 mm. fish agrees with the description given by Gunther, with the exception that it possesses a slightly larger eye, 4.9 instead of 6 as mentioned by Gunther, or $6\frac{1}{2}$ as stated by Jordan and Evermann for a male. As Gunther's specimen was 12 inches long and ours a little over 7, the discrepancy may possibly be laid to size.

SIZE AND WEIGHT: Grows to 12 inches. Our 180 mm. fish weighed 71 grams.

GENERAL RANGE: Dominica, St. Vincent, Venezuela, Haiti.

OCCURRENCE IN HAITI: Known to us from a single specimen from the Grand Riviere, Cul-de-Sac Plain.

ABUNDANCE: Rare.

STUDY MATERIAL: Specimen, 1; 180 mm., No. 7459.

Family SPHYRAENIDAE; THE BARRACUDAS

Sphyraena Klein, 1778

Key to Port-au-Prince Bay Species

- A. Ventral fins inserted in advance of dorsal; pectorals reaching beyond base of ventrals.
- B. Scales large, 79 to 85 in a lateral series.....*barracuda*
- BB. Scales smaller, 118 to 130.....*guachancho*

AA. Ventral fins inserted directly under origin of spinous dorsal, much nearer base of last anal ray than tip of lower jaw; pectoral fins failing to reach base of ventrals. Scales 123 to 130 in a lateral series.....*picudilla*

REFERENCES: *Esox barracuda*, Walbaum, 1792, Artedi Piscium, III, p. 94, (after Catesby).
Sphyraena barracuda, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 283.

FIELD CHARACTERS: Medium to large, elongate, cylindrical and slightly compressed fishes with long snout and projecting lower jaw; mouth with large, pointed, wide-set teeth; pectoral fins overlapping ventral fins; scales large, 79 to 85 in a lateral series.

DESCRIPTION: Our specimens are typical in every way of this species.

Ontogenetic Characters					
Specimen Numbers	7185	6809	7315	7314	7110
Actual Length, mm.	25.5	106	210	454	705
Length	3.6%	15%	30%	64%	100%
Depth	3.8	16	36	65	100
Head	5.3	19	35	70	100
Eye	6.4	23	46	78	100
Snout	5.1	18	32	67	100
Average	4.8%	18%	36%	69%	100%
Weight in grams		8	70	794	2495
Average		.32%	2.8%	33%	100%

SIZE AND WEIGHT: Reaches a length of at least 5 feet 3 inches and a weight of 54 pounds; unauthenticated reports of 10 foot specimens. Our 705 mm. specimen weighed 5½ pounds.

COLOR: Young:—Five preserved fish, 20 to 26.5 mm. had the following disposition of pigment:

- 1.—A broad lateral band extending through the eye from snout to the tail, narrowed anteriorly, about ½ width of eye at posterior edge of the eye, becoming wider posteriorly and spreading over the entire upper and lower surfaces beyond the anal and soft dorsal fin. When viewed without a lens this band tends to break up into a series of spots, six in number from the pectorals to the caudal fin.
  - 2.—A series of six dark blotches along dorsal surface, which when viewed through a low power microscope, merge, into a broad band.
  - 3.—Upper surface of head and anterior portion of lower mandible covered with chromatophores.
  - 4.—Spines of first dorsal fin spotted, other fins clear.
- It is possible that smaller fish than those in our collection may possess a complete lateral band, which is here shown breaking up into the spots characteristic of fishes of medium size (100–200 mm.).

GENERAL RANGE: West Indies to Brazil, north to South Carolina and Bermuda. Rarely straggles as far north as Woods Hole.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed near surface and over reefs; small ones taken close to shore over weed-covered bottom, both at Bizoton and at Source Matelas. Three foot fish photographed under water, 15 feet deep, on Sand Cay. Large specimens, estimated at 5 feet and over, circled about our schooner at least half a dozen times.

ABUNDANCE: A common species; small and medium sized individuals often seen in the market.

METHOD OF CAPTURE: Caught on hook and line and in seines, and in hand-net at surface light.

FOOD: Stomach contents of 3 individuals as follows:

1—200 mm. specimen had eaten a 55 mm. *Scarus croicensis*.

2—400 mm. specimen had eaten an 80 mm. *Chloroscombrus chrysurus*.

3—697 mm. specimen had eaten a 70 mm. *Ocyurus chrysurus*, the *Ocyurus* in turn, having swallowed three anchovies.

SIZE AT MATURITY: A ♂, 705 mm. long (No. 7110) was in full breeding condition on March 28, with testes 140 x 10 mm.; a 400 mm. individual was also in breeding condition, with testes 120 x 14 mm.

YOUNG: Five young individuals, from 20 to 26 mm. were taken from March 6th to May 8th. Three were taken at the surface light at night and two scooped from the surface several miles from land in full daylight.

GENERAL HABITS: Like the gars, large sized barracudas now and then swam around the schooner for an hour or two at a time, apparently in the hope of picking up a dead fish or other refuse.

STUDY MATERIAL: Specimens, 12; of which five were under 26 mm., 7006, 7185, 7230, and 7271; five were 175 mm., 6809; two, 465 and 705 mm., Nos. 7110, 7314.

Guachancho Barracuda

Sphyraena guachancho Cuvier and Valenciennes

REFERENCES: *Sphyraena guachancho*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., III, p. 342.

Sphyraena guachancho, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 285.

FIELD CHARACTERS: Medium sized, elongate, cylindrical and slightly compressed fishes with long snout and projecting lower jaw; mouth with large teeth; pectoral fins overlapping ventrals; scales small, 118 to 130 in a lateral series.

SIZE AND WEIGHT: Known to reach a length of two feet.

GENERAL RANGE: Florida and West Indies south to Panama.

OCCURRENCE IN PORT-AU-PRINCE BAY: Occasionally seen at the surface and over reefs.

ABUNDANCE: Rarely seen alive but common in the market.

FOOD: Small fish, including remains of Atherinids and Pomacentrids.

STUDY MATERIAL: Specimens, 7; four averaging 200 mm., and three averaging 325, Nos. 7311, 7312, 7313.

Picudilla Barracuda

Sphyraena picudilla Poey

REFERENCES: *Sphyraena picudilla*, Poey, 1860, *Memorias*, II, p. 162.

Sphyraena picudilla, Meek and Hildebrand, 1923, *Marine Fishes of Panama*, I, p. 287.

FIELD CHARACTERS: Medium-sized, elongate, slightly compressed fishes, with long snout and projecting lower jaw; teeth large and wide set; pectoral fins not overlapping the ventral fins; scales small, 123 to 130 in lateral series.

DESCRIPTION: Adult specimens taken are typical of the species.

A specimen 33 mm. long has the posterior lateral line scales keeled, forming a carangid-like keel along the sides of the caudal peduncle. It possessed a black, cutaneous flap at the tip of the lower jaw. Both of these characters are mentioned by Nichols and Breder (*Zoologica*, IX, Number I) as having appeared in a specimen of *Sphyraena borealis*, 2 $\frac{3}{8}$ inches total length, from Sandy Hook.

Meek and Hildebrand (*Marine Fishes of Panama*, 1923, Part I, p. 288) state of *picudilla*, that "The species is very closely related to *Sphyraena borealis* from which it is probably not distinct." and "A larger series must be secured before their true relationship can be established."

The presence of the lateral keel in these two young fishes is an additional character tending to unite the two species.

COLOR: The 33 mm. fish, Number 7194, in its preserved condition, differs considerably in color pattern from similar sized specimens of *Sphyraena barracuda*.

The most noticeable character in *picudilla* is the dark lateral band, which in this species is much narrower than in *barracuda* and extends from the tail about half way to the gill-openings. The upper posterior part of the head is densely pigmented, and pigment is found in the other parts of the body as follows: 7 quadrate patches on the dorsal surface, the three posterior patches being duplicated on the ventral surface, the center of each patch less dense; upper surface of snout, more densely toward the tip; tip of lower jaw, especially the black cutaneous portion; basal part of dorsal spines and posterior part of soft dorsal with small black spots; anal fin, small blackish spots more abundant on basal half of fin; other fins plain.

GENERAL RANGE: West Indies south to Bahia.

OCCURRENCE IN PORT-AU-PRINCE BAY: Obtained now and then near reefs.

ABUNDANCE: Less common than the other two species of the genus.

FOOD: Small fish and shrimps.

SIZE AT MATURITY: A female of 335 mm. had ovaries 115 x 10 mm.

STUDY MATERIAL: Specimens, 5; four of which are medium, 149 to 335 mm., No. 6810; one small, 33 mm., No. 7194.

Family POLYNEMIDAE; THE THREADFINS

Polynemus Linnaeus **Seven-fingered Threadfin; Barbudo***Polynemus virginicus* Linnaeus

REFERENCES: *Polynemus virginicus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 317.

Polynemus virginicus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 289.

FIELD CHARACTERS: Small fishes with small scales, two separated dorsal fins and a projecting pig-like snout; seven thread-like filaments arising from just in front of the pectoral fin; scales 53 to 61.

DESCRIPTION: Ontogenetic Characters.

Specimen Number	7163	7006	6835
Actual Length, mm.	23	35	113
Length	20%	31%	100%
Depth	17	30	100
Head	22	33	100
Eye	24	36	100
Snout	27	39	100
Average	22%	34%	100%

SIZE AND WEIGHT: Grows to a foot in length. Our largest specimen was 113 mm. in length and weighed 28 grams.

GENERAL RANGE: Florida, West Indies, Panama and possibly from Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found at the surface both by day and night. Larger ones around coral. Nine small specimens taken near floating sargassum weed in daytime, and 21 small ones at surface light in evening from Feb. 27 the April 21.

ABUNDANCE: Not common. Usually seen singly.

METHOD OF CAPTURE: Taken at surface with hand net. A few seen in market taken with other fish in seines.

YOUNG: Found occasionally among floating Sargassum weed, and taken now and then at submerged light in the evening.

STUDY MATERIAL: Specimens, 34; of which 30 are small, from 23-35 mm., Nos. 6984, 6997, 7006, 7027, 7097c, 7163, 7183, 7192, 7192a, 7195d, and 4, 100-113 mm.

Family SCOMBRIDAE; MACKERELS

Scomberomorus Lacépède, 1802

Key to Port-au-Prince Bay Species

- A. Pectoral fins scaled; sides with bronzy longitudinal bar and spots...*regalis*
AA. Pectoral fins naked; sides with bronzy spots only.....*maculatus*

King Mackerel, Painted Mackerel*Scomberomorus regalis* (Bloch)

REFERENCES: *Scomber regalis*, Bloch, 1795, Ichthyol., Plate CCCXXXIII.
Scomberomorus regalis, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 323.

FIELD CHARACTERS: Medium-sized, elongate, compressed fishes, with slender spines in first dorsal fin; second dorsal and anal fin followed by a series of finlets. Pectoral fins scaled. Bluish above, silvery below with a longitudinal golden-brown band on middle of sides; spots above and below this.

DESCRIPTION: All our specimens agree with the descriptions given for species.

SIZE AND WEIGHT: Grows to 6 feet and 20 pounds weight.

GENERAL RANGE: Massachusetts to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Rather widely distributed over the bay.

FOOD: A carnivorous species feeding upon anchovies and small snappers.

STUDY MATERIAL: Specimens, 5; Nos. 6976, 7019, and 7145.

Spanish Mackerel, Cazard*Scomberomorus maculatus* (Mitchill)

REFERENCES: *Scomber maculatus*, Mitchill, 1815, Trans. Lit. and Phil. Soc., N. Y., I, p. 426 (New York).

Scomberomorus maculatus, Meek and Hildebrand, 1923, Marine Fishes of Panama, Part I, p. 324

FIELD CHARACTERS: Medium-sized, elongate, compressed fishes with slender spines in first dorsal fin; second dorsal and anal fins followed by a series of finlets; pectoral fins naked; bluish above, silvery below, sides with elliptical bronzy spots.

DESCRIPTION: Our specimens are typical of the species.

SIZE AND WEIGHT: Grows to a length of $3\frac{1}{2}$ feet and a weight of 10 pounds. The largest specimen taken during the expedition measured 745 mm. and weighed $9\frac{1}{2}$ pounds. A 280 mm. fish weighed 234 grams.

COLORATION: A fish 170 mm. long, had the anterior half of the spinous dorsal, the distal $\frac{2}{3}$ of the soft dorsal, the caudal and edge of pectoral black;

posterior half of spinous dorsal whitish; proximal third of soft dorsal, and all of pectoral except edge yellow.

A 255 mm. fish was recorded as follows: bluish above, silvery below. Membrane of dorsal spines, tip of 2nd dorsal lobe, and posterior part of pectoral fins blackish. Anal fin whitish. Caudal dusky, especially so on anterior rays of upper lobe. The spots on the sides of the body are almost invisible and disappear entirely when the fish became dry.

GENERAL RANGE: Atlantic coast from Maine to Brazil and West Indies. Also on Pacific coast from Cortez Banks to the Galapagos Islands.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed in many localities in the bay. Seen occasionally while diving over reefs.

ABUNDANCE: A common fish, often seen in the markets, and one of the fishes most often brought to our table. An excellent food fish.

METHOD OF CAPTURE: Seines and hooks and lines.

FOOD: The stomach contents of about a third of our specimens contained fish, a number of them being identified as Anchovies *Anchoviella epsetus* and *Cetengraulis edentulus*. The major number of our specimens were taken in the early morning hours, from midnight to 3 or 4 o'clock. This may account for their empty stomachs, as it is possible that they do not feed at night.

PARASITES: Nematodes and trematodes (D. T. R. 27190) especially the first, were taken in the alimentary tract of a number of specimens. Encysted worms, were found in the liver (D. T. R. 27189, 27108) and parasitic isopods were found on the outer surfaces (D. T. R. 27186). A small fish had the marks of some boring parasite just beneath the thin skin. The meanderings ran back and forth, across and under the lateral line, like the marks of a bark-boring beetle or leaf-mining caterpillar.

STUDY MATERIAL: Photographs, 3963, 3965; Specimens, 25; 85-730 mm., Nos. 6832, 6879, 6975, 7028 and 7096. One hundred or more additional fish were examined in the field.

Family THUNNIDAE; TUNNIES

Key to Port-au-Prince Bay Genera

- A. Scales present on anterior part of body only, forming a corselet, and along the lateral line; palatine teeth wanting.
- B. Spinous and soft dorsal fins close together, the former of 15 to 16 spines.
Gymnosarda
- BB. Spinous dorsal not close to soft dorsal, the space between equal to about $\frac{4}{5}$ of the length of the head; first dorsal with 9 to 11 spines. . . . *Auxis*
- AA. Body covered with scales, sometimes very small or rudimentary, forming a corselet or not, palatine teeth present. Teeth on jaws small, conical, curved inward, body robust, slightly or not at all compressed.
Parathunnus

Gymnosarda Gill, 1862**Little Tunny***Gymnosarda alletterata* (Rafinesque) REFERENCES: *Scomber alletteratus*, Rafinesque 1810, Carrateri, etc., p. 46.*Gymnosarda alletterata*, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 311.

FIELD CHARACTERS: Elongate, robust, fusiform, slightly compressed fishes; scales present on anterior part of body only, forming a corselet; dorsal fins close together, the first of 15 to 16 spines, a series of finlets following the dorsal and anal fins. Bluish above, silvery below; sides above lateral line with black, oblique lines or spots.

DESCRIPTION: Our single specimen was typical.

SIZE AND WEIGHT: A 496 mm. fish weighed 3.75 pounds.

GENERAL RANGE: A pelagic species known from all warm seas.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Taken in seines by Greek fishermen.

STUDY MATERIAL: Specimen, 1; 496 mm., No. 7053.

Auxis Cuvier, 1829**Frigate Mackerel***Auxis thazard* (Lacépède) REFERENCES: *Scomber thazard*, Lacepede, 1802, Hist. Nat. Poiss., III, 9.*Auxis thazard*, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 313.

FIELD CHARACTERS: Small to medium, fusiform-shaped fishes; scales present on body in the form of a corselet close to the head, and along the lateral line; remainder of body naked; spinous and soft dorsal fins widely separated, the first with 9 to 11 spines, a series of finlets following the dorsal and anal fins.

DESCRIPTION: Our single specimen was typical, with the exception that it had 11 dorsal spines instead of 9 or 10,—the last one being exceedingly small and difficult to find.

SIZE AND WEIGHT: A 395 mm. fish weighed 2 pounds.

GENERAL RANGE: Known from all warm seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found offshore in the Bay.

ABUNDANCE: Seldom seen in the fish markets. About fifteen observed,—the result of one day's fishing of a Greek fisherman. It is interesting to note that this species and the other Bonito-like fishes, *Gymnosarda* and *Parathunnus*, are

seldom seen in the fish markets where most of the fishing was done by negroes. The Greek fishermen, of which there is a small colony in Port-au-Prince, specialize in the capture of these fishes,—an interesting carrying over of the customs of their homeland.

STUDY MATERIAL: Specimen, 1; 395 mm., No. 7052.

Parathunnus Kishinouye, 1923

Deep-bodied Tunny

Parathunnus obesus (Lowe)

REFERENCES: *Thynnus obesus*, Lowe, Trans. Zool. Soc. London, III, 1849, p. 4.

FIELD CHARACTERS: Large robust fishes with pointed snout and large eye; body covered with scales: soft dorsal fin followed by a series of finlets; pectoral fin quite long, extending to the end of the spinous dorsal fin, 3.8 in the length; teeth, on jaws, small, conical, curved slightly inward.

DESCRIPTION: Our single specimen is placed under this species with very little hesitation. It agrees very well with Lowe's description, and falls within the genus *Parathunnus* as described by Jordan and Evermann (Occasional Papers of the Cal. Acad. of Sciences) although we have not been able to examine some of the internal characters mentioned by these authors and Kishinouye. As the finlets were not yellow in life and *obesus* is described from the Atlantic, we consider our specimen to be this species, and not *sibi* as Cunningham (1910) mentions. Mr. John T. Nichols has seen our fish and considers that we are quite justified in assigning it to this species.

SIZE AND WEIGHT: Reaches a length of 5 feet. Our 620 mm. fish weighed 12 pounds.

GENERAL RANGE: Atlantic, known from Madeira, St. Helena and Haiti.

ABUNDANCE: Uncommon.

FOOD: Carnivorous, the stomach contents mainly shrimps and small fish, among the latter, anchovies and small snappers, *Rhomboplites aurorubens*.

STUDY MATERIAL: Specimen, 1; 620 mm., No. 7037.

Family TRICHIURIDAE; THE CUTLASS-FISHES

Trichiurus Linnaeus, 1758

Cutlass-fish

Trichiurus lepturus Linnaeus

REFERENCES: *Trichiurus lepturus*, Linnaeus, 1758, Syst. Nat. Ed. X, p. 246.

Trichiurus lepturus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 328.

FIELD CHARACTERS: Elongate, compressed, band-like, bright silvery fishes with slender tail tapering to a point; no caudal fin; teeth on jaws strong and unequal, the lower jaw projecting beyond the upper. No ventral fins.

SIZE AND WEIGHT: Grows to 34 inches. A 500 mm. fish weighed 79.5 grams.

GENERAL RANGE: Widely distributed in warm seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Often brought into the market by fishermen. Not otherwise seen by us.

ABUNDANCE: Uncommon, two or three specimens a week brought into the markets.

STUDY MATERIAL: Specimens, 5; 345-500 mm., No. 6943.

Family CORYPHAENIDAE; DOLPHINS

Coryphaena Linnaeus, 1758

Dolphin

Coryphaena hippurus Linnaeus

REFERENCES: *Coryphaena hippurus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 261; (open seas).

Coryphaena hippurus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 406.

FIELD CHARACTERS: Large, compressed, elongate, tapering fishes with very long high dorsal fin beginning on the nape, entirely of flexible spines or jointless rays; brilliantly colored, blues, yellows, and greens.

SIZE AND WEIGHT: Grows to 6 feet. A 34-lb. specimen is the largest of its species to be caught by hook and line. A 325 mm. fish weighed 3.25 pounds and one of 645 mm. weighed 5 pounds.

GENERAL RANGE: Atlantic and Pacific.

OCCURRENCE IN PORT-AU-PRINCE BAY: Occasionally seen accompanying ships in the Gulf. Observed at the market about once a week. It is not valued very highly for food. The 3.25 pound fish sold for 40 cents gold and the 5 pound fish for 30 cents, an apparent contradiction but very likely the result of bargaining.

ABUNDANCE: Uncommon.

BREEDING: In the 645 mm., 5 pound fish, captured on March 23rd, 1927, the ovaries measured 175 by 30 mm., and weighed 96 grams. The estimated number of eggs was 500,000, about one-third of the mass averaging .85 mm. in diameter, while the remainder averaged from .17 to .28 in diameter.

FOOD: Vertebral column of a small unidentified fish, 1 *Rhomboplites aurorubens*, and a small piece of sea-weed.

STUDY MATERIAL: Specimens, 2; 325-645 mm., No. 694.

Family STROMATEIDAE; THE HARVEST-FISHES

Peprilus Cuvier, 1829 **Harvest-fish***Peprilus paru* (Linnaeus)

REFERENCES: *Stromateus paru*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 248.
Peprilus paru, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 411.

FIELD CHARACTERS: Small, compressed, small scaled, deep, silvery-blue fishes without ventral fins. Snout very short and steep, pug-nosed; anterior portions of dorsal and anal fins long, falcate.

DESCRIPTION: Many of the Haitian fish have the anal fin with 38 to 40 rays.

SIZE AND WEIGHT: Grows to 8.5 inches. A 182 mm. fish weighed 205 grams.

GENERAL RANGE: Cape Cod to West Indies and Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Not seen by us over the coral reefs, but taken by seine fishermen along shore.

ABUNDANCE: Rather common, practically always to be seen in the fish markets.

METHOD OF CAPTURE: Older fish taken by seine fishermen. Our smaller fish were taken with larger numbers of bumpers (*Chloroscombrus chrysurus*) under jelly-fish. One 29.2 mm. fish was taken while swimming free at light. Whether it had temporarily emerged from its coelenterate host was not ascertained.

SIZE AT MATURITY: A seven inch male was in full breeding condition with testicles 20 x 5 mm.

FOOD: The pharyngeal teeth of this species apparently are sufficiently strong to chew up the food to such an extent that by the time it has reached the stomach it is almost of the consistency of mucus. Incidentally in all of our specimens large quantities of mucus was present. In examining the teeth in the pharynx we found considerable sand, intermixed with minute crustaceans and comminuted vegetable matter. Two specimens contained a single spine of a Porcupine fish (*Diodon hystrix*), and others contained animal tissue too far gone to identify.

STUDY MATERIAL: Specimens, 24; 22-182 mm., including Nos. 6859, 7182, 7185 and 7193.

Family NOMEIDAE; PORTUGUESE MAN-OF-WAR FISH

Nomeus Cuvier, 1817**Portuguese Man-of-War Fish***Nomeus gronovii* (Gmelin) REFERENCES: *Gobius gronovii*, Gmelin, 1789, Syst. Nat., I, p. 1205.*Nomeus gronovii*, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 408.

FIELD CHARACTERS: Small, symmetrically shaped fishes with forked tail; ventral fins comparatively very large and black; conspicuously marked with dark cross bands.

NOTE: This fish was seen by us while diving. It was swimming close to the surface near a small patch of Sargasso weed. (W. B.).

SIZE: Grows to 6 or 8 inches.

GENERAL RANGE: Tropical parts of the Atlantic and Pacific.

Family CARANGIDAE; THE CAVALLAS

Key to Port-au-Prince Bay Genera

- A. Lateral line armed in some part with bony scutes. (Very weak and occasionally wanting in *Chloroscombrus*.)
- B. Dorsal and anal each with a single detached finlet.....*Decapterus*
- BB. Dorsal and anal without finlets.
- C. Shoulder girdle with a deep furrow near its juncture with the isthmus and with a fleshy projection above it; eye large.....*Selar*
- CC. Shoulder girdle normal, not as above; eye of normal size.
- D. Teeth uneven, in one or a few series, persistent; villiform teeth usually present on vomer, palatines and tongue, deciduous or wanting in some species.....*Caranx*
- DD. Teeth, if present, small and even, in a single series, or in villiform bands on the jaws.
- E. The back much elevated; the dorsal outline more strongly curved than the ventral.
- F. Snout well in advance of the forehead; anterior profile convex; anterior rays of the second dorsal and anal filamentous.....*Alectis*
- FF. Snout scarcely in advance of forehead; anterior profile nearly vertical; soft dorsal and anal low, never falcate, the anterior rays not produced in filaments.....*Vomer*
- EE. Back little elevated; ventral outline much more strongly curved than the dorsal; lateral line with a few very weak bony scutes or none.

Chloroscombrus

- AA. Lateral line entirely unarmed.
- G. Second dorsal and anal fins equal in length, both longer than the abdomen.
- H. Body deep, ovate; premaxillaries protractile; 2nd dorsal and anal fins anteriorly elevated, falcate.
- I. Body very closely compressed, the outline everywhere trenchant; pre-orbital extremely deep; maxillary broad, with a well developed supplemental bone.....*Selene*
- II. Body less closely compressed; abdomen never trenchant; preorbital very narrow; maxillary narrow, without a distinct supplemental bone.
Trachinotus
- HH. Body oblong; premaxillaries not protractile, except in very young; maxillary narrow, without a supplemental bone; second dorsal and anal fins low, never falcate.....*Oligoplites*
- GG. Anal fin much shorter than second dorsal, its base shorter than the abdomen; 1st dorsal with 3 or 4 low stiff spines.....*Naucrates*

Decapterus Bleeker, 1851

Round Scad; Round Robin; Cigar-fish; Quia-quia

Decapterus punctatus (Agassiz)

REFERENCES: *Caranx punctatus*, Agassiz in Spix, Pisc. Brazil. 1831, p. 108, Plate LVIIa, fig. 2.

Decapterus punctatus, Meek and Hildebrand, Marine Fishes of Panama, II, 1925, p. 334.

FIELD CHARACTERS: Small, elongate, slightly compressed or fusiform fishes with minute teeth, long dorsal and anal fins, each followed by a single detached finlet.

DESCRIPTION: The specimens in the collection agree with the descriptions published, except that the smaller fish are considerably compressed and by no means fusiform. The widths of these specimens are contained about twice in the depth. Larger specimens in the American Museum of Natural History are almost fusiform. The two smallest individuals also have a larger head, it being contained 3.4 and 3.5 in the length. Teeth are present on the tongue of the large specimen.

SIZE AND WEIGHT: Grows to 1 foot. Our 95 mm. fish weighed 15 grams.

COLOR: One of the larger fish has 12 small black spots on the anterior portion of the lateral line, these being absent on the smaller fish. Jordan and Evermann mention these spots in their key to the species of the genus *Decapterus* but not in their description.

GENERAL RANGE: Known from Cape Cod to Brazil.

ABUNDANCE: This species seems to be rather rare about Port-au-Prince. It was seldom seen in the markets.

METHOD OF CAPTURE: The larger specimens were taken with hook and line, while the smaller were scooped up from beneath floating Sargasso weed.

Evermann and Marsh in "The Fishes of Porto Rico" mention young about 2 inches in length taken in a beam trawl at 220 fathoms. Judging from our small specimens taken under Sargasso weed by us, this record is questionable. As a beam trawl was used, the specimens may have been taken at almost any depth and could very likely have come from the surface.

Some of our other small specimens were taken at light at night.

FOOD: The 95 mm. specimen had fed copiously upon planktonic organisms, namely small copepods, and numerous zoea and ostracods. The small fish contained no food.

ENEMIES: A 6 mm. nematode in the alimentary canal of the 95 mm. fish.

STUDY MATERIAL: Specimens, 6; 33-95 mm., Nos. 7027, 7167, 7195.

Selar Bleeker, 1851

**Large-eyed Selar Goggle-eyed
Scad**

Selar crumenophthalmus (Bloch)

REFERENCES: *Scomber crumenophthalmus*, Bloch, 1793, *Naturg. Ausl. Fische*, VII, p. 77, Plate CCCXLIII.

Selar crumenophthalmus, Meek and Hildebrand, *Marine Fishes of Panama*, II, 1925, p. 335.

FIELD CHARACTERS: Small, elongate, little compressed carangids, with very large eye and well developed adipose eyelids; a deep furrow on the shoulder girdle near the isthmus and a fleshy projection above the furrow. Silvery, highly iridescent.

DESCRIPTION: Our specimens are typical in every respect.

SIZE AND WEIGHT: Grows to 2 feet. Our two specimens are as follows:

<i>Length</i>	<i>Weight</i>
175 mm.	104 grams
178 "	109 "

COLOR: Highly iridescent. Upper parts sage green shading into lighter green with a narrow band of calliste green on the middle of the sides. Lower parts opalescent, iridescent silver. Breast in front of the ventrals light rhodamine purple shading into blue violet and venice green. Opercles opalescent, blue violet, venice green and rhodamine purple predominating. Eye opalescent. Dorsal fin rays pale green yellow. Caudal pale green yellow edged with black. Pectorals, anal and ventral fins pearly white.

GENERAL RANGE: Known from most tropical seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen only beneath our schooner from 10 to 15 feet beneath the surface, where they came to feed upon worms, fish and other creatures that had been attracted to our lights.

ABUNDANCE: Not uncommon at light, but seen nowhere else. Not seen at the markets.

METHOD OF CAPTURE: Taken only by hook and line, the hook being baited with small silvery fish.

FOOD: Fed entirely upon small fish of various kinds and polychaete worms.

GENERAL HABITS: As mentioned above this fish was found only about our lights, where they took great delight in preying upon any living organism that they could capture. They took a hook readily, and were easily brought to the surface when captured.

STUDY MATERIAL: Specimens, 2; 175 and 178 mm., No. 7191.

Caranx Lacepede, 1802

Key to Port-au-Prince Bay Species

- A. Gill rakers 13 to 18 exclusive of rudiments, on the lower limb of the first arch.
- B. Breast naked, with only a small triangular patch of scales in front of the ventrals; a large opercular spot present.....*hippos*
- BB. Breast covered with small scales; opercular spot present or wanting.
- C. Second dorsal and anal fins scarcely elevated anteriorly, the fins completely covered with minute scales; no opercular spots; lateral scutes 22 to 35.....*bartholomaei*
- CC. Second dorsal and anal fin moderately or strongly developed anteriorly, only the elevated portions of the fins with minute scales; lateral scutes 35 to 38.....*latus*
- AA. Gill rakers 24 to 32 exclusive of rudiments, on the lower limb of the first arch.
- D. Second dorsal and anal fins long, the former with 27 or 28 rays, the latter with 23 or 24; lateral scutes 30 to 35; gill rakers 30 to 32.....*ruber*
- DD. Second dorsal and anal shorter, the former with 22 to 25 rays; the latter with 19 to 24; lateral scutes 38 to 52; body moderately deep, 2.8 to 3 in length; gill rakers 24 or 25.....*crysos*

**Common Jack-fish; Crevalle Toro;
Horse Crevalle; Cavally**

Caranx hippos (Linnaeus)

REFERENCES: *Scomber hippos*, Linnaeus, 1766, Syst. Nat. Ed., XII, p. 494.

Caranx hippos, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 350.

FIELD CHARACTERS: Large, robust, compressed fishes, with short, deep head and blunt snout and with strong enlarged scutes along the posterior sides; breast naked; upper profile very strongly convex, lower slightly curved anteriorly. Bluish green above, sides with a brassy lustre, a large, very distinct

black spot on opercle; dorsal and caudal fins dusky; axil of pectoral fin black, lower rays of pectoral with a black blotch, indistinct or wanting in the young.

GENERAL RANGE: Tropical Atlantic and Pacific.

ABUNDANCE: Fairly common. Large specimens are often seen at the market places.

METHOD OF CAPTURE: Taken by us during airplane bombing practice, and with hook and line.

FOOD: Small fish, consisting mainly of young *Lutianus aya* and *Rhomboplites aurorubens*.

BREEDING: In a 520 mm. fish, taken on March 11, 1927, the eggs were well-developed, and the ovary measured 110 by 60 mm.

STUDY MATERIAL: Photograph, 3751; Specimen, 1, 520 mm.

Yellow Jack

Caranx bartholomaei Cuvier and Valenciennes

REFERENCES: *Caranx bartholomaei*, Cuvier and Valenciennes, 1833, Hist. Nat. Poiss., IX, p. 100.

Caranx bartholomaei, Meek and Hildebrand, Marine Fishes of Panama, 1925, II, p. 351.

FIELD CHARACTERS: Small, rather deep, compressed fishes with weak scutes along the posterior sides and with upper and lower profile almost evenly convex, the upper slightly more so; head short and blunt. Bluish green above, sides silvery, in the young strongly reticulated with gold.

SIZE AND WEIGHT: Grows to 15 inches. A 65 mm. fish weighed 5.25 grams.

COLOR: All of the smaller specimens observed by us, and especially those smaller than 75 mm. were strongly reticulated on the sides with irregularly-shaped patches of gold.

GENERAL RANGE: North Carolina to Panama.

OCCURRENCE IN PORT-AU-PRINCE BAY: This species is found all over the Bay in quite widely differing situations. It was found on the reefs and inshore in shallow water, on or near the bottom in 50 to 60 feet, and also at the surface at light at night.

ABUNDANCE: A common species, seen always while diving, and, although small and not of much value from a food stand-point, often seen in the market.

METHOD OF CAPTURE: Seines, dynamite, traps and hook and line; also taken at light.

STUDY MATERIAL: Specimens 15; 52-121 mm., Nos. 6959, 7154 and 7015.

Horse-eye Jack*Caranx latus* Agassiz

REFERENCES: *Caranx latus*, Agassiz, in Spix, Pisc. Brazil, 1831, p. 105.

Caranx latus, Meek and Hildebrand, Marine Fishes of Panama, II, 1925, p. 354.

FIELD CHARACTERS: Elongate, compressed, rather deep fishes with enlarged scutes along the posterior part of the sides, and with steeply descending forehead. Lobe of soft dorsal fin blackish, other fins pale, caudal yellowish or dusky.

DESCRIPTION: Most of our specimens have had 36 lateral scutes.

SIZE AND WEIGHT: Grows to 22 inches. Weights and measurements of three of our specimens are as follows:

<i>Length</i>	<i>Weight</i>
115 mm.	42 grams
158 "	103 "
238 "	320 "

GENERAL RANGE: Occurring in all tropical seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: We have taken this species practically everywhere in the Bay,—at the surface, among coral heads on the reefs, and—especially the smaller individuals, along shore in shallow water.

METHOD OF CAPTURE: Seines, hooks and lines, dynamite, and by scoop-nets at night at the surface.

FOOD: When these fish came to light they usually gorged themselves upon the many animals of this fruitful source of sustenance. One small specimen that we captured after its sojourn about the light, contained 33 small fish, including 2 full grown anchovies, 10 anchovy larvae, 8 leptocephalid eel larvae, in addition to 6 trigger-fish (*Monacanthus*), 2 puffers (*Spheroides testudineus*) and 6 Bumpers (*Chloroscombrus chrysurus*). This list was duplicated with variations in many other fish taken under the same conditions. While it may not be significant, none of our specimens contained worms, although they were as abundant as the fish under our lights.

GENERAL HABITS: When these voracious attendants came about our submerged lamps they practically always remained from 6 to 15 feet beneath the surface, making quick darts up to the vicinity of the lights to capture food.

STUDY MATERIAL: Specimens, 27; 72–280 mm., Nos. 6851, 7013.

**Blue-striped Cavalla; Carbonero;
Cibi Mancho***Caranx ruber* (Bloch)

REFERENCES: *Scomber ruber*, Bloch, 1793, *Naturng. Ausl. Fische*, VII, 75, Plate 342.

Caranx ruber, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 357.

FIELD CHARACTERS: Elongate, compressed fish with long tapering head and with enlarged keeled plates along the posterior middle of the sides; upper profile evenly convex, lower outline only slightly curved in front of anal. Bluish and silvery with a brilliant blue line on sides just beneath the dorsal fin. Lower lobe of caudal fin with a black bar.

COLOR: Bluish olive, silvery below, scarcely yellowish in life; a stripe of brilliant clear blue just below the dorsal fin, which disappears rapidly after death. Dorsal yellowish gray, other fins dusky olive. Caudal fin vinaceous tawny with a distinct blackish band extending along the lower lobe.

GENERAL RANGE: West Indies; North Carolina, Bahamas and southward to Cozumel.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found generally over reefs and in deeper water.

ABUNDANCE: Common, seen in markets in fair numbers practically every day. This was by far the commonest species of its genus seen while diving on the reefs. Schools of 10 to 20 often swam about the divers, their blue dorsal line making them exceptionally conspicuous as it reflected the sunlight from above.

METHOD OF CAPTURE: Taken by hook and line, in seines and by dynamite.

STUDY MATERIAL: Color Plate, H123; Specimens, 15; 77 to 275 mm., No. 7016.

**Golden Jack; Hard-tailed Jack;
Runner, Jurel, Yellow Mackerel,
Caran***Caranx crysos* (Mitchill)

REFERENCES: *Scomber crysos*, Mitchill, 1815, *Trans. Lit. and Phil. Soc., N. Y.*, I, p. 424.

Caranx crysos, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 358.

FIELD CHARACTERS: Elongate, rather slender, compressed short-headed and short-snouted fishes with rather strong scutes along the posterior middle sides; upper and lower profile evenly convex. Bluish above, silvery below; spinous

dorsal and margins of dorsal and caudal dusky; other fins pale; a black opercular spot.

SIZE AND WEIGHT: Grows to one foot. A 95 mm. specimen weighed 16.5 grams.

COLOR: A 95 mm. fish had 8 well-marked vertical cross-bars. It was brassy in lustre with yellow dorsal and caudal fins, rather than greenish yellow. A dusky opercular and axillary spot present.

GENERAL RANGE: Cape Cod to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found usually over fairly deep banks.

ABUNDANCE: Uncommon, seen occasionally in the markets.

STUDY MATERIAL: Specimens, 7; 92 to 324 mm., Nos. 6844 and 7117.

Chloroscombrus Girard, 1858

Bumper, Casabe

Chloroscombrus chrysurus (Linnaeus)

REFERENCES: *Scomber chrysurus*, Linnaeus, 1766, Syst. Nat. Ed. XII, p. 494.

Chloroscombrus chrysurus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 369, Plate XXX.

FIELD CHARACTERS: Small, very compressed fishes, with convex dorsal and ventral outlines, the latter more convex than the former; anal and dorsal fins long and low. Silvery, specimens over 30 mm. in length with a black spot on the upper side of the caudal peduncle; fins yellowish.

DESCRIPTION: In a series of 25 specimens the soft rays of the dorsal fin were 27 in number in 22 individuals, 28 in two and 29 in one, instead of 26 to 27 as given by Meek and Hildebrand. The anal fin count in all our specimens was 26 to 28. The young are deeper than the adults, and in individuals from 13 to 30 mm. standard length, the depth was from 1.9 to 2. At 35 mm. and over our specimens had the described depth assigned to the species of 2.1 to 2.4. A procumbent dorsal spine was present in all of our specimens.

SIZE AND WEIGHT: Grows to 8 inches. Specimens in the Haitian collection range from 6.5 to 180 mm. in length.

COLOR: "Bluish gray above, sides silvery; a small opercular spot present; a prominent black, quadrate blotch on the upper half of the base of caudal: fins yellowish in life; vertical fins edged with black; pectorals and ventrals pale in spirits." (Meek and Hildebrand.)

The quadrate black spot on the upper side of the caudal peduncle is not present in very small fish. In a series of 408 ranging from 6.5 to 60 mm. it does not begin to show until the fishes are about 30 mm. in length. When the fish approach this length the pigment becomes more concentrated and in some individuals the black spot has already taken its intense black adult form.

In 10–11 mm. preserved specimens there is a considerable concentration of pigment along the bases of the dorsal and anal fins, the pigment spots having their longer axes horizontal in those beneath the dorsal. A line of elongated horizontal pigment spots present along the posterior half of the body. Upper surfaces of the body peppered with minute chromatophores, especially prominent above the brain and a few on the posterior half of the body beneath the lateral line pointing backward toward the tail. These spots tend to become elongate. A few scattered chromatophores on the anal and lower caudal rays. Through the transparent skin a number of chromatophores are visible on the peritoneum.

In a 7.5 mm. fish the coloration is much the same, except that the spots above the anal fin are concentrated so that they form a continuous line, and some of the pigment spots on the lower posterior part of the sides, follow the direction of the myomeres.

In a 23 mm. fish the spots are more numerous, and they are especially abundant on the upper part of the sides. The chromatophores along the base of the anal and ventral fins are not as noticeable. Chromatophores are visible on the dorsal fin, there are very few on the anal, and quite a number on the caudal.

GENERAL RANGE: Cape Cod to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Generally distributed over the bay, and especially along the coast north of Port-au-Prince.

ABUNDANCE: Bumpers are among the most abundant of fishes to be found in the vicinity of Port-au-Prince, and they are taken in large numbers by the seine and net fishermen. Although a poor food fish, they are commonly seen in the market, either whole and fresh in the morning, or, later in the day, with slashed sides, which have been rubbed with salt and lime as a preservative.

METHOD OF CAPTURE: Although practically all of our fish and especially the larger ones, were taken by seines and drift nets considerable distances from shore, all of the small ones (6 to 20 mm.) were captured at night as they came to our submerged lights. Three groups were captured in daylight with scoop nets placed under jelly fish, 303 specimens from 12.5 to 47 mm. under a *Chiropsalmus* (T. R. S. 27469) on May 10, 1927; 18 fish from 24 to 34.5 mm. from under the bell of *Tamoya haplonema* (T. R. S. 27324) on April 21, 1927, and twenty-two of an estimated 400 from beneath the tentacles of a *Cyanea* about 3 feet across the disk. In the last mentioned instance the medusa was swimming about 4 feet beneath the surface under the poop of our schooner. When the jelly broke up during capture, clusters of fish gathered beneath each fragment. The fish that we captured and placed in an aquarium lived but a short time. In the first case mentioned, the 303 specimens under one bell,—the Bumpers were accompanied by a 22 mm. Harvest-fish (*Peprilus paru*); in the second case with several small fish of the same species.

In the first and second captures a fine meshed net was lowered beneath the medusa and the captures can be definitely stated as containing all of the fish beneath the jelly, the fish crowding up as close to the coelenterate as they could, when they observed the net approaching them.

FOOD: This species apparently feeds mostly in daylight, as the examinations of the stomachs of dozens of specimens caught during the hours just before dawn revealed little or no food. However those that did, had mostly planktonic

forms and our notes lists the following organisms as contributing toward the diet of these fishes. Mass of stalk-eyed shrimps; pure culture of crustaceans resembling *Lucifer*; shrimps; many small transparent shrimps, megalops; in short a truly planktonic diet, specializing in crustacea. Two other specimens had fish scales in their stomachs, and a daylight captured fish had a polychaete worm.

ENEMIES: Nematodes were found rather sparsely in the alimentary tract. Two fishes had a number of purplish punctures on the sides and especially on the caudal peduncle. These, apparently, were the result of contact with the spines of purplish sea-urchins. Whether this ever results disastrously we do not know.

SIZE AT MATURITY: Specimens 80 mm. long carry well developed gonads, and it is possible that they mature at a still earlier stage.

SPAWNING SEASON: Eggs were mature during March and April, but we have no evidence of their being laid, or of the duration of the spawning season before or after these dates.

EGGS: Eggs .17 to .34 mm. in diameter observed on March 19.

GENERAL HABITS: The habits of the young living beneath medusa have already been mentioned.

STUDY MATERIAL: Photograph, 3878; Specimens, 1500 individuals; 6.5-180 mm., including Nos. 6830, under medusa, 6842, 7006, 7024, 7050, 7054, 7087a, 7183, 7184, 7185, 7192, 7193 under medusa, 7203, 7243, 7250, 7259, 7281 under medusa.

Oligoplites Gill, 1863

Leather Jacket, Kal

Oligoplites saurus (Bloch and Schneider)

REFERENCES: *Scomber saurus*, Bloch and Schneider, 1801, Syst. Ichth., p. 321.

Oligoplites saurus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 390, Plate XXXIX.

FIELD CHARACTERS: Medium, compressed, lanceolate fishes with unarmed lateral line, long second dorsal and anal fins, the membranes very deeply cut down, so that the depressed fin resembles a series of finlets, similar to those of the mackerels. Skin leather like. Bluish above, sides silvery, fins mostly yellowish.

SIZE AND WEIGHT: Grows to 12 inches. Our 233 mm. fish weighed 132 grams.

GENERAL RANGE: Both coasts of tropical America, extending north to New York and Lower California.

OCCURRENCE IN PORT-AU-PRINCE BAY: Small specimens fairly common at light, the adults seen in the market rarely.

ABUNDANCE: Rather a rare species.

METHOD OF CAPTURE: Our large specimen was seined. The smaller ones were

taken with scoop nets at the surface, both at light at night and during the day time.

FOOD: Small anchovies found in stomach.

STUDY MATERIAL: Specimens, 4; 13.5–233 mm., Nos. 6968, 7113, 7163 and 7243.

Alectis Rafinesque, 1815

Threadfish

Alectis ciliaris (Bloch)

REFERENCES: *Zeus ciliaris*, Bloch, 1787, *Naturg. Ausl. Fische*, III, p. 36, Plate CXCI.

Alectis ciliaris, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 364.

FIELD CHARACTERS: Adults: elongate, very strongly compressed fishes with outline everywhere trenchant, scales very small; anterior profile convex; dorsal and anal filamentous. Young: body strongly ovate; dorsal and anal filaments exceedingly long and thread-like.

DESCRIPTION: The maxillary in our specimen is narrow and barely reaches the front of the eye.

SIZE: Grows to 22 inches and possibly larger.

COLOR: The 2nd, 3rd and 4th dorsal filaments and the 2nd and 3rd anal filaments black. All others white.

GENERAL RANGE: Cosmopolitan in tropical seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Our single specimen seined close along shore.

METHOD OF CAPTURE: Our single small specimen was taken in a seine.

STUDY MATERIAL: Color Plate, H20, No. 6872; Specimen, 1; 118 mm. No. 6872.

Vomer Cuvier, 1817 **Bristle-finned Moonfish***Vomer setapinnis cubensis* Nichols

REFERENCES: *Argyreiosus setipinnis*, var. a (In part) Günther, 1860, Cat. Fishes Brit. Mus., II, p. 459.

Vomer gabonensis (Not of Guichenot), Jordan and Evermann, 1896, Bull 47, U. S. National Mus., I, p. 934.

Vomer setapinnis cubensis Nichols, 1918, Bull. Amer. Mus. Nat. Hist., XXXVIII, p. 672.

FIELD CHARACTERS: Very much compressed, bright silvery fishes with vertical forehead, soft dorsal and anal fins low anteriorly, not falcate. Jaws weak, pectorals falcate.

DESCRIPTION: All of the specimens of this genus in our collection can be assigned to this subspecies as it is described by Nichols. Our experience parallels that of Evermann and Marsh in Porto Rico, as all of their specimens were assigned to "*gabonensis*," which Nichols has shown to be invalid as a name for this fish.

SIZE AND WEIGHT: Grows to 12 inches. An 88 mm. fish weighed 16 grams.

GENERAL RANGE: West Indies.

METHOD OF CAPTURE: Taken with seines at night.

FOOD: Several small anchovies and long, eye-stalked shrimps found in the stomach of one fish.

STUDY MATERIAL: Specimens, 21; 59-181 mm., No. 6821.

Selene Lacépède, 1803 **Look-down***Selene vomer* (Linnaeus)

REFERENCES: *Zeus vomer*, Linnaeus, 1758, Syst. Nat. Ed. X, p. 266.

Selene vomer, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 372.

FIELD CHARACTERS: Very deep, exceedingly compressed silvery fishes with falcate second dorsal and anal fins. Edges of the body trenchant. Anterior line of the head sloping backward.

GENERAL RANGE: Maine to Uruguay.

METHOD OF CAPTURE: In seine at night.

ABUNDANCE: Rare. Not seen at the market.

STUDY MATERIAL: Photographs, 3775, 4000, 4001; Specimen, 1; 123 mm., No. 6836.

Trachinotus Lacépède, 1802

Key to Port-au-Prince Bay Species

- A. Body deep ovate, the depth 1.3 to 1.8 in the length, sides without black cross bars.....*falcatus*
AA. Body moderately elongate, depth 1.9 to 2.65 in the length, sides with cross bars, except in the very young.....*glaucus*

**Round Pampano; Palometa,
Kareng-a-plime**

Trachinotus falcatus (Linnaeus)

REFERENCES: *Labrus falcatus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 284.

Trachinotus falcatus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 378, Plate XXXIII.

FIELD CHARACTERS: Small to medium compressed, rather deep fish without enlarged keeled scales on the sides; abdomen rounded, never trenchant; anal fin about as long as soft dorsal; pectoral fins not falcate; adults with lobes of soft dorsal and anal fins elongate, sometimes reaching to the caudal fin.

DESCRIPTION: With the exception of one fish, all of our specimens have been small. Our fish differs from the photograph (Plate XXXIII) of a 48 mm. fish given by Meek and Hildebrand in that the depression over the eyes is not so marked. In all the specimens the profile from the nostrils to the dorsal fin is almost straight, with a slight convexity on the posterior part. The spines on the opercles are considerably more in evidence than they are in the illustration mentioned above. In a 13 mm. fish there is a large spine, one-half the diameter of the eye, at the lower angle of the preopercle, flanked above and below by a smaller one; 3 small spines are present on the lower and 6 on the upper limb of the preopercle. A 10.5 mm. fish differs in having 4 spines on the upper and 2 on the lower.

In all of our small specimens the two spines preceding the anal fin are connected by membrane with the fin.

SIZE AND WEIGHT: Grows to 12 inches and a weight of 3 pounds. Our specimens ranged from 10.5 mm. to 180. Our 180 mm. fish weighed 206 grams.

COLOR: Great variation exists among the small specimens taken in Haiti, and the variations change while the fish is being watched. Some of these small fishes instead of being silvery, have parts of the sides a warm brown, usually unsymmetrically. Descriptions from life of a 13, 15 and 45 mm. specimens are given below:

13 mm. Entire body thickly covered with small brown spots, so close together that the paler ground color is almost obliterated; the brown color absent on the maxillary, premaxillary and on the branchiostegal membranes. Top of head brick-red. Membrane of the spinous dorsal and base of the anterior membranes of the soft dorsal black, the black on the soft dorsal becoming less as it progresses backward. A few black dots on the dorsal spines. Base of the anal, membranes between the anal spines and the anterior membranes of the anal fin black. All other fins pale.

15 mm. Two specimens of this length were recorded as being iridescent bronze throughout; the iris and thickened web about the dorsal and anal spines grenadine red; the web between these spines and the basal half of the dorsal and anal rays black.

45 mm. Bluish silvery, with minute blackish punctulations over the entire body with the exception of the lower chin, isthmus and just before the ventrals. Dorsal membranes dusky. Anal membranes dusky basally, the duskiess decreasing posteriorly. Pectorals clear. Tips of the ventrals, the anal spines and tip of the anal lobe orange-red.

GENERAL RANGE: Cape Cod to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Small specimens were not uncommon inshore over shallow, weed-covered beaches and about shallow coral reefs. Other small fish of 15 to 20 mm. came to light at our ship, which was anchored one quarter of a mile offshore in from 40 to 60 feet of water, so that the young are very likely surface forms, quite widely distributed.

ABUNDANCE: Uncommon, rarely seen at the markets.

METHOD OF CAPTURE: Seined near shore, and taken in scoop nets at surface near lights at night.

GENERAL HABITS: The small specimens captured by us demonstrated the most amazing vitality and powers of motion. Two or three that were placed in aquariums for observation, kept whirling about at a rapid rate for long periods at a time, the one that persisted longest maintaining this whirling for several days. We could see no reason for this habit, and the fish were not injured when captured.

STUDY MATERIAL: Color Plate, H59, No. 7018; Specimens, 6; 13-180 mm.; Nos. 6906, 7018 and 7120.

Gaff-topsail; Pampano; Palometa*Trachinotus glaucus* (Bloch)

REFERENCES: *Chaetodon glaucus*, Bloch, 1787, *Naturg. Ausl. Fische*, III, p. 112, Plate CCX.

Trachinotus glaucus, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 382, Plate XXXVI.

FIELD CHARACTERS: Medium sized, somewhat elongate, strongly compressed fishes with blunt snout and with the profile over the snout very steep. Color, variable, bluish black to pale brown above, silvery below; sides with 4 or 5 cross bars, varying much in width and intensity and wanting in fishes smaller than 75 mm.

DESCRIPTION: Two small specimens of 22 mm. length are assigned to this species. The lateral line in both is somewhat straighter than is shown in the illustration given of an adult by Meek and Hildebrand.

SIZE AND WEIGHT: Grows to 12 inches.

GENERAL RANGE: Virginia to Argentina.

OCCURRENCE IN PORT-AU-PRINCE BAY: Our 2 specimens were taken over a smooth sandy beach at Source Matelas. We did not take it along the southern shore of the Bay.

METHOD OF CAPTURE: Seining.

STUDY MATERIAL: Specimens, 2; 22 mm., No. 7106.

Naucrates Rafinesque, 1810

Pilot Fish*Naucrates ductor* (Linnaeus)

REFERENCES: *Gasterosteus ductor*, Linnaeus, 1758, *Syst. Nat.*, Ed. X, p. 295.

Naucrates ductor, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 400.

FIELD CHARACTERS: Small, rather elongate cigar-shaped fishes with small mouth; spinous dorsal with 3 to 4 low disconnected spines; young and old with 6 vertical cross bands.

This species is included on the basis of a 5-inch specimen which was seen three times while diving at Sand Cay in Port-au-Prince Bay. It was swimming in the midst of a school of *Caranx ruber*, came close to me for five minutes, and measured from 10 to 16 inches. (W. B.)

Family AMIIDAE; THE CARDINAL FISHES

Key to Port-au-Prince Bay Genera

- A. Margin of preopercle serrate; ventral fins not reaching to base of anal. *Amia*
 AA. Margin of preopercle not serrate; ventral fins reaching to middle of anal fin.....*Apogonichthys*

Amia Gronow, 1763

Key to Port-au-Prince Bay Species

- A. Color scarlet, with a black band from posterior portion of soft dorsal to anal fin, and a similar bar on the caudal peduncle.....*binotatus*
 AA. Color pinkish iridescent coppery, an oval dark blotch on the caudal peduncle. Small pigment spots over entire body.....*pigmentarius*

Two-spotted Cardinal Fish

Amia binotata Poey

REFERENCES: *Amia binotata*, Poey, 1867, Repertorio, II, p. 234.

Apogon binotatus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 416.

FIELD CHARACTERS: Small, compressed, large-mouthed fishes with continuous lateral line; large scales; dorsal fins separated; scarlet, with narrow black band on sides from posterior dorsal rays to anal fin and another on caudal peduncle.

DESCRIPTION: A 93 mm. fish from Haiti agrees with the description of similar sized specimens from Panama with the following slight differences in proportional measurements:

	<i>Haiti</i>	<i>Panama</i>
Depth	3.15	3
Head	2.5	2.58
Eye	3.1	2.9
Interorbital	5.3	5
Snout	4.2	4.6
Maxillary	1.8	1.85
Pectoral	1.65	1.6
Caudal peduncle	2.8	2.75

A second fish, 53 mm. long, is provisionally identified as this species, although differing considerably in a number of details. In color (we possess a drawing of the specimen in life) it agrees perfectly with the description of the species. It differs in having the maxillary shorter, reaching only to between the center of the eye and the posterior margin of the pupil; the lower profile is not angulated at the angle of the jaw, but at the ventral fins. In contrast to the larger Haitian fish, the dorsal profile is absolutely straight from snout to dorsal fin.

Whether these differences can be laid to age is a question, and in the present state of our knowledge of the growth stages of these West Indian fishes, it seems better to assign this specimen to this species.

SIZE AND WEIGHT: Grows to less than 4 inches. A 93 mm. fish weighed 25 grams.

COLOR: Scarlet, including the fins, which are especially rich in color. Upper surfaces of head and body with dark punctulations. A blackish bar from posterior rays of dorsal fin to the anal and a similar bar on the caudal peduncle.

GENERAL RANGE: Haiti, Cuba, Panama, Curacao and Venezuela.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken by us on the coral reefs.

ABUNDANCE: Rare.

METHOD OF CAPTURE: Dynamite.

FOOD: The smaller fish had swallowed an enormous shrimp, creamy white, variegated and banded with scarlet. Its stomach was extended greatly by this prey.

BREEDING: The ovaries in the 53 mm. fish captured April 30 were well developed and contained about 200 round white eggs, averaging .25 mm. in diameter.

STUDY MATERIAL: Colored Plate, H109, No. 7205; Photograph, 4249; Specimens, 2; 53-93 mm. including Nos. 7256, 7267.

Peppered Cardinal Fish

Amia pigmentarius (Poey)

REFERENCES: *Monoprion pigmentarius*, Poey, 1860, *Memorias*, II, p. 123.

Apogon pigmentarius, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 418.

FIELD CHARACTERS: Small, compressed, large mouthed fishes with continuous lateral line, large scales, dorsal fins separated; coppery colored, with a dark peduncular spot, and a dark line from eye downward and backward. Lives in sponges.

DESCRIPTION: 30 Haitian fishes in the collection ranging from 23 to 43 mm. are assigned to this species. When compared with the descriptions given by Meek and Hildebrand, Jordan and Evermann (except color) and in the key to West Indian forms of *Amia* given by Breder (1927), we are unable to separate our specimens from *pigmentarius*. Poey, in the original description, however, makes the statement that *pigmentarius*, is "rouge carmine dore," which the Haitian specimens never were, either in life or preservative. Jordan and Evermann translate this as carmine red, but it is possible that the "dore" of Poey, may be the coppery bronze appearance of our fish. Our preserved fish agree with the description of similar fish taken by Meek and Hildebrand.

One pattern, present on our fishes, is not mentioned by anyone, and we have not been able to obtain specimens to compare with our fishes. This is a dark bar which runs downward and backward from the eye across the opercle.

This is present in the majority of our fish, and is vaguely indicated in all but the very palest of our specimens. Four of the fish are very pale, lacking all pattern but a few scattered pigment cells.

The present series without exception came from the interiors of tubular sponges, and this may be significant in relation to Poey's statement as to the rarity of examples. Our experience in Haiti was that without a diving helmet it is practically impossible to capture these fish.

Because of the difference in color and habitat there is a temptation to describe these fishes as new, but it is felt that further knowledge will demonstrate these fishes to be *pigmentarius*.

SIZE AND WEIGHT: Grows to two inches. A 40 mm. fish weighed 2 grams.

COLOR: Iridescent, changing from coppery to silvery, bronze and violet on the maxillary, sides of head, opercles, anterior half of the body and on the mid-sides to the caudal, the general effect being pinkish gold. The back and posterior sides and belly pinkish flesh. The whole head, except the crown is thickly speckled with reddish brown, rayed pigment spots. The whole body has a scattering of these spots, which can be closed up, leaving a sparse peppering of minute black specks. Two distinct pattern spots are always present, an elongated upright blotch at the base of the caudal, and a broad dark bar of pigment spots, down and back from the eye to the lower edge of the preopercle. The fins are pink finely dotted with pink and black, the bases of the vertical fins darkly pigmented. Iris dull gold.

GENERAL RANGE: Cuba, Haiti, St. Eustatius, Curacao and Panama.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found only in tall, tubular sponges.

ABUNDANCE: Fairly common in their restricted habitat, more than fifty percent of the sponges being inhabited by these fish.

METHOD OF CAPTURE: Diving and stuffing cotton into the efferent apertures of the sponges, and then sending the sponges to the surface whence the fish were removed. Dynamite often killed these fishes while they were in their sponges, even though fifteen to twenty feet or more away from the explosion.

EGGS: About 285 eggs in a 40 mm. fish taken on February 11th measured .35 mm. in diameter; there were about 770 eggs altogether in the ovary. In a second individual examined there were about 750 eggs, most of them measuring about .4 in diameter.

ENEMIES: A proportionately large number of these fish are attacked by parasitic isopods. On one fish a pair of these crustaceans had been firmly attached to the side of a fish in front of the dorsal fin. They were removed with difficulty long after the fish's death, and left a bare area, free of scales, eaten into the flesh.

STUDY MATERIAL: Color Plate, H104; No. 7179; Photographs, 3813, 3856, 4053; Specimens, 30; 23 to 43 mm., including Nos. 6869, 6911, 6912, 6919, 6964, 6986, 6989, 7179, and 7180.

Apogonichthys Bleeker, 1859**Spot-finned Cardinal Fish***Apogonichthys stellatus* Cope

REFERENCES: *Apogonichthys stellatus*, Cope, 1866, Trans. Amer. Philos. Soc., p. 400.

Apogonichthys stellatus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 1110.

FIELD CHARACTERS: Very small, rather deep, large-eyed fishes with separate spinous and soft dorsal fins; margin of preopercle smooth; ventral fins long; all fins except pectorals and caudals with a dark blotch; body with minute black punctulations.

DESCRIPTION: A single 14.4 mm. fish is believed to belong to this species.

COLOR: Dark golden, much like *Amia pigmentarius*. At death the pigment cells contract and are visible only as small points.

GENERAL RANGE: Bahamas, Haiti and St. Eustatius.

ABUNDANCE: Rare.

METHOD OF CAPTURE: Seine.

STUDY MATERIAL: Specimen, 1; 14.4 mm. No. 7114.

Family CENTROPOMIDAE; THE ROBALOS

Centropomus Lacépède, 1803

Key to Port-au-Prince Bay Species

- A. Scales small, 67 to 90 in lateral series from supraclavicle serrae to base of caudal; pectorals short, not nearly reaching tips of ventrals, 1.5 to 2.2 in head.
- B. Gill rakers on lower limb of first arch 13 to 15, exclusive of rudiments.
pectinatus
- BB. Gill rakers 7 or 8 on lower limb of first gill arch, exclusive of rudiments.
undecimalis
- AA. Scales larger, 50 to 56 in lateral series from supraclavicle serrae to base of caudal, pectorals longer, reaching to or nearly to tips of ventrals.
ensiferus

Comb-toothed Snook*Centropomus pectinatus* Poey

REFERENCES: *Centropomus pectinatus*, Poey, 1860, *Memorias*, II, p. 121.

Centropomus pectinatus, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 421.

FIELD CHARACTERS: Medium sized, elongate, compressed fishes with rather low head and snout, and prominent, lateral line; second and third anal spines of equal length; pectoral fin tips not reaching tips of ventrals; 13 to 15 gill-rakers on lower limb of first arch exclusive of rudiments.

DESCRIPTION: Our specimens agree perfectly with typical descriptions.

SIZE AND WEIGHT: Seldom grows larger than a foot. Our four specimens measure and weigh as follows:

	<i>Length</i>	<i>Weight</i>
Number 7236	281 mm.	327 grams
" 6936	272 "	325 "
" 7324	272 "	320 "
" 7327	236 "	202 "

COLOR: The black lateral line is especially conspicuous in our specimens, although it is supposed to fade out in larger individuals.

GENERAL RANGE: Known from both coasts of tropical America, ranging in the Atlantic from the West Indies to Bahia, and in the Pacific from Guaymas, Mexico to Buenaventura, Colombia.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken by fishermen generally.

METHOD OF CAPTURE: Mainly by seines.

FOOD: The stomach contents of four specimens contained an almost pure culture of shrimps and anchovies, the latter group containing specimens of *Anchoviella* sp. and *Centengraulis edentulus*, up to 90 mm. in length.

BREEDING: Two males and two females taken in February showed practically no indication of breeding.

STUDY MATERIAL: Specimens, 4; 236 to 281 mm. including Nos. 6936, 7236, 7324 and 7327.

Common Snook

Centropomus undecimalis (Bloch)

REFERENCES: *Sciaena undecimalis*, Bloch, 1792, *Naturg. Ausl. Fische*, VI, p. 60, Plate CCCIII.

Centropomus undecimalis, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 425.

FIELD CHARACTERS: Medium to large, elongate, somewhat compressed fishes, with long, low head and projecting lower jaw; scales rather small, 67 to 77 in lateral series to base of tail; gill rakers 7 or 8 on lower limb of first arch.

DESCRIPTION: Our specimens are typical. The smallest and largest examined measured as follows:

Number	6857	7252
Length	83 mm.	795 mm.
Depth	21 "	192 "
Head	33 "	274 "
Eye	7 "	26 "
Snout	9 "	19 "

SIZE AND WEIGHT: A female measuring 31 inches or 795 mm. weighed 16 pounds.

GENERAL RANGE: Florida and the West Indies to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken generally by the fishermen in the Bay and seen sparingly in the market. Small ones were taken in brackish streams, and several in the land-locked, brackish, sulphurous lagoons inhabited by small tarpon at Source Matelas.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Taken in seines.

FOOD: Specimen 6857, length 83 mm., from land-locked tarpon lagoon, had eaten 41 water boatmen, *Trichocorixa reticulata* (Guerin), and a small fish, somewhat comminuted, but resembling a small *Centropomus*.

SIZE AT MATURITY: A female 795 mm. was in full breeding condition.

SPAWNING SEASON: The above individual was taken on May 3rd.

EGGS: In the 795 mm. female, each ovary is 210 by 45, by 25 mm. high, and weighed 206 grams. Conservative count of 200 to each fortieth of a gram worked out at 1,648,000 eggs. Average diameter of the round, white eggs .5 mm.

STUDY MATERIAL: Photographs, 3910, 4253; Specimens, 5; three small ones 72 to 83 mm., Nos. 6857, 7330, 7331, two large ones, 665 and 795 mm., Nos. 7129 and 7252.

Sword-spined Snook

Centropomus ensiferus Poey

REFERENCES: *Centropomus ensiferus*, Poey, 1860, *Memorias*, II, p. 122, Plate XII, fig. 1.

Centropomus ensiferus, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 433.

FIELD CHARACTERS: Rather small, elongate, moderately compressed fishes with rather long, depressed head; scales rather large, 50 to 56 in lateral line to base of tail; second anal spine much enlarged, reaching to or beyond base of caudal fin when deflexed. Pectoral fin reaching to or nearly to tip of ventrals.

DESCRIPTION: All of our specimens are typical.

SIZE AND WEIGHT: Our largest and smallest specimens; Length 173 mm., weight 102 grams; 212 mm., weight 212 grams.

GENERAL RANGE: West Indies and the Atlantic coast of tropical America, from Cuba to Rio de Janeiro.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken generally near shore, and also in center of bay.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Taken by seines, and on hooks and lines.

FOOD: Like the other Snooks, this species also devoured shrimps and anchovies.

BREEDING: In a 260 mm. fish taken on March 3rd, the ovaries measured 60 x 26 mm. and the eggs were well developed.

STUDY MATERIAL: Specimens, 5; 173-212 mm., including Nos. 6834, 7057, 7325, 7328, and 7329.

Family EPINEPHILIDAE; SEA-BASS; GROUPERS

Key to Port-au-Prince Bay Genera

- A. Anal fin with 3 spines.
- B. Dorsal fin normally with 9 spines. Caudal fin rounded; dorsal fin rather high, with 14 to 17 soft rays; gill rakers rather short, fewer than 18 on the lower limb of the first arch.
- C. Dorsal fin IX-15 to 17; anal rays III-9. .... *Cephalopholis*
- CC. Dorsal fin IX-14; anal rays III-8. .... *Petrometopon*
- BB. Dorsal fin normally with 10 or 11 spines.
- D. Anal fin with 11 or 12 soft rays. .... *Mycteroperca*
- DD. Anal fin shorter, with 7 to 9 soft rays.
- E. Posterior margin of the preopercle serrate, the lower limb entire; no antrorse spines.
- F. Scales of the lateral line normal.
- G. Cranium narrow above the interorbital space, deeply concave; occipital crest meeting the interorbital region. .... *Epinephilus*
- GG. Cranium very broad and flat above, the interorbital space little concave; the occipital crest disappearing before reaching the interorbital region. .... *Garrupa*
- FF. Scales of the lateral line with 4 to 6 strong radiating ridges; cranium short, extremely broad and depressed between the eyes; anterior profile of the head a little concave; dorsal spines low, dorsal fin XI-16. .... *Promicrops*
- EE. Posterior margin of the preopercle serrate; a single antrorse spine on the lower posterior angle. .... *Alphestus*
- AA. Anal fin without spines; dorsal fin with 2 or 3 spines only. .... *Rypticus*

Cephalopholis Bloch and Schneider, 1801

Key to Port-au-Prince Bay Subspecies

- A. General color red. .... *ruber*
- AA. General color brown. .... *punctatus*

Red Guativere; Outalibi

Cephalopholis fulvus ruber (Bloch and Schneider)

REFERENCES: *Gymnocephalus ruber*, Bloch and Schneider, 1801, Syst. Ichth., p. 346, plate 67.

Bodianus fulvus ruber, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 1145.

FIELD CHARACTERS: Scarlet sea-bass; sides and back with small black or bluish spots. Two black spots on upper part of caudal peduncle and two black spots on the tip of the lower jaw.

DESCRIPTION: Some of our fish have a slightly smaller eye than has been published for the species.

SIZE AND WEIGHT: Grows to about a foot. Our three examples measure and weigh as follows:

<i>Length</i>	<i>Weight</i>
172 mm.	104 grams
194 "	190 "
209 "	250 "

COLOR: Reddish with an orange tone, deepest on the dorsal surfaces and especially on the head. Small blue spots, surrounded by a narrow brownish line, scattered over the entire surfaces except below and on the tail. In some specimens these spots are black, and occasionally they are white. Tips of the ventral and anal fins especially brilliant.

GENERAL RANGE: West Indian fauna; Florida Keys to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen rarely on reefs, rather common on the banks at the eastern end of Gonave Island.

ABUNDANCE: This is a common species, especially about the banks of Gonave Island, as mentioned above. It is often seen in the fish markets of Port-au-Prince.

METHOD OF CAPTURE: Hook and line and traps.

FOOD: Most of our specimens contained crustaceans, mostly shrimps. One, however, was filled with algae.

ENEMIES: In two fish small cysts (?) were found loosely attached to the intestine near the anus. They were grape-like in consistency, mainly metallic blue and gray in color, the largest measuring 6 by 7 mm. Three of them collapsed when removed from the fish.

STUDY MATERIAL: Colored Plate, H58, No. 6992; Specimens, 3; 172-209 mm. including 6992.

Nigger-fish; Negro-fish; Black Guativere

Cephalopholis fulvus punctatus (Linnaeus)

REFERENCES: *Perca punctatus*, Linnaeus, 1758, Syst. Nat., X, p. 291.

Bodianus fulvus punctatus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 1146.

FIELD CHARACTERS: Brown sea-bass; sides and back with small black or bluish spots. Two black spots on upper part of caudal peduncle and two black spots on the tip of the lower jaw.

SIZE AND WEIGHT: Grows to about a foot. Our 177 mm. fish weighed 143 grams.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on reefs.

ABUNDANCE: As far as we were able to observe this fish is not as common as the red variety.

STUDY MATERIAL: Specimen, 1; 143 mm., No. 7238.

Petrometropon Gill, 1865

Brown Hind; Petit Negre

Petrometopon cruentatus coronatus (Cuvier and Valenciennes)

REFERENCES: *Serranus coronatus*, Cuvier and Valenciennes, 1828, Hist. Nat. Poiss., II, 371.

Petrometopon cruentatus coronatus, Jordan and Evermann, 1896, Bull. 47, U. S. National Museum, I, p. 1142.

FIELD CHARACTERS: Small, compressed sea-bass with nine dorsal spines and rounded tail; brown with very dark, red, round spots on lower part of sides and head; a jet black spot on the back just below the base of first soft dorsal rays; sometimes with several dark spots on back just below base of dorsal.

SIZE AND WEIGHT: Grows to about a foot. None of our specimens were larger than 166 mm., such a fish weighing 114 grams. A 59 mm. fish weighed 6 grams.

GENERAL RANGE: Florida to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found more or less all over the Bay, and especially common on the banks just east of Gonave Island. It was by far the most abundant species taken at our schooner anchorage, where the bottom ranged from 40 to 60 feet beneath the surface. Authors speak of finding it among rocks, but we found it most common over mud.

ABUNDANCE: Common, seen every day at the market. Especially abundant in the deeper waters away from shore.

METHOD OF CAPTURE: Taken almost entirely by hook and line, but it is also captured in wicker traps.

FOOD: One fish caught with a stomatopod in its mouth.

STUDY MATERIAL: Color Plate, H7, No. 6831; Photograph, 3760; Specimens, 59; 59 to 166 mm., Nos. 6831 and 7241.

Mycteroperca Gill, 1862**Bonaci Cardinal***Mycteroperca venenosa apua* (Bloch)

REFERENCES: *Bodianus apua*, Bloch, 1790, *Naturg. Ausl. Fische*, IV, 50, Plate CCXXIX.

Mycteroperca venenosa apua, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 446.

FIELD CHARACTERS: Medium-sized sea-bass with long anal fin of 11 rays. General color red or scarlet with large blackish spots on upper part of sides, and with red spots on a gray background on lower sides. Soft dorsal, anal and caudal fins with a black subterminal band.

SIZE AND WEIGHT: Grows to $2\frac{1}{2}$ to 3 feet. Our specimen measured 406 mm. and weighed four pounds.

COLOR: General color above scarlet, becoming gray on sides of head and body and under parts; the red below the soft dorsal somewhat paler than the rest. Scales on the upper part of the caudal peduncle with conspicuous, small black spots. Sides of the head and chin with small reddish spots becoming paler below. Upper parts and sides of body from the beginning of the dorsal fin backward with rather large black spots. Lower parts of sides with red spots becoming elongate between the ventral and anal fins. Spinous dorsal reddish with an orange tone toward the tips of some of the spines and membranes, the central portion mottled gray and pinkish. Soft dorsal with medium sized pinkish spots along the base, pink and white medianly and with a rather wide, subterminal black band and a very much narrower terminal white band. Caudal fin brilliant scarlet mottled with gray and pinkish yellow and also with a wide subterminal black band and a narrow terminal white one. Anal fin scarlet with grayish markings, and tipped in the same way as the soft dorsal and the caudal. Pectoral fins pinkish at base and yellow on their distal half. Ventral fin red with a narrow black edge anteriorly. Eye with an orange pupil rim.

GENERAL RANGE: Florida to Brazil.

OCCURRENCE AND ABUNDANCE IN PORT-AU-PRINCE BAY: Uncommon. Only a single specimen seen at the fish market.

STUDY MATERIAL: Color Plate, H73; Specimen, 1; 406 mm., No. 7078.

Epinephelus Bloch, 1793

Key to Port-au-Prince Bay Species

- A. Second dorsal spine nearly as long as third; posterior spines not noticeably reduced in length; caudal fin with straight or concave margin; color nearly uniform brownish.....*morio*

- AA. Second dorsal spine noticeably shorter than third; posterior spines more or less reduced in length.
- B. Soft dorsal noticeably higher than spines; sides with 5 or 6 dark cross bars; no red spots.....*striatus*
- BB. Soft dorsal lower than longest spines; soft dorsal, anal and caudal fins broadly edged with black.....*guttatus*

**Red Grouper; Cherna Americana;
Negue couleur rouge**

Epinephelus morio (Cuvier and Valenciennes)

REFERENCES: *Serranus morio*, Cuvier and Valenciennes, 1828, Hist. Nat. Poiss., II, p. 285.

Epinephelus morio, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 455.

FIELD CHARACTERS: Large, somewhat compressed sea-bass, with second dorsal spine almost as long as third; caudal fin with posterior margin straight or slightly concave. Brown with more or less distinct paler blotches; well defined dark spots around eye; an indistinct saddle-like blotch on the caudal peduncle.

DESCRIPTION: Some of our specimens have the tail slightly rounded.

SIZE AND WEIGHT: Grows to 1 to 3 feet. A 265 mm. fish weighs 460 grams.

COLOR: Our fishes have been colored as in typical descriptions, but in many the saddle-like blotch on the caudal peduncle has been absent, and the pectoral fins have been lemon yellow on the basal half; the outer end tipped with orange.

GENERAL RANGE: Massachusetts to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found usually on the banks along shore.

ABUNDANCE: Uncommon, but seen occasionally at the markets.

METHOD OF CAPTURE: Hooks and lines.

GENERAL HABITS: The vitality of this fish is quite remarkable and they are able to live under poor conditions for a long time. Very often, these fish were placed in milk cans containing from 2 to 5 gallons of water with 30 to 50 other specimens, mostly dead, and shipped to us by the fishermen. They almost invariably arrived alive, thrashing about in the tanks and in full possession of their faculties.

STUDY MATERIAL: Photograph, 4006; Specimens, 7; 145 to 255 mm., No. 6904.

Nassau Grouper, Hamlet, Negue

Epinephelus striatus (Bloch)

REFERENCES: *Anthias striatus*, Bloch, 1792, Naturg. Ausl. Fische, VI, p. 92, Plate CCCXXIV.

Epinephelus striatus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 460.

FIELD CHARACTERS: Large, compressed sea-bass with rays of soft dorsal somewhat longer than spines and with gently rounded posterior margin of tail. Brown above, sometimes gray or green, paler below, a black spot on the caudal peduncle; black dots about the eye; a dark stripe from eye to upper angle of gill opening.

SIZE AND WEIGHT: Grows to three feet and to a weight of 50 pounds.

COLOR: When excited this fish becomes a dark brown or uniform black; in aquarium when it quieted, the pattern returned and soon it was marbled in strong contrast of black and white; before death and afterward it turned a uniform pale olive green, with the pectoral fins tinged with orange.

GENERAL RANGE: North Carolina to Brazil.

ABUNDANCE: Fairly common, seen quite often at the fish market.

FOOD: Small fish.

STUDY MATERIAL: Colored Plate, H8; Photographs, 3978, 4002; Specimens, 1; 61 mm.

**Red Hind; Cabrilla; Grandgle
Grand forte**

Epinephelus guttatus (Linnaeus)

REFERENCES: *Perca guttata*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 292.

Epinephelus guttatus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 461.

FIELD CHARACTERS: Small to medium sized compressed sea-bass, with 3 broad oblique, obscure olive bands running upward and backward on side; spots on body scarlet, darker above; soft dorsal, anal and caudal fins widely edged with black; pectoral fins yellow with rows of small scarlet spots.

SIZE AND WEIGHT: Rarely exceeds 18 inches in length. Our two specimens measure and weigh as follows:

<i>Length</i>	<i>Weight</i>
138 mm.	58.5 grams
235 "	303 "

COLOR: Our two preserved specimens differ widely in body coloration although agreeing in all essentials with the published descriptions. In the larger specimen the spots are pale, leaving the surrounding darker net work of color dominant, while in the smaller fish small dark spots against a lighter background are the conspicuous features of the color pattern. Otherwise these fish agree in all other phases of coloring.

The difference in coloration mentioned above caused us to separate these two specimens as different species, until we found two *Petrometopon cruentatus*

coronatus, each of which exhibited this same difference in color, the anterior parts of their bodies being light spots on a dark background and the posterior dark spots on a light background.

GENERAL RANGE: Carolinas through the West Indies to Brazil.

ABUNDANCE: Apparently rare as the two specimens purchased in the market were the only ones seen during our visit.

METHOD OF CAPTURE: Taken with hook and line.

FOOD: 1 specimen contained unrecognizable animal matter, while the second contained a small parrot-fish and shrimps.

BREEDING: A 235 mm. female captured on March 1, 1927 had the ovaries well developed.

STUDY MATERIAL: Specimens, 2; 138 and 235 mm., No. 6993.

Garrupa Jordan, 1890

**Black Jewfish; Black Grouper;
Mero de la Alto**

Garrupa nigrita (Holbrook)

REFERENCES: *Serranus nigritus*, Holbrook, 1856, Ichthyol. South Carolina, Ed. I, p. 173, Plate XXV, fig. 11.

Garrupa nigrita, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 1161.

This species is included on the following evidence. After a dynamite explosion at Lamentin Reef on May 4, 1927, a large fish took a dead victim at the surface. When we dived a few minutes later, we found a huge olive-gray grouper at least five feet long, searching for dead fish in the coral. The distal parts of its fins were dusky and the eyes dull yellow. The teeth were irregular and seemed to be at least an inch in length. The fish showed practically no fear of us, and remained from 8 to 10 feet away, advancing and retreating as we moved away or toward it, and showing much interest in our operations.

From the close contact with this fish, and careful observation of its grouper characters, color and size, the identification seems beyond question.

Promicrops Poey, 1868

Spotted Jew-fish

Promicrops itaiara (Lichtenstein)

REFERENCES: *Serranus itaiara*, Lichtenstein, 1821, Abh. Ak. Wiss. Berlin, p. 278.

Promicrops itaiara, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 450.

FIELD CHARACTERS: Very large sea-bass with broad cranium, narrower in the young, depressed between the eyes. Scales of the lateral line with 4 to 6 strong radiating ridges. Brown, sometimes with a greenish shade, 4 or 5 crossbands on sides; head, body and fins with many black spots.

SIZE AND WEIGHT: Grows to 8 feet and a weight of 693 pounds. A 122 mm. specimen weighed 45 grams.

GENERAL RANGE: Both coasts of tropical America.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on rather deep banks.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Both specimens taken on a hook.

FOOD: The stomach of the 367 mm. fish contained the remains of a parrot fish, the solidified teeth being quite evident.

STUDY MATERIAL: Specimens, 2; 122 and 367 mm., Nos. 6876 and 7050.

Alphestes Bloch and Schneider, 1801

Guaseta; Cherna

Alphestes afer (Bloch)

REFERENCES: *Epinephelus afer*, Bloch, 1793, Ichthyologia, Plate 327.

Alphestes afer, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 463, Plate XLIII.

FIELD CHARACTERS: Small, rather large-eyed sea-bass with a forward curved spine on the lower angle of the preopercle. Brownish with indistinct darker blotches.

SIZE AND WEIGHT: Grows to a foot or more. Our specimen measured 145 mm. and weighed 102 grams.

GENERAL RANGE: West Indies to Brazil. Also found at the Falkland Islands.

ABUNDANCE: This species seems to be rather rare. It was not seen during the expedition, and only a single example was purchased or seen at the market.

FOOD: The stomach contents of our single fish contained one crustacean and a lump of coral mud.

STUDY MATERIAL: Specimens, 1; 147 mm.

Rypticus Cuvier, 1829

Key to Port-au-Prince Bay Species of *Rypticus*

- A. 3 spines on the opercle; brown, the anterior part of the body grayish with good sized black spots.....*bornoi* new species
- AA. 2 spines on the opercle, plain brown, edges of the vertical fins dusky.
coriaceus

Haitian Soap-fish*Rypticus bornoi* sp. nov.

TYPE: No. 7206; Length 51 mm.; Lamentin Reef, Port-au-Prince Bay, Haiti; dynamited among coral; 27-IV-1927.

MEASUREMENTS AND COUNTS:

Length	51 mm.	Dorsal fin	II-26
Head	20 (2.5)	Anal fin	15
Depth	14 (3.6)	Pectoral rays	13
Eye	5.1 (3.9)	Pectoral length	11 (1.8)
Snout	4.6 (4.3; 1.1)	Ventral length	5.5
Maxillary	8.1 (2.4)	Ocular angle	30° up
Interorbital	1.6 (3.2)	Mouth angle	50° down
Weight	2.5 grams	Scale count	92
		Lateral line pores	70

DESCRIPTION:

Body: Rather elongate.

Back: Slightly elevated.

Anterior profile: Convex.

Mucous pores: Abundant on head.

Interorbital: Flat, 3.2 in eye.

Snout: Short, strongly convex in front of eye.

Eye: Large, directed obliquely upward.

Mouth: Medium, oblique.

Lower jaw: Projecting.

Maxillary: Reaches between pupil and posterior edge of eyeball.

Gill-rakers; 9, Slender, graduated from lower rudiment to uppermost, which is 2 mm. long.

Teeth: Sharp, recurved; in each jaw forming a wide patch of several rows near the symphyses, narrowing to two rows along the side of the jaws; round patch on vomer, thin line along palatines.

Tongue: Free, very long and slender, parallel-sided.

Preopercular margin: 3 spines, far apart, upper small, others subequal.

Opercular margin: 3 spines, upper smallest, middle largest.

Dorsal fins: Close together but not united.¹

Dorsal spines: Subequal.

Pectorals: Twice length of ventrals.

Ventrals: Small, slightly larger than eye.

¹The gap between soft dorsal and spinous is somewhat less marked than is shown in the figure.

COLOR: General color wood brown, the body uniformly immaculate, except for three large round spots of darker olive brown just behind the pectorals, two above them, and three more close in front. The body color is continued over the head to the snout, and extends down over the upper third of the opercles. The remainder of the head is greyish white, the branchiostegals immaculate. A few large, round, olive brown spots on head as follows: 2 on lower operculum, 3 on preoperculum, 2 on maxillary, 5 on premaxillary, and 5 on each side of the rim of the lower mandible. Iris golden, with the outer rim sepia. The spots on each side of the head are slightly unsymmetrical in number and placing.

STUDY MATERIAL: Type specimen, Color Plate H107.

COMPARISON: This species approaches nearest to *arenatus*, but differs radically in pattern, in possessing two dorsal spines, in the larger head and eye, the concentration of teeth at the symphyses, in the longer, much narrower tongue, in the longer ventrals, in three opercular spines, and in the upper opercular spine being the smallest.

TYPE NAME AND LOCATION: The name is given in honor of President Borno of Haiti, who did everything to further our work. The type and only specimen is deposited in the collection of the Department of Tropical Research of the New York Zoological Society.

Soap-fish
Rypticus coriaceus (Cope)

REFERENCES: *Eleutheractis coriaceus*, Cope, 1870, Trans. Amer. Phil. Soc., p. 467.

Rypticus coriaceus, Jordan and Evermann, 1895, Bull. U. S. National Museum 47, I, p. 1233.

FIELD CHARACTERS: Small, compressed fish with pointed head and rounded tail; dorsal fin with 3 spines, no spines in anal fin. Brown with paler spots, tips of fins dark.

DESCRIPTION: All of our large soap fishes agree in possessing the weak armature and other characters of this species as contrasted with those of *saponaceus*.

SIZE AND WEIGHT: A 129 mm. fish weighed 47 grams.

GENERAL RANGE: West Indies.

ABUNDANCE: Fairly common, occasionally seen in the market, but not an especially good food fish.

FOOD: All fishes of this species examined had been feeding upon shrimps.

STUDY MATERIAL: Photograph, 3774; Specimens, 8; 112–120 mm., including No. 6806.

Family SERRANIDAE; SEA-BASS

Key to Port-au-Prince Bay Genera

- A. Ventral fins inserted a little behind the pectorals.
- B. Dorsal fin normally with 9 spines. Caudal fin deeply forked. 19 or 20 soft rays in the dorsal fin. Gill rakers long and slender, about 25 on the lower limb of the first arch.....*Paranthias*

- BB. Dorsally fin normally with 10 or 11 spines, anal fin with 7 to 9 soft rays; jaws without enlarged depressible teeth.....*Hypoplectrus*
 AA. Ventral fins inserted below or a little in advance of the base of the pectoral fins. Dorsal fin with 7 to 10 spines.
 C. With 7 branchiostegal rays.....*Prionodes*
 CC. With 6 branchiostegal rays, and truncate caudal fin.....*Eudulus*

Paranthias Guichenot, 1868

Creole Fish; Rabirubia de la Alto
Paranthias furcifer (Cuvier and Valenciennes)

REFERENCES: *Serranus furcifer*, Cuvier and Valenciennes, 1828, Hist. Nat. Poiss., II, p. 196.

Paranthias furcifer, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 436.

FIELD CHARACTERS: Small, short-headed, short-snouted seabass with long, deeply forked tail and low dorsal fin with 9 spines and 19 to 20 rays. Bright red or salmon color, with small violet spots, 1 on side of the back and 1 or 2 on the sides of the tail.

SIZE AND WEIGHT: Grows to 10 inches. A 164 mm. fish weighed 96 grams.

COLOR: Our fish agreed with the following description given by Jordan and Evermann (Bull. 47, U. S. National Museum, p. 1222). "Color bright red or salmon color, with 3 small violet spots, 1 on side of back and 1 or 2 on side of tail; a bar of similar color extending from upper corner of pectoral across the humeral process; sides with faint oblique streaks along the rows of scales; dorsal fin with a longitudinal blackish streak" with the following exceptions:— in a number of fish the small violet spots on the tail and body were practically obsolete; under surfaces of head and body pale pinkish. Center of spinous dorsal dark greenish yellow; center of soft dorsal yellowish and dusky.

GENERAL RANGE: Both coasts of tropical America from Cuba to Brazil and from Cape San Lucas to Peru.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken by us only over the deeper coral reefs.

ABUNDANCE: Rather uncommon, observed occasionally in the fish markets.

METHOD OF CAPTURE: As far as known all our specimens were taken on a hook and line on fairly deep banks.

FOOD: The stomach contents of one fish were recorded as masses of small shrimps and other crustacea, mainly plankton.

BREEDING: A 170 mm. female on March 11, had moderately developed ovaries.

STUDY MATERIAL: Specimens, 2; 167–170 mm., including No. 7034.

Hypoplectrus Gill, 1862**Vaca; Petit Negre***Hypoplectrus unicolor* (Walbaum)

REFERENCES: *Perca unicolor*, Walbaum, 1792, Artedi Piscium, Part III, p. 352.

Hypoplectrus unicolor, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 1190. (plus forms listed on following pages.)

FIELD CHARACTERS: Small, rather deep, compressed sea-bass without depressible inner teeth; with short, tapering head and slightly emarginate caudal fin. Color extremely variable, the commonest varieties with six vertical dark bands on side, the one below the spinous dorsal widest; head and body spotted and lined with blue. Other varieties are with or without pattern of various colors, sometimes plain or with black and other colored blotches on snout or caudal peduncle.

DESCRIPTION: Although differing widely in appearance, our series of 109 specimens agree in all essentials with the description given in Jordan and Evermann. However, in measuring a series of different color forms, the following range of variations in proportions were found:

Depth in Body	2	to 2.25
Head in Body	2.6	" 2.8
Eye in Head	3.45	" 4
Snout in Head	2.8	" 3.4
Maxillary in Head	1.8	" 2.06

SIZE AND WEIGHT: Grows to 12 inches. In Haiti specimens over 5 inches were very rare.

COLOR: The unraveling of the many color phases of this fish is a tremendous problem, and to write a color description that would fit all the specimens observed by us in life or preserved in our collection is almost impossible. Nevertheless, widely differing though these patterns and colors are, the extreme forms can be linked to each other in one way or another, and if sufficient specimens were at hand there is little doubt that the gaps in a series such as ours could be filled, and that all the variations would be connected by intermediates.

The seven extreme forms in the Haitian collection are described herewith:

Form A.—(=*Hypoplectrus puella* Cuvier and Val.) Spec. 6866—Port-au-Prince Bay, Feb. 5, 1927.

General color of head and body olive buff, paler below, body and head crossed by six dark vertical bands, the third widest and almost black. These bands are distributed as follows:

1. From eye through center of preopercle.
2. From nape through base of pectoral fin to just in back of the base of the ventrals. Broad above, narrower on sides.
3. From spinous dorsal to anus and anterior end of anal. This is very broad and becomes slightly narrower on the belly.
4. A narrow weak band from the middle of the soft dorsal to the middle of the anal fin.
5. A slightly stronger band from the end of the soft dorsal downward.
6. A well marked band on caudal peduncle.

The following narrow blue lines and small spots are also found:—

1. A lavender blue line beginning beneath the eye posteriorly, running back and completely around it and then to the lower edge of the preopercle.
2. Four vertical blue lines on the opercle, the first short, the second beginning back of the upper level of the eye, running across the opercle and connecting with the blue anterior edge of the ventral fins; the third back of the second and ending at the edge of the opercle, and the fourth beginning at the spines on the opercle, crossing the edge of the branchiostegal membrane and ending in front of and at the lower insertion of the pectoral.
3. Faint lavender blue vertical bands on the sides, paler and often not visible in the dark bands.
4. Seven blue spots on each side of the snout.
5. One blue spot on front of lower lip.
6. Four round blue spots on top of snout.
7. Two short lines of blue spots on top of the head.

Spinous dorsal dark on the basal fourth continuing the wide dark band below it, dark yellow above with narrow blue edge. Soft dorsal with many irregular oblique bands and lines of pale blue and lemon yellow. Caudal fin pale yellowish green. Pectorals hyaline. Ventral fins dark green with narrow blue anterior edge.

Pupil pear-shaped. Iris dull golden yellow, with a small bright gold streak above and below pupil; a broad band of lavender blue across the upper iris.

The immediate variations upon this ground color and pattern are numerous, and no one of the specimens assigned to *puella* is quite like any other. However, they all agree in possessing the dark vertical bands and bluish stripes, in most cases possessing all the above mentioned lines or at least the great majority of them. The most important variations in this type are concerned with the general body color. This varies considerably but with no correlation to the pattern. Thus in one fish the general color was quite brownish, while the central broad vertical band was bright blue, this color being continued to the tips of the dorsal fin. In another the anterior half of the body was bluish lavender and the posterior part a lilac gray.

Cuvier and Valenciennes's colored plate (Hist. Nat. Poiss., II, pl. 37) representing a fish of this variety is fairly typical. It differs in that the membrane of the spinous dorsal is pinkish with blue spots; the blue vertical lines along the sides are absent; two short oblique bands are present on the upper parts of the sides just anterior to the large vertical dark bar. These characters, especi-

ally the first and the last have not been observed in the Haitian fishes, but very likely ought to be considered as other patterns belonging to this variety.

Poey's uncolored plate (Memorias, Vol. I, Pl. 9, fig. 2) also shows a form like ours, differing in that the pale vertical blue lines on the sides are much stronger, and the blue line on the head does not start immediately below the eye but is a continuation of a line which comes up abruptly from below. This can be considered as a variation in which the blue lines are especially brilliant and well marked.

Form B.—Dark bluish purple or purplish blue; all fins, except the hyaline pectorals, black. Dark broad vertical bands of *puella* are retained, those on the head merged with each other so that the head is completely black. All of the narrow blue lines and spots of *puella* are absent.

Form C.—Dark brown, more or less unicolor, with dark fins. Bluish line about eye present.

Form D.—Brown above with brown dorsal fin; pectorals dusky; orange yellow beneath with orange-yellow pelvic, anal and caudal fins. Oblique cross bars of dull orange on dorsal fin. The blue line partly surrounding eye present, pale lilac in one specimen instead of blue.

Form E.—Brilliant yellow, with traces of oblique bluish bands on soft dorsal fin. A black spot on caudal peduncle and one on each side of snout.

Form F.—Same coloration as E., but lacking the spot on the snout.

Form G.—Orange with remnants of the blue line that partly surrounds the eye and descends to the opercle. An irregularly-shaped black spot on snout surrounded by bluish lines and dots. The variations in the form of this spot and the surrounding lines is very great, and two sides of the same fish only remotely resemble each other.

This fish is close to Poey's *gummigutta*.

It will be noticed that the color form A (*puella*) has been described in considerable detail, more so than any of the others. This has been done because the patterns of this fish seem to be the basic ones within the species and after studying the materials the suggestion can be made that all of the many varieties in the Haitian collection have arisen by the suppression or obliteration of parts or of all this pattern, usually by means of or accompanied by a changed or intensified body color, the great majority of specimens retaining at least a remnant to prove their relationship.

It may also be significant that this form (*puella*) is by far the most abundant of all the varieties taken in Haiti. It must be remembered however that the specimens grouped under Form A. vary tremendously within themselves, the character holding them together being the possession of the majority of pattern elements.

At first glance the variation among the Vacas seems to be a radial one, but closer study seems to indicate that a three dimensional variation would be a better way to describe it—with typical form A placed at the center of a sphere and the different forms at varying intervals toward and at the surface.

The tendency of this species to vary in color was first noticed in systematic ichthyology, by the describing of some 15 species.

Jordan and Evermann in 1896, (Fishes of N. and M. America I, p. 1190) say of these many nominal species; "We have examined large numbers of specimens of this type in the Museum at Cambridge and elsewhere. The best series seen is that sent from Havana by Poey to the Museum at Cambridge. So far as we can discover, the various nominal species of this type are absolutely identical in all respects except in color. Many of them—e. g. *puella*, *indigo*, *colorurus*,—seen at first sight to be certainly different. Nevertheless, each of these forms is subject to wide variations, and from the material which we have seen, we can draw no other conclusion than this: All belong to a single species, which varies excessively in its coloration. Blue, yellow and black are arranged in a great variety of patterns, in different specimens, and the cause of such variation is still unknown . . . . "

Breder, 1927, has resurrected one of these forms, *nigricans*, differing in color from *puella*, in possessing 10 scales from the dorsal to the lateral line instead of 11 to 12 and a few other characters. He suggests that there are possibly two variable species in the West Indian fauna.

Specimens similar to Breder's *nigricans* are not present in the Haitian collection, so his suggestion is quite possibly right.

The problems offered by the fishes of this genus, must, because of the changes after preservation, be solved in the field, where specimens can be watched in life, and where their breeding habits can be observed. The rearing of a single batch of eggs would solve many of our problems, and this would not be exceptionally difficult in their native surroundings as the fishes live quite well in captivity. Such a procedure would answer questions as to whether dark purple forms spring directly from *puella* types or not or whether the variations can be laid to age, habitat, temperature or other conditions. It is of interest in this light, to note that the larger dark fishes of Form B. and the orange fish of Form G. came from much deeper water than the others; all of the other fishes having been taken in shallow water along shore and on the reefs down to 30 or 40 feet.

Although the variation in color in the species is tremendous, there is but little change in the individual fishes. Certainly color changes such as individual Pomacentrids demonstrate were never observed in *Hypoplectrus*.

Interesting problems and questions as to the correlations of colors constantly intrude as the specimens are looked over,—the problem of why the line about the eye in some brown and yellow fish should be changed to lilac instead of blue, as in most of the other fish, being but one indication of the many fascinating aspects of the coloration of these fish.

One other problem can be mentioned here. In some of the fishes intermediate between *puella* and the extreme forms the intensity of the dark bar under the eye seems to directly control the presence or absence of the light blue bands in front of and behind it. It almost seems as if the fish had a limited amount of pigment and that when the amount taken by the dark bars increased beyond a certain limit it was necessary to take pigment from the blue line, thus making a direct balance between the amounts of blue and black pigments.

This suggestion also applies to the forms with black spots on caudal peduncle and snouts. In these fishes the complicated body pattern of *puella* is reduced, usually only the lines on the dorsal being present.

The above paragraphs can do little more than indicate the vast field offered to the student of color and variation by this species. Unfortunately, the lack of time on the Haitian expedition precluded doing more with these fish. (J.T-V.)

GENERAL RANGE: Florida, West Indies, Grenada, Panama.
OCCURRENCE AND ABUNDANCE IN PORT-AU-PRINCE BAY: One of the most abundant of Haitian Fishes, being found practically everywhere along shore and on the various reefs. It is especially abundant near the *Thalassia* covered bottoms on the shallower, slowly shelving beaches.

METHOD OF CAPTURE: Taken by seining weed-covered shore zones, traps and by dynamiting.

FOOD: Crustaceans, fishes.
PROPORTIONS OF SEXES: All of the extreme types of coloration with the exception of one of the *indigo* forms were females. The central color form seems to average a few more females than males.

GENERAL HABITS: This species seems to be found everywhere along shore where the bottom is sufficiently diversified to enable it to hide. They were often observed hiding among the leaves of the weed *Thalassia*, not only in the shallows in water two to four feet deep, but also farther out in depths of fifteen to twenty feet. However, it must be noticed that only the *puella* and the solid yellow forms were found here. The orange and indigo forms were taken from deeper water.

Although this fish likes to hide under weed, it is far from shy. When we were diving on the coral reefs, they were most inquisitive and often came very close.

STUDY MATERIAL: Colored Plates, H10, 17, 47, 93, No. 7161; Photographs, 3732, 3772; Specimens, 109; 42-113 mm., including Nos. 6866, 6867, 7280, 7161, 6945, 7135.

Prionodes Jenyns, 1842

Key to Port-au-Prince Bay Species

- A. Sides yellow, body conspicuously marked with cross-bands, bars and spots of black.....*tigrinus*
- AA. Reddish brown, with 5 or 6 yellowish white blotches on upper surfaces; a brown bar on each lobe of the caudal fin.....*tabacarius*

Harlequin Serranid
Prionodes tigrinus (Bloch)

REFERENCES: *Holocentrus tigrinus*, Bloch, 1790, Ichthyologia, Pl. 237, after Seba, Thesaurus, III, plate XXVII, fig. 5.
Prionodes tigrinus, Jordan and Evermann, 1896, Bull. U. S. National Museum, 47, I, p. 1214.

FIELD CHARACTERS: Small, compressed sea-basses with pointed head and lunate caudal fin. Sides yellow, the entire body and fins very conspicuously spotted, barred and marked with black.

DESCRIPTION: Some of our specimens differ in having the dorsal fin X-12.

SIZE AND WEIGHT: A 73 mm. fish weighed 7.5 grams.

COLOR: Our specimens agree with the description in Jordan and Evermann (l. c.) in most particulars, the differences being that the anal was not plain in our specimens, and that a certain amount of regularity exists in the pattern of the black. The following description is taken from a typical example from the Haitian reefs:

Length 72 mm. Upper surfaces of head and body anterior to the dorsal fin, grayish brown. Remaining body color yellowish to grayish white, more yellowish beneath. A wide yellow band from maxillary and mandible under the eye to end of opercle, continued more or less in the coloration of the sides to the caudal fin. Upper part of head spotted with subcircular spots of black. A series of black spots from the upper part of the eye, along the top of the head, continued on the sides as smaller spots, and ceasing somewhere under the center of the soft dorsal. A band of black from the snout through the eye, continued across the opercles and thence, as a paler series of spots, to the caudal. Under surfaces of head with large irregular black spots, two especially large ones on the posterior part of the preopercle and on the opercle, followed by one on the anterior base of the pectoral fin,—this line continued as a vague series of dots to the caudal. A large irregular black spot beneath the pectoral continued under the belly to meet its fellow. Sides with six black bands, each one meeting its fellow of the opposite side beneath, blackest inferiorly. These bands are displaced somewhat forward above the lateral line, so that in the case of the anterior bands, the portion above the lateral line is almost between the bar to which it belongs and the bar just anterior to it. These bars are placed as follows:—one beneath the anterior end of the spinous dorsal, 2 others beneath the spinous dorsal, 2 beneath the soft dorsal and one at the base of the caudal fin. Dorsal fin yellowish white,—a series of pale blackish spots along the base of the posterior $\frac{2}{3}$ of spinous dorsal and the first few rays of the soft dorsal. A large black spot on the membrane between the 3rd and 5th spines followed by a row of smaller spots about $\frac{2}{3}$ the way up the fin. Membranes following the 5th to 9th spines with a black spot at the tip followed by a yellow spot. A narrow band of yellow along the outer border of the soft dorsal, the remainder of the fin with blackish spots, largest anteriorly. Pectorals salmon color. Ventrals yellowish. Anal milky white basally, yellow distally, with small black spots on the distal portion. Caudal spotted with black, forming 3 or 4 more or less regular vertical bands. Tips of the caudal lobes yellowish orange.

The variation in pattern in this species, however, is quite large and spots in some specimens are found forming lines in others, or the opposite may be true and lines can easily be transformed into a group of spots.

GENERAL RANGE: West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: The only place that we have seen this fish is on the coral reefs, both inshore and out in the center of Port-au-Prince Bay.

METHOD OF CAPTURE: Traps and hooks and lines seemed to be of no value whatsoever in catching these fish, and our only successful method was by employing dynamite.

FOOD: Most of our fish had fed upon shrimps and other small crustaceans.

EGGS AND BREEDING: A 72 mm. fish carried roe in a fairly advanced state, the diameter of the largest eggs averaging .41 mm.

GENERAL HABITS: This fish was observed for many days on the reefs before we could capture one. They usually kept close to the ground or to the larger coral lumps, sometimes waving in and out among the sponges and gorgonians. In movement they slightly resemble the elongate wrasses.

Metzelaar mentions taking it in sponges, but we have seen no indications of the Haitian specimens possessing this interesting habit.

STUDY MATERIAL: Color Plate, H100, No. 7171; Photograph, 4166; Specimens, 2; 72 mm., No. 7171.

Jacome; Tobacco-fish; Bout-de-tabac

Prionodes tabacarius (Cuvier and Valenciennes)

REFERENCES: *Centropistes tabacarius*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., III, p. 44.

Prionodes tabacarius, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 1215.

FIELD CHARACTERS: Small, compressed, large-eyed, sea-bass. Reddish-brown, with 5 or 6 yellowish white blotches on upper surfaces; a brown stripe on each lobe of the caudal fin.

DESCRIPTION: Our specimens agree fully with the description given by Boulenger,¹ but not so well with Jordan and Evermann (Bull. 47, U. S. Nat. Mus.). The latter give the depth as 3.75 while Boulenger states it as $3\frac{1}{4}$ to $3\frac{1}{2}$ in the total length, which happens to be the case in our fishes. In addition the eye is given as 3.25 in Jordan and Evermann, and 3.5 to 3.66 by Boulenger. Our fish average from 3.45 to 3.7.

SIZE AND WEIGHT: The following are the sizes and weights of our fish:

<i>Length</i>	<i>Weight</i>
107.5 mm.	29 grams
107.5 "	34 "
105 "	26.4 "

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found occasionally along shore in fairly shallow water and also seen while diving on the reefs along shore. It is also taken in deeper water by the fishermen. and can practically always be found in the market, although never more than five or six a day.

ABUNDANCE: Fairly common.

METHOD OF CAPTURE: Taken by hook and line, in traps and by dynamiting.

¹ Cat. Fish Brit. Museum, 2nd ser., I, p. 291.

FOOD: An engraulid, too far gone to identify was found in the stomach of one individual.

BREEDING: A 107 mm. fish had its ovaries quite well developed, the entire organ measuring 20 mm. long by 3.5 mm. in diameter.

STUDY MATERIALS: Specimens, 3; 105 to 107.5 mm., Nos. 6954 and 7111.

Eudulus Fowler, 1907

Mottled Sea-basslet

Eudulus dispilurus (Günther)

REFERENCES: *Centropistes dispilurus*, Günther, 1867, Proc. Zool. Soc. London, p. 99.

Dules dispilurus, Jordan and Evermann, 1896, Fishes of North and Middle America, I, p. 1219.

FIELD CHARACTERS: Small, somewhat compressed sea-bass with six branchiostegal rays and truncate tail; a conspicuous, rather sharply defined creamy white bar extending upward on each side from just before the vent; two small black spots at the base of the tail.

DESCRIPTION: The following variations in measurements were found in our fish; depth 2.72 to 3; head 2.6 to 2.78. All have the dorsal fin X-12.

COLOR: Our specimens agreed in life with the description given by Jordan and Evermann, and especially with the somewhat better description given by Evermann and Marsh in the "Fishes of Porto Rico." Some were especially brilliant in life, the mottlings on the anal, caudal and soft dorsal fins being quite scarlet; the lower surfaces of the cheeks and face were also spotted with red. The brown line from the shoulder through the eye was especially well marked in our fish. In some specimens the base of the dorsal fin, both spinous and soft, was quite greenish.

While there has been a considerable amount of discussion and changes in the validity of the three West Indian species of this genus, we are unable to add anything to it. In coloration our fishes are certainly nothing like the plate given by Fowler of *Dules subligarius* or of Cuvier and Valenciennes' plate in "Hist. Nat. Poiss.," of *Dules auriga*. In Jordan and Evermann's key our specimens run straight to *dispilurus*, and agree especially well with the somewhat complicated color description of that species. As our 49 mm. specimens carry eggs of quite good size, it is possible that this species is quite valid.

SIZE AND WEIGHT: This species apparently never grows to a large size. Evermann and Marsh report a $2\frac{3}{4}$ inch fish. None of our specimens were longer than 60 mm. A 58 mm. specimen weighed 5.5 grams.

GENERAL RANGE: Trinidad, St. Eustatius, Jamaica, Haiti and Porto Rico.

DISTRIBUTION IN PORT-AU-PRINCE BAY: This fish lived mostly inshore, over weed covered shallow banks, in company with small snappers, and in

localities that we called "Nurseries." They were especially common about the fronds of a weed *Thalassia*, and could be usually seen with a water-glass winding in and out among the leaves.

ABUNDANCE: Fairly common, Usually 3 or 4 could be taken in each haul over the shallow inshore weedy banks when using a small seine. Evermann and Marsh found this species at Porto Rico in 7 fathoms, and also one nine miles from Mayaguez in 220 fathoms on rocky bottom.

EGGS: A 49 mm. fish had the ovaries quite well developed, the largest eggs averaging .35 to .4 mm.

STUDY MATERIAL: Colored Plate, H70; Specimens, 7; 28.5–50 mm., including No. 6902.

Family PSEUDOCROMIDAE.

Gramma Poey, 1868.

Purple and Gold Fairy Bass

Gramma hemichrysos Mowbray

REFERENCES: *Gramma hemichrysos*, Mowbray, 1927, in C. M. Breder, Bull. Bingham Oceanographic Coll., Vol. 1, Art. 1, p. 42, figure 2.

FIELD CHARACTERS: Small, compressed, sea-bass-like fishes, with lateral line running concurrently with the back and ending under the 6th or 7th dorsal ray, beginning again on the caudal peduncle; conspicuously colored, the anterior half of body rhodamine purple, the posterior half lemon yellow; a black blotch on anterior rays of spinous dorsal.

DESCRIPTION: Our single fish, when compared with Mowbray's figure, (l. c.) disagrees considerably in the relation of the placing of the dorsal, pectoral and pelvic fins. We have compared it with all of Mowbray's original specimens except the type (No. 526, Bingham Coll.) and one paratype (No. 215 Bingham Coll.).

All of these Bingham fish agree with ours and differ from the figure in having the pectoral fins proportionately longer and in having their origin further forward. This change of position alters the relation of the origin of the dorsal and pelvic fins. Both of these arise under or over the base of the pectorals, or very slightly in advance, never in all the specimens examined by us, as far away from the pectoral base as shown by Mowbray's figure.

This figure is of the type, which we have not been able to examine, and it is possible that this fish may be different from the rest of the specimens. However, Mr. Albert C. Parr, in shipping the specimen to us, mentions that the type which he had examined, differs in no way from the remaining specimens.

The Haitian fish differs from the paratypes examined in being slightly deeper, 2.9 instead of 3.5, a condition due possibly to its carrying eggs, in having a

slightly shorter maxillary, reaching to the posterior edge of the pupil instead of the posterior edge of the eye, in having 11 dorsal rays instead of 9 or 10, and in the color pattern. Our fish has the purple extending considerably further back than the Bingham specimens, this color reaching to the origin of the soft dorsal. The purple extends onto the spinous dorsal, making this fin markedly darker than in the Bingham fish.

It is possible that the Haitian fish represents a different species or subspecies but the paucity of our material does not allow us to do more than point out the differences.

Twelve or fifteen of these fish were constantly seen about a tall clump of millepore corals on Lamentine Reef. We were unable to trap them, and only a single individual was obtained by using dynamite.

SIZE: Grows to a little more than two inches.

COLOR: Anterior part of body as far back as origin of soft dorsal and anal, including the spinous dorsal and pelvic fins, rhodamine purple; posterior part of body, including the soft dorsal, caudal and anal fins, cadmium yellow. A small yellowish spot below eye extending on maxillary. A black spot on anterior spines of dorsal; a narrow band of reddish along tip of anterior dorsal rays. Anal spines pinkish, the border of the fin with a very narrow pinkish line. A narrow diagonal line of reddish from base of anal spines extending downward and backward over middle of fin. Pectoral rays yellowish, the fin transparent.

Mowbray gives the color of the anterior part of his fish as royal purple, which in Ridgway's color key is quite different from the living color of the Haitian specimen.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Dynamite.

FOOD: Small crustaceans.

STUDY MATERIAL: Color Plate, H112; Specimen, 1; 47 mm., No. 7225, Lamentin Reef, Port-au-Prince Bay.

Family PRIACANTHIDAE; THE BIG-EYES

Priacanthus Oken, 1817

Spineless Big-eye, Juif

Priacanthus arenatus Cuvier and Valenciennes

REFERENCES: *Priacanthus arenatus*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., III, 97.

Priacanthus arenatus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 487, Plate LI.

FIELD CHARACTERS: Elongate, considerably compressed, bright red fish with extremely large eyes, very long ventral fins, and with a single small indentation on the opercle just above the flat preopercular spine.

SIZE AND WEIGHT: A 240 mm. fish weighed 357 grams.

GENERAL RANGE: Tropical Atlantic, from Gulf Stream northward as far as Rhode Island and southward to Brazil.

ABUNDANCE: Not uncommon, usually one or two being brought to the market each day and sometimes more. However, we never saw this species while diving on the shallower inshore reefs.

STUDY MATERIAL: Specimens, 2; 240 mm., No. 6947.

Family LOBOTIDAE; TRIPLE-TAILS

Lobotes Cuvier, 1829

Triple-tail; Flasher

Lobotes surinamensis (Bloch)

REFERENCES: *Holocentrus surinamensis*, Bloch, 1790, *Naturg. Ausl. Fische*, IV, 98, Plate CCXLIII.

Lobotes surinamensis, Meek and Hildebrand, 1925, *Marine Fishes of Panama*, II, p. 485, Plate L.

FIELD CHARACTERS: Rather large, deep, compressed, bass-like fishes with projecting lower jaw and serrate opercle. Soft dorsal and anal fins almost as large as the tail, combining with the caudal fin to give the fish its name of "Triple-tail." Outline of body concave over eyes; scales small and rough.

SIZE AND WEIGHT: Reaches three feet in length. Our specimens are from 18 to 161 mm. in length. The 33 mm. fish weighed 1.2 grams, and the 161 mm. fish 194 grams.

COLOR: "Dark brown to pale brown, with more or less silvery, at least below the lateral line; an indistinct dark band from eye to occiput, 2 narrower bands or lines extending backward for a short distance from interorbital, another band from lower margin of eye to angle of preopercle; all the fins, except the dorsal, darker than the body, the caudal fin with an abruptly pale margin in young, which is not present in adult; pectoral fins pale translucent." (Meek and Hildebrand, l. c.)

Our largest specimen agrees fully with the above description. The 33 mm. example also agrees with this except that the general body color was dull grayish green. All the fins except the pectorals were black, their bases the same color as the rest of the body. Caudal broadly and dorsal and anal narrowly tipped with grayish white. Five black spots at base of soft dorsal, the second and

fourth much paler than the others. A black spot at base of posterior rays of the anal fin. A narrow grayish line continues forward from this spot along the base of the rays.

The 18 mm. fish differed from the older examples in having the soft dorsal tipped with pinkish, the remainder of the fin being gray with a pinkish tint toward the base. Caudal with a very wide translucent terminal band. Snout pale, not black.

GENERAL RANGE: Massachusetts to Uruguay.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Under Sargassum weed at surface.

ABUNDANCE: Uncommon, only one specimen seen in the markets during four months of observations.

METHOD OF CAPTURE: The two smaller fish were taken by scooping up Sargassum weed in a hand net, the fish being found among the fronds.

FOOD: The 118 mm. fish contained the vertebrae of a small fish.

GENERAL HABITS: Our only notes relate to the young individuals being found under weed. The two smaller individuals were taken under separate patches of Sargassum, so that there can be but little doubt that the young are to be found living under these conditions.

STUDY MATERIAL: Specimens, 3; 18 to 161 mm., No. 7227.

Family LUTIANIDAE; THE SNAPPERS

Key to Port-au-Prince Bay Genera

- A. Pterygoid teeth¹ wanting; dorsal spines 10 or 11.
- B. Gill rakers few and short, fewer than 12 on the lower limb of the first gill arch; the caudal lobes not especially produced in the adult; anal fin with 7 to 9 rays.....*Lutianus*
- BB. Gill rakers long and numerous, about 20 on the lower limb of the first arch; caudal lobes much produced in the adult.....*Ocyurus*
- AA. Pterygoid teeth present, at least in adult; dorsal spines about 12. Gill rakers long and slender, about 17 or 18 on the lower limb of the anterior arch; color red or yellowish red.....*Rhomboplites*

Lutianus Bloch, 1790

Key to Port-au-Prince Bay Species

- A. Vomerine teeth in a crescent-shaped patch. Dorsal fin X—14, anal fin III—8. 55 to 60 scales in a lateral series. A small, jet black spot on the side..... *analis*
- AA. Vomerine teeth anchor-shaped, with a distinct median backward projection.
- B. Dorsal fin normally with 12 rays; a black lateral spot, rarely as large as the eye; body chiefly greenish, with 3 golden stripes on the head and 9 on the body.....*synagris*
- BB. Dorsal fin normally with 14 rays.
- C. Gill rakers 10 or 11 on lower limb of the first arch. Color uniform rose-red; young with a black lateral patch.....*campechanus*

¹ A group of teeth found on the roof of the mouth, continuing backward the line of the palatines.

CC. Gill rakers fewer, 7 or 8 on the lower limb of the first arch.

D. Scales rather small, series above the lateral line very oblique, 7 or 8 rows between the lateral line and the base of the first dorsal spine; a broad white bar from eye to angle of mouth.....*jocu*

DD. Scales rather larger, the series above the lateral line usually fewer than 7; no white bar below the eye.

E. Body rather deep, 2.45 to 2.7 in length; anterior profile notably concave in the adult; snout long, pointed, 2.4 to 3.25 in the head; 5 or rarely 6 rows of scales between the lateral line and the base of the first dorsal spine; rows of scales not marked by dark lines or only faintly so; caudal fin not edged with black.....*apodus*

EE. Body more elongate, 2.65 to 2.9 in length; anterior profile only slightly concave in the adult; snout less strongly pointed, 2.55 to 3.2 in the head; 6 or rarely 7 rows of scales between the lateral line and the base of the first dorsal spine; rows of scales on sides marked by dark lines; caudal fin edged with black.....*griseus*

Mutton Fish; Card Claire

Lutianus analis (Cuvier and Valenciennes)

REFERENCES: *Mesoprion analis*, Cuvier and Valenciennes, 1828, Hist. Nat. Poiss., II, p. 452.

Lutianus analis, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 501.

FIELD CHARACTERS: Large, elongate, compressed snappers with rather deep head and long snout. Greenish brown above, yellowish green below with a tinge of red on chest and abdomen. Blue lines on head. Fins all reddish, caudal with a black margin. A small jet black spot, smaller than eye, on the lateral line under the anterior rays of the soft dorsal.

SIZE AND WEIGHT: Reaches a weight of 25 pounds. A 542 mm. fish weighed 10 pounds.

GENERAL RANGE: Massachusetts to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found mostly on the deeper banks, especially near the eastern end of Gonave Island.

ABUNDANCE: Fairly common, practically always found in the market, although in small numbers.

METHOD OF CAPTURE: Hook and line and with traps.

FOOD: Strictly carnivorous according to the stomach contents examined, specializing in small fish, one specimen containing a porcupine fish (*Diodon hystrix*), crustaceans such as shrimps and crabs, and mollusks.

BREEDING: A 542 mm. fish weighing 10 pounds and taken on March 11th, had ovaries measuring 88 by 20 mm. The eggs were not especially enlarged.

The smaller specimens examined during the period of January to March gave few signs of breeding.

STUDY MATERIAL: Specimen, 1; 204 mm., No. 7017.

Lane Snapper; Argente

Lutianus synagris (Linnaeus)

REFERENCES: *Sparus synagris*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 280.
Lutianus synagris, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 505.

FIELD CHARACTERS: Medium, elongate, compressed snappers, with 9 horizontal golden bands on the sides and 3 on the head. A black spot present on the sides on and above the lateral line under the anterior part of the soft dorsal. Anal and ventral fins golden, dorsal and caudal fins reddish. Vertical bands present at times.

SIZE AND WEIGHT: Reaches a weight of four pounds. Our largest fish measured 320 mm. A 285 mm. fish weighed 2 pounds, and a 128 mm. specimen 50 grams.

COLOR: The following notes were made on the colors of some of these fish:

22 mm. length—In this fish the iris was silvery, and there were 5 golden lines along the sides, the black spot being smaller than the eye. Seven broad, faint dark vertical bands from the nape to the caudal, the black spot being in the 4th band counting from the head. Dorsal fin edged with red, the caudal faintly pink, and the ventral fins bright orange.

Spec. 7011, about 300 mm. Body above the lateral line dusky silvery with shading of heliotrope gray. Below the lateral line pale silvery with shadings of pink, except the belly and the lower jaw which are silvery white. The pink color especially noticeable on the lower part of the caudal peduncle, on the opercle and preopercle and at the base of the pectoral. Nine rather wide golden stripes, each about $\frac{2}{3}$ the width of the pupil, along the sides of the body, and 3 on head. Above the lateral line are numerous smaller irregular stripes of gold running obliquely upward towards the dorsal fin. A black spot on the sides twice the diameter of the eye, situated below the center of the soft dorsal fin.

Lips brilliant grenadine pink as is also the caudal fin and the iris. The dorsal fin is lighter pink with a golden splotched band about the width of the pupil and with the tips of the fin edged with gold. Ventral fins, anal fin, mouth and tongue splashed with gold. Pectorals pale pinkish.

INDIVIDUAL CHANGE OF COLOR: This was extreme. The permanent pattern was a pearly white background, with the conspicuous golden stripes extending lengthwise along the body and sides. There was also usually a faint black

spot on the upper posterior sides below the center of the soft dorsal. Within one or two minutes in an aquarium, this spot might double in size and become intense black, while over the entire body would spread nine vertical dark bands, very wide and black along the back, becoming narrower and of a maroon color down the sides. The top of the head would change from pale pink to deep sepia, but the scarlet iris and the yellow and scarlet fins were never altered.

GENERAL RANGE: Florida to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: A widely distributed species found near reefs and along shore. It is also found on the reefs off Gonave Island, and practically everywhere else we were able to observe.

ABUNDANCE: The Lane Snapper is by far the most abundant of its genus to be found within the bay, and also one of the most abundant Haitian fishes, regardless of species. It is to be found in large numbers in the markets, and was the commonest species brought to us by our Greek fishermen.

METHOD OF CAPTURE: Seines, traps, hook and line and dynamite.

FOOD: This species, like its relatives, is almost entirely carvorivorous, and the vegetable records can most likely be regarded as accidental. The examination of the stomach contents of 78 fish show an interesting combination of foods. Among these various elements, fish and crustaceans were dominant. In the following list the number denotes the number of times that the food was found:

Eels 2 times, Silversides (*Atherina*) 5, Anchovies (*Anchoviella*) 5, Porcupine-fish (*Diodon*) 10, Unidentified Fish 8, Stomatopods 2, Crabs, 15, Shrimps 15, other crustaceans 3, Mollusks 1, Polychaete Worms 3, Purple Holothurians 1, Sponge spicules 1, and Seaweed 2 times.

PROPORTION OF SEXES: Of 80 specimens examined 47 were males, 22 were females. The remainder represented specimens in which the gonads were too small to be determined by macroscopic examination.

SIZE AT MATURITY: In examining the 80 specimens ranging from 70 to 320 mm. in length, our notes, made mostly during March, record that specimens less than 140 mm. in length do not have the gonads developed to any great extent.

The greatest length and width of the ovaries were recorded in twenty-two fish. This varied in actual measurements from 40 by 7 mm. in a 180 mm. fish, to a maximum of 75 by 13 in a fish of 300 mm. Fish larger than 300 mm. seemed to be spent, a 320 mm. fish showing an ovary of only 38 by 20 mm.

EGGS: In a 252 mm. fish with an ovary of 72 by 10 mm. the eggs varied in size from .22 to .45 in diameter, while in a 220 mm. fish they were larger, from .34 to .45 mm.

ENEMIES: Red leeches were found in the stomachs of two fishes. These animals measured 6 x 15 mm., and were very active when removed from their host.

STUDY MATERIAL: Colored Plate, H11, figs A and B; Photographs, 3861, 3944, 4072, 4106, 4107, 4108; Specimens, about 500; 22-320 mm.

**Red Snapper; Sard Rouge;
Ronde**

Lutianus campechanus (Poey)

REFERENCES: *Mesoprion campechanus*, Poey, 1860, *Memorias*, II, p. 149.
Lutianus campechanus, Hildebrand & Ginsburg, 1926, *Bull.*
U. S. Bur. Fish., XLII, 82.

FIELD CHARACTERS: Large, elongate, deep-headed, pointed-snouted snappers. Deep rose-red; bluish streaks along the sides, fins brick red. A large black lateral spot on the sides in young specimens.

SIZE AND WEIGHT: Reaches a length of three feet and a weight of 40 pounds. Our 217 mm. fish weighed 252 grams.

GENERAL RANGE: Massachusetts south to Rio de Janeiro, Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found mostly in the deeper banks in the bay, and especially off the eastern end of Gonave Island and along the north coast of the southern peninsula of Haiti.

ABUNDANCE: Abundant, but not seen by us on the shallower inshore reefs. In the market it is one of the commonest of the larger fishes.

METHOD OF CAPTURE: Mostly by hook and line.

FOOD: Carnivorous, the stomach of two of our specimens containing anchovies.

STUDY MATERIAL: Specimens, 3; 217 mm., No. 6931.

Dog Snapper; Carde Roulesse

Lutianus jocu (Bloch and Schneider)

REFERENCES: *Anthias jocu*, Bloch and Schneider, 1801, *Syst. Ichthy.*, p. 310.
Lutianus jocu, Meek and Hildebrand, 1925, *Marine Fishes of*
Panama, II, p. 508.

FIELD CHARACTERS: Medium-sized, elongate, long-snouted, deep-headed snappers. Brown above, reddish below, sides of head with a blue stripe below the eye. A broad, whitish bar from eye to angle of mouth, sometimes wanting in the young.

SIZE AND WEIGHT: A 150 mm. fish weighed 107 grams.

GENERAL RANGE: Massachusetts to Bahia, Brazil.

ABUNDANCE: Rare, only one specimen seen in four months, seined by fisherman.

STUDY MATERIAL: Specimen, 1; 150 mm. No. 6910.

Schoolmaster

Lutianus apodus (Walbaum)

REFERENCES: *Perca apoda*, Walbaum, 1792, Artedi Piscium, Plate III, p. 351 (based on Catesby, Hist. Carolina, 1743, Plate XLI).
Lutianus apodus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, 1925, p. 509.

FIELD CHARACTERS: Medium, elongate, compressed snappers. Greenish above, pale below, no lateral spot. Fins, except the orange ventrals, pale yellow to green. Young with about 8 pale vertical bars and a blue stripe on the head below the eye.

SIZE AND WEIGHT: Attains a weight of 8 pounds. The lengths and weights of the two extremes of our specimens are as follows:

Length 114.5 mm., weight 42 grams; length 225 mm., weight 308 grams.

COLOR: Like its congeners, this species is extremely changeable in color, the vertical bars practically disappearing in pale specimens. The line from the snout through the eye is also subject to great variation in intensity. The blue stripe below the eye was conspicuous in all of our specimens.

GENERAL RANGE: Massachusetts to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: A wide spread species inhabiting almost all of the localities visited.

ABUNDANCE: Abundant during our stay in Haiti, but by no means as common as the Lane Snapper. It was always to be seen in the markets, and our seine fishermen constantly brought it to us in quite large numbers.

METHOD OF CAPTURE: Seines, hooks and line, traps, and dynamite.

FOOD: Strictly carnivorous, our records containing notes on crabs, shrimps of various kinds and numerous fish, most conspicuous of which were silver-striped anchovies (*Anchoviella*), thread-herrings (*Opisthonema oglinum*), and porcupine fish (*Diodon hystrix*). The latter were very commonly found in the stomachs of this fish, in fact they were taken from 15 out of 25 stomachs examined. In one case the porcupine-fish was found fully inflated. We recorded of three other specimens that they were found facing toward the cardiac end of the stomach. The number of species of fish that consume these apparently unpalatable pincushions is quite amazing. The secretions of the captors are sufficient, however, to reduce most of the porcupine-fish to chyme but the spines are found intact.

BREEDING: Most of the specimens examined by us did not seem to be breeding (February to May). The testicles of a 245 mm. fish captured on March 18, 1927, measured 35 by 3 mm.

STUDY MATERIAL: Specimens, 78; 114.5–225 mm.

Gray Snapper; Carde Gris

Lutianus griseus (Linnaeus)

REFERENCES: *Labrus griseus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 283.

Lutianus griseus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 511.

FIELD CHARACTERS: Large, elongate, compressed snappers. Dark green above, chest and abdomen dark red; scales on the sides with rusty centers, forming lines along the sides. Fins all red, vertical fins darkest.

SIZE AND WEIGHT: Grows to 3 feet and a weight of 18 pounds. A 90 mm. fish weighed 13.5 grams.

GENERAL RANGE: Massachusetts to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed in the bay. Small specimens were found by us along shore, and larger ones taken in deeper water near Port-au-Prince and on the fishing banks off Gonave Island.

ABUNDANCE: Very common, always seen at the Markets and captured sometimes in large numbers by the seine fishermen.

METHOD OF CAPTURE: Seines, hand nets, hook and line, traps and dynamite.

STUDY MATERIAL: Specimens, 4; 145 to 208 mm., No. 6863.

Ocyurus Gill, 1862

Yellow-tail; Kola

Ocyurus chrysurus (Bloch)

REFERENCES: *Sparus chrysurus*, Bloch, 1791, Naturg. Ausl. Fische, V, p. 28, Plate CCLXII.

Ocyurus chrysurus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 515.

FIELD CHARACTERS: Medium, elongate, compressed snappers with very compressed head and tapering snout, and a long and deeply forked caudal fin. Violet above, silvery below; a bright yellow-bronze stripe from the snout through the eye to the caudal peduncle. Caudal fin and peduncle golden yellow.

SIZE AND WEIGHT: Grows to a length of two feet.

COLOR: Most of our specimens have the ground color violet. Iris silvery, irregularly mottled with scarlet.

GENERAL RANGE: Florida to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: A widespread species, the young being found in relatively large numbers along shore in weedy areas, and the larger ones further off shore. They were constantly present on the various reefs where we dived.

ABUNDANCE: Very common, always seen in the markets. An excellent food fish. Small fish are found quite abundantly along shore in shallow water.

METHOD OF CAPTURE: Seines, traps, dynamite.

FOOD: Sixteen stomachs examined contained a general assortment of food, both vegetable and animal matter being represented.

A 40 mm. fish had fed almost exclusively upon plankton, being full of copepods and 1 pteropod. The larger fish contained remnants of bottom detritus, with numerous coral fragments, sand grains, mud, algae, sponges, polychaete worms, crustacea such as shrimps and crabs, and small fish, notably silver-striped anchovies.

BREEDING: The gonads were not developed to any extent in the few specimens examined by us during February to April.

STUDY MATERIAL: Color Plate, H124; Photograph, 3750; Specimens, 20; 40 to 251 mm., No. 6818.

Rhomboplites Gill, 1862

Golden-red Snapper; Fadate

Rhomboplites aurorubens (Cuvier and Valenciennes)

REFERENCES: *Centropristes aurorubens*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., III, p. 45.

Rhomboplites aurorubens, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 517.

FIELD CHARACTERS: Small, elongate, compressed snappers with moderate-sized oblique mouth, dorsal and ventral outlines equally curved. 12 dorsal spines, 11 rays. Pterygoid teeth present in adults. Color vermillion.

SIZE AND WEIGHT: A 150 mm. specimen weighed 102 grams.

COLOR: Vermillion, paler below. Caudal bright red. Iris gold.

GENERAL RANGE: North Carolina to Southern Brazil.

ABUNDANCE: Like the red snapper, this species is one of the most abundant of Haitian fishes. Strings of 20 to 30 are brought in by the fishing boats to the market, and are to be found there practically all of the time.

ENEMIES: One of these fishes was found in the stomach of a tunny (*Parathunnus obesus*).

STUDY MATERIAL: Specimens, 4; 103–153 mm., Nos. 7036, 7041.

Family HAEMULIDAE; THE GRUNTS

Key to Port-au-Prince Bay Genera

- A. Preopercle strongly serrate, two of the spines at the angle enlarged, the serrae on the lower margin directed forward; body elongate, not much compressed.....*Conodon*
- AA. Preopercle rather finely serrate, none of the serrae directed forward.
- B. Soft parts of the dorsal and anal densely scaled.
- C. Dorsal spines normally 13; body elongate, the back little elevated.
Bathystoma
- CC. Dorsal spines normally 12, occasionally 11 or 13.
- D. Snout short, more than 3 in head; mouth small, more or less oblique; maxillary short, not curved. Sides with about 5 yellow horizontal stripes.....*Brachygenys*
- DD. Snout long, usually 3 or less in head; mouth large, nearly or quite horizontal, maxillary long and curved.....*Haemulon*
- BB. Soft parts of dorsal and anal not densely scaled, naked or with small scales on the inter-radial membranes.
- E. Body rather elongate; head long, snout pointed; lips thin. Anal fin with III, 6 to 8 rays; second anal spine somewhat enlarged...*Pomadasys*
- EE. Body short and deep; head short; snout blunt; lips thick; second anal spine notably enlarged.....*Anisotremus*

Conodon Cuvier and Valenciennes, 1830

**Large-toothed Conodon Grunt;
Bureteado**

Conodon nobilis (Linnaeus)

REFERENCES: *Perca nobilis*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 191.

Conodon nobilis, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 521.

FIELD CHARACTERS: Small, slightly compressed, elongate grunts with about 8 vertical dark bands; preopercle serrate, the serrations largest at the angle, those below the angle pointing forward.

SIZE AND WEIGHT. Our three specimens are as follows:

Length	Weight
139.5 mm.	78 grams
152 "	100 "
169 "	135 "

COLOR: Meek and Hildebrand mention that the very young of this species have 3 or 4 indistinct horizontal bands. These bands persist in our 139 mm.

fish, which is $2\frac{1}{2}$ times as long as their smallest specimen and almost half as large as their largest. This fish has 4 horizontal bands, the three lowermost being well defined, while the fourth is rather indistinct. The width of the lowermost bands is about one-third that of the eye.

GENERAL RANGE: Atlantic, from Texas to Brazil; Pacific from Lower California to Panama.

ABUNDANCE: Uncommon. Rare in the market, about 6 having been seen in four months.

METHOD OF CAPTURE: Hook and line and by seining.

FOOD: The stomach of one of our fishes was filled with rather large fish scales and with the remains of a shrimp.

STUDY MATERIAL: Specimens, 3; 139-169 mm., No. 6863.

Bathystoma Scudder, 1863

Key to Port-au-Prince Bay Species

- A. Body elongate, depth 2.85 to 3.1 in length; scales 50 to 59 in lateral series; a large black caudal spot present.....*rimator*
AA. Body very elongate, the depth 3.4 to 3.85 in length; scales small, 65 to 72 in lateral series; caudal spot wanting.....*striatum*

Tom Tate; Red-mouthed Grunt

Bathystoma rimator (Jordan and Swain)

REFERENCES: *Haemulon chrysopteron*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 240.

Haemulon rimator, Jordan and Swain, 1884, Proc. U. S. Nat. Museum, p. 308.

Bathystoma rimator, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 523.

FIELD CHARACTERS: Small, rather elongate, red-mouthed grunts with two yellow stripes on side, one from interorbital to base of last dorsal rays, the other from eye to base of caudal where it ends in a large black spot.

DESCRIPTION: Small specimens of 50 to 60 mm. occasionally have the depth 3.3 to 3.4.

SIZE AND WEIGHT: Our specimens range from 44 to 139 mm.

COLOR: In fish of 50 mm. the deeper portion of the throat and the inner opercular rim is pink; in fish of 85 to 100 mm. this color has become scarlet and has extended to the sides and the whole floor of the mouth, the tongue and the posterior half of the lower tooth-bearing bones, both inside and out.

In the small fish and increasingly so in some of the larger individuals, there are numerous, irregularly scattered patches of pigment dots.

Small fish have the iris silvery, except antero-posteriorly, where gold carries through the gold line from snout to caudal.

The black peduncle spot is present in all our specimens, but it is exceedingly variable in strength. The peritoneum is black in all specimens examined.

GENERAL RANGE: North Carolina to Trinidad.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found usually close inshore in shallow water, especially over weed-covered patches.

ABUNDANCE: Very common, taken in numbers in almost every seining. Occasionally seen in the market, but owing to its small size, not a common commercial fish.

BREEDING: A 110 mm. female examined on February 20 had eggs moderately developed. Two males, 80 and 125 mm. long dissected on March 21st seemed to be in full breeding; the testes of the 125 mm. specimen measured 15 by 3 mm.

FOOD: This species is omnivorous, usually feeding near the bottom, but not necessarily confined to it. Our examination of stomach contents of this species reveals an amazing number of different foods, chief of which were the following:

Sand, mud and bottom detritus, algae sometimes in very large amounts; worms of various kinds; mollusk shells, broken and entire; with one record of a small, brilliantly colored cardium; crustaceans, such as copepods, isopods, "plankton," shrimps and small crabs.

STUDY MATERIAL: Photograph: 3902; Specimens, 406; 44 to 139 mm., No. 6822.

Striped Grunt

Bathystoma striatum (Linnaeus)

REFERENCES: *Perca striata*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 233.

Bathystoma striatum, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 524.

FIELD CHARACTERS: Very elongate, red-mouthed compressed grunts with 5 or 6 greenish yellow stripes on sides and without a black caudal spot.

DESCRIPTION: Our single specimen of this species does not agree entirely with the published descriptions, but for lack of other material we are assigning it to this species. It differs in the following particulars; eye 3.76 instead of 2.6 to 3.35; snout 2.65 instead of 3.5 to 3.6. In other words it has a smaller eye and longer snout than is usually recorded for this species. It has eighteen gill rakers on the lower half of the first arch.

GENERAL RANGE: Bermuda Islands to Brazil.

ABUNDANCE: Apparently rather rare, our single specimen being the only one seen during the expedition.

STUDY MATERIAL: Specimen, 1; 174 mm., No. 6933.

Brachygenys Scudder, 1868

Small-mouthed Golden Grunt

Brachygenys chrysargeus (Günther)

REFERENCES: *Haemulon chrysargeum*, Günther, 1859, Cat. Fish Brit. Mus. 1, p. 314.

Brachygenys chrysargeus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 527.

FIELD CHARACTERS: Elongate, large-eyed, short-snouted, red-mouthed grunts, with 5 horizontal yellow stripes along sides, almost half as broad as the interspaces.

GENERAL RANGE: Florida to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: All of our specimens were taken on Sand Cay, a coral and sand reef three miles from shore in Port-au-Prince Bay.

ABUNDANCE: Uncommon, seen occasionally on the reefs, and now and then in the fish markets.

METHOD OF CAPTURE: All of our fish were taken by dynamite. Two of them had evidently been very close to the explosive as they came to the surface with irregular patches of black on various parts of their fins and bodies.

STUDY MATERIAL: Color Plate, H96; No. 7166; Specimens 2; 153 mm., No. 7166.

Haemulon Cuvier, 1829

Key to Port-au-Prince Bay Species

- A. Scales below lateral line notably enlarged, very deep; sides with yellow stripes, parallel with lateral line above it, very oblique below it. *flavolineatum*
- AA. Scales below lateral line not especially enlarged.
- B. Scales above lateral line enlarged, four rows between the lateral line and the origin of the dorsal; about twelve well defined, more or less wavy, horizontal blue stripes, most prominent on the head, occasionally extending on the upper body..... *plumieri*
- BB. Scales above the lateral line not enlarged, not fewer than 5 series between the lateral line and the origin of the dorsal.
- C. Maxillary reaching nearly or quite to middle of eye, 1.9 to 2.3 in head; sides with blue, black or golden stripes.
- D. Soft dorsal with strongly convex margin, the anterior rays scarcely longer than the posterior ones; head and body with about 10 horizontal blue stripes, becoming pale but not disappearing in spirits, well defined on snout and cheeks..... *sciurus*
- DD. Soft dorsal with nearly straight margin, anterior rays nearly twice as long as the posterior ones; upper part of sides with 4 or 5 dark stripes, present at all ages, no stripes on snout and cheeks..... *macrostomum*

CC. Maxillary reaching to or slightly past anterior margin of eye, 2.2 to 2.8 in head; sides with continuous dark stripes following the rows of scales, wavy above the lateral line. No caudal spot in adult.....*bonariense*

French Grunt; Open-mouthed Grunt

Haemulon flavolineatum (Desmarest)

REFERENCES: *Diabasis flavolineatus*, Desmarest, 1823, Premier Dec. Ichth., p. 35, Plate II, fig. 1.

Haemulon flavolineatum, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 531.

FIELD CHARACTERS: Small, somewhat elongate, compressed, fairly large mouthed grunts with very large and deep scales on the sides below the lateral line. Sides with yellow stripes more or less parallel with lateral line above it, those below the lateral line quite oblique.

COLOR: The ground color in all of our specimens is bluish pearl gray as stated by Jordan and Evermann and not greenish as stated by Meek and Hildebrand. The yellow stripe from occiput along the base of the dorsal is not evident in our specimens.

GENERAL RANGE: West Indies; Bermuda and Florida Keys to Brazil.

ABUNDANCE: This species is fairly common on the various reefs in Port-au-Prince Bay, and is also brought in small numbers from the deeper reefs by the fishermen.

FOOD: Echinoderms and crustacean remains.

STUDY MATERIAL: Colored Plate, H4, No. 6890, H28, fig. B; Specimens, 9; 105 to 157 mm., Nos. 6890 and 7236.

Common Grunt; Ronco-ronco

Haemulon plumieri (Lacépède)

REFERENCES: *Labrus plumieri*, Lacépède, 1802, Hist. Nat. Poiss., III, p. 480, Plate II, fig. 2.

Haemulon plumieri, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 532.

FIELD CHARACTERS: Medium, rather deep, large-mouthed grunts with very large scales above the lateral line. Bluish-gray, bases of scales above bright

bronze tinged with olive. Head bronze, with many narrow stripes of clear deep blue.

SIZE AND WEIGHT: Reaches a length of 18 inches, and a weight of 4 pounds. A 235 mm. specimen weighed 316 grams.

COLOR: Considerable variation in color is shown by this species. All of our specimens had black pigmented peritoneums.

GENERAL RANGE: West Indies; North Carolina to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Fish up to 100 mm. have been seen quite often on the shallower diving reefs, while most of the larger fish are taken on the deeper banks further off shore.

ABUNDANCE: The commonest grunt in the bay, and practically always seen in the market.

METHOD OF CAPTURE: Taken in seines, traps, hook and line and by dynamite.

BREEDING: Of 7 specimens examined during February and March, none gave any indications of breeding.

FOOD: Echinoderms, polychaete worms, mollusk shells, shrimps, crabs, otolith of undetermined fish, porcupine-fish (*Diodon hystrix*), and unidentifiable bottom debris.

STUDY MATERIAL: Colored Plate, H28, fig. A; Photograph, 3754; Specimens, 22; 35-235 mm., Nos. 6891 and 6881.

Yellow Grunt; Boar Grunt

Haemulon sciurus (Shaw)

REFERENCES: *Sparus sciurus*, Shaw, 1803, Gen. Zool., IV, Plate LXIV.

Haemulon sciurus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 533.

FIELD CHARACTERS: Medium, somewhat elongate, compressed, large-mouthed, long-snouted grunts with about 10 horizontal blue stripes on head and body, one below the eye wavy.

COLOR: One of our specimens represents *multilineatum*, which appears to be based solely on a lack of dusky shading.

SIZE AND WEIGHT: Grows to a length of 18 inches. A 211 mm. fish weighed 270 grams.

GENERAL RANGE: West Indies; Florida Keys to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found generally over the reefs and along shore, the smaller specimens being especially common in shallow water.

ABUNDANCE: Very common, and next to *Haemulon plumieri*, the commonest grunt about Port-au-Prince. It can always be seen in the markets.

METHOD OF CAPTURE: Seines, traps, hook and line and dynamite.

STUDY MATERIAL: Colored Plate, H28, fig. C; Specimens, 8; 49 to 305 mm. No. 7270.

**Gray Grunt; Striped Grunt;
Caco Gris**

Haemulon macrostomum Günther

REFERENCES: *Haemulon macrostoma*, Günther, 1859, Cat. Fish Brit. Mus., 1, p. 308.

Haemulon macrostomum, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 535.

FIELD CHARACTERS: Medium, rather deep, long-snouted, large-mouthed grunts, with 4 or 5 dark horizontal stripes on the upper part of the sides. Greenish above, brownish below.

DESCRIPTION: Our 304 mm. fish has a slightly smaller eye, 4.9 in the head instead of 3.1 to 4.4 as given by Meek and Hildebrand.

COLOR: Greenish silvery above becoming clearer silver below, scales mostly with pearly centers. Under surface of head dusky. Conspicuous dark streaks along the sides of the body; a median streak from tip of snout to dorsal, one from snout above eye along side of the back to last ray of the soft dorsal, two below this from eye above, to the last ray of the soft dorsal, the upper one more or less interrupted posteriorly, a fourth from eye nearly straight to base of caudal; traces below this of a fifth streak. Spinous dorsal brownish green; soft dorsal and anal greenish yellow. Caudal dusky, greenish yellow distally.

GENERAL RANGE: West Indies, Florida, Panama and Columbia.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken by us only over rather deep coral reefs.

ABUNDANCE: Uncommon, not seen at the markets.

METHOD OF CAPTURE: Taken by us only with dynamite.

STUDY MATERIAL: Specimen, 1; 304 mm., No. 7273.

Black Grunt; Ronco Prieto

Haemulon bonariense Cuvier and Valenciennes

REFERENCES: *Haemulon bonariense*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 254.

Haemulon bonariense, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 541.

FIELD CHARACTERS: Medium, moderately deep, rather long-snouted grunts with rusty brown lines on the sides following the lines of scales; young with 3 or 4 black longitudinal stripes and with a distinct caudal spot.

SIZE AND WEIGHT: A 185 mm. fish weighed 147 grams and a 264 mm. fish weighed 401 grams.

GENERAL RANGE: West Indies, south to Buenos Aires.

ABUNDANCE: Fairly common, usually seen in the market 2 or 3 times a week.

STUDY MATERIAL: Photograph, 3925; Specimens, 6; 175 to 259 mm., Nos. 6970, 6971 and 6873.

Pomadasys Lacépède, 1803

Key to Port-au-Prince Bay Species

- A. Pectoral fins long, reaching to or past tips of the ventrals, 1.05 to 1.6 in head; scales large, $3\frac{1}{2}$ to 4 series between the lateral line and the middle of the soft dorsal.....*corvinaeformis*
- AA. Pectoral fins very short, not reaching the tips of the ventrals, 1.5 to 1.9 in head; scales small, 5 to $6\frac{1}{2}$ series between the lateral line and the middle of the soft dorsal.....*crocro*

Croaker-like Roughcheek

Pomadasys corvinaeformis (Steindachner)

REFERENCES: *Haemulon corvinaeforme*, Steindachner, 1868, Ichthy. Notizen, VII, p. 16.

Pomadasys corvinaeformis, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 549.

FIELD CHARACTERS: Elongate, compressed, small-mouthed grunts, with 49 to 52 scales in a lateral series. Silvery below, greyish above; several dark, longitudinal streaks along the side. Pectorals long, reaching to or past the ventrals.

DESCRIPTION: The tail is not forked to any great extent in our specimens, but deeply emarginate.

SIZE AND WEIGHT: A 122 mm. fish weighed 45 grams and a 184 mm. fish weighed 153 grams.

GENERAL RANGE: Atlantic coast from the West Indies south to Brazil.

ABUNDANCE: Fairly common, often seen in the fish market, but never as a common food fish.

STUDY MATERIAL: 3; 122 to 184 mm., No. 6907.

Croco Roughcheek

Pomadasys crocro (Cuvier and Valenciennes)

REFERENCES: *Pristipoma crocro*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 264.

Pomadasys crocro, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 559.

FIELD CHARACTERS: Elongate, compressed, small-mouthed grunts, with 57 to 63 scales in a lateral series. Silvery below, dark olivaceous above, sides often with dusky punctulations. Pectorals short, not reaching ventrals.

DESCRIPTION: Our single specimen runs to *ramosus* in Jordan and Evermann.

COLOR: Dark olivaceous above, silvery white below; all of the scales when viewed from the side, silvery blue with a gray green edge. Sides with dusky punctulations most prominent about the axil, below the pectoral, the lower part of the cheeks, maxillary, and in front of the nostril. Fins dusky.

GENERAL RANGE: Atlantic coast of tropical America, from the West Indies south to Brazil; ascending rivers.

DISTRIBUTION: Our one specimen was found at Source Mariani, an artificially constructed pool, about 50 feet wide and 120 feet long, surrounding and including the spring from which it originated, situated about a mile from the sea and connected with the ocean by two small and narrow streams. The pool was completely emptied of fish by running a wide and deep seine through from one end to the other, and this specimen was the only one of its species taken. It lived in company with large (2 foot) mullets (*Mugil curema*) and smaller fresh-water mullets (*Agonostomus monticola*.)

ABUNDANCE: Rare. Not seen at the fish markets.

METHOD OF CAPTURE: Seine.

STUDY MATERIAL: 1; 305 mm., No. 7173.

Anisotremus Gill, 1861

Pork Fish

Anisotremus virginicus (Linnaeus)

REFERENCES: *Sparus virginicus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 281.

Anisotremus virginicus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 569, Plate LX.

FIELD CHARACTERS: Deep, small-mouthed grunts with 10 horizontal golden lines on a silvery blue background. A wide black band from the nape through eye, another from origin of dorsal to or across the base of the pectorals.

DESCRIPTION: Our specimens agree with the description given by Meek and Hildebrand, but the profile in our 158 mm. fish is by no means as steep as is shown in their plate.

SIZE AND WEIGHT: Grows to the length of 1 foot and a weight of 2 pounds. Our 205 mm. specimen weighed 330 grams.

COLOR: The pectoral fins were golden in our fish, while the other fins were golden mottled with black.

GENERAL RANGE: Florida to Brazil.

OCCURRENCE IN THE GULF OF GONAVE: Uncommon, seen occasionally in the fish markets.

METHOD OF CAPTURE: One specimen was taken during airplane bombing practice in water from 50 to 100 feet deep.

FOOD: Stomach contents dominated by minute crustaceans such as those found crawling about on coral; other comminuted animal remains, including many small elongate spines and small mollusks.

STUDY MATERIAL: Specimens, 2; 158-205 mm., Nos. 6817, 7336.

Family SPARIDAE; THE PORGIES

Key to Port-au-Prince Bay Genera

- A. Front teeth conical or pointed, not compressed; second interhaemal spine enlarged, hollowed anteriorly, cone-like.....*Calamus*
- AA. Front teeth broad, incisors; dorsal fin preceded by a small antrorse spine; interhaemal spine not cone-shaped.....*Archosargus*

Calamus Swainson, 1839

Key to Port-au-Prince Bay Species

- A. Scales rather small, 54 to 57 pores in lateral line.
- B. Outer teeth $\frac{10-12}{12-10}$ in number, outer canines of upper jaw directed forward except in young.
- C. Preorbital with reticulations of bluish ground-color around bronze spots.
calamus
- CC. Preorbital region, snout, cheeks and opercles brassy, crossed by horizontal, wavy, non-reticulating lines of violet-blue.....*proridens*
- BB. Anterior teeth strong $\frac{4-8}{8-10}$. No antrorse canines at any age...*bajanado*
- AA. Scales larger, 45 to 52 pores in lateral line.....*arctifrons*

Saucer-eyed Porgy

Calamus calamus (Cuvier and Valenciennes)

REFERENCES: *Pagellus calamus*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., VI, p. 206, Plate CLII.

Calamus calamus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 575.

FIELD CHARACTERS: Medium sized, compressed, rather deep fishes with moderate sized horizontal mouth, placed low; sides of jaws with molar teeth, outer teeth 10 to 12 in number, the outer canines of the upper jaw directed forward, except in young; 54 to 57 pores in lateral line. Preorbital with reticulations of bluish ground color around bronzy spots.

SIZE AND WEIGHT: Grows to 15 inches. A 219 mm. fish weighed 295 grams.

GENERAL RANGE: Florida to Brazil.

ABUNDANCE: Uncommon, rarely seen at the markets.

METHOD OF CAPTURE: Taken by seine fishermen.

FOOD: Omnivorous, our records showing algae, shells of foraminifera, sea urchins, mollusk shells, shrimps, crabs and small anchovies.

STUDY MATERIAL: Photograph, Specimens, 1; 219 mm., No. 7333.

Little-head Porgy; Pez de Pluma

Calamus proridens Jordan and Gilbert

REFERENCES: *Calamus proridens*, Jordan and Gilbert, 1884, Proc. U. S. Nat. Mus., p. 150.

Calamus proridens, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1350.

FIELD CHARACTERS: Compressed, oblong fishes, considerably elevated; the mouth small, low and horizontal; dorsal fin continuous; head large, deep, the suborbital very wide; anterior profile in adult rising in a very steep line to nape, thence in a gentle curve to front of dorsal; scales 54 to 57; teeth on sides molar; outer canines of upper jaw directed forward except in very young; preorbital region, snout, cheeks and opercles brassy, crossed by horizontal, wavy, non-reticulating lines of violet blue.

SIZE AND WEIGHT: Our 255 mm. fish weighed 580 grams.

GENERAL RANGE: West Indies north to Florida Keys.

ABUNDANCE: Not uncommon, seen quite often in the markets.

FOOD: The stomachs contained small crustaceans.

STUDY MATERIAL: Specimens, 5; 84-260 mm. including No. 7334.

Jolt-head Porgy; Diol pas bleu

Calamus bajanado (Bloch and Schneider)

REFERENCES: *Sparus bajanado*, Bloch and Schneider, 1801, Syst. Ichth., p. 284.

Calamus bajanado, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1352.

FIELD CHARACTERS: Compressed, oblong fishes, considerably elevated; mouth rather small, horizontal, low; anterior profile rising in a fairly regular curve to front of dorsal; scales 54; no antrorse canines; a blue line bordering the eye below and another above, extending on forehead.

SIZE AND WEIGHT: Reaches a length of two feet and a weight of 10 lbs. The single specimen taken measured 143 mm. and weighed 94 grams. It was a female past breeding.

GENERAL RANGE: Florida and the West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: A single specimen taken in a seine at night.

FOOD: An omniverous browser; comminuted sea urchins, shells, bits of coral, sponge, and worms, crabs and other crustaceans.

STUDY MATERIAL: Specimen, 1; 143 mm. No. 7335.

Grass Porgy; Shad Porgy

Calamus arctifrons Goode and Bean

REFERENCES: *Calamus arctifrons*, Goode and Bean, 1882, Proc. U. S. Nat. Mus., p. 425.

Calamus arctifrons, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1355.

FIELD CHARACTERS: Small to medium sized, compressed, rather deep fishes with moderate sized horizontal mouth placed rather low; sides of jaws with molar teeth; scales larger than other Haitian species in the collection, 45 to 52 in lateral line.

SIZE AND WEIGHT: A 185 mm. fish weighed 95 grams.

GENERAL RANGE: Shores of the Gulf of Mexico; Porto Rico and Haiti.

ABUNDANCE: Rather uncommon.

FOOD: The stomach contents of three fish contained comminuted animal matter, too far gone to definitely identify, and vegetable matter, notably two or three leaves of *Thalassia*.

STUDY MATERIAL: Specimens, 3; 145-195 mm., including No. 6895.

Archosargus Gill, 1865 **Tropical Sheepshead; Medance***Archosargus unimaculatus* (Bloch)

REFERENCES: *Perca unimaculatus*, Bloch, 1792, Naturg. Ausl. Fische, VI, Plate CCCVIII, fig. 1.

Archosargus unimaculatus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 578.

FIELD CHARACTERS: Body short and deep, back much elevated; mouth small; incisors and molar teeth in two rows; 13 dorsal spines; sides with golden stripes, dark bars in young.

SIZE AND WEIGHT: A 145 mm. specimen weighed 142 grams.

GENERAL RANGE: Florida and the West Indies, south to Rio de Janeiro.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken commonly by the fisherman in seines at night.

FOOD: A browser: small crustaceans and anemones, much algae and bits of *Thallasia*.

SIZE AT MATURITY: A 165 mm. fish was in full breeding condition, and ripe ovaries were found in late March in females from 160 to 210 mm.

SPAWNING SEASON: Three mature females were taken in mid and late March.

EGGS: In a female of 170 mm. the ovaries measured 65 x 10 mm. and the eggs were .34 to .45 in diameter.

STUDY MATERIAL: Specimens, 4; 145 to 210 mm. including Nos. 6849, 6856 and 7336.

Family KYPHOSIDAE; THE RUDDER-FISHES

Kyphosus Lacépède, 1802 **Rudder-fish; Bermuda Chub; Chub; Chopa Blanca***Kyphosus sectatrix* (Linnaeus)

REFERENCES: *Perca saltatrix*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 293.

Kyphosus sectatrix, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 608, Plate LXV.

FIELD CHARACTERS: Medium, rather deep, compressed fishes with small mouths, rather large flattened teeth, and the soft dorsal and anal fins scaly

in the adult. Dark brown above to pale brown below; sides with blue lines and purplish reflections.

SIZE AND WEIGHT: Grows to 18 inches. Our specimen, 78 mm. long, weighed 13 grams.

GENERAL RANGE: Massachusetts south to the West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: 1 specimen from market; a 15-inch specimen clearly seen in motion picture film, taken two fathoms down.

ABUNDANCE: Rare, a single specimen found at the fish market.

FOOD: Small crustaceans.

STUDY MATERIAL: Specimen, 1; 78 mm. No. 7379.

Family GERRIDAE; THE MOJARRAS

Key to Port-au-Prince Bay Genera

- A. Second interhaemal spine hollow, cone-shaped, its cavity entered by the posterior end of the air bladder; preopercle entire; anal spines 3, the second not much enlarged.....*Eucinostomus*
- AA. Second interhaemal spine normally developed, not hollow, and not entered by air-bladder; preopercle entire or serrate; anal spines, 2 or 3, the second large or small.
- B. Second interhaemal small; anal spines 2, the second small; preopercle entire.....*Ulaema*
- BB. Second interhaemal long; spear-shaped; anal spines 2 or 3, the second enlarged.
- C. Preopercle entire; the second anal spine moderate.....*Gerres*
- CC. Preopercle serrate; the second anal spine much enlarged.....*Diapterus*

Eucinostomus Baird and Girard, 1854

Key to Port-au-Prince Bay Species*

- A. Premaxillary groove crossed by scales in front, leaving a naked pit behind; depth 2.2 to 3.....*gula*
- AA. Premaxillary groove not crossed by scales in front, usually open and linear, sometimes slightly restricted by scales in front, and wider posteriorly; body less compressed, rather slender; depth 2.5 to 3.3.....*californiensis*

Silver Mojarra

Eucinostomus gula (Cuvier and Valenciennes)

* We keep the two Haitian species *gula* and *californiensis* separate, although there is an apparent over-lapping in our specimens.

REFERENCES: *Gerres gula*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., VI, p. 464.

Eucinostomus gula, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 582.

FIELD CHARACTERS: Small, elliptical, moderately compressed, silvery fishes with extremely protractile mouth parts; second interhaemal bone in the shape of a hollow cone; premaxillary groove closed or nearly closed by scales in front.

SIZE AND WEIGHT: A 65 mm. fish weighed 5 grams, and a 35 mm. fish 1.1 grams.

GENERAL RANGE: Massachusetts to Brazil.

ABUNDANCE: Fairly common, often seen in the fish markets.

STUDY MATERIAL: Specimens, 77; 25 to 100 mm.

Common Mojarra

Eucinostomus californiensis (Gill)

REFERENCES: *Diapterus californiensis*, Gill, 1862, Proc. Acad. Nat. Sci. Phila., p. 245.

Eucinostomus californiensis, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 584.

FIELD CHARACTERS: Small, elongate, moderately compressed, silvery fishes with extremely protractile mouth parts; second inter-haemal bone shaped like a hollow cone; premaxillary groove open and linear in young; often oval and restricted in front in older examples.

SIZE AND WEIGHT: A 65 mm. fish weighed 5 grams, and a 35 mm. specimen 1.1 grams.

GENERAL RANGE: Pacific coast from California to Ecuador; Atlantic coast from North Carolina to Brazil, West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Seen mostly along shore, where they fed in shallow water among submerged plants.

ABUNDANCE: A very common species, often seen in the markets and taken in large numbers by seine fishermen.

METHOD OF CAPTURE: Mainly by seines.

FOOD: A number of specimens examined by us contained detritus of both animal and vegetable origin.

STUDY MATERIAL: Specimens, 39; 37 to 100 mm., including Nos. 6887, 6900 and 7209.

Ulaema Jordan and Evermann, 1895

Lefroy's Mojarra

Ulaema lefroyi (Goode)

REFERENCES: *Diapterus lefroyi*, Goode, 1874, Amer. Journ. Sci. and Arts, VIII, p. 123.

Ulaema lefroyi, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 588.

FIELD CHARACTERS: Medium, elongate, compressed, silvery fishes with extremely protractile mouth parts; preopercle entire; anal spines 2; second interhaemal spine short and bluntish. Traces of dark cross bars on sides.

SIZE AND WEIGHT: Grows to 8 inches.

GENERAL RANGE: Florida to Brazil.

ABUNDANCE: Rare, only a single specimen seen at market during four months.

STUDY MATERIAL: Specimen, 1; 139 mm. No. 7101.

Gerres Cuvier, 1824

Dark-barred Mojarra

Gerres cinereus (Walbaum)

REFERENCES: *Mugil cinereus*, Walbaum, 1792, Artedi Piscium, Pt. III, p. 228.

Gerres cinereus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 589.

FIELD CHARACTERS: Elongate, compressed fishes with extremely protractile mouth parts; preopercle entire; 3 anal spines; second interhaemal bone large and spear shaped; sides of body with 7-8 bluish vertical cross bars.

SIZE AND WEIGHT: Grows to 12 to 15 inches. The majority of our fish were about 3 inches long. A 300 mm. specimen weighed $2\frac{3}{4}$ pounds. During the period of our stay in Haiti, more large specimens of this species were seen than any other of its family.

COLOR: The dark bars on the sides are well marked in our fish, and especially so in the smaller ones (40 mm.), where they are often concentrated on the mid-line.

GENERAL RANGE: Atlantic coast from Florida to Cartagena; Pacific coast from lower California to Peru.

ABUNDANCE: Not especially common, but seen practically always in the market in small numbers.

METHOD OF CAPTURE: Mostly by means of seines.

FOOD: Like other members of its family a general feeder. Our notes mention an assortment of worms, mollusks, crustaceans and parts of small fish.

BREEDING: In a 290 mm. fish captured on the 18th of March, the ovaries measured 70 x 8 mm., and in a 285 mm. specimen taken on March 13, the ovaries were 70 x 15 mm. The eggs were not well developed.

STUDY MATERIAL: Specimens, 13; 21 to 300 mm. including Nos. 6843, 7209, 7237.

Diapterus Ranzani, 1840

Rhomboid Mojarra

Diapterus rhombeus (Cuvier)

REFERENCES: *Gerres rhombeus*, Cuvier, 1829, Règne Animal, Ed. II, II, p. 188; Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., VI, p. 459. *Diapterus rhombeus*, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 593.

FIELD CHARACTERS: Small, short and deep, much compressed, rhomboidal, bright silvery fishes with extremely protractile mouth parts. Preopercle serrate; preorbital smooth; 2 anal spines, the second much enlarged.

SIZE AND WEIGHT: Grows to 8 to 13 inches. Most of our specimens were no larger than 125 mm. One recorded, but unfortunately not preserved, measured 338 mm.

GENERAL RANGE: West Indies south to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found rather widely distributed, but mostly along the shore north of Port-au-Prince, near and around mangrove-covered islands. We practically never saw it on the shallower diving reefs.

ABUNDANCE: An extremely common species, brought in large numbers to the markets. Like many of the smaller fishes they spoil very rapidly and, like the small engraulids and clupeids, they are usually salted as soon as captured.

METHOD OF CAPTURE: Practically all of our fish were taken in seines, and mostly by purse seines.

FOOD: The stomach contents of 22 fish were examined. This species is a general feeder, the stomachs revealing algae, *Thalassia*, foraminifera shells, sponge spicules, worms of various kinds, small bivalve mollusks, crustaceans including ostracods, copepods, Nebalia-like forms, paddles of small crabs, and parts of a large red crab in the case of one fish, and finally, a few spines of a very small fish.

BREEDING: The gonads of most of the specimens taken during February to April were not advanced. A 130 mm. female however, taken on March 27, 1927 had spherical, nearly ripe eggs measuring .34 to .39 mm.

STUDY MATERIAL: Specimens, 549; including No. 6805.

Family MULLIDAE; THE SURMULLETS

Upeneus Cuvier, 1829

Key to Port-au-Prince Bay Species

- A. Scales large, 30 to 32 in a lateral series; several large dark blotches along sides..... *maculatus*
 AA. Scales smaller, 39 or 40 in a lateral series; no dark blotches along sides. *martinicus*

Red Goatfish; Salmonete; Bar-baray Rouge*Upeneus maculatus* (Bloch)

REFERENCES: *Mullus maculatus*, Bloch, 1793, Naturg. Ausl. Fische, VII, p. 95.

Upeneus maculatus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 303.

FIELD CHARACTERS: Elongate, rather compressed fish with two long chin barbels; greenish brown above, sides green; head, lower lobe of caudal, anal, ventrals and pectorals red; 3 or 4 large, brownish blotches along sides.

SIZE AND WEIGHT: A 220 mm. specimen has been recorded. Our largest measured 190 mm. and weighed 145 grams.

GENERAL RANGE: Florida and south to Rio Janeiro.

OCCURRENCE IN PORT-AU-PRINCE BAY: Obtained only from market, where they were common.

FOOD: Bottom debris, organic and inorganic, animal and vegetable.

STUDY MATERIAL: Photograph, No. 3911; Specimens, 5; 168 to 195 mm. No. 6928.

Yellow Goatfish; Salmonete Amarilla; Barbaray Jaune et Gris*Upeneus martinicus* Cuvier and Valenciennes

REFERENCES: *Upeneus martinicus*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., III, p. 483.

Upeneus martinicus, Meek and Hildebrand, 1923, Marine Fishes of Panama, I, p. 306.

FIELD CHARACTERS: Elongate, somewhat compressed fish with two long barbels at chin; pinkish with yellow band on sides from eye to caudal fin; pectorals pinkish; other fins yellow.

DESCRIPTION: Our specimens differ in no way from typical descriptions.

SIZE AND WEIGHT: A 275 mm. specimen is recorded. Our largest measured 165 mm. and weighed 98 grams.

GENERAL RANGE: Florida and the West Indies south to Panama.

OCCURRENCE IN PORT-AU-PRINCE BAY: All three of our specimens were secured from the fishermen, who took them at night in seines near the reefs.

STUDY MATERIAL: Specimens, 3; 113 to 165 mm. No. 6884.

Family SCIAENIDAE; THE CROAKERS

Key to Port-au-Prince Bay Genera

- A. Preopercular margin with bony serrae, or at least with one or more spines.
- B. Body elongate; lower jaw with a row of small barbels on each side along the rami, not in a tuft at tip of chin. . . . . *Micropogon*
- BB. Body less elongate; no barbels on lower jaw.
- C. Head broad above; interorbital space wide; skull excessively cavernous, spongy to the touch. . . . . *Stellifer*
- CC. Head narrower, the skull not cavernous; gill rakers comparatively long and slender; preopercle with its lowermost spine directed abruptly downward; lower jaw without canines. . . . . *Bairdiella*
- AA. Preopercular margin with a membranous border; never with bony serrae or spines.
- D. Mouth small, wholly inferior, horizontal, the snout protruding; second dorsal very long, of 38 to 41 rays; bizarre appearing fishes with conspicuous stripes. . . . . *Eques*
- DD. Mouth large, oblique.
- E. Mouth very oblique, the lower jaw much in advance of the upper; silvery. *Larimus*
- E. Mouth less oblique, the lower jaw little if at all in advance of the upper, lower jaw with canines; brownish, coppery. . . . . *Odontoscion*

Micropogon Cuvier and Valenciennes, 1830

White-mouthed Drummer; Verrugato

Micropogon furnieri (Desmarest)

REFERENCES: *Umbrina furnieri*, Desmarest, 1823, Prem. Déc. Ichth., 22, Pl. II, fig. 3.

Micropogon furnieri, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 618.

FIELD CHARACTERS: Rather robust, moderately compressed croakers with convex profile over long snout; jaws weak, the lower jaw included and inferior; very small barbels under lower jaw; preopercle armed with teeth; silvery, darker

above, rows of scales above lateral line with dark streaks, 8 or 9 short oblique bars running upward and backward across the arched portion of the lateral line.

SIZE: All brought to us ranged from 250 to 330 mm. No small fish were observed.

GENERAL RANGE: West Indies south, probably to coast of Argentina.

DISTRIBUTION IN PORT-AU-PRINCE BAY: This fish is apparently confined to the deeper waters and fishing banks, especially along the coast of the southern peninsula of Haiti.

ABUNDANCE: Fairly common, found in the market quite often.

METHOD OF CAPTURE: Taken mostly with traps and hook and line.

FOOD: Mostly carnivorous, the stomachs of 15 fish examined contained the following assortment: annelids, shrimps and crabs of various species, a small tarpon, a file fish and three or four unidentifiable small fish. A small piece of limestone was found in the stomach of one fish. The species is a grubber, searching about on the bottom for whatever can be found.

BREEDING: The ovaries of 13 specimens taken from February 13 to March 30 averaged 75 mm. long and 15 mm. wide. In those taken from the 9th to the end of March the eggs were quite well developed. Most of the eggs taken from a 310 mm. fish on March 18th measured .45 mm. in diameter, the remainder measured .28 mm.

STUDY MATERIAL: Specimens, 6; 250-330 mm., No. 6839.

Stellifer Oken, 1817

Spongy-headed Croaker

Stellifer colonensis Meek and Hildebrand

REFERENCE: *Stellifer colonensis*, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 623.

FIELD CHARACTERS: The bones of the skull of these fish are hollowed out to paper thinness; rather deep, thick-bodied fish, back elevated, sloping straightly to the rounded snout; mouth inferior, almost straight; gill-rakers 18 to 21; dorsal fin XI-I, 23.

DESCRIPTION: Agrees well with the original description. In Meek and Hildebrand's specimen No. 81220 there is decided obliquity of the mouth, and the anterior end of the premaxillary cuts the eye, so that there is agreement in these two uncertain characters.

GENERAL RANGE: On coral reefs at Atlantic end of Panama Canal, and Haiti.

STUDY MATERIAL: Specimens, 3; 120-133 mm., No. 7035.

Bairdiella Gill, 1861 **Ronco; Ground Drummer***Bairdiella ronchus* (Cuvier and Valenciennes)

REFERENCES: *Corvina ronchus*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 107.

Bairdiella ronchus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 634, Plate LXVII, fig. 2.

FIELD CHARACTERS: Small, oblong, compressed croakers with slightly oblique mouths; preopercle serrate, the serrae becoming stronger toward the angle, the lowermost directed downward. Grayish above, silvery below; sides usually with brownish punctulations, a dark blotch on upper anterior angle of opercle.

DESCRIPTION: Our specimens were typical.

SIZE AND WEIGHT: Grows to 7 inches. The lengths and weights of our 3 specimens were as follows:

Length	Weight
163 mm.	85 grams
138 "	58 "
132 "	48 "

GENERAL RANGE: West Indies, coast of Mexico south to Brazil.

ABUNDANCE: Uncommon, brought to us by our seine fishermen about once every two weeks. Observed at the market fairly often.

FOOD: Stomach contents were mainly small fish and crustaceans.

STUDY MATERIAL: Specimens, 3; 132-163 mm., including No. 7124.

Eques Bloch, 1793

Key to Port-au-Prince Bay Species

- A. Soft parts of vertical fins with white spots, dorsal fin X to XII-I, 46.
punctatus
 AA. Soft parts of vertical fins without white spots, Dorsal fin XIV or XV-I, 53.
lanceolatus

Spotted Ribbon-fish, Serrana Hispana*Eques punctatus* Bloch and Schneider

REFERENCES: *Eques punctatus*, Bloch and Schneider, 1801, Syst. Ichthy., p. 106.

Eques punctatus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1488.

FIELD CHARACTERS: Small, oblong, compressed fish; deepest anteriorly, tapering posteriorly to the narrow caudal peduncle. Dark brown, variegated with lighter, and with light spots on soft dorsal, caudal and anal fins and on the caudal peduncle.

SIZE AND WEIGHT: Our 187 mm. fish weighed 137 grams.

GENERAL RANGE: West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Rarely observed by us on the reefs.

ABUNDANCE: Fairly common at the market, but among the uncommon food fish.

FOOD: The single example had fed exclusively upon crustaceans.

STUDY MATERIAL: Photograph, 3923; Specimen, 1; 187 mm., No. 6955.

**Lance-shaped Ribbon-fish;
Guapena; Serrana**

Eques lanceolatus (Linnaeus)

REFERENCES: *Chaetodon lanceolatus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 277.

Eques lanceolatus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1489.

FIELD CHARACTERS: Small, oblong compressed fishes; deepest anteriorly, tapering to the narrow caudal peduncle, and with a short, high spinous dorsal and a long soft dorsal fin. Conspicuously marked with brownish bands; fins not spotted with dirty white.

DESCRIPTION: The single fish assigned to this species had 6 anal rays and a fairly large eye, the diameter of this averaging 3.27 instead of 4 in the head.

SIZE AND WEIGHT: A 140 mm. fish weighed 57 grams.

GENERAL RANGE: West Indies northward to Pensacola.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Fairly common on the various reefs. Now and then, while diving, these fish were observed swimming about in arena-like spaces in the coral. They preferred sandy places, usually 2 to 3 feet in diameter and surrounded on all sides by masses of coral. Within these barrel-like holes the fishes slowly circled about, retreating and advancing as competitors, such as snappers and sea-basses, shoved their noses into the retreat.

ABUNDANCE: Uncommon, seen but rarely at the markets; less often than its relative *punctatus*.

FOOD: Our 140 mm. fish had fed almost exclusively upon small crustaceans.

STUDY MATERIAL: Photograph, 3987; Specimen, 1; 140 mm., No. 7049.

Larimus Cuvier and Valenciennes, 1830 **Cabezon***Larimus breviceps* Cuvier and Valenciennes

REFERENCES: *Larimus breviceps*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 146, Plate CXI.

Larimus breviceps, Meek & Hildebrand, 1925, Marine Fishes of Panama, II, p. 686.

FIELD CHARACTERS: Medium, compressed croaker with large, oblique mouth; the second dorsal fin long, composed of 27 or 28 rays. Brownish above, silvery on sides, clear whitish-silvery below; rows of scales above with distinct dark streaks; a brownish axillary spot.

SIZE AND WEIGHT: Grows to 12 inches. A 140 mm. fish weighed 89 grams.

GENERAL RANGE: West Indies to Brazil.

ABUNDANCE: Apparently rather rare. Only one specimen seen in five months.

FOOD: Carnivorous, 2 silver-sides (*Hepsetia stipes*) being found in the stomach of our single specimen.

BREEDING: Our 140 mm. fish had ovaries 39 x 8 mm. long, the great majority of the eggs averaging .4 mm. in diameter (March 23, 1927).

STUDY MATERIAL: Specimen, 1; 140 mm., No. 7091.

Odontoscion Gill, 1862 **Corvina; Brown large-eyed Croaker***Odontoscion dentex* (Cuvier and Valenciennes)

REFERENCES: *Corvina dentex*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 139, Plate CIX.

Odontoscion dentex, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 688.

FIELD CHARACTERS: Small, elongate, compressed croakers, with very large eyes; sides of body flattened. Reddish-brown, the rows of scales with faint dark streaks; a conspicuous black axillary spot.

SIZE AND WEIGHT: Grows to 12 inches. A 131 mm. fish weighed 44.3 grams; a 126 mm. fish, 41 grams, and a 95 mm. fish 18 grams.

GENERAL RANGE: West Indies, Panama, Trinidad.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Corvinas were seen constantly on

the coral reefs in 10 to 25 feet of water, and they were among the fishes most commonly found floating at the surface after dynamiting. We seldom saw them swimming free while we were diving, and they spend most of their time hiding among the coral from which they jump forth after whatever luckless prey may happen to pass. We never saw them on the shallower, weed covered reefs near shore.

ABUNDANCE: Very common, and brought to the markets in fairly large numbers.

METHOD OF CAPTURE: Traps and dynamite.

FOOD: A carnivorous species with crustaceans, especially amphipods and small shrimps, anchovies and other small fish constituting the greater part of their diet.

STUDY MATERIAL: Specimens, 54; 59 to 131 mm., including Nos. 6871, 6957, and 7244.

Family OTOLITHIDAE; WEAK-FISHES

Cynoscion Gill, 1861

Mongolar Drummer

Cynoscion jamaicensis (Vaillant and Bocourt)

REFERENCES: *Otolithus jamaicensis*, Vaillant and Bocourt, 1883, Miss. Sci. Mex., etc., Pt. IV, p. 156, Plate VI.

Cynoscion jamaicensis, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 662.

FIELD CHARACTERS: Medium, elongate, compressed, rather deep, conical headed, short and blunt-snouted croakers with large, oblique mouth and fair-sized teeth in two rows; preopercle entire; 2 weak anal spines; a long, low second dorsal fin. Brownish above, silvery below, rows of scales above lateral line with dark streaks which run obliquely upward and back.

SIZE AND WEIGHT: Grows to a foot long. A 193 mm. fish weighed 102 grams.

GENERAL RANGE: West Indies; Colon.

ABUNDANCE: Rare, not observed in markets.

METHOD OF CAPTURE: Captured with hook and line.

FOOD: Carnivorous, our single fish contained a silver-striped anchovy.

STUDY MATERIAL: Specimen, 1; 193 mm., No. 7277.

Family MALACANTHIDAE; THE BLANQUILLOS

Malacanthus Curvier, 1829

Plumier's Blanquilla

Malacanthus plumieri (Bloch)

REFERENCES: *Coryphaena plumieri*, Bloch, 1787, Ichthy., V, 119, Plate 175.
Malacanthus plumieri, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2275.

FIELD CHARACTERS: Medium sized, elongate, slightly compressed small-scaled fishes with conical snout; preopercle entire; long dorsal and anal fins; lateral line complete; caudal fin forked; caudal lobes yellowish.

DESCRIPTION: The interorbital in our fish is wider than the eye, and there are 55 dorsal and 50 anal rays.

SIZE AND WEIGHT: Grows to 15 inches. Our 297 mm. fish weighed 190 grams.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: One specimen purchased at fish market.

ABUNDANCE: Uncommon.

STUDY MATERIAL: Colored Plate, H64, No. 7044; Specimen, 1; 297 mm., No. 7044.

Family EPHIPPIDAE; THE SPADE-FISHES

Chaetodipterus Lacépède, 1803

Spade-fish; Karengue a plime

Chaetodipterus faber (Broussonet)

REFERENCES: *Chaetodon faber*, Broussonet, 1782, Ichth. Syst. Pisc., (19), Pl. (VI).

Chaetodipterus faber, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 761.

FIELD CHARACTERS: Moderate-sized, compressed, deep fishes with small but rough scales; spinous dorsal fin separate from soft dorsal; dorsal and anal scaled; mouth very small, teeth in brush-like bands, slender, closely set and movable. Young with third dorsal filament, much more produced than in the adults. Pearly gray, more or less uniform, the young with dark vertical bands.

SIZE AND WEIGHT: Grows to three feet and a weight of twenty pounds.

COLOR: The 381 mm. fish was dark gray without pattern, the soft dorsal, anal and ventral fins black.

GENERAL RANGE: Cape Cod to Rio de Janeiro.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found along shore by native fisherman.

ABUNDANCE: Fairly common, often brought to the markets, and constantly brought to us by our native seine fisherman.

METHOD OF CAPTURE: Mainly by seines.

STUDY MATERIAL: Drawings, H6, No. 6802; Specimens, 4; 38-280 mm., including Nos. 6802 and 6916.

Family CHAETODONTIDAE; BUTTERFLY FISHES

Key to Port-au-Prince Bay Genera

- A. Preopercle unarmed; the snout little if at all produced; dorsal spines 12 to 13, not graduated, some of the middle ones highest....*Chaetodon*
- AA. Preopercle armed at its angles with a very strong spine, which is sometimes grooved.
- B. Interopercle unarmed; vertical limb of the preopercle above the spine entire or nearly so; dorsal fin with 8 to 11 spines.....*Pomacanthus*
- BB. Interopercle short and broad, armed with 1 to 4 strong spines; preopercle serrate or spinous; dorsal spines about 14, graduated, the last one longest.
- C. Vertical limb of preopercle simply serrate, with 10 to 30 small teeth, body oblong, rather robust.....*Holacanthus*
- CC. Vertical limb of preopercle with 3 to 9 conspicuous spines; body ovate, much compressed.....*Angelichthys*

Chaetodon Linnaeus, 1758

Key to Port-au-Prince Bay Species

- A. Body without ocelli, crossed by dark bands.....*striatus*
- AA. Body with a large black ocellus below the soft dorsal.....*capistratus*

Mariposa, Butterfly-fish

Chaetodon striatus Linnaeus

REFERENCES: *Chaetodon striatus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 275.

Chaetodon striatus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 768.

FIELD CHARACTERS: Small, deep-bodied fishes with single dorsal fin of spines and rays; vertical fins densely scaled; mouth small, teeth fine and brush-

like; three vertical black bands on body, one from nape through eye and over cheek, second from anterior part of spinous dorsal, and third from posterior part of spinous dorsal to middle of anal.

SIZE AND WEIGHT: Grows to 4 or 5 inches long. A 102 mm. fish weighed 44 grams.

GENERAL RANGE: West Indies to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Known to us only by specimens obtained in the markets.

ABUNDANCE: Uncommon.

FOOD: Very minute crustaceans, algae, and other organic matter too disintegrated to identify.

STUDY MATERIAL: Photograph, 4054; Specimens, 3; 59–102 mm.

Mariposa; Parché; Butterfly

Chaetodon capistratus Linnaeus

REFERENCES: *Chaetodon capistratus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 275.

Chaetodon capistratus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 767.

FIELD CHARACTERS: Small, deep-bodied fishes with single dorsal fin composed of spines and rays, vertical fins covered with scales; mouth small; teeth fine, brush-like; yellowish, a black line from nape through eye and a large black ocellus under soft dorsal fin.

SIZE AND WEIGHT: Grows to 6 inches.

GENERAL RANGE: Southern Florida, southward through the West Indies, and north to Woods Hole, Mass.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found generally distributed in the Bay.

ABUNDANCE: Fairly common, more so than *striatus*.

METHOD OF CAPTURE: Most of our fish were taken as a result of bombing practice and dynamiting.

STUDY MATERIAL: Color Plate, H19; Photographs, 3988, 4037, 4038; Specimens, 9; 32–72 mm., including No. 6811.

Pomacanthus Lacépède, 1803

Key to Port-au-Prince Bay Species

- A. Scales in lateral line 50 to 55; color of adult steel gray or scarcely yellowish; young with four whitish cross bands.....*arcuatus*
 AA. Scales in lateral line 70 to 90; color black in adult with yellow mottlings; base of pectoral yellow; young with several yellowish cross-bands.

*paru***Mariposa; Black Angel; Chirivita; Portugais***Pomacanthus arcuatus* (Linnaeus)

REFERENCES: *Chaetodon arcuatus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 273.

Pomacanthus arcuatus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 773.

FIELD CHARACTERS: Small to medium sized, deep, compressed, but rather robustly built fishes with dorsal and anal fins completely covered with scales, the two fins falcate and produced; mouth small, teeth brush-like or setiform; eight or nine dorsal spines; grayish or brown, mottled, the young with 4 vertical white cross bands; pectoral fin base without a yellow spot.

DESCRIPTION: Jordan and Evermann call the tail rounded, and this is true in the 103 mm. fish. All the rest have the tail lunate, and in one the tips are slightly produced. The figure given in "Fishes of North and Middle America," and copied by Evermann and Marsh in "Fishes of Porto Rico," resembles *paru* more than *arcuatus*.

SIZE AND WEIGHT: Grows to 1½ to 2 feet. A 240 mm. fish weighed 1¾ pounds.

COLORS: (240 mm. fish in life). Head pale gray, chin ivory white. Scales of body dark brown with pale edges. Caudal with a narrow white edge, bordered internally with a still narrower golden line. Edges of fins and the pectoral fins black. Anterior half of iris dark chocolate, posterior half cream.

GENERAL RANGE: West Indies, occasionally north to New Jersey and New York, south to Bahia.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen very often on the reefs while diving.

ABUNDANCE: Common, often seen in the markets.

METHOD OF CAPTURE: Hooks, spears, dynamite.

FOOD: Alimentary canal crammed with algae, hydroids, etc.

STUDY MATERIAL: Photograph, 3756; Specimens, 5; 103–240 mm. including No. 6812.

Paru; Indian Fish; Flat Fish

Pomacanthus paru (Bloch)

REFERENCES: *Chaetodon paru*, Bloch, 1787, Ichthyologia, 57, Plate 197, fig. 1.
Pomacanthus paru, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 775.

FIELD CHARACTERS: Small to medium-sized fishes with small mouth containing fine, brush-like teeth; dorsal and anal fins completely covered with scales, the former containing 10 spines. Black, pectoral fin with an orange bar at base. Young with 5 light cross bars.

SIZE AND WEIGHT: Grows to a foot or more. Our 235 mm. fish weighed 1½ pounds.

GENERAL RANGE: West Indies, south to Bahia.

ABUNDANCE: Uncommon, a single fish purchased at the fish market.

STUDY MATERIAL: Specimen, 1; 235 mm., No. 7123.

Holacanthus Lacépède, 1803

Rock Beauty; Catalineta; Marguerite

Holacanthus tricolor (Bloch)

REFERENCES: *Chaetodon tricolor*, Bloch, 1795, Ichthyologia, p. 103, Plate 426.
Holacanthus tricolor, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 779.

FIELD CHARACTERS: Small to medium-sized fishes with dorsal and anal fins completely covered with scales; mouth small, teeth brush-like; head, anterior third of body and tail rich orange, rest of body black.

SIZE AND WEIGHT: Grows to a foot. A 115 mm. fish weighed 84 grams.

GENERAL RANGE: West Indies south to Bahia and north to Bermuda.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on all coral reefs.

ABUNDANCE: Rather common.

METHOD OF CAPTURE: Mainly by traps.

FOOD: Algae and scrapings.

STUDY MATERIAL: Color Plate, H122, No. 6948; Photograph, 3920; Specimens, 4; 89–154 mm., including No. 6948.

Angelichthys Jordan and Evermann, 1896

Angel-fish; Isabelito; Maguerite

Angelichthys ciliaris (Linnaeus)

REFERENCES: *Chaetodon ciliaris*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 276.

Angelichthys ciliaris, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 252, plate 37.

FIELD CHARACTERS: Medium to large-sized compressed, robust fish with small mouth; teeth fine, brush-like; preopercle with a series of spines on the upper limb; bluish to yellowish; sides of head pale yellow; pectoral, ventral and caudal fins lemon yellow; the nape with a blue ocellus.

SIZE AND WEIGHT: Grows to two feet.

GENERAL RANGE: Southern Florida, West Indies to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen on all the reefs.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Mainly by traps.

STUDY MATERIAL: Color Plate, H89; Specimens, 2; 119–195 mm., including Nos. 6961, 7143.

Family ACANTHURIDAE; SURGEON-FISHES.

Acanthurus Forskal, 1775

Key to Port-au-Prince Bay Species

- A. Body deep, rhomboid, depth 1.55 to 1.75 in length; snout 1.25 to 1.5 in head; longest dorsal spine shorter than snout; dorsal rays IX, 25–27; anal rays III, 24–26; color deep bluish black, base of caudal not paler than rest of body; sides with narrow, horizontal blue lines. . . . *caeruleus*
- AA. Body more elongate, at least when specimens of equal size are compared; color lighter, brownish; anal rays III, 21 to 23.
- B. Caudal fin deeply concave, the upper lobe notably produced in adult; color uniform, without vertical bars in young; concave portion of caudal

- fin with a broad white margin, dorsal fin with about eight horizontal dark lines.....*bahianus*
- BB. Caudal fin only moderately concave, the upper lobe not produced and not much longer than the lower; young with narrow vertical bars; concave portion of caudal fin with a very narrow white margin or none; dorsal fin dark, almost black.....*hepatus*

Barbero; Blue Tang; Blue Surgeon; Sous-gé

Acanthurus caeruleus Bloch and Schneider

REFERENCES: *Acanthurus caeruleus*, Bloch and Schneider, 1801, Syst. Ichthyologia, p. 214.

Acanthurus caeruleus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 782.

FIELD CHARACTERS: Surgeon fishes; small fish with erectile spine on side of caudal peduncle; fairly deep, the depth once and a half in the length. Color, brown, washed with deep blue, with undulating longitudinal pale blue streaks on body.

SIZE AND WEIGHT: Grows to about one foot. A 95 mm. fish weighed 39.5 grams.

GENERAL RANGE: West Indies; Bermuda to Bahia; occasionally northward to the vicinity of New York.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken over all the reefs.

ABUNDANCE: Fairly common. Seen quite often in the markets.

METHOD OF CAPTURE: Mainly traps and dynamite.

STUDY MATERIAL: Specimens 5; 81-166 mm., including No. 6926.

Crescent-tailed Surgeon Fish; Ocean Tang

Acanthurus bahianus Castelnau

REFERENCES: *Acanthurus bahianus*, Castelnau, 1855, Anim. Nouv. Rares Amer. Sud, p. 24, Plate XI, fig. 1.

Acanthurus bahianus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 783.

FIELD CHARACTERS: Medium sized fish with an erectile spine on each side of the caudal peduncle; depth about one half the length, caudal fin deeply emarginate, the upper tip produced in older fish; brown, 8 dark lines running parallel with edge of dorsal fin for its whole length.

SIZE AND WEIGHT: Grows to about a foot. A 125 mm. fish weighed 67 grams.

GENERAL RANGE: West Indies; Florida to Bahia, occasionally northward to Woods Hole.

OCCURRENCE IN PORT-AU-PRINCE BAY: Quite widely distributed, but mainly on the deeper reefs.

ABUNDANCE: Fairly common.

METHOD OF CAPTURE: Traps and dynamite.

FOOD: Finely disintegrated organic matter, with traces of algae and of worm tubes.

STUDY MATERIAL: Color Plate, H125; Specimens, 9; 57-129 mm., including No. 6815.

**Common Surgeon, Doctor-fish;
Lancet-fish**

Acanthurus hepatus (Linnaeus)

REFERENCES: *Teuthis hepatus*, Linnaeus, 1766, Syst. Nat., Ed. XII, p. 507.
Acanthurus hepatus, Meek and Hildebrand, 1928, Marine Fishes of Panama, Part III, p. 784.

FIELD CHARACTERS: Surgeon fishes; small fish with an erectile spine on sides of caudal peduncle; depth about one-half the length; caudal fin lunate; brown, with about 12 vertical blackish bars.

SIZE AND WEIGHT: Grows to 10 inches. A 106 mm. fish weighed 48 grams.

GENERAL RANGE: West Indies; Recorded from Massachusetts to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found generally on the reefs.

ABUNDANCE: Fairly common and often seen in the markets.

METHOD OF CAPTURE: Traps and dynamite.

FOOD: The powerful gizzard-like stomach contained unidentifiable vegetable and animal matter.

STUDY MATERIAL: Specimens, 14; 51-181 mm. including Nos. 6862 and 6925.

Family SCORPAENIDAE; THE SCORPION-FISHES

Key to Port-au-Prince Bay Genera

- A. Dorsal spines normally 12; palatine teeth present.....*Scorpaena*
- AA. Dorsal spines normally 13; palatine teeth absent.....*Scorpaenodes*

Scorpaena Linnaeus, 1758

Key to Port-au-Prince Bay Species

- A. A distinct pit below anterior margin of eye; head quite as broad as deep; occipital pit very deep, prominent; axil black, with small white or pale blue spots.....*plumieri*
- AA. No pit below anterior margin of eye; head not broader than deep.
- B. Suborbital stay with 2 or 3 distinct spines, not counting the terminal one on the preopercle.
- C. Third anal spine longer, but not stronger than second; scales small, 55 to 60; axil of pectoral pale with small round dark spots.....*brasiliensis*
- CC. Second anal spine longer and stronger than third; supraorbital tentacles very long, always longer than eye; scales 41 to 45; axil of pectoral grey with very small bluish spots enclosed in black rings..*grandicornis*
- BB. Suborbital stay without spines, a terminal one on the preopercle; scales about 50; second anal spine not longer than 3rd; maxillary reaches to middle of eye.....*isthmensis*

Plumier's Scorpion Fish*Scorpaena plumieri* Bloch

REFERENCES: *Scorpaena plumieri*, Bloch, 1789, K. Vet. Ac. Nya. Handl., X, p. 234.

Scorpaena plumieri, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 835.

FIELD CHARACTERS: Small fishes with many conspicuous dermal flaps and tentacles on head and body; head very rugose; a small but very distinct pit below anterior border of eye; axil of pectoral usually black, with white or blue spots.

DESCRIPTION: The single specimen in the collection is typical.

SIZE AND WEIGHT: Grows to about a foot. Our 116 mm. fish weighed 85 grams.

GENERAL RANGE: West Indies, south to Brazil occasionally north to Massachusetts.

ABUNDANCE: Rather rare, a single specimen taken in trap.

STUDY MATERIAL: Photographs, 4027, 4028; Specimen, 1; 116 mm., No. 7380.

Small-scaled Scorpion Fish

Scorpaena brasiliensis Cuvier and Valenciennes

REFERENCES: *Scorpaena brasiliensis*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., IV, p. 305.

Scorpaena brasiliensis, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 837.

FIELD CHARACTERS: Rather small fishes with rough spiny head and with a few dermal flaps along the lateral line; no pit below eye; the suborbital stay with 2 or 3 spines; third anal spine longer but not stronger than second; axil of pectoral fin pale with small black spots.

SIZE AND WEIGHT: A 142 mm. fish weighed 92 grams, and an 87 mm. specimen 23.5 grams.

GENERAL RANGE: West Indies, South Carolina and Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found along shore, among coral and on reefs.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Seines.

STUDY MATERIAL: Drawing, H12, No. 6801; Specimens, 2; 87-141 mm., including No. 6801.

Long-horned Scorpion-Fish

Scorpaena grandicornis Cuvier and Valenciennes

REFERENCES: *Scorpaena grandicornis*, Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., IV, p. 309.

Scorpaena grandicornis, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 838.

FIELD CHARACTERS: Small fishes with many conspicuous dermal flaps and tentacles on head and body, one above the eye always much longer than diameter of the eye; head with numerous sharp spines; axil grayish with small bluish or white spots enclosed in black rings.

DESCRIPTION: Agrees in all particulars with the type description.

SIZE AND WEIGHT: A 109 mm. fish weighed 47 grams.

GENERAL RANGE: Florida keys to Brazil.

ABUNDANCE: A single specimen purchased in fish market.

STUDY MATERIAL: Specimen, 1; 108 mm., No. 6934.

Smooth-cheeked Scorpion Fish

Scorpaena isthmensis Meek and Hildebrand

REFERENCE: *Scorpaena isthmensis*, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 842, Plate LXXX.

FIELD CHARACTERS: Medium sized fish with fleshy tentacle over eye and small dermal flaps along the lateral line; no pit below the anterior margin of the eye; suborbital stay without spines; scales about 50.

DESCRIPTION: We are assigning a single 169 mm. fish to *isthmensis*, recently described by Meek and Hildebrand from a 90 mm. fish from Porto Bello, Panama, although it is possible that our fish represents a new species. The most marked differences between the two specimens are the possession of a greater number of gill-rakers (5 short and stockily-built and 5 additional smaller ones) in the Haitian fish, in the greater extent of the membranes of the dorsal fin and in the presence of an ocular cirrus. The similarities are quite numerous, however, and considering the fewness of specimens it seems better to call our fish *isthmensis*, at least until further material is gathered.

The following are the dimensions of our fish:

Length	169 mm.	Dorsal fin XII, $9\frac{1}{2}$
Depth	57 (2.96)	Anal fin III, $5\frac{1}{2}$
Head	69 (2.44)	Scales 50, 23 pores
Eye	19 (3.6)	
Snout	18 (3.8)	
Maxillary	37 (1.85)	
Interorbital space	10.5 (1.9)	

The pectoral fin has 20 rays, of which the upper three and the lower 11 are simple, the middle 7 are branched. It possesses an elongate flap above the base of the pectoral.

SIZE AND WEIGHT: The 169 mm. fish weighed 158 grams.

GENERAL RANGE: Panama and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken from a trap 15 feet deep on reef.

ABUNDANCE: Rare.

STUDY MATERIAL: Specimen, 1; 169 mm., No. 7381. Port-au-Prince Bay.

Scorpaenodes Bleeker, 1857**Haitian Scorpion Fish***Scorpaenodes russelli* new species

TYPE: No. 7207. Length 71 mm. Bizoton Reef, Port-au-Prince Bay, Haiti.
 Taken in wire trap in 12 feet of water on coral. 27-IV, 1927.

MEASUREMENTS AND COUNTS:

Length: 71 mm.
 Head: 30 (2.3)
 Depth: 25 (2.8)
 Eye: 9 (3.3)
 Snout: 7 (4.3)
 Maxillary: 15 (2)
 Scale count: 40
 Interorbital: 4 (7.5)

Weight: 12.5 grams
 Dorsal fin: XIII-9½
 Anal fin: III-5½
 Pectoral rays: 19
 Pectoral length: 21 (1.4)
 Ventral length: 16
 Ocular angle: 30° up
 Mouth angle: 40° down
 Lateral line pores: 23-25

DESCRIPTION:

Body: Short, deep, robust.

Back: Slightly elevated.

Anterior profile: Irregularly convex.

Cephalic armature:

Interorbital: 2 longitudinal ridges ending in small spines.

Supraorbital: Prominent ridge with 3 spines all ending in short filaments.

Preorbital: No spines or blunt points.

Narial spine: Well developed.

Occipital region: A strong spine close behind and almost in line with the supraorbital spines; 2 pairs of nuchal spines behind the one just mentioned, much nearer the mid-line and converging obliquely forward.

Shoulder girdle: 2 spines at anterior end of lateral line, merging abruptly into lateral line scales each of which has a short spine of its own; 1 spine half way between lateral line and upper base of pectoral.

Preopercular margin: 3 spines, lowermost with dermal flap.

Opercular margin: 2 strong spines, not divergent, upper larger.

Suborbital stay: 4 spines; 3 spines beneath anterior part of stay.

Interorbital: Very concave.

Snout: Broad, high-ridged.

Eye: Large, superior, directed obliquely upward.

Mouth: Wide, oblique.

Lower jaw: Included.

Maxillary: Reaching to mid-eye.

Gill-rakers: Short, thick and widely spaced; 8 + 4 rudiments on left side, 9 + 2 rudiments on right gill.

Teeth: In villiform bands; a broad V-shaped patch on vomer; none on palatines.

Tongue: Narrow, spoon-shaped tip, widening rapidly.

Scales: Small, finely ctenoid, absent from snout, lips and chin.

Lateral line: Prominent, irregularly absent from a few precaudal scales; each with a small spine and dermal flap.

Dorsal fin: Deeply notched, 5th and 6th spines longest.

Caudal fin: Shape indefinite, as tips of rays are broken.

Anal spines: 3; the 2nd enlarged, longer and stronger than 3rd.

Pectoral rays: 19; Upper 2 simple, next 7 branched, lower 10 simple.

COLOR: Body corinthian red with white mottlings; head and spines scarlet; iris scarlet on inner half, sepia spotted with white outside; spinous dorsal fin pale grey boldly spotted with scarlet; soft dorsal, anal and caudal white, spotted with scarlet and sepia, and broadly tipped with lemon yellow; ventrals wholly lemon yellow, finely dotted with scarlet; pectorals pale grey, thickly streaked with sepia on proximal half, scarlet distally, with wide terminal band of flame orange; lips lemon yellow, touched at symphysis with scarlet.

In preservative all colors fade to a uniform greyish brown.

COMPARISON: This species is closest to *caribbaeus*, the much larger body scales setting it apart at once from *tredecimspinosus*. From the former it differs in the present of dermal flaps on supraocular spines, in 4 spines on suborbital stay, 2 series of occipital spines, 2nd anal spine not greatly enlarged, different number and diversity of pectoral rays, in ctenoid head scales, slightly less number of body scales, much larger snout, narrower interorbital, and larger number of gill rakers.

STUDY MATERIAL: Type specimen. Color Plate H108.

TYPE NAME AND LOCATION: The name is given in honor of General John H. Russell, American High Commissioner of Haiti under the American Occupation, who, with Mrs. Russell, insured the success of the expedition while in the island.

The type, No. 7207, and only specimen, is deposited in the Collection of the Department of Tropical Research of the New York Zoological Society.

Family TRIGLIDAE; THE GURNARDS

Prionotus Lacépède, 1802**Spotted Gurnard***Prionotus punctatus* (Bloch)

REFERENCES: *Trigla punctata*, Bloch, 1793, Naturg. Ausl. Fische, VII, p. 125, Plate CCCLIII.

Prionotus punctatus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 850.

FIELD CHARACTERS: Small to medium fishes with head inclosed in a bony, somewhat spiny armature; pectoral fins with three lower anterior rays separate from the rest and free from each other.

DESCRIPTION: The Haitian fish have no spine in the center of radiation of the cheek. They differ in no other way.

SIZE AND WEIGHT: Grows to about a foot. A 189 mm. fish weighed 171 grams, a 183 mm. fish 131 grams, and a 134 mm. fish 56 grams.

GENERAL RANGE: West Indies, East Coast of Mexico, Brazil and Uruguay.

OCCURRENCE IN PORT-AU-PRINCE BAY: Most of our specimens were from the market, but two were taken at night with submerged lights.

ABUNDANCE: Rather uncommon.

METHOD OF CAPTURE: Seines and scoop-nets.

FOOD: Small crustaceans and shrimps.

STUDY MATERIAL: Color Plate, H33; Specimens, 6; 136-189 mm., including Nos. 6908, 7095, and 7385.

Family CEPHALACANTHIDAE; THE FLYING GURNARDS

Cephalacanthus Lacépède, 1802**Flying Gurnard***Cephalacanthus volitans* (Linnaeus)

REFERENCES: *Trigla volitans*, Linnaeus, 1758, Systema Natura, Ed. X, 1, p. 302.

Cephalacanthus volitans, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 860.

FIELD CHARACTERS: Small to medium fishes with head enclosed in a bony armature; pectoral fins long, wing-like, used for flying; pectoral fins without fleshy tentacles at their base anteriorly.

SIZE AND WEIGHT: Grows to 12 inches. A 182 mm. fish weighed 136 grams and a 70 mm. specimen 5.5 grams.

GENERAL RANGE: Known from both coasts of the Atlantic Ocean, straying north to Woods Hole, Mass.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found widely over the surface of the Bay, small fish often coming to our submerged lamps at night.

METHOD OF CAPTURE: Scoop nets at light and seines.

HABITS: A short account, with three figures, of habits has been published by William Beebe as chapter XI, in his volume "Beneath Tropic Seas" (Putnam).

STUDY MATERIAL: Color Plate, H60, No. 6892; Photographs, 3862, 3945, 3968, 3972; Specimens, 19; 43 to 182 mm., including Nos. 6892, and 7208.

Family POMACENTRIDAE; THE DEMOISELLES

Key to Port-au-Prince Bay Genera

- A. Body elongate, the depth usually more than 2 in the length; teeth in the jaws conical, in bands, the outer ones enlarged. Tail with upper and lower margin black.....*Chromis*
- AA. Body usually deep, ovate; teeth in one or two series, compressed, more or less incisor like; tail variously colored, but never with conspicuous black upper and lower margin.
- B. Teeth rather large, immovable, of about equal size in each jaw, usually truncate or more or less notched; suborbital without a deep notch between nostril and maxillary.
- C. Preopercle and suborbital distinctly serrate; teeth with straight or slightly truncate margins, never distinctly notched.....*Pomacentrus*
- CC. Preopercle and suborbital entire; teeth always with distinctly notched margins; mouth oblique, terminal, the lips thin.....*Abudefduf*
- BB. Teeth small, movable, those in upper jaw close set, compressed, with entire margins, those in the lower jaw larger anteriorly, much reduced at sides; suborbital with a deep notch between nostril and maxillary.
Microspathodon

Chromis Cuvier, 1815

Key to Port-au-Prince Bay Species

- A. Base of anal fin shorter than longest anal ray, or rarely equal to it, the height of the longest ray averaging 4.4 to 4.9 in standard length. No black axillary spot. Color in life blue and black.....*cyaneus*
- AA. Base of anal fin longer than longest anal ray; the height of the longest anal ray averaging 6.9 to 8.1 in standard length. A conspicuous black axillary spot. Color in life light brown and black.....*marginatus*

Blue Chromis*Chromis cyaneus* (Poey)

REFERENCES: *Furcaria cyanea*, Poey, 1860, *Memorias*, II, 196, Plate 14, figs. 5-8.

Chromis cyaneus, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1547.

FIELD CHARACTERS: Small, oblong, compressed fishes with body tapering gradually backward; teeth conical, in bands; anal fin rather high, its longest ray equal to or longer than base of fin; sides bluish and black; axillary spot absent, but a scattering of small spots across upper base of pectoral. Upper and lower lobe of caudal fin with a black band.

DESCRIPTION: The Port-au-Prince Bay fishes of the genus *Chromis* can be divided into two species, differing, as shown in the key, both in shape of the anal fin, and in color. Our specimens show no intermediates between the two, and we possess males and females of both species.

The practice of recent authors has been to consider the various West Indian forms of *Chromis* as belonging to one species. Thus Meek and Hildebrand (*Marine Fishes of Panama*, II, p. 696) state that "we have referred our specimens to *Chromis marginatus* but we are of the opinion that further study will show that *Chromis multilineatus* (Guichenot), *Chromis cyaneus* (Poey) and *Chromis punctatus* (Poey) are all identical.

Breder (*Bulletin Bingham Oceanographical Collection*, Vol. I, Article 1, page 50), on the basis of 141 specimens, refers all West Indian fish to *Chromis marginatus*, and tentatively divides his materials into three "ecological races," *marginatus marginatus*, *marginatus multilineatus*, and *marginatus cyaneus*.

We have examined 79 of Breder's 141 specimens, Bingham Collection Numbers, 100, 558, 242 and 244, representing all 3 of his forms.

The 4 specimens in No. 100 are typical *cyaneus* according to our key, possessing the characteristic type of anal fin, a dark blue coloring and lacking an axillary spot. Numbers 242, *m. multilineatus* and 244, *m. marginatus*, are similar to our brown fish. The 15 fish in Number 558, assigned by Breder to *marginatus marginatus* can be divided by our key into two very distinct groups, and like our fish the 9 specimens with higher anals possess a much darker coloration and lack the dark axillary spot. We consider these 9 fish as belonging to *cyaneus*, their coloring in preservative differing in no way from our specimens of *cyaneus*, which in the field were brilliantly blue. The other six fish are typical of our *marginatus*.

Our specimens of *cyaneus* agree in form with the plate given by Poey, and it is of interest to note that Poey in his original description states that the anal and dorsal fins are higher than in *multilineatus*, which is exactly the condition found in the Haitian fish. In measuring the height of the anal rays we have

measured from the base of the fin, ignoring the scales covering the base of the fin.

SIZE AND WEIGHT: Grows to about 5 inches. A 85 mm. fish weighed 26 grams.

GENERAL RANGE: Cuba, Bahamas, Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on all reefs, living under the same conditions as *Chromis marginatus*, the two species coming to the surface together as the result of the same dynamite explosion.

ABUNDANCE: Fairly common.

METHOD OF CAPTURE: Most of our fish were taken by dynamite, but a few were captured in traps.

STUDY MATERIAL: Drawings: H116; Photographs, 4046; Specimens, 7; 65-85 mm., including Nos. 7097, 7232, 7342, 7343, 7345, 7346.

Brown Chromis

Chromis marginatus (Castelnau)

REFERENCES: *Heliasis marginata*, Castelnau, 1855, Anim. Nouv. Rares Amer. Sud, 9, Plate III, fig. 1.

Chromis marginatus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 695, Plate LXIX, fig. 1.

FIELD CHARACTERS: Small, oblong, compressed fishes with body tapering gradually backward; teeth conical, in bands; anal fin low, its base always longer than longest anal ray, the longest ray 6.9 to 8.1 in length; brownish, with conspicuous black axillary spot; caudal fin with black band along upper and lower lobe.

DESCRIPTION: The brown species of *Chromis* found in Haiti is nearest the descriptions of *marginatus*, but it is very likely that the low-analed brownish forms of the genus vary considerably in color. None of the Haitian fishes had any indication in life of the yellow spot on the caudal peduncle mentioned for *multilineatus* by Jordan and Evermann and for *marginatus* by Meek and Hildebrand.

The plate given by the latter authors resembles our species closely, and shows well the characteristic low anal fin of this species.

SIZE AND WEIGHT: Grows to about 4 inches. A 104 mm. fish weighed 28 grams.

GENERAL RANGE: Bahia, Glover reef, Isle of Pines, Bahamas and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on all reefs.

ABUNDANCE: Fairly common, slightly more so than *Chromis cyaneus*.

METHOD OF CAPTURE: Mostly by dynamite and also in traps.

STUDY MATERIAL: Specimens, 9; 79-104 mm., including Nos. 6927, 7229, 7341 and 7348.

Pomacentrus Lacépède, 1803

Key to Port-au-Prince Bay Species

- A. Color extremely variable, black, brown, blue, yellow or orange in various combinations; often a large ocellus on dorsal fin.....*fuscus*
- AA. Anterior part of body purplish-black; posterior portion grayish-white, the caudal fin black; living in tall tubular sponges.

freemani new species

Common Demoiselle

Pomacentrus fuscus Cuvier and Valenciennes

REFERENCES: *Pomacentrus fuscus*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 432.
Eupomacentrus fuscus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1552.
Eupomacentrus leucostictus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1555.
Pomacentrus fuscus, Breder, 1927, Bull. Bing. Oceanographic Collection, I, Art. I, p. 54.

FIELD CHARACTERS: Small, compressed, rather deep fishes with one row of entire teeth in each jaw; preopercle and suborbital serrate; coloration variable; sometimes with yellow and blue and an ocellus under the soft dorsal fin, changing to brown with vertical darker stripes.

DESCRIPTION: The systematic problems offered by the Demoiselles can be settled only by study of living or fresh specimens in the field. In an aquarium in Haiti we have had the extreme *leucostictus* form,—blue, yellow and ocellated—change within a half hour to an equally extreme *fuscus*,—brown, with many vertical dark bands, and with no trace of ocelli. We believe that many, if not all of the West Indian species to which names have been given will be found to be ontogenetic color phases. We have satisfied ourselves that utmost diversity in collected specimens may result from whether the fish were killed in the day or at night, and in what liquid they were preserved.

SIZE AND WEIGHT: Six inches seems to be the maximum size of this fish. A 75 mm. individual weighs 20.5 grams.

GENERAL RANGE: Florida and West Indies to Brazil.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found everywhere among the grass along shore and on all the reefs.

METHOD OF CAPTURE: Do not take the hook. Captured with traps and dynamite.

FOOD: Algae, small organisms and all manner of bottom debris.

SIZE OF MATURITY: Breeding individuals were found less than 2 inches in length.

GENERAL HABITS: These fish are individually extremely local, living singly or in pairs in some particular crevice or large shell, and defending it fearlessly against any intruder.

STUDY MATERIAL: Colored Plate, H13, No. 6824; Photograph, 3877; Specimens, 107; from 10 to 100 mm., including Nos. 6824, 6874, 6987, 7235, 7338 and 7339.

Haitian Demoiselle

Pomacentrus freemani new species

TYPE: No. 7269. Length 48 mm. Sand Cay, Port-au-Prince Bay, Haiti; Found in sponge which was growing on coral reef; 7-V-1927.

FIELD CHARACTERS: Small, compressed, deep-bodied demoiselle; dark brown, with the posterior fourth of the body, including the soft dorsal and caudal peduncle white; pectoral fins yellow; caudal fin black.

MEASUREMENTS AND COUNTS:

Length: 54 mm.

Head: 16 (3.3)

Depth: 26 (2)

Eye: 6 (2.7)

Snout: 4.3 (3.8)

Scales: 28

Lateral line pores: 20

Weight: 6 grams

Dorsal fin: XII-14½

Anal fin: II-13½

Pectoral length: 16 mm.

Ventral length: 17 mm.

Ocular angle: 10° up

Mouth angle: 30° down

DESCRIPTION:

Body: Very deep, compressed.

Back: Elevated.

Anterior Profile: Straight from dorsal to eye, slightly convex from eye to mouth.

Head: Deeper than long.

Interorbital: 5.5 mm., convex, 1.09 in eye.

Snout: Broad, swollen.

Eye: Large.

Mouth: Small, terminal, oblique.

Maxillary: Not reaching eye.

Teeth: Palisade-type, flat, with truncate, yellowish tips; about 30 in upper jaw; 28 in lower jaw, 6 large ones on each side of the symphysis, giving place rather abruptly to 8 small, lateral teeth.

Preopercular margin: Finely serrated.

Opercular margin: Smooth.

Gill-rakers: 8-9, longest behind (2 mm.) graduated to an anterior rudiment; slender.

Scales: Large, finely ctenoid, absent only from chin.

Lateral line: Parallel with back, ending beneath 6th ray of the soft dorsal.

Dorsal fin: High, first dorsal strongly scaled to the tip, soft dorsal with smaller scales half-way up; 9th ray longest, 12 mm. three-fourths as long as head, forming with the few adjacent rays an elongated, sharp, posterior angle.

Anal fin: 2nd anal spine five times as thick and long as the 1st spine; soft rays scaled for three-fourths of their length, contour more rounded than in soft dorsal.

COLOR: General color purplish to black; under surface of head, breast and belly brownish; caudal peduncle, soft dorsal and body posteriorly from a line drawn from the anterior part of the anal fin greyish white with a slight yellowish or orange tinge, especially pronounced on the dorsal fin; pectoral yellowish; remaining fins black.

COMPARISON: Resembles *fuscus* in the wide sense but with a larger eye than most of the varieties, although some of the so-called species have as large, and with a very different, definite coloration and pattern. The type and six co-types show no variation in this respect, and at least five other individuals were seen but not captured. All, without exception, were living in the tubes of tall chimney and in vase sponges, and came out only when disturbed or killed by dynamite. The larger eye and the lighter patterning may both be related to this mode of life. While it may seem peculiar to regard the other Pomacentrids as consisting of a single or at most two or three extremely variable species, and then to describe a new one, we feel that the coloration, which although it resembles that of *partitus*, is different, and especially the restricted habitat make this species valid.

STUDY MATERIAL: Specimens, 7; Type No. 7269, 6 co-types, 48-53 mm., Nos. 7269a and 7347. Color plate, H120.

TYPE NAME AND LOCATION: Named for Dr. George F. Freeman, Directeur General, Service Technique, Haiti, who did all in his power to assist us.

Type in the Collection of the Department of Tropical Research of the New York Zoological Society.

Abudefduf Forskal, 1775

**Sergeant Major; Cow-Pilot;
Cockeye Pilot**

Abudefduf saxatilis (Linnaeus)

REFERENCES: *Chaetodon saxatilis*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 276.

Abudefduf saxatilis, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 701.

FIELD CHARACTERS: Small, deep, compressed fishes, with small terminal mouth and entire preopercle and suborbital; teeth always notched; grayish-green, sometimes with yellow; sides with 5 broad, dusky vertical bars.

DESCRIPTION: The Haitian specimens do not differ from published descriptions.

SIZE AND WEIGHT: Grows to 6 inches. Our specimens are from 12 to 108 mm. The 108 mm. fish weighed 76 grams.

COLOR: The smaller specimens, 12 to 20 mm., have the entire body covered with chromatophores, through which the dark bars show as denser concentrations of pigment. The density of these vertical bars in the preserved small fish varies considerably, in some it is barely visible and in others very strongly marked.

A note on coloration shows the ground-color of a 105 mm. fish to be bluish silver on the sides, with considerable golden along the back. Iris, dark brown with silver around the edges.

GENERAL RANGE: Pacific coast from Lower California to Peru. Atlantic coast, Florida to Peru, once accidental in Rhode Island.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Widely distributed near shore, especially over shallow reefs.

ABUNDANCE: A common species, often seen in markets.

METHOD OF CAPTURE: Taken by us mostly in traps; also by dynamite and with aid of airplane practice bombs.

STUDY MATERIAL: Color Plate, H62; Photograph, 3933; Specimens: 16; 12 to 115 mm., including Nos. 6816, 6963, 7002, 7162, 7192, 7195d, and 7279.

Microspathodon Günther, 1862

Key to Port-au-Prince Bay Species

- A. Sides brown, sometimes with small bluish spots on head and dorsal surfaces, tail yellow or orange, or the same color as the rest of the body... *chrysurus*
- AA. Sides with conspicuous bluish-white spots, about the size of a scale.

niveatus

**Yellow-tailed, Soft-toothed
Demoiselle**

Microspathodon chrysurus (Cuvier and Valenciennes)

REFERENCES: *Glyphisodon chrysurus*, Cuvier and Valenciennes, 1830, Hist. Nat. Poiss., V, p. 476.

Microspathodon chrysurus, Meek and Hildebrand, 1925, Marine Fishes of Panama, II, p. 706.

FIELD CHARACTERS: Small, deep, compressed, brownish fishes with small terminal mouth, and with small, close-set movable teeth in upper jaw; dark brown, sometimes with an orange or yellow tail.

DESCRIPTION: Our specimens are quite typical.

SIZE AND WEIGHT: Grows to six inches. A 115 mm. fish weighed 76 grams, and a 100 mm. fish 53 grams.

COLOR: The life colors of a 100 mm. fish were as follows: Dusky brown with a golden sheen; fins black; opercle dull golden; tail abruptly cadmium yellow; iris dusky brown, silvery in the antero-inferior fourth.

A 115 mm. specimen, which preserved agrees wholly with the description of *chrysurus*, is close to *niveatus* in color, and was described in the field as follows: Brownish black, with yellowish centres to scales below, and with small blue spots on some above. Three blue spots along the lateral line, and many below the eye and along the dorsal fin. A strong, yellowish tinge to the distal part of the caudal.

GENERAL RANGE: West Indies and Panama.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Widely distributed on reefs.

ABUNDANCE: A common species, often brought into the markets.

METHOD OF CAPTURE: We took it almost entirely by dynamite, and it was by far the commonest fish to rise to the surface after an explosion.

FOOD: Stomach contents of a number of fish contained mostly large quantities of chewed algae and bottom debris, with an occasional entomostracan.

SPAWNING SEASON: A 100 mm. fish captured during the beginning of March had well developed eggs.

EGGS: The ovaries in the fish mentioned above measured 36 by 6 mm. the eggs being oval, averaging .7 mm. in diameter, the estimated number being 9200 in each ovary.

STUDY MATERIAL: Color Plate, H71; Photograph, 3908; Specimens, 6; 75-115 mm., Nos. 6932 and 7165.

**White-spotted, Soft-toothed
Demoiselle**

Microspathodon niveatus (Poey)

REFERENCES: *Pomacentrus niveatus*, Poey, 1875, Enumeratio, p. 102.

Microspathodon niveatus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1567.

FIELD CHARACTERS: Small, deep, compressed fish with small, movable teeth; blackish, the sides with sky blue spots about the size of a scale.

NOTE: This species was not taken by us, but 8 to 10 individuals from 4 to 6 inches long were seen while diving. Breder on the basis of materials collected on the Bingham Oceanographic Expedition, synonymizes this species with *chrysurus*, stating that he considers it to be one of immature color phases of the latter species.

However, as we saw specimens of apparently typical *niveatus* larger than those he possessed, and as Silvester, in Porto Rico, speaking of *niveatus*, states that "Many specimens of this beautiful fish were seen swimming among the corals of the western end of Rojas de la Parda; they varied in length from about 2 to 4 inches." we consider it, for the time being, valid. However, it is of interest to note that some of our large, undoubted specimens of *chrysurus* possessed blue spots on the head and along the dorsal surfaces and fin. These spots seemed to be smaller and concentrated on the places mentioned, and not widely distributed over the sides, as in Silvester's plate of *niveatus*, and in the individuals seen by us.

It is possible that these two forms represent color-phases of the same species, but until further evidence is secured we are treating them as separate species.

GENERAL RANGE: Cuba, Isle of Pines, Haiti and Porto Rico.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found only on reefs.

ABUNDANCE: Rather rare, not seen in markets.

Family LABRIDAE; WRASSES

Key to Port-au-Prince Bay Genera

- A. Anterior canines strong; spinous dorsal not enveloped in scales.
- B. Dorsal spines 13 or 14, the first three or four falcate, produced into long streamers. . . . . *Lachnolaimus*
- BB. Dorsal spines 11 or 12, rarely 13, with no long filaments; soft dorsal and anal fins with a scaly sheath at the base; soft dorsal and anal elevated, produced behind. . . . . *Bodianus*
- AA. Anterior teeth small, bluntish, not canine-like; dorsal and anal fins enveloped in scales. . . . . *Clepticus*

Lachnolaimus Cuvier and Valenciennes, 1839**Hogfish***Lachnolaimus maximus* (Walbaum) REFERENCES: *Labrus maximus*, Walbaum, 1792, *Artedi Piscium*, p. 261.*Lachnolaimus maximus*, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1579.

FIELD CHARACTERS: A large reddish wrasse resembling a Serranid or sea-bass; anterior spines of dorsal fin greatly prolonged; a dark spot on base of posterior rays of soft dorsal.

DESCRIPTION: Our single specimen is typical in every way.

SIZE AND WEIGHT: Reaches a length of two feet and a weight of 15 pounds. Our fish was 341 mm. (13½ inches) long and weighed 3 pounds.

COLOR: At death the general color was pinkish red, with yellow edges to the scales; the iris was reddish orange.

GENERAL RANGE: Bermuda, Key West and the West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: A single specimen taken on March 3rd at the fish market.

STUDY MATERIAL: Specimen, 1; 341 mm., No. 6979.

Bodianus Bloch, 1790**Lady-fish***Bodianus rufus* (Linné) REFERENCES: *Labrus rufus*, Linné, 1758, *Syst. Nat.*, Ed. X, p. 284.*Harpe rufa*, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1583.*Bodianus rufus*, Meek and Hildebrand, 1928, *Marine Fishes of Panama*, III, p. 711.

FIELD CHARACTERS: Small to medium sized wrasses with 11 or 12 dorsal spines; soft dorsal and anal with a scaly sheath at base, elevated and produced behind; violet red above and anteriorly; yellow or orange behind and below, the two colors in strong contrast to each other.

SIZE AND WEIGHT: The species reaches a length of two feet. Our male of 173 mm. weighed 136 grams.

GENERAL RANGE: Florida and Bermuda to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen by us only occasionally in the fish market.

ABUNDANCE: We secured only two specimens, a male and a female.

SPAWNING SEASON: Neither sex showed any signs of breeding activity.

STUDY MATERIAL: Color Plate, H65, Female, No. 7045; Specimens, 2; male 173 mm., No. 6956; female 177 mm., No. 7045.

Clepticus Cuvier, 1829

Purple-tailed Wrasse; Creole
Clepticus parrae (Bloch and Schneider)

REFERENCES: *Brama parrae*, Bloch and Schneider 1801, Syst. Ichth., p. 100.
Clepticus parrae, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1586.

FIELD CHARACTERS: Medium-sized robust, compressed fish; head and vertical fins enveloped in small scales; teeth weak; head and irregular anterior two-thirds of body deep purple and violet; tail fin rich maroon; remainder of body including ventrals, anal, posterior soft dorsal, belly and peduncle, bright yellow mottled with violet and purple.

DESCRIPTION: Purchased from a fisherman. The entire mouth of our only specimen was torn away, making identification by teeth impossible, but the spines and rays, the basal sheath of scales on the vertical fins, scales and especially the coloration leave no doubt as to the species.

SIZE AND WEIGHT: A 12 inch specimen has been recorded. Ours measured 163 mm. (6½ inches), and weighed 124 grams.

STUDY MATERIAL: Color Plate, H84, No. 7140; Specimen, 1; 163 mm., No. 7140.

Family CORIDAE; WRASSES

Key to Port-au-Prince Bay Genera

- A. Lateral line complete and continuous, with an abrupt downward curve posteriorly.
- B. Dorsal spines 9; dorsal enlarged, without scaly sheath; posterior canine well developed on both sides.....*Halichoeres*
- BB. Dorsal spines 8; a low sheath of scales at the base of the dorsal fin; no posterior canines.....*Thallasoma*
- AA. Lateral line interrupted posteriorly, beginning again on the level of the axis of the body; posterior canine present; first three dorsal spines longest and with filamentous appendages; scales large.....*Doratonotus*

Halichoeres Rüppell, 1835

Key to Port-au-Prince Bay Species

- A. Sides without a vertical blackish band, caudal fin without continuous blue bands.
- B. A black spot, partly surrounded by blue behind the eye, anal fin pinkish with two series of bluish spots.....*caudalis*
- BB. No black spot behind eye; anal fin divided into three more or less equal horizontal bands of color.....*radiatus*
- AA. Sides with a vertical band from beginning of soft dorsal downward; short narrow dark lines from eye upward; a few small dots on nape; caudal fin with narrow vertical semicircular bands of blue.....*garnoti*

Pink-finned Wrasse
Halichoeres caudalis (Poey)

REFERENCES: *Julis caudalis*, Poey, 1860, *Memorias*, II, p. 213.
Iridio caudalis, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1599.

FIELD CHARACTERS: Small, elongate, compressed, brilliantly colored wrasse; dorsal and caudal fins pink with bluish spots; body mottled olive green with numerous blue lines on head and spots on body.

SIZE AND WEIGHT: A 120 mm. fish weighed 35 grams.

GENERAL RANGE: Cuba and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Generally distributed, both near shore and down to 8 fathoms.

ABUNDANCE: Fairly common. Seen frequently in diving. Ten specimens collected.

STUDY MATERIAL: Color Plates, H14, No. 6854; H35, No. 6882; Specimens, 10; 79–126 mm., including Nos. 6854, 6882, and 6915.

Variegated Wrasse; Pudding Wife
Halichoeres radiatus (Linnaeus)

REFERENCES: *Labrus radiatus*, Linne, 1758, *Syst. Nat.*, Ed. X, p. 288.
Halichoeres radiatus, Meek and Hildebrand, 1928, *Marine Fishes of Panama*, III, p. 717.

FIELD CHARACTERS: Medium-sized wrasse exhibiting astonishing variation in proportions of body, fins, color and pattern from young to adult. The anal fin seems always to be divided longitudinally into three bands of color of equal width. Until we know more of the anatomy and life history of this

species, Meek and Hildebrand's characterization must suffice; "Dark lateral band disappearing with age, when present rather narrow, never extending beyond base of caudal; head in adult with several bluish lines; a narrow one, about the width of pupil, extending from eye to nape; dorsal plain yellowish red in young; in adult with a narrow blue stripe at base, above with many blue spots."

SIZE AND WEIGHT: The sizes and weights of three individuals are as follows:

68 mm. length	4 grams
139 mm. length	55 grams
325 mm. (12.75 in.) length	907 grams (2 lbs.)

GENERAL RANGE: North Carolina southward, including Panama and West Indies and Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen on every dive among the coral reefs, along shore, and taken in traps eight fathoms deep.

ABUNDANCE: One of the commonest of the wrasses.

METHOD OF CAPTURE: Taken in seines, traps, and on hooks.

FOOD: The young fish feed on floating bits of dead food, small crustaceans, etc., while the older individuals are browsers, taking sponge, coral, or other organic debris.

STUDY MATERIAL: Color Plates: H25, 70 mm. specimen; H66, 230 mm.; H49, 325 mm., No. 6966; Specimens, 45; 65-325 mm., including 6864, 6885, 6952, 6966, 7108 and 7133.

Coral Wrasse

Halichoeres garnoti (Cuvier and Valenciennes)

REFERENCES: *Julis garnoti*, Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., XIII, 390.

Iridio garnoti, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1593.

FIELD CHARACTERS: Small, rather elongate wrasses with nine dorsal spines, complete lateral line, with posterior canine well developed on both sides; color varying, but with a conspicuous wide vertical band on middle of sides, the upper part of body anterior to this yellowish or greenish in general color, posterior to this line the body is bluish or purplish red; caudal fin with narrow curved, vertical bluish lines; narrow, short black lines from eye upward and backward; small dark spots on nape.

SIZE AND WEIGHT: Grows to about eight inches. A 140 mm. fish weighed 53 grams.

COLOR: Exceedingly variable in general color and pattern, the ground color varying anteriorly from various shades of brown and green to yellowish, posteriorly to purplish red or bluish. The fish is conspicuous in the field by the striking difference of color anteriorly and posteriorly.

GENERAL RANGE: West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found on all coral reefs.

ABUNDANCE: Very common, to be seen at almost any time on the reefs.

METHOD OF CAPTURE: Hooks and lines, traps and dynamite.

FOOD: Omnivorous; small crustaceans, sea-urchins, spines and all, and mollusks and their shells.

STUDY MATERIAL: Color Plates, H45, H129, No. 7133; Photographs: 3921, 3922; Specimens, 43; 73-147 mm., Nos. 7086 and 7133.

Thalassoma Swainson, 1839

Key to Port-au-Prince Bay Species

- A. Head bluish or greenish followed usually by two black or very dark blue bands separated by a pale blue band, the two darker bands sometimes coalescing, posterior part of body green.....*bifasciatus*
AA. A lateral band, usually broken up into large spots.....*nitidus*

Bicolored Wrasse

Thalassoma bifasciatus (Bloch)

REFERENCES: *Labrus bifasciatus*, Bloch, 1792, Syst. Ichthy., p. 131, pl. 283.

Chlorichthys bifasciatus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1609.

FIELD CHARACTERS: Small, elongate wrasses, with 8 dorsal spines and no posterior canines, head blue, body green, two vertical black bands on sides behind head, sometimes somewhat merged, between which is a paler bluish band.

DESCRIPTIONS: The relations of this species are discussed under *nitidus*.

SIZE AND WEIGHT: The largest Haitian fish, 115 mm., weighed 30 grams.

GENERAL RANGE: West Indies.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Widely distributed on the reefs.

ABUNDANCE: Rather common on some reefs. Brought occasionally to the markets.

METHOD OF CAPTURE: Traps, under-water guns.

FOOD: All of the specimens examined had devoured polychaete worms.

STUDY MATERIAL: Color Plate, H23, No. 6886; Specimens, 16; all males, 85-115 mm., including No. 6886.

Shining Wrasse

Thalassoma nitida (Günther)

REFERENCES: *Julis nitida*, Günther, 1862, Cat. Fishes Brit. Museum, IV, 190.

Chlorichthys nitidus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1608.

FIELD CHARACTERS: Small, elongate wrasses with continuous lateral line, 8 dorsal spines, no posterior canines; greenish with a lateral band which in larger individuals is broken up into a series of large blotches.

DESCRIPTION: Breder 1927 (Bull. Bingham Ocean. Coll., Vol. 1, No. 1) suggests, as a result of investigating a series of small specimens, that *nitidus* is the same as *bifasciatus*, but does not synonymize the two species on the ground that "It is quite conceivable that there may be existing in closely adjacent but different environments two such species in which one matures to a very different fish from its young, whereas the other almost or quite indistinguishable when small, matures without losing its juvenile characters."

Our 6 Haitian specimens of *nitidus*, 73–93 mm. long, some of which are as large as those considered by Breder in his series to be adult "blue-heads," are all females, and the 16 specimens of *bifasciatus*, 84–115 mm. are all males. Considering these circumstances and Breder's suggestion as to the identity of the young, it is very probable that these two species are the same, and that the females (*nitida*) retain a considerable amount of the generalized color pattern of the young; while the males (*bifasciatus*) lose this pattern and attain their striking adult coloration. The data from the present series is considered consistent enough to make this a definite suggestion. In the field in Haiti, the two species are found in exactly the same surroundings, and are equally wary and inquisitive. The females (*nitidus*) were somewhat less plentiful, as far as visual observation is concerned, than the males (*bifasciatus*).

However, we are not synonymizing the two species until other collections can be examined or until the fishes can be studied in the field. If the two forms prove to be differentiated merely by sex, both must be known as *Thalassoma bifasciatus*.

SIZE AND WEIGHT: A small species, at least as far as our Haitian experiences are concerned, the largest specimen captured measuring 93 mm. and weighing 16 grams.

GENERAL RANGE: Jamaica and Haiti.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Found on all coral reefs.

ABUNDANCE: Uncommon, but usually one or two specimens to be seen while diving on the richer coral reefs.

METHOD OF CAPTURE: Mainly by traps, dynamite.

FOOD: Carnivorous,—worms and crustaceans.

EGGS: The eggs of the 93 mm. fish averaged .22 mm. in diameter.

STUDY MATERIAL: Specimens, 6; 73–93 mm. all females, including No. 7084.

Doratonotus Gunther, 1862

**Tall-finned Pygmy Wrasse;
Baucket**

Doratonotus megalepis Günther

REFERENCES: *Doratonotus megalepis*, Günther, 1862, Cat. Fish Brit. Museum, IV, p. 125.
Doratonotus megalepis, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 731.

FIELD CHARACTERS: A small wrasse (2½ inches), head long and low, snout long and pointed, dorsal fin elevated in front; general color greenish, variegated with dull red on fins.

DESCRIPTION: Our two small specimens are typical in every way. The smallest individual is 13 mm. and in markings and development of fins shows no difference from those of maximum size. It seems quite certain that the young fish figured by Breder (Bull. Bingham Ocean. Coll., I, 1, p. 64) as typical of his 61 specimens from 8.5 to 13 mm., cannot be this species. The shape of the head and snout and dorsal fin and the size of the diminutive ventrals and the coloration all set it apart from the individuals in our collection.

SIZE AND WEIGHT: Our largest specimen measured 23 mm.

METHOD OF CAPTURE: Taken in *Thalassia* weed in shallows near shore, Lamentin Reef.

STUDY MATERIAL: Specimens, 2; 13–23 mm., No. 7279.

Family SCARIDAE; THE PARROT-FISHES

Key to Port-au-Prince Bay Genera

- A. Teeth not forming continuous plates; anterior teeth enlarged, often more or less canine-like; median suture of jaws not evident externally. *Cryptotomus*
- AA. Teeth in jaws fully coalesced, forming continuous plates; the median suture of the jaws evident externally.
- B. Dorsal spines flexible; lower jaw included in the upper when mouth is closed; cheeks with two or more rows of scales; lower pharyngeals much longer than broad.
- C. Teeth pale.....*Scarus*
- CC. Teeth bluish or green.....*Pseudoscarus*
- BB. Dorsal spines stiff, pungent; upper jaw included in the lower when mouth is closed.....*Sparisoma*

Cryptotomus Cope, 1871

Scorched Parrotfish

Cryptotomus ustus (Cuvier and Valenciennes)

REFERENCES: *Callyodon ustus*, Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., XIV, p. 286. Plate CCCCXV.

Cryptotomus ustus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 733.

FIELD CHARACTERS: Small, elongate, compressed, dull-colored parrot-fish with teeth not fully coalesced; the two rows of teeth of the lower jaw overlapping slightly on the sides.

SIZE AND WEIGHT: Our 131 mm. specimen weighed 42 grams.

GENERAL RANGE: South Carolina to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on coral reef at twenty feet depth.

ABUNDANCE: A single individual taken during our four months stay. Not seen at the markets.

METHOD OF CAPTURE: Taken with dynamite.

FOOD: Vegetable matter.

STUDY MATERIAL: Specimen: 1; 131 mm.

Scarus Forskal, 1775

Key to Port-au-Prince Bay Species

- A. Upper jaw with canines posteriorly; cheeks with 2 or 3 rows of scales.
- B. Dorsal and anal fin greenish blue at base, then a broad band of orange and tipped with a broad bluish band. No spots on either fin. Caudal fin with a narrow black band on upper and lower edge, the rays immediately inside the black edge orange, remainder of caudal bluish.....*taeniopterus*
- BB. Dorsal and anal fin bright green at base and tip, mesially orange, the orange of dorsal sometimes with a bluish line, that of the anal with a line of bluish spots; caudal bright greenish blue, the inner rays with their membranes orange.....*punctulatus*
- AA. Upper jaw without canines; cheeks with 2 rows of 5 or 6 equal sized scales and a third partial row of 3 or 4 scales; sides with two brownish longitudinal bands; a small dull colored species.....*croicensis*

Painted-tailed Parrotfish

Scarus taeniopterus Desmarest

REFERENCES: *Scarus taeniopterus*, Desmarest, 1831, Dict. Classique, XV, 244, Plate 12.

Scarus taeniopterus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1646.

FIELD CHARACTERS: Small to medium sized parrotfish, orange-brown above, changing to blue below; two horizontal green stripes on head, the interspace yellowish brown; dorsal and anal fins greenish blue at base, then a broad band of orange, and tipped with a rather broad bluish band; no spots in the

orange of either fin; caudal fin with outer rays orange, the upper and lower edge with a narrow black band.

DESCRIPTION: One of our specimens has two posterior canines on each side of the upper jaw.

SIZE AND WEIGHT: A 180 mm. fish weighed 150 grams.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on all reefs, our specimens from Port-au-Prince market.

ABUNDANCE: Rather rare, and seldom seen in the markets.

STUDY MATERIAL: Color Plate, H87, No. 7132; Specimens, 2; 180-205 mm., including No. 7132.

Punctulated Parrotfish

Scarus punctulatus Cuvier and Valenciennes

REFERENCES: *Scarus punctulatus*, Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., XIV, p. 195.

Scarus punctulatus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 737.

FIELD CHARACTERS: Small parrotfishes with pale teeth, the lower jaw included in the upper when mouth is closed; mesial band of orange in dorsal fin with a blue line and that of the anal with blue spots.

SIZE AND WEIGHT: A 93 mm. fish weighed 17 grams.

COLOR: In some of our fish the yellow longitudinal band is rather indistinct. However, they agree in all other respects.

GENERAL RANGE: West Indies, Venezuela.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on all of the deeper reefs, and often seen in the markets.

ABUNDANCE: Common.

METHOD OF CAPTURE: Seines, hooks and lines and traps.

STUDY MATERIAL: Color Plate, H29; Specimens, 68; 80-150 mm., including No. 6883.

Brown Parrotfish

Scarus croicensis Bloch

REFERENCES: *Scarus croicensis*, Bloch, 1790, Naturg. Ausl. Fische, IV, p. 27, Plate CCXXI.

Scarus croicensis, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 741.

FIELD CHARACTERS: Small, brownish parrotfish with lower jaw included in

upper, and with longitudinal stripes along sides, these stripes alternately dark brown and whitish yellow, varying considerably in intensity.

SIZE AND WEIGHT: Grows to 7 inches.

GENERAL RANGE: Key West to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found by us mainly along shore over shallow reefs. Small specimens were abundant on the shallow weed-covered areas along shore, where they lived among the fronds of *Thalassia*. When diving we often saw specimens on the deeper outside reefs.

ABUNDANCE: One of the commonest parrotfish of Port-au-Prince Bay, and although small, often brought into the market.

METHOD OF CAPTURE: Most commonly taken in traps; occasionally with seines.

FOOD: Algae, small crustaceans, etc.

STUDY MATERIAL: Photographs, 3781, 3907; Specimens, 40; 50-100 mm.

Pseudoscarus Bleeker, 1861

Key to Port-au-Prince Bay Species

- A. Posterior canines absent, or, sometimes in *coelestinus*, one present on each side.
- B. Olive green, with more or less ill-defined markings on head; lower parts brownish.....*guacamaia*
- BB. Bright blue, the edges of the scales brownish; tubes of lateral line branched.
coelestinus
- AA. Posterior canines present, 2 to 6 in number; color black and green; sides below pectorals green.....*pleianus*

Green Parrotfish; Guacamaia

Pseudoscarus guacamaia (Cuvier)

REFERENCES: *Scarus guacamaia*, Cuvier, 1829, Règne Animal, Ed. II, II, 265.
Pseudoscarus guacamaia, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 744.

FIELD CHARACTERS: Large parrotfish with green teeth; no posterior canines on upper jaws. Olive green with more or less ill defined green markings on head; lower parts more or less reddish (often dark brown in preserved specimens) vertical fins brownish orange, all edged with deep blue.

DESCRIPTION: Our large specimens are typical.

SIZE AND WEIGHT: Grows to two or three feet. A 500 mm. fish weighed 8½ pounds.

COLOR: A 180 mm. specimen (formalin) is exceptionally dark, this color extending to all the fins, the ventrals being especially dark.

GENERAL RANGE: West Indies, north to Florida Keys, south to Rio de Janeiro.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seen occasionally while diving on reefs.

ABUNDANCE: Not especially common, seen occasionally in the markets. The 8½ pound fish cost 60 cents, American money.

METHOD OF CAPTURE: Hook and line.

STUDY MATERIAL: Color Plate, H90, No. 7136; Specimens, 2; 180-500 mm., including No. 7136.

Blue Parrotfish

Pseudoscarus coelestinus (Cuvier and Valenciennes)

REFERENCES: *Scarus coelestinus*, Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., XIV, p. 180.

Pseudoscarus coelestinus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1655.

FIELD CHARACTERS: Large parrotfish with green teeth; bright blue; dorsal, caudal and anal fins black, narrowly edged with blue; middle rays of caudal tipped with blue.

DESCRIPTION: The single specimen preserved agrees with the description of this species given by Jordan and Evermann, except that it lacks the posterior canines, and the color of the fins in life was somewhat different; dorsal, anal and caudal being black narrowly edged with blue, the middle rays of the caudal being tipped with blue.

This specimen runs close to Bean's *plumbeus*, but differs in color. While we were diving, this species was commonly observed, and the many specimens seen were consistently bright blue in color.

SIZE AND WEIGHT: Reaches two or three feet. Our 460 mm. fish weighed 7 pounds.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Commonly found on reefs, and often seen in markets.

ABUNDANCE: Common.

STUDY MATERIAL: Color Plate, H130, No. 7083; Specimen, 1; 460 mm., No. 7083.

Green and Black Parrotfish

Pseudoscarus pleianus (Poey)

REFERENCES: *Scarus pleianus*, Poey, 1861, *Memorias*, II, p. 393.

Scarus pleianus, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1656.

FIELD CHARACTERS: Very large parrotfish with green teeth; 2 to 6 canines on upper posterior part of upper jaw; coloration black and green, posterior part of body greenish as well as isolated scales on anterior part of sides; sides below pectorals green.

DESCRIPTION: A single specimen (number 7200), 640 mm. long, is assigned to this species. In the key to the species of *Pseudoscarus*, given by Jordan and Evermann (l. c.) it runs straight to this species. Compared with the description, it agrees very well in form, and in color, if the colors mentioned are those of a preserved specimen, which seems more than likely. The presence or absence of numerous canines seems to be a fairly valid character, not entirely dependent upon age, by which to differentiate this species from some others of the genus. However, it is not a wholly reliable one, mainly because of variation. The specimen at hand has two posterior canines on the left hand side and six on the right. The right hand teeth are situated at various levels, and there are possible indications of a few more.

The dimensions of our fish are as follows:

Length	640 mm.
Depth	267 "
Head	231 "
Eye	24 "
Length of pectoral fin	154 "
Length of ventral fin	144 "
Lateral line scales	25

SIZE AND WEIGHT: Grows to 25 inches standard length and possibly larger. Our 25 inch fish weighed 20 pounds.

GENERAL RANGE: Known from St. Thomas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Captured by native fisherman on fairly deep reef.

ABUNDANCE: Rare, a single specimen seen in four months.

STUDY MATERIAL: Specimen, 1; 640 mm., No. 7200.

Sparisoma Swainson, 1839

Key to Port-au-Prince Bay Species

- A. Upper jaw with one or more lateral canines.
- B. General color dark red or brown; no pale streaks along sides; scales along back with dark edges; margin of opercles black....*abildgaardi*
- BB. Color paler, reddish brown or greenish; margin of opercles not black.
- C. Pectoral fin with a black spot at its base, or with its base somewhat dusky.
- D. Black spot at base of pectoral fin very prominent; bluish green, with center of dorsal, caudal and anal fins reddish, bases of dorsal and anal bluish, each of these fins narrowly tipped with blue....*chrysopteron*
- DD. Pectoral fin dusky at base; a golden orange spot on and below the fifth scale of the lateral line, its upper portion blackish; caudal fin with black tips.....*aurofrenatum*

CC. Pectoral fin without a black spot at base.

E. Canines 1 or 2 on each side; top of head and streak back from eye brownish; caudal fin with a red crescent separated by a green band from the transparent posterior portion.....*viride*

EE. Canines 1 to 4 on each side; tubes of lateral line much branched; body and fins mottled reddish brown.....*radians*

AA. Upper and lower jaw without lateral canines.

F. Pectorals with a very evident jet black spot at base of upper rays.

G. Caudal fin with irregular bars and spots.....*squalidum*

GG. Caudal fin clear peach red, its posterior border bluish (our Haitian specimen possesses no lateral canines).....*brachiale*

FF. Pectoral without a black spot at base of upper rays; body robust, not very much compressed.....*flavescens*

Red Parrotfish; Parroquette

Sparisoma abildgaardi (Bloch)

REFERENCES: *Sparus abildgaardi*, Bloch, 1791, *Naturg. Ausl. Fische*, V, p. 22, Plate CCLIX.

Sparisoma abildgaardi, Meek and Hildebrand, 1928, *Marine Fishes of Panama*, III, p. 748.

FIELD CHARACTERS: Small to medium-sized parrotfish with upper jaw included in lower, and with a small posterior canine on upper jaw; brownish or greyish above, the edges of the scales dark; lower parts bright red; membranous edge of opercle black; dorsal and anal fins dark; intensity and deposition of color variable.

DESCRIPTION: Our specimens are typical.

SIZE AND WEIGHT: A 167 mm. specimen weighed 132 grams and a 193 mm. specimen 235 grams.

COLOR: Very variable, but all of our specimens when fresh, were within the range of variation shown by Dr. Townsend in his plate of this fish (*Bulletin*, N. Y. Zoological Society, 1927).

GENERAL RANGE: West Indies and Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed over the bay, both on the coral reefs and on the mud and sand banks.

ABUNDANCE: A common species, always seen in the markets.

METHOD OF CAPTURE: Taken mainly in wicker traps placed on bottom.

FOOD: Unrecognizable detritus found in alimentary tract.

STUDY MATERIAL: Photograph, 3909; Specimens, 19; 83 to 193 mm., including Nos. 6937 and 6942.

Blue Parrotfish; Vieja

Sparisoma chrysopteron (Bloch and Schneider)

REFERENCES: *Scarus chrysopteron*, Bloch and Schneider, 1801, Syst. Ichth., p. 286, Plate LVII.

Sparisoma chrysopteron, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 753.

FIELD CHARACTERS: Medium sized parrotfish, with teeth of lower jaw extending beyond the upper. Bluish-green, with center of caudal fin, dorsal and anal fins reddish, base of dorsal or anal bluish, each of these fins narrowly tipped with blue. Pectoral fin with a black spot at its base; iris pinkish.

DESCRIPTION: Our three specimens agree very well with the descriptions of this species. Posterior canine teeth are present in all, but the number present varies. Their distribution is as follows:

Length	Posterior canines		Anterior canines	
	Right	Left	Right	Left
235 mm.	0	2	1	0
252 mm.	3	2	1	0
277 mm.	4	4	1	1
				(faint indication)

SIZE AND WEIGHT: Grows to a little more than a foot.

COLOR: Our specimens are typical, except that the edge of the opercle just anterior to the base of the pectoral is tinged with yellow. Iris pinkish.

GENERAL RANGE: West Indies to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Over coral reefs.

ABUNDANCE: Rare, seen occasionally in the markets.

METHOD OF CAPTURE: Our three specimens were taken in traps.

FOOD: Vegetable matter.

STUDY MATERIAL: Color Plate, H57, No. 7014; Specimens, 3; 235-277 mm., including No. 7014.

Vermillion-banded Parrotfish

Sparisoma aurofrenatum (Cuvier and Valenciennes)

REFERENCES: *Scarus aurofrenatus*, Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., XIV, p. 191.

Sparisoma aurofrenatum, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1634.

FIELD CHARACTERS: Small to medium sized parrotfishes with pale upper jaw included in lower, and with one posterior canine tooth on each side of upper jaw; purplish above, becoming reddish on sides and vivid green below; a reddish line from mouth under the eye almost to top of gill opening; a yellow spot surmounted with black on anterior sides; tail with outer angles tipped with black.

SIZE AND WEIGHT: Grows to $8\frac{1}{2}$ inches and possibly larger. A 128 mm. fish weighed 53.5 grams and a 130 mm. fish 60 grams.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken by native fisherman on reefs generally.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Mainly traps.

STUDY MATERIAL: Color Plate, H63, No. 7039; Photograph, 3904; Specimens, 7; 128-139 mm., including Nos. 6938, 7039, 7360, 7361, 7362 and 7363.

Dark-green Parrotfish

Sparisoma viride (Bonnaterre)

REFERENCES: *Scarus viridis*, Bonnaterre, 1788, Enc. Meth., X, p. 96.

Sparisoma viride, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1638.

FIELD CHARACTERS: Small to medium sized parrot-fish with upper teeth included. Greenish with brown edges to the scales; head with brownish top and lines along side; a small yellow spot on opercle and a large one on caudal peduncle; caudal fin with a subterminal orange crescent, outside of which is a bluish crescent; dorsal and anal fins pinkish red, the latter with a bluish terminal band.

SIZE AND WEIGHT: A 240 mm. fish weighed 416 grams.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Commonly found on reefs 20 to 40 feet deep.

ABUNDANCE: Fairly common.

STUDY MATERIAL: Color Plate, H44, No. 6949; Specimens, 5; 125-240 mm. including Nos. 6949, 7353, 7354, 7355 and 7356.

Short-snouted Parrotfish

Sparisoma radians (Cuvier and Valenciennes)

REFERENCES: *Scarus radians*, Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., XIV, p. 206.

Sparisoma radians, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 750.

FIELD CHARACTERS: Small parrotfish with 1 to 4 canines on each jaw; reddish brown; no black spot at base of pectoral fins; body and fins mottled with darker.

DESCRIPTION: The four small specimens assigned to this species have the procurent canines much more in evidence than any other of the Haitian Scarids.

GENERAL RANGE: Florida south to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: All of our specimens were purchased at Port-au-Prince market.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Traps.

STUDY MATERIAL: Specimens, 4; 88–108 mm., including No. 7387.

Gray Parrotfish

Sparisoma squalidum (Poey)

REFERENCES: *Scarus squalidus*, Poey, 1860, Memorias, II, p. 218.

Sparisoma squalidum, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 755.

FIELD CHARACTERS: Small to medium sized parrotfish without posterior canines on upper jaw and with upper jaw included in lower, snout somewhat long, interorbital space slightly concave; preserved specimens brownish gray; pectoral with a conspicuous black spot at base of upper rays; caudal fin with obscure markings.

SIZE AND WEIGHT: A 163 mm. fish weighed 117 grams.

GENERAL RANGE: Bahamas, through West Indies to Venezuela.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found on all reefs, and brought commonly to the markets.

ABUNDANCE: Common.

METHOD OF CAPTURE: Mainly by traps.

STUDY MATERIAL: Color Plate, H76, No. 7368; Specimens, 12; 157–297 mm., including Nos. 6878, 6942, 6950, 7364, 7365, 7366, 7368, 7369 and 7370.

Stocky Parrotfish

Sparisoma flavescens (Bloch and Schneider)

REFERENCES: *Scarus flavescens*, Bloch and Schneider, 1801, Syst. Ichth., p. 290.

Sparisoma flavescens, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 758.

FIELD CHARACTERS: Small to medium, robust, rather stockily built parrotfish, without lateral canines, and with upper jaw included in lower; no spot at base of pectoral.

DESCRIPTION: Our three specimens are conspicuously different from the other Haitian parrotfish in being less compressed and much more stockily built.

SIZE AND WEIGHT: A 205 mm. fish weighed 217 grams.

GENERAL RANGE: Key West to Rio de Janeiro.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken from traps near shore on old coral reef.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Traps.

STUDY MATERIAL: Color Plate, H72; Specimens, 3; 163-205 mm., including Nos. 7349, 7350, 7351.

Red-tailed Parrotfish

Sparisoma brachiale (Poey)

REFERENCES: *Scarus brachialis*, Poey, 1861, Memorias, II, p. 345.

Sparisoma brachiale, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1641.

FIELD CHARACTERS: Medium sized parrotfish without lateral canines; and with upper jaw included in lower; pectorals with a very distinct black spot at base; green in life, the center of the caudal fin clear peach red.

SIZE AND WEIGHT: A 154 mm. fish weighed 102 grams.

GENERAL RANGE: Cuba, Jamaica, Haiti, Porto Rico and Curacao.

OCCURRENCE IN PORT-AU-PRINCE BAY: A single fish taken at Port-au-Prince market.

ABUNDANCE: Rare.

STUDY MATERIAL: Specimen, 1; 154 mm., No. 6951.

Family ELEOTRIDAE; SLEEPERS

Key to Port-au-Prince Bay Genera

- A. Vomer with teeth; jaws with bands of pointed teeth; gill openings extending forward to below the eye.....*Gobiomorus*
- AA. Vomer without teeth.
  - B. Dentary bones not expanded and not meeting under the chin; head broad; eyes lateral.....*Dormitor*
  - BB. Dentary bones broad, expanded, meeting under posterior angle of mouth, leaving an oval-shaped, naked patch at the chin.....*Leptophilypnus*

Gobiomorus Lacépède, 1806 **Sleeper; Guavina***Gobiomorus dormitor* Lacépède

REFERENCES: *Gobiomorus dormitor*, Lacépède, 1798, Hist. Nat. Poiss., II, p. 599.

Philypnus dormitor, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2194.

FIELD CHARACTERS: Large-sized gobies with ventral fins separated from each other, rays 1-5; vomer with teeth; brownish with an interrupted lateral band, sometimes absent, fins dusky and mottled.

DESCRIPTION: The dorsal count on two Haitian fish is VI-11 and the anal I-10. In all other respects the fish are quite typical.

SIZE AND WEIGHT: Reaches a length of two feet. A 165 mm. fish weighed 71 grams.

COLOR: Specimen 7175 (102 mm.) is very conspicuously marked, being dark brown above and pale yellow white below. The irregularly dark brown band from pectoral is very dark in this fish, and extends across the side of the head to the eye, and from the anterior part of the eye to and onto the mandible. Tip of lower jaw dark. Side of head below lateral bar, much mottled with brown. Upper portion of spinous dorsal with a broad blackish brown bar; soft dorsal and caudal fins mottled with brown; all other fins plain.

A second specimen (165 mm.) is much paler in color, and resembles closely the figure given by Jordan and Evermann. In neither specimen is the dorsal margined with black.

GENERAL RANGE: Streams of the West Indies and Atlantic shores of Central America, Mexico and Surinam.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found in streams emptying into the Bay, one specimen being found close to the sea at Bizoton. The conspicuously marked fish mentioned above, was captured at Source Mariani and the paler one was taken in a small stream emptying into Etang Saumatre, the brackish lake in the Cul de Sac Plain. This species, plus a gar which we were not able to capture, represent the only marine forms that we were able to find in or near this dying lake. All other fish taken by us at Etang Saumatre and the surrounding streams were either Cichlids or Poecilids.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Seines and traps.

FOOD: Contents of the alimentary tract in one fish revealed an ant and the coiled spiral of a mollusk.

STUDY MATERIAL: Specimens, 3; 102-165 mm., Nos. 7056 and 7175, Stream at Maneville, Etang Saumatre, and Source Mariani.

Dormitator Gill, 1862**Common Spotted Sleeper; Guavina Mapo***Dormitator maculatus* (Bloch) REFERENCES: *Sciaena maculata*, Bloch, 1790, Syst. Ichth., pl. 299, fig. 2.*Dormitator maculatus*, Regan, 1906, Biol. Centr. Americana, Pisces, p. 8.

FIELD CHARACTERS: Small, robust-bodied gobies, head flattened; dark brown mottled and spotted with lighter; scales large, ctenoid, 30-33; outer teeth movable; dorsal count VII-8, anal I-9; in fresh or brackish water.

MEASUREMENTS OF A 33 MM. SPECIMEN:

Head: 9.7 (3.4)
Depth: 9 (3.7)
Eye: 2.3 (4.2)
Interorbital: 2.8 (3.5)
Snout: 2.1 (4.6)
Maxillary: 2.3 (4.2)

Dorsal fin: VII-9
Anal fin: 10
Pectoral length: 7.5
Ventral length: 8.3
Ocular angle: Vertical
Mouth angle: 40° down
Scales 30

SIZE AND WEIGHT: Reaches a length of two feet. Our largest specimen measured only 36 mm.

COLOR: The color of our young fish was typical of adults.

GENERAL RANGE: Both coasts of America; on the Atlantic from South Carolina and the West Indies to Panama and Para.

OCCURRENCE: We found it in the brackish water of Etang Saumatre.

ABUNDANCE: Apparently rather rare as we took only three specimens.

STUDY MATERIAL: Specimens, 3; 33 to 36 mm., No. 7466.

Many-fanged Goby*Leptophilypnus crocodilus* new species

TYPE: No. 7467. Length 22 mm. Lamentin Reef, Port-au-Prince Bay, Haiti.

FIELD CHARACTERS: Small, compressed, elongate gobies, with dark, vertical bands from eye to caudal, and a fine dark line down center of interspaces; a large black spot in front and on base of rays of pectoral; teeth in several rows, the outer of few, distant, enlarged canines.

MEASUREMENTS AND COUNTS:

Length: 22 mm.

Depth: 4. (5.5)

Head: 5.4 (4.1)

Eye: 1.5 (3.6)

Interorbital: .37 (4 in eye)

Snout: .97 (5.6)

Maxillary: 1.7 (3.2)

Dorsal fin: VI-10

Anal fin: I-9

Pectoral length: 5.4

Ventral length: 6.2

Ventral rays: I-5

Ocular angle: 30° up

Mouth angle: 20° down

Scales: 30

DESCRIPTION:

Body: Elongate, compressed, deepest at opercle.

Anterior profile: Gently curved from dorsal to eye, more steeply from eye to snout.

Head: Fairly deep.

Interorbital: Very narrow, 4 in eye, slightly concave.

Snout: Blunt, lower jaw projecting slightly.

Eye: Large, cutting profile, set rather obliquely.

Mouth: Rather large, oblique.

Maxillary: Reaching to pupil.

Teeth: Several bands of small, villiform teeth in each jaw, the outer series larger and wider spaced; in front are four widely-spaced sharp and very large canines, and six in lower jaw.

Opercular margin: Curved, smooth.

Gill openings: Broad, isthmus opening far behind eye.

Scales: Large, ctenoid, absent from head, nape and along first five dorsal spines.

Dorsal fins: Separate, rather low.

COLOR: (preserved specimen) Body with broad, dark brown, vertical bands, the first two extending down from the eye over the cheeks, the third on the nape breaking into large irregular spots on the opercles, a broken one on mid-peduncle and the last very dark and on the base of caudal. The pale interspaces on the body have a thin, dark, threadlike line down their centers. A very dark spot on base of pectoral.

COMPARISON: Differs from *latifrons* in color, and in form.

STUDY MATERIAL: Specimen, 1; 22 mm., No. 7467.

TYPE NAME AND LOCATION: Named from the many-fanged character of the dentition. Type is in the Collection of the Department of Tropical Research of the New York Zoological Society.

Family GOBIIDAE; THE GOBIES

Key to Port-au-Prince Bay Genera

- A. Body either completely scaled or with scales on some part of the body.
- B. Scales not confined to the lower posterior sides.

- C. Pectoral fins with free silk-like rays above; tongue anteriorly with an evident notch.....*Bathygobius*
 CC. Pectoral fins without free silk-like rays above.
 D. Two or three fleshy flaps on the anterior edge of the gill arch, projecting into the gill cavity.....*Chonophorus*
 DD. No dermal fleshy flaps projecting into the gill cavity.....*Gobius*
 BB. Scales confined to the lower posterior sides: elongate, eel-like fishes living in sponges.....*Evermannichthys*
 A. Body scaleless.....*Gobiosoma*

Bathygobius Bleeker, 1878

Sleeper

Bathygobius soporator (Cuvier and Valenciennes)

REFERENCES: *Gobius soporator*, Cuvier and Valenciennes, 1837, Hist. Nat. Poiss., XII, p. 56.

Bathygobius soporator, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 867.

FIELD CHARACTERS: Medium sized gobies with united ventral fins free from the abdomen; body compressed posteriorly, the head depressed; pectoral fins with upper rays filamentous and silk-like.

Color various, from plain dark brown, to pale straw color; with or without cross bars; dorsal and caudal fins with dark spots or cross-bars.

SIZE: Grows to six inches.

COLOR: The three specimens in our collection are uniformly pale, but possess the usual markings of the species.

GENERAL RANGE: Known from all tropical seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken by us only along shore over sandy beaches.

ABUNDANCE: Fairly common.

METHOD OF CAPTURE: Mainly with small seines.

FOOD: Carnivorous, two of our specimens contained small blennies, one being identifiable as *Auchenopterus fajardo*.

STUDY MATERIAL: Specimens, 3; 56-72 mm., including Nos. 6917 and 7274.

Chonophorus Poey, 1860

Fringe-shouldered Goby; Guavina; Saga

Chonophorus taiasica (Lichtenstein)

REFERENCES: *Gobius taiasica*, Lichtenstein, 1822, Berl. Abhandl., p. 273.

Awous taiasica, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 297.

FIELD CHARACTERS. Medium sized to large, scaled gobies with united ventral fins free from the belly, simple teeth, and with two fleshy flaps on the inner edge of the shoulder girdle. 60 to 70 scales in the lateral line. Pale olivaceous or yellowish, sides blotched with darker.

SIZE AND WEIGHT: Grows to a foot or more. An 84 mm. fish weighed 9.5 grams.

COLOR: Head and upper half of body pale greenish yellow, variegated with irregular markings of dark brown. Dorsal and caudal fins light greenish yellow, crossed by several narrow dark brown bands. Belly flesh color. A black line starts half way between eye and pectoral and extends backward and obliquely half way over the fleshy part of pectoral. Iris golden.

GENERAL RANGE: Fresh waters of West Indies; Mexico to Brazil; lower California to Panama.

DISTRIBUTION IN PORT-AU-PRINCE BAY: Taken in brackish streams, in fresh water at Source Mariani, and near the Agricultural Station at Grande Riviere.

ABUNDANCE: Fairly common.

METHOD OF CAPTURE: Mainly with seines.

STUDY MATERIAL: Specimens: 4; 84-190 mm., including Nos. 6962 and 7174. Grande Riviere and Source Mariani.

Gobius Linnaeus, 1758

Key to Port-au-Prince Bay Species

- A. Scales larger, 30 in a longitudinal series.....*fasciatus*
 AA. Scales smaller, 64 to 75 in a longitudinal series.....*oceanicus*

Gill's Banded Goby

Gobius fasciatus (Gill)

REFERENCES: *Ctenogobius fasciatus*, Gill, 1858, Fishes of Trinidad, p. 378.

Gobius fasciatus, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2222.

FIELD CHARACTERS: Small, elongate gobies; scales large, ctenoid, absent on nape and breast; body yellowish with four oblong, dark blotches along sides, and dark spot at base of tail.

GENERAL RANGE: Trinidad and Haiti.

OCCURRENCE: We took six specimens in the brackish waters of Etang Saumatre.

STUDY MATERIAL: Specimens, 6; 16-37 mm., No. 7067.

Emerald-tongued Goby; Esmerelda

Gobius oceanicus Pallas

REFERENCES: *Gobius oceanicus*, Pallas, 1770, Spicil. Zool., I, Fasc. VIII, p. 4.
Gobionellus oceanicus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 877.

FIELD CHARACTERS: Very elongate, compressed gobies, with united ventral fins forming a large sucking disk; tail very long, sometimes half the length of the body; scales small, 64 to 75; anterior dorsal spines filamentous; opercle with a patch of scales above.

DESCRIPTION: Our fish resembles the illustration given by Evermann and Marsh (Fishes of Porto Rico) of *Gobionellus bayamonensis*, and also agree in possessing the same number of scales. In other characters such as head and length, etc., they are closer to *oceanicus* and agree completely with the description of that species given by Meek and Hildebrand, 1925. It is very possible that *bayamonensis* is not valid.

SIZE AND WEIGHT: Grows to a foot in length. A 112 mm. fish weighed 15.5 grams.

COLOR: Both fish in the collection are more or less colorless, possessing only the faintest indication of the color pattern. One fish was noted in life as being uniform dark brown.

GENERAL RANGE: South Carolina to Texas; Panama, West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Our specimens were both taken in fairly shallow water along shore.

ABUNDANCE: Rather uncommon.

METHOD OF CAPTURE: Seines.

STUDY MATERIAL: Specimens, 2; 112-122 mm., Nos. 7118, 7188.

Evermannichthys Metzelaar, 1919

Giant-scaled Sponge Goby

Evermannichthys metzelaari Hubbs

REFERENCES: *Evermannichthys spongicola*, Metzelaar, 1919, Over Tropisch Atlantische visschen, p. 139, figs. 39 and 40.

Evermannichthys metzelaari, Hubbs, 1923, Occ. Papers, Univ. of Mich., No. 144.

FIELD CHARACTERS: Very small, elongate, eel-shaped gobies with united ventral fins; scales present on lower, posterior portion of body only, where they are large and equipped with strong spines. Greenish with vertical dark cross bands, some of which are united on the lower sides and form saddle-shaped patterns, with a milky white spot in center, two wide red bands on tail, two narrower red bands on dorsal and anal fins.

DESCRIPTION: On the posterior surface each side of the anal fin, is a series of 9 or 10 enormous, ctenoid scales, each scale isolated and with the spines considerably raised from the skin surface. The series begin at the last third of the anal fin. There are four similar scales in the center of the lower part of the caudal peduncle.

The pectoral fins are very long, and the webs are torn to ribbons, most likely by attrition on the silicious sponge substance.

All of these characters, in addition to the elongate eel-like body and small head, mark this species as admirably adapted to the peculiar habitat that it has chosen for itself.

SIZE AND WEIGHT: The largest specimen taken so far, is that of Metzelaar, measuring 26 mm. The largest Haitian fish is 19 mm. long.

COLOR: (In life) General color pale yellowish to dusky white, the head somewhat darker than rest of body. Eight to ten saddle-like, dark brown blotches along back, with milky-white spot in center of each blotch. In Metzelaar's illustration these blotches are shown as bands which meet on the lower part of the sides. In between the saddle-like connected bands there is often a single vertical dorsal band ending at the middle of the sides. Caudal fin with two wide reddish bands, most conspicuous superiorly. Dorsal and anal fins each with two narrow pinkish lines, the one nearest the body slightly wider than the other.

GENERAL RANGE: Known from Curacoa and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Seven of these remarkable fishes were taken from the galleries of enormous sponges, where they lived in company with snapping shrimps and small crabs.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Taken only by searching among galleries of sponges.

STUDY MATERIAL: Drawings, H114, No. 7228; Photographs, 4233; Specimens, 7; 16 to 19 mm., including Nos. 7228 and 7251.

Gobiosoma Girard, 1859

Key to Port-au-Prince Bay Species

A. A sharply-defined bluish-white line from eye to tail along upper sides.

horsti

AA. Sides of body and head with narrow vertical dark lines.

macrodon, new species

White-lined Sponge Goby

Gobiosoma horsti Metzelaar

REFERENCES: *Gobiosoma horsti*, Metzelaar, 1922, Bijdr. Dierk. Amsterdam, 22, p. 133.

FIELD CHARACTERS: Small, scaleless gobies with a conspicuous, sharply defined bluish-white line from eye along dorsal surface to base of caudal. Upper surfaces dark, becoming paler below.

DESCRIPTION: The Haitian specimens agree well with the original description and figure of this species. The vertical fins, however, are considerably higher and some of the posterior rays are almost filamentous at their extremities. The lower rays of the pectorals, as is the case also in sponge living blennies, are considerably worn.

SIZE AND WEIGHT: Grows to 2½ inches in length.

COLOR: The colors of a 37 mm. fish were as follows: Upper half of head and body dark brown, shading gradually on sides into the colorless greyish white of ventral areas. This color extends almost to the snout, ending in a broad rounded area in front of the eyes, in the center of which is a small, round turquoise spot. The upper fourth of the iris is bluish white, and this is continued back halfway between the back and the upper edge of the opercula and pectoral insertion, and on to the upper third of caudal as a straight, narrow, very distinct turquoise line. On brown coral 4 ft. down this is very conspicuous.

The brown area below this becomes narrowed just back of the eye, and extends into the iris as the same color, the whole lower three-fourths of the eye being of this color, except for an area of gold at the very bottom.

A narrow line of red runs along the base of the pectoral and the colorless opercles are made rosy from the underlying gills. A small patch of concentrated red pigment lies just beneath the eye. Vertical fins somewhat dusky, especially along the edges. The dark lateral body pigment extends almost halfway to the tip of the caudal.

The smallest specimen (22 mm.) lacked all pigment on the back and upper sides, so that the dark brown is reduced to a broad, low, lateral band and the blue line extends through a colorless area.

In preservative the ground color varies considerably, the white line being always discernable, and usually very conspicuous. In typical specimens the upper surfaces are bluish to purplish brown, while the lower parts of head and body are brownish. Both of these colors may fade out almost entirely. The dark color of the upper side is concentrated at the base of the caudal fin into a blackish spot, which often continues on the central rays of the caudal.

In a 13 mm. (alcoholic) fish, the darker coloration is present mainly as a dark band from the eye, descending slightly until it reaches the middle of the sides, and thence to the tail where the black spot at caudal is especially prominent.

GENERAL RANGE: Known from Curacao, Dutch West Indies; and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Almost all the Haitian fish were taken from tall tubular sponges, the great majority living on reefs from 15 to 20 feet deep. The gobies are not confined to the sponges, but came out during daylight, and were often seen resting on the bottom. A few were taken along sandy shores and near broken-up shallow coral reef bottoms.

ABUNDANCE: Common: Found in about half of the tall, tubular sponges of the reefs.

METHOD OF CAPTURE: Usually taken by stuffing cotton into the mouths of tube sponges, and sending the sponges to the surface where the fish are extracted. A few taken with bait seines.

HABITS: These little gobies are quite fearless, and slide and slither over the coral close to one's feet. I tried to catch two on brain coral at Sand Cay but they were too agile and cunning. They must be protected either by their agility or by nauseous flesh, and most likely by the former, for their prominent, large eyes must see everything that comes near.

When I put a sponge containing one of the fish in an aquarium it came out and swam about for a minute, then seemed to climb the trunk of the sponge

under the surface and actually climbed out of the water to wriggle over the rim and back into the bottom of the animal chimney.

After death the naked skin gave out a solid coating of thick, almost opaque slime, which was easily removed in a sheet.

At night the dark back (as in the small specimens) pales until it becomes almost as pale as the under parts.

When the gobies are kept in a small aquarium and begin to feel the want of oxygen they begin a peculiar movement which is probably related to their normal environment. This, near the bottom and in crevices of coral, is where they have often need of water in movement. About every four seconds they balance on the ventral fin and begin a vigorous movement of the pectorals, both dorsals and the posterior third of the body and caudal. The object is apparently to drive a current of water back over the gills, and is stopped as soon as the water is changed. The outer ray or rays of the pectoral and the ventral cup form the fixed grip while the others drive the water past. (W. B.)

STUDY MATERIAL: Color Plate, H36; Photographs, 4054, 4056, 4057, 4181; Specimens, 42; 13-50 mm., including Nos. 6870, 6914, 6986, 7074, 7115, 7138, 7180, 7197, 7278, and 7279.

Large-toothed Scaleless Goby

Gobiosoma macrodon new species

TYPE: No. 7462. Length 29 mm. Lamentin Reef, Port-au-Prince Bay, Haiti.

FIELD CHARACTERS: Very small, elongate, compressed, scaleless gobies, with ventrals forming a sucking disk; two dorsal fins, the first ray of the anterior fin long and filamentous; sides of body and head with about sixteen narrow vertical dark lines.

MEASUREMENTS AND COUNTS:

Length: 29 mm.
Head: 7.3 (4)
Depth: 6 (4.85)
Eye: 1.2 (6.1)
Interorbital: .6 (2)
Snout: 1.8 (4)
Maxillary: 4 (1.8)

Dorsal fin: VII-11
Anal fin: 10
Pectoral length: 7.5
Ventral length: 5.4
Ocular angle: 20° up
Mouth angle: 30° down

DESCRIPTION:

Body: Elongate, compressed.

Anterior profile: Sloping gently downward to posterior margin of eye, then more abruptly curved to the snout.

Head: Moderate, compressed.

Interorbital space: Narrow, slightly concave.

Snout: Short.

Mucus pores: In numbers on head, in the form of lines of papillae and tubes; after death the entire head and body covered with a thick sheet of opaque white mucus.

Eye: Moderate, well below profile.

Mouth: Medium, oblique, terminal.

Maxillary: Reaches beyond eye.

Teeth; In several rows; the outer row above consists of eight teeth enlarged successively backward, the fourth on each side being very large and canine-like; the outer row below small, but with a single, greatly enlarged, sharp canine on each side of the truncate lower jaw.

Opercular margin: Smooth, rounded.

Gill openings: Broadly attached to isthmus.

Scales: Absent.

Dorsal fin: First spine elongate, greater than depth of body; the rest about same length as soft rays.

Anal fin: Beginning slightly back of origin of soft dorsal.

Caudal fin: Rounded, not quite equal to head.

Pectoral fins: Rather long, a little shorter than head.

Ventral fins: United, rather long.

COLOR: (In formalin) Grayish brown formed by minute punctulations, with a series of twelve narrow, brownish lines on the body from pectoral to caudal, becoming slightly narrower and closer together posteriorly, three more dark lines in front of pectoral, more angular than the rest, the posterior one starting at the nape, passing under the posterior part of gill flap and across the pectoral base; the second considerably angled, starting on the nape and crossing the preopercle; a third shorter line from nape toward the eye not quite reaching the orbit; two short brown lines downward and backward from eye; small dark brown spots on head; two small spots at base of caudal lobes.

COMPARISON: Closest to *multifasciatus*; our Haitian fish differs in its greater depth, smaller eye, longer maxillary, presence of canines, filamentous first dorsal spine, and different pattern and coloring.

STUDY MATERIAL: Specimen, 1; No. 7462.

TYPE NAME AND LOCATION: Named from the large size of the canines. Type in the Collection of the Department of Tropical Research of the New York Zoological Society.

Family ECHENEIDIDAE; THE REMORAS; SHARK-SUCKERS

Echeneis Linnaeus, 1758

Short-disked Shark-sucker

Echeneis naucrates (Linnaeus)

REFERENCES: *Echeneis neucrates* (misprint for *naucrates*), Linnaeus, 1758, Syst. Nat., Ed. X, p. 261.

Echeneis naucrates, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 896.

FIELD CHARACTERS: Medium-sized fishes with oval sucking disk on top of head composed of 23 or 24 laminae; a black band from snout through eye; dorsal and anal dark brown, with distal part of anterior rays pale.

SIZE AND WEIGHT: Grows to 38 inches. A 297 mm. fish weighed 80 grams.

GENERAL RANGE: Cosmopolitan in warm seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Four specimens taken, two of them by hook. A 297 mm. fish spent two days circling about the ship's launch and attaching itself to the boat.

ABUNDANCE: Fairly common, seen now and then in the markets.

METHOD OF CAPTURE: Mainly taken by hook and line.

FOOD: Part of a chicken in the stomach of our largest fish.

STUDY MATERIAL: Specimens, 4; 235-640 mm., including Nos. 6858 and 7119.

Family CLINIDAE; BLENNIES

Key to Port-au-Prince Bay Genera

- A. Lateral line present, arched anteriorly over the pectoral fin, becoming posteriorly median in position or else obsolete.
- B. Scales ctenoid, very rough; dorsal fin divided into three parts; an ocular cirrus present.....*Gillias*
- BB. Scales cycloid; dorsal fin not divided into three parts.
- C. Dorsal with six to twenty soft rays.
- D. Males with 1st anal spine not differentiated from remainder of fin. Color pattern not as in DD.
- E. Nape with a comb of filaments on each side.
- F. Jaws with a single row of strong teeth only; mouth small; dorsal fin notched.....*Malacoctenus*
- FF. Jaws each with a band of villiform teeth behind the row of outer teeth; mouth large.....*Labrisomus*
- EE. Nape with a single filament on each side; mouth small; jaws with a narrow band of teeth behind the strong teeth.....*Acteis*
- DD. Males with the 1st anal spine thickened and separated from the rest of the fin. Color brown, mottled with darker; a series of dark spots along the back, extending on the dorsal fin; two blotches especially conspicuous at the base of the tail; a wide light bar on cheek extending backward from the eye and breaking up on the opercle into two lines; head rather large.....*Brannerella*
- CC. Dorsal with one short soft ray only, often difficult to find, or without, the fin more or less deeply notched behind the third spine; 1st three dorsal spines stiff, wide-set, not remote from rest of fin behind the dorsal notch.....*Cremnobates*
- AA. Lateral line absent; very small, elongate blennies with dorsal fin formed entirely of spines.....*Auchenistius*

Gillias Evermann and Marsh, 1899

Rough-scaled Blenny

Gillias jordani Evermann and Marsh

REFERENCES: *Gillias jordani*, Evermann and Marsh, 1899, Report U. S. Fish Comm., 1899, p. 357.

Gillias jordani, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 307, fig. 95.

FIELD CHARACTERS: Very small blennies with three dorsal fins; scales ctenoid; a tentacle over each eye; vertical dark bars on the body, the one on the caudal peduncle most intense on larger specimens.

DESCRIPTION: Two small fishes of 12 and 14 mm. are apparently of this species. They differ in size of head, which is 2.86 instead of 3.5, and in eye which is 2.8 instead of 2.5, in having a spoon-shaped entire tentacle over the eye instead of a bifid one; and slightly in color. In both of our specimens the vertical dark bars of the body are very intense, so much so that the bar on the caudal peduncle, so marked in Evermann and Marsh's examples, is of the same degree of conspicuousness as the rest. The diagonal bars on the anal fin are also well marked in the Haitian fish. The edges of the dorsal and caudal fins are broken in our fish and the shape of these fins is somewhat doubtful.

While our specimens are somewhat different from *jordani*, the differences may be assigned to age, and for that reason we are placing the Haitian fish under this species until larger individuals can be obtained.

GENERAL RANGE: Porto Rico and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken among broken coral on Lamentin Reef.

ABUNDANCE: Rare.

STUDY MATERIAL: Photograph, 4496; Specimens, 2; 12-14 mm., No. 7278, Lamentin Reef, Port-au-Prince Bay.

Malacoctenus Gill, 1860

Cope's Two-spotted Blenny

Malacoctenus biguttatus (Cope)

REFERENCES: *Labrisomus biguttatus*, Cope, 1873, Trans. Amer. Philos. Soc. Phila., 473.

Malacoctenus biguttatus, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2360.

FIELD CHARACTERS: Small, compressed, scaled blennies with complete lateral line; teeth in a single series in each jaw; a fringe of tentacles on nape;

7 or 8 dark quadrate blotches on sides; a black blotch on anterior two membranes of dorsal fin; two brownish spots behind the eye.

DESCRIPTION: The single specimen assigned to *biguttatus* agrees fairly well with the meager description of proportions and fins given by Cope, and quite well as to color. The dorsal however has XIX, 10 instead of XIX-I, 11, and the anal II-19 instead of II-16. In view of the few specimens which have been taken, this variation may well be within specific lines.

The following description of our specimen is given: Specimen No. 7275

Length: 36.5 mm.

Depth: 9.5 (3.84)

Head: 11 (3.3)

Eye: 3.1 (3.66)

Snout: 3.9 (2.8)

Maxillary: 4 (2.7)

Dorsal fin: XIX-10

Anal fin: II-19

BODY: Elongate, considerably compressed, the head slightly less so than the body; upper and lower profiles about equally curved.

ANTERIOR PROFILE: Straight to above the anterior half of eye, thence after an abrupt angle, straight to the upper lip.

HEAD: Medium, 3.3 in length.

INTERORBITAL SPACE: Narrow, slightly wider than $\frac{1}{2}$ the eye, almost flat but with a very slight depression.

SNOUT: Conical, the lips, especially the upper, rather thick and heavy, entering the profile.

EYE: 3.66 in head, placed rather high, its upper border not quite entering the dorsal profile.

MOUTH: Small, horizontal, the maxillary reaching the anterior margin of the orbit.

TEETH: Strong, pointed, in a single series in each jaw, those of the lower jaw larger; teeth present on the vomer and palatines.

LATERAL LINE: 46 pores; straight from upper angle of gill opening, decurved over origin of anal fin, thence straight on center of sides to caudal fin.

SCALES: Medium in size, absent on head.

CIRRI: A simple cirrus on anterior nostril, two cirri above eye, and a group of five cirri arising from a single base on each side of the nape.

DORSAL FIN: Continuous, arising over the origin of the lateral line, the 1st spine higher than the next three or four, but not higher than posterior spines; the penultimate spines lower than the ultimate spine. Soft portion of fin higher than spinous portion.

ANAL FIN: Arises under center of spinous dorsal, the posterior rays longer than the anterior ones.

PECTORAL FINS: Elongate, rounded at end, equal to $\frac{3}{4}$ length of head.

PELVIC FINS: Elongate; arising in front of the pectoral base, the tips extending to the 2nd anal ray.

CAUDAL FIN: Broken, but apparently rounded.

COLOR: (alcoholic specimen) Pale greyish brown, with traces of 8 large vertical blotches on sides, these somewhat broken, and not forming continuous bars in all cases; a black spot on membrane between the first and third dorsal

spines; two very distinct brownish spots behind the eye, slightly more than $\frac{1}{2}$ the eye in diameter, the posterior on the operculum. Lower head with traces of lighter bars.

SIZE AND WEIGHT: Grows to $2\frac{1}{4}$ inches.

GENERAL RANGE: St. Martins; Bahamas and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Our fish was taken close along shore in shallow water near Lamentin Reef.

ABUNDANCE: Rare.

METHOD OF CAPTURE: Scoop net among weeds.

FOOD: Minute crustaceans and organic detritus too comminuted to identify.

STUDY MATERIAL: Specimen, 1; 36.5 mm., No. 7275.

Labrisomus Swainson, 1839

Key to Port-au-Prince Bay Species

- A. Scales small, 68 to 80 in the lateral line.....*nuchipinnis*
- AA. Scales larger, 42 to 45 in lateral line.
- B. Dorsal XX-11, anal fin II-20. Color mottled brown. No light spot below eye posteriorly.....*haitiensis* new species
- BB. Dorsal XVIII-10, Anal II-18, brownish with a conspicuous light spot on cheek below the eye posteriorly, bordered above and below by darker.
albigenys, new species

Fringe-naped Blenny

Labrisomus nuchipinnis (Quoy and Gaimard)

REFERENCES: *Clinus nuchipinnis*, Quoy and Gaimard, 1824, in Freycinet, Voy. Uranie et Physicienne, Zool., p. 255.

Labrisomus nuchipinnis, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 936.

FIELD CHARACTERS: Small, scaly blennies with complete lateral line; teeth in an outer large series and an inner, smaller villiform group; a fringe of tentacles on the nape; brownish with indistinct cross-bars and blotches; fins brownish with darker spots forming cross-bars; scales small, 68 to 80 in lateral line.

DESCRIPTION: The Haitian specimens are quite typical.

COLOR: Our two specimens are rather pale, but agree well with the description given by Meek and Hildebrand.

GENERAL RANGE: Florida to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Rather widely distributed on the reefs and along shore.

ABUNDANCE: A common species, seen often on the reefs.

METHOD OF CAPTURE: Taken mainly with traps, set on bottom near shore.

STUDY MATERIAL: Photograph, 4014; Specimens, 2; 90-101 mm., including No. 7065.

Haitian Spotted Blenny*Labrisomus haitiensis* new species

TYPE: No. 7170, 52.5 mm. long, Bizoton, Port-au-Prince Bay, Haiti, March 15, 1927, Captured in small trap in four feet of water.

FIELD CHARACTERS: Small scaly blennies with complete lateral line; teeth in an outer large series and an inner villiform band of small teeth; fringe of tentacles on the nape. Scales large, about 45 in the lateral line. Brownish with conspicuous darker spots.

MEASUREMENTS AND COUNTS OF TYPE:

Length: 52.5 mm.
Depth: 12.5 (4.2)
Head: 14.9 (3.5)
Eye: (2.9)

Dorsal fin: XX-11
Anal fin: II-20
Pectoral fin: 13
Scales: 45

DESCRIPTION:

Body: Elongate, compressed, the dorsal and ventral profiles, exclusive of the anterior profile, similar.

Anterior profile: More or less straight from origin of dorsal fin to over middle of the eye, then angled and straight to the snout.

Head: 3.5 in length, compressed.

Interorbital Space: Narrow, slightly concave, its width about $\frac{1}{3}$ the diameter of the eye.

Snout: Very short, a little more than $\frac{1}{2}$ the eye in length.

Eye: Large, 2.9 in head, placed well forward in the head, its upper edge reaching almost to the dorsal profile.

Mouth: Terminal, slightly oblique.

Maxillary: 2 in head, reaching beyond anterior border of pupil but not quite to center of eye.

Teeth: In both jaws with an outer row of large conical teeth,—about 10 large graduated teeth anteriorly, with 10 smaller equal sized teeth on each side. Behind these anteriorly is a villiform band of small teeth.

Opercles: Unarmed.

Lateral line: Complete, the anterior portion straight, with a long low arch, beginning under the 9th spine of the dorsal.

Scales: 45 in lateral line, medium in size, covering the entire body except the head.

Cirri: Anterior nostril with a multifid cirrus (8 tentacles on right and 4 on

left,—possibly injured); eye with a 5 or 7 branched tentacle on its upper, slightly posterior border; a five fingered tentacle on nape.

Dorsal Fin: Long, the 3rd and 4th spines slightly shorter than the 1st and 2nd, the 17th, 18th and 19th becoming progressively shorter, the 20th as long as the 16th or 17th, the spines free at their tips; the soft dorsal considerably higher than the spinous dorsal.

Caudal Fin: Rather long, the end roughly rounded.

Anal Fin: Rays lower than the dorsal rays, increasing in length slightly posteriorly.

Pectoral Fins: Width of base 3 in head; the fin not quite as long as the head.

Ventral Fins: Rather long, close together, composed of 1 spine and 2 rays.

COLOR: (preserved specimen) Brownish gray, much paler on the lower surfaces, with darker mottlings. Three very dark brown, vertical spots on the posterior sides, the first spot confluent with a dark spot at base of and extending on the dorsal fin. Between these spots are vague indications of others. Five dark spots on the body at the base of the spinous dorsal, half of each spot being on the fin, these spots continued upward through the fin as grayish bars. Two small spots on the body at the base of the soft dorsal. Head dark brown, marbled slightly with lighter, the opercle especially dark. Anal with alternate dark and light bars. Soft dorsal, caudal, pectoral and ventral fins with small brownish spots on the rays, forming bars.

COMPARISON: This species differs mainly from *nuchipinnis* because of its larger scales, from *herminier* by its larger eye and different fin count, from *bucciferus* by its larger eye and shape of dorsal, from *macrolepidotus* by its larger eye and larger scales, from *heilneri* because of larger eye and shorter maxillary, and from *lentiginosus* by its larger eye and small snout, and because of the longer pectoral and ventral fins. In coloration it almost duplicates the description given for *nuchipinnis* by Meek and Hildebrand, but the much larger scales of *haitiensis* immediately separate the two species.

STUDY MATERIAL: Specimen, 1; the type, No. 7170.

TYPE NAME AND LOCATION: Named for the island of Haiti. Type in the collections of the Department of Tropical Research of the New York Zoological Society.

White-cheeked Blenny

Labrisomus albigenys new species

TYPE: No. 7372, Length 16 mm., Lamentin Reef, Port-au-Prince Bay, Haiti. Taken among broken coral in two feet of water on inside of reef. May 9, 1927.

FIELD CHARACTERS: Very small, scaly blennies, with complete lateral line; a pair of three to five-fingered comb cirri on nape, ocellus on anterior dorsal web, and a large, white, black-bordered spot on cheek.

MEASUREMENTS AND COUNTS OF TYPE:

Length: 16 mm.
Head: 5.9 (2.7)
Depth: 4.3 (3.7)
Eye: 1.6 (3.4)
Interorbital: .8 (2)
Snout: 1.2 (4.5)
Maxillary: 1.6 (3.4)

Dorsal fin: XVIII-10
Anal fin: II-18
Pectoral length: 5.8
Ventral length: 4
Ocular angle: 20° up
Mouth angle: 50° down
Scales: 42
Lateral line pores: 42

DESCRIPTION:

Body: Elongate, compressed.

Back: Scarcely elevated.

Anterior profile: Evenly curved from dorsal to snout.

Head: Pointed.

Interorbital: Concave, with a furrow down the center.

Snout: Short, lips thick.

Nares: Posterior nares near eye, almost sessile, anterior nares in tube, between posterior and lips.

Cirri: Narial cirri, two elongated tentacles from same base, extending up from posterior half of each narial tube, four times the height of the tubes; ocular cirrus, a long, slender, round, fleshy finger, giving off a short, external branch near base, half as long as eye; nuchal cirri, two oblique combs of five slender fingers (in two smaller paratypes there are only three fingers), one mm. in front of dorsal, the finger tips reaching back to base of dorsal.

Eye: Large, not quite cutting profile.

Mouth: Moderate, oblique, terminal.

Maxillary: Reaching past first quarter of eye.

Teeth: Several rows of villiform teeth, outer row enlarged; a single row on vomer and palatines.

Preopercular margin: Rounded.

Opercular margin: Rounded.

Scales: Large, rounded.

Lateral line: Anteriorly following line of back, lying half way between back and pectoral base; at vertical of 12th dorsal spine, curved abruptly down to midline; arched part considerably shorter than straight.

Dorsal Fin: Spines considerably shorter than soft rays.

Anal Fin: Lower than dorsal.

Ventrals: 1-3.

COLOR: Brown, mottled irregularly with darker, head almost uniform, the solid brown appearance caused by minute pigment dots; a broad, rectangular patch of whitish extending obliquely down and back from eye, across cheek and preopercle, broadly banded on each side with black; dorsal mottled with

two shades of brown, with a large black ocellus on the first and second webs, between the first and third spines; the elongated distal half of the soft rays pearly white, with three irregular lines of large, brown spots; end of peduncle pale, followed by a narrow black band on base of caudal; anal mottled with brown; pectoral pale mottled toward tip. The paratypes are not as brilliantly colored.

COMPARISON: This species is nearest *nuchipinnis* but differs in smaller dorsal count, shorter snout, larger eye, short maxillary, difference in character of cirri, and especially in the much larger scales.

STUDY MATERIAL: Photographs, 4498 and 4506; Specimens, 4; 13–16 mm. type and three paratypes, Nos. 7372 and 7372a.

TYPE NAME AND LOCATION: Named from the white patch on the cheeks. Type in the Collection of the Department of Tropical Research of the New York Zoological Society.

Acteis Jordan, 1904

Moore's Blenny

Acteis moorei (Evermann and Marsh)

REFERENCES: *Malacoctenus moorei*, Evermann and Marsh, 1899, Rept. U. S. Fish Comm., p. 358.

Malacoctenus moorei, Evermann and Marsh, 1900, Fishes of Porto Rico, p. 309, fig. 97.

FIELD CHARACTERS: A small, scaled blenny with complete lateral line; teeth with an outer larger row and a group of inner smaller villiform teeth; a single tentacle on nape; first dorsal spine longer than others; brownish with cross-bands of darker.

DESCRIPTION: Four small fish, the largest 18 mm. long, are assigned to this species. Two of them have 22 dorsal spines and one has 47 lateral line scales.

SIZE: Grows to $2\frac{1}{4}$ inches.

COLOR: The coloration of our fishes, is less definitely marked than in specimens described by other authors. The vertical bands are broken up to a greater extent, forming almost horizontal bands of irregular spots, each spot with a lighter center. The bars or spots continue more or less on the dorsal fin, and that fin may be described as mottled with dark brown. Anal fin with a dusky shade towards the edge.

GENERAL RANGE: Porto Rico, Haiti and Tortugas.

OCCURRENCE IN PORT-AU-PRINCE BAY: In shallow water along shore near Lamentin Reef.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: By scoop nets, and searching among weeds and broken coral.

STUDY MATERIAL: Specimens, 4; 15–18 mm., Nos. 7373, 7278.

Brannerella Gilbert, 1900

Marbled Blenny

Brannerella culebrae (Evermann and Marsh)

REFERENCES: *Malacoctenus culebrae*, Evermann and Marsh, 1899, Rep. U. S. Fish Comm., Dec. 19, 1899, p. 357.

Malacoctenus culebrae, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 308, fig. 96.

FIELD CHARACTERS: Small, brownish scaled blennies with complete lateral line; males with 1st anal spine detached and covered with rather thickened skin. Body mottled with dark brown, a series of dark spots on the back, extending sometimes on the dorsal fin; two blotches especially conspicuous at the base of the tail; a wide light bar on the cheek, often breaking up into two posteriorly and forming a Y-shaped figure.

DESCRIPTION: Evermann and Marsh described this fish in 1899 from three specimens of about equal size, the type, taken from a reef outside of Culebra harbour, Porto Rico, being 1.38 inches long.

A series of specimens from Port-au-Prince Bay agree excellently well in form and coloration with the description and plate given by them and upon dissection all were found to be females. Agreeing equally well in color, considering the well-marked pattern of this species and the variations mentioned and described under Color, are another series of Port-au-Prince Bay specimens, all possessing, however, the detached first anal spine which Gilbert (1900) made a distinguishing character of his genus *Brannerella*. All of these specimens were males, as proven by dissection. The Porto Rican specimens upon which the species was based were evidently, therefore, all females.

Evermann and Marsh mention of their specimens that they possess a single row of teeth in each jaw. Our specimens have the outer rows of cardiform teeth and inner band of villiform teeth mentioned by Gilbert for *Brannerella*. In view of the difficulties of dissecting these small fishes and of the fewness of specimens it is possible that the inner teeth of the Culebra specimens were overlooked. It is of interest to note that Evermann and Marsh recognized that their three specimens were different from other Porto Rican specimens of *Malacoctenus*, as they say "A rather plainly marked species of different aspect from other Porto Rican species of *Malacoctenus*, but not differing widely in any important characters and as yet known only from Porto Rico."

SIZE: Our largest specimens are about 32 mm. in length. The type of *culebrae* was 1.38 inches (34.5 mm.).

COLOR: Our preserved (alcoholic and formalin) specimens vary considerably in intensity of coloring, but agree in possessing all of the essential patterns mentioned in the original description. The following description is based on Evermann and Marsh's description and our specimens:

Body brownish, with lighter rivulations and mottled everywhere with dark brown blotches. A series of 8 to 10 dark blotches, rather regularly arranged

on the body along the base of the dorsal fin, extending on the lower portion of the fin, where occasionally each one divides and forms two black blotches; these blotches sometimes join with blotches on the body to form broken vertical bars on the sides. A similar series of dark blotches along the base of the anal fin, not evident in all specimens. Head nearly plain below but with some darker spots on the chin and on the isthmus; two pale streaks from the eye across the cheek, divided posteriorly on the opercle so as to form an irregular Y-shaped figure; opercle dark brown; top of head colored same as body; lips with brown and pale stripes; posterior half of the maxillary pale; dorsal fin rather dark, sometimes with a conspicuous dark spot on the membrane between the 1st and 2nd spines and occasionally with pale tips to the spines. Caudal fin uniform gray or faintly barred; anal fin similar to the dorsal in color, the rays with pale tips forming a white edge, sometimes with a dark narrow sub-terminal band, joined here and there to the spots at the base of the body; pectoral fin same as caudal; two or three small dark spots at base of pectoral; ventrals pale. Two dark spots near the base of the caudal fin are very conspicuous in practically all of our fish.

A 10.6 mm. fish in the collection most likely belongs to this species, although the pattern on the head is different from the older ones. The rather narrow light line passing upward and back from the eye, as shown in the illustration in the "Fishes of Porto Rico" is, in this fish, very wide and continues backward over the nape to meet its fellow. It is bordered below by broken brown spots. The top of the head from this line forward to a line above the middle of the eyes is dark brown. The following patterns are also found; a broad band of brown from the eye to the maxillary and a few odd spots of brown on the lips. Two dark brown spots on the base of the pectoral. Sides with three series of vertical rectangular brown spots, the uppermost extending onto the dorsal fin, the lowermost not reaching the anal base. Wherever space is available on the body, these rectangles send downward or upward as the case may be, an attenuated band of chromatophores. Dorsal fin with a series of spots, mostly following the rays. Anal fin with nine spots of blackish. Pectoral, ventral and caudal fins clear.

GENERAL RANGE: Porto Rico, Curacao and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found along shore and on the various shallower reefs, especially among low weeds and in broken coral.

ABUNDANCE: Quite common.

STUDY MATERIAL: Photograph, 4487; Specimens, 18; 10.6–32 mm., including Nos. 7066, 7086, 7151, 7261a and 7278. Sand Cay, Bizoton Reef, and Lamentin Reefs, Port-au-Prince Bay.

Cremnobates Günther, 1861

Key to Port-au-Prince Bay Species

- A. Basal third of caudal dark, dorsal fin with 3 ocelli. . . . *argus* new species
- AA. A bar on body at base of caudal, but not extending on fin; reddish with darker vertical bars extending on the fin, a single ocellus on dorsal fin.

fajardo

Tri-ocellated Blenny*Cremnobates argus*, new species

TYPE: No. 7375, Length 22 mm., Lamentin Reef, Port-au-Prince Bay, Haiti. Found among coral debris in shallow water on inside of reef.

FIELD CHARACTERS: Very small, compressed, elongated blennies, brown body and fins mottled with darker; three ocelli on dorsal, posterior two-thirds of caudal whitish; narial cirri simple truncate flap, ocular cirrus branched, nuchal cirri flat, leaf-like.

MEASUREMENTS AND COUNTS:

Length: 22.5 mm.

Head: 6.7 (3.3)

Depth: 4.8 (4.7)

Eye: 1.7 (4)

Interorbital: 1 (6.7)

Snout: 1.2 (5.5)

Maxillary: 3 (2.2)

Dorsal fin: III-XXVII

Anal fin: II-17

Pectoral length: 5

Ventral length: 4.3

Ocular angle: 20° up

Mouth angle: 30° down

Scales: 34

Lateral line pores: 34

DESCRIPTION:

Body: Elongate, compressed.

Back: Very slightly elevated.

Anterior profile: Gently curved from snout to dorsal.

Head: Depth less than three-fifths of length.

Interorbital: Flattened; slightly more than half of eye.

Snout: Very slightly convex.

Nares: Posterior nares in slightly raised rim, close to antero-superior edge of eye; anterior nares in elevated tubes nearer lips than to anterior nares.

Cirri: Narial cirrus a simple truncate flap rising from posterior half of anterior nasal tubes, equal to the tubes in height; ocular cirri close to postero-superior rim of eye, each a transverse, flat flap narrowing to an elongated point, with two internal branches, the uppermost the larger; nuchal cirri rising on a short narrow stem, expanding at once into a broad, triangular leaflike shape, topped with three slightly marked points. The two anterior pairs of cirri are pale mottled brown, the nuchals are black, with a wide white border like the vertical fins.

Eye: Large, not cutting profile, iris pink.

Mouth: Rather large, oblique.

Maxillary: Not quite reaching the posterior border of the eye.

Teeth: Several rows of villiform bands, narrowing to one row along the sides; vomer with horseshoe shaped patch of very small teeth.

Preopercular margin: Almost straight and vertical, curved below.

Opercular margin: Smooth, extending obliquely backward, a deep bay at the top ending in a blunt spine.

Scales: Large, smooth, rounded, with thin fleshy rims which curl outward on drying.

Lateral line: Well marked, following the dorsal outline, and curving steeply downward to the mid-line at the extremity of the pectoral; the pores lie in the center of deep notched scales.

Dorsal Fin: Spines only; relative length of anterior seven spines—2.1, 2.1, 1.5, 1.3, 1.9, 2.2, 2.4, mm., and so on to end; the extent of the membrane of the anterior part of the dorsal as follows—membrane of 3rd spine attached halfway up on 4th, 4th halfway up 5th, 5th two-thirds up 6th, remainder attached at tips.

Caudal Fin: Rounded, shorter than depth of body.

COLOR: Body brown, mottled with darker along sides and below; vertical fins darker than body, mottled with black, and with a wide, white margin; dorsal with three ocelli, a small one centered on the 16th spine (total dorsal count), another three times as large and white-ringed between the 23rd and 25th spines, a third equal in size to the anterior one close to the antero-superior border of the large ocellus; caudal dark brown for basal third, then a clear zone, followed by a wider area mottled along the rays, and a wider, white terminal band; pectoral light, with a large, dark, sub-basal patch on lower half; ventrals dark on basal half, white for the rest; head mottled in two shades of brown, three wide, irregular bands extending up and back from the eye across nape and opercles; snout and chin with many large dark spots.

COMPARISON: This fish is nearest to *albicaudatus*, named by Evermann and Marsh from a single specimen taken in Porto Rico. Our Haitian specimen differs in the less depth, shorter snout and narrower interorbital, in the spotting and banding of the head, in the presence of three dorsal ocelli, the deeper notch between dorsal fins, differently colored caudal, and in the wholly different character of cephalic cirri.

STUDY MATERIAL: Photographs, 4501, 4502 and 4502a; Specimen, 1; Type No. 7375.

TYPE NAME AND LOCATION: Named on account of the three dorsal ocelli. Type in the Collection of the Department of Tropical Research of the New York Zoological Society.

Fajardo Blenny

Cremnobates fajardo (Evermann and Marsh)

REFERENCES: *Auchenopterus fajardo*, Evermann and Marsh, 1899, Rep. U. S. Fish Comm., p. 361.

Auchenopterus fajardo, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 313, pl. 47.

FIELD CHARACTERS: Small, compressed scaled blennies with a single ray only in the dorsal fin in addition to the spines; lateral line complete. Reddish, mottled, with darker cross bars extending on the dorsal and anal fins. An ocellus present on the dorsal in some specimens.

SIZE: Grows to 1.6 inches.

COLOR: This species, judging by the specimens in the Haitian collection, varies considerably, the variation being mainly in the intensity of color, especially in the vertical bars which extend from the body onto the dorsal and anal fins.

Our specimens agree better with the description given by Evermann and Marsh than with their figure. But as they had but a single specimen a certain amount of latitude is allowable. In the Haitian fish the sides are usually mottled, often with pale pinkish or whitish spots. All possess the vertical bars on the body which extend onto the dorsal and anal fins, the intensity of this pattern, varying, however, to such an extent that in some the bars are scarcely visible, while in the most vividly colored (alcoholic) fish, the bars are bright brown anteriorly becoming darker posteriorly and finally black, all of the bars on the anal fin being black. Conspicuous in this specimen is the last body bar, placed at the base of the caudal, which is black. The dorsal ocellus is not present in all specimens. It varies in intensity of color. Its absence may possibly be laid to preservation.

GENERAL RANGE: Known from Porto Rico, Bahamas and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found by us in shallow water among weeds and small coral masses.

ABUNDANCE: Uncommon, but always to be found when especially searched for.

STUDY MATERIAL: Photographs, 4493, 4494; Specimens, 11; including Nos. 6852, 7254 and 7279.

Auchenistius Evermann and Marsh, 1899

Green Thalassia Blenny

Auchenistius stahli Evermann and Marsh

REFERENCES: *Auchenistius stahli*, Evermann and Marsh, 1899, Rept. U. S. Fish Commission, p. 359.

Auchenistius stahli, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 316, fig. 102.

FIELD CHARACTERS: Very small, greenish, scaled, blennies without lateral line. Dorsal fin composed entirely of spines, the spines becoming smaller posteriorly. Membrane of dorsal and anal connected with caudal. Pectoral fin small. Green, a golden spot behind and below eye.

DESCRIPTION: 32 specimens are assigned to this species, the only difference, outside of color which is mentioned below, between our specimens and the figure and original description being that the lips in a few of the Haitian fish are larger, and more swollen, and the maxillary sometimes extends beyond

the eyes. This is especially true of the more brilliantly colored specimens, and it is possible that it may be a sexual or age character. In all other characters, including teeth, these specimens agree fully. It may be mentioned here that Metzelaar's (1919) new genus and species, *Histioclinus veliger*, resembles this species closely. Very dark specimens of our blennies practically duplicate the color pattern of his fish, the only difference being that *Histioclinus* does not possess the small inner teeth of the upper jaw and the vomerine teeth of *Auchenistius*, and that the dorsal fin has rays instead of spines. Metzelaar's figure shows considerably smaller scales than *Auchenistius*, although the number of rows according to the description is practically the same (58-60). The measurements given in his description do not coincide with his drawings and the two drawings appear to be of different fish.

The supra-orbital tentacle in our fishes, except in the smaller specimens, is paddle-shaped.

COLOR: In life clear yellow green. A short, oblong patch of gold, back and down from eye halfway to preopercular margin. Iris golden.

The preserved specimens vary considerably in color, especially in the distribution of the chromatophores. The general body color is gray or faded yellowish, a few having a reddish tinge. A constant feature in all our specimens is a yellowish or whitish bar below and in back of the eye, this being golden in life. This is bordered above and below by brownish, the extent of which varies considerably, sometimes being suffused over the entire cheek, and at other times concentrated into a short dark bar immediately above and below the golden bar. This pattern is well shown in Metzelaar's figure of *Histioclinus veliger*.

There is also considerable variation in general body coloration. Some or most or all of the following patterns may be present,—pigment spots, black and brown, irregularly placed on body, in one case forming apparent cross-bars; 1, 2, or 3 cross-bars on ventral fins; spots on anal fin, especially near the tips of the posterior rays; caudal fin with pigment spots; lower jaw with a series of spots; dorsal and anal fin with a terminal black band, in one specimen this band is subterminal.

GENERAL RANGE. Known heretofore only from Porto Rico and the Bahamas.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed over the shallower coral reefs and also in the weed (*Thalassia*) on the beaches along-shore, a fact which caused us in the field to name this fish the Green *Thalassia* Blenny.

ABUNDANCE: Common, always to be found when searched for among corals and weeds.

METHOD OF CAPTURE: Mainly by searching carefully among coral debris brought up from bottom, and from weed beds dug up bodily and brought to the surface.

STUDY MATERIAL: Color Plate, H75, No. 7085a; Photographs, 4231, 4232; Specimens, 33; 12.5 to 24 mm., including Nos. 7085a, 7112, 7151, 7261, 7278, 7279.

Family BLENNIDAE; BLENNIES

- A. Teeth comb-shaped, in a single row in each jaw, behind which on each side is a single canine. Snout very short.....*Rupiscartes*

AA. Jaws each with 4 strong canines in front; a hooked posterior canine below.
Ophioblennius

Rupiscartes Swainson, 1839

Rock-hopping Blenny

Rupiscartes atlanticus (Cuvier and Valenciennes)

REFERENCES: *Salarias atlanticus*, Cuvier and Valenciennes, 1836, Hist. Nat. Poiss., XI, p. 321.

Rupiscartes atlanticus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 948.

FIELD CHARACTERS: Small, compressed, naked blennies, with extremely short snout (pug-nosed); teeth on front jaws movable; a large posterior canine on each side inside of anterior row of teeth; vomer toothless; dorsal fin continuous.

DESCRIPTION: Our single fish has the dorsal fin count of XI-20, and the anal 22. In all other respects this fish agrees with the published descriptions of the species. The Haitian fish had none of the peculiarities of coloring that Sylvester's *Alticus macclurei* of similar size showed. Fowler (1920) considers *macclurei* to be a young stage of this species.

GENERAL RANGE: Atlantic, West Indies to Brazil and Ascension Island; Pacific, Mazatlan to Ecuador and Chatham Island.

OCCURRENCE IN PORT-AU-PRINCE BAY: Our single fish was taken at Sand Cay by trap.

FOOD: The alimentary canal contained organic detritus only, apparently of both animal and vegetable origin.

STUDY MATERIAL: Photograph, 4492; Specimen, 1; 68.5 mm., No. 6888.

Ophioblennius Gill, 1860

Haitian Snake Blenny

Ophioblennius ferox new species

TYPE: No. 7152. Length 43 mm. Taken at light alongside schooner, at night, near Bizoton, Port-au-Prince Bay, Haiti, April 6th, 1927.

FIELD CHARACTERS: Small, elongate, strongly compressed, scaleless blennies, with incomplete lateral line; snout very short; jaws with four large, recurved fangs in front, above and below, two more halfway back on mandibles, and a row of elongate movable teeth on sides of upper jaw.

MEASUREMENTS AND COUNTS:

Length: 43 mm.
Head: 10.6 (4)
Depth: 8.3 (5.1)
Eye: 3 (3.5)
Interorbital: 2 (1.5)
Snout: 3 (3.5)
Maxillary: 3.7 (2.8)

Dorsal fin: XII-20
Anal fin: II-21
Pectoral length: 11 mm.
Ventral length: 6 mm.
Ocular angle: Vertical
Mouth angle: 30° down
Scales: None

DESCRIPTION:

Body: Low, much elongated, compressed.

Back: Scarcely elevated.

Anterior profile: Straight from dorsal to forward part of eye, thence curved to snout.

Head: Large, almost as deep as long.

Interorbital: Convex.

Snout: Short, abruptly curved downward, very convex.

Nares: Posterior with slight rim, anterior twice diameter of the other and with short tube.

Cirri: Narial cirrus, a flat, six-fingered, handlike tentacle, with the wrist arising from inner side of nasal tube; ocular cirrus a simple, tapering tentacle, less than half diameter of eye; nuchal cirrus, two short tentacles arising close together, halfway between dorsal fin and eye.

Eye: Large, below profile.

Mouth: Moderate, oblique, terminal.

Maxillary: Reaching to first fifth of eyeball.

Teeth: Four large teeth close to premaxillary symphysis, the inner pair directed obliquely toward each other, the outer pair recurved, fanglike; lateral teeth elongate, palisade-like, movable; four teeth in front of lower jaw, the inner pair curved back almost into a semicircle, the outer pointing low, sideways, along the line of the jaw; halfway to gape on the mandible, two isolated recurved teeth, the posterior one much the largest tooth in the mouth.

Opercular margin: Smooth, curved, a small bay at the top.

Scales: Absent.

Lateral Line: Incomplete; beginning at postero-superior edge of opercle, and following line of back to vertical of 14th dorsal element.

Dorsal fin: Long, the spines slender, separated by slight notch from soft rays.

Caudal: Forked.

COLOR: The preserved specimens are almost colorless, one paratype showing traces of ten, vertical dark bands down the sides; there is considerable dark pigment along the dorsal fin base, on the top of the head and the lips; several faint bands radiate from the eye back over the opercles.

COMPARISON: Differs from *webbii* in longer head, two fangs on mid-mandible,

in shape and position of anterior fangs, presence of nuchal tentacles, in pigmentation, and greater number of dorsal and anal elements.

From *trinitatis* it may be distinguished by a lesser depth of body, wholly different coloration, much fewer dorsal elements and much narrower inter-orbital space.

STUDY MATERIAL: Photographs, 4497 and 4499; Specimens, 3; 40–43 mm. Type and two paratypes, Nos. 7152 and 7152a.

TYPE NAME AND LOCALITY: Named from the large, recurved fangs. Type is in the Collection of the Department of Tropical Research of the New York Zoological Society.

Family EMBLEMARIIDAE¹

Acanthemblemaria Metzelaar, 1919

Key to species

- (A. A few villiform teeth behind the front row in the lower jaw only; color olivaceous with traces of dusky crossbands, finely punctulate with innumerable brown dots.....*spinosa* Metzelaar, extralimital)
- AA. Small teeth behind the outer in both upper and lower jaws.
- B. Profile evenly curved from snout to dorsal fin. A conspicuous black spot on membranes between the third and fourth dorsal spines. Supraocular tentacle very large and with many branches; center of top of head not spined.....*arborescens* new species
- BB. Profile straight from dorsal fin to above eye, then angled and descending straight to snout. Color variegated; no black spot on dorsal fin. Supraocular tentacles small, with very short branches if any. Top of head scaled almost to nape.....*variegata* new species

Bushy-headed Spiny Blenny

Acanthemblemaria arborescens new species

TYPE: No. 6923, 22 mm. length, Lamentin Reefs, Port-au-Prince Bay, February 22, 1927.

FIELD CHARACTERS: Very small, scaleless blennies with front of the head covered with small spines; a large multifid tentacle over the eye and another on the snout; a conspicuous black spot on membranes between the 3rd and 4th dorsal spines.

¹ The genera *Acanthemblemaria* and *Stathmonotus* are assigned to the families *Emblemaridae* and *Chaenopsidae* respectively in this paper, following Jordan's "Classification of Fishes." We are not at all certain that this is correct, but we are letting the genera remain so until further studies can be made.

MEASUREMENTS AND COUNTS OF THE TYPE:

Length: 22 mm.
Depth: 3.2 (6.9)
Head: 6 (3.66)
Eye: 1.23 (4.85)
Snout: 1.23 (4.85)
Maxillary: 2.8 (2.14)

Dorsal fin: XX-15
Anal fin: II-23
Pectoral fin: 13
Ventral fin: 3
Scales absent
Lateral line absent

DESCRIPTION:

Body: Elongate, compressed, tapering and becoming more compressed from the posterior portion of the head backward; greatest depth at the origin of the dorsal fin; upper and lower profiles of trunk similar.

Profile of Head: Upper surface (exclusive of spines) descends in a gradual curve from the origin of the dorsal fin to the snout.

Head: 3.66 in length, more heavily built than the trunk, almost as broad as high. The difference in depth of head, body and tail shown in Metzelaar's *spinosa* not apparent in our fish.

A series of short, strong, forward-pointing spines on the head, exclusive of the cheeks, opercles and occipital regions, these strongest on the supraorbital ridge, and continued in a short triangular patch backward and above the eye. The spines are also found around the eye on its anterior border, on the snout and below the eye. On the posterior border of the eye the spines are absent but their place is taken by a broad bony ridge.

A large multifid tentacle over the eye, its length greater than the diameter of the orbit. A smaller multifid tentacle on the anterior nostril, its length about equal to eye.

Interorbital space: Concave, because of supraorbital ridges, slightly greater in width than half the diameter of the orbit.

Snout: Short, equal to eye when protuberant lip is measured.

Eye: 4.85 in head, situated in anterior part of the head, fairly high.

Mouth: Terminal, slightly oblique; the lips, especially the upper somewhat swollen; maxillary reaches beyond eye, 2.14 in head.

Teeth: (Paratype dissected) Upper jaw with a band of strong, pointed, inwardly-directed teeth, strongest anteriorly and becoming progressively shorter on the sides. Inside of this row anteriorly there is a band of much smaller pointed teeth. Mandible with a similar series of teeth, the inner teeth in a band anteriorly. Vomer and palatines strongly toothed.

Opercles: Smooth; a series of widely spaced pores on the preopercle.

Dorsal Fin: Continuous, the last ray connected to the caudal fin by a large delicate membrane, the fin originating about an eye's diameter back of the eye, immediately in back of the occipital region; the rays slightly longer than the spines. Space between the 3rd and 4th spines wider than remaining spaces.

Metzelaar's figure of *spinosa* the only other species of this genus, and his description show only rays in the dorsal and anal fins. In damaged specimens of *arborescens* and *variegata*, the spines are difficult to differentiate and might easily be called rays. Evidently the same condition is to be found in the related genus *Emblemaria*, as reference to Jordan and Evermann's "Fishes of North and Middle America" show that some of the species are supposed to possess

spines and others have only rays. It is felt that reexamination of some of these species will reveal that spines are present, although they are weak and flexible.

Anal Fin: Arises under 13th dorsal spine, rather low anteriorly, the rays longer posteriorly and connected to the caudal fin by a thin membrane.

Pectoral Fin: 13 to 14 rays, originating close to the opercle, its base with a slightly backward slant below; length of fin 1.6 to 1.7 in head.

Ventral Fins: Very small, I-2, inserted anterior to pectoral base.

Caudal Fin: Rather elongate, equal to slightly more than $\frac{1}{2}$ the head in length; roughly truncate, the outer rays but little shorter than the middle ones.

COLOR: (In life) General color of body tan, becoming paler posteriorly, and changing to dull blackish brown on lower anterior sides, especially on lower sides of head; the entire body heavily punctate with small black and reddish chromatophores, more marked anteriorly. A series of small whitish spots on cheeks and anterior part of the body. Supraocular and nasal tentacles as well as the spines on the head yellowish, the tentacles with minute black dots. Anterior portion of lips yellowish, with an indistinct vertical band of black dots followed by a white band on the middle of the lips. Dorsal fin membrane yellowish as far back as the 20th spine, the spines with vertical orange spots here and there, the membrane heavily pigmented basally and with a black semi-ocellus between the 3rd and 4th spines, the ocellus bordered below by a narrow white band beneath which is a broader pinkish one. Remainder of dorsal fin, the pectoral, caudal and anal rays pinkish, the anterior five membranes of the anal fin punctate.

(Alcoholic specimen) Olivaceous, pale and almost immaculate posteriorly, with small brownish punctations increasing in number anteriorly until the belly and most of the head, especially the lower parts, are closely pigmented. No traces of cross bands. Dorsal fin heavily pigmented anteriorly, especially the base, the fin with a pale margin. Posterior half of dorsal, and all other fins hyaline.

COMPARISON: This species differs from *spinosa*, the only species of the genus described heretofore, in teeth, smaller eye and greatly in color. It can be separated from the following species most easily by the presence of its large conspicuous, multifid supraocular tentacle, as well as in color, and in the shape of the anterior profile.

STUDY MATERIAL: Color Plate, H42 (the type in life); Photographs, 4482, 4484; Specimens, 4; all from same locality;—No. 6923, type, Lamentin Reef, Port-au-Prince Bay, February 22, 1927; 1 paratype, No. 7201, 20 mm., April 22, 1927; 2 paratypes, No. 7278, May 9, 1927.

TYPE NAME AND LOCATION: *arborescens*,—in allusion to the remarkable nasal and supra-ocular tree-like tentacles. Types and paratypes in the collections of the Department of Tropical Research of the New York Zoological Society.

Variegated Spiny-headed Blenny*Acanthemblemaria variegata* new species

TYPE: No. 7464, 25.2 mm. long, Lamentin Reef, Port-au-Prince Bay, May 8, 1927. Taken from inner side of reef in two feet of water.

FIELD CHARACTERS: Very small, scaleless blennies with top and front of head covered with short spines; a single simple cirrus over eye; brown mottled with lighter; lower jaw and chin with black spots.

MEASUREMENTS AND COUNTS OF TYPE:

Length: 25.2 mm.
Depth: 4.1 (6.15)
Head: 7 (3.6)
Eye: 1.5 (4.65)
Snout: 1.5 (4.65)
Maxillary: 3 (2.3)
Interorbital space: 1.8 (3.9)

Dorsal fin: XXI-14
Anal fin: II-22
Pectoral fin: 13
Ventral fin: 3
Scales absent
Lateral line absent

DESCRIPTION:

Body: Elongate, the trunk compressed, dorsal and ventral outlines similar, but abdomen rather heavy, a distinct angle at the vent.

Anterior profile: Horizontal from origin of dorsal fin to over middle of eye, then curved and descending in a straight line to the snout.

Head: 3.6 in length, about as wide as deep. Top of head to almost as far back as origin of dorsal fin, snout, suborbital region and region immediately posterior to eye, covered with short, strong, forward-pointing spines. These spines form a ring around the eye, the posterior ones shorter and blunter than the others. A very short blunt cirrus over each eye. Nuchal tentacles absent.

Interorbital Space: Concave, because of circumorbital spines, densely covered with spines, its width (including spines) slightly greater than diameter of eye.

Snout: Short, about equal to diameter of eye.

Eye: 4.65 in head, placed forward and high, but not entering the dorsal profile.

Mouth: Terminal, slightly oblique, the maxillary not quite reaching the posterior border of the eye.

Teeth: Both jaws with an outer row of strong inwardly-pointing teeth, the anterior ones much stronger and larger than the others. Inside of the large row in both jaws there is a band of smaller teeth anteriorly. Posterior to the group of smaller teeth the outer row of each side come closer to each other; they then gradually separate again. The general appearance of the lower jaw when viewed from above is that of an old fashioned key-hole.

Opercles: Smooth, rounded, the preopercular margin with a series of mucus pores.

Dorsal Fin: (XX-13 to XXI-15 in paratypes), the spines slightly shorter than the rays, the fin arising over the insertion of the preopercle. Posteriorly it is connected to the caudal peduncle by a membrane which barely touches the caudal rays.

Anal Fin: (II-21 to II-23 in the paratypes) similar to dorsal, arising beneath the space between the 12th and 13th dorsal spines.

Caudal fin: Short, equal to snout and eye, rather high and broadly rounded.

Pectoral Fins: 13 rays, its base broad, equal to snout and one third the eye.

Pelvic Fins: Small, placed under center of the opercle.

COLOR: In life, opercles pinkish cinnamon, dotted less densely above but becoming almost solid snuff brown below. Posterior edge of preopercle and whole of opercle sparsely stained with bluish white. Short area behind the nape pinkish cinnamon, dotted with snuff brown, this color also extending on the gill covers below. Three dark cross bars across the lower jaw.

Body complexly colored, but in general the ground color is greenish yellow, almost wholly obscured by brownish dots. Along the base of the dorsal are, from nape to caudal, about 12, fairly well marked, large spots of rufus; ten somewhat larger ones along the belly and an irregularly indicated band along the mid sides, all rufus or ferrugineous. The body, from the opercles including the pectoral pad to the anal fin, is sparsely stained with white. The posterior half of the body shows irregular areas rather paler than the rest of the ground color. The anterior 3 or 4 dorsal spines are golden green, the remainder rufus, the anterior 8 or 9 spines being dotted with brown. Pectoral and anal fins greenish, caudal colorless, but with 3 small black spots on upper and lower margins.

The type, in alcohol, is colored as follows: Entire trunk and head heavily covered with brown chromatophores, the chromatophores being found in irregularly-shaped patches, leaving the pale yellowish ground color and producing a mottled effect, these mottlings more marked along the base of the anal fin, leaving a series of more or less regularly spaced yellowish spots. The opercles are more completely covered with chromatophores, and possess an especially well-marked patch behind the eye on the preopercle. Lower jaw with three transverse, conspicuous brown bands; a brown spot on the branchiostegal rays. All fins hyaline, the rays with a few dark punctulations. Caudal fin with three small black spots near the tips of the rays, on its upper and lower margins.

VARIATION: The nine paratypes vary very slightly in form. In color, as might be expected among fishes that live inside of crevices and holes in coral, our specimens vary greatly, and the one extreme specimen was at first set aside to be described as a new species.

The type, the largest specimen of the series, is also the most brilliantly colored. The paratypes differ in that the mottled coloration of the sides has taken a more definite form, and is present in some specimens as a series of vertical dark bands, each two of which are roughly connected dorsally and ventrally. In others, the color is concentrated in a series of spots along the base of the anal, along the middle of the sides and sometimes at the base of the dorsal. The spots and lines on the lower jaw are always present to some degree, while the small spots on the upper and lower rays of the caudal are

sometimes absent. The myomeres are often marked with dark lines of pigment.

The one extreme specimen, mentioned above, agrees in proportions, disposition of spines, profile, etc. but its body is deep uniform blackish brown in color, with the spots on the caudal fin quite marked. In this specimen pigment is present along the dorsal and anal fins to such an extent that the rays appear to be thickened. However, a few of the other paratypes approach this condition, and as the specimen is not separable on other grounds we are considering it as a melanistic specimen of a variable species.

COMPARISON: Differs from *arborescens* in degree of armature of the head, the dorsal profile and markedly in color. From *spinosa* it differs in being less deep, in having simpler supraocular cirri, shorter rounded caudal fin and, comparing equal sized specimens, in color.

STUDY MATERIAL: Photographs 4483, 4500; Specimens, 10; 1, type, No. 7464, Lamentin Reef, Port-au-Prince Bay, May 8, 1927, and 9 paratypes, 14-23 mm. long, including Nos. 7098, 7195 (melanistic specimen) 7261, 7261a, 7278, 7278a, 7454,—all from worm-holes, coral and from among the branches of *Halimeda*-like coral, Sand Cay and Lamentin Reef, Port-au-Prince Bay, March 24 to May 9th, 1927.

Family CHAENOPSIDAE

Stathmonotus Bean, 1885

Coral Scaleless Blenny

Stathmonotus corallicola new species

TYPE: No. 7463, 21 mm. length, Lamentin Reef, Port-au-Prince Bay, April 22, 1927, taken from worm holes in old broken coral submerged about a foot.

FIELD CHARACTERS: Very small, longate, scaleless blennies, with long continuous dorsal fin composed of spines only; pectoral and ventral fins very small; a series of black and white bars on chin; anal fin with regular white vertical bars, the fin with a narrow pale border.

MEASUREMENTS AND COUNTS:

Length: 21 mm.
Depth: 2.1 (10)
Head: 3.4 (6.)
Eye: .78 (4.35)
Snout: .45 (7.8)

Dorsal fin: XLVII
Anal fin: II-25
Pectoral: 5 to 6
Scales absent
Lateral line absent

DESCRIPTION:

Body: Rather long, considerably compressed, especially posteriorly, dorsal and ventral profiles about equally curved.

Anterior Profile: Straight from dorsal fin to above eye, then gently curved to snout.

Head: Rather small, 6.2 in the length.

Interorbital Space: Narrow, flat, less than $\frac{1}{2}$ the width of the eye.

Snout: Conical, shorter than eye.

Eye: Small, 4.35 in head, placed far forward and high in the head, but not entering the dorsal profile.

Mouth: Slightly oblique; jaws equal: the maxillary reaching to posterior border of the pupil.

Teeth: Upper jaw with two rows of pointed teeth, the outer enlarged, the anterior ones largest. Lower jaw with two rows of teeth, the outer enlarged. A few teeth on the vomer.

Opercles: smooth.

Anus: Under 18th dorsal spine.

Dorsal Fin: XLVII, long, continuous, formed entirely of spines which are short anteriorly and become longer posteriorly, beginning over the posterior tip of the pectoral fin, and joined to the caudal fin by membrane.

Anal fin: II, 25, the posterior rays slightly longer. The two spines are as long as the anterior rays and are included in the membrane of that fin, not short and separated as in the illustration of *hemphilli*.

Caudal Fin: Rounded, equal in length to depth of fish.

Pectoral Fin: Extremely small and short, situated at posterior border of opercle, and consisting of about 5 rays.

Ventral Fins: Extremely short and small; situated anterior to pectoral base, consisting of 1 spine and 2 rays.

COLOR: (Alcoholic specimen) Grayish brown with indications of about 10 indistinct pale areas on the upper surfaces, extending about $\frac{1}{3}$ way down the sides. Scattered through the gray brown are very small pale dots, largest and most conspicuous on the cheeks. (These dots are formed by the absence of the darker chromatophores and those on the body are not discernable without a lens.) Snout and anterior part of head pale. Four radiating dark lines extend downward and backward from the eye, meeting their fellows from the opposite side of the head on the lower part of the head. Dorsal fin hyaline. Bases of caudal, pectoral and ventral fins dark. Anal fin dark with 7 white squarish spots, and with its lower edge pale.

COMPARISON: This species differs mainly in color, and slightly in fin count and proportions from *hemphilli*.

STUDY MATERIAL: Photographs, 4491, 4495; Specimens, 1; 21 mm., No. 7463, Lamentin Reefs, Port-au-Prince Bay, April 22, 1927.

TYPE NAME AND LOCATION: *corallicola*, in allusion to the fish being found inside of coral.

Type in the collection of the Department of Tropical Research of the New York Zoological Society.

Family OPHIDIIDAE; THE CUSK-EELS

Lepophidium Gill, 1863**Black-finned Cusk Eel***Lepophidium brevibarbe* (Cuvier)

REFERENCES: *Ophidion brevibarbe*, Cuvier, 1829, *Regne Animal*, Ed. 2, Vol. II, p. 358.

Lepophidium brevibarbe, Nichols and Breder, 1922, *Proc. Biol. Soc. Wash.*, 35, p. 13, fig. 1.

FIELD CHARACTERS: Elongate, somewhat compressed, tapering, eel-like fish with dorsal and anal fins confluent around the tail; head scaly as far as forehead; snout with a decurved hook; gill rakers 4 in number; scales very small; dorsal and anal fin with a black margin.

DESCRIPTION: A single 209 mm. fish is placed under this species, differing from Nichol's and Breder's redescription of the species in having longer ventral filaments, 2.4 in head. It agrees well in all other characters.

SIZE AND WEIGHT: A 209 mm. fish weighed 48 grams.

GENERAL RANGE: West Indies, Gulf of Mexico and Brazil.

STUDY MATERIAL: Specimen, 1; 209 mm., No. 7059.

Family GOBIESOCIDAE; THE CLING-FISHES

Key to Port-au-Prince Bay Genera

- A. Incisors of lower jaw with entire edges.....*Gobiesox*
 AA. Incisors of lower jaw tricuspid or serrate.....*Arbacia*

Gobiesox Lacépède, 1799**Large-eyed Clingfish***Gobiesox macrophthalmus* Günther

REFERENCES: *Gobiesox macrophthalmus*, Günther, 1861, *Cat. Fishes Brit. Museum*, III, p. 502.

Gobiesox macrophthalmus, Jordan and Evermann, 1898, *Fishes of North and Middle America*, III, p. 2335.

FIELD CHARACTERS: Small, rather elongate fishes, broad and depressed in front; a large sucking disk on ventral surface, formed of part of the body as well as the ventral fins. Incisor teeth without serrations. Coloration reddish.

DESCRIPTION: Seven very small fish (8-14 mm. long) are placed under this species, but with considerable hesitation. In most of our fish the teeth are not evident, and even when they are the determinations are extremely doubtful. The status of the Haitian Gobiesocids must be left until larger specimens are secured, and until the West Indian species are worked over.

GENERAL RANGE: St. Thomas, Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken from coral heads in Lamentin Reef in water two to three feet deep.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Taken by lifting old coral and coral heads into seines, breaking up the coral and searching through the debris.

STUDY MATERIAL: Specimens, 7; 8-14 mm., No. 7279.

Arbacia Jordan and Evermann, 1896

Key to Port-au-Prince Bay Species

- A. Color yellow-green with dark vertical bands on sides.....*rupestris*
 AA. Color red.....*sp.*

Rock-living Clingfish

Arbacia rupestris (Poey)

REFERENCES: *Gobiesox rupestris*, Poey, 1861, *Memorias*, II, p. 283.

Arbacia rupestris, Jordan and Evermann, 1898, *Fishes of North and Middle America*, III, p. 2341.

FIELD CHARACTERS: Small fish with anterior part of the body depressed; under surfaces with a conspicuous sucking disk formed of part of the body as well as the ventral fins. Incisor teeth with serrations along their edges. Greenish, with vertical brownish bands on sides.

DESCRIPTION: The single Haitian fish, 12 mm. long, had 6 rays in the anal fin.

SIZE: Grows to 1½ inches.

COLOR: General color pale yellow green, upper surface of head with brownish reticulations, inside of which are paler greyish spots. Sides of body with nine vertical, irregular brownish bands thickly dotted with blackish chromatophores. The first and second, and the third and fourth bands are joined superiorly. The brown of these bands is continued across the upper surface as a broken line of dots. A rather wide brown band from eye to snout; a broad brown band directly below eye on suborbital, three additional brown bands radiating from eye to base of pectoral. Head with many black chromatophores, especially prominent along edges of brown lines. Belly and under sides white. Pectoral, anal, ventral and caudal fins, plain, translucent. Dorsal fin with a group of small black chromatophores on base of anterior rays and membranes.

GENERAL RANGE: Cuba, Bahamas and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken in coral debris.

ABUNDANCE: Rare.

METHOD OF CAPTURE: Searching among weeds and broken coral.

STUDY MATERIAL: Specimens, 1; 12 mm., No. 7258.

Red Clingfish

Arbacia sp.

NOTE: Two specimens, 9.5 and 11 mm., differ from *rupestris* in color and

form. The incisors of the lower jaw are denticulated, but too slightly developed for adequate counting, while the teeth of the upper jaw are not visible.

COLORATION IN PRESERVATIVE: Covered everywhere with a fine peppering of minute scarlet dots, except for two wide, pale, vertical bands in front of and behind the dorsal. Dorsal and anal fins each with three scarlet bars and two plain interspaces. Caudal with four scarlet bars and three plain interspaces.

STUDY MATERIAL: Specimens, 2; 9.5 and 11 mm., Nos. 7234 and 7255. Lamentin Reef, Port-au-Prince Bay.

Family BALISTIDAE; THE TRIGGER-FISHES

Key to Port-au-Prince Bay Genera

- A. Gill opening with a number of enlarged bony plates or scutes behind it; eye with a groove before it; lateral line developed, not conspicuous, undulating ..... *Balistes*
- AA. Gill opening without bony plates or scutes behind it; no groove before eye; lateral line absent..... *Canthidermis*

Balistes Linnaeus, 1758

Queen Trigger-fish; Old Wife; Old Wench; Bouze

Balistes vetula Linnaeus

REFERENCES: *Balistes vetula*, Linnaeus, 1758, *Systema Natura*, p. 329.

Balistes vetula, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1703.

FIELD CHARACTERS: Medium-sized, compressed fish with small mouths; skin leathery but the scales very evident; dorsal fins separate, the 1st of 3 spines; the first spine much the longest and heaviest; dorsal and caudal fins with filamentous tips in the adult; cheeks with two broad curved bands of blue, and a series of smaller narrower bands above these.

GENERAL RANGE: Tropical parts of the Atlantic, occasionally north in the Gulf Stream to Woods Hole.

SIZE AND WEIGHT: Grows to 15 inches. A 166 mm. fish weighed 171 grams.

ABUNDANCE: Uncommon.

FOOD: Alimentary canal contained remains of *Thalassia* and small crustaceans.

STUDY MATERIAL: Specimens, 2; 166–300 mm., No. 7093.

Canthidermis Swainson, 1839 **Ocean Trigger-fish; Sobaco***Canthidermis sobaco* Poey

REFERENCES: *Canthidermis sobaco*, Poey, 1861, *Memorias*, II, p. 324.

Canthidermis sobaco, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1705.

FIELD CHARACTERS: Compressed, rather deep, leathery-skinned fishes, the scales of the trunk each with a median keel or spine; dark brown, the vertical fins dusky. Small specimens are mottled, green, and black, and yellow; the membrane of the spinous dorsal intense black.

DESCRIPTION: This species is included on the basis of one specimen, 29 mm. long, taken under Sargassum weed, on April 29th, 1927, in Port-au-Prince Bay. In the confused state of our knowledge of young specimens of *Canthidermis*, or for that matter of the adults, it is extremely difficult to identify them as accurately as is desired. The present specimen fits into *sobaco* slightly better than anything else. It bears comparison with a 67 mm. fish AMNH 3585 collected and identified by Mr. John T. Nichols as *sobaco*.

The relative dimensions of our 29 mm. fish are as follows:

Depth 1.5, head 2.4, eye 3, snout 1.9, dorsal fin III-26, anal fin 25.

SIZE AND WEIGHT: Grows to two feet.

GENERAL RANGE: West Indies, occasionally north in the Gulf Stream.

OCCURRENCE IN PORT-AU-PRINCE BAY: Known to us by a single specimen captured under Sargassum weed.

STUDY MATERIAL: Specimens, 1; 29 mm., No. 7231, under Sargassum weed.

Family MONACANTHIDAE; THE FILE-FISHES

Key to Port-au-Prince Bay Genera

- A. Pubic bone with a small spine at its end; gill opening short, nearly vertical.
- B. Dorsal spine not barbed, its edge merely rough.....*Cantherines*
- BB. Dorsal spine armed with strong retrorse barbs, usually in two series.
Monacanthus
- AA. Pubic bone without spine at its end; gill opening long, oblique; dorsal spine without barbs, inserted above the orbit, (very small fish may have barbs).....*Ceratacanthus*

Cantherines Swainson, 1839

Dusky Filefish; Lija Colorado

Cantherines pullus (Ranzani)

REFERENCES: *Monacanthus pullus*, Ranzani, 1842, Nov. Comm. Acti. Sci. Inst. Bonon., V, p. 4, Plate 1.

Cantherines pullus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 800.

FIELD CHARACTERS: Small to medium, leathery-skinned, small mouthed fishes, with dorsal spine large, situated immediately above the eye, and without barbs on its posterior side; pelvic flap ending in a short spine; brown with dull orange spots and bands.

DESCRIPTION: Four Haitian fish of about the same size (123–132 mm.) have the following dimensions, differing somewhat from those given by other authors.

Depth at vertical from vent 2.4.

Head to upper angle of gill opening 3.36–3.6.

COLOR: Dark chocolate brown, the entire body thickly covered with small, round dull orange spots each with a dark center. On the breast toward the snout these spots become irregular wavy bands. Five narrow blue stripes from eye to snout. Dorsal and anal fins transparent orange brown, the spines golden. Tip of caudal bright yellowish green shading into orange at base. Iris dark brown variegated with cream.

In preservative, indications of the above patterns remain, and in addition the caudal peduncle has become very pale. In three of the specimens pale horizontal bars are present on the sides, the most conspicuous being one from the upper portion of the caudal peduncle and one from the lower part. One band is visible above and one below these two bands.

SIZE AND WEIGHT: Reaches a weight of 6 pounds. A 131 mm. fish weighed 72 grams.

GENERAL RANGE: Florida, West Indies and Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Four specimens obtained by explosion of depth bomb in 60 to 150 feet of water, Lamentin Bay, February 2nd, 1928.

ABUNDANCE: Rare.

FOOD: Stomach contents showed sponge spicules, minute crustaceans, and a portion of a sea-urchin.

STUDY MATERIAL: Specimens, 4; 123–132 mm., No. 6814.

Monacanthus Cuvier, 1817

Key to Port-au-Prince Bay Species

(Based on Haitian Expedition specimens only.

See also key given by Breder, 1927.)

- A. Dorsal rays 35; anal rays 36.....*tuckeri*
 AA. Dorsal and anal rays 26 to 31.
 B. Dorsal and anal rays 29 to 31, the ventral flap extending beyond the ventral spine, the margin convex; profile in young concave....*ciliatus*
 BB. Dorsal and anal rays 26 to 29 (usually 27 to 29 in both anal and dorsal, one specimen only having 26 in both fins). The ventral flap never extending beyond the ventral spine.....*oppositus*

Reticulated Filefish*Monacanthus tuckeri* Bean

REFERENCES: *Monacanthus tuckeri*, Bean, 1906, Proc. Biol. Soc. Wash., XIX, p. 33.

FIELD CHARACTERS: Leathery-skinned fish with long barbed dorsal spine over posterior part of eye; pelvic flap large and extending beyond the spine; about 35 dorsal rays and 36 anal rays.

DESCRIPTION: Our single specimen (68 mm.) agrees quite well with the original description, the depth of our specimen being somewhat greater, 2.39 instead of 3.1. The eye in our specimen is 3.5 instead of 3 in the head. These differences can perhaps be accounted for by difference in size.

COLOR: (From life) General color above bluish gray brown, the lower half of the sides brown. The general color is more reddish anterior to the eye and darkest on the upper sides just behind the eye. Pelvic flap with irregular yellowish lines, more abundant distally and with bluish markings basally. Lower sides with coarse, bluish reticulations (corresponding to the hieroglyphic-like bands of Bean's description). Lips orange. Dorsal, anal and pectoral fins orange pink. Caudal fin dusky with irregular brownish bands. Small black cirri on sides of body. The four dark bands on the dorsal fin mentioned by Bean in his description were absent.

Compared with the description of other authors of preserved, slightly smaller fish, our alcoholic specimen shows the following differences: the dark band from the eye to the caudal is not sharply demarcated dorsally. It merges with the body color, and is most intense near the eye. The ventral outline is not marked by a band. The caudal is dusky, and the vertical bands are extremely irregular. The two dark lines on the ventral flap are absent and the spot on spot at its base is not present.

DIMENSIONS: Length 68 mm. standard measurement, 85 mm. total

<i>Proportionate Measurements</i>	
Depth	2.39
Head	3.1
Eye	3.5
Snout	1.26
Dorsal spine in head	1.39

GENERAL RANGE: Bermudas, Bahamas, Misteriosa Bank, Glover Reef, St. Eustatius, St. Martin and Porto Rico.

OCCURRENCE IN PORT-AU-PRINCE BAY: Our single specimen was taken on Sand Cay, a small sand and coral reef three miles from the nearest shore.

ABUNDANCE: Rare, a single specimen captured.

METHOD OF CAPTURE: Dynamite.

STUDY MATERIAL: Specimens, 1; 68 mm., No. 7268.

Leather-fish; Lija

Monacanthus ciliatus (Mitchill)

REFERENCES: *Balistes ciliatus*, Mitchill, 1818, American Monthly Magazine and Critical Review, March, 1818, p. 326.

Monacanthus ciliatus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1714, Plate CCLIX, fig. 634.

FIELD CHARACTERS: Small, leathery-skinned fishes with long pelvic flap, the outer margin of which is convex, and (in present Haitian specimens), with 29 to 31 dorsal rays.

DESCRIPTION: The Haitian specimens placed under this species differ from previous descriptions in having a consistently smaller fin count. All of our specimens have 29 to 31 anal rays. Previously described fin counts for the species have varied considerably and the following list shows a few of these variations:

	<i>Dorsal Rays</i>	<i>Anal Rays</i>
Jordan and Evermann, 1898	I-30	30
Metzelaar (Curacoa, St. Eustatius), 1919	I-30-32	31-33
Breder, 1927 (Florida, Bahamas, Isle of Pines)	I-31-35	31-35
Meek and Hildebrand, 1928, Panama	I-30-34	30-33
Haitian Expedition	I-29-31	28-31

Since the publication of Jordan and Evermann's "Fishes of North and Middle America," additional material has tended to raise the upper limit of the fin count to 35. The present specimens lower it. As the species is quite variable

and our fish cannot be separated from *ciliatus* in any other way, we conclude that the dorsal and anal rays of this species vary from 29 to 35.

It is however, important to emphasize that the variation in the fin ray in our material is small, and that the fin ray count averages consistently lower.

Examination of ten young from 11 to 13 mm. in length, revealed an average depth of 2.07.

In coloration they were somewhat different from similar sized *oppositus*,—in place of dots the green coloring is arranged in irregular spots and blotches. The webbing of the dorsal spine is almost free from pigment, wholly transparent except for a small round area of dense black pigment, close to and not far above the base of the spine, in the anterior central part of the web.

SIZE AND WEIGHT: Grows to 8 inches. A 50 mm. fish weighed 7 grams.

GENERAL RANGE: North Carolina to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found along shore mainly over weedy banks and at the surface, in the same situations as *oppositus*.

ABUNDANCE: Common.

METHOD OF CAPTURE: Seines and scoop-nets.

FOOD: Algae, small crustaceans, and other organic materials, all the result of browsing habits.

STUDY MATERIAL: Color Plate, H22; Photographs, 3771; Specimens, 37; 11 to 55 mm., including Nos. 6875, 7006, 7023, 7043, 7050, 7087, and 7185. Young taken at light, March 6th to April 20, 1927.

Poey's File-fish

Monacanthus oppositus Poey

REFERENCES: *Monacanthus oppositus*, Poey, 1861, *Memorias*, II, p. 331.

Monacanthus oppositus, Meek and Hildebrand, 1928, *Marine Fishes of Panama*, III, p. 798.

FIELD CHARACTERS: Small, leathery-skinned fishes with long, barbed spine over eye; dorsal and anal fins with 26 to 29 rays; pelvic flap short, never extending beyond the pelvic spine. Sides with longitudinal lines of small dark elongate spots.

DESCRIPTION: The Haitian material with the exception of one specimen which had 26 dorsal rays, instead of 27 to 29, answers perfectly the published descriptions of this species, both structurally, and in color.

Juveniles are readily separated from young *ciliatus*, even in specimens where the dorsal and anal fin counts are the same, by the greater depth of *oppositus*, and by the color. A series of *oppositus* captured at the surface at light at the same time as a similar series of *ciliatus* gave an average depth of 1.49 as

opposed to 2.07 for *ciliatus*. The average of the fin count was also lower, averaging D27.4, A27.6 for *oppositus*, and D30, A30 for *ciliatus*. In *oppositus* the profile from snout to dorsal is almost straight, only very slightly concave.

They differ also in color, a series of five young *oppositus*, 13 to 21 mm. are pale whitish, somewhat obscured by greenish, over which is scattered a number of large, very dark green dots, about 20 on the smallest specimen. The webbing of the dorsal spine is finely and evenly colored with minute green pigment.

COLOR: An 11.5 mm. fish had the body coppery gold with scattered dark pigment, more abundant above, and with faint indications of four broad, vertical bands.

SIZE AND WEIGHT: Grows to about 6 inches. A 116 mm. fish weighed 38 grams.

GENERAL RANGE: Cuba, Haiti, Panama, Colombia.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found along shore especially on weed covered banks.

ABUNDANCE: Common, captured at practically every seining along shore near Bizoton, and elsewhere in the Bay. The young came in great numbers to our submerged lamps.

METHOD OF CAPTURE: Older fish captured by seines, the young mainly taken in scoop nets as they came to the light.

FOOD: Omnivorous, quartz pebbles, small crustaceans, algae, and organic detritus found in alimentary canal.

STUDY MATERIAL: Color Plate, H102, No. 7187; Specimens, 82; 11.5 to 116 mm., including Nos. 6852, 6997, 7006, 7022, 7054, 7097, 7107, 7113, 7125, 7152, 7153, 7157, 7187, 7195, 7209 and 7260.

Ceratacanthus Gill, 1861

Key to Port-au-Prince Bay Species

- A. Dorsal rays 35 to 38, anal rays 39 to 41.....*schoepfi*
 AA. Dorsal rays 45 to 47; anal rays 48 to 50.....*scripta*

Common File-fish

Ceratacanthus schoepfi (Walbaum)

REFERENCES: *Balistes schoepfi* Walbaum, 1792, Artedi Piscium, p. 461.

Ceratacanthus schoepfi, Hildebrand and Schroeder, 1928, Fishes of Chesapeake Bay, p. 344.

FIELD CHARACTERS: Medium sized, ungainly, leathery-skinned fishes with small terminal mouth; dorsal fin consisting of a single spine followed after a wide space by the soft dorsal. Dorsal rays 35 to 38; anal rays 39 to 41.

DESCRIPTION: Our series of seventeen specimens show very unexpected

changes from young to adult in relative length and depth of body, the presence of four series of barbs on the dorsal spine, and their subsequent loss, a forward shifting of the dorsal spine from behind to in front of the eye, and a great reduction of the caudal fin.

The first character is demonstrated in the following six specimens:

Length	Depth in Length
21.5 mm.	4.5
34	3.8
55	3.5
97	2.8
175	2.3
398	1.9

SIZE AND WEIGHT: The extremes of our specimens were 21.5 mm. weighing .5 of a gram, and 430 mm. weighing 1134 grams (2½ lbs.).

COLOR: The colors varied not only in the species but from minute to minute in the same individual, changing swiftly and radically both in pattern and hue.

A 34 mm. fish usually had the head and body dark olive brown with silvery mottling on cheeks and anterior half of body, iris silvery, mottled with olive brown; base of vertical fins with three light zones and two dark ones, all of equal width. Spines with four series of strong, retrorse barbs.

The 430 mm. specimen was dark chocolate brown, densely covered with small, round, gold and orange dots; basal half of dorsal, anal and pectoral fins golden, distal half black, iris, tip of spine and edges of teeth clear gold.

GENERAL RANGE: Maine to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Occasionally seen in the market. We took young at light after dark, in seines near the reefs and under sargassum weed. A 17-inch adult was killed by an airplane bomb.

ABUNDANCE: Young common, adults more rarely seen.

FOOD: The alimentary tract of the largest fish was filled with algae similar to the common Sargassum weed, the small gaseous berry-like bladders being especially conspicuous. In smaller fish the contents of the long intestine were too comminuted to identify.

YOUNG: Young fish of about two inches in total length swim by very rapid vibrations of the vertical fins, too fast for the eye to follow, the fins appearing as a rayless blur. The tail is kept closed and used only for fast turns, the pectorals functioning as balancers and for slow turns.

GENERAL HABITS: I have recorded an interesting habit in my volume on the Haitian expedition "Beneath Tropic Seas," p. 154. (W. B.)

STUDY MATERIAL: Color Plate, H106, Drawings, 4117, 4119; Specimens, 17; 21.5–430 mm., including Nos. 6807, 6829, 7121, 7147, 7156, 7376, 7377, 7378

Scrawled File-fish

Ceratacanthus scripta (Osbeck)

REFERENCES: *Balistes scriptus*, Osbeck, 1757, Iter. Chin., 1, p. 144.

Alutera scripta, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1719.

FIELD CHARACTERS: Elongate, compressed, ungainly, leathery fishes; a single separate dorsal fin of one spine followed, after a wide space, by the soft dorsal fin; dorsal rays 45-47; anal rays about 48-50; caudal fin elongate, with rounded angles.

SIZE AND WEIGHT: Grows to 2 or 3 feet. Our 83 mm. fish weighed 7 grams.

GENERAL RANGE: West Indies, South Carolina to Brazil.

ABUNDANCE: Rare. A single specimen brought to us by a native fisherman.

STUDY MATERIAL: Specimens, 1; 83 mm., No. 7217.

Family OSTRACIDAE; THE TRUNK-FISHES

Lactophrys Swainson, 1839

Key to Port-au-Prince Bay Species

- A. Carapace without spines.....*triqueter*
- AA. Carapace with spines, one pointing backward on each side of the ventral ridge being always present.
- B. No spines in front and above eye.
- C. Carapace closed behind the dorsal fin; body with round dark spots.
bicaudalis
- CC. Carapace open behind the dorsal fin; body mottled with paler...*trigonus*
- BB. Frontal region with two strong spine-like horns.....*tricornis*

Trunk-fish; Rock Shellfish; Drunken-fish; Chopin; Plate- fish

Lactophrys triqueter (Linnaeus)

REFERENCES: *Ostracion triqueter*, Linnaeus, 1758, Systema Natura, Ed. X, p. 330.

Lactophrys triqueter, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1722.

FIELD CHARACTERS: Fishes with body encased in a bony box; the carapace without spines anywhere. Dark brown, thickly studded with circular spots of yellowish white.

SIZE AND WEIGHT: Grows to over 10 inches. A 135 mm. fish weighed 127 grams.

GENERAL RANGE: West Indies north to the Bermudas, Key West to Pensacola, Bahia; very common in the Tropics.

OCCURRENCE IN PORT-AU-PRINCE BAY: Known to us only from two specimens brought in by native fisherman.

ABUNDANCE: Uncommon.

FOOD: Alimentary canal contained only comminuted vegetable matter.

STUDY MATERIAL: Specimens, 2; 105–129 mm., including No. 7142.

**Chopin; Spotted Trunk-fish;
Coffre**

Lactophrys bicaudalis (Linnaeus)

REFERENCES: *Ostracion bicaudalis*, Linnaeus, 1758, Systema Natura, Ed. X, p. 330.

Lactophrys bicaudalis, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1723, Plate, CCLXII.

FIELD CHARACTERS: Fishes with the body encased in a bony box; carapace with a flat triangular spine on each ventral ridge, none in front of eyes; the carapace closed and continuous behind the dorsal fin. Yellowish, with numerous small, round, brown spots on carapace, tail and caudal fin.

SIZE AND WEIGHT: Grows to 16 inches. A 101 mm. fish weighed 63 grams.

GENERAL RANGE: West Indies to Bahia, Ascension Island.

OCCURRENCE IN PORT-AU-PRINCE BAY: A single specimen taken as the result of an airplane bomb explosion in 100 feet of water.

ABUNDANCE: Rare.

METHOD OF CAPTURE: High explosive.

FOOD: Algae and unidentifiable material.

STUDY MATERIAL: Specimen, 1; 101 mm. No. 6813.

**Common Trunk-fish; Chopin;
Shellfish**

Lactophrys trigonus (Linnaeus)

REFERENCES: *Ostracium irigonus*, Linnaeus, 1758, Systema Natura, Ed. X, p. 330.

Lactophrys trigonus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1723, Plate CCLXIII.

FIELD CHARACTERS: Fishes with the body enclosed in a bony box; the carapace open behind the dorsal fin; ventral ridges ending in a large flat spine; no spines in front of eye.

SIZE AND WEIGHT: Grows to 9 inches. A 216 mm. fish weighed 316 grams.

GENERAL RANGE: West Indies, very common as far north as Bermuda and Key West, occasionally to Massachusetts; south to Bahia.

OCCURRENCE IN PORT-AU-PRINCE BAY: One specimen brought in by fisherman. Occasionally seen in the fish markets.

ABUNDANCE: Uncommon.

STUDY MATERIAL: Specimen, 1; 216 mm., No. 7012.

Cow-fish; Cuckold; Toro*Lactophrys tricornis* (Linnaeus)

REFERENCES: *Ostracion tricornis*, Linnaeus, 1758, *Systema Natura*, Ed. X, p. 331.

Lactophrys tricornis, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1724.

FIELD CHARACTERS: Fishes with body enclosed in a bony case; the ventral ridges and frontal ridges with spines; color brown, yellow, blue or green, with irregular blue blotches.

SIZE AND WEIGHT: Grows to a foot or more. An 89 mm. fish weighed 37 grams, a 149 mm. fish 104 grams, and a 270 mm. fish 450 grams.

GENERAL RANGE: Tropical parts of the Atlantic, very common from Carolina to Brazil, ranging North in the Gulf Stream to Chesapeake Bay and rarely to Massachusetts.

OCCURRENCE IN PORT-AU-PRINCE BAY: Rather widely distributed in the bay.

METHOD OF CAPTURE: Seines, dynamite.

ABUNDANCE: Fairly common, seen quite often in markets.

FOOD: Alimentary canal of 72 and 100 mm. fish contained algae and remnants of sponge. The 260 mm. fish had eaten parts of algae, sponges and the spines of a small club-spined sea-urchin.

STUDY MATERIAL: Color Plates, H24, H111, H119; Photographs, 3765, 4118, 4122; Specimens, 8; 72-260 mm., including Nos. 6808, 6827 and 7212.

Family TETRAODONTIDAE; THE PUFFERS

Key to Port-au-Prince Bay Genera

- A. Body comparatively elongate; dorsal and anal rays 12 to 15; nostrils not in a tube.....*Lagocephalus*
 AA. Body oblong, plump; dorsal and anal fins with 6 to 8 rays; nostrils on either side in a short tube.....*Tetraodon*

Lagocephalus Swainson, 1839**Smooth Puffer***Lagocephalus laevigatus* (Linnaeus)

REFERENCES: *Tetrodon laevigatus*, Linnaeus, 1766, *Systema Natura*, Ed. XII, p. 411.

Lagocephalus laevigatus, Jordan and Evermann, 1898, *Fishes of North and Middle America*, II, p. 1728. Plate CCLXVI, fig. 642.

FIELD CHARACTERS: Smooth-skinned fish capable of inflating the abdomen with air or water. Jaws beak-like, with a median suture. Belly covered with three rooted spines. Body elongate, the depth four and one half times the length. Olive green above, silvery white on sides and below.

SIZE AND WEIGHT: Grows to a length of two feet. Our 200 mm. fish weighed 244 grams.

GENERAL RANGE: Massachusetts to Brazil.

FOOD: Our single specimen was taken on a hook baited with a small fish.

STUDY MATERIAL: Specimen, 1; 200 mm.

Tetraodon Linnaeus, 1758

Key to Port-au-Prince Bay Species

(Specimens over 20 mm. long)

- A. Upper surfaces of body without conspicuous, more or less concentric, pale lines.
- B. Snout, back and sides covered with honey-comb-like reticulations of fine, pale blue lines; a sparse scattering of large, dark spots within the reticulations. Body with evident membranous (not ossified) scales on sides, having free margins..... *marmoratus*
- BB. Sides with a conspicuous series of large blackish circular spots; membranous scales if present not possessing free margins; rather elongate, long headed puffers..... *spengleri*
- AA. Upper surfaces with light lines enclosing circular and elliptical areas and forming reticulations on the sides; sides and upper surface covered with small black dots..... *testudineus*

Spiny-backed Puffer

Tetraodon marmoratus (Ranzani)

REFERENCES: *Tetraodon marmoratus*, Ranzani, 1840, *Novi Comment. Ac. Sci. Inst. Bonon.*, IV, p. 73, Plate X, fig. 1.

Sphoeroides marmoratus, Meek and Hildebrand, 1928, *Marine Fishes of Panama*, III, p. 813.

FIELD CHARACTERS: Small fishes with rather loose skin, the belly capable of being inflated with air or water; mouth small, teeth nipper-like, with a median suture; sides of head and body prickly. Sides with pale blue reticulations enclosing large dark spots.

DESCRIPTION: Two small specimens 18 and 33 mm. come within the descriptions of this species, although the head in both is slightly larger than the specific average.

The blue reticulations are not visible on either of the preserved specimens, but this coloration was very conspicuous in the living fishes, marking them at once as different from the other Haitian Puffers.

A series of 22 small puffers, 6 to 14 mm. was taken at the surface at night, as they came to our submerged lamps. They are placed with some hesitation under this species. In form they resemble the 18 and 33 mm. specimens, being considerably heavier than the other Haitian species. In coloration they also are closest to *marmoratus*, possessing none of the conspicuous dorsal marks of *testudineus* or the large spots of *spengleri*. Of importance also is the fact that they have pale transparent caudal fins, agreeing with our slightly larger *marmoratus* and not with the other species.

An 11.5 mm. specimen of this series can be described as follows:

Head 2.3, depth 2.88; dorsal 8, anal 7, caudal 10 and pectoral 10.

Body rather robust, its greatest width and depth at the gill slit; head large; snout 2.5 in head; interorbital bone, 2.5 in eye; skin with conspicuous prickles from behind eyes to dorsal fin, and on sides and belly, those on the sides more flattened and scale-like; dorsal fin inserted posteriorly, the distance from snout to origin of dorsal fin 1.28 in length: the distance from origin of dorsal to tip of caudal 1.9 in length: anal fin similar to dorsal but lower: caudal fin truncate, the edges slightly rounded; upper rays of pectoral fin about twice as long as lower.

In color this fish agrees well with the others, and may be described as follows:

Entire dorsal surface (alcoholic specimens) and sides down to line of belly, dark brown, thickly peppered with small black spots. In a few specimens this coloration is continued on the belly. Lower surfaces pale yellow white. Lips and end of caudal peduncle pale yellowish. All other fins pale translucent.

COLOR: (33 mm. fish from life). Above olive brown or greenish, with snout, back and sides covered with honey-comb-like reticulations of fine, pale blue lines. An irregular sparse scattering of large dark spots always in the blue cells, increasing in distinctness and number on the sides; on the sides are 11 to 12 large spots bounded by white instead of pale blue, the white forming intervening spots. Below, ivory white becoming pale lemon from pectoral to anal fins. Caudal yellowish, unmarked. Iris gold at center changing to olive green on outer two-thirds.

SIZE AND WEIGHT: Our 33 mm. fish weighed 2 grams.

GENERAL RANGE: West Indies to Brazil.

OCCURRENCE IN PORT-AU-PRINCE BAY: Taken along shore over shallow, weed-covered banks, and at surface at night.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Seines, traps and scoop nets at night.

STUDY MATERIAL: Specimens, 2; 18-33 mm., including 6897, and the following small specimens tentatively placed here; 22, 6-14 mm., all taken at surface at night, including Nos. 6963, 6984, 6997, 7027, 7054, 7087A, 7097D, 7125, 7152, 7243.

Southern Puffer

Tetraodon spengleri (Bloch)

REFERENCES: *Tetraodon spengleri*, Bloch, 1785, *Naturg. Ausl. Fische*, I, 135, Plate CXLIV.

Spheroides spengleri, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 815.

FIELD CHARACTERS: An elongate, smooth-skinned, flat-keeled fish, dark mottled over white below, with about twelve large, round, dark spots extending along sides from mouth to tail. Caudal divided into thirds by three vertical bands, black, white and black.

SIZE AND WEIGHT: An 80 mm. fish weighed 13.5 grams.

GENERAL RANGE: Massachusetts to West Indies and Panama.

OCCURRENCE IN PORT-AU-PRINCE BAY: Observed near shore and in coral reef three miles out.

ABUNDANCE: Rare; two small specimens taken.

METHOD OF CAPTURE: Seined and taken on hook.

STUDY MATERIAL: Photograph, 4096; Specimens, 2; 80-84 mm., including Nos. 6896 and 7139.

Turtle-headed Globefish; Fou-fou sans piquant; Tambor

Tetraodon testudineus Linnaeus

REFERENCES: *Tetraodon testudineus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 332.

Sphoeroides testudineus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 817.

FIELD CHARACTERS: Small to medium fishes with rather loose skin, the belly capable of being inflated with air or water; mouth small, the teeth nipper-like, with a median suture; upper surfaces dark, with pale, narrow bands forming more or less concentric ovals and circles.

DESCRIPTION: The Haitian fish are quite typical.

SIZE AND WEIGHT: Grows to 9 inches. A 32 mm. specimen weighed 1.2 grams, and a 143 mm. fish weighed 73.5 grams.

GENERAL RANGE: West Indies, occasionally northward to the vicinity of New York.

OCCURRENCE IN PORT-AU-PRINCE BAY: Quite widely distributed and found along shore.

ABUNDANCE: Common.

METHOD OF CAPTURE: Traps, seines, dynamite.

STUDY MATERIAL: Specimens, 24; 30-171 mm., including No. 6898.

Family CANTHIGASTERIDAE

Canthigaster Swainson, 1839

Sharp-nosed Puffer

Canthigaster rostratus (Bloch)

REFERENCES: *Tetrodon rostratus*, Bloch, 1782, Ichthyologia, Plate 146.

Canthigaster rostratus, Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1741.

FIELD CHARACTERS: Smooth-skinned puffer, snout elongated, body from the eye to the dorsal fin compressed and ridge-like, dorsal and ventral aspects of peduncle black; radiating lines around eye.

SIZE AND WEIGHT: Our 50 mm. specimen weighed 6.5 grams.

COLOR: General color of upper surfaces of head, body back to posterior portion of dorsal fin, and the chin, brownish. Sides and belly creamy white, the belly with a median, narrow bluish line. Head above, below and in front of eye, sides of head immediately in back of eye, dull orange, the orange continued as a narrow line on side of body as far back as posterior end of dorsal fin, the orange on the side of the head with many small bluish dots. A series of vertical blue lines on snout, the anterior ones continued onto the chin. A series of curved blue bands radiating outward from the eye,—four forward and downward, and four downward and backward. Upper edge of eye blue. Pectoral fin with a yellowish base. Dorsal fin yellow at base, then blackish and with a series of short bluish bands extending downward and forward on the body from the base of the fin. Caudal fin translucent with a slight yellowish tinge, the upper and lower edge black. This black continued onto the body and reaching almost to the posterior base of the dorsal. A few longitudinal bluish bands within the upper black patch, the lowermost continued forward on the sides as a series of small blue spots. Blue on lower patch in more oblique bands and smaller spots. Iris gold.

GENERAL RANGE: Florida, West Indies, Bermuda, and the Madeiras.

OCCURRENCE IN PORT-AU-PRINCE BAY: The only specimen taken was shot with a small harpoon from an air rifle at Sand Cay on February 25th. A second individual was seen day after day while we were diving at the same reef but was not secured.

STUDY MATERIAL: Color Plate, H46, No. 6958; Photograph, 3924; Specimen, 1; 50 mm., No. 6958.

Family DIODONTIDAE; THE PORCUPINE-FISHES

Key to Port-au-Prince Bay Genera

- A. Dermal ossifications consisting of slender, stiff, pointed movable spines. *Diodon*
- AA. Dermal ossifications consisting of short, stiff, immovable spines. *Chilomycteris*

Diodon Linnaeus, 1758

Key to Port-au-Prince Bay Species

- A. Frontal spines equal to or shorter than the post-pectoral ones. . . . . *hystrix*
- AA. Frontal spines longer than the post-pectoral ones. . . . . *holacanthus*

**Short-spined Porcupine-fish;
Foufou avec piquant**

Diodon hystrix Linnaeus

REFERENCES: *Diodon hystrix*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 335.

Diodon hystrix, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 827.

FIELD CHARACTERS: Small to medium, short and robust fishes with body covered with sharp, erectile movable spines; belly capable of spherical inflation; spines of front of head shorter or almost as long as those behind the pectoral fin.

DESCRIPTION: The separation of the two West Indian species of *Diodon* is based chiefly upon the relative length of the frontal and post-pectoral spines. We have three young and two large adults which show the frontal spines distinctly short, and to this we follow Meek and Hildebrand in adding 22 specimens which have the spines in the two areas of equal length. In ontogenetic growth there is a relative increase in size of the snout and interorbital and a considerable decrease in size of the eye.

SIZE AND WEIGHT: A specimen of 56 mm. weighed 15 grams. Attains a length of three feet.

COLOR: There is considerable individual change of color, both under stress of emotion and by night and day. At night, those which were taken at the submerged light were pale grey with the dark patches barely discernable. Iris and fins often lemon yellow.

GENERAL RANGE: Recorded from all warm seas.

OCCURRENCE IN PORT-AU-PRINCE BAY: The young are very common among the weeds and wharves near shore and at the surface at night; seldom seen near coral reefs. Adults secured by airplane bombs and in market.

METHOD OF CAPTURE: Seining, dynamite.

FOOD: Bottom debris, crustaceans, sponges, algae, etc.

ENEMIES: Although apparently well protected by their armature of spines we found the following six species of fish feeding upon these puffers:

Haemulon plumieri.

Peprilus paru.

Lutianus analis.

Lutianus griseus (11 snappers had eaten 15 puffers).

Lutianus synagris (14 individuals had eaten 15 puffers).

Tylosurus raphidoma.

In a series of sixty small puffers, seven had external parasitic isopods on either fins or skin, as follows:

Specimen No. 1,—2 parasites on right pectoral.

Specimen No. 2,—2 parasites on left pectoral.

Specimen No. 3,—2 parasites on left pectoral.

Specimen No. 3,—1 parasite on right pectoral.

Specimen No. 3,—1 parasite on skin near anal.

- Specimen No. 4,—1 parasite on left pectoral.
Specimen No. 4,—1 parasite on right pectoral.
Specimen No. 4,—2 parasites on dorsal.
Specimen No. 4,—2 parasites on caudal.
Specimen No. 4,—1 parasite on ventral.
Specimen No. 5,—3 parasites on right pectoral.
Specimen No. 5,—1 parasite on caudal.
Specimen No. 6,—1 parasite on left pectoral.
Specimen No. 7,—1 parasite on right pectoral.

GENERAL HABITS: When picked up these fish inflate themselves immediately, and if thrown back, turn over and deflate in from three to five seconds. When inflating in the air, crackling sounds are given forth. Usually when taken out of the water they live for ten or fifteen minutes, without struggling, and then gradually swell up to full rotundity in about five seconds, and after five minutes they die. They may flatten or remain quite round in death. ("Beneath Tropic Seas," pp. 24-25.)

STUDY MATERIAL: Photographs 4021, 4022; Specimens, 77: 2; 290 and 312 mm. About 75 young, 55-65 mm.

Long-spined Porcupine-fish

Diodon holacanthus Linnaeus

REFERENCES: *Diodon holacanthus*, Linnaeus, 1758, Syst. Nat., Ed. X, p. 335.

Diodon holacanthus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 829.

FIELD CHARACTERS: Small to medium, short and robust fishes with body covered with sharp erectile movable spines; belly capable of inflation; spines of front of head longer than those behind the pectoral fin.

DESCRIPTION: The greater length of the frontal spines over those of the post pectoral ones, is the only consistent character. The data under *hystrix* applies equally to this species.

GENERAL RANGE: Recorded from all warm seas.

STUDY MATERIAL: Specimens. About 100 young 55-70 mm.

Chilomycterus Bibron, 1846

Cuvier's Burr-fish

Chilomycterus antennatus (Cuvier)

REFERENCES: *Diodon antennatus*, Cuvier, 1818, Mem. Mus. Hist. Nat., Paris, IV, p. 131.

Chilomycterus antennatus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 832.

FIELD CHARACTERS: Small fishes with skin covered with short, stiff, more or less immovable spines; mouth small, transverse; body usually covered with small black spots; a larger black spot on nape, a kidney shaped black spot above each pectoral fin, and a dark spot surrounding the anterior part of the dorsal fin.

DESCRIPTION: The three specimens in the collection have the entire body and the caudal fin spotted with black, those on the fin small and few in number. On one of the fish the black nape spot is absent. The largest fish has very small spines about the head, and the supra-orbital spines and tentacle are represented only by their apparently much abraded bases.

SIZE AND WEIGHT: Grows to about eight inches. A 127 mm. fish weighed 160 grams.

GENERAL RANGE: West Indies southward. Recorded from Porto Rico, Haiti, Jamaica, St. Croix, Trinidad, Panama, and Cape of Good Hope.

OCCURRENCE IN PORT-AU-PRINCE BAY: One fish taken as the result of air-plane bombing, and two seined along shore over weed covered shallows.

ABUNDANCE: Uncommon.

METHOD OF CAPTURE: Seines and explosive.

FOOD: Two specimens contained the remains of mollusks.

STUDY MATERIAL: Photographs, 3752, 3753; Specimens, 3; 111-127 mm., including Nos. 6826 and 6973.

Family ANTENNARIIDAE; FROG-FISHES

Key to Port-au-Prince Bay Genera

- A. Ventral fins well developed and long, often reaching nearly or quite to the origin of the anal fin.....*Histrio*
 AA. Ventral fins short, never remotely reaching the base of the anal fins.

Antennarius

Histrio Fischer, 1813

Common Frog-fish

Histrio gibbus (Mitchill)

REFERENCES: *Lophius gibbus*, Mitchill, 1815, Trans. Lit. and Phil. Soc. N. Y., I, Pl. IV, fig. 9.

Histrio gibbus, Meek and Hildebrand, 1928, Marine Fishes of Panama, III, p. 1010.

FIELD CHARACTERS: Strange, small-sized, froglike fish, living among floating seaweed; body oval, robust, mouth almost vertical, a long fleshy tentacle on head, pectoral fin with the lbow, rays mobile, used like fingers, ventrals long, reaching to anal; color variegated, spotted with yellow and white and black like seaweed.

DESCRIPTION: Our specimens are typical.

SIZE AND WEIGHT: Our largest specimen of 63 mm. weighed 15 grams.

GENERAL RANGE: Panama, Key West and the West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Not rare under masses of sargassum weed brought in by the tide.

FOOD: Shrimps and small fish; two individuals proved their cannibalistic nature by swallowing entire, smaller companions.

STUDY MATERIAL: Photographs, 4148 to 4153 inclusive, 4167, 4189 and 4226; Specimens, 14; 14 to 63 mm., Nos. 7104, 7155, 7195D, 7199, 7211 and 7223.

Antennarius Lacépède, 1798

Short-tentacled Frogfish

Antennarius inops Poey

REFERENCES: *Antennarius inops*, Poey, 1881, Anal. Soc. Esp. Hist. Nat. X, p. 340.

Antennarius inops, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2718.

FIELD CHARACTERS: Typical frogfish, with three separate dorsal spines; the first short, translucent, arising from the stem of the second, ending in an oval, fleshy bait; color brown variegated with white, three very wide bands radiating from the eye, forward, backward and downward.

DESCRIPTION: Although our two specimens are very small, in measurements and spine structure they agree with the published descriptions.

GENERAL RANGE: Porto Rico and Haiti.

OCCURRENCE IN PORT-AU-PRINCE BAY: Two small specimens taken under sargassum weed.

STUDY MATERIAL: Specimens, 2; 12 and 14 mm., No. 7469.

Family OGCOCEPHALIDAE; THE BAT-FISHES

Key to Port-au-Prince Bay Genera

- A. Disk with frontal region elevated, snout more or less produced forward, the tail stout; eyes lateral.....*Ogcocephalus*
- AA. Disk with the frontal region depressed, not elevated above the rest; snout rounded.....*Halieutichthys*

Ogcocephalus Fischer, 1813

Key to Port-au-Prince Bay Species

- A. Snout produced, the rostral process pointed, 6 to 10 in length of body.....*vespertilio*
 AA. Snout shorter, the rostral process 12 to 15 times in length of body.
nasutus

Long-snouted Batfish*Ogcocephalus vespertilio* (Linnaeus)

REFERENCES: *Lophius vespertilio*, Linnaeus, 1758, Syst. Nat., Ed. X, I.

Ogcocephalus vespertilio, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2737.

FIELD CHARACTERS: Small, bottom fish, body depressed, broad, triangular, studded with tubercles; head as long as the rest of the body; a projecting bony rostral process six to ten times in length of body; cavity of rostral tentacle higher than broad.

DESCRIPTION: Measurements of two specimens are as follows:

	No. 6823	No. 6861
Length	64 mm.	76 mm.
Depth	15 (4.3)	15 (5.1)
Width	35 (1.85)	42 (1.8)
Head	32 (2)	37 (2)
Eye	5 (6.4)	10.5 (3.5)
Rostral process (snout)	8 (8)	9.5 (8)
Pectoral length	16 (2)	18 (2)

Two small individuals come within the rostral measurements of *vespertilio*, but this very extension of the anterior part of the head has resulted in a lengthening of the tentacular cavity, making it longer than broad. The maxillary reaches a vertical line only half-way back across the eye. In life all the tubercles are tipped with waving filaments of brownish grey.

SIZE AND WEIGHT: The two specimens taken are two and one-half, and three inches in length. The latter weighed 17 grams.

COLOR: Upper parts monochrome brown, except face below eye, a patch on each side of mid-back, and armpits, which are covered with good-sized, round, dark-brown spots, each narrowly bordered with silver. Ventral surface reddish; pectoral brilliant yellow on under surface of basal half, remainder of lower surface of pectoral black; posterior half of caudal black. Iris silvery, reticulated and mottled with dark brown, except anteriorly where it is very finely peppered with dark; pupil irregularly heart-shaped.

GENERAL RANGE: West Indies to Florida, occasionally north in mid-summer to New York.

OCCURRENCE IN PORT-AU-PRINCE BAY: Widely distributed over bottom.

ABUNDANCE: Two specimens taken; six or eight others seen in market.

METHOD OF CAPTURE: Seines dragged along the bottom.

STUDY MATERIAL: Photographs, 3832, 3986 of living fish; Specimens, 2; 64-76 mm., both males, No. 6861 and 6823.

Short-snouted Batfish

Ogcocephalus nasutus (Cuvier and Valenciennes)

REFERENCES: *Malthaea nasuta*, Cuvier and Valenciennes, 1837, Hist. Nat. Poiss., XII, p. 452.

Ogcocephalus nasutus, Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2737.

FIELD CHARACTERS: Same as *Ogcocephalus vespertilio*, but rostral process shorter, twelve to fifteen times in length of body, cavity of rostral process not higher than broad.

DESCRIPTION: Measurements of two specimens are as follows:

	No. 7299	No. 7040
Length (upper jaw to caudal)	152 mm.	174 mm.
Depth	31 (4.9)	37 (4.7)
Width	82 (1.85)	103 (1.7)
Head	70 (2.2)	84 (2.1)
Eye	13 (5.4)	13 (6.5)
Rostral process (snout)	11.5 (13.3)	14.5 (12)
Pectoral length	34 (1.3)	43 (1.9)

SIZE AND WEIGHT: A specimen nearly seven inches long weighed 185 grams.

COLOR: Above a mingling of olive-buff, cinnamon-drab and glaucous blue, with irregular blotches of honey yellow, and groups of dark brown dots near the gill-openings and back of the eyes; the face and sides of the head, and much of the sides of the body are also dark brown. The entire ventral surface is deep red, changing from indian red to dragon's-blood; base of the anal fin, interior of the gill-openings and the inside of the lips and mouth are bright spectrum red. The tentacle, the tip of the caudal and the ventrals are pink; the base of the pectorals greenish yellow. The iris is variegated like the back, and the pupil, even after preservation, reflects the light as brilliant blue.

GENERAL RANGE: West Indies.

OCCURRENCE IN PORT-AU-PRINCE BAY: Found generally on the bottom of the Bay.

ABUNDANCE: Not rare; two specimens taken, others seen in the market.

METHOD OF CAPTURE: Seines drawn along the bottom.

STUDY MATERIAL: Color Plates, H30, H31, Dorsal, ventral, lateral and front views of 7040; Photographs, 3985, 4044, 4045, living fish; Specimens, 2; 152 and 174 mm., Nos. 7040 and 7299.

Halieutichthys Poey, 1863

Reticulated Batfish

Halieutichthys aculeatus (Mitchill)

REFERENCES: *Lophius aculeatus*, Mitchill, 1818, Amer. Mon. Mag., II, p. 325.

Halieutichthys aculeatus, Evermann and Marsh, 1902, Fishes of Porto Rico, p. 338.

FIELD CHARACTERS: Very small, pale-colored batfish with conspicuous dark reticulations all over disk; pectoral fins pale bluish white, black and turquoise blue, at least in young.

DESCRIPTION: A typical specimen showed the following measurements:

Length: 17.6
Depth: 4 (4.4)
Width: 11.5 (1.5)
Head: 10.5 (1.68)
Eye: 2.1 (5)

Snout: .75 (14)
Width of mouth: 2.5
Interorbital: 1.1 (1.9)
Length pectoral rays: 5.5 (1.9)
Pectoral count: 18
Dorsal count: 5
Anal count: 4
Caudal count: 9

The width of the disk is slightly less than from snout to last dorsal ray; the bridge over the rostral cavity has a three-pointed spine above, and a similar one on each side; a large, simple spine between eye and nostril; a double-pointed spine on the supraorbital margin; three, low soft fleshy protuberances near the lower margin of eyeball.

SIZE AND WEIGHT: The longest individual taken was 21 mm. in length.

COLOR: Pale, cold gray with many fine, dark brown reticulations. Pectoral, gray and reticulated for the first eight rays, the reticulations tending into black, broad, cross-bars. The anterior elongated ten rays are bluish white for the basal third, the second third black with the spines golden, and the terminal third is pale turquoise blue with yellowish spines. Dorsal dark. Caudal bluish white, deepening to turquoise at tip, with four brown cross bars. The iris is like the body, the pupil both in life and long after preservation showing a vivid iridescence of deep blue to green.

GENERAL RANGE: Western Atlantic; West Indies; Gulf of Mexico, and Gulf Stream.

OCCURRENCE IN PORT-AU-PRINCE BAY: Observed only at surface light, at night.

ABUNDANCE: Twelve young individuals were taken on nine nights in March and April.

METHOD OF CAPTURE: Hand net at night, from schooner's gang-way.

YOUNG: All specimens taken were young, under an inch in length.

GENERAL HABITS: *Halieutichthys aculeatus* has only once been taken in water shallower than twenty-four fathoms, while one hundred miles off Cape Fear it came up from ninety-five fathoms. Elsewhere, species of the genus have been found living at a depth of one hundred and thirty-seven fathoms. *Aculeatus* is a typical member of its family, which in structure and known facts of habitat is essentially composed of bottom dwellers, restricted to deep coastal waters. It seems probable that this family originated in tropical coastal waters and became slowly distributed outward and downward.

It was an interesting surprise to find young *Halieutichthys* coming to the surface light, night after night, swimming easily and sustaining themselves without effort. The pectorals were constantly expanded to the widest extent and the propelling power was derived from the caudal, with some help from the dorsal and anal fins. The full pectoral expansion is equal to four-fifths of the entire dorsal surface of the body, so its sustaining power, given any forward impetus at all, is very considerable. Twice I saw these young fish come to the surface and cup their pectorals and actually float motionless, with the tips of the pectoral rays and the snout and eyes just out of water.

From 9 P. M. during nine separate nights, these young batfish came singly to the light, up from the black depths, and allowed themselves to be scooped up. The light was two thousand candle power and dropped just below the surface at the schooner's side, about two hundred yards from shore over a depth of six to ten fathoms.

These individuals, both in pectoral colors and more deep-seated characters, present a number of differences from typical *aculeatus*, but not greater than can be attributed to immaturity.

The bathymetrical activities of the young may be taken as an illustration of the somewhat discarded Von Baer's law. (W. B.)

STUDY MATERIAL: Color Plate, H61, No. 7042; Photographs, No. 3975, 3976, 3977, of living fish; Specimens, 12; averaging 17 mm., Nos. 7042a, b, c, 7097, 7182.

MARINE FISH RECORDED FROM HAITI AND SANTO DOMINGO

In addition to the fishes recorded in the preceding pages, the following species have been listed from the island of Haiti. In making this list we have ignored the political boundaries between the two countries composing the island, as has been customary with most authors.

The present list contains a single reference, not necessarily the first, to an account wherein the species is mentioned as found on the island. Combined with the Port-au-Prince Bay species, it forms a check-list of the known fishes of Haiti, exclusive of the fresh-water families *Cichlidae* and *Poeciliidae* which will be treated in a later paper. We have attempted to make this list as complete as possible, but owing to the obscurity of some Haitian fish records, a few may have escaped us. The correction of such omissions will be gratefully received.

In certain cases where we are not certain of the status of a species, we have included it under the name by which it was originally published. This applies especially to some of the gobies.

Class ELASMOBRANCHII

Order BATOIDEA

Family DASYATIDAE

Dasyatis say (Le Sueur)

Dumeril, A., 1865, Hist. Nat. Poiss., I, p. 603.

Class PISCES

Order HOLOSTEI

Family LEPISOSTEIDAE

? *Cylindrosteus scabriceps* Fowler

Fowler, 1910, Proc. Phil. Acad. Nat. Sci., 1910, p. 607.

(This record is very doubtful as, according to the describer of the fish, the Santo Domingan specimens may have been wrongly labelled.)

Order ISOSPONDYLI

Family ALBULIDAE

Dixonina nemoptera Fowler

Fowler, 1910, Proc. Phila. Acad. Nat. Sci., 651.

Family CLUPEIDAE

? *Sardinella clupeola* (Cuvier and Valenciennes)

Metzelaar, 1919, Over tropische Atlantische visschen, p. 11 (Identification uncertain).

Family ENGRAULIDAE

Anchoviella perfasciatus (Poey)

Günther, 1868, Cat. Fish. Brit. Mus., VII, p. 391.

Anchovia clupeoides (Swainson)

Fowler, 1915, Copeia, No. 24, p. 50.

Order APODES

Family MURAENIDAE

Enchelycore nigricans Bonnaterre

Lönnberg, 1895, Oefvers. Svensk. Vet. Akad. Förh., 52, 657-663.

Gymnothorax ocellatus Agassiz

Fowler, 1915, Copeia, 24, p. 50.

Echidna catenata (Bloch)

Lönnberg, 1895, Oefvers. Svensk. Vet. Akad. Förh., 52, 657-663.

Order INIOMI

Family SYNODONTIDAE

Synodus dominicensis Fowler

Fowler, 1911, Proc. Phila. Acad. Nat. Sci., 1911, p. 564.

Order SYNENTOGNATHI

Family BELONIDAE

Tylosurus timucu (Walbaum)

Fowler, 1915, Copeia, 24, p. 50.

Order HETEROSOMATA

Family ACHIRIDAE

Achirus inscriptus Gosse

Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2696.

Family BOTHIDAE

Platophrys ocellatus (Agassiz)

Lönnberg, 1895, Oefvers. Svensk. Vet. Akad. Vorh., 52, 657-663.

Order THORACOSTEI

Family SYNGNATHIDAE

? Hippocampus longirostris Cuvier

Dumeril, A., 1865, Hist. Nat. Poiss., II, p. 518 (Identity uncertain).

Order PERCOMORPHI

Family MUGILIDAE

Mugil brasiliensis Agassiz

Günther, 1861, Cat. Fish. Brit. Museum, III, p. 431.

Agonostomus percoides GüntherGünther, 1861, Cat. Fish. Brit. Museum, III, p. 464. (A doubtful species, probably identical with *monticola*.)*Joturus pichardi* Poey

Fowler, 1915, Copeia, 24, p. 50.

Family SPHYRAENIDAE

Sphyraena borealis De KayFowler, 1903, Proc. Phila. Acad. Nat. Sci., 1903, p. 750. (This species and *picudilla* are possibly the same.)

Family SCOMBRIDAE

Scomberomorus cavalla (Cuvier)

Günther, 1860, Cat. Fish Brit. Mus., II, 373.

Family GEMPYLIDAE

Gempylus serpens Cuvier

Fowler, 1904, Proc. Phila. Acad. Nat. Sci., 1904, p. 767.

Family CENTROPOMIDAE

Centropomus parallelus Poey

Boulenger, 1895, Cat. Fish Brit. Mus., 2nd ed., I, p. 369.

Centropomus gabbi FowlerFowler, 1906, Proc. Phila. Acad. Nat. Sci., 1906, p. 423. (Same as *parallelus* according to Meek and Hildebrand, 1925.)

Family EPINEPHILIDAE

Mycteroperca tigris (Cuvier and Valenciennes)

Günther, 1859, Cat. Fish Brit. Mus., I, p. 112.

Epinephilus flavolimbatus Poey

Fowler, 1915, Copeia, 24, p. 50.

Alphestes lightfooti (Fowler)

Fowler, 1907, Proc. Phila. Acad. Nat. Sci., 1907, p. 258.

Family LUTIANIDAE

Lutianus mahogani (Cuvier and Valenciennes)

Fowler, 1915, Copeia, 24, p. 50.

Lutianus buccanella (Cuvier and Valenciennes)

Fowler, 1915, Copeia, 24, p. 50.

Lutianus vivanus (Cuvier and Valenciennes)

Fowler, 1915, Copeia, 24, p. 50. (Deep-water form of the common red snapper.)

Lutianus megalophthalmus Evermann and Marsh

Metzelaar, 1919, Over tropische Atlantische Visschen, p. 67.

Family HAEMULIDAE

Haemulon eckmani Lönnberg

Lönnberg, 1895, Oefvers. Svensk. Vet. Akad. Vorh., 52, 657-663.

Family GERRIDAE

Diapterus olisthostomus (Goode and Bean)

Fowler, 1915, Copeia, 24, p. 50.

Diapterus plumieri (Cuvier and Valenciennes)

Fowler, 1915, Copeia, 24, p. 50.

Family SCIAENIDAE

Umbrina coroides (Cuvier and Valenciennes)

Fowler, 1915, Copeia, 24, p. 50.

Corvula subaequalis (Poey)

Fowler, 1915, Copeia, 24, p. 50.

Family BRANCHIOSTEGIDAE

Caulolatilus chrysops (Cuvier and Valenciennes)

Fowler, 1915, Copeia, 24, p. 50.

Family CHAETODONTIDAE

Chaetodon ocellatus Bloch

Cuvier and Valenciennes, 1831, Hist. Nat. Poiss., VII, p. 67.

Family CORIDAE

Iridio poeyi (Steindachner)

Fowler, 1915, Copeia, 24, p. 50.

Family SPARISOMIDAE

Cryptotomus auropunctatus Cuvier and Valenciennes

Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., XIV, p. 290.

Sparisoma lorito Jordan and Swain

Jordan and Evermann, 1898, Fishes of North and Middle America, II, p. 1637.

Sparisoma rubripinne (Cuvier and Valenciennes)

Cuvier and Valenciennes, 1839, Hist. Nat. Poiss., p. 199.

Family ELEOTRIDAE

Sicydium vicente Jordan and Evermann

Jordan and Evermann, 1898, Fishes of North and Middle America, III, p. 2207.

Eleotris amblyopsis (Cope)

Hilgendorf, 1889, Sitz. Ges. Naturf. Berlin, p. 51-55.

Eleotris pisonis Gmelin

Regan, 1906-08, Pisces, Biol. Centr. Amer., p. 7.

Eleotris maltzani Hilgendorf

Hilgendorf, 1889, Sitz. Ges. Naturf. Berlin, p. 51-55.

Eleotris smaragdus Hil

Hilgendorf, 1889, Sitz. Ges. Naturf. Berlin, p. 51-55.

Sicydium buscki Evermann and Clark

Evermann and Clark, 1906, Proc. U. S. Nat. Mus., 30, 854.

Evorthodus breviceps Gill

Hilgendorf, 1889, Sitz. Ges. Naturf. Berlin, p. 51-55.

Lophogobius cyprinoides (Pallas)

Günther, 1861, Cat. Fish Brit. Mus., III, p. 8.

Gobiosoma bosci (Lacépède)

Hilgendorf, 1889, Sitz. Ges. Naturf. Berlin, p. 51-55.

The following fossil species have been recorded from Haiti.

Shark remains of undetermined families.

Carcharodon megalodon

Moore, J. C., 1853, Quart. Journ. Geol. Soc. London, 9, 129-132.

Oxyrhina xiphodon

Moore, J. C., 1853, Quart. Journ. Geol. Soc. London, 9, 129-132.

Hemipristis serra

Moore, J. C., 1853, Quart. Journ. Geol. Soc. London, 9, 129-132.

Odontaspis dubius

Moore, J. C., 1853, Quart. Journ. Geol. Soc. London, 9, 129-132.

Family CICHLIDAE

Cichlasoma woodringi Cockerell

Cockerell, T. D. A., 1924, Proc. U. S. Nat. Mus., Vol. 63, Article 7.

(Taken from locality considered to be of upper or middle Miocene age. It is of interest to note that a species of *Cichlasoma* is still abundantly found in Haiti.)

Beebe, William and Tee-Van, John. 1928. "The fishes of Port-au-Prince Bay, Haiti. With a summary of the known species of marine fishes of the Island of Haiti and Santo Domingo." *Zoologica : scientific contributions of the New York Zoological Society* 10(1), 1–279. <https://doi.org/10.5962/p.190326>.

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