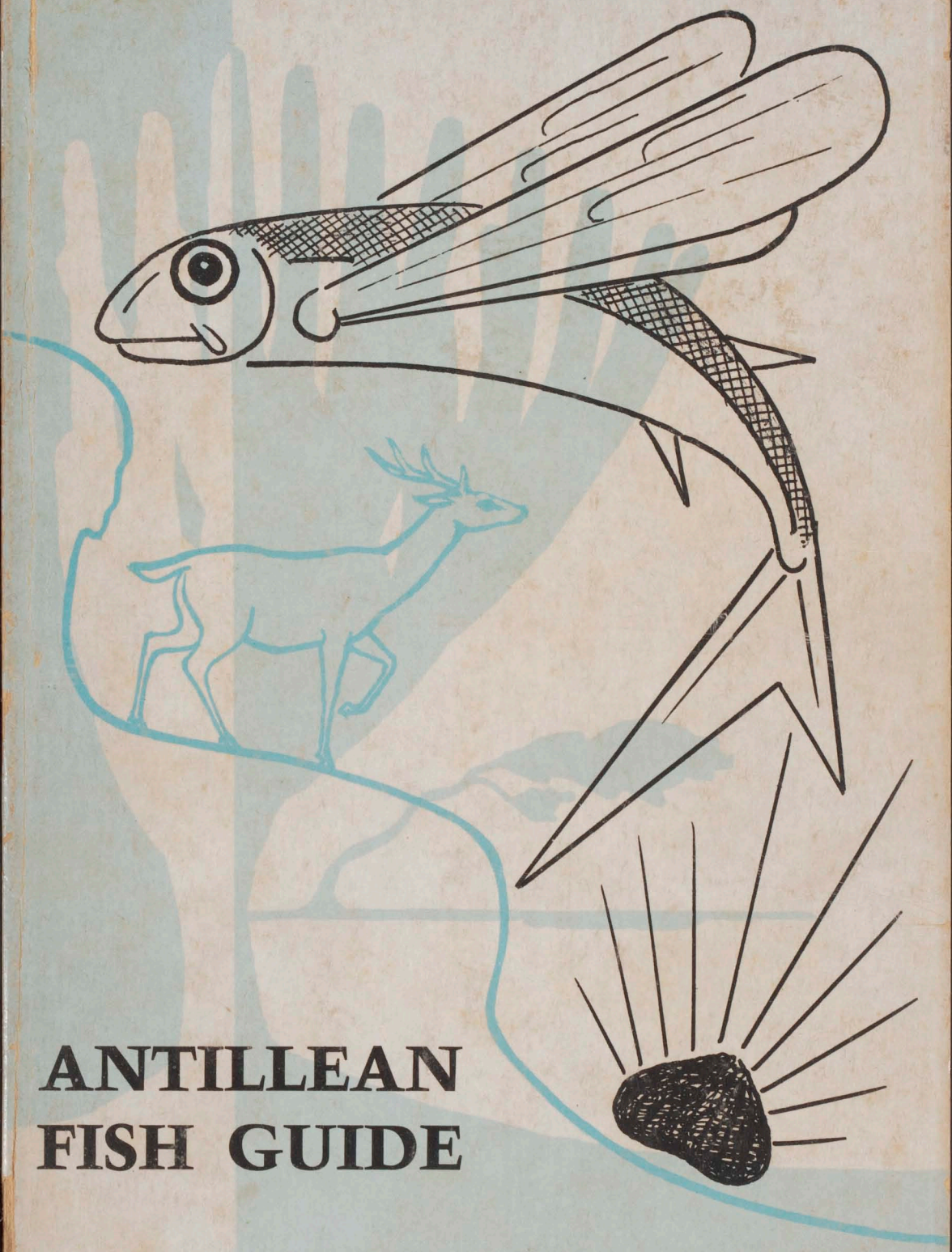

ANTILLEAN FISH GUIDE

STINAPA No. 7

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ANTILLEAN FISH GUIDE

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183 drawings of reef fishes and turtles
by

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and
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CARIBBEAN MARINE BIOLOGICAL INSTITUTE
Curaçao, Netherlands Antilles
1973

Foreword

This booklet is meant as a guide to identify the fishes and turtles of the reefs of the Netherlands Antilles. Those in need of detailed information on fishes may use "Caribbean Reef Fishes", written by John E. RANDALL who visited our islands several times.

In this guide we used both the vernacular names and the scientific names as presented in Randall's book. This is to facilitate the use of that excellent book.

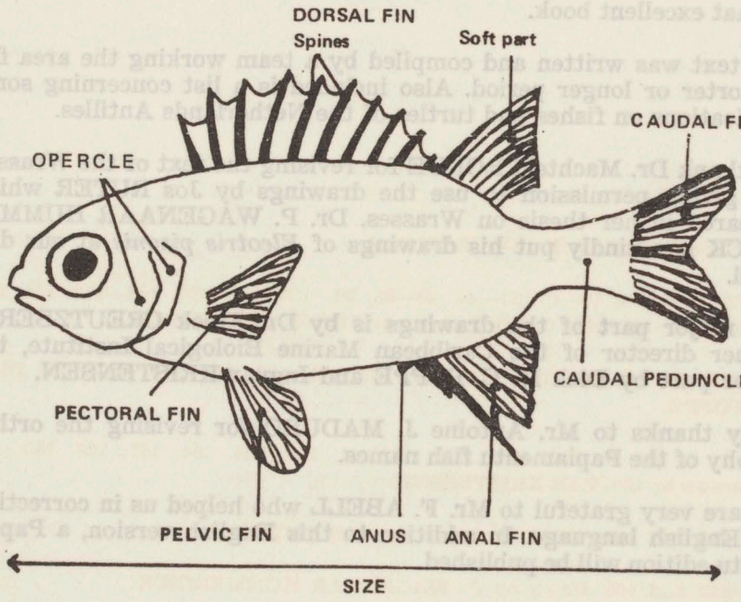
The text was written and compiled by a team working the area for a shorter or longer period. Also included is a list concerning some publications on fishes and turtles of the Netherlands Antilles.

We thank Dr. Machteld ROEDE for revising the text of the Wrasses and giving permission to use the drawings by Jos RUTER which appeared in her thesis on Wrasses. Dr. P. WAGENAAR HUMMELINCK has kindly put his drawings of *Eleotris pisonis* at our disposal.

The major part of the drawings is by Dr. Freek CREUTZBERG, former director of the Caribbean Marine Biological Institute, the minor part by Dick M. C. POPPE and Ingvar KRISTENSEN.

Many thanks to Mr. Antoine J. MADURO for revising the orthography of the Papiamentu fish names.

We are very grateful to Mr. F. ABELL who helped us in correcting the English language. In addition to this English version, a Papiamentu edition will be published.



Explanation of abbreviations in the text:

ad.	=	adult
juv.	=	juvenile
spec.	=	species
1 cm	=	0.4 inches
1 m	=	3.3 feet

Cover designed by DICK HOOGERWERF.

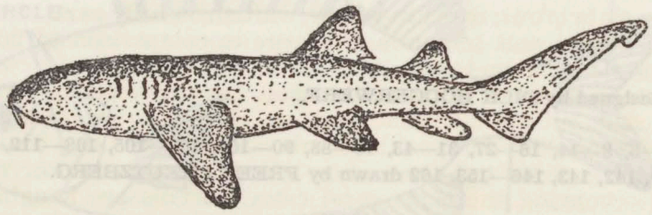
figs. 2—6, 8—14, 16—27, 31—43, 45—88, 90—101, 103—105, 108—112, 114, 118, 119, 142, 143, 146—153, 162 drawn by FREEK CREUTZBERG.

figs. 28—30, 89, 115, 155—158, 161, 163, 165, 166, 169—179 drawn by DICK POPPE.

figs. 1, 7, 15, 44, 102, 106, 107, 113, 144, 145, 154, 164, 167, 168, 180—183 drawn by INGVAR KRISTENSEN.

figs. 116, 117 and 120—141 drawn by JOS RUTING.

figs. 159 and 160 drawn by P. WAGENAAR HUMMELINCK.



SHARKS (Selachi)

Sharks have survived over 150 million years and are adapted to the sea to perfection. If a swimmer could conquer his natural fright for the shark, he would be much impressed by the elegance, power and super streamline of this creature.
Irregular motions or splashing in the water are easily registered by the shark. Smell is excellent. When spotting its prey the shark will start its circling motion to see what is in for it.

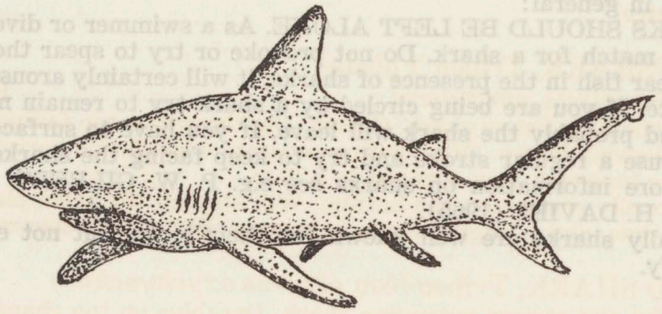
In the Lesser Antilles only one actual attack has been registered, viz. in 1952. The victim's buttocks were mauled once, and he recovered completely. This happened at Knip Beach, Curaçao at a moment when a freshly slaughtered goat was cleaned. The shark was caught on a hand line shortly after the attack, and identified as a Bull Shark *(Carcharhinus leucas)*.
Advise in general:
SHARKS SHOULD BE LEFT ALONE. As a swimmer or diver, you are no match for a shark. Do not provoke or try to spear them. Do not spear fish in the presence of sharks, it will certainly arouse their appetite. If you are being circled by a shark try to remain motionless and probably the shark will leave. If you have to surface or to swim, use a regular stroke and try to keep facing the sharks.
For more information on sharks see e.g. P. W. GILBERT (1963) and D. H. DAVIES (1965).
Generally sharks are well known for their looks, but not easy to identify.

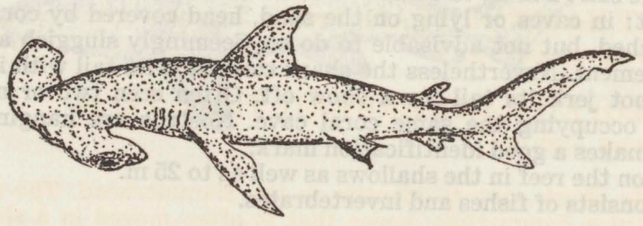
NURSE SHARK, Tribon inocente
(Ginglymostoma cirratum) Fig. 2

Colour: slate brown to ochre yellow, whitish on belly part.
Dorsal, caudal and pectorals are large in comparison to body.
Average size: 2 m up to 4 m.
Habitat: in caves or lying on the sand, head covered by corals. Can be touched, but not advisable to do so. Seemingly sluggish and slow in movement. Nevertheless the shark can reach its tail with its jaws, so do not jerk its tail for a show off. Often seen two or more together occupying the same coral cave. Nostrils are hanging down which makes a good identification mark.
Sleeps on the reef in the shallows as well as to 25 m.
Food consists of fishes and invertebrates.

TIGER SHARK, Tintorero *(Galeocerdo cuvier)*

Fast moving shark, deep bodied and growing quite big. Dorsal fin has a strangely looking upper lobe. Blunt nosed with widespread caudal fin. Colour greyish brown with dark spots that will form a striped pattern. Probably cause of name. In elderly sharks spots will fade away completely. Size: 3 m (up to 5 m).
Takes any fish wounded or recently speared, from line or spear alike. This shark is very aggressive. Better get out of the water when a "tiger" is near.





LEMON SHARK, Tribon berdè *(Negaprion brevirostris)*
Colour: greenish yellow, brown. Size: 3 m.
Has been witnessed attacking freshly speared fish. Behaves in the same way as the Nurse Shark.
Like all sharks it will enter the shallows preying on schools of mackerel and will even break a fisherman's net to reach its goal.

SHARPNOSE SHARK, Tribon mulá
(Rhizoprionodon porosus)

Colour: ochre brown fading to white belly. Pectorals sharply bent backwards. Lower jaw also far backwards. A smaller species that grows to about 1—1.50 m.
Often found in small schools that chase anything edible. Very aggressive.

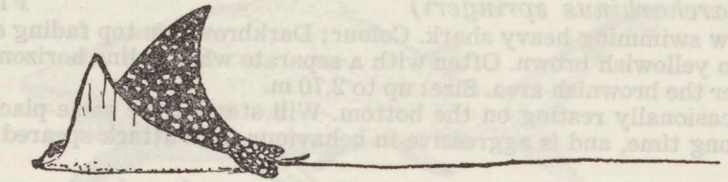
REEFSHARK, Tribon 'i pieda
(Carcharhinus springeri) Fig. 3
Slow swimming heavy shark. Colour: Darkbrown on top fading away into yellowish brown. Often with a separate whitish line horizontally over the brownish area. Size: up to 2.70 m.
Occasionally resting on the bottom. Will stay on the same place for a long time, and is aggressive in behaviour. Will attack speared fish.

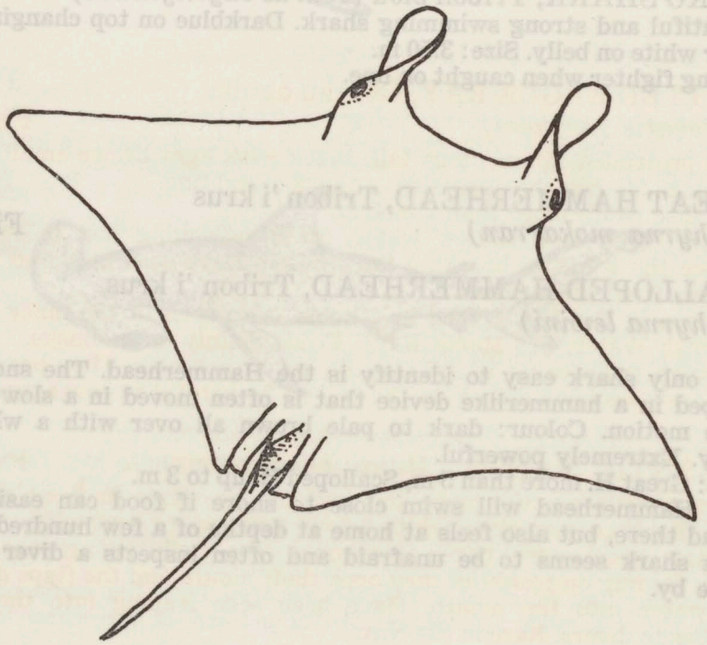
MAKO SHARK, Tribon blou *(Isurus oxyrhynchus)*
Beautiful and strong swimming shark. Darkblue on top changing to clear white on belly. Size: 3.50 m.
Strong fighter when caught on line.

GREAT HAMMERHEAD, Tribon 'i krus
(Sphyrna mokarran) Fig. 4

SCALLOPED HAMMERHEAD, Tribon 'i krus
(Sphyrna lewini)

The only shark easy to identify is the Hammerhead. The snout is shaped in a hammerlike device that is often moved in a slow sidewise motion. Colour: dark to pale brown all over with a whitish belly. Extremely powerful.
Size: Great H. more than 5 m, Scalloped H. up to 3 m.
The Hammerhead will swim close to shore if food can easily be found there, but also feels at home at depths of a few hundred feet. This shark seems to be unafraid and often inspects a diver from close by.





RAYS (Batioidea)

Three groups of rays are represented in the Caribbean: the Stingrays (Dasyatidae), the Eaglerays (Myliobatidae) and the Mantas (Mobulidae). In rays, the mouth and gill openings are situated ventrally. One more pair, however is found just behind the eyes.
Propagation: in adult males the anal fins have been changed into long copulatory tools. After copulation internal fertilization of 4-12 eggs takes place. After about one year the foetuses have consumed their yolk sacs and will hatch; they will swim away almost immediately after hatching.

SOUTHERN STINGRAY, Chuchu ròk
(Dasyatis americana) Fig. 5

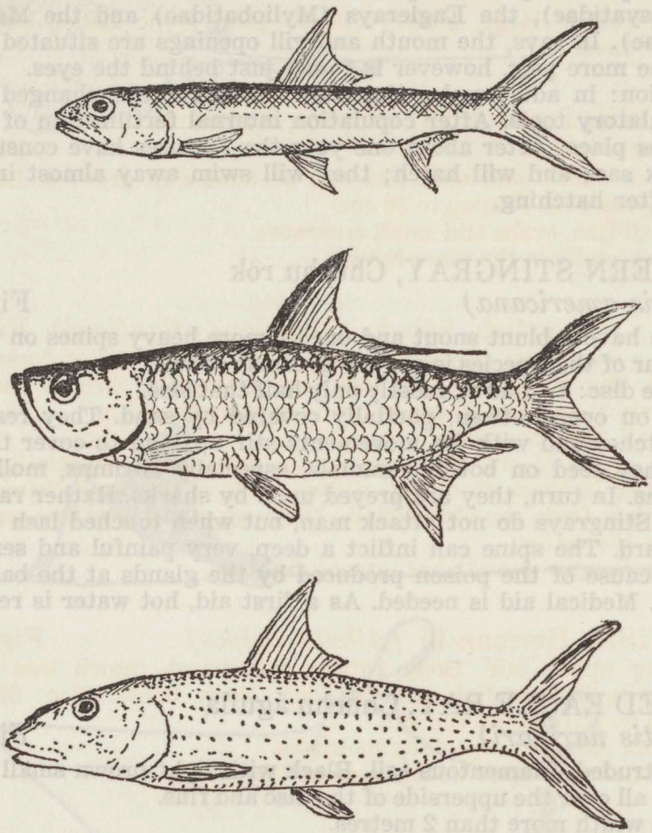
Stingrays have a blunt snout and one or more heavy spines on their tail. Colour of this species is gray to greenish brown.
Size of the disc: 1 - 1.50 m, mostly only half that size.
Habitat: on open bottom, partially covered by sand. They rest on sandy patches and with fin movements stir up sand to cover themselves. They feed on bottom animals, especially shrimps, mollusks and worms. In turn, they are preyed upon by sharks. Rather rare in the N.A. Stingrays do not attack man, but when touched lash their tail forward. The spine can inflict a deep, very painful and serious wound because of the poison produced by the glands at the base of the spine. Medical aid is needed. As a first aid, hot water is recommended.

SPOTTED EAGLE RAY, Chuchu águila
(Aetobatis narinari) Fig. 6

Head protruded, filamentous tail. Black with light brown small dots and rings all over the upperside of the disc and fins.
Size: disc width more than 2 metres.
Habitat: deep and shallow water, often swimming just below the surface the wingtips breaking the surface. Have been observed leaping free from the surface.
Not rare in the N.A., often in schools. Also seen in the inner bays (Spanish Water, Sta Marta Bay). Feeds mainly on mollusks.
Although frightening to see they do not attack man. They have one or more poisonous spines on the tail so be careful in touching!

ATLANTIC MANTA *(Manta brevirostris)* Fig. 7

Characteristic are the large size and the two flaps in front of the eyes. Black on top, clear white below. Size: up to 6 m wide.
Habitat: open water. Often in schools - especially young ones.
When feeding on plankton they open their mouth and the flaps direct the water into the mouth. Have been seen leaping into the air. Curious to divers. Rare in the N.A.



LADYFISHES & TARPONS (Elopidae) and BONEFISHES (Albulidae)

Group of rather large, silvery fishes, good game fishes but not valued for food.

LADYFISH, Tenpounder, Tinpòni, Makambi *(Elops saurus)* Fig. 8

Small head, dorsal and anal fins can be hidden in grooves. Larvae look like glass-eels. Size up to 80 cm.
Food: small fish, crabs and small crustacea.
Schools especially in the inner bays.

TARPON, Silverfish, Sábalo *(Megalops atlanticus)* Fig. 9

Protruding lower jaw (gives menacing look!). Last ray of dorsal fin prolonged. Big scales. Larvae look like glass-eels. Size in shallow water rarely more than 90 cm, in open sea more than 2 m.
Food: small fish, crustacea.
Juveniles, up to 75 cm, abundant in the inner bays, especially near sewage; also in brackish or supersaline parts of the bays. Being able to take in air from the atmosphere, they can stand very low oxygen content of the water.
Adults are famous gamefishes: strong fighters.

BONEFISH, Hermanchi *(Albula vulpes)* Fig. 10

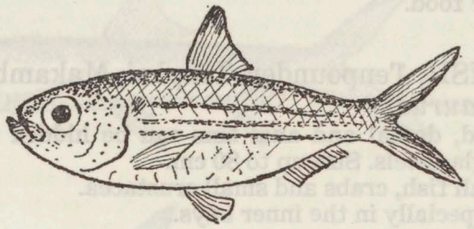
Protruding upper jaw. Body rather cylindrical (much less compressed than in Ladyfish and Tarpon). Many bones. Size: 60 cm.
They feed by stirring up the silt.
Food: small animals, especially mollusks.
Habitat: shallow muddy water, lagoons (Bonaire).

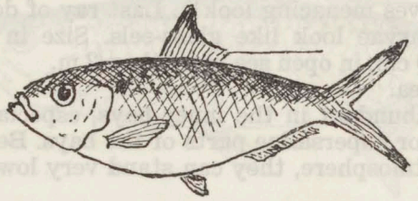
ANCHOVIES (Engraulidae) Fig. 11

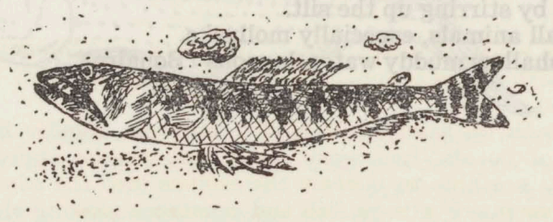
Several species, all identifiable by their shortened lower jaw. Very small fishes, good bait.

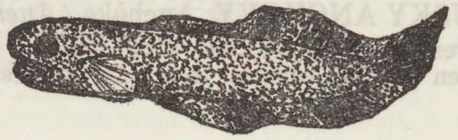
DUSKY ANCHOVY, Anchòks *(Anchoa lyolepis)*

Silvery, very slender. Size: about 7 cm.
Often in large schools, in coastal waters. Plankton feeders.









HERRINGS (Clupeidae)

12 different species are known in the N.A. All show schooling behaviour.

SARDINE, Sardinchi, Saldinchi *(Harengula humeralis* and *Harengula clupeola)* Fig. 12

Silvery, the first species with an orange snout tip, the second with a blackish spot under the eyes. Size: 15 to 20 cm.
Habitat: the coastal waters of the islands.
They form large schools and are caught, in shallow water, by seine nets ("reda"). When chased by Jacks, (see p. 45) they will jump above the surface.
Plankton feeders. Meat locally highly in demand.

THREAD HERRING, Haring *(Opisthonema oglinum)* Fig. 13

Silvery, conspicuous by its "thread" (the last ray of the dorsal fin). Size: 25 cm.
Habitat: in open shallow water, especially in the open parts of the inner bays. Plankton feeder.

LIZZARD FISHES (Synodontidae)

Single specimens are mostly found on open sandy stretches between corals. Body flattened, large mouth. Several species in the Caribbean which are difficult to identify in the field.

SAND DIVER, Yuan'i awa *(Synodus intermedius)* Fig. 14

Grayish with darker dots, with distinctive greenish brown cast. Size: 30 cm.
Habitat: both on sandy and muddy bottoms, mostly in the neighbourhood of corals. Lies very quiet and can be approached quite close. They are able to burrow themselves into the sand quickly by body movements. Feeds on fish and crustacea passing close by which are caught by a sudden dart.
Can be caught by slowly trolling with a jig or spoon.

BLACK WIDOW *(Stygnobrotula latebricola,* fam. Brotulidae) Fig. 15

Almost completely black, especially the juveniles; the adults have a dark brown body; blue lips; often in pairs. Size: 7 cm.
Habitat: underwater caves where they keep to the walls and ceiling. Hard to find. Their beautiful velvet black fins undulate continuously, even if the fish does not move forwards. Harmless towards other fish, in spite of their name.

EELS (Anguillidae) and CONGER EELS (Congridae)

The Common Eel, Anguía *(Anguilla rostrata)* is found once in a while in the N.A., mostly in fresh water.
Among the Conger Eels only one species is seen regularly, i.c. the Garden Eel.

GARDEN EEL *(Nystactichthys halis)* Fig. 16

Colour brownish, the tail somewhat paler. Size 30 cm.
Food: plankton animals.
Habitat: coral sand, at 3—60 m depth. They live in burrows, in colonies, each specimen having its own burrow.
They constantly move their upper part to and fro in elegant movements. On approach they slowly withdraw into their holes.

SNAKE EELS (Ophichthidae)

True Sea Snakes do not occur in the Caribbean and if reported, have always turned out to be Snake Eels. Unlike true Sea Snakes, Snake Eels are not venomenous.
Snake Eels are quite common in the shallows.

GOLDSPOTTED SNAKE EEL, Kolebra pintá *(Myrichthys oculatus)* Fig. 17

Yellowish white with dark brown spots with a bright yellow center. Size 60 cm, sometimes up to 90 cm.
Habitat: between limestone blocks, partly burrowed into the bottom. Moves around by snake-like sinusoid movements, in search of crustacea. When disturbed digs into the sand, tail first. Not aggressive like Morays; can be touched. Is preyed upon by large Moray Eels.

Fig. 18

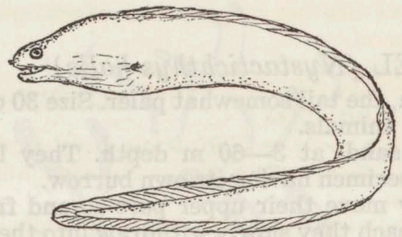


Fig. 19

Fig. 22

Fig. 20

Fig. 21

MORAYS (Muraenidae)

The Morays are large reef eels with rather secretive and nocturnal habits. They lack pectoral fins and lateral-line pores common to most fishes. The gill-openings are roundish holes. They have strong jaws and teeth. They hide in holes and crevices on the reef, feeding at night. Morays are scavengers and predators. In the N.A. four species are common.

GREEN MORAY, Kolebra berdè

(Gymnothorax funebris) Fig. 18

The largest of the morays. The whole body is olive-green. Size: up to 1.80 m. Food: carnivorous. Preys on other animals alive or dead, even Snake Eels.

Habitat: the reef, from shallow water to a depth of at least 50 m. In daytime to be found in holes, the head protruding.

The only moray reportedly attacking divers, who should therefore refrain from prodding these animals and be careful when investigating caves and holes in the reef. The mucus covering the skin is poisonous. Therefore, this moray must be carefully skinned before cooking.

SPOTTED MORAY, Kolebra bobo

(Gymnothorax moringa) Fig. 19

The colour of the body is yellowish with numerous black spots and dots. Size: up to 1 m.

Habitat: the coral reef down to at least 50 m. In the N.A. this is the moray most often observed by divers. May occasionally be seen swimming in the day-time.

CHAINED MORAY, Kolebra oromani

(Echidna catenata) Fig. 20

The body has dark-brown areas interspersed by yellow lines. Size: not larger than 75 cm.

Food: small fish and crustaceans.

Habitat: shallow water on the reef. Difficult to find because of its hiding habits.

GOLDENTAIL MORAY, Kolebra

(Muraena miliaris) Fig. 21

Body dark-brown with numerous small yellow spots. These spots increase in size towards the tail and may colour the tip of the tail completely yellow. Sometimes this moray is yellow all over. Size: maximum 60 cm.

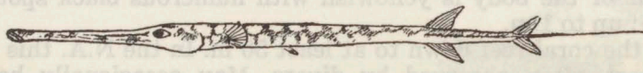
Habitat: in shallow water on rocky shorelines. Hiding under coral boulders, only its head protruding from under the coral.

VIPER MORAY, Kolebra *(Enchelycore nigricans)* Fig. 22

Adults are coloured uniformly brown, juveniles have a mottled pattern. Size: up to 90 cm.

Habitat: shallow water, down to 6 m in rocky surroundings.

Rarely seen in the N.A.



NEEDLEFISHES (Belonidae)

Characteristic are the long jaws. In the young (5—7 cm) however only the lower jaw is prolonged, like in the Halfbeaks.
The meat, although tasty, is despised by many because of the green backbone; this colour is not caused by copper, but a bile derivate.
Several species are found, but they are difficult to distinguish.

STRONGYLURA SPEC., Guepi Fig. 23

Like all other Needlefishes silvery, with a cast of dark green or black on the back. Size: 40 cm.
Habitat: open as well as coastal waters.
Food: fish and crustacea.

HALFBEAKS (Hemiramphidae) Fig. 24

Two species are present in the N.A.: BALLYHOO, Bokalargu, *(Hemiramphus brasiliensis)* and BALAO, Balau *(H. balao)*. Less slender than the Needlefishes. The short upper jaw and prolonged lower jaw are characteristic. Size: 35 cm.
Habitat: mostly in coastal waters. Feeds on small fishes, but is not completely carnivorous. Used as baitfish.

CORNETFISH, Swip *(Fistularia tabacara, fam.* Fistulariidae Fig. 25

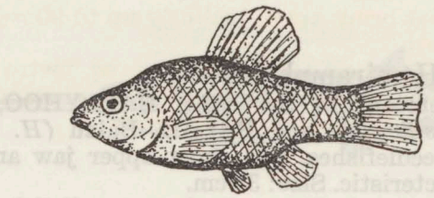
Impossible to be mistaken for any other fish. Size: more than 1 m.
Habitat: especially in seagrass *(Thalassia)*, but also among corals.
Fish eater. Rare in the N.A.

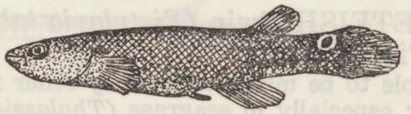
TRUMPETFISH, Tròmpèt *(Aulostoma maculatus, fam.* Aulostomidae Fig. 26

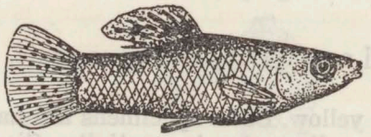
Brown-orange with longitudinal lines. Size: 75 cm.
Habitat: everywhere between reefs, often in vertical position head downwards. Swallows its prey by a sucking movement of the flexible trumpet-like mouth. Often swimming very close to parrots and other fishes so it looks like hitchhiking. Quite common.

SEA HORSE, Kaba 'i awa *(Hippocampus reidi, fam.* Syngnathidae Fig. 27

Colour black, reddish or yellow. Some specimens are hairy. The skin filaments ("hairs") often disappear in captivity. Size: more than 10 cm.
Habitat: Sea grass beds, but also on dikes, piers and underwater nets. Feeds on small animals (crustacea, fish larvae).
The female deposits her eggs in the breeding pouch of the male, which carries the eggs until hatching takes place about 2 weeks later.







KILLIFISH OR TOOTHCARPS (Cyprinodontidae)

Most species of this circumtropical family inhabit fresh water only. The three species of the N.A. are found in fresh, brackish and in supersaline water, and also in seawater, especially among mangrove roots. All three species have means of survival when the shallow water they prefer dries up.

BROAD KILLIFISH, Barigonchi *(Cyprinodon dearborni)* Fig. 28

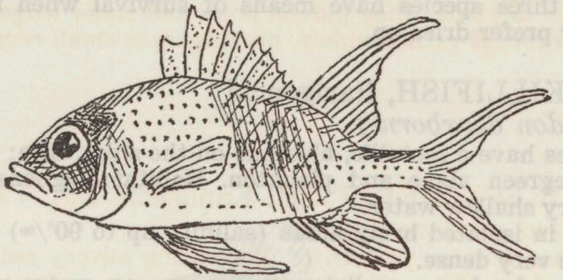
Adult males have a metallic, blue hue on the sides. Size: 4.5 cm.
Food: bluegreen algae and plankton. Habitat: lagoons and inner bays in very shallow water.
Especially in isolated briny areas (salinity up to 90‰) the population can be very dense.
Breeding: males have small territories: one sq. metre may contain many territories. The eggs are very tough and can stand adverse and almost dry environmental conditions for weeks.

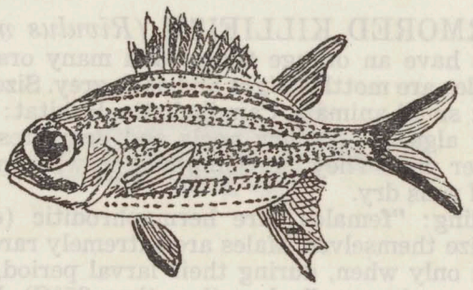
MARMORED KILLIFISH *(Rivulus marmoratus)* Fig. 29

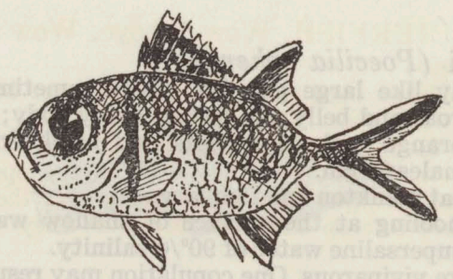
Males have an orange throat and many orange spots on the sides. Females are mottled, light and dark grey. Size: 6 cm.
Food: small animals. Cannibalistic. Habitat: among mangrove roots, under algae in shallow pools and near freshwater seepages. Often one per pool. They can jump and crawl from one pool to another if a pool runs dry.
Breeding: "females" are hermaphroditic (eggs and roe) and can fertilize themselves. Males are extremely rare. Juveniles develop into males only when, during their larval period, the water temperature has been abnormally low (less than 25°C). When a male is present, cross-fertilization occurs more readily than self-fertilization.

MOLLY, Machuri *(Poecilia sphenops)* Fig. 30

Females look exactly like large guppies. Males sometimes have a yellow or orange throat and belly and have a shiny body; the dorsal fin can be bright orange with black dots and black fringe. Size: males up to 8 cm, females 10 cm.
Food: they browse, eat plankton and fish larvae.
Habitat: always schooling at the surface of shallow waters, from completely fresh to supersaline water of 90‰ salinity.
Breeding: females are viviparous. One copulation may result in many successive litters at 5-weeks intervals.
In complete absence of a male the females sometimes produce small litters of females only. This will increase survival possibilities in case their habitat — often small pools — remains isolated for a long time.







SQUIRRELFISHES and SOLDIERFISHES
(Myripristidae)

This family consists of reddish fishes with proportionally big eyes. They have spiny scales and head bones. Being nocturnal they are not often seen in daytime. They hide in holes and under ledges. At night these fishes forage rather widely, preying upon small crustacea.

LONGJAW SQUIRRELFISH, Kandèlchi, Bar 'i klabu
(Holocentrus ascensionis) Fig. 31

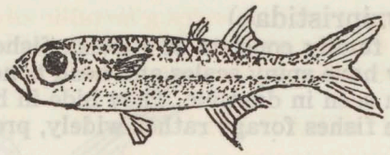
The body has a faint pattern of alternating silvery red and white stripes. The dorsal fin is greenish-yellow. Size: 20 cm.
Habitat: rather abundant on the reef down to at least 18 m.
Hides in daytime in semi-shadow under ledges and in crevices. At night they are out on the reef.

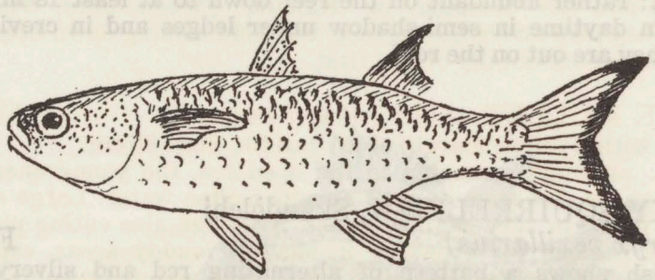
DUSKY SQUIRRELFISH, Skandèlchi
(Adioryx vexillarius) Fig. 32

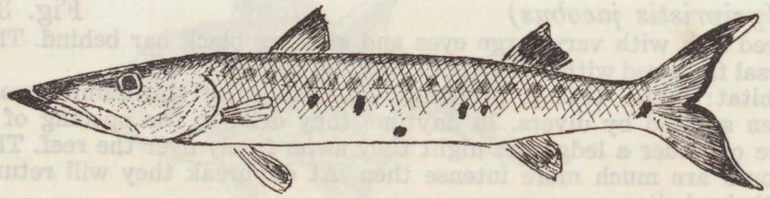
This fish shows a pattern of alternating red and silvery white stripes, which on the back are separated by some black lines.
The dorsal fin is red with black streaks. Size: 12 cm.
Habitat: coral reefs and rocky bottom. Abundant, hiding in daytime in holes in the reef and feeding at night.

BLACKBAR SOLDIERFISH, Wow 'i boyo, Wow 'i deboyo
(Myripristis jacobus) Fig. 33

A red fish with very large eyes and striking black bar behind. The dorsal fin is red with white spots. Size: 20 cm.
Habitat: reefs. This is probably the member of this family most often spotted by divers. In daytime they drift in the opening of a cave or under a ledge. At night they swim freely over the reef. The colours are much more intense then. At daybreak they will return to their shelter.







SILVERSIDES (Atherinidae)

Along the whitish sides a metallic silvery stripe is visible. They form vast schools and are the basic food for many predators. They are caught with casting nets ("trai") and used for bait.

HARDHEAD SILVERSIDE, Piskechi *(Atherinomorus stipes)* Fig. 34

Size only 7 cm. Habitat: Shallow water, they gather in dense schools. Plankton feeders.

MULLETS (Mugilidae)

Two species are quite common in the innerbays: the "Aldu" *(Mugil curema)* and the "Karmou" or "Kalmou" *(Mugil lyza)*. When disturbed they leap above the surface, the Aldu coming down head first, the Karmou horizontally or tail first.

WHITE MULLET, Aldu *(Mugil curema)* Fig. 35

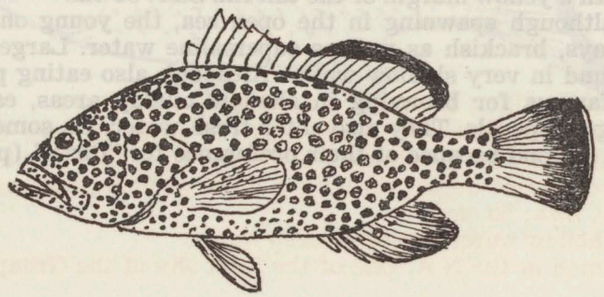
Silvery, with a yellow margin of the tail fin. Size: 35 cm.
Habitat: although spawning in the open sea, the young ones enter the innerbays, brackish as well as supersaline water. Large schools may be found in very shallow water. Although also eating plankton they are famous for browsing in shallow muddy areas, especially near sewage disposals. They also enter fresh water. On some islands not valued as food because of their preference for "dirty" (polluted) water.

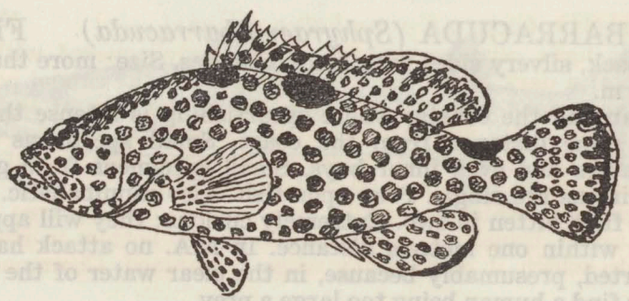
BARRACUDAS (Sphyraenidae)

Two species are found. A small species (up to 40 cm: *Sphyraena picudilla)* and a large species which is "fabulous" the world over:

GREAT BARRACUDA *(Sphyraena barracuda)* Fig. 36

Dark on back, silvery sides with black blotches. Size: more than 1 m up to 1.50 m.
Habitat: around the coasts; where spearfishing is intense they are found at some distance from the coast. Small specimens prefer coastal waters and even inner bays. Small specimens form groups, large specimens are single. Prey upon fish. Also cannibalistic. Large fishes are first bitten in two. Extremely curious: they will approach swimmers within one metre's distance. In N.A. no attack has ever been reported, presumably because, in the clear water of the Caribbean, they find a human being too large a prey.





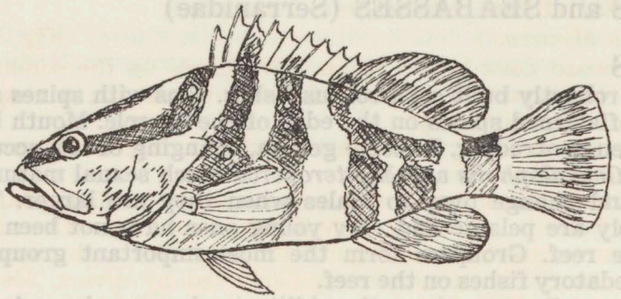
GROUPERS and SEABASSES (Serranidae)

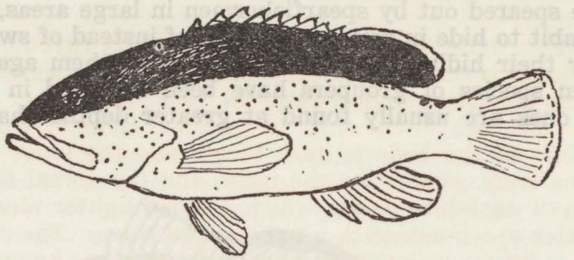
GROUPERS

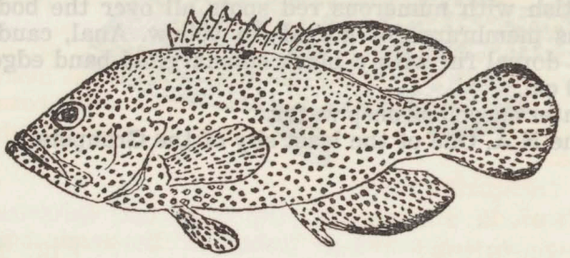
Groupers are robustly built carnivorous fishes. Fins with spines and usually three flattened spines on the edge of the opercle. Mouth big, lower jaw often protruding. In some genera, changing of sex occurs. *Epinephelus, Cephalopholis* and *Mycteroperca* reach sexual maturity as females, and change over to males when they are larger. The larvae probably are pelagic and very young ones have not been observed on the reef. Groupers form the most important group of residential predatory fishes on the reef.
Coloration: many Groupers have the ability to change colour. A few exhibit very different colour phases. Size: ranging from about 0.25 to 2 m. Groupers are highly valued as food and the bigger species may be speared out by spearfishermen in large areas, partly due to their habit to hide in crevices in the reef instead of swimming away. Usually their hiding place does not protect them against spearing. Thirteen species of groupers have been observed in the N.A. The bigger ones are usually found at greater depths than the smaller ones.

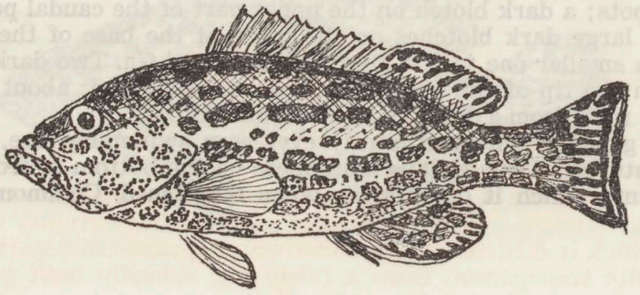
RED HIND, Gatu kòrá *(Epinephelus guttatus)* Fig. 37
Ground colour whitish with numerous red spots all over the body. Tips of interspinous membranes of dorsal fin yellow. Anal, caudal and soft portion of dorsal fin with a black submarginal band edged with white. Size: 50 cm.
Habitat: shallow water as well as deep water.
Quite common in the N.A. One of the least shy of the Groupers.

ROCK HIND, Gatu *(Epinephelus adcensionis)* Fig. 38
Coloration: light olivaceaous, the entire body covered with light brown spots; a dark blotch on the upper part of the caudal peduncle and two large dark blotches on the back, at the base of the dorsal fin and a smaller one just in front of the dorsal fin. Two dark bands run from the tip of the nose to beyond the eyes. Size: about 50 cm.
Habitat: reefs from a depth of 50 cm to about 40 m.
A wary grouper, which is hardly ever seen swimming free, except when disturbed. Usually lays motionless on the bottom in front of a crevice into which it darts away when frightened. Common in the N.A.









NASSAU GROUPER, Yakupeper, Yakupepu
(Epinephelus striatus) Fig. 39

Whitish with broad dark brown bands. Two bands on the forehead originating on the nose and ending before the dorsal fin. A ring of small black spots around the eye.
Size: a fairly big grouper, attaining about one metre. Maximum weight reported as 55 pounds.
Habitat: observed from a depth of 4 m to about 40 m. This grouper is a typical reef dweller usually seen half hidden under a rock or in a large gorgonian, motionless waiting for its prey. Not a shy species and known to become tame when regularly fed by divers. Makes barking sounds when disturbed.
Not uncommon in the N.A., but has disappeared where much spear-fishing is done.

CONEY, Purunchi pretu *(Cephalopholis fulva)* Fig. 40

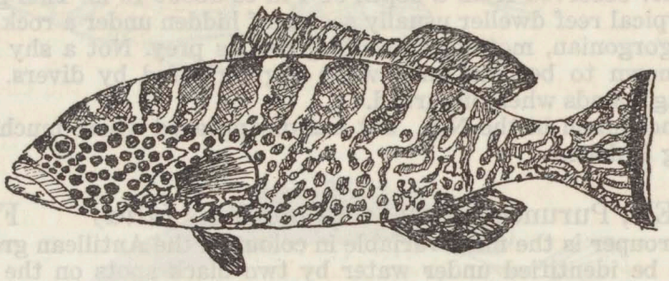
This grouper is the most variable in colour of the Antillean groupers. It can be identified under water by two black spots on the caudal peduncle and two on the chin. In the most common colour phase the upper part of the body is dark brown and the lower part abruptly pale. The body, except for the belly, and the dorsal fin are covered with small dark-blue spots, which become lighter blue, or white, in deep water specimens with a dark or red colour. The so-called "Gold Coney" is bright yellow with blue spots. It is not known whether the brilliant red or gold coneys can change their colour. The bicoloured phase has often been observed to change into the even brown phase.
Size: about 25 cm. Habitat: from 50 cm depth to 65 m.
Stays close to the bottom in a small area where it swims around actively. Prefers open areas like sandy bottoms with coral heads. Typical for the sandy open area between the blue edge and the coast. This is the only grouper which is sometimes seen in small groups. Abundant in the N.A.

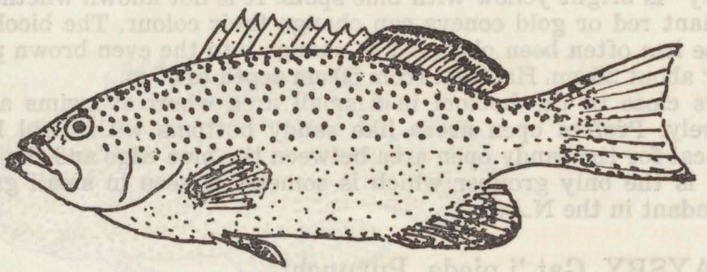
GRAYSBY, Gat 'i pieda, Purunchi
(Petrometopon cruentatum) Fig. 41

Light to dark gray with numerous brown spots on body and fins. Three spots which may be black or white along the base of the dorsal fin. Size: does not exceed 30 cm in length.
Habitat: reefs. A typical reef grouper, most abundant where the shape of the reef is capricious. Quite unafraid of divers. Observed at any diving depth. Usually not very active. Abundant in the N.A.

YELLOWFIN GROUPER, Patachi
(Mycteroperca venenosa) Fig. 42

Light to dark gray or greenish with more or less elongate rectangular dark blotches. Posterior third of pectoral fins abruptly orange-yellow which is difficult to see under water because that part of the fin is quite transparent. Size: a fairly big, robustly built grouper, which reaches about one metre in length.



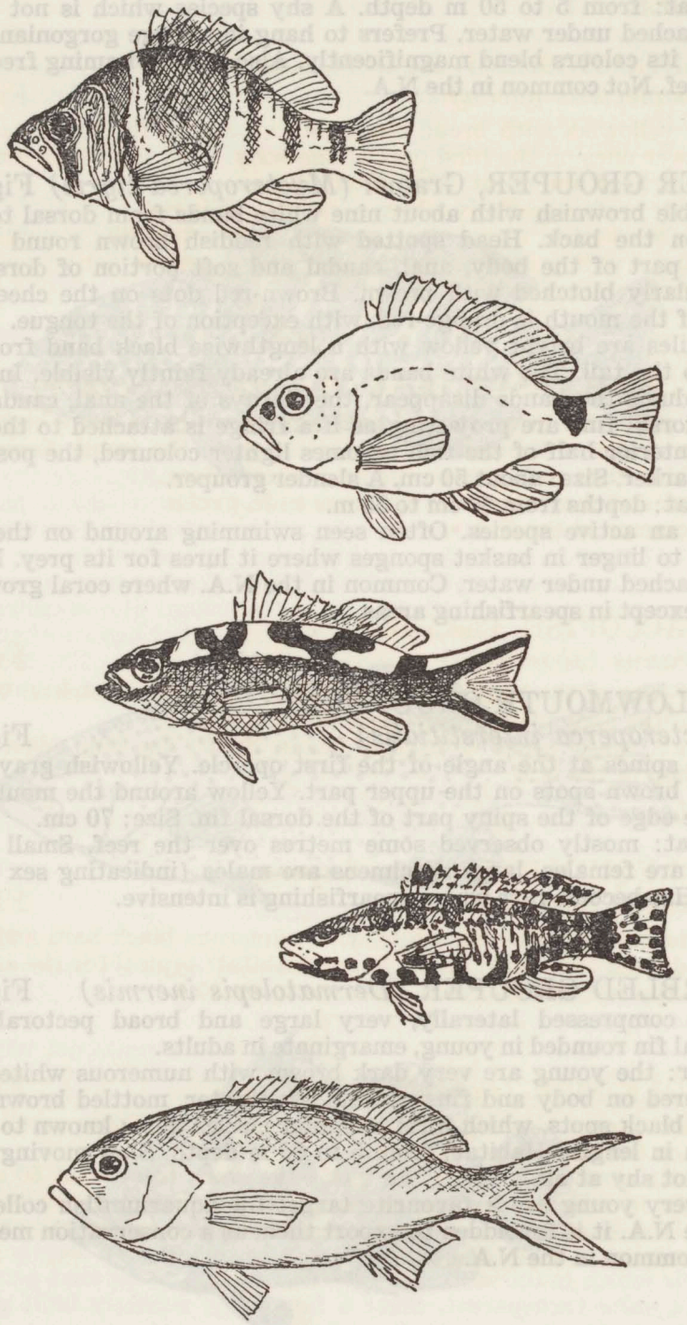


Habitat: from 5 to 50 m depth. A shy species which is not easily approached under water. Prefers to hang in a large gorgonian, with which its colours blend magnificently. Also seen swimming free over the reef. Not common in the N.A.

TIGER GROUPER, Gramèl *(Mycteroperca tigris)* Fig. 43
Variable brownish with about nine white bands from dorsal to ventral on the back. Head spotted with reddish brown round spots, lower part of the body, anal, caudal and soft portion of dorsal fin irregularly blotched with brown. Brown-red dots on the cheek. Inside of the mouth is orange-red, with exception of the tongue.
Juveniles are bright yellow with a lengthwise black band from the eye to the tail. The white bands are already faintly visible. In large individuals the bands disappear, the finrays of the anal, caudal and soft dorsal fins are projecting as if a fringe is attached to the fins. The anterior half of the fish becomes lighter coloured, the posterior half darker. Size: about 50 cm. A slender grouper.
Habitat: depths from 50 cm to 55 m.
Quite an active species. Often seen swimming around on the reef. Likes to linger in basket sponges where it lures for its prey. Easily approached under water. Common in the N.A. where coral growth is rich, except in spearfishing areas.

YELLOWMOUTH GROUPER
(Mycteroperca interstitialis) Fig. 44
Small spines at the angle of the first opercle. Yellowish gray, with many brown spots on the upper part. Yellow around the mouth and at the edge of the spiny part of the dorsal fin. Size: 70 cm.
Habitat: mostly observed some metres over the reef. Small specimens are females, large specimens are males (indicating sex reversal). Has become rare where spearfishing is intensive.

MARBLED GROUPER *(Dermatolepis inermis)* Fig. 45
Body compressed laterally, very large and broad pectoral fins. Caudal fin rounded in young, emarginate in adults.
Colour: the young are very dark brown with numerous white spots scattered on body and fins. Adults are lighter, mottled brown with small black spots, which form irregular circles. Size: known to reach 80 cm in length. Habitat: from 5 to 60 m depth. Slow moving grouper, not shy at all.
The very young are a favourite target for aquariumfish collectors. In the N.A. it is forbidden to export them as a conservation measure. Not common in the N.A.



BASSES

BARRED HAMLET, Kakobòl, Kakubòl
(Hypoplectrus puella) Fig. 46

Light yellowish with broad bluish black bars on the front part and narrower ones on the hind part of the body. Very light blue lines and spots on head and snout. Size: about 12 cm.
Habitat: reefs, especially where coral growth is rich.
Most abundant in rather deep water (20 m). Acts like a small grouper, stays well protected by the reef and is not an active swimmer.
Not very common in the N.A.

BUTTER HAMLET, Okfes *(Hypoplectrus unicolor)* Fig. 47

Light yellowish gray, ventral part almost white. A large black spot at the origin of the tail and a black spot on the snout. Some faint light blue lines and spots on the head. Size: 12 cm.
Habitat and characteristics the same as *H. puella.*
Not common in the N.A.

TOBACCOFISH, Piská di oro
(Serranus tabacarius) Fig. 48

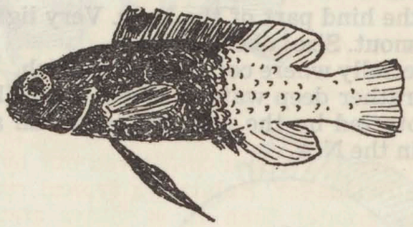
Upper part of the body dark brown with large pale blotches. Ventral part of the body plain orange. Size about 17 cm.
Habitat: sandy areas with coral heads, before the blue edge.
Common in the N.A.

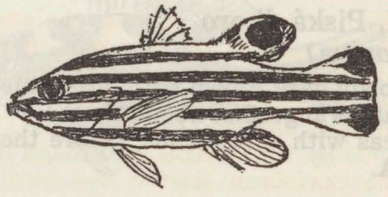
HARLEQUIN BASS, Piská 'i spons
(Serranus tigrinus) Fig. 49

Ground colour yellowish white with numerous black bars and spots on body and fins. Size: about 10 cm. Habitat: typical for the area between the reef and the coast. Common in the N.A.

CREOLE FISH *(Paranthias furcifer)* Fig. 50

Reddish brown shading ventrally to light gray. Three small white spots on the back. Size: to 25 cm.
Habitat: coral reefs, from the blue edge down to at least 60 m.
Usually in schools, feeding on plankton a few feet above the reef.
Often observed to have a large parasitic crustacean on the cheek or in the mouth. Locally fished.





FAIRY BASSLETS (Grammidae)

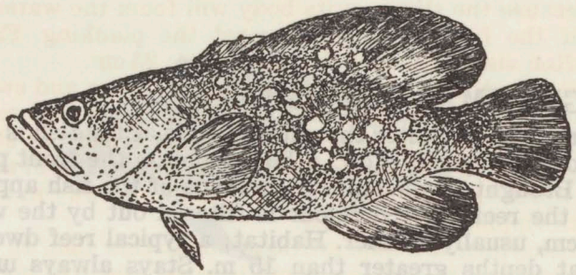
A small family of beautifully coloured tiny fishes, two of which are mentioned here.

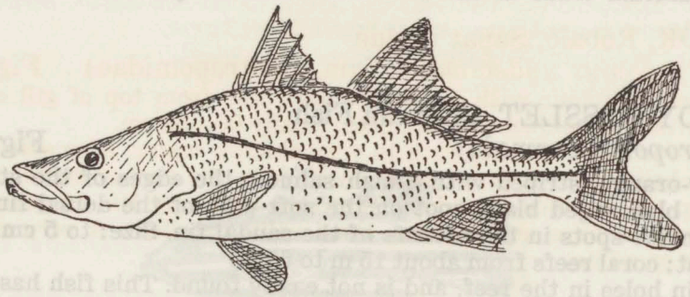
ROYAL GRAMMA *(Gramma loreto)* Fig. 51

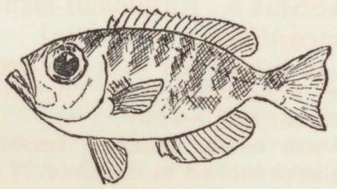
When observed under water the anterior part of the fish is a brilliant blue, the posterior part yellow. A black spot on the front part of the dorsal fin. Brought to the surface, the blue of the fish appears to be purple: on the reef the red colour is filtered out by the water.
Size: to 7 cm, usually smaller. Habitat: a typical reef dweller, most abundant at depths greater than 15 m. Stays always under coral heads and ledges. Swims always with its belly towards the substratum, so upside down under ledges. Caught in very large numbers for the aquarium trade in the N.A. Abundant everywhere on the reef.

CANDY BASSLET, Carmabi Fish *(Liopropoma carmabi)* Fig. 52

Yellow-orange, striped with bluish salmon, the edges of the stripes red. A blue edged black spot on the soft part of the dorsal fin and two similar spots in the corners of the caudal fin. Size: to 5 cm.
Habitat: coral reefs from about 15 m to 65 m.
Lives in holes in the reef, and is not easily found. This fish has only been described in 1963 by RANDALL who found it when he was invited to stay at the Caribbean Marine Biological Institute (CARMABI) to which this fish was named.







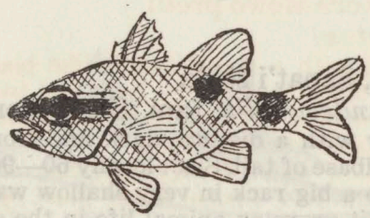
SOAPFISH, Habon
(Rypticus saponaceaus, fam. Grammistidae) Fig. 53
This purple bluish fish with its snakelike face and big fins is called Soapfish because the slime on its body will foam the water in a fishing craft if the fish is rubbed against the planking. Faint white spots are often visible all over the body. Size: 25 cm.
Habitat: all over the coral reef. It is a night feeder and swims freely at night. Feeds on crabs, crustacea and takes a cut bait readily, also shrimp. If in daytime you observe a purplish broad tail sticking out of a coral cluster, it will undoubtly be a Soapfish. It will act dead till you really touch the slimy body, and then swim away in a moray eel fashion with rippling fins and tail.
The local fishermen are superstitious about this fish. If a Soapfish is caught you may as well go home because you will not catch another fish for the rest of the night.

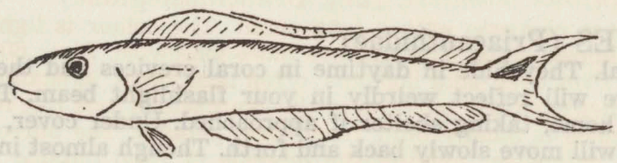
SNOOK, Róbalo, Sapat'i sòldá
(Centropomus undecimalis, fam. Centropomidae) Fig. 54
Silverish in colour with a distinct dark line from top of gill cover, horizontally to midbase of tail. Size: locally 60—90 cm.
Will hover close to a big rack in very shallow water. Also seen close to beaches, where it preys on animal life in the surf or current.
Rare in the Antilles nowadays. Was seen regularly 10—15 years ago especially in bays and lagoons. Food value excellent. A very strong fighter on a line.

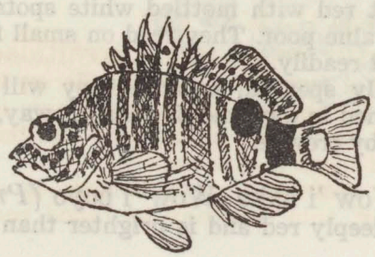
BIGEYES (Priacanthidae)
Nocturnal. They hide in daytime in coral crevices and the big dull black eye will reflect weirdly in your flashlight beam. They stay close to home, taking shelter if approached. Under cover, however, the fish will move slowly back and forth. Though almost invisible in daytime, a careful checking of all coral crevices at about 15 m will give amazing results. There are 2 species in the N.A.

GLASSEYE, Kandèlchi stinki
(Priacanthus cruentatus) Fig. 55
Pink to bright red with mottled white spots. Normal length about 12 cm. Food value poor. They feed on small fishes, crustaceans, etc. Take a cut bait readily.
They are easily speared, because they will stay in their crevices when approached in daytime. If chased away, they will make a short dash to a nearby crevice.

BIGEYE, Wow 'i baka, Wow 'i boyo *(Priacanthus arenatus)*
Its colour is deeply red and is brighter than in the Glasseye.







CARDINALFISHES (Apogonidae)

These are small, brightly coloured fishes which are nocturnal. They are red, orange, pink or blue with many black markings. During the day they hide deep in caves and crevices on the reef. Often they seek shelter between the spines of sea-urchins. At night they swim over the reef. Some associate with Basket Stars, others with Sea-anemones or Sponges. *Apogonichthys stellatus* hides in *Pinna* shells and Queen Conchs. Their breeding-habits are very peculiar. After the male has fertilized the eggs, the male or the female takes the eggs in its mouth. The fish swims around keeping them until they hatch. They feed upon small animals (mostly zooplankton).
There are several species in the N.A., which mutually differ mainly in the place and form of the black markings on the body. Only one species is mentioned here.

FLAMEFISH, Kòrá wowo pretu

(Apogon maculatus) Fig. 56

The fish is all red with a broad saddle-like black marking on the base of the tail, a black spot on the back and two sharp white lines through the eye, the area between them being black. The male keeps the egg cluster in its mouth. Size: 8 cm.
Habitat: from shallow water down to the deep-sea. In daytime to be found in caves in the reef. Probably the most common Cardinalfish in the N.A.

SAND TILEFISH, Piskarai

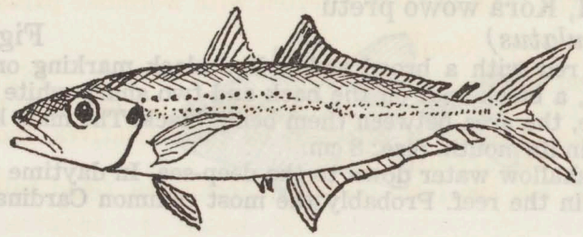
(Malacanthus plumieri, fam. Branchiostegidae) Fig. 57

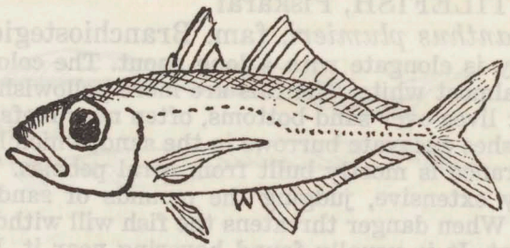
The body is elongate with a long snout. The colour is light bluish-yellow, almost white. The fins are more yellowish. Size: 60 cm.
Habitat: lives over sand bottoms, often near reefs, in shallow water. These fishes excavate burrows in the sand, which look like real forts. The entrance is mostly built from coral pebbles. The burrows must be fairly extensive, judging the mounds of sand outside their entrances. When danger threatens the fish will withdraw in its burrow, head first. It is usually found hovering near it. It feeds mainly on invertebrates and fishes.

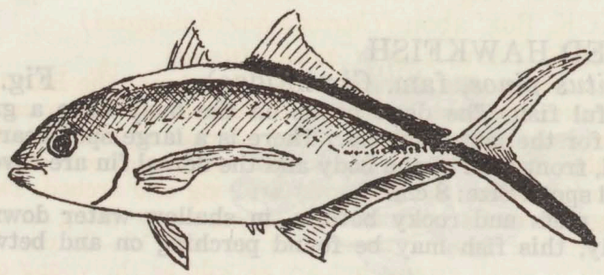
REDSPOTTED HAWKFISH

(Amblycirrhitus pinos, fam. Cirrhitidae) Fig. 58

A very colourful fish. The dark bands on the body have a green colour, except for the last black bar. There is a large spot near the tail-base. Head, front part of the body and the dorsal fin are covered with bright red spots. Size: 8 cm.
Habitat: coral reefs and rocky bottom, in shallow water down to 10 m. Typically, this fish may be found perching on and between coral heads.







JACKS (Carangidae)

The Jacks are a great and powerfully swimming family whose members show a big variety in size and shape. They have very small scales; some of the Jacks have a specially strengthened tailbase. They are fast swimmers, mostly silvery in colour with schooling behaviour. They take any bait trolled or otherwise moved. Their appetite seems unsatiable.

Many Jacks are no true reef inhabitants. Therefore, descriptions are short and only a few species have been figured.

GREATER AMBERJACK, Kabiou *(Seriola dumerili)*

Colour: silvery with a green cast olive blue over back. Dark stripe from nose tip crossing the eye going upwards. Average length: 1.20 m. A solitary fish of greater depth (60 m or more). Only smaller specimens will swim in the shallows. The fish is very curious. Food value good, but the flesh is often infected with wormlike parasites.

MACKEREL SCAD, Moulo

(Decapterus macarellus) Fig. 59

Dark green on the back, silvery below, with a pinkish tail. They swim with bursts of speed if attacked by their relatives, the big Runners or Jacks. Average size: 15 cm.

Food value good, but the flesh quickly deteriorates. Good bait for trolling.

ROUND SCAD, Moulo i' pieda *(Decapterus punctatus)*

The same coloration as *D. macarellus* with a faint yellow stripe at level of the eye. They are pelagic but often school over the reef and are locally caught with seines.

BIG EYE SCAD, Masbangu

(Selar crumenopthalmus) Fig. 60

Colours: faint copper green over the back and silvery for the lower part, separated by a faint yellow stripe. The big eye is the best clue for identification. Size: average 15 cm.

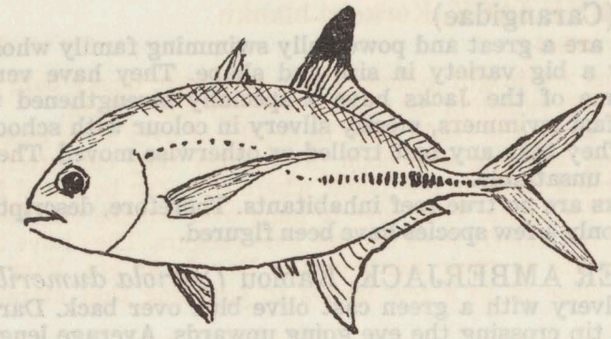
Plankton feeder, but easily caught on line with a small piece of bait or with a silvery hook. They love turbid waters. Much sought as food and bait.

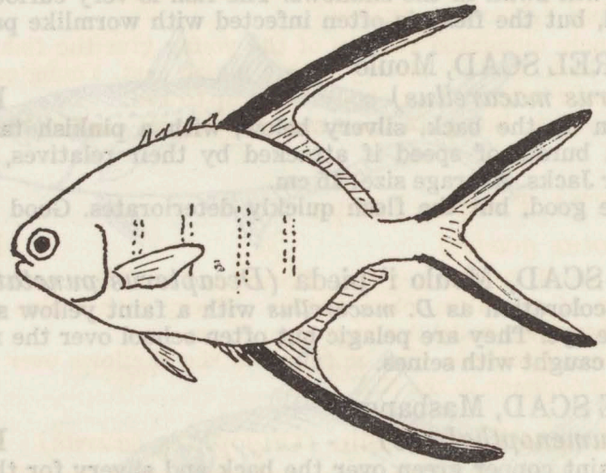
BAR JACK, Yaru, Yag *(Caranx ruber)* Fig. 61

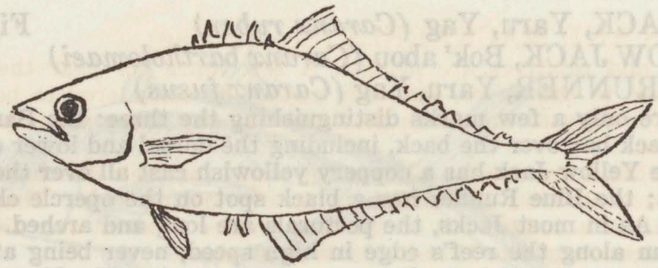
YELLOW JACK, Bok' abou *(Caranx bartholomaei)*

BLUE RUNNER, Yaru, Yag *(Caranx fusus)*

There are only a few marks distinguishing the three: the Bar Jack has a black bar over the back, including the dorsal and lower caudal lobe; the Yellow Jack has a coppery yellowish cast all over the body and fins; the Blue Runner has a black spot on the opercle close to the eye. As in most Jacks, the pectorals are long and arched. These Jacks run along the reef's edge in high speed, never being at rest. Most common are the smaller ones, average size 15—20 cm. The larger ones swim in small groups but are as wild as the young ones when they charge. Food value good.







HORSE EYE JACK, Korkobá blanku
(Caranx latus) Fig. 62

Colour: fins are bright yellow. The young have dusky bars over the body, that will vanish in the adults. Average size: 25 cm.
They rush along the reef's edge to depths of over 45 m especially in the morning and late afternoon. At midday they can often be seen milling around lazily in one place, where they can be found for days, sometimes for years. They love to hang over wrecks etc. They swim in schools, but elderly ones become lone rangers. They have the same hunting habits as their relatives the Bar Jacks etc. Very curious. They will close in to a few inches to anything that attracts their attention.

AFRICAN POMPANO, Pamper (Pampu) grandi, Kar'i Kabai *(Alectis crinitus)*

The extremely elongated finrays of the young give the fish a horse like, weird look. Colour: silvery with a bluish cast. Young ones have faint bars over bright silvery body. Size: up to 1 m.
Rare in the N.A. Being an open sea species, not easily observed by divers.

PALOMETA, Pamper, Pampu
(Trachinotus goodei) Fig. 63

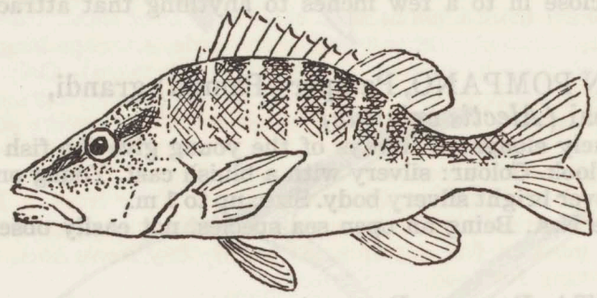
A relative small, deepbodied fish. Dorsal and anal fins prolonged almost to tip of caudalfin lobes. Colour: silvery with a blue cast and four dark bars over body. Average size: 25 cm.
Swims in small schools. Can be found in the shallows over a sandy bottom. Not common in the N.A.

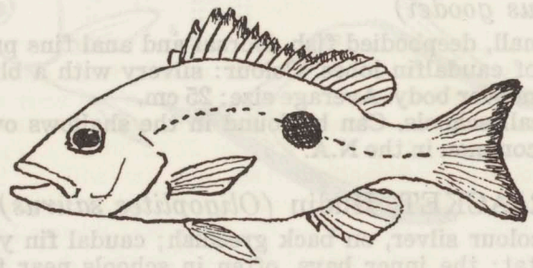
LEATHERJACKET, Hudiu *(Oligoplites saurus)* Fig. 64

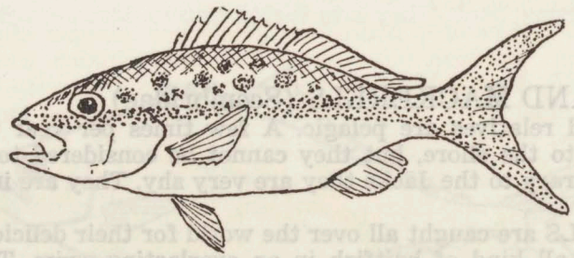
Thin body; colour silver, on back greenish; caudal fin yellow. Size: 30 cm. Habitat: the inner bays, often in schools near the surface. When disturbed leap into the air.

TUNAS AND MACKERELS (Scombridae)

TUNAS and relatives are pelagic. A few times per year they will come close to the shore, but they cannot be considered to be reef-fishes. Contrary to the Jacks they are very shy. They are important foodfishes.
MACKERELS are caught all over the world for their delicious flesh. They chase all kind of baitfish in an everlasting swim. They may appear all of a sudden out of the blue yonder to swim over the reef in small schools of 6 to 10 individuals or all alone.







SNAPPERS (Lutjanidae)

Snappers are powerfully muscled fish and next to the Groupers are the biggest of the reeffishes. Some Snapper species can easily reach a 100 pounds. Snappers have thrown divers going in deeper water (over 30 m) into a panic, because they will swim full speed towards the diver's faceplate or bubbles. A case is known of a Snapper knocking a diver's regulator out of his mouth. The denture of the Snapper is very impressive and it is understandable that fishermen respect it. Most Snappers have a pair of canine teeth that will hold their prey from escape. They eat anything alive. Snappers are found in shallow water as well as at depths of over 125 m. Many species, a few of which are mentioned here.

SCHOOLMASTER, Bers *(Lutjanus apodus)* Fig. 65

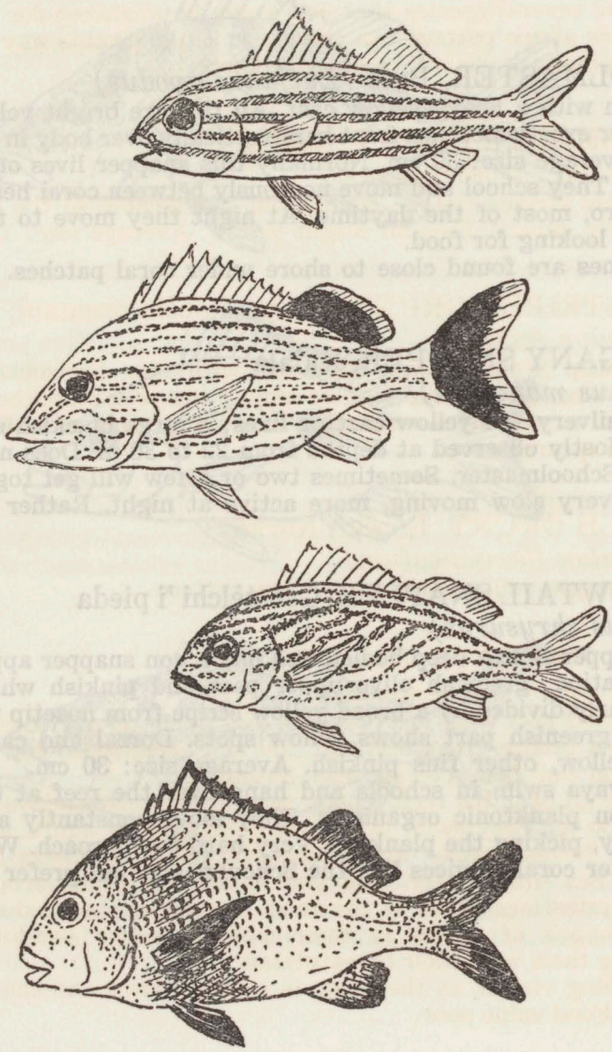
Brownish with a heavy yellow cast. All fins are bright yellow. Blue line under eye. Sometimes faint bars vertically over body in a whitish blend. Average size: 30 cm. Normally this snapper lives on the reef at 15 m. They school and move nervously between coral heads going to and fro, most of the daytime. At night they move to the sandy shallows looking for food.
Young ones are found close to shore under coral patches.

MAHOGANY SNAPPER, Kalala *(Lutjanus mahogoni)* Fig. 66

Pinkish silvery. No yellow cast or lines; a large blackish spot. Size 35 cm. Mostly observed at depths from 22 to 30 m. Does not school like the Schoolmaster. Sometimes two or a few will get together. In daytime very slow moving, more active at night. Rather common.

YELLOWTAIL SNAPPER, Grastèlchi 'i pieda *(Ocyurus chrysurus)* Fig. 67

This Snapper is less deep bodied and has a non snapper appearance. Its coloration: greenish olive upper part and pinkish white lower part, clearly divided by a broad yellow stripe from nosetip to caudal fin. The greenish part shows yellow spots. Dorsal and caudal fins bright yellow, other fins pinkish. Average size: 30 cm.
They always swim in schools and hang over the reef at the edge, feeding on planktonic organisms. They move constantly and swim graciously, picking the plankton. Very hard to approach. Will sometimes enter coral crevices like the Schoolmaster but prefer the open water.



GRUNTS (Pomadasyidae)

The Grunts present a wide variety of fishes that swim in schools all over the reef from shallow water to a depth of about 25 m. They could be called the "Snappers of the Shallows", because their behaviour is almost identical. There are two marked differences: Grunts show a bright red or deep orange inside of the mouth, and secondly, by grinding their teeths they can produce a sound like an underwater growl to which the name "Grunt" refers. When hooked and being picked up, the sound can be clearly heard. They take a bait readily and especially the young ones of only 5 cm long can be caught. They love inlets. Some use Anemones or Sea urchins as a protector.

There are several species that can easily be mistaken for others, as the yellow stripe pattern can change in a remarkable way. Only the most common species will be described here.

SMALLMOUTH GRUNT, Robèki

(Haemulon chrysargyreum) Fig. 68

Six yellow stripes clearly visible, but changeable so the fish looks completely silvery. Fins all bright yellow. Average size: 12 cm.

BLUESTRIPED GRUNT, Brons, Robèki oromani, Korkó

(Haemulon sciurus) Fig. 69

Colour deep bronze yellow all over, with blue horizontal stripes. Average size: 30 cm. The biggest among the yellowmouthed Grunts. When full grown often swimming in small groups as well as alone. Has been speared a lot.

FRENCH GRUNT, Robèki, Korkó

(Haemulon flavolineatum) Fig. 70

Colour: bright yellow stripes in a wavy pattern.

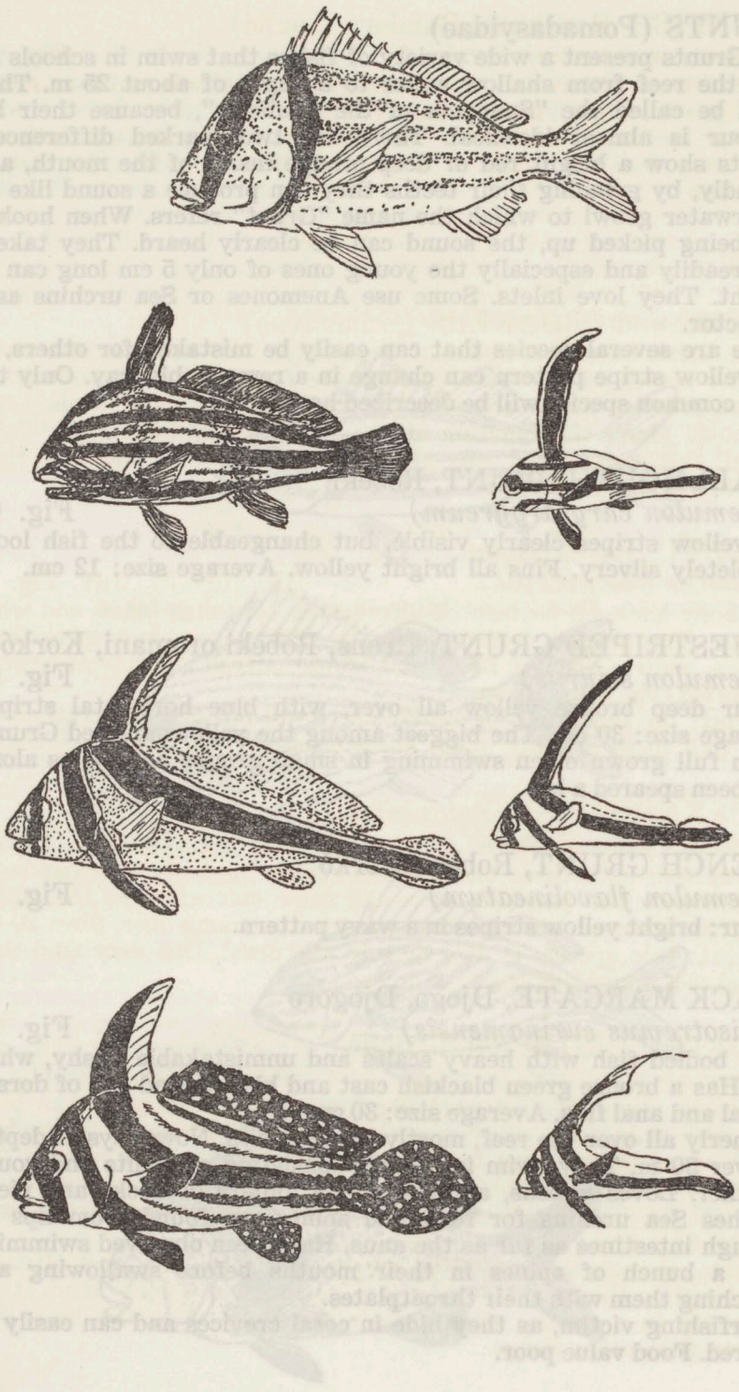
BLACK MARGATE, Djogo, Djogoro

(Anisotremus surinamensis) Fig. 71

Deep bodied fish with heavy scales and unmistakable fleshy, white lips. Has a bronze green blackish cast and blacktipped end of dorsal, caudal and anal fins. Average size: 30 cm.

Formerly all over the reef, mostly seen at 15 m. Nowadays at depths of over 30 m. They swim in schools consisting of adults and young together. Loves wrecks, artificial reefs, pillars of docks and piers. Crushes Sea urchins for food and spines are found from lips all through intestines as far as the anus. Have been observed swimming with a bunch of spines in their mouths before swallowing and crunching them with their throatplates.

Spearfishing victim, as they hide in coral crevices and can easily be speared. Food value poor.



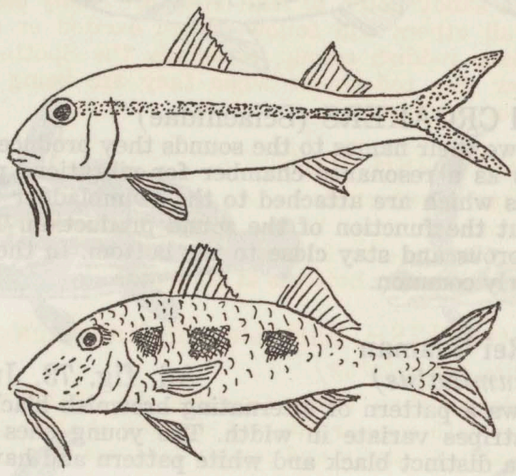
PORKFISH, Boneknap, Bandera (spañó)
(Anisotremus virginicus) Fig. 72
Alternatively yellow and blue horizontal stripes and two remarkable broad black stripes. Average size: 25 cm.
Habitat and behaviour like in the Margate. Also a spearfishing victim. They now are found at depths of 30 m or more. Not easy to approach.

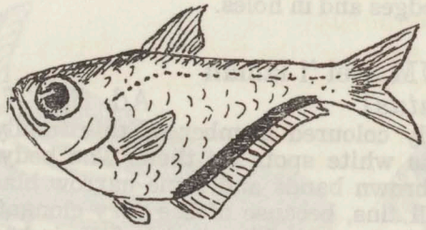
DRUMS and CROAKERS (Sciaenidae)
These fishes owe their names to the sounds they produce. The swimbladder serves as a resonance chamber for vibrations produced by special muscles which are attached to the swimbladder walls. Little is known about the function of the sound production. These fishes are all carnivorous and stay close to the bottom. In the N.A. three species are fairly common.

CUBBYU, Rei 'i laman
(Equetus acuminatus) Ad. fig. 73, Juv. fig. 74
The body shows a pattern of alternating brownish black and white stripes. The stripes variate in width. The young ones have fewer stripes, show a distinct black and white pattern and have markedly elongated fins. Size: 15 cm.
Habitat: the Cubbyu is primarily nocturnal in habit. In daytime one may find them drifting under coral heads or other shadowy places.

JACKKNIFE FISH, Rei 'i laman
(Equetus lanceolatus) Ad. fig. 75, Juv. fig. 76
A gray fish with three black bands across the body. The bands are white-edged. The juveniles have the same coloration as the adults. The fins, however, are very elongated in the young ones. Size: 20 cm.
Habitat: this species is also largely nocturnal. One may find them on the reef under ledges and in holes.

SPOTTED DRUM, Rei 'i laman
(Equetus punctatus) Ad. fig. 77, Juv. fig. 78
The most strikingly coloured member of this family. It has black fins with numerous white spots on them. The body is white with three broad dark brown bands and some narrow black stripes. The young ones look all fins, because of the very elongated first dorsal and tail fin. The black and white parts of their body are sharply contrasting. Size: 20 cm.
Habitat: though also nocturnal this species is the one most often encountered on the reef. Mostly it is hovering near a coral head. It will disappear in a crevice when danger threatens. Juveniles have been seen to clean other fishes.





GOATFISHES (Mullidae)

When you observe clouds of sand rising from the bottom, you are likely to have come across feeding Goatfishes. These fishes have two long barbels to dig in sandy or muddy bottom. When at rest the barbels are stored in a groove. Goatfishes swim in schools and are busy feeding especially in the early morning and afternoon. At midday you may see schools drifting at ease over the reef or even settling down on a sandy patch to rest. They are easily disturbed and if one moves all others will follow. When excited or asleep they change to a deep reddish colour, especially the Spotted Goatfish. They also show this red colour when they are being cleaned by cleaning fishes or shrimps.

YELLOW GOATFISH, Barbí

(Mulloidichthys martinicus) Fig. 79

White with a pinkish cast. Yellow stripe horizontally over body. Fins all yellow. Average size: 20 cm.
Habitat: sandy and muddy bottoms at all depths.

SPOTTED GOATFISH, Barbí shouru, Mandinga

(Pseudupeneus maculatus) Fig. 80

Body slightly deeper than Yellow Goatfish. All pinkish white. Three clear dark spots with regular interval starting at the top of opercle. Size: 25 cm. Habitat: sandy and muddy bottoms at all depths.

SWEEPERS (Pempheridae)

Another weird looking fish with big eyes. They shelter under corals during the day. Swinging in the surf they wait for nightfall to feed over the sandy flats and reef. Easily recognizable by deep body tapering strongly at analfin base.

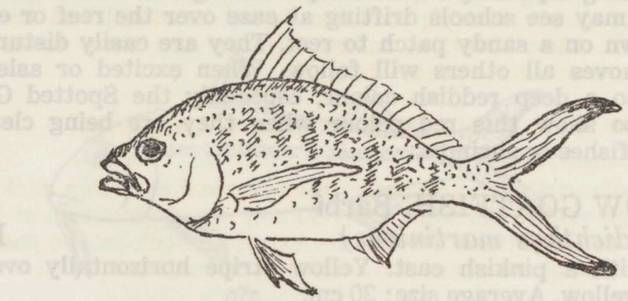
COPPER SWEEPER, Babalochi

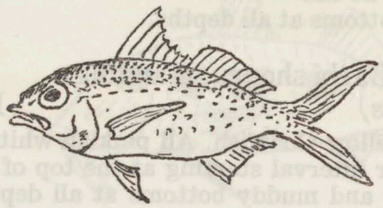
(Pempheris schomburgki) Fig. 81

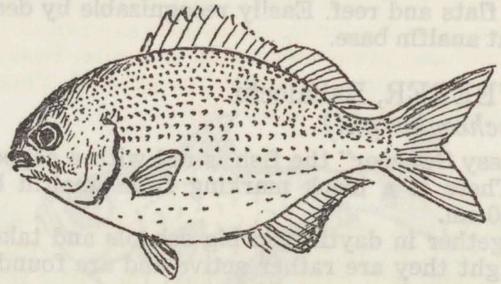
Known as "Glassy Sweeper" the fish is red with a coppery cast and silvery belly. There is a black marking from analfin base to end. Average size: 10 cm.
They school together in daytime in big schools and take it easy till nightfall. At night they are rather active and are found down to 15 m. They swim separately.

SHORTFIN SWEEPER, Babalochi *(Pempheris poeyi)*

Darker in appearance. Caudal fin blackish. Average size: 10 cm. Same behaviour as Copper Sweeper.







MOJARRAS (Gerreidae)

The mojarras are fishes of the sandy flats. They have not been observed deeper than 15 m. Mostly silvery coloured they swim in small groups, but not in close formation. They hover a foot or so over the sandy bottom, to dive down and take a mouthfull of sand, which they sieve through the gill rakers. They have a strange habit of swimming slowly, coming to a complete "stand-still" to move again and so on. They dwell in inlets, lagoons and seem to do well in brackish water with a muddy bottom.

YELLOWFIN MOJARRA, Bersla, Warda kosta

(Gerres cinereus) Fig. 82

Silvery coloured with sometime faint vertical bars in a darkish cast. Pelvic fins yellow. Average size: 20 cm, the biggest fish of the family. The Yellowfin can stretch its snout to suck in the sand. Quite common, though numbers diminished by spearfishing.

SPOTFIN MOJARRA, Kabekuchi

(Eucinostomus argenteus) Fig. 83

The smallest and most slender member of the family, bright silvery in colour. Dorsal fin dusky. Average size: 12 cm. Common. Used as baitfish. Easily caught by line with fresh bait or shrimp.

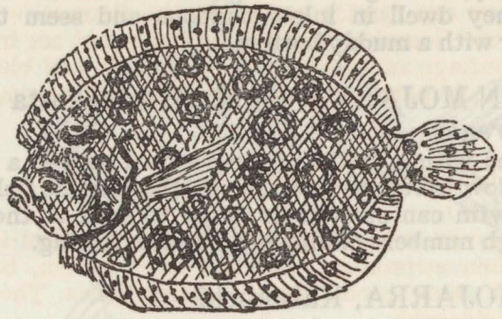
SEA CHUBS (Kyphosidae)

They swim in schools and are abundant where *Sargassum* is found, e.g. on the North coast of Curaçao. They may be observed on the Southside of the islands at greater depths, from which they "zoom" up to the coral reef. They love wrecks and artificial reefs. The chubs are inedible. As a plant feeder the intestines are full of half digested matter that stinks and takes away your appetite. Besides being unedible, they have an ugly appearance in general. Short and stout they are as Randall states: "Drab looking".

BERMUDA CHUB, Boka chikí

(Kyphosus sectatrix) Fig. 84

Drab looking, with faint yellow stripes over head and body. Average size: 30 cm. Found from 15 till 60 m. Will show curiosity to divers and the whole school will close in around the diver for a moment.



FLOUNDERS (Bothidae)

Easily spotted when the fish is swimming in a wave-like motion like the flying carpet, close to sandy bottom or corals. If chased the flounder can escape in an amazing burst of speed. As long as the fish is pursued it will not rest on the bottom. If it cannot escape its pursuer it will make a dazzling quick turn and hide under the sand. If you wait a moment, you will see a pair of eyes protruding out of the sand and you can faintly make out the flounder's form. If you do not disturb the flounder, you will probably not see him at all, because the camouflage of this fish is perfect. It can blend with any rock, weed or sandy pattern in split seconds, and become completely invisible.

PEACOCK FLOUNDER, Sobrá 'i Dios

(Bothus lunatus) Fig. 85

Brownish-grey-green with bluish circles. The pectoral is quite large and erected when swimming. Average size: 30 cm, but can grow quite big. Food value good, but too many bones. They have been spearfished considerably.

JAWFISHES (Opistognathidae)

Jawfishes live in vertical burrows. Although several species have been found in the Caribbean, only one seems to be common in the N.A.

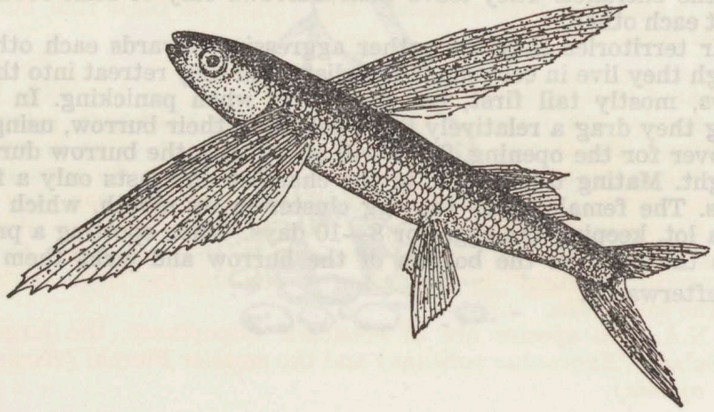
YELLOWHEAD JAWFISH, Jack in the box

(Opistognathus aurifrons) Fig. 86

Head yellow, body bluish, fins blue or violet. Males more deeply coloured than females. Size: 10 cm. Food: plankton, especially crustacea. Habitat: specially where bottom consists of sand and gravel, at depths of 8 m, down to 60 m.

Burrows can be 20 cm deep; the bottom is a little chamber where they can turn; the shaft is narrow. Mostly the fish is seen hovering above the entrance. They leave their burrows only to seize food or to fight each other.

In their territories they are rather aggressive towards each other, although they live in colonies. When disturbed they retreat into their burrows, mostly tail first, but head first when panicking. In the evening they drag a relatively large pebble to their burrow, using it as a cover for the opening. They will stay inside the burrow during the night. Mating takes place in the chamber and lasts only a few seconds. The female takes the egg cluster in its mouth, which extends a lot, keeping the eggs for 8—10 days. When spotting a prey, it puts the eggs on the bottom of the burrow and picks them up again afterwards.



SPOTTED SCORPIONFISH, Brantfes kòrá, Brantkonofeshi *(Scorpaena plumieri*, fam. Scorpaenidae) Fig. 87

Colour variable but usually with a broad pale band across the base of the tail following a darker band on the body. There is a striking black-purple, reddish and white coloration on the inside of the pectoral fins. Size: 45 cm.

Food: they prey upon fishes and crustaceans which venture too nearby. Habitat: a common inhabitant of the shallow reef and sandy bottoms. Like most scorpionfishes it will lay motionless on the bottom and is very inconspicuous because of its colour which blends very well with the background. When disturbed it will spread its pectoral fins showing in this way their striking colours. This may serve as a warning for intruders and this warning is well-meant. The dorsal, anal and ventral fins possess venomous spines. When trodden on by bathers or swimmers, these spines inflict extremely painful wounds. If this happens a physician should be warned.

In the N.A. there are a number of species called Branthorifes or Brant which differ from each other mostly in colour pattern.

FLYING GURNARD, Buladó di benewater *(Dactylopterus volitans*, fam. Dactylopteridae) Fig. 88

The colour is changeable and rather indistinctive, mostly brownish, varying according to the surroundings. The pectoral fins have a broad dark area and two lines of vivid blue concurrent with the fin margin. There are several rows of blue spots more toward the center of the fin. Size: 45 cm.

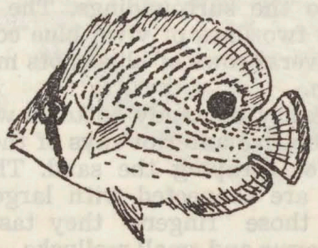
Habitat: observed mostly on sandy bottoms where it often "walks" on its ventral fins. The five anterior rays of the pectorals are finger-like and are used for scraping the sand. They are covered with sense organs which are connected with large knots of the spinal nerve system. With those "fingers" they taste and locate bottom animals, especially worms and small mollusks.

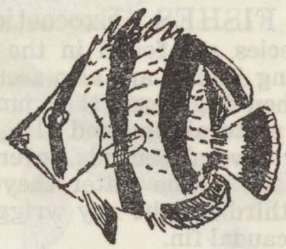
When disturbed the Flying Gurnard spreads its pectoral fins which really look like wings then, showing the bright blue markings on them. It is said that they even can "fly" (glide) on these fins, but it has never been observed.

FLYING FISHES (Exocoetidae) Fig. 89

Several species are found in the surface water. Although pelagic, young Flying Fishes are also seen in shallow water, often in small schools. When frightened they jump out of the water. By spreading their long pectoral fins and also the ventral fins they can stay in the air for several seconds covering considerable distances. When dropping back to the water they are able to take off again for a second or third "flight" by wriggling or sculling the large ventral lobe of the caudal fin.

In the N.A. two species are of economic importance, the largest called Buladó *(Exocoetus volitans)* and the smaller Flerchi *(Hirundichthys affinis)*.





BUTTERFLYFISHES and ANGELFISHES (Chaetodontidae)

These fishes have compressed, disc-like bodies. The mouth is small and protruding, in Butterflyfishes more so than in Angelfishes. The dorsal and anal fin form more or less one whole with the body. They usually live in pairs or in small groups. The Angelfishes have a stout spine at the corner of the preopercle, which distinguishes them from the Butterflyfishes. The coloration of the young often differs greatly from the adults.

The food of the adult Butterflyfishes consists mainly of the tentacles of polychaete tube worms and zoantharians (colonial sea anemones). Angelfishes mainly feed on sponges but also eat algae etc. The young feed in part on parasites which they pick from the skin of other fishes (cleaning symbiosis). Large numbers of these fishes are collected for the aquarium trade, especially Pygmy Angel, juvenile French Angels and juvenile Rock Beauties.

As a conservation measure the N.A. forbids the export of the rare Spotfin Butterflyfish, the Gray Angelfish and the more common Queen Angelfish. Neither the Angelfishes nor the Butterflyfishes are shy. Always seen actively swimming around.

FOUREYE BUTTERFLYFISH, Makamba marinier *(Chaetodon capistratus)* Fig. 90

Very light gray yellowish with numerous parallel dark lines originating approximately mid-laterally and running diagonally backwards across the body, on the upper part of the body in dorsal, on the lower part in ventral direction. A large round black spot edged with white on the body above the origin of the tail. A black band running from front to cheek across the eye. Size: to about 12 cm.

Habitat: observed in depths to 60 m.

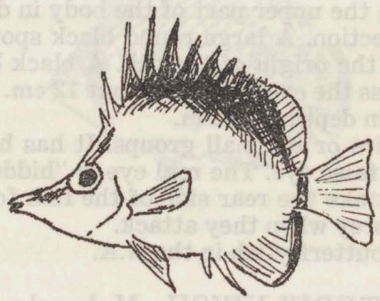
Usually seen in pairs or in small groups. It has been presumed that the large spot is a false eye. The real eye is "hidden" by a black bar. Predators may mistake the rear side of the fish for the front in that way missing their prey when they attack.

The most common butterflyfish in the N.A.

BANDED BUTTERFLYFISH, Makamba kulu berdè *(Chaetodon striatus)* Fig. 91

White with two broad black bands on the body and a narrower bar across the eye. Anal, caudal and posterior half of dorsal fin black, edged with white. Numerous faint black parallel stripes on body like in the Foureye Butterfly.

Size: a little larger than the Foureye Butterfly; this species grows to about 14 cm. Habitat: shallow water but also seen at greater depths (to approx. 40 m). Usually seen in pairs or in small groups. A common fish in the N.A.



SPOTFIN BUTTERFLYFISH, Chamba blanku

(Chaetodon ocellatus) Fig. 92

White with yellow fins except for the pectoral fin. A dark band running through the eyes. A dark blotch above the origin of the tail, and caudally at the edge of the dorsal fin a small black spot. The dark blotch has been observed to be absent in some specimens from the N.A. Size: to about 18 cm.

Always observed in pairs. A rare species in the N.A. Reported between 8 and 35 m. More common at the north coasts of the islands than at the south coasts. Included in the forbidden-to-collect list in the N.A.

REEF BUTTERFLYFISH, Chamba hel

(Chaetodon sedentarius) Fig. 93

White, grading into yellow brown on the back. Tail light yellow, white at the base. A black bar from the base of the dorsal fin through the eyes down to the cheek. A broader black bar from soft portion of dorsal fin across the caudal peduncle on the anal fin.

Size: to about 13 cm.

A typical deep water species. Rarely observed in less than 35 m depth. Usually in pairs. Quite rare in the N.A.

LONGSNOUT BUTTERFLYFISH, Chamba pinset

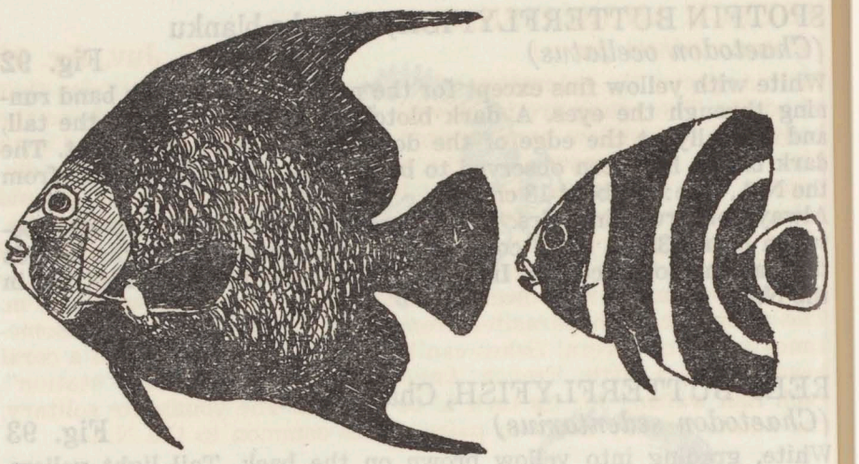
(Prognathodes aculeatus) Fig. 94

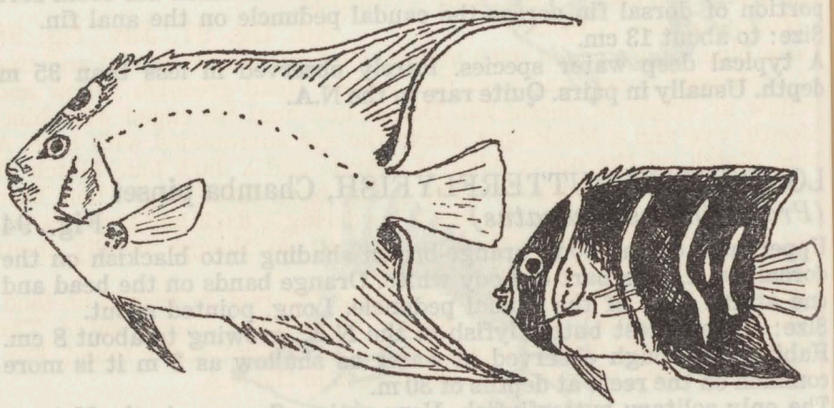
Upper half of the body orange-brown shading into blackish on the dorsal fin. Lower part of body white. Orange bands on the head and one at the base of the caudal peduncle. Long, pointed snout.

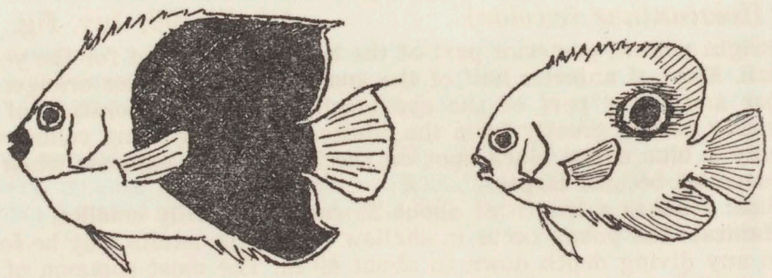
Size: the smallest butterflyfish in the N.A., growing to about 8 cm.

Habitat: although observed in water as shallow as 3 m it is more common on the reefs at depths of 30 m.

The only solitary butterflyfish. Very active. Common in the N.A.







FRENCH ANGELFISH, Sheu

(Pomacanthus paru) Ad. fig. 95, Juv. fig. 96

In this species the coloration of the young differs greatly from that of adults. The young are black with four bright yellow bands on the body and one yellow band around the tail. Pelvic fins edged with blue. When they grow older the bands fade, until they finally disappear. The scales on the body become yellow-edged, the ground colour remains black. A yellow band at the base of the pectoral fin. Head bluish gray, a yellow band around the eye. Size: to about 40 cm. Habitat: the young generally stay in the shallows, whereas the adults are mainly reef dwellers. Observed at depths down to 60 m. The young feed on parasites from the skin of other fishes. Sometimes a row of several fishes can be seen lined up in front of a coral head where a little French Angelfish has its "cleaning station", each fish waiting for its turn to be cleaned. The young are solitary, the adults usually swim in pairs. Quite common in the N.A.

QUEEN ANGELFISH, Rei 'i chamba

(Holacanthus ciliaris) Ad. fig. 97, Juv. fig. 98

Deep blue, scales edged with yellow. Pectoral pelvic, caudal and tips of prolonged dorsal and anal fins yellow. Head greenish yellow and yellow at origin of dorsal fin. Dorsal and anal fin edged with blue. Mouth, eye and a black spot above the eye surrounded with blue. A blue blotch on the upper edge of opercle and a dark blue blotch at the base of the pectoral fin. The young have three bright blue bars on the body and two on the head, bordering a dark bar through the eye. Size: reported to reach more than 40 cm, though usually about 25 cm. Habitat: depths from 4 to 50 m.

They live in fairly deep water roaming the reef in search of food. Generally a solitary species. Easily approached under water. The young, which are desired aquarium fishes are not easily found. Forbidden to export, although not uncommon in the N.A.

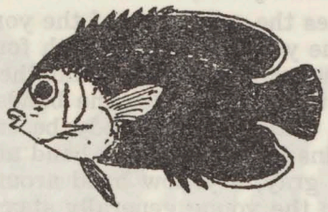
ROCK BEAUTY, Ladronchi grandi

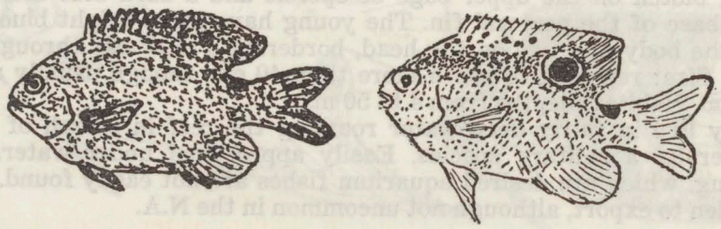
(Holacanthus tricolor) Ad. fig. 99, Juv. fig. 100

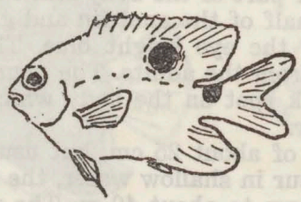
Bright yellow, posterior part of the body black except for the yellow tail. Edge of anterior half of the anal fin and gill cover orange. Upper and lower part of the eye bright blue. The coloration of the young differs greatly from the adults. The young being yellow with only a blue edged black spot on the body which expands when the juveniles become larger.

Size: reaches a length of about 25 cm, but usually smaller.

Habitat: the young occur in shallow water, the adults may be found in any diving depth down to about 40 m. The most common of the Angelfishes in the N.A. The juveniles are a favourite target of aquarium fish collectors.







PYGMY ANGELFISH *(Centropyge argi)* Fig. 101

Deep purple-blue. Head and chest orange-yellow. Dorsal and anal fin edged with light blue. Pectoral fins pale yellowish.
Size: grows to about 6 cm. Habitat: usually found in small or large groups, mainly among coral rubble, under which it hides immediately when frightened. It always keeps very close to the bottom.
In the N.A. most abundant in coral rubble areas behind the reefs, thus in fairly shallow water (9—15 m). This species, although quite common in the N.A. has only been described in 1951, probably because it is not caught in nets or fish traps.
A very active fish, valuable as an aquarium fish and collected in large numbers in the N.A.

DAMSELFISHES, Ladronchi (Pomacentridae)

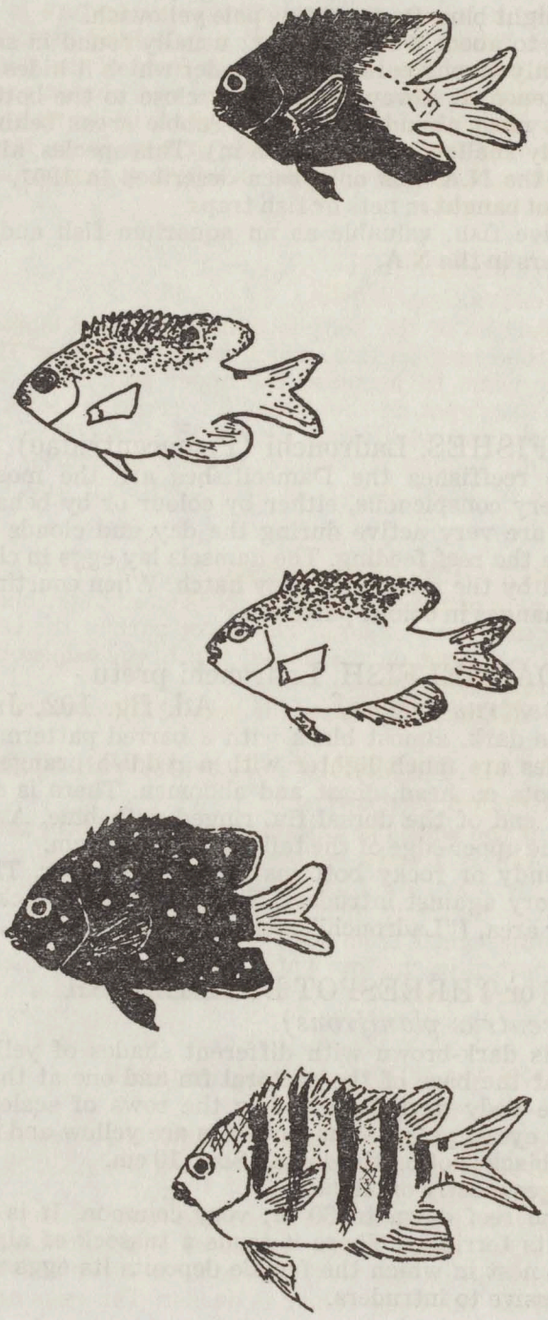
Among the reeffishes the Damselfishes are the most numerous. They are very conspicuous, either by colour or by behaviour. Being small they are very active during the day and clouds of them will hover above the reef feeding. The damsels lay eggs in clusters which are guarded by the male until they hatch. When courting they show dramatic changes in colour pattern.

DUSKY DAMSELFISH, Ladronchi pretu
(Eupomacentrus fuscus) Ad. fig. 102, Juv. fig. 103

The adult is dark, almost black with a barred pattern on the body. The juveniles are much lighter with a reddish orange nape. There are blue spots on head, chest and abdomen. There is a large black spot at the end of the dorsal fin, ringed with blue. A smaller dark spot is on the upper edge of the tail-base. Size: 15 cm.
Habitat: sandy or rocky bottoms in shallow water. They defend a large territory against intruders. They will even attack a diver who enters their area. ("Ladronchi" means "Little Robber").

YELLOW or THREESPOT DAMSELFISH
(Eupomacentrus planifrons) Fig. 104

The adult is dark-brown with different shades of yellow. It has a dark spot at the base of the pectoral fin and one at the base of the tail. On the body dark lines follow the rows of scales. The upper edge of the eye is yellow. The juveniles are yellow and have another blue-edged black spot on the dorsal. Size: 10 cm.
Food: forages mostly on algae.
Habitat: the reef down to 30 m; very common. It is seen darting around in its territory. There it tends a tussock of algae. This will become the nest in which the female deposits its eggs when mating. Very aggressive to intruders.



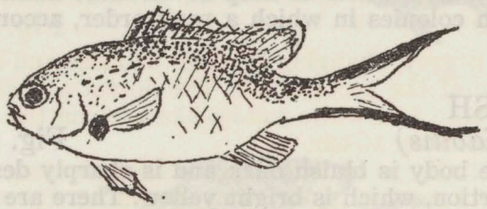
BICOLOR DAMSELFISH
(Eupomacentrus partitus) Fig. 105
Very variable in colour. Its most distinctive feature is a sharp division between brown front part and a pale hind part. This division may be right behind the head or just in front of the tail. Part of the pale region may be coloured orange, the rest almost white. Changes in colour may be caused by age, sex or phase of courtship. Size: 8 cm.
Habitat: the reef from shallow water to deep down. Most numerous from 6 to 30 m. Lives in colonies in which a rank order, according to size, seems to exist.

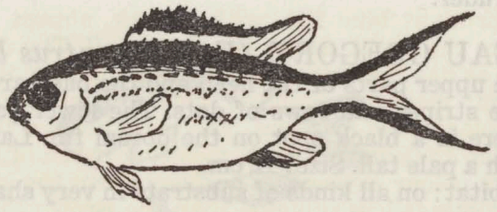
COCOA DAMSELFISH
(Eupomacentrus variabilis) Fig. 106
The upper portion of the body is bluish dark and is sharply demarcated from the lower portion, which is bright yellow. There are blue spots on the head. In juveniles the upper part of the body is more blue with a dark spot on the dorsal fin. There is also a dark spot at the base of the tail which may persist in adults. Size: 10 cm.
Habitat: sandy bottom in shallow, often a bit murky water (e.g. in the entrance of inner bays). Is also territorial and attacks every intruder.

BEAU GREGORY *(Eupomacentrus leucostictus)* Fig. 107
The upper parts of the head and the back are faintly blue with bright blue stripes and rows of dots. The lower part of the body is yellow. There is a black spot on the dorsal fin. Large adults become dusky with a pale tail. Size: 12 cm.
Habitat: on all kinds of substrate in very shallow water.

YELLOWTAIL DAMSELFISH or JEWELFISH
(Microspathodon chrysurus) Fig. 108
The colour of the adults is variable from dusky brown to a very pale violet. The tail is always yellow. There may be blue spots on the back. The juveniles are blue with numerous iridescent blue spots scattered over the body, hence the name "Jewelfish". Size: 15 cm.
Food: it browses algae from dead coral surfaces.
Habitat: common in shallow water, the young very often among the branches of fire-corals. They have territories and are very aggressive.

SERGEANT MAJOR, Katabali, Katabòli
(Abudefduf saxatilis) Fig. 109
The upper one third of the body is yellow, the remainder gray. Five broad black bars run downwards over the body. Juveniles have the same coloration. Size: 18 cm.
Food: a variety of animal and vegetable food, among which colonial anemones, algae, small fishes, tunicates and nudibranchs.
Habitat: common on the reef. The male is often observed guarding the eggs. Then, the body colour is darker. The eggs are visible as a





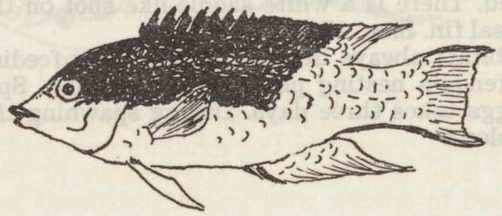
violet patch on bare rocks or dead coral. The male charges at all intruders that venture too close.
A close relative is the NIGHT SERGEANT *(Abudefduf taurus)* which is larger and more blackish brown coloured. Characteristically this fish is found under rocks close to shore.

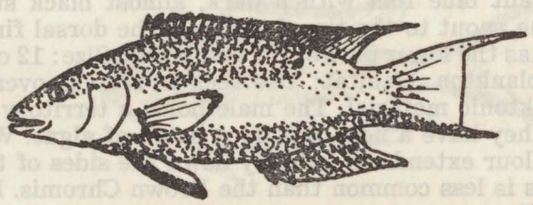
BROWN or YELLOW-EDGE CHROMIS, Stèlchi bobo *(Chromis multilineata)* Fig. 110

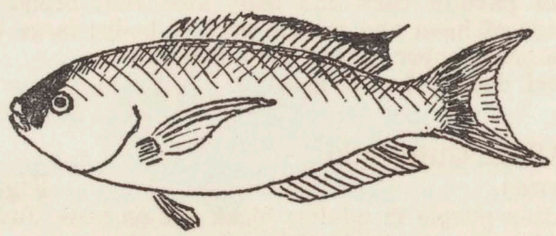
The back of this species is grey, changing to silver on sides and belly. A black spot at the base of the pectoral fin. The dorsal and caudal fins are yellow edged. There is a white saddle-like spot on the back at the end of the dorsal fin. Size: 15 cm.
Food: plankton. Habitat: always in very large schools feeding over the reef. It only defends a nesting place when spawning. Spawning and guarding the eggs takes three days. During spawning the male becomes darker in colour.

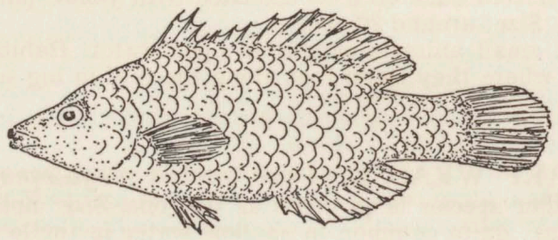
BLUE CHROMIS, Stèlchi blou *(Chromis cyanea)* Fig. 111

A brilliant blue fish with a dark, almost black stripe on the back from the snout to the tip of the tail. The dorsal fin has a dark edge too as has the lower part of the caudal fin. Size: 12 cm.
Food: plankton. Habitat: also seen in schools over the reef feeding on planktonic material. The male holds a territory on the bottom in which they have a nest, mostly a patch of algae. When courting the dark colour extends to halfway down the sides of the fish. The Blue Chromis is less common than the Brown Chromis. Not as aggressive as the *Eupomacentrus*-species.









WRASSES (Labridae)

Wrasses are found all over the reef where they mainly feed on shelled preys like mollusks and small crustaceans. They move around mainly propelled by their pectorals. They inspect every crevice and their ability to find their way back enables them also to escape from pots, where other fish fail to find the exit.

The colours of the juveniles often differ from that of the adults. The adults may show two distinct colour patterns (dichromatism), the terminal phase being displayed by the large individuals. In some species females and young adult males have the same colour pattern which is different from the bright colours in larger males. In some species, however, there is no clear relation between sex and colour phase. Females changing into males is a common process in all species (literature: *Roede,* 1972).

Most species inhabit the sandy patches between the coral reefs. They are able to dig themselves into the sand in a few seconds. They may stay there quite some time, especially when they are alarmed. Wrasses sleep at night, mostly buried in the sand. Juveniles of several wrasse species have been seen cleaning large fishes of parasites. Cleaning is only found in species with brightly coloured juveniles.

SPANISH HOGFISH, Djent 'i kachó

(Bodianus rufus) Fig. 112

Head and anterior part of back blue purple coloured (deep water specimens red), the belly and posterior part yellow. Size: 30 cm. Habitat: coral reef.

SPOTFIN HOGFISH, Purunchi kabritu

(Bodianus pulchellus) Fig. 113

Head and anterior part of back and belly area red; broad white stripe on lower side of head and middle part of body; large bright yellow area on posterior, upper part of body. Size: 20 cm.
Habitat: on the reef, deeper than 25 m.

CREOLE WRASSE, Gutu chikí

(Clepticus parrae) Fig. 114

Colour violet to deep purple in adults; black dot on nose. Juveniles show dotted dark bars on the back with yellow pattern, even copper green. Size: around 20 cm.
Food: small animals caught in open water. Habitat: over the blue edge, where they swim fast along the reef in big schools. Very common.

DWARF WRASSE *(Doratonotus megalepis)* Fig. 115

No other species is as green as this one. Size: not more than 7 cm. Habitat: quite common in shallow water in turtle grass beds where they browse and pick up small animals.

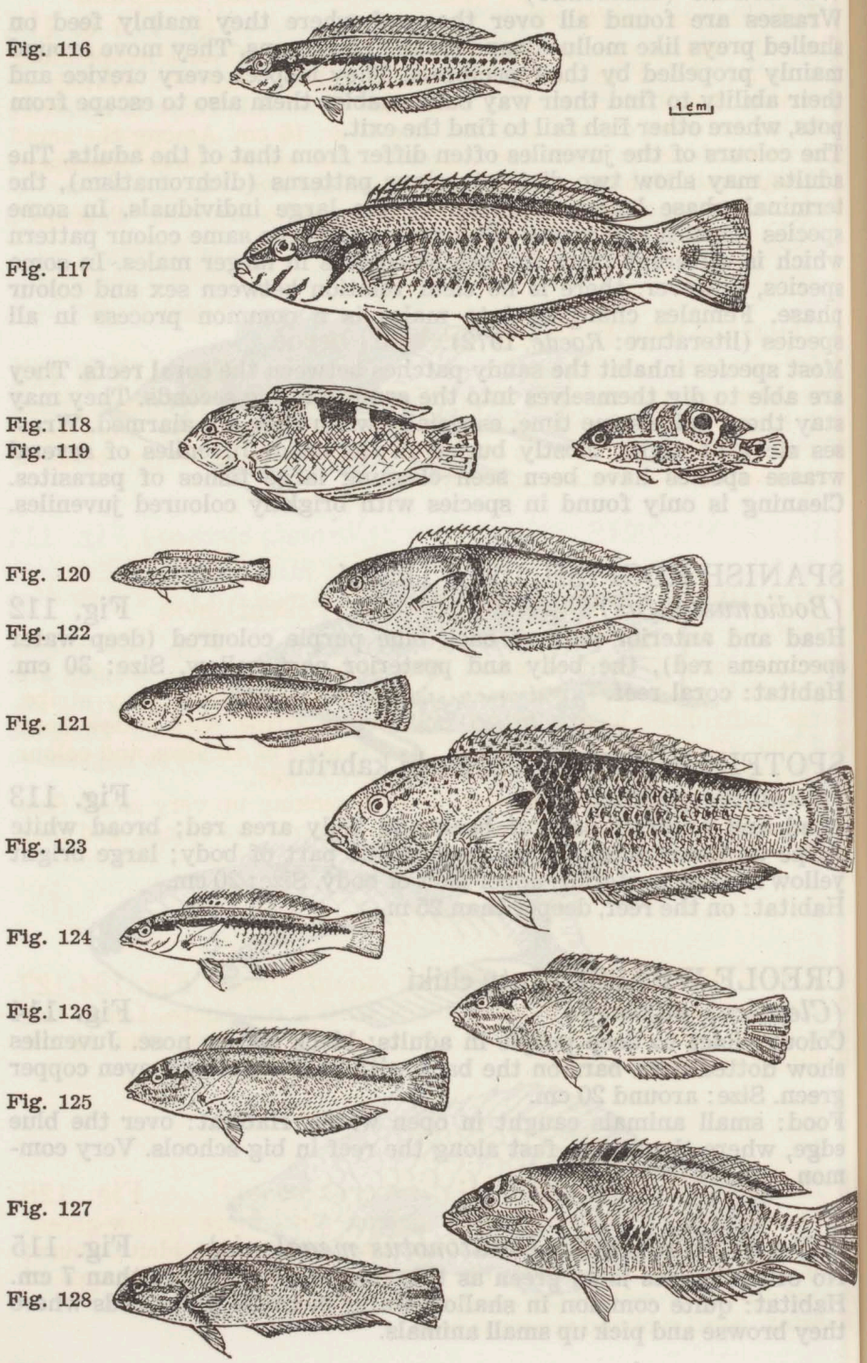


Fig. 116
Fig. 117
Fig. 118
Fig. 119
Fig. 120
Fig. 122
Fig. 121
Fig. 123
Fig. 124
Fig. 126
Fig. 125
Fig. 127
Fig. 128

SLIPPERY DICK, Pepchi, Pekchi or Peuchi pampuna
(Halichoeres bivittatus) Fig. 116 & 117

The only wrasse species with a vague longitudinal dark stripe along the belly. Colour in large individuals rather uniform: whitish or greenish. Small black spot at rear base of dorsal. There is no strict relation between colour, size and sex. Size: 16 cm. Among the small specimens females form the majority and among large specimens males prevail. Habitat: shallow water and the reef.
Food: all types of bottom animals. The juveniles are keen "cleaners".

PUDDING WIFE, Pepchi (Pekchi) berdè
(Halichoeres radiatus) Fig. 118 & 119

Juveniles are yellow with blue bands. Adults are yellowish green, and large males almost green. Size 20 cm, eventually more than 30 cm. Habitat: young ones in shallow water, adults deeper, between coral reefs. Food: bottom animals.

YELLOWHEAD WRASSE, Pepchi (Pekchi) blou
(Halichoeres garnoti) Fig. 120 - 123

Juveniles orange with a small blue horizontal stripe. Adults are yellow-red, with dark red back plus a vague vertical gray stripe. Large individuals have a broad dark brown stripe, with yellow head and blue green abdomen. Size: 16 cm. Females of all sizes and colour phases are found, most males, however, are larger.
Habitat: as former species. Can be seen picking up very small Sea-urchins smashing them against rocks to remove the spines, and then eating them.

CLOWN WRASSE *(Halichoeres maculipinna)* Fig. 124-127

Colour ventrally white, dorsally black with a red stripe. Large fish turn green, with a black spot on the dorsal fin and side. Size: 13 cm. Habitat: as former species.

BLACK-EAR WRASSE *(Halichoeres poeyi)* Fig. 128

Head and body olivaceous; belly behind anus more yellow-green; above eye a distinct spot with dark blue, blue and golden colours; faint red spot behind lower lip. There are no distinct changes of colour during growth of the adults. Size: 16 cm.
Habitat: coral reef and seagrass beds.

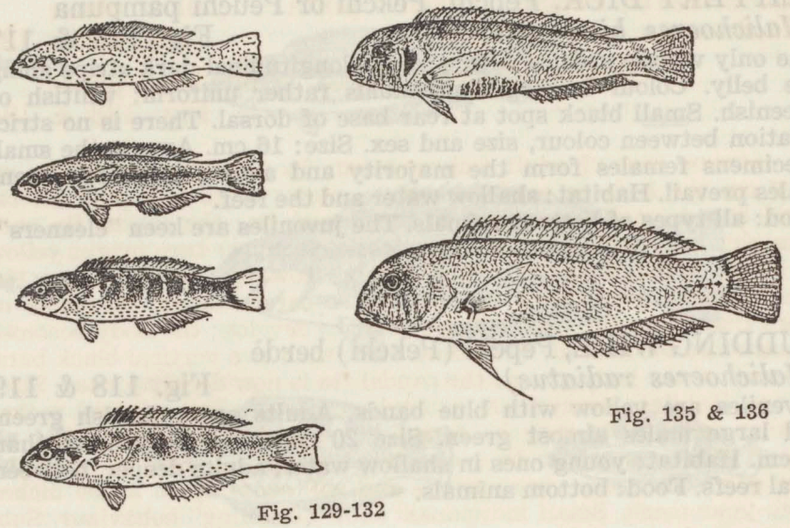
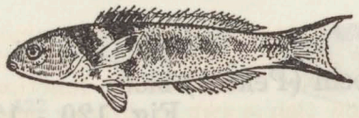


Fig. 135 & 136

Fig. 129-132



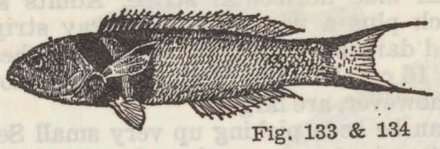


Fig. 133 & 134

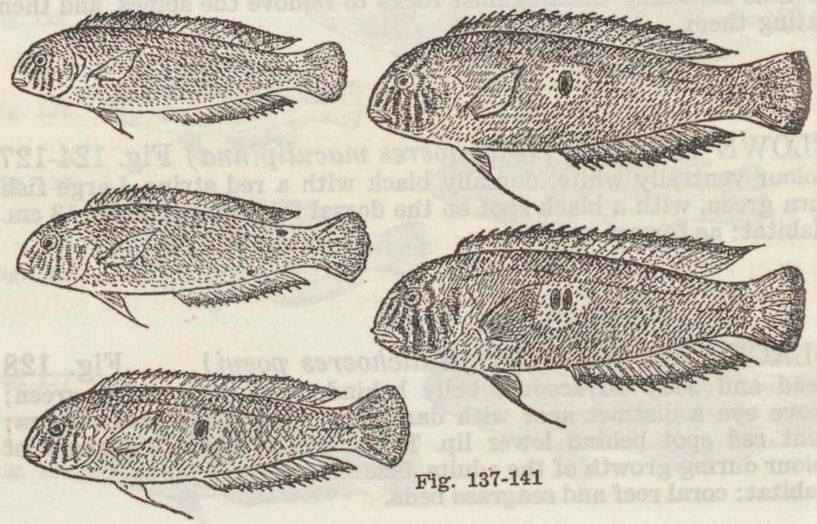


Fig. 137-141

BLUEHEAD, Pepchi (Pekchi) pintá = yellow phase
(Thalassoma bifasciatum) Fig. 129 - 132

Pepchi (Pekchi) doktó = bluehead phase
Fig. 133 & 134

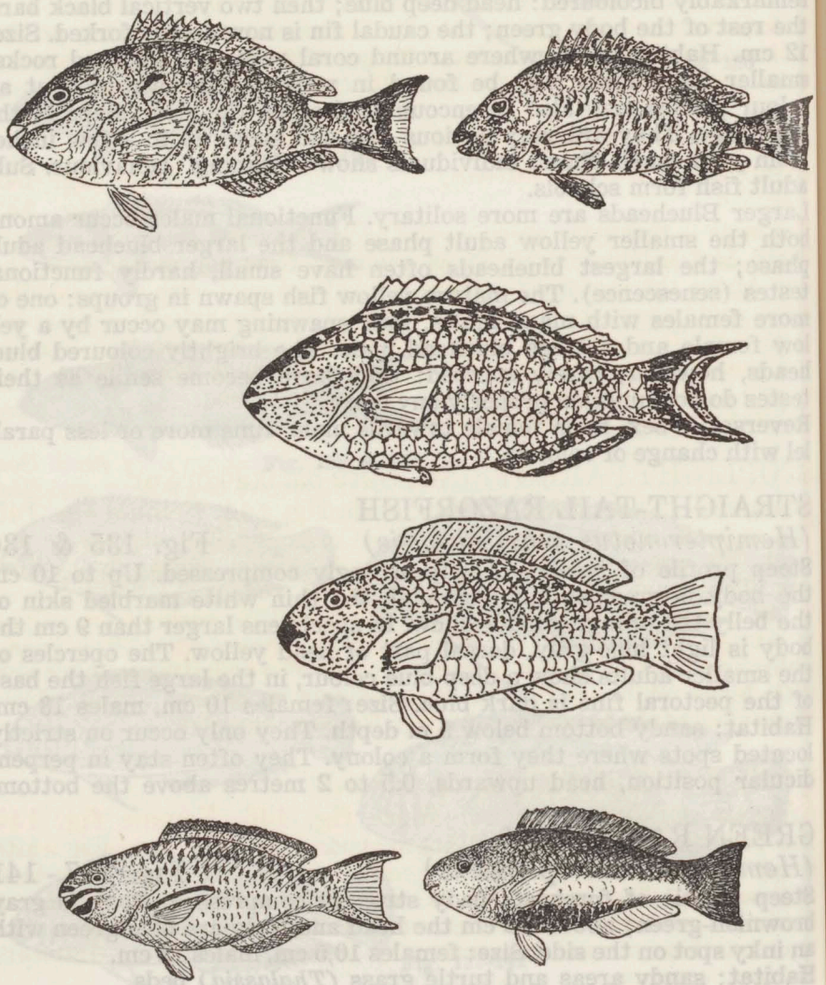
An extreme case of adult dichromatism. In juveniles and adults up to 9 cm the body is predominantly yellow; there is a pink lateral band and a small black spot in the dorsal fin; the caudal fin ends straight. Excited individuals (e.g. while cleaning) turn bright yellow all over; when disturbed, they change towards darker hues; the lateral band may break up into six separate spots. In males of more than 7 cm the final colours start to develop; the body becomes remarkably bicoloured: head deep blue; then two vertical black bars, the rest of the body green; the caudal fin is now deeply forked. Size: 12 cm. Habitat: everywhere around coral reefs and exposed rocks; smaller individuals may be found in very shallow waters, but all colour phases may also be encountered along the steep slope of the blue edge. They are very curious and will swim up to a few inches from your mask. Small individuals show "cleaning" behaviour. Sub-adult fish form schools.
Larger Blueheads are more solitary. Functional males occur among both the smaller yellow adult phase and the larger bluehead adult phase; the largest blueheads often have small, hardly functional testes (senescence). The mature yellow fish spawn in groups: one or more females with many males. Pair spawning may occur by a yellow female and a large bluehead male. The brightly coloured blueheads, however, rarely succeed: they have become senile as their testes do not function properly any more.
Reversal of sex, from female towards male, runs more or less parallel with change of colours.

STRAIGHT-TAIL RAZORFISH
(Hemipteronotus martinicensis) Fig. 135 & 136

Steep profile of forehead, body strongly compressed. Up to 10 cm the body is greenish-blue; through the thin white marbled skin of the belly the orange gonads show. In specimens larger than 9 cm the body is light blue-gray, dorsal part of head yellow. The opercles of the smaller adults show a deep blue colour, in the large fish the base of the pectoral fins is dark blue. Size: females 10 cm, males 13 cm. Habitat: sandy bottom below 5 m depth. They only occur on strictly located spots where they form a colony. They often stay in perpendicular position, head upwards, 0.5 to 2 metres above the bottom.

GREEN RAZORFISH
(Hemipteronotus splendens) Fig. 137 - 141

Steep profile of forehead, body strongly compressed. Body is gray brownish-green; above 9,5 cm the head and body are blue-green with an inky spot on the side. Size: females 10,5 cm, males 13 cm.
Habitat: sandy areas and turtle grass *(Thalassia)* beds.



PARROTFISHES (Scaridae)

Most Parrotfishes live on reefs, being some of the most conspicuous members of the reef-community. The males are very colourful with green, blue and red in different combinations. The females have a more subdued coloration. They graze algae from the rocks and crunch pieces of coral. This coral is pulverized in the gullet in which they have a strong set of teeth. In doing so they are a very important factor in reef demolition and erosion.
Territorial males are brightly coloured. These spawn with individual females. The less colourful individuals may be either males or females. These spawn in aggregations at the peak of upward rushes. This reproductivity pattern also occurs in wrasses. It is likely that the territorial males are sex-reversed females.
At night some species envelop themselves in a layer of mucus. It is transparent and the fishes may be found within it sleeping on the bottom, safe, for instance, from Moray attacks as most fish species avoid the mucus. Size: 25 cm. Habitat: common on reefs.

REDBAND PARROTFISH, Gutu ketekete
(Sparisoma aurofrenatum) Male fig. 142
Female fig. 143

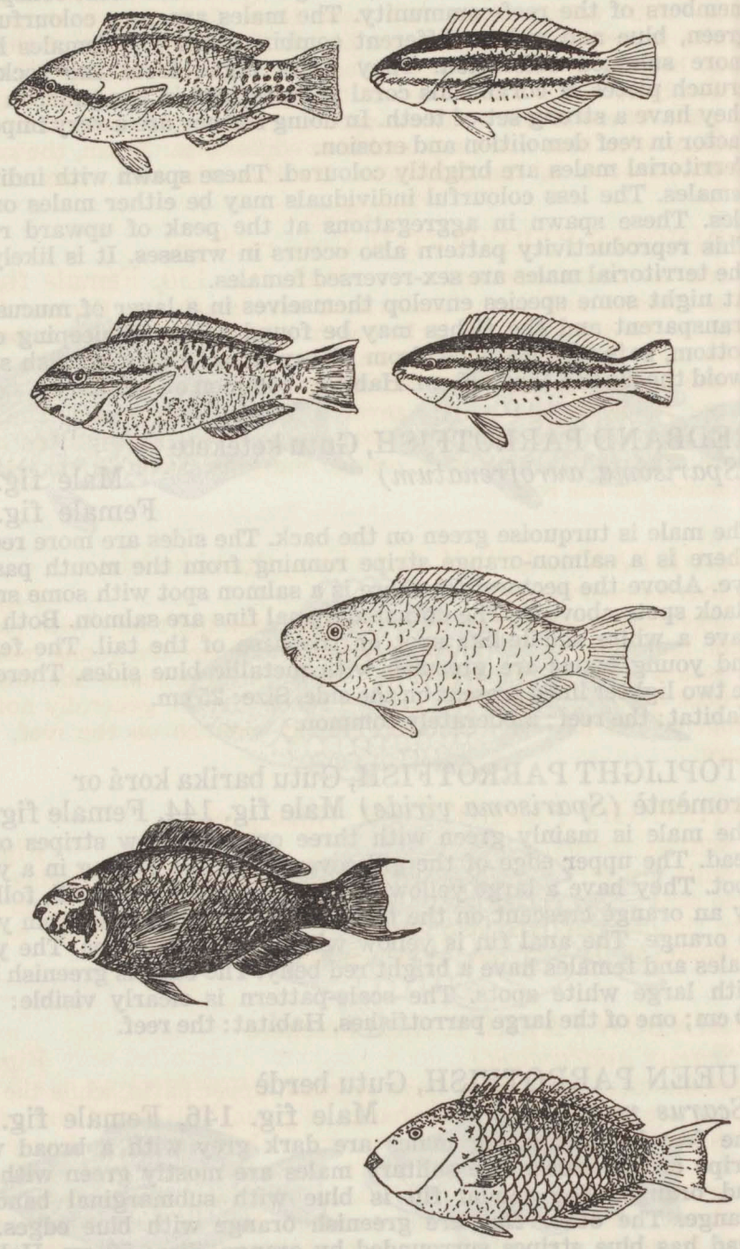
The male is turquoise green on the back. The sides are more reddish. There is a salmon-orange stripe running from the mouth past the eye. Above the pectoral fin there is a salmon spot with some smaller black spots above it. The dorsal and anal fins are salmon. Both sexes have a white saddle-like spot on the base of the tail. The females and young males are greenish with metallic blue sides. There may be two lighter lines present on the side. Size: 25 cm.
Habitat: the reef; moderately common.

STOPLIGHT PARROTFISH, Gutu barika korá or promèntè *(Sparisoma viride)* Male fig. 144, Female fig. 145

The male is mainly green with three orange-yellow stripes on the head. The upper edge of the gill cover is orange, ending in a yellow spot. They have a large yellow spot on the base of the tail, followed by an orange crescent on the tail. The dorsal fin varies from yellow to orange. The anal fin is yellow with blue-green edges. The young males and females have a bright red belly. The back is greenish black with large white spots. The scale-pattern is clearly visible: Size: 50 cm; one of the large parrotfishes. Habitat: the reef.

QUEEN PARROTFISH, Gutu berdè
(Scarus vetula) Male fig. 146, Female fig. 147

The females and young males are dark grey with a broad white stripe on the sides. The solitary males are mostly green with blue and orange. The caudal fin is blue with submarginal bands of orange. The other fins are greenish orange with blue edges. The head has blue stripes surrounded by orange. Size: 50 cm. Habitat: the reef; common.



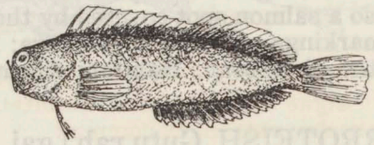
STRIPED PARROTFISH, Gutu pepchi (pekchi)
(Scarus croicensis) Male fig. 148, Female fig. 149
The "dull" colour phase fish have three dark brown stripes with white in between. The fins are bluish. The upper part of the snout may be yellow. The solitary males are green with orange. There is a green band at the lower edge of the eye. Most of the head and chest is pink. There is also a salmon spot covered by the pectoral fins. Fins orange with blue markings and blue edges. Size: 25 cm, the smallest *Scarus*-species in the Caribbean. Habitat: the reef; very common.

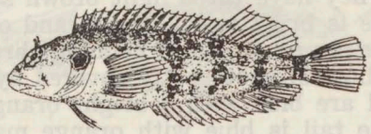
PRINCESS PARROTFISH, Gutu rab'i gai
(Scarus taeniopterus) Male fig. 150, Female fig. 151
The females and young males look very much like Striped Parrotfishes. They have three light brown stripes with white in between. The male is brightly blue-green and orange. There are two narrow green stripes on the head running through the eye. On its side is a large yellowish spot partly covered by the pectoral fin. The dorsal and anal are blue with a bright orange stripe through the median part. The tail is blue with orange margins. Size: 30 cm. Habitat: common on the reef.

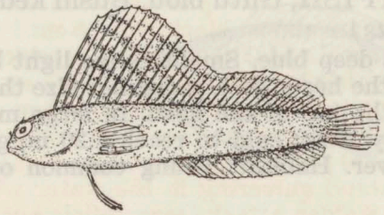
BLUE PARROTFISH, Gutu blou, Bushi kedebe
(Scarus coeruleus) Fig. 152
Large sized adults deep blue. Smaller sizes light blue with pale salmon markings on the head. At a particular size the young ones have a yellow area on the top of the head. In large males the nose protrudes quite clearly. Size: said to reach 1.20 m, generally not more than 60 cm however. Habitat: young common on the reef, adults rare.

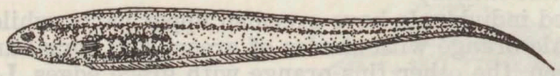
MIDNIGHT PARROTFISH, Gutu pretu
(Scarus coelastinus) Fig. 153
Adults are very dark blue with lighter blue markings on chin, cheek and snout. The young ones are somewhat lighter in colour. In adults the fins develop into long streamers. Size: 75 cm. Habitat: not very common on the reef. May be seen in very shallow water.

RAINBOW PARROT, Gutu ketekete
(Scarus guacamaia) Fig. 154
Medium-sized individuals have greenish upper parts, while the lower parts are pale orange with shades of green. The dorsal and pectoral fins are green, the other fins orange with green edges. Large males show bronze-brown anterior parts, while the upper part of the back, starting halfway the dorsal fin, is brilliantly green. Size: 40 cm. Habitat: on the reef, but not common. May be seen, together with the Midnight Parrotfish, in such shallow inshore waters that the backs of the fishes stick out of the water.









BLENNIES (Blenniidae, Clinidae and Chaenopsidae)

Small, bottom dwelling fishes, more than hundred species, difficult to identify. Many species are common in shallow waters, on corals, in rockpools and in sea-grass.

REDLIP BLENNY, Pegapega
(Ophioblennius atlanticus) Fig. 155

Dark brown with red lips, and partly red pectoral and dorsal fins. Size: 10 cm. Food: algae and plankton. Habitat: in shallow water where it perches on rocks; extremely common.

HAIRY BLENNY, Brant bobo
(Labrisomus nuchipinnis) Fig. 156

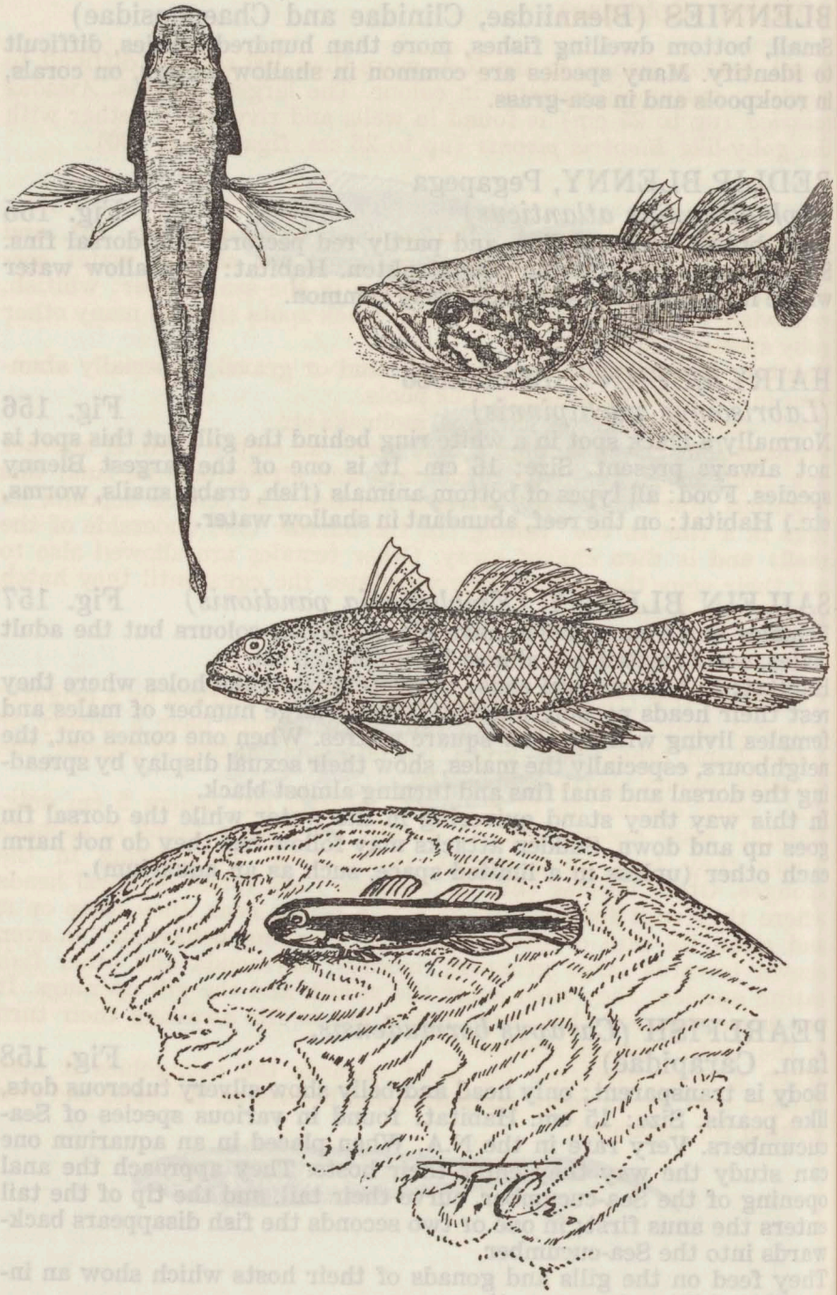
Normally a black spot in a white ring behind the gill, but this spot is not always present. Size: 16 cm. It is one of the largest Blenny species. Food: all types of bottom animals (fish, crabs, snails, worms, etc.) Habitat: on the reef, abundant in shallow water.

SAILFIN BLENNY *(Emblemaria pandionis)* Fig. 157

Females and young males have plain grayish colours but the adult males, when excited, are almost black. Size: 5 cm.
Habitat: in hollow coral ends; they prefer tubelike holes where they rest their heads peeping outside. Often a large number of males and females living within a few square metres. When one comes out, the neighbours, especially the males, show their sexual display by spreading the dorsal and anal fins and turning almost black.
In this way they stand quivering in the water while the dorsal fin goes up and down. Sudden attacks may follow but they do not harm each other (unless in a limited space, such as an aquarium).

PEARLFISH *(Carapus bermudensis,* fam. Carapidae) Fig. 158

Body is transparent; only head and belly show silvery tuberous dots, like pearls. Size: 15 cm. Habitat: found in various species of Sea-cucumbers. Very rare in the N.A. When placed in an aquarium one can study the way they enter their hosts. They approach the anal opening of the Sea-cucumber, curve their tail, and the tip of the tail enters the anus first; in one or two seconds the fish disappears backwards into the Sea-cucumber.
They feed on the gills and gonads of their hosts which show an incredible ability of regeneration.

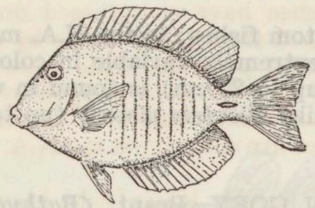


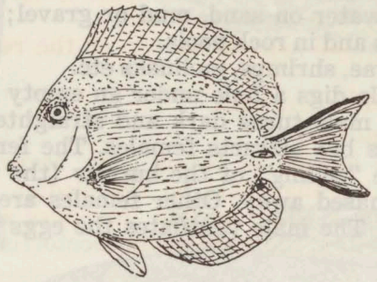
GOBIES (Gobiidae)

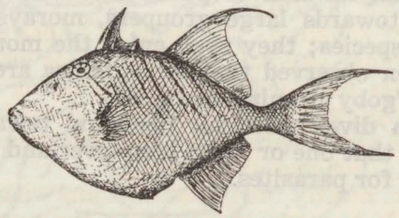
Small, bottom fishes; in the N.A. more than 100 species, difficult to identify; extremely variable in colour. The largest species, *Awaous taiasica* (up to 25 cm) is found in wells and rivulets, together with the goby-like *Eleotris pisonis* (up to 25 cm, figs. 159 & 160).

FRILLFIN GOBY, Brant, *(Bathygobius soporator)* fig. 161, and CURAÇAO GOBY *(Bathygobius curaçao)* are shallow water species; they belong to the largest gobies in the sea. Colour: whitish, yellowish, or dark brown, with small black spots (like so many other goby species). Size: 10 cm.
Habitat: in shallow water on sand, mud or gravel; especially abundant in the inner bays and in rock pools.
Food: small fish, larvae, shrimps, mollusks etc.
Propagation: the male digs a hole under an empty shell. If another fish approaches, the male turns dark and straightens its fins; this frightens other males but attracts females. The female deposits its eggs in a film to the "ceiling" of the burrow (the underside of the shell) and is then chased away. Other females are allowed also to put their eggs there. The male ventilates the eggs until they hatch after a few days.

NEONGOBIES *(Gobiosoma spec)* fig. 162, are marked by a brightly coloured stripe from snout to tail. Some species have a silvery or golden band, others blue, green, red or a combination of colours; the variable colours also depend on age.
Size: some species up to 8 cm *(G. horsti)* but others 5 cm only.
Habitat: some species (like *G. horsti)* are always found in sponges where they feed upon worms (polychaets) parasitizing in the sponges. Other species (like *G. evelynae)* are found on coral heads where they wait for fish. When a fish comes near, they jump on it and clean its skin of parasites. This "cleaning behaviour" is even shown towards large groupers, morays, barracuda and other fish eating species; they even enter the mouth and the gill openings. It has been observed that large fishes are in file awaiting their turn at the "goby cleaning stations".
When a diver stretches his hand towards the neongobies it may happen that one or more jump over and browse on the hand and arm looking for parasites.







SURGEONFISHES (Acanthuridae)

Surgeonfishes have compressed disc-like bodies and can easily be distinguished from other fishes by a razor-sharp spine on both sides of the caudal peduncle. This spine folds into a sheath and can be erected by the fish as a weapon by which severe wounds can be inflicted. Their food consists of filamentous algae.
Two species are common in the N.A.

DOCTORFISH, Kleinfeshi blanku

(Acanthurus chirurgus) Fig. 163

Colour variable, from light grayish brown to dark brown. About ten narrow vertical bars on the side. The border of the dorsal and anal fin and the pelvic fin blue. The caudal spine is surrounded by black with a blue outer margin. Size: up to 30 cm.
Habitat: usually in small schools on top of the reef at any depth.

BLUE TANG, Kleinfeshi blou

(Acanthurus coeruleus) Fig. 164

Colour of the adults is blue or bluish grey. Many horizontal grey bars in the side, and orange bars on the median fins. The caudal spine is surrounded by a white margin. Juveniles are bright yellow. Size: up to 35 cm. Habitat: the same as the Doctorfish.

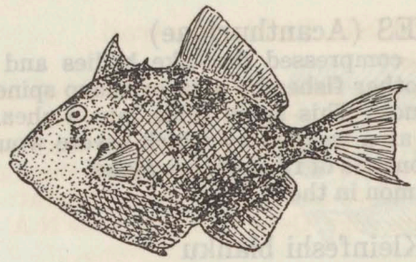
TRIGGERFISHES (Balistidae)

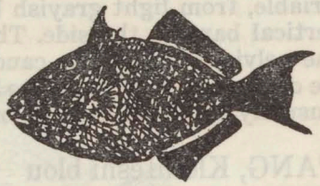
Body laterally compressed, mouth small and more or less protruding. No pelvic fins, but a small spinous knod instead. Dorsal fin: front part consisting of three spines. They swim by undulating the soft part of the dorsal and anal fin. The gill opening is only a small slit.

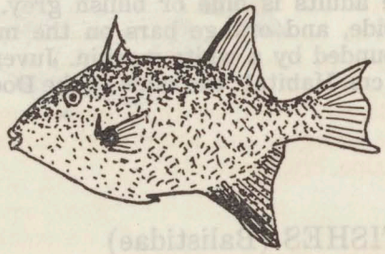
QUEEN TRIGGERFISH, Pishiporko rab 'i gai

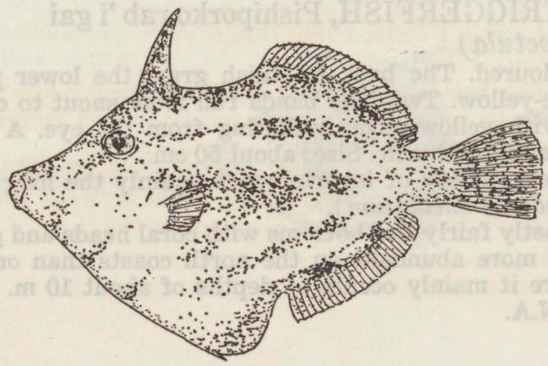
(Balistes vetula) Fig. 165

Brightly coloured. The back is bluish gray, the lower part of the body orange-yellow. Two blue bands run from snout to cheek. Dark blue lines with yellow edges radiating from the eye. A broad blue bar across caudal peduncle. Size: about 50 cm.
Food: a great variety of invertebrates, mainly the long spined Sea Urchin *(Diadema antillarum)*.
Habitat: mostly fairly flat bottoms with coral heads and gorgonians. In the N.A. more abundant on the north coasts than on the south coasts, where it mainly occurs at depths of about 10 m. Quite common in the N.A.









GRAY TRIGGERFISH, Pishiporko trail
(Balistes capriscus) Fig. 166

Ground colour olivaceous gray. Large dark blotches on the back and three broad irregular dark bands on the body. Small light blue spots on upper half of the body. Whitish irregular lines on the anterior and spots on the posterior of the ventral part. Size: up to about 30 cm. Food: crabs, mollusks and echinoderms. Habitat: shallow water between coast and blue edge. Quite common in the N.A.

BLACK DURGON, Pishiporko pretu, Doro, Dròli-bambu
(Melichthys niger) Fig. 167

Almost completely black, with contrasting pale blue bands at the base of dorsal and anal fins. Size: 35 cm.
Habitat: reefs at depths of 12 m and deeper where they browse and pick up all kinds of invertebrate animals. Feed also on plankton organisms.

OCEAN TRIGGERFISH, Pichiporko wow'i spil
(Canthidermis sufflamen) Fig. 168

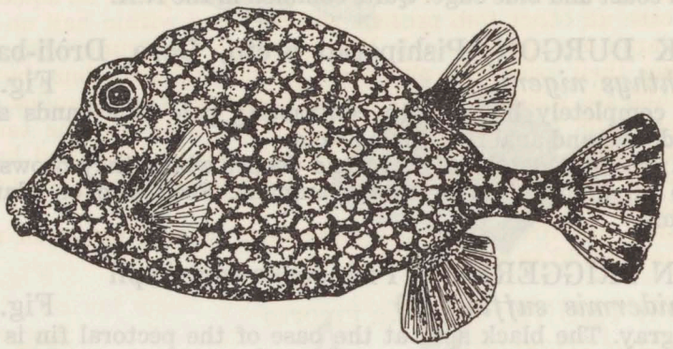
Colour gray. The black spot at the base of the pectoral fin is more pronounced than in the other Triggerfishes. Dorsal and ventral fins are prolonged. Size: 50 cm.
Habitat: on deeper reefs; as their name suggests, the Ocean Triggers are more pelagic, and their food consists mainly of plankton animals like salps, crustacea etc.

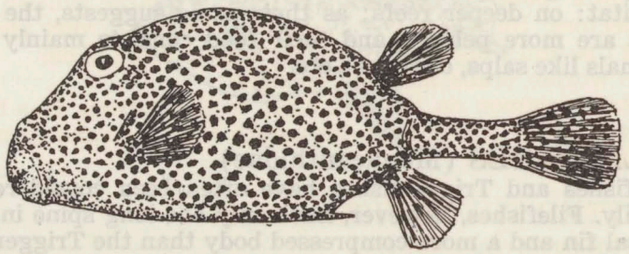
FILE FISHES (Monacanthidae)

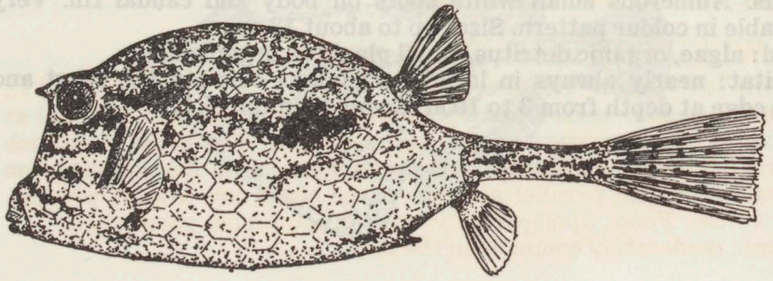
Filefishes and Triggerfishes have often been considered to be one family. Filefishes, however, have only one long spine in front of the dorsal fin and a more compressed body than the Triggerfishes. They are slow moving reef fishes. Some species vary their colours.

FRINGED FILEFISH, Pishiporko
(Monacanthus ciliatus) Fig. 169

Light-gray with brown blotches which form more or less longitudinal bands. Numerous small white spots on body and caudal fin. Very variable in colour pattern. Size: up to about 12 cm.
Food: algae, organic detritus, small plankton organisms.
Habitat: nearly always in large Gorgonians between the coast and blue edge at depth from 3 to 10 m. Common in the N.A.







TRUNKFISHES (Ostraciontidae)

Trunkfishes are reef fishes which stay most of the time close to the bottom. They have a bony cuirass which covers the fish almost completely. There are holes for eyes, tail, fins and mouth. The cuirass is made of bony plates and is an excellent protection against enemies. Another defense mechanism is the ability to secrete a poisonous substance. This poison is produced by glands in the skin and is secreted under stress, e.g. when chased or when put into a jar or an aquarium. In that case all other fish present will be killed within half an hour — even large morays succumb. When at ease the Trunkfishes swim by moving their pectorals and their dorsal and anal fins, but not their caudal fin which is used only for steering. The juveniles often keep their tails bent sideways. If disturbed they use the tail for propulsion when accelerating. The species can be identified by the contours of the exoskeleton, colour pattern and the presence of spines on the cuirass.
Trunkfishes are roasted by the fishermen. The cuirasses of small specimens are sold as souvenirs.

SMOOTH TRUNKFISH, Ka'i morto

(Lactophrys triqueter) Fig. 170

The upper part of the carapace and the tail are blackish with numerous white spots. On the carapace there is a large whitish spot behind the pectoral fin where the hexagonal plates are very clearly visible. Black lips and a big dark eye. Belly brown. Size: 25 cm.
Food: worms, crabs, shrimps, sponges.
Habitat: common on the reef close to the bottom. Has been seen to squirt a jet of water from its mouth into the sand to uncover burrowing organisms.

SPOTTED TRUNKFISH, Chapin

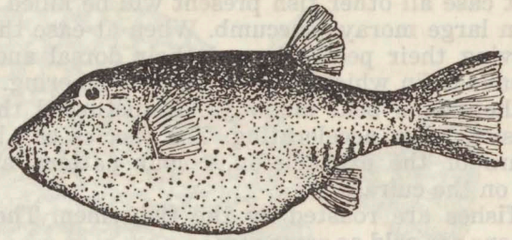
(Lactophrys bicaudalis) Fig. 171

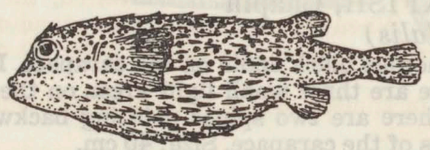
A white fish with numerous black spots on the carapace. Lips white. In old individuals there are three small light areas on the sides on a level with the eyes. There are two spines pointing backwards from the ventro-lateral edges of the carapace. Size: 40 cm.
Food: tunicates, sea cucumbers, crabs, sea urchins, brittle stars.
Habitat: the reef; not very common.

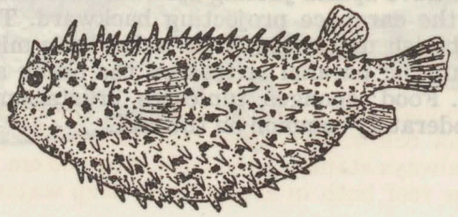
CRAWLED COWFISH, Chupachupa

(Acanthostracion quadricornis) Fig. 172

These fishes have spines jutting forward in front of the eyes, and at the end of the carapace projecting backward. The body is greyish green with bluish markings. Some individuals miss the markings on the body, but the parallel stripes on the cheek are always present. Size: 45 cm. Food: sponges, tunicates, crustaceans, gorgonians.
Habitat: moderately common on the reef.







PUFFERS (Tetraodontidae and Canthigasteridae)

Puffers are well known for the capacity of inflating themselves with water or with air (when lifted out of the water). Most of them are covered with small spines, which in combination with the size the inflated fish can reach, probably are a good defense mechanism against predators. Several cases of poisoning are known from eating puffers, caused by a poison which is especially located in the liver.

SHARPNOSE PUFFER, Blas

(Canthigaster rostrata) Fig. 173

When not inflated, the body is moderately compressed. The upper portion of the body is brown, the lower part white with blue dots. Vertical blue lines on the tail base. There is an orange region around the eyes with blue lines radiating from the eyes. Blue lines on the snout. Size: 10 cm. Food: sea-grasses, sponges, crustaceans, mollusks, worms and sea-urchins.

Habitat: although not restricted to any special habitat, this species is quite abundant in regions with a dense growth of gorgonians.

PORCUPINEFISHES (Diodontidae)

Porcupinefishes can also inflate themselves several times their normal size. They are covered with spines, which are movable in *Diodon*-species and immovable in *Chilomycterus*-species. The tooth plates form a solid beak to crack hard shells.

PORCUPINEFISH, Djindja *(Diodon hystrix)* Fig. 174

The back of this fish is olivaceaus green to brown with numerous black spots. The belly is white. When not inflated, the spines lay flatly against the body. When inflated, the spines stand out forming a very effective protection against predators. Size: 50 cm (said to reach 1.20 m).

Habitat: mostly seen in shallow water but not very common. Often under ledges or coral heads.

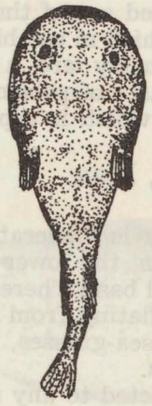
Food: sea urchins, mollusks, crabs. A special feature about this fish is its capability of regenerating the eyes. When eating sea urchins it often happens that spines go through the eyes of the fish. It has also been observed that one of the claws of a hermit crab got hold of an eye and broke off. The fish swam for some hours with the crab's arm clawed to the eye. The eye was damaged considerably, but regenerated within a few days.

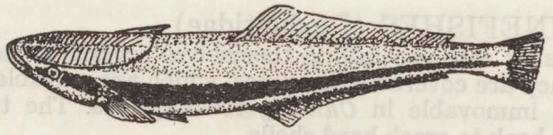
WEBB BURRFISH, Djindja

(Chilomycterus antillarum) Fig. 175

Large individuals are green to brown on the upper side, changing to golden yellow below. Dark lines make a net-like pattern on the body. The spines always stand off the body. Size: 30 cm.

Habitat: the reef both in shallow and deep water. Not common.





CLINGFISHES (Gobiesocidae)

A family of small-size fishes that have a sucking disc on their belly. In the Caribbean several species, mainly found in the tidal zone, even in the splash zone.

TADPOLE CLINGFISH, Pegapega

(Arcos macrophthalmus) Fig. 176

Body flattened and cakepan-like, yellowish or brownish with dark spots and patches. Size: 8 cm.
Habitat: under and among coral stones in the tidal zone.
Food: small animals, especially crustacea and mollusks.

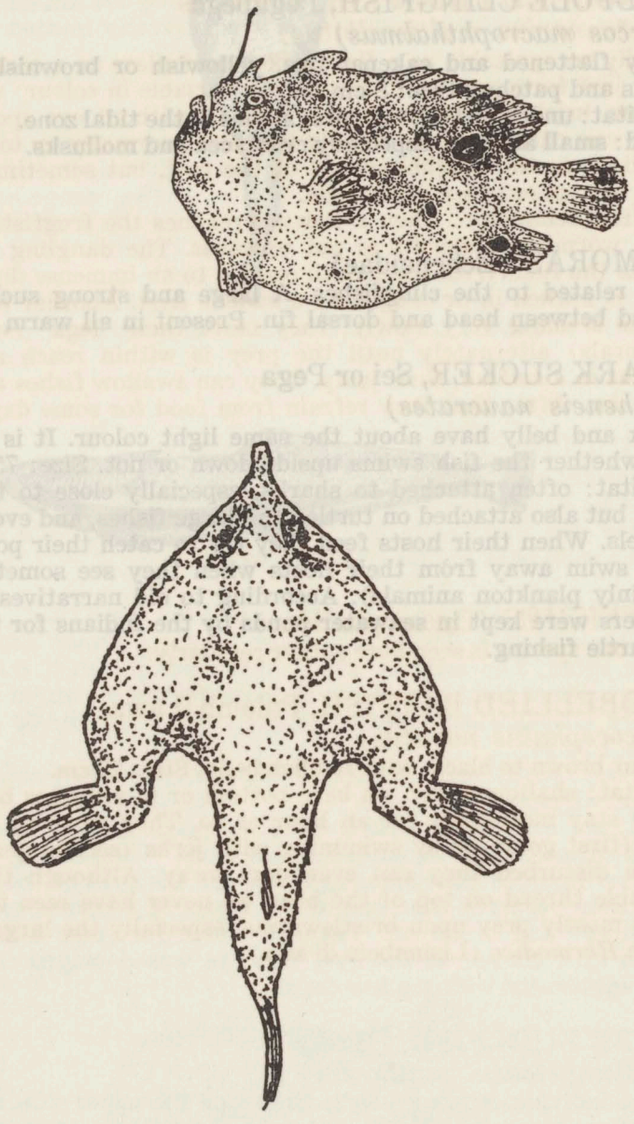
REMORAS (Echeneidae)

Not related to the clingfishes. A large and strong sucking disc is found between head and dorsal fin. Present in all warm seas.

SHARK SUCKER, Sei or Pega

(Echeneis naucrates) Fig. 177

Back and belly have about the same light colour. It is difficult to see whether the fish swims upside down or not. Size: 75 cm.
Habitat: often attached to sharks, especially close to the pectoral fins, but also attached on turtles and large fishes, and even to sailing vessels. When their hosts feed they try to catch their portion. They also swim away from their hosts when they see something edible (mainly plankton animals). According to old narratives, the Shark suckers were kept in seawater ponds by the Indians for the purpose of turtle fishing.



FROGFISHES (Antennariidae)

Some of the species live in floating Sargasso weed, but most species are bottom dwellers.
Not quite common in the N.A.

LONGLURE FROGFISH, Zumbifes

(Antennarius multiocellatus) Fig. 178

Hardly recognizable as a fish: when motionless on a coral or sponge they just form part of it. Extremely variable in colour: white, ochre yellow, brick-red, brown, black, with or without eye spots, etc. They can change colour rapidly too. Size: normally up to 12 cm.
Habitat: in the neighbourhood of the reef, but sometimes on sand, mud bottom or in sea grass beds.
Feeding behaviour: when a fish approaches the frogfish the thread with wormlike appendix is put upwards. The dangling "worm" attracts the fish. With the mouth opened to an immense dimension the prey is sucked in or caught by a sudden dart. Another way of preying is stealing very slowly; they move their "legs" (ventrals and pectorals) alternately until the prey is within reach and is then caught in a sudden, final jump. They can swallow fishes almost their own size. After that they refrain from food for some days.

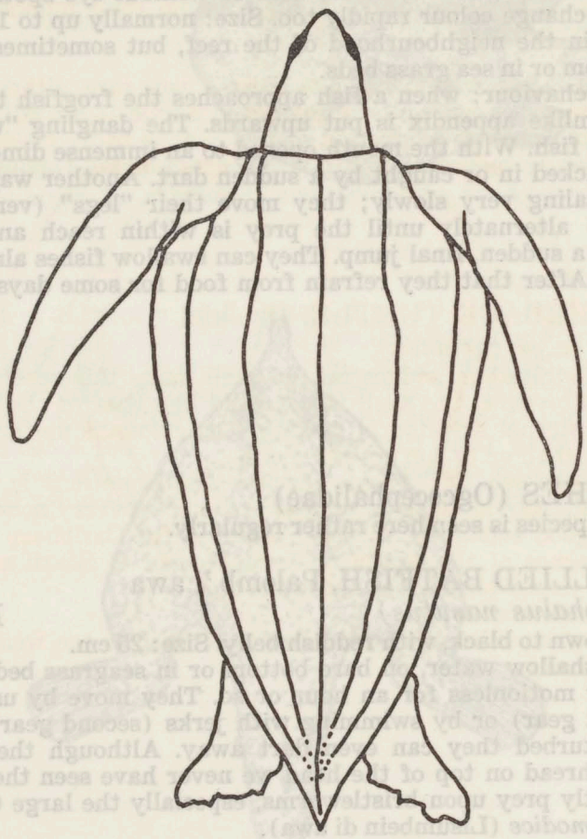
BATFISHES (Ogcocephalidae)

Only one species is seen here rather regularly.

REDBELLIED BATFISH, Palomb 'i awa

(Ogcocephalus nasutus) Fig. 179

Colour brown to black, with reddish belly. Size: 25 cm.
Habitat: shallow water, on bare bottom or in seagrass beds.
They stay motionless for an hour or so. They move by using their legs (first gear) or by swimming with jerks (second gear).
When disturbed they can even dart away. Although they have a movable thread on top of the head we never have seen them use it.
They mostly prey upon bristleworms, especially the large Glass silk worm *Hermodice* (Lisumbein di awa).



SEATURTLES

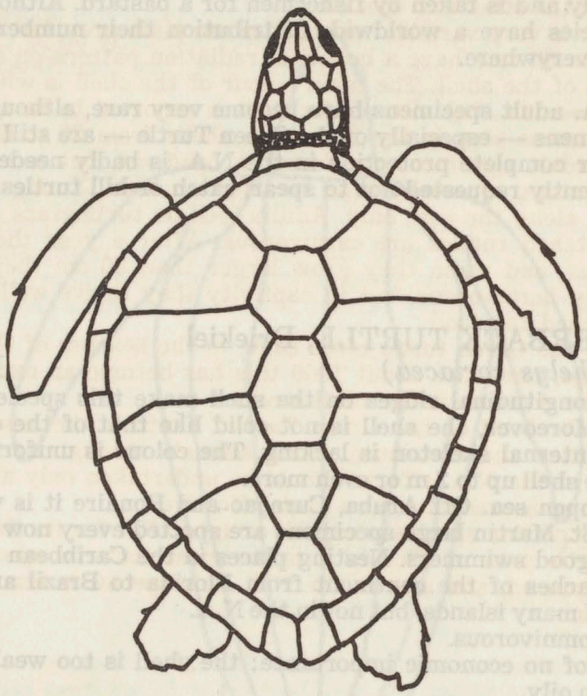
In the area of the Netherlands Antilles four turtle species are regularly observed: the LEATHERBACK, the GREEN TURTLE, the HAWKSBILL and the LOGGERHEAD. One more species has been seen in adjacent waters: the RIDLEY *(Lepidochelys kempi)*. According to Antillean fishermen, "bastards" of Green Turtle and Hawksbill or Loggerhead have also been seen. This does not sound very plausible, but it is possible that the RIDLEY also turns up occasionally and is taken by fishermen for a bastard. Although most turtle species have a worldwide distribution their numbers are decreasing everywhere.

In the N.A. adult specimens have become very rare, although immature specimens — especially of the Green Turtle — are still regularly seen. Their complete protection in the N.A. is badly needed. Everyone is urgently requested not to spear, catch or kill turtles.

LEATHERBACK TURTLE, Driekiel

(Dermochelys coriacea) Fig. 180

The five longitudinal ridges on the shell make this species easy to identify. Moreover, the shell is not solid like that of the others, as the firm internal skeleton is lacking. The colour is uniformly dark.
Size of the shell up to 2 m or even more.
Habitat: open sea. Off Aruba, Curaçao and Bonaire it is very rare, but near St. Martin large specimens are spotted every now and then. They are good swimmers. Nesting places in the Caribbean are found on the beaches of the continent from Florida to Brazil and on the beaches of many islands, but not in the N.A.
They are omnivorous.
They are of no economic importance: the shell is too weak and the flesh is too oily.



GREEN TURTLE, Turtuka blanku

(Chelonia mydas) Fig. 181

This species can be distinguished from the next two species by the following characteristics:

1) each flipper has only one nail (in the other species two)
2) on top of the head, just behind the snout, a pair of longitudinal scales are present (in the other species the scales are almost square)
3) the lateral edge of the shell is almost smooth and not serrated like in the other two species.

The colour is very variable: old turtles are plain grey, but the young ones (up to 60 cm) have a beautiful radiation pattern on each separate piece of the shell. The main colour of the shell is whitish, reddish or greenish. The size of the shell is reported to be 1.50 m but most specimens seen in the N.A. have shells from 25 to 60 cm.

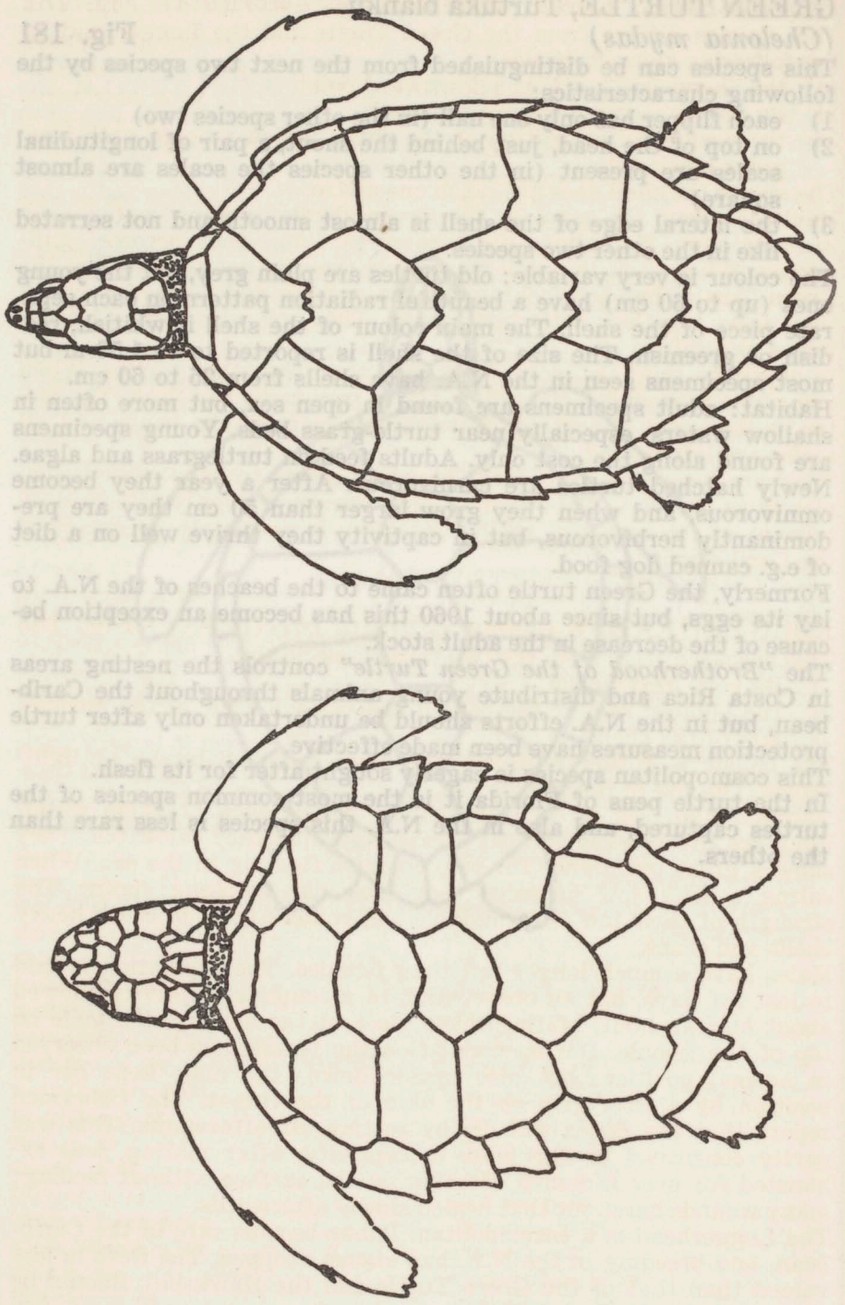
Habitat: adult specimens are found in open sea, but more often in shallow waters, especially near turtle-grass beds. Young specimens are found along the cost only. Adults feed on turtlegrass and algae. Newly hatched turtles are carnivorous. After a year they become omnivorous, and when they grow larger than 50 cm they are predominantly herbivorous, but in captivity they thrive well on a diet of e.g. canned dog food.

Formerly, the Green turtle often came to the beaches of the N.A. to lay its eggs, but since about 1960 this has become an exception because of the decrease in the adult stock.

The *"Brotherhood of the Green Turtle"* controls the nesting areas in Costa Rica and distribute young animals throughout the Caribbean, but in the N.A. efforts should be undertaken only after turtle protection measures have been made effective.

This cosmopolitan species is eagerly sought after for its flesh.

In the turtle pens of Florida it is the most common species of the turtles captured, and also in the N.A. this species is less rare than the others.



HAWKSBILL, Karèt *(Eretmochelys imbricata)* Fig. 182

This species differs from the Green Turtle and the Loggerhead by the following characteristics:

1) the "hawksbill" ends in a downward point
2) its deeply serrated edge of the shell
3) the wonderful coloration of the shell; yellow or gold with irregular black dots.

The size of the shell does not reach one metre.

Habitat: about the same as the Green Turtle: shallow water, even in inner bays. Hatchlings are carnivores. Later they become omnivorous. When seen in turtlegrass beds they do not browse like the Green Turtle, but are looking for sea urchins and tunicates, which they take together with turtlegrass. They are also fond of jellyfishes and salps.

In captivity they are more aggressive than the other turtles. When one turtle is wounded the others try to torn away the flesh. The victim is devoured almost completely: only part of the bones and all scales are left behind.

They are becoming very rare; breeding seems to have ceased completely in the N.A. This cosmopolitan species is highly esteemed on account of its beautiful shell. Protection is absolutely necessary in the Caribbean.

LOGGERHEAD, Kawama *(Caretta caretta)* Fig. 183

This species differs from the two former species by

1) its very heavy head
2) the pointed keel at the caudal end of each scale of the medium row of the shell.

The colour is rather uniform: the shell is yellow-brown or light-brown. The size of the shell is 1 m.

Habitat: high sea as well as shallow water, even brackish water. They are carnivorous and eat almost anything they can catch. They show a great preference for salp colonies floating in the sea. When eating a long row of salps they look like smoking cigars. The strength of their jaw is formidable and enables them to crush heavy shells and crabs.

Males have a much longer tail than females. The copulation is said to last for days, but an observation of a couple in captivity showed about half an hour. Mating takes place at the surface, the male on top of the female. During copulation the female has been observed in normal position, but also upside down: the male kept her in position by a firm grip on the skin of the throat. The fishermen report that the males will die by rotting off afterwards. This was partly confirmed as the male in captivity, after mating, was exhausted for over a month, floating on the surface without feeding; many wounds burst out that healed slowly afterwards.

The Loggerhead is a cosmopolitan. It has become rare in the Caribbean, and breeding in the N.A. has almost stopped. The flesh is less valued than that of the Green Turtle and the Hawksbill. Should be protected completely.

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