

The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden

Field Identification Guide to the Sharks and Rays of the Red Sea and Gulf of Aden



This document has been prepared by Dr. Ramon Bonfil (Fisheries Centre, University of British Columbia, Vancouver, Canada) and Dr. Mohamed Abdallah (PERSGA) under contract to, and with the cooperation of, The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA).

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INTRODUCTION

The Red Sea and Gulf of Aden (Figure 1) have formed a traditional trading route for centuries. Since the opening of the Suez Canal in 1869 and the discovery of oil in the middle 1900's, the geopolitical significance of the Region and the importance of these waters for international trade have grown enormously. This route now carries around seven percent of total world shipping (Suez Canal Authority statistics 1996), which is equivalent to 14,000 or more vessels each year. Although still relatively understudied, the living marine resources of the Region have attracted increasing interest in recent years, both locally and internationally. Some of the earliest collections, particularly of fish, were made by the renowned Swedish naturalist Peter Forsskal during 1761-1762. The most recent studies in the Region include the work carried out through the Strategic Action Programme, a multi-disciplinary project executed by the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) and funded by the Global Environment Facility, and the Biodiversity Conservation and Sustainable Development Programme for the Socotra Archipelago, implemented through the United Nations Development Programme. An indication of the global importance of the Region is shown by the high degree of biodiversity at genetic, species and ecosystem levels. Endemism is also unusually high; 17% of the fish species are not found outside the Region.

PHYSICAL AND CHEMICAL CHARACTERISTICS

Geology and Physical Features

The Red Sea is a relatively newly formed ocean located in an arid zone between 12.5°N and 30°N. It consists of a deep, narrow trench 1,932 km in length with an average width of 280 km; the widest point (300 km) is found near Massawa (Eritrea) (ALECSO-PERSGA/UNESCO, 1990). The average depth may be 500 m but its greatest depth exceeds 2,000 m. At the southern end of the Red Sea are the straits of the Bab el Mandeb (literally "Gate of Lamentations"), only 29 km wide and with a maximum depth of 130 m. This structure has profound effects on movement of water between the Red Sea and the Gulf of Aden and in the past, during periods of lower sea level, has effectively separated the two water bodies.

The Red Sea has developed from the separation of the Arabian plate from the African plate, an event which started about 70 million years ago. The western and southern edges of the plate lie along the rift that runs from the Dead Sea, down the Gulf of Aqaba, the Red Sea, and out through the Gulf of Aden. The Arabian plate is moving north-east away from the African plate and rotating counter-clockwise as the sea floor spreads. Rifting has not taken place as a continuous process, but in episodes. After a lull in the latter part of the Tertiary, rifting recommenced between 2 and 5 million years ago, giving a spreading rate averaging 2 cm per year (SHEPPARD ET AL, 1992).

The Gulf of Aqaba is a continuation of the Red Sea rift. It is short and narrow (150 km by 16 km) but also deep, up to 1,800 m with steeply shelving sides. A strike-slip faulting pattern has caused the formation of three deep basins. The Gulf meets the Red Sea at the Straits of Tiran where a relatively shallow bar or sill (250-300 m) separates the two water bodies.

The Gulf of Suez, (length 280 km, width 20-40 km), is spreading due to normal faulting. It is shallow with depths mostly less than 50 m, reaching nearer 100 m at the southern

end where it meets the Red Sea. In stark contrast to the Gulf of Aqaba, the coastline of the Gulf of Suez is generally flat or of low relief.

Wind, Temperature, Currents and Tides

The wind patterns over the northern Red Sea are dominated by the weather systems of the Mediterranean, whereas the southern Red Sea and Gulf of Aden are strongly influenced by Asian weather patterns, and the Indian Ocean monsoons (Figure 2). In the northern Red Sea (north of latitude 20°N) winds are predominantly from the north north-west, all the year round. Only during winter months are there occasional southerly winds. The Bab el Mandeb, the Gulf of Aden and the Red Sea south of 20°N are subject to two monsoonal events each year. During the winter (October to May) the NE monsoon winds blow into the Gulf of Aden and wind funnels up into the Red Sea from the SSE. During the summer (June to September) the SW monsoon winds blow over the Gulf of Aden but the strong winds from the NNW extend their influence over the southern Red Sea until they are deflected north-east up the southern coast of Arabia. These summer wind patterns cause strong upwelling of deep, cold, nutrient-rich ocean water along the southern Arabian coastline. Coral growth is inhibited, but kelp beds thrive and productivity is high, reflected in the rich coastal fisheries (SHEPPARD ET AL, 1992).

Water currents in the Red Sea are driven by density and wind. Evaporation levels of 1-2 m/yr greatly exceeds precipitation (10 mm/yr) raising salinity, particularly in the north, to 42 ppt. The loss of water is made up by an inflow of cooler, less saline (39 ppt), surface water from the Gulf of Aden that drifts north. During the winter, in the northern Red Sea and Gulf of Suez, the high salinity surface water cools and its density increases, causing it to sink below the thermocline and flow back towards and into the Gulf of Aden, flowing over the shallow sill at the Bab el Mandeb below the incoming surface water. However, during the summer the wind is blowing from the NNW out through the Bab el Mandeb. This causes the inflowing 'surface current' to be split vertically into two layers, a top layer flowing out into the Gulf of Aden driven by the wind, a lower layer continuing to flow into the Red Sea to replace the net loss, with the dense saline water continuing to flow out of the Red Sea at a deeper level.

The tide system within the Red Sea is generally semi-diurnal with a difference of about six hours in the time of high water between the north and the south. The tidal range is low. The average spring range is 0.5 m in both north and south, decreasing from both ends to a point where there is no appreciable semi-diurnal range near Port Sudan and Jeddah. In the Gulf of Aden the tide is generally diurnal, with the extreme range being about 3 m at Aden and Djibouti. Eastwards the tidal system becomes more semi-diurnal, though the diurnal inequality remains great, with ranges up to 3 m.

BIOLOGICAL CHARACTERISTICS

The Red Sea has become one of the most important repositories of marine biodiversity in the world. Its relative isolation has given rise to an extraordinary range of biological diversity and endemism, particularly among reef fishes and reef-associated organisms. The coral reef systems of the Region are legendary. They are comprised of more than 250 species of scleractinian corals, representing the highest diversity in any section of the Indian Ocean. The northern Red Sea and the Gulf of Aqaba coasts are fringed by an almost continuous band of coral reef, which physically protects the shoreline. Corals assemblages in the shallow Gulf of Suez are less well developed. Further south the shelf becomes much broader and shallower, the fringing reefs gradually disappear and are replaced with shallow, muddy shorelines. Despite the seasonal upwellings in the Gulf of Aden, diverse and complex reefs and non-reef

assemblages exist and well developed coral systems occur around the Socotra Archipelago. (PERSGA, in press).

Mangrove systems have developed where the continental shelf is wider and inter-tidal distances are greater. They assist in the accumulation and retention of sediments and prevention of coastal erosion. Mangroves are well developed in the southern part of the Red Sea, contributing their high primary productivity to the marine ecosystem and providing important nursery grounds for a wide range of marine fauna.

Seagrasses constitute the only group of higher plants to have adapted to a sub-aquatic habitat and inhabit shallow water areas with soft benthos. The Region's seagrass areas are highly productive ecosystems where many species of living marine resources abound. For example, in the Khor-Umeira lagoon in the west of the Gulf of Aden, *Halodule* spp. provide important feeding grounds for the green turtle *Chelonia mydas* and many species of sea cucumbers that form the basis of important artisanal fisheries.

FISHERIES

The fisheries of the Red Sea and Gulf of Aden are of considerable socio-economic importance to PERSGA member states in terms of national food security and income generation for rural communities. Fisheries resources are exploited by artisanal subsistence fishermen, local commercial fisheries and foreign industrial fisheries targeting invertebrates, demersal finfish and pelagic finfish. Many species cross national boundaries and are essentially shared stocks. Some are truly highly migratory, for example the tuna and small shoaling pelagic species of the Region (PERSGA/GEF, 2002).

The socio-economic importance of the artisanal and industrial fisheries in the Region to the national economies and rural communities in the Region is significant in all the PERSGA states, with the exception of Jordan, which has minimal fisheries in the Red Sea. In the artisanal sector at least 29,500 fishermen and 9,000 vessels are employed in the Red Sea and at least 27,900 fishermen and 6,400 vessels in the Gulf of Aden. The Red Sea industrial sector includes at least 7,500 fishermen and 1,600 industrial vessels and the Gulf of Aden at least another 450 fishermen and 65 vessels.

Artisanal fishermen use a range of gear including longlines, handlines, gillnets, trawls, trammel nets, tangle nets, set nets, traps and spears. Industrial vessels utilise purse-seine, trawl, longline and vertical drop-line gear.

The artisanal and industrial fisheries in the Red Sea and Gulf of Aden produced around 17,096 mt of invertebrate species and 194,844 mt of finfishes in 1998. These figures indicate a considerable increase in the Region's production from 7,951 mt of invertebrates and 135,904 mt of finfishes in 1988. (PERSGA/GEF, 2002). Important commercial invertebrate species include penaeid shrimps in the Red Sea and cuttlefish and rock lobsters in the Gulf of Aden. Pelagic finfish catches are dominated by sardines, Indian mackerel, Spanish mackerel and yellowfin tuna. The demersal catch is dominated by species of snapper, jack, emperor, lizard-fish, grouper, seerfish, rabbitfish and sea-bream.

The greatest fishery production occurs in Yemen. In 1998 Yemen accounted for 56% of total production of invertebrates and 52% of total fin-fish production. Egypt and Saudi Arabian are the next most important players. Artisanal fisheries are under-exploited in Djibouti, Sudan and Somalia. However, declines in catches have been reported for several

major fisheries e.g. Indian mackerel, kingfish, sharks, cuttlefish, shrimp, rock-lobster and trochus.

Fish collecting for the aquarium trade is only significant in Saudi Arabia and Yemen. The former has at least seven aquarium fish exporters in operation.

Marine aquaculture in the region includes shrimp farming in Egypt and Saudi Arabia and pearl-oyster farming in Sudan. Turtles are caught opportunistically by fishermen throughout the southern Red Sea and Gulf of Aden. Turtle meat and eggs are eaten and oil collected along the coasts of Sudan, Djibouti, Yemen, and Somalia.

The shark resources of the Region are heavily fished especially in Sudan, Djibouti, Yemen, around the Socotra Archipelago, and off Somalia where there is evidence of stock depletion. This is attributed to a lack of control over national shark fisheries and also an increase in illegal fishing by fishermen working outside their normal territorial boundaries for the south-east Asia shark-fin market. Sharks are caught with gillnets and longline which also damage reefs. Carcasses are habitually discarded once the fins are removed. The shark-net fishery and shrimp trawl fisheries have very high by-catch rates of fish, turtles and dolphins, which are discarded.

In the Red Sea, there are signs that industrial trawl fisheries for penaeid shrimps are placing considerable pressure on shrimp stocks. The large but unrecorded by-catch of non-target species taken by shrimp trawlers, which is dominated by juveniles, is having an unknown impact on the recruitment of other living marine resources. Despite the importance of fishing as a source of income and in terms of national food supply, the direct effects of fishing on fish stocks, especially vulnerable species such as sharks, cuttlefish, shrimps and rock lobster, and indirectly on the marine environment is largely unknown.

Although most of the coastal areas and the waters of the Region are considered still to be in a pristine state, this situation is changing. The accelerated growth and expansion in urban coastal centres during the 1980's and 1990's, coupled with a wide range of human activities, have increased the risk of environmental degradation, depletion of fisheries resources and the loss of the invaluable amenity of the Region's precious coastal and marine habitats and ecosystems.

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Figure (1): Map showing the Red Sea and Gulf of Aden

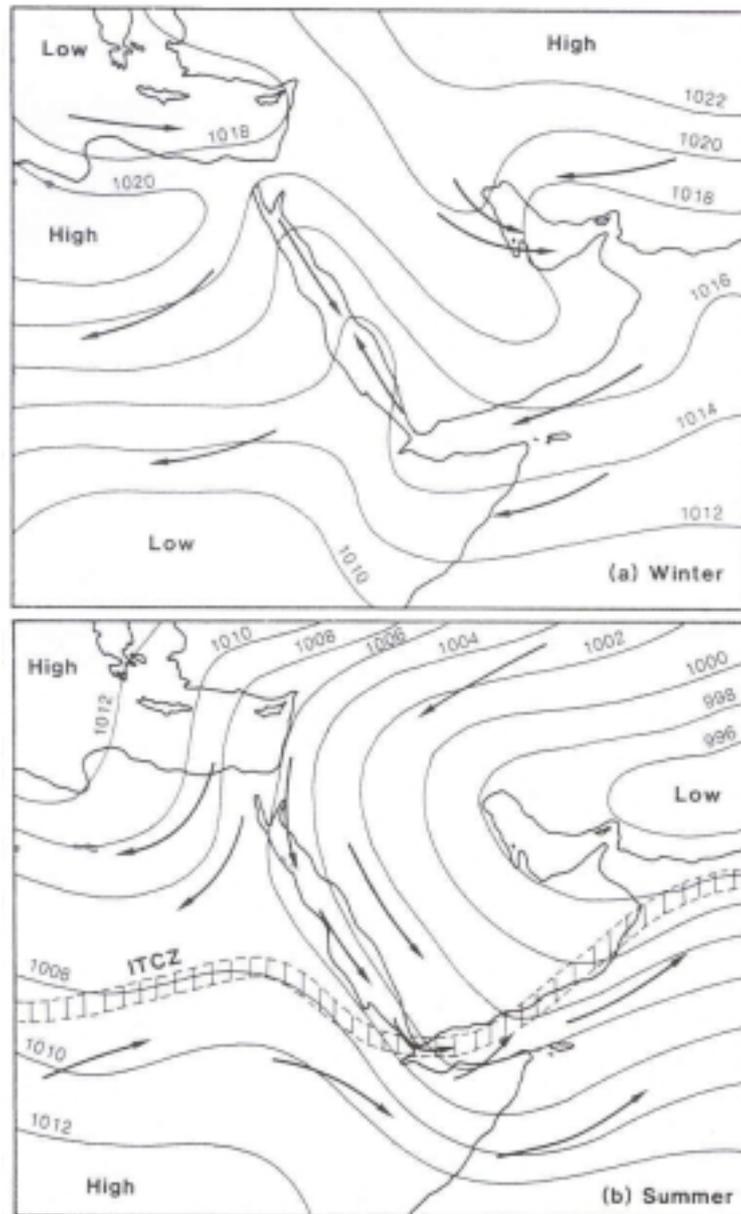


Figure (2): (a) Winter and summer wind patterns. After Cheppard et al (1992).

FIELD IDENTIFICATION GUIDE TO THE SHARKS AND RAYS OF THE RED SEA AND GULF OF ADEN

General remarks

The Class Chondrichthyes comprises a diverse group of fishes (chimaeras, sharks, and batoids) whose most obvious common feature is the possession of a cartilaginous skeleton, as opposed to the bony skeleton of the Osteichthyes or bony fishes. The cartilaginous fishes form an ancient successful group dating back to the Devonian, in which basic models remain largely unchanged since their last large flourish during the Cretaceous. Despite their ancient origin, sharks and their relatives have evolved some of the most acute and remarkable senses found in the animal kingdom, allowing them to coexist successfully with the more modern teleost designs. The chondrichthyans are grouped into two main subclasses: the Holocephalii (Chimaeras or ghostsharks, ratfishes and elephant fishes) with about 50 species that inhabit cool and deep waters; and the Elasmobranchii which is a large and diverse group (including sharks and batoids) with representatives in all types of environments, from fresh waters to the depths of marine trenches and from polar regions to warm tropical seas. The great majority of the commercially important species of chondrichthyans are elasmobranchs. The latter receive their name from their plated gills, which communicate to the exterior by means of 5-7 gill openings.

Although the elasmobranchs have traditionally been divided into two major groups, the sharks and the batoids, there is mounting evidence that the two groups are actually part of a single continuum. Typical sharks always have the gill slits placed clearly on the sides of the body, have pectoral fins well separated from the head, and generally have fusiform bodies. Current knowledge indicates that there are approximately 465 species of 'typical' sharks. The batoids tend to have a body which is flattened to various degrees, have the gill openings always on the ventral side of the body, and have the pectoral fins fused to the sides of the head. Furthermore, the batoids comprise a wide array of elasmobranchs with over 600 species, including skates, rays, guitarfishes, sawfishes, and mantas.

One of the most attractive features of sharks is that they can be fully utilised, with each part of the shark used for different purposes. Shark meat is used for human consumption and is an excellent source of protein free from fat. The liver of sharks provides high quantities of oil that depending on the species, can have very high contents of vitamin-A or in other cases, a highly prized chemical compound known as squalene, which is used in the production of cosmetics, pharmaceuticals, and paintings. Shark's skins can be turned into some of the most resistant and high-quality leathers known. Traditional Chinese cuisine uses sharks' fins as a base for a soup that attains very high prices in restaurants around the globe. The corneas of sharks have been used for human transplants and even the cartilage is now marketed as a pretended cure for all sorts of human ailments. Sharks' jaws and teeth make also attractive souvenirs for tourists and collectors. Even the offal that remains after utilising most of the shark has a use: it can be burned down to fishmeal and added as a complement of animal feed.

The incentive for increased shark fishing due to the high price of the fins, together with the ever expanding need for food supply globally, have meant that world elasmobranch catches have increased year after year, reaching an estimated total of 800,000 t of sharks and shark-like fishes (including skates, rays, etc.) in 1998 (FAO FishStat Database 2000). However, the true total catch is probably larger by an estimated 50-100% due to unreported catches and bycatches (Bonfil 1994). Almost every fishing nation has shark catches, but the larger part of the total catch is taken by a few countries: Indonesia, Spain, India, Pakistan, USA, Taiwan (Province of China), Mexico, Japan, Argentina, and Sri Lanka, are in this order the top shark fishing nations according to 1998 catch statistics,

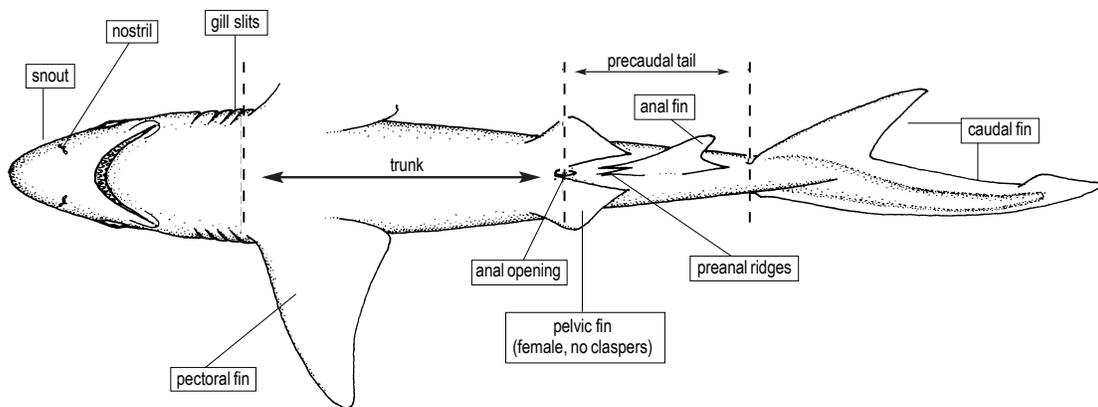
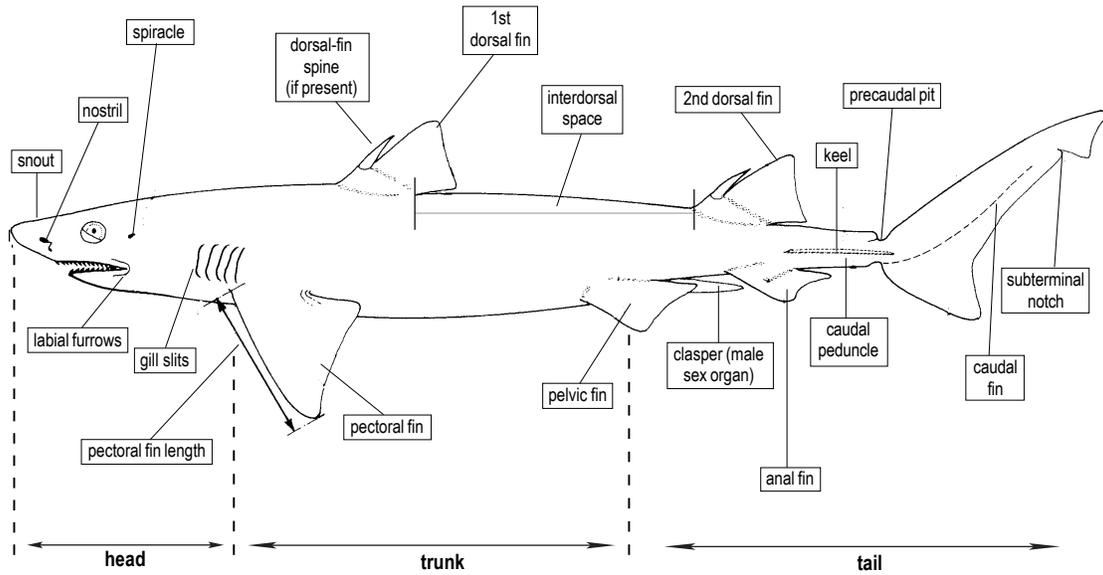
with a collective catch of 463,000 t (57% of the reported world total). Naturally, for these nations sharks are an important asset, but sharks can be important also for nations where sharks contribute in a proportionally large amount to the total fishery production even though their shark catch might be small for international standards. This is the case of countries like Costa Rica, the Maldives, Tanzania, Oman, Cuba, Gabon, Yemen, Australia, Portugal and Brazil.

Fisheries for sharks and shark-like fishes face a major problem. The biological and ecological characteristics of these fishes make them highly prone to overexploitation. Most shark and many batoid species are long-lived and this, together with their typical slow growth, results in a late age of first sexual maturation, which commonly ranges between 3 and 25 years depending on the species. Most elasmobranchs have very low fecundity when compared with bony fishes or marine invertebrates; the number of young produced by each female is between 2 and 125 per litter. The combination of the above factors translates into a low reproductive potential and means that the productivity of elasmobranchs and their ability to sustain fishing pressure are comparatively low.

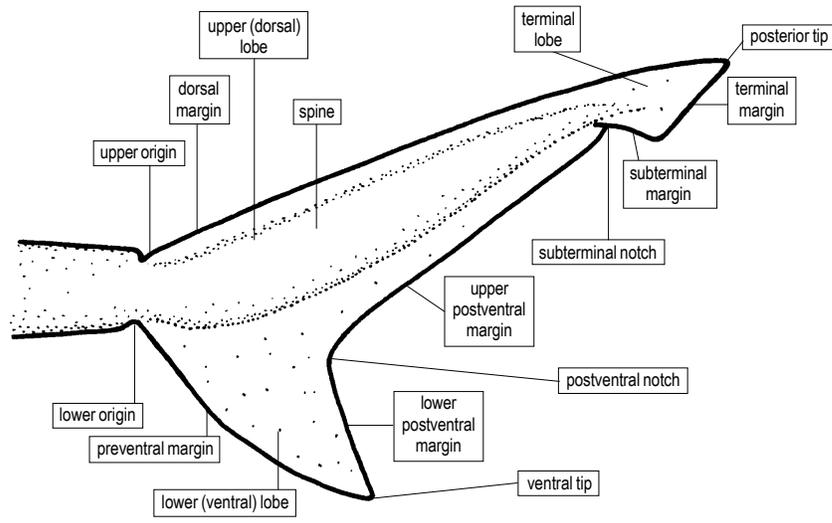
The present guide is designed to help alleviate the lack of knowledge about the diversity of the elasmobranch fauna of the Red Sea and Gulf of Aden region, and the pressing problem of inadequate fisheries data gathering that currently prevents the proper assessment and management of these important resources.

SHARKS

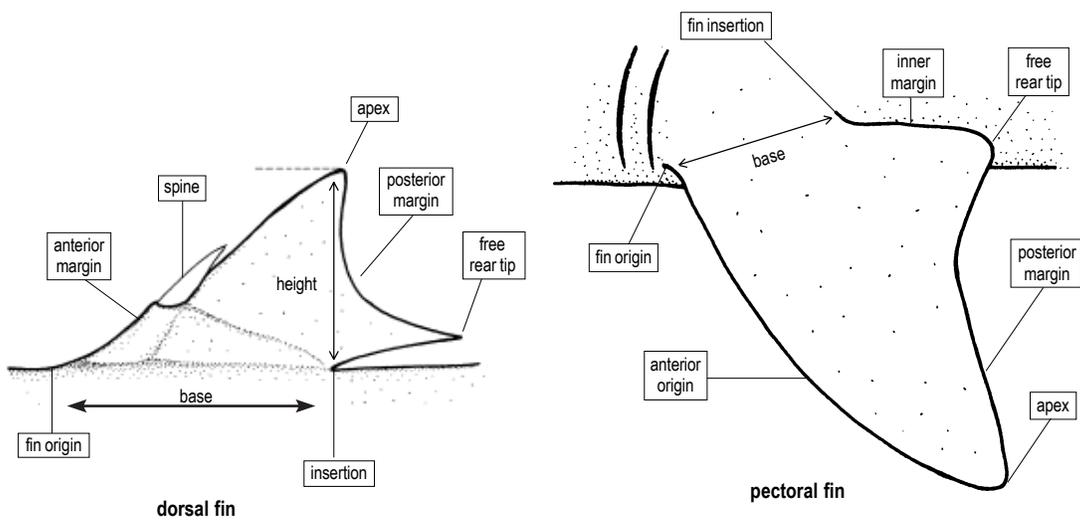
Technical terms and measurements



underside view

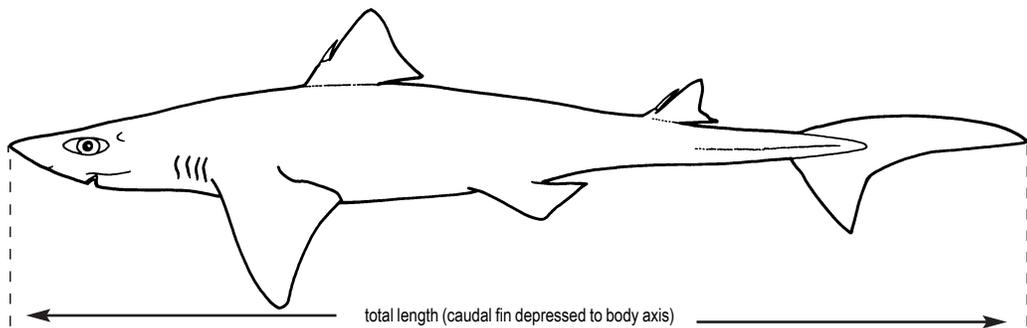


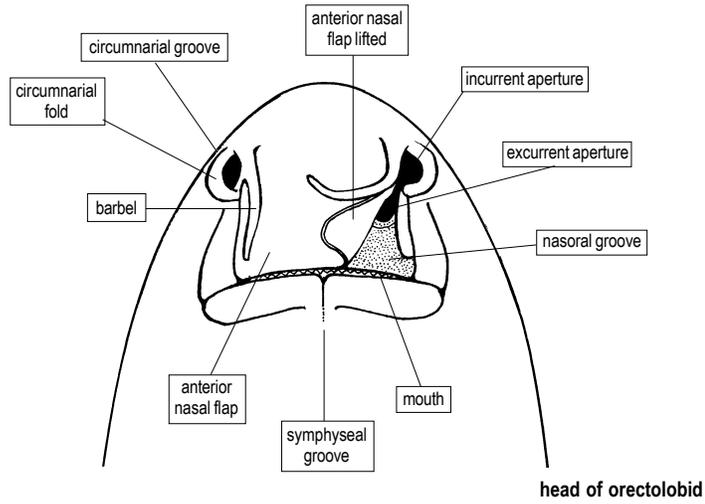
caudal fin



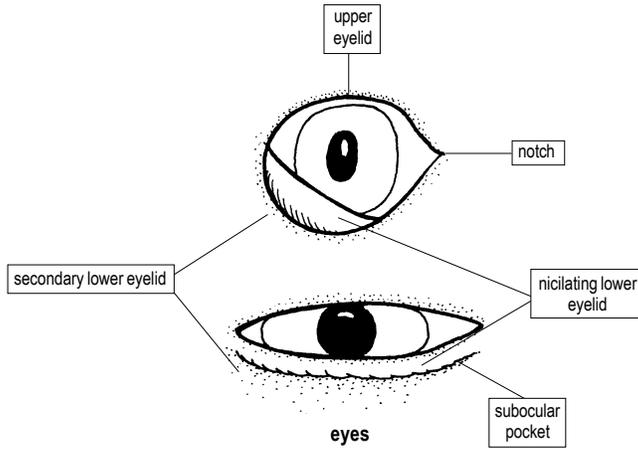
dorsal fin

pectoral fin

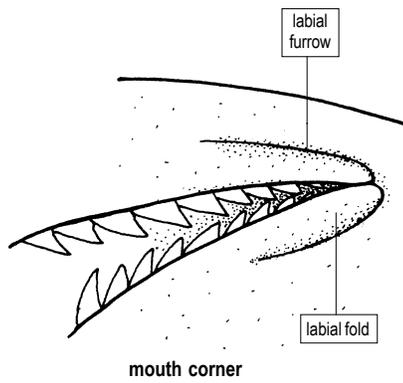




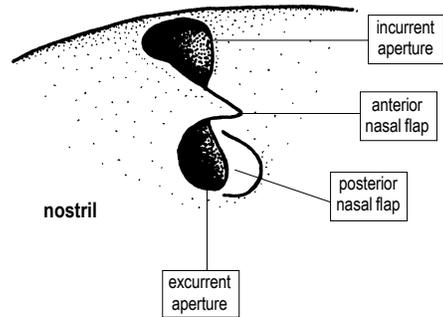
head of orectolobid



eyes



mouth corner



nostril

LIST OF FAMILIES AND SPECIES OCCURRING IN THE AREA

An asterisk is given when species accounts are given. A question mark indicates that presence in the area needs confirmation.

Order Squaliformes

Family Echinorhinidae

* *Echinorhinus brucus*

Family Centrophoridae

* *Centrophorus atromarginatus*

* *Centrophorus granulosus*

* *Centrophorus tessellatus*

* *Deania profundorum*

? Order Squatiniformes

? Family Squatinidae

? *Squatina africana*

? *Squatina squatina*

Order Heterodontiformes

Family Heterodontidae

* *Heterodontus ramalheira*

* *Heterodontus sp A*

Order Lamniformes

Family Odontaspidae

* *Carcharias taurus*

Family Alopiidae

* *Alopias pelagicus*

* *Alopias superciliosus*

* *Alopias vulpinus*

Family Lamnidae

? *Carcharodon carcharias*

* *Isurus oxyrinchus*

Order Orectolobiformes

Family Stegostomatidae

* *Stegostoma fasciatum*

Family Ginglymostomatidae

* *Nebrius ferrugineus*

Family Rhincodontidae

* *Rhincodon typus*

Order Carcharhiniformes

Family Scyliorhinidae

* *Apristurus indicus*

* *Halaelurus boesemani*

Family Proscyllidae

* *Eridacnis radcliffei*

Family Triakidae

* *Iago omanensis*

* *Mustelus mosis*

Family Hemigaleidae

- * *Hemigaleus microstoma*
- * *Hemipristis elongatus*

Family Carcharhinidae

- * *Carcharhinus albimarginatus*
- * *Carcharhinus altimus*
- * *Carcharhinus amblyrhynchoides*
- * *Carcharhinus amblyrhynchos*
- * *Carcharhinus amboinensis*
- * *Carcharhinus brevipinna*
- * *Carcharhinus dussumieri*
- * *Carcharhinus falciformis*
- * *Carcharhinus leucas*
- * *Carcharhinus limbatus*
- * *Carcharhinus longimanus*
- ? *Carcharhinus macloti*
- * *Carcharhinus melanopterus*
- ? *Carcharhinus obscurus*
- * *Carcharhinus plumbeus*
- * *Carcharhinus sealei*
- * *Carcharhinus sorrah*
- * *Galeocerdo cuvier*
- * *Loxodon macrorhinus*
- * *Negaprion acutidens*
- * *Triaenodon obesus*
- * *Rhizoprionodon acutus*

Family Sphyrnidae

- * *Sphyrna lewini*
- * *Sphyrna mokarran*

Guide to the Orders and Families of sharks found in the Red Sea and Gulf of Aden

How to use this guide

Readers are strongly advised to follow these simple steps in order to successfully identify any shark or batoid found in the region. First, read **carefully** through the description of key characters listed under each Order. Use the illustrations of the Families under each Order only as a secondary aid in making certain that the right Order has been found. Once the right Order has been identified, proceed to narrow down on the Family of the specimen using the illustration for the Family and key characters annotated in each illustration; make use of the size data included for each Family. Once the Family has been identified, move to the corresponding pages where the species for that Family are illustrated. These illustrations and the key characters marked on them should allow proper identification of all sharks and batoids known from the region.

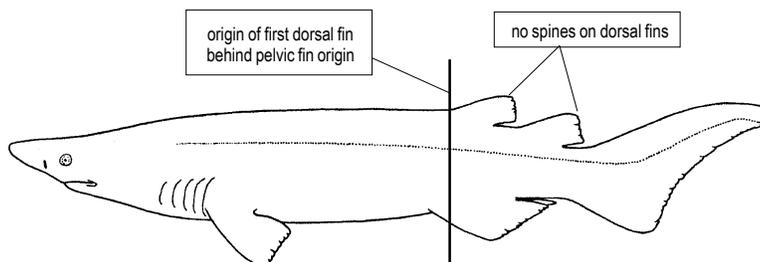
Order SQUALIFORMES – Dogfish sharks

No anal fin; body cylindrical; two dorsal fins often with spines in the anterior margins; mouth extending behind front of eyes.

ECHINORHINIDAE

Bramble sharks. Page 11

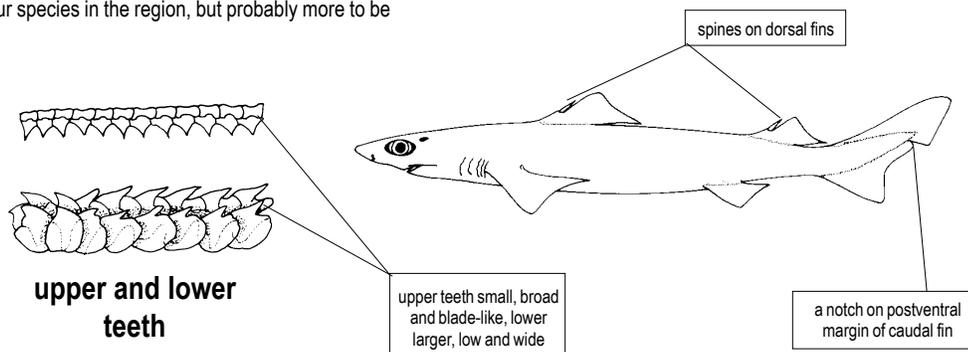
To 4 m. Demersal sluggish sharks, mostly in cold and deep waters to at least 1100 m, occasionally found in the intertidal. A single species in the region.



CENTROPHORIDAE

Gulper sharks. Page 11

To 1.7 m. Primarily demersal deep-water sharks from 200 to at least 2400 m. Four species in the region, but probably more to be discovered.



Order HETERODONTIFORMES – Bullhead sharks

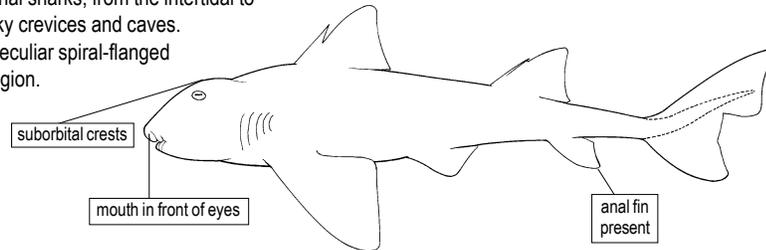
Anal fin present; two dorsal fins with spines in the anterior margins; small mouth in front of eyes; head elevated and with supraorbital crests.

HETERODONTIDAE

Bullhead sharks. Page 13

To 1.62 m. Demersal, sluggish, nocturnal sharks, from the intertidal to at least 275 m. Some species like rocky crevices and caves.

Egg-laying species, egg-cases have peculiar spiral-flanged shapes. Possibly two species in the region.



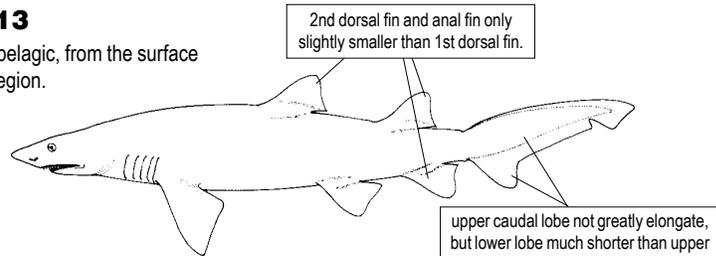
Order LAMNIFORMES – Mackerel sharks and allies

No spines on dorsal fins; mouth strongly arched and extending behind front of eyes; no movable nictitating eyelid; intestinal valve of ring type.

ODONTASPIDIDAE

Sand tiger sharks. Page 13

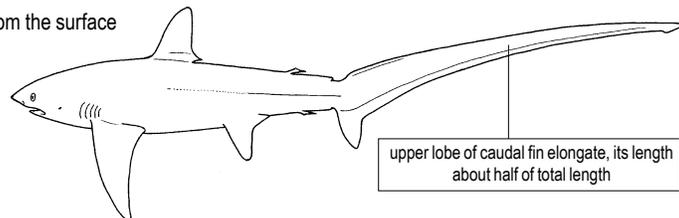
To 3.2 m. Usually demersal, but sometimes pelagic, from the surface to depths of 191 m. A single species in the region.



ALOPIIDAE

Thresher sharks. Page 14

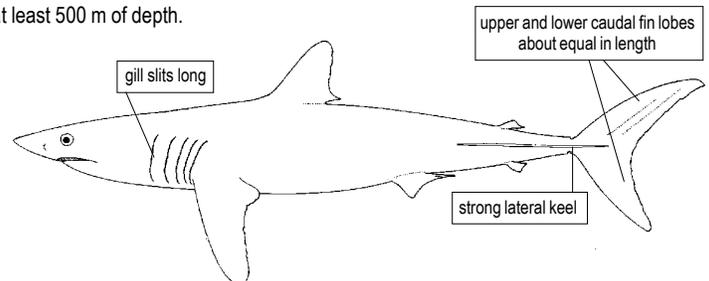
To 5.5 m. Pelagic in coastal and oceanic waters, from the surface to at least 500 m. Three species in the region.



LAMNIDAE

Mackerel sharks. Page 14

To 6 m. Mainly epipelagic, from the surface to at least 500 m of depth. A single species in the region.



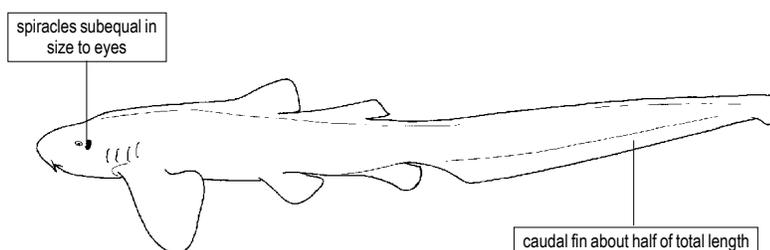
Order ORECTOLOBIFORMES – Nurse, carpet and whale sharks

Mouth in front of eyes; five gill slits on each side of the head, the 4th usually overlapping the 5th; nostrils with barbels.

STEGOSTOMATIDAE

Zebra sharks. Page 16

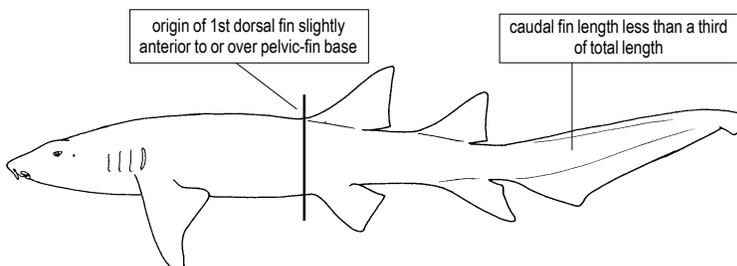
Possibly to 3.54 m. Inshore demersal sharks of coral reefs and sandy bottoms, from the intertidal down to 62 m. One species in the region.



GINGLYMOSTOMATIDAE

Nurse sharks. Page 16

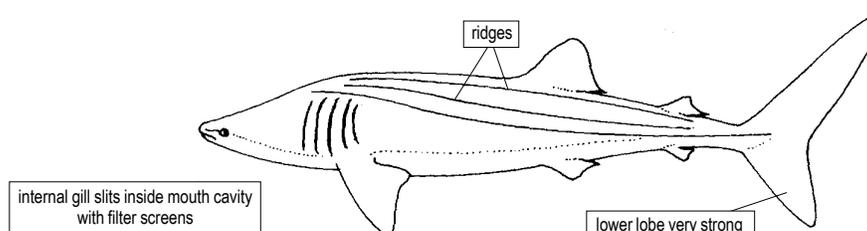
To 3.0 m. Demersal, from the intertidal to at least 70 m deep. A single species in the region.



RHINCODONTIDAE

Whale sharks. Page 16

Possibly to 18 m. Pelagic, in inshore and offshore waters, from the surface to at least 700 m. A single species in the region.



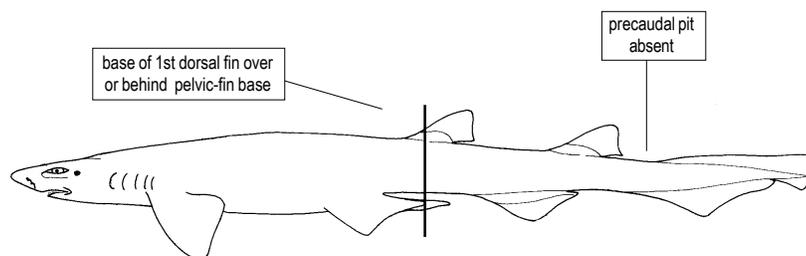
Order CARCHARHINIFORMES – Ground sharks and allies

Mouth arched and extending behind anterior end of eyes; a movable nictitating eyelid; intestinal valve of scroll or spiral type.



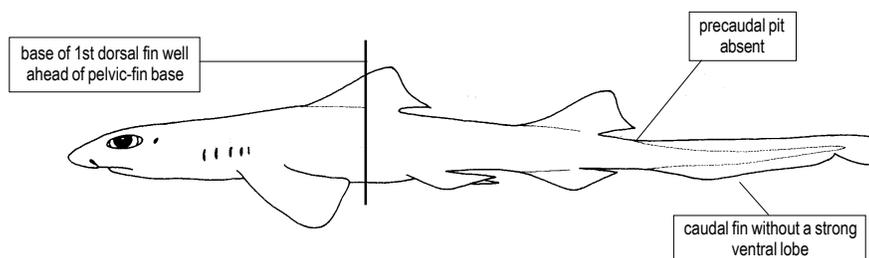
SCYLIORHINIDAE Catsharks. Page 17

To 1 m. Demersal, from depths of 37 to 1840 m.
Two species in the region.



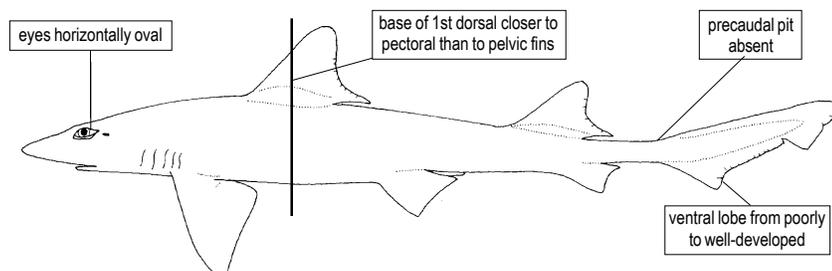
PROSCYLLIDAE Finback catsharks. Page 18

To 46 cm. Demersal, from depths of 70 to 766 m.
One species in the region.



TRIAKIDAE Houndsharks, smoothhounds, topes. Page 18

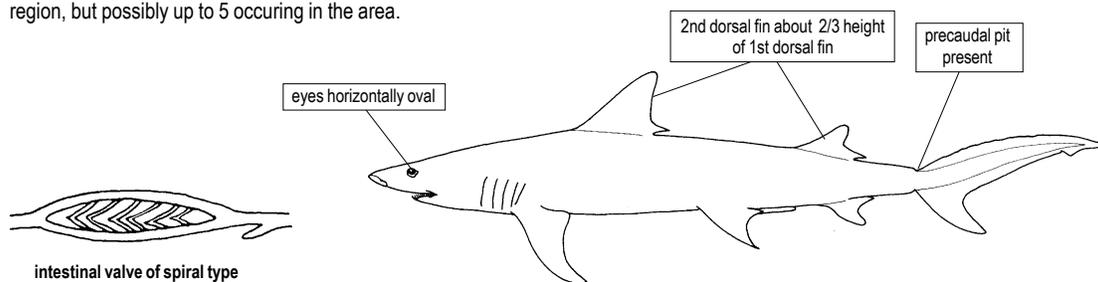
To 1.5 m. Demersal, from the intertidal to a depth of at least 1000 m. Two species in the region.



HEMIGALEIDAE

Weasel sharks. Page 19

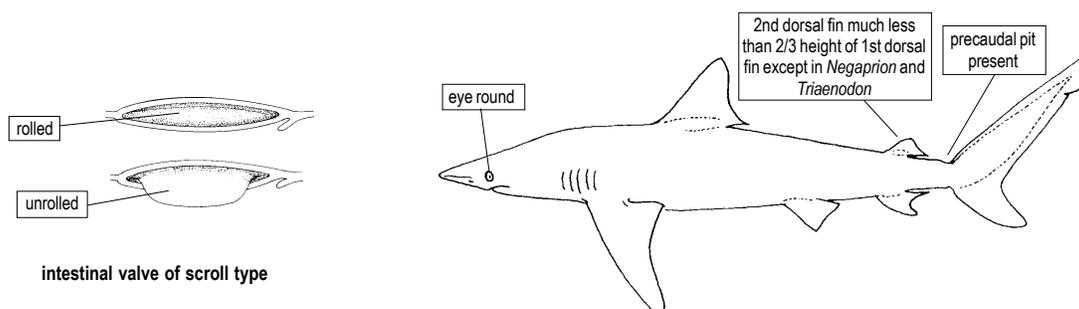
To 2.4 m. Demersal, from depths of 1 to 30 m. Two species in the region, but possibly up to 5 occurring in the area.



CARCHARHINIDAE

Requiem sharks. Page 19

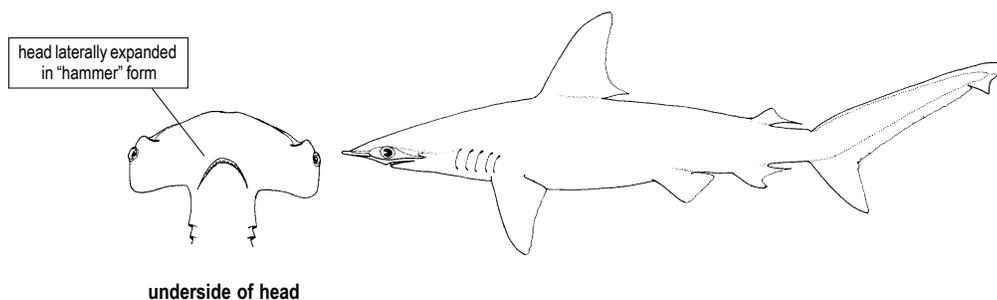
To 5.5 m. Demersal to epipelagic, from the intertidal and surface waters to depths of at least 800 m. At least 19 species known in the region, but possibly up to 5 more occurring in the area.



SPHYRNIDAE

Hammerhead sharks. Page 28

To 6 m. Coastal and oceanic, from the intertidal and surface waters to at least 260 m of depth. Two species in the region.



ECHINORHINIDAE

Echinorhinus brucus (Bonnaterre, 1788)

Frequent synonyms / misidentifications: *Echinorhinus* (*Rubusqualus*) *mccoyi* Whitley, 1931/ *Echinorhinus cookei* Pietschmann, 1928.

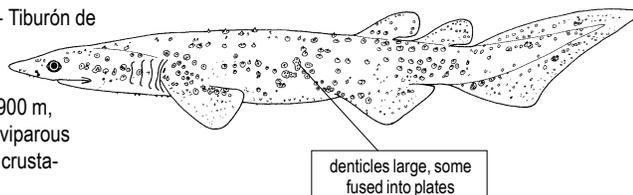
FAO names: En - Bramble shark; Fr - Squale boucle; Sp - Tiburón de clavos.

Size: To 310 cm.

Habitat and biology: Mostly deep-water between 200 to 900 m, occasionally found inshore in cold-temperate areas. Ovoviviparous with 15 to 26 young. Eats bony fishes, smaller sharks and crustaceans (including crabs).

Importance to fisheries: Unimportant to fisheries but frequently caught as bycatch with bottom trawls and line gear in the NE Atlantic; used for fishmeal and oil.

Distribution: Found in the Atlantic, Indian (including Gulf of Aden), and western Pacific Oceans.



CENTROPHORIDAE

Centrophorus atomarginatus Garman, 1913

Frequent synonyms / misidentifications: *Centrophorus armatus barbatus* Teng, 1962 / *Centrophorus granulatus* (Bloch and Schneider, 1801); *Centrophorus moluccensis* Bleeker, 1860.

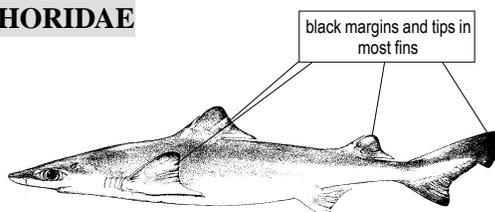
FAO names: En - Blackfin gulper shark; Fr - ; Sp - Quelvacho de márgenes negros.

Size: To at least 94 cm.

Habitat and biology: In outer continental and insular shelves and upper slopes, between 150 and 450 m. Eats shrimps.

Importance to fisheries: Caught in Japan, and off Taiwan (Province of China). Used for production of squalene from the liver oil.

Distribution: off Somalia (Gulf of Aden), India, Sri Lanka, Japan, Taiwan (Province of China), and northern Papua-New Guinea.



underside of head

Centrophorus granulatus (Bloch and Schneider, 1801)

Frequent synonyms / misidentifications: None / *Centrophorus atomarginatus* Garman, 1913; *Centrophorus harrissoni* McCulloch, 1915; *Centrophorus lusitanicus* Bocage and Capello, 1864; *Centrophorus niaukang* Teng, 1959.

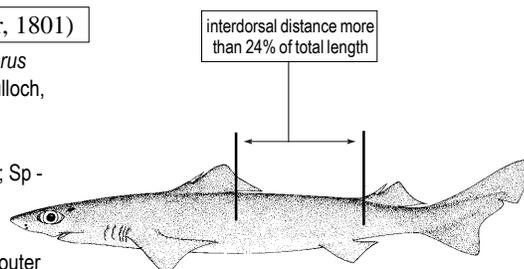
FAO names: En - Gulper shark; Fr - Squale-chagrin commun; Sp - Quelvacho.

Size: To 105 or possibly 110 cm.

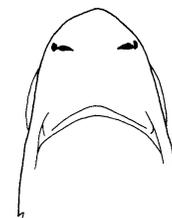
Habitat and biology: Found usually on or near the bottom in outer continental shelves and upper slopes between 50 and 1440 m. Ovoviviparous with one or two young. Eats herring-smelts, hake, cods, rattails, epigonids, lanternfish, squid, and crabs.

Importance to fisheries: Fishes in the eastern Atlantic with various gears. Eaten smoked or dried-salted; valuable for the high squalene content in the liver oil. It is listed as Vulnerable on the 2000 IUCN Red List of Threatened Species.

Distribution: Found in the Atlantic, western Indian (including the Gulf of Aden), and western Pacific Oceans.



no markings on fins



underside of head

***Centrophorus tessellatus* Garman, 1906**

Frequent synonyms / misidentifications: None / None.

FAO names: En - Mosaic gulper shark; Fr - Squale-chagrin mosaïque; Sp - Quelvacho mosaico.

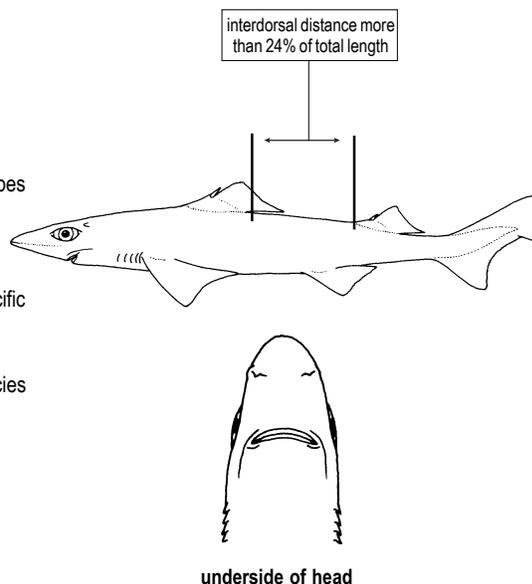
Size: To at least 89 cm.

Habitat and biology: A little-known gulper shark of the insular slopes near or on the bottom at 260 to 732 m depth.

Importance to fisheries: Of little or no importance to fisheries.

Distribution: Known from the western North Atlantic, Indian (including seamount off the Gulf of Aden), western and Central Pacific Oceans.

Remarks: Status of this species uncertain, might be synonymous with *C. granulatus*. Except for the type locality, records of this species are provisional.



***Deania profundorum* (Smith and Radcliffe, 1912)**

Frequent synonyms / misidentifications: *Deania elegans* Springer, 1959; *Deania cremouxi* Cadenat, 1960 / None.

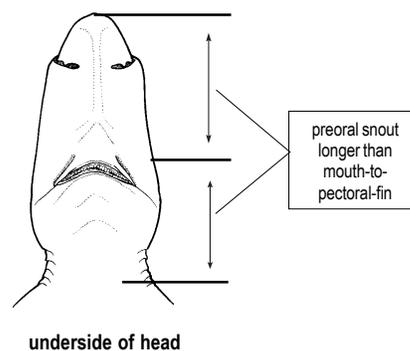
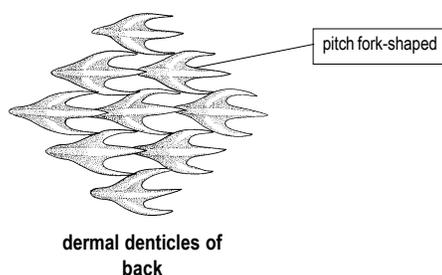
FAO names: En - Arrowhead dogfish; Fr - Squale-savate lutin; Sp - Tollo flecha.

Size: To 97 cm.

Habitat and biology: Lives on or near the bottom in deep waters of continental and insular slopes between 275 and 1785 m. Sometimes forms large schools. Ovoviviparous with 5 to 7 young. Eats small bony fishes, squids and crustaceans.

Importance to fisheries: Of little interest to fisheries. Utilized for liver oil and meat where caught (mostly as bycatch).

Distribution: Known from the western North Atlantic, eastern Atlantic, western Indian (including the Gulf of Aden) and western Pacific Oceans.



HETERODONTIDAE

Heterodontus ramalheira (Smith, 1949)

Frequent synonyms / misidentifications: None / None.

FAO names: En – Whitespotted bullhead shark; Fr – Requin dormeur chabot; Sp – Dormilón boquigrande.

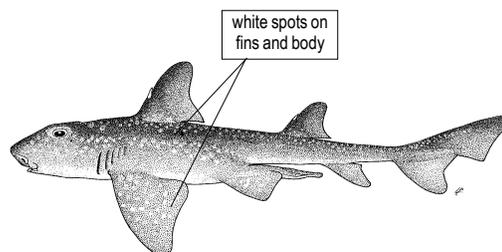
Size: To about 83 cm.

Habitat and biology: A rare benthic species of the outer shelf and upper slope; from 40 to 274 m of depth. Presumably ovoviparous but eggs unknown. Recently hatched young have been found at 110 m depth. Known to eat crabs.

Importance to fisheries: Occasionally caught by bottom trawlers in deep waters (over 100 m) but of no commercial use.

Distribution: Known only from South Africa, Mozambique, Somalia, and southern Oman.

Remarks: Newborns with thin curved lines on body.



Heterodontus sp A.

Frequent synonyms / misidentifications: None / None.

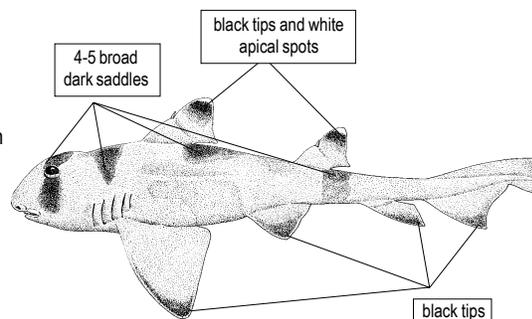
FAO names: En – Oman bullhead shark; Fr – Requin dormeur d'Oman; Sp – Dormilón de Omán.

Size: to 61 cm.

Habitat and biology: A rare species known only from one specimen caught off Oman by a commercial trawler at 80 m of depth.

Importance to fisheries: Of no importance to fisheries at present. Caught with bottom trawls.

Distribution: Known only from the coast of Oman. Likely to occur in the Gulf of Aden and other parts of the northern Indian Ocean.



ODONTASPIDIDAE

Carcharias taurus (Rafinesque, 1810)

Frequent synonyms / misidentifications: *Odontaspis taurus* Rafinesque, 1810; *Eugomphodus taurus* (Rafinesque, 1810) / *Odontaspis ferox* (Risso, 1810).

FAO names: En - Sand tiger shark; Fr - Requin taureau; Sp – Toro bacota.

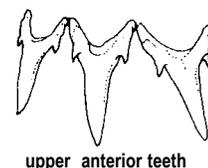
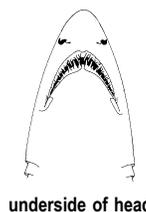
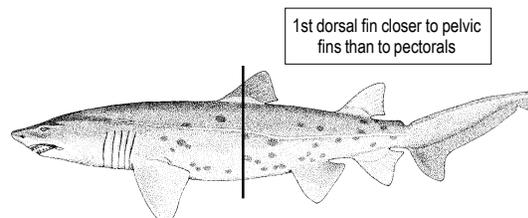
Local names:

Size: Possibly up to 4.3 m, known to reach 3.2 m and common between 2.2 and 2.8 m.

Habitat and biology: Littoral, inshore and offshore, usually near the bottom; migratory. Ovoviparous with uterine cannibalism. Feeds on small bony fishes, small sharks and rays, and occasionally on crabs and lobsters.

Importance to fisheries: Caught with line gear and gillnets and utilized for human consumption; its meat is highly prized in some places. Caught also by sport fishermen accros its range. Lives well in aquaria.

Distribution: Warm-temperate and tropical coastal waters of all oceans of the world except the central and eastern Pacific.



LAMNIDAE

Isurus oxyrinchus (Rafinesque, 1810)

Frequent synonyms / misidentifications: *Isurus glaucus* (Müller and Henle, 1839) / *Isurus paucus* Guitart-Manday, 1966.

FAO names: En - Shortfin mako; Fr - Taupe bleu.; Sp - Marrajo dientuso

Local names: Cawar.

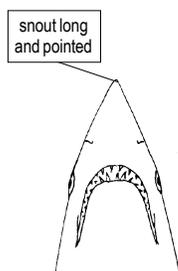
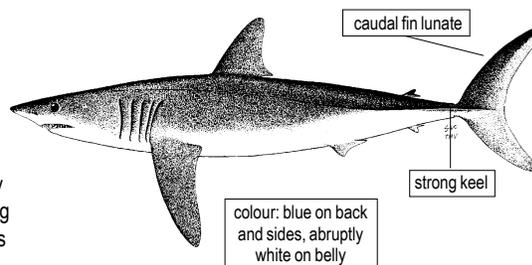
Size: To 4.0 m, common to 2.0 m.

Habitat and biology: Highly migratory, oceanic and coastal, usually in surface waters. Ovoviviparous and oophagous with 10 to 25 young per litter. Feeds mainly on pelagic and demersal fishes, but also eats cephalopods and other sharks and rays.

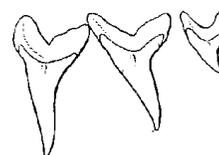
Importance to fisheries: Caught with longlines, hook and line and gillnets; meat of extremely high quality. Very important for sport fisheries.

Distribution: Worldwide in all temperate and tropical waters.

Remarks: Considered dangerous, responsible for unprovoked attacks on swimmers and boats.



underside of head



upper anterior teeth

ALOPIIDAE

Alopias pelagicus (Nakamura, 1935)

Frequent synonyms / misidentifications: None / *Alopias superciliosus* (Lowe, 1839); *Alopias vulpinus* (Bonaterre, 1788).

FAO names: En - Pelagic thresher; Fr - Renard pelagique; Sp - Zorro pelágico.

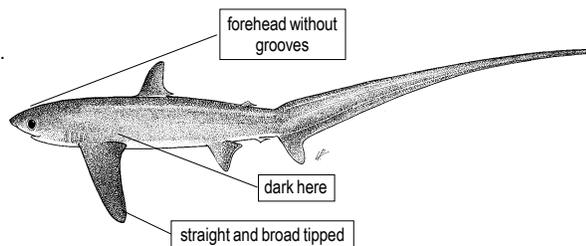
Local names:

Size: To 3.7 m.

Habitat and biology: Oceanic, epipelagic, caught near shore where shelf is narrow, from the surface to at least 152 m deep. Ovoviviparous and oophagous; two embryos per litter. Presumably feeding on pelagic fish and possibly squid. Thought to use its long tail to herd and stunt prey.

Importance to fisheries: Caught with longlines and driftnets; meat used for human consumption, liver for oil extraction, hide for leather production, and the fins for the oriental soup market.

Distribution: Poorly known due to confusion with other threshers. Absent from the Atlantic Ocean, but known from South Africa, the Red Sea and Gulf of Aden, and several areas of the Pacific Ocean.



***Alopias superciliosus* (Lowe, 1839)**

Frequent synonyms / misidentifications: *Alopias profundus* Nakamura, 1935 / *Alopias pelagicus* Nakamura, 1935; *Alopias vulpinus* (Bonaterre, 1788).

FAO names: En - Bigeye thresher; Fr- Renard à gros yeux; Sp – Zorro ojón.

Local names:

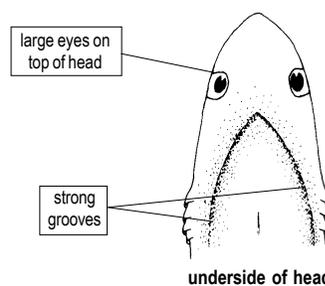
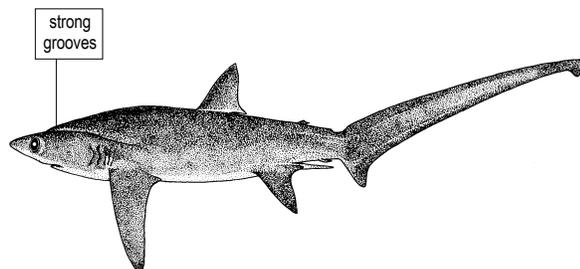
Size: To 4.6 m.

Habitat and biology: Oceanic and coastal, in depths to 500 m. Ovoviviparous and oophagous with litters of 2-4 embryos. Feeds mostly on pelagic fishes such as herring, mackerel, and small billfishes, but also on demersal fishes such as hake, and on squids.

It probably stunts its prey with its long caudal fin.

Importance to fisheries: Caught with longlines, fixed bottom and pelagic gillnets, and trawls, and occasionally by sport fishermen. Meat used fresh, smoked and salt-dried for human consumption, its liver, fins and hide are also utilized.

Distribution: Found in all tropical and warm temperate seas of the world.

***Alopias vulpinus* (Bonaterre, 1788)**

Frequent synonyms / misidentifications: None / *Alopias pelagicus* Nakamura, 1935; *Alopias superciliosus* (Lowe, 1839).

FAO names: En - Thresher shark; Fr- Renard; Sp – Zorro.

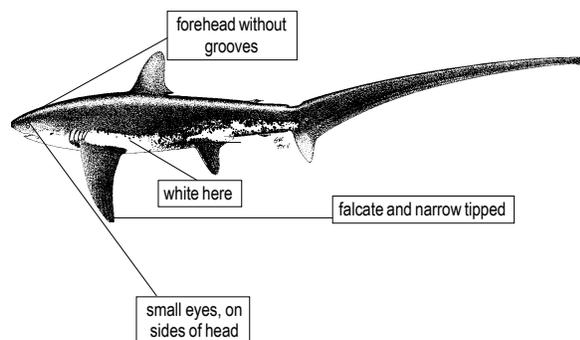
Local names:

Size: Known to reach 5.7 m and possible up to 6.1 m.

Habitat and biology: Coastal on continental and insular shelves, and epipelagic far from land; young often close inshore and in shallow bays. Migratory. Ovoviviparous and possibly oophagous, with litters of 2-7 embryos. Feeds mainly on small schooling fishes, but also on cephalopods and pelagic crustaceans; known to herd and stun its prey with its tail.

Importance to fisheries: Caught with pelagic longlines and driftnets, often hooked by its tail. An important target of some fisheries for the high quality of its meat. Fins, hides and livers also utilized. An important target for sport fishermen.

Distribution: Circumglobal in cold temperature and tropical waters.



STEGOSTOMATIDAE

Stegostoma fasciatum (Hermann, 1783)

Frequent synonyms / misidentifications: *Stegostoma varium* (Seba, 1758); *S. tygrinus* (Bonaterre, 1788) / None.

FAO names: En – Zebra shark; Fr – Requin zebre; Sp – Tiburón acebrado.

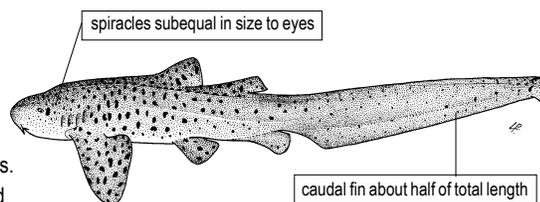
Local names: Farluuq Shabeellow; hayyasa.

Size: To possibly 3.5 m, commonly up to 2.5 m.

Habitat and biology: Inshore, very common on coral reefs. Oviparous. Feeds on molluscs, crustaceans and small bony fishes.

Importance to fisheries: Caught with bottom trawls, floating and fixed bottom gillnets, longlines.

Distribution: Tropical waters of Indian and Western Pacific Oceans, from South Africa to the Red Sea, eastward to Japan, Palau, Australia, and New Caledonia.



young



GINGLYMOSTOMATIDAE

Nebrius ferrugineus (Lesson, 1830)

Frequent synonyms / misidentifications: *Ginglymostoma ferrugineum* (Lesson, 1830); *Nebrius concolor* Rüppell, 1837; *N. doldi* Smith, 1953 / None.

FAO names: En - Tawny nurse shark; Fr - Requin nourrice fauve; Sp – Gata nodriza atezada.

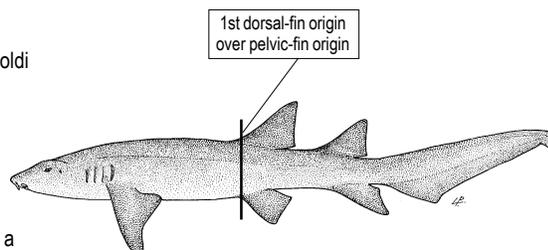
Local names:

Size: Reported to 3.2 m, common to 2.5 m.

Habitat and biology: In shallow waters from the intertidal zone to a depth of at least 70 m. Demersal, on coral and rocky reefs, in lagoons and on sand flats. Ovoviviparous and oophagous. Feeds on a variety of cephalopods, crustaceans, sea urchins, corals, small fishes and occasionally sea snakes.

Importance to fisheries: Caught with gillnets and line gear and utilized for human consumption fresh or salt-dried. Fins used for the oriental trade. Target for sport fishing in Queensland, Australia.

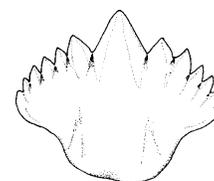
Distribution: Tropical waters of the Indian and western Pacific Oceans, from South Africa to the Red Sea, and eastwards to China, southern Japan, Australia, New Caledonia, Palau, Marshall Islands, and Tahiti.



barbles almost reaching mouth



underside of head



upper front tooth

RHINCODONTIDAE

Rhincodon typus Smith, 1828

Frequent synonyms / misidentifications: *Rhiniodon typus* Smith, 1828 / None.

FAO names: En - Whale shark; Fr - Requin baleinel; Sp - Tiburón ballena.

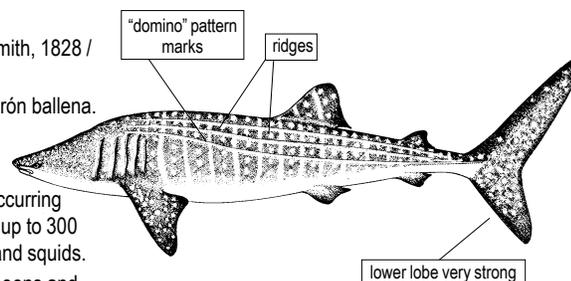
Local names: Qirsh al-hoot.

Size: To at least 12 m, possibly to 21 m.

Habitat and biology: A highly migratory pelagic filter feeder, occurring singly or in schools, often near the surface. Ovoviparous with up to 300 embryos per female. Feeds on zooplankton, schooling fishes, and squids.

Importance to fisheries: Caught with floating gillnets and harpoons and incidentally in trawls; utilized for human consumption in Pakistan, India and Taiwan. Probably more valuable as a focus of eco-tourism.

Distribution: Found in all tropical and warm temperate oceans of the world; coastal and oceanic.



SCYLIORHINIDAE

Apristurus indicus (Brauer, 1906)

Frequent synonyms / misidentifications: None / None.

FAO names: En - Smallbelly catshark; Fr - Holbiche artouca; Sp - Pejegato indico.

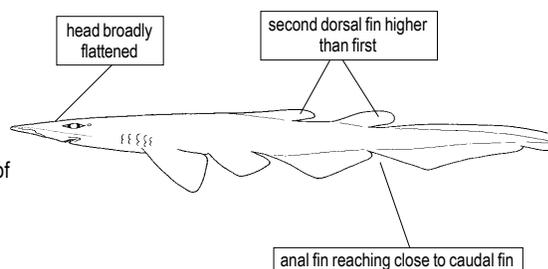
Local names:

Size: To at least 34 cm.

Habitat and biology: Poorly known; in deep waters from depths of 1289 to 1840 m.

Importance to fisheries: Caught probably with bottom trawls, presently of no interest to fisheries.

Distribution: Off Somalia, Gulf of Aden, and Oman; possibly in South East Atlantic off Namibia and South Africa.



Halaelurus boesemani (Springer & D'Aubrey, 1972)

Frequent synonyms / misidentifications: None / None

FAO names: En - Speckled catshark; Fr - Holbiche mouchetee; Sp - Pejegato pintado.

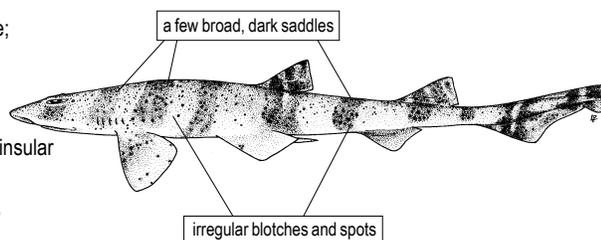
Local names:

Size: To 48 cm.

Habitat and biology: Bottom-dwelling on the continental and insular shelves, at depths of 37 to 91 m.

Importance to fisheries: Caught probably with bottom trawls, presently of no interest to fisheries.

Distribution: Somalia, Gulf of Aden, Western Australia, Indonesia, Philippines, and Viet Nam.



PROSCYLLIIDAE

Eridacnis radcliffei, Smith, 1913

Frequent synonyms / misidentifications: *Proscyllium alcocki* (Misra, 1950) / None.

FAO names: En - Pygmy ribbontail catshark; Fr - Requin chat pygme; Sp - Tollo coludo pigmeo.

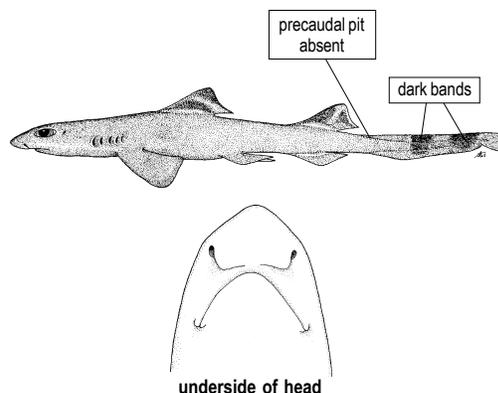
Local names:

Size: To 24 cm.

Habitat and biology: An abundant deepwater benthic shark found on mud bottoms of the upper continental and insular slopes and the outer shelves at depths from 71 to 766 m. Ovoviviparous, with 1-2 young per litter. Feeds primarily on small bony fishes and crustaceans and occasionally on squid.

Importance to fisheries: Caught with bottom trawls, presently of no interest to fisheries.

Distribution: Widespread but spottily distributed in the Indian and Western Pacific Oceans: Tanzania, Gulf of Aden, India, Andaman Islands, Viet Nam, and Philippines.



TRIAKIDAE

Iago omanensis (Norman, 1939)

Frequent synonyms / misidentifications: None / *Galeorhinus omanensis* (Norman, 1939).

FAO names: En - Bigeye houndshark; Fr - Requin-ha a gros yeux; Sp - Cazón ojigrande.

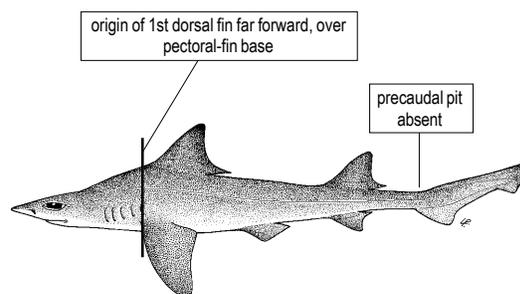
Local names:

Size: To 59 cm.

Habitat and biology: Inhabits deep waters from 110 m or less to at least 1000 m. Viviparous with 2-10 young. Feeds mainly on cephalopods and bony fishes, but also on shrimps, bivalves, gastropods and polychaetes.

Importance to fisheries: Caught with gillnets and handlines, utilized fresh for human consumption in India and Egypt.

Distribution: Red Sea, Gulf of Oman, Pakistan and western India.



Mustelus mosis (Hemprich & Ehrenberg, 1899)

Frequent synonyms / misidentifications: None / *Mustelus manazo* (not Bleeker, 1854).

FAO names: En - Arabian smooth-hound; Fr - Emissole d'Arabie; Sp - Musola arábiga.

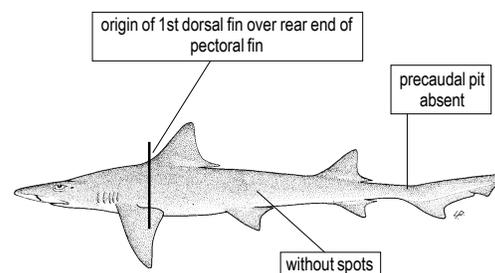
Local names:

Size: To 1.5 m.

Habitat and biology: Bottom-dwelling in inshore and offshore waters, also on coral reefs. Viviparous with 6-10 young per litter. Feeds on small bottom fishes, molluscs, and crustaceans. Lives well in captivity.

Importance to fisheries: Caught with bottom trawls, fixed bottom and floating gillnets, and line gear. Utilized for human consumption in the Red Sea, Pakistan and India.

Distribution: Red Sea to India, also northern South Africa.



HEMIGALEIDAE

Hemigaleus microstoma Bleeker, 1852

Frequent synonyms / misidentifications: *Negogaleus microstoma* (Bleeker, 1852) / *Chaenogaleus macrostoma* (Bleeker, 1852); *Hemipristis elongatus* (Klunzinger, 1871).

FAO names: En - Sicklefins weasel shark; Fr - Milandre faucille; Sp - Comadreja segadora.

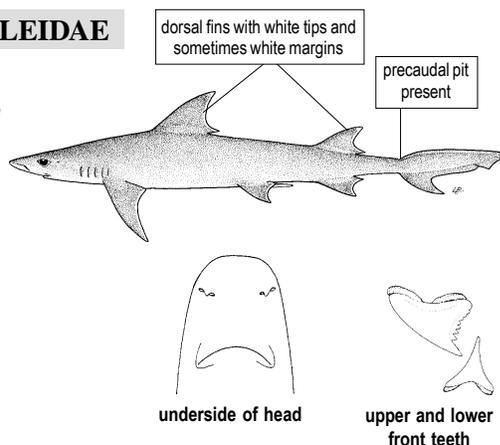
Size: To about 1.1 m.

Habitat and biology: Coastal, inshore and offshore at depths down to 170 m. Viviparous; 2 young per litter. Feeds mainly on octopus, cuttlefish, and squid, but also on crustaceans and equinoderms.

Importance to fisheries: Caught with floating and bottom gill nets, longlines and hook-and-line. Utilized fresh for human consumption; offal used for fishmeal.

Distribution: Red Sea, Southern India and Sri Lanka; from tropical China to northern Australia.

Remarks: Collected by the author at Gizan (KSA), Aden (Yemen) and Hurghada (Egypt).



Hemipristis elongatus (Klunzinger, 1871)

Frequent synonyms / misidentifications: *Hemipristis pingali* Setna and Sarangdhar, 1946; *Paragaleus acutiventralis* Chu, 1960; *Heterogaleus ghardaguensis* Gohar and Mazar, 1964 / *Hemigaleus microstoma* Bleeker, 1852.

FAO names: En - Snaggletooth shark; Fr - Milandre chicor; Sp - Comadreja sobrediente.

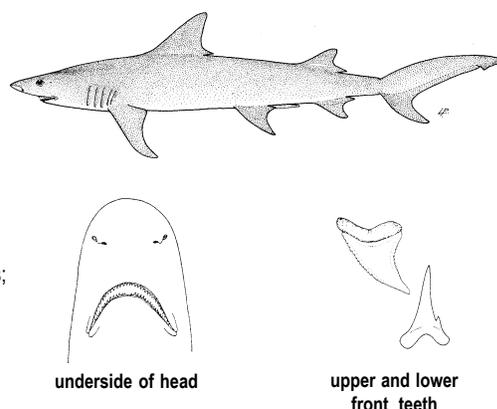
Local names:

Size: Between 1.2 and 2.0 m; reported to 2.4 m.

Habitat and biology: Inshore and offshore down to 30 m. Viviparous; 6-8 young per litter. Feeds on anchovies, sea catfish, mackerel, croakers, gray sharks, and butterfly rays.

Importance to fisheries: Caught with floating and fixed bottom gillnets and floating longlines. Meat used for human consumption, very appreciated in India; liver used for oil extract and fins for the oriental shark-fin soup market.

Distribution: Indian and western Pacific Oceans, from South Africa to China and Australia including the Red Sea and Gulf of Aden.



CARCHARHINIDAE

Carcharhinus amblyrhynchos (Bleeker, 1856)

Frequent synonyms / misidentifications: *Carcharhinus meninsorrah* (Valenciennes, 1839), *wheeleri* Garrick, 1982 / None.

FAO names: En - Grey reefshark; Fr - Requin dagsit; Sp - Tiburón de arrecifes

Local names:

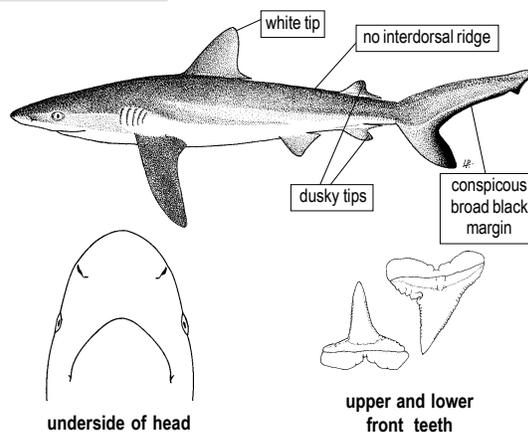
Size: To 2.33 and possibly 2.55 m.

Habitat and biology: A common coastal, inshore to offshore reef species; from the surface to a depth of 140 m. Viviparous; 1-6 young per litter; gestation about 12 months. Feeds on surface bottom, and reef fishes, cephalopods, crabs and shrimp.

Importance to fisheries: Caught with line gear and gillnets. Utilized for human consumption salt-dried or fresh; fins used for the oriental shark-fin soup market.

Distribution: Indian Ocean, including the Red Sea and western and Central Pacific.

Remarks: The blacktail reefshark *C. wheeleri* is considered to be a synonym of *C. amblyrhynchos* (L.J.V. Compagno pers.comm.). This shark can be very aggressive when cornered or confronted.



***Carcharhinus albimarginatus* (Rüppell, 1837)**

Frequent synonyms / misidentifications: *Eulamia (Platypodon) platyrhynchus* Gilbert 1892 / *Carcharhinus platyrhynchus* (Gilbert, 1892); *Triaenodon obesus* (Rüppell, 1837).

FAO names: En - Silvertip shark; Fr - Requin pointe blanche; Sp - Tiburón de puntas blancas.

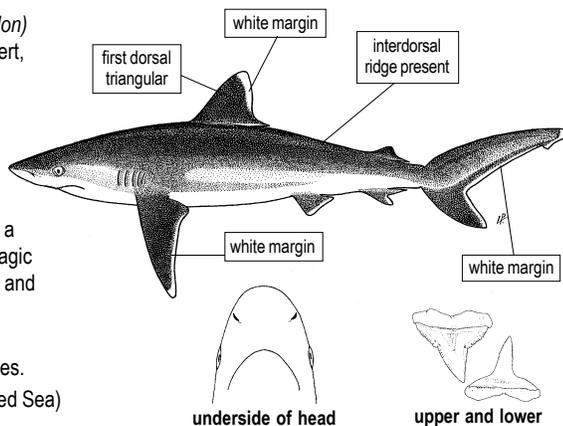
Local names:

Size: To 3.0 m.

Habitat and biology: Coastal and pelagic, from the surface to a depth of 800 m. Viviparous; 1-11 young per litter. Feeds on pelagic and bottom fish, including flyingfishes, tunas, soles, eagle rays and cephalopods.

Importance to fisheries: Caught by small-scale fisheries with longlines and gillnets, and also as bycatch in some tuna fisheries.

Distribution: From the western Indian Ocean (including the Red Sea) all the way to the eastern Pacific.



***Carcharhinus altimus* (Springer, 1950)**

Frequent synonyms / misidentifications: *Carcharhinus radamae* Fourmanoir, 1961 / *Carcharhinus galapagensis* (Snodgrass and Heller, 1905); *C. obscurus* (Lesueur, 1818); *C. plumbeus* (Nardo, 1827).

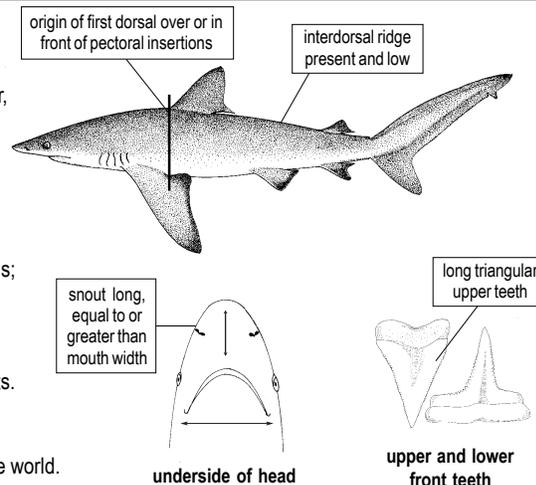
FAO names: En - Bignose shark; Fr - Requin babosse; Sp - Tiburón baboso.

Size: To about 3 m; commonly to 2.4 m.

Habitat and biology: Found off the continental shelves and uppermost slopes near the bottom, at depths of 30 to 430. Viviparous; with 3-15 young per litter. Feeds chiefly on bony fishes, but also on small sharks, rays, and cuttlefish.

Importance to fisheries: Taken on deep-set and surface longlines, also in bottom trawls and probably on hook-and-line and with gill nets. Utilized for human consumption, liver oil, and shagreen; fins appreciated in the oriental shark-fin soup market.

Distribution: Patchily distributed in all tropical and warm seas of the world.



***Carcharhinus amblyrhynchoides* (Whitley, 1934)**

Frequent synonyms / misidentifications: *Carcharhinus pleurotaenia* (Bleeker, 1852) / *Carcharhinus limbatus* (Valenciennes, 1839); *C. brevipinna* (Müller and Henle, 1839).

FAO names: En - Graceful shark; Fr - Requin gracie; Sp - Tiburón grácil.

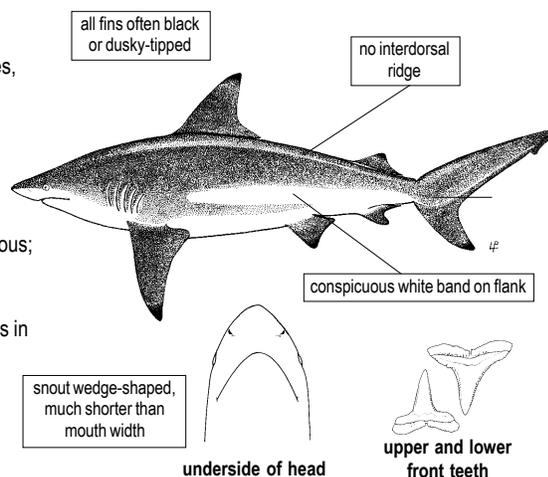
Local names:

Size: To at least 1.67 m.

Habitat and biology: An inshore, coastal pelagic species. Viviparous; details on reproduction unknown. Feeds mainly on carangids and mugilids, but also on cephalopods and crabs.

Importance to fisheries: Caught with longlines and drifting gillnets in fisheries across its range. Utilized fresh and dried for human consumption, fins used in the oriental shark-fin soup market.

Distribution: Gulf of Aden, India, Gulf of Thailand, Viet Nam, Philippines, Indonesia and N Australia.



Carcharhinus amboinensis (Müller and Henle, 1839)

Frequent synonyms / misidentifications: *Triaenodon obtusus* Day, 1878 / *Carcharhinus leucas* (Valenciennes, 1839).

FAO names: En - Pigeye shark; Fr - Requin balestine; Sp - Tiburón baleta.

Local names:

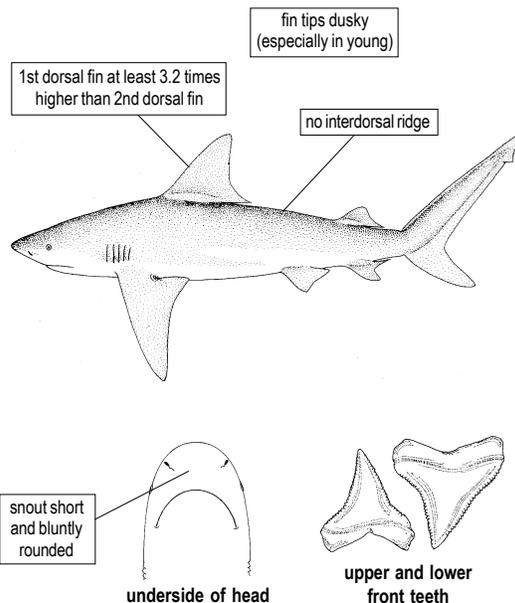
Size: To 2.8 m.

Habitat and biology: Occurs inshore and offshore, from the surfline to a depth of 60 m. Viviparous; 3-13 young per litter. A bottom-feeding shark, preying on pelagic and demersal bony fishes, sharks and rays, squid, shrimps, cuttlefish, octopi, lobsters, gastropods and mammalian carrion.

Importance to fisheries: Caught with longlines and gillnets. Its meat utilized fresh for human consumption, its fins in the oriental shark-fin soup market.

Remarks: Potentially dangerous to people.

Distribution: Nigeria, South Africa, Madagascar, Gulf of Aden, Pakistan, Sri Lanka, Indonesia, N Australia.



Carcharhinus brevipinna (Müller and Henle, 1839)

Frequent synonyms / misidentifications: *Carcharhinus johnsoni* Smith, 1951 / *Carcharhinus limbatus* (Valenciennes, 1839); *C. amblyrhynchoides* (Whitley, 1934); *Carcharhinus melanopterus* (Quoy and Gaimard, 1824); *C. sorrah* (Valenciennes, 1839)

FAO names: En - Spinner shark; Fr - Requin tisserand; Sp - Tiburón aleta negra.

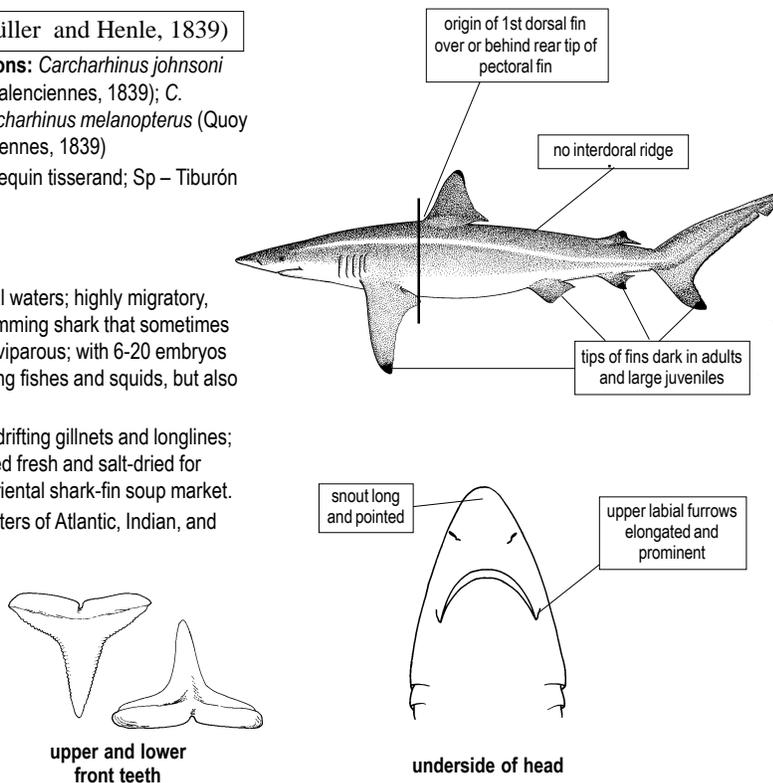
Local names:

Size: To 2.8 m, common to 2.5 m.

Habitat and biology: Pelagic in coastal waters; highly migratory, sometimes forming schools. A fast-swimming shark that sometimes leaps out of the water when feeding. Viviparous; with 6-20 embryos per litter. Feeds mainly in small schooling fishes and squids, but also on small sharks and rays.

Importance to fisheries: Caught with drifting gillnets and longlines; also targetted by sport fishermen. Utilised fresh and salt-dried for human consumption, fins used in the oriental shark-fin soup market.

Distribution: Tropical and temperate waters of Atlantic, Indian, and western Pacific Oceans.



Carcharhinus dussumieri (Valenciennes, 1839)

Frequent synonyms / misidentifications: *Carcharhinus menisorrhah* (Valenciennes, 1839); *C. tjtjtjt* (Bleeker, 1852) / *Carcharhinus sealei* (Pietschmann, 1916).

FAO names: En - Whitecheek shark; Fr - Requin a joues blanches; Sp - Tiburón cariblanco.

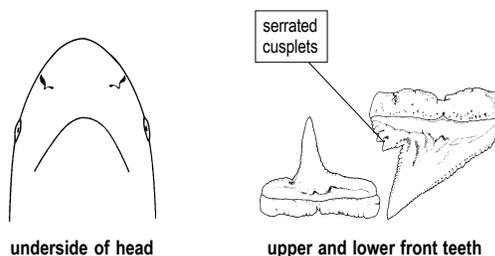
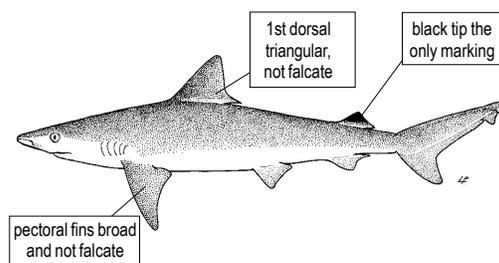
Size: To about 90 cm.

Habitat and biology: A common, but little-known shark of the continental and insular inshore waters. Viviparous; with 1 to 4 young per litter. Feeds primarily on crabs, shrimp and bony fishes, also on other crustaceans, cephalopods and other molluscs.

Importance to fisheries: Caught with gillnets and longlines in small-scale fisheries. Commonly marketed for its meat for human consumption.

Distribution: Occurs from the Red Sea eastward to Thailand, China, southern Japan, Java, Borneo, and probably New Guinea and northern Australia.

Remarks: This species differs from the blackspot shark, *Carcharhinus sealei* by its triangular rather than falcate first dorsal fin, more numerous upper teeth, a broader mouth, broader pectoral fins, and less numerous vertebrae. Observed by the author at the Jeddah (KSA) fish market in two different seasons, but fishing locality unknown.



Carcharhinus falciformis (Bibron, 1839)

Frequent synonyms / misidentifications: None / *Carcharhinus obscurus* (Le Sueur, 1818).

FAO names: En - Silky shark; Fr - Requin soyeux; Sp - Tiburón jaquetón.

Local names:

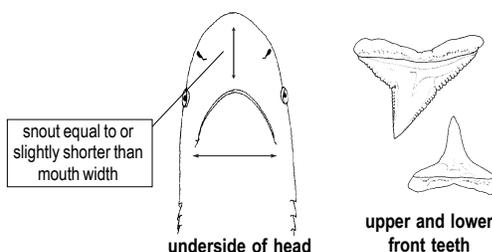
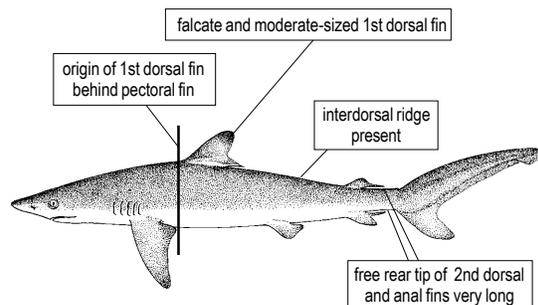
Size: To 3.3 m.

Habitat and biology: Coastal and oceanic, common near shelves and slopes, from the surface to depths of 500 m. Late juveniles commonly associated with tuna schools. Viviparous; with 2-16 young per litter; nursery areas in the outer shelves. Feeds mainly on fish, including sea catfish, groupers and snappers, tunids and clupeoids, but also on squids, octopi and crustaceans.

Importance to fisheries: Very important in fisheries throughout its range, caught with longlines, handlines, and gillnets. One of the most common bycatches of industrial tropical tuna fisheries with longlines and specially purse seines. Utilized fresh or salt-dried for human consumption, livers used for oil extraction (rich in Vitamin A), fins for the oriental shark-fin soup market, and hides for leather.

Distribution: Found in all tropical seas of the world, one of the most common sharks worldwide. Known from the Red Sea and Gulf of Aden.

Remarks: Reported to be dangerous to humans.



Carcharhinus leucas (Valenciennes, 1839)

Frequent synonyms / misidentifications: *Carcharhinus zambezensis* (Peters, 1852); *C. vanrooyeni* Smith, 1958 / *Carcharhinus amboinensis* (Müller and Henle, 1839).

FAO names: En - Bull shark; Fr - Requin bouledogue; Sp - Tiburón sarda.

Local names:

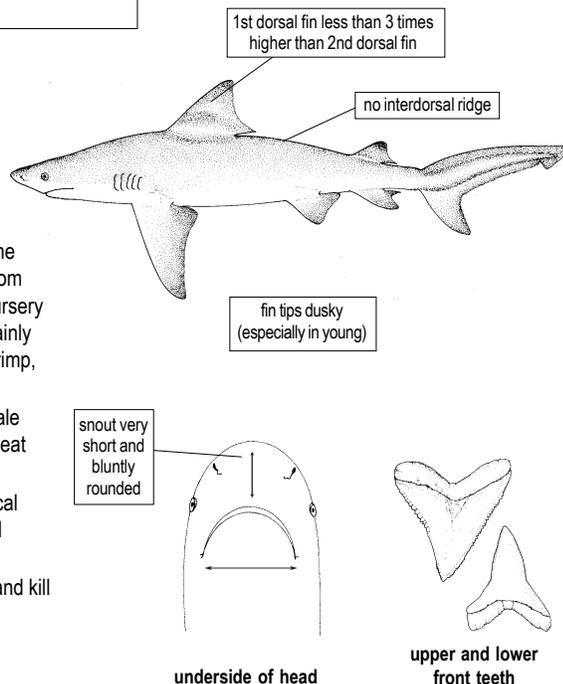
Size: To 3.5 m.

Habitat and biology: In coastal, estuarine, riverine and lacustrine waters, usually found close inshore in marine habitats; occurs from depths of 1 to 152 m. Viviparous; with 6 to 12 young per litter; nursery areas in estuaries and coastal lagoons. Omnivorous, feeding mainly on other sharks and rays and bony fishes, but also on crabs, shrimp, turtles, sea birds and carrion.

Importance to fisheries: A common catch on inshore small-scale shark fisheries, caught with gillnets and longlines. Used for its meat for human consumption, and priced for its fins, hides, and livers.

Distribution: Found in coastal areas of all tropical and subtropical seas of the world. Known to enter freshwater systems and found several hundred kilometres upstream in rivers and lakes.

Remarks: One of the most dangerous sharks, known to attack and kill people.



Carcharhinus limbatus (Valenciennes, 1839)

Frequent synonyms / misidentifications: None / *Carcharhinus brevipinna* (Müller and Henle, 1839); *C. amblyrhynchoides* (Whitley, 1934); *C. melanopterus* (Quoy and Gaimard, 1824); *C. Sorrah* (Valenciennes, 1839)

FAO names: En - Blacktip shark; Fr - Requin borde; Sp - Tiburón macuira.

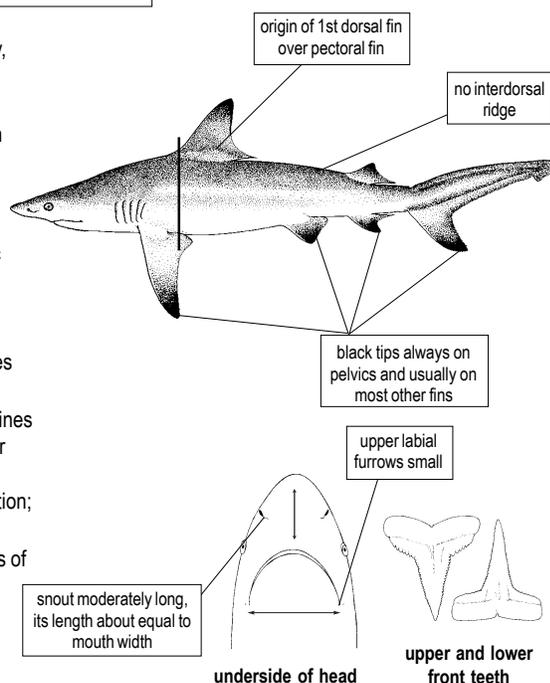
Local names:

Size: To 2.6 m, common to 1.5 m.

Habitat and biology: A coastal and offshore but not truly oceanic species. Highly migratory, sometimes forming large schools. Fast-moving, sometimes leaping out of the water. Viviparous; with 1-10 embryos per litter and a 10-12 month gestation period; nursery areas in coastal lagoons. Feeds mainly on schooling fishes but takes also cephalopods and crustaceans.

Importance to fisheries: Caught commercially with floating longlines and gillnets, and incidentally in trawl nets; an important species for sport fishermen. Sometimes an important bycatch of coastal tuna fisheries. Its meat is highly appreciated fresh for human consumption; its fins, hides and liver are also utilized.

Distribution: Widespread in all tropical and warm-temperate seas of the world.



***Carcharhinus longimanus* (Poey, 1861)**

Frequent synonyms / misidentifications: *Carcharhinus maou* (Lesson, 1830) / None.

FAO names: En - Oceanic whitetip shark; Fr - Requin oceanique; Sp - Tiburón oceánico.

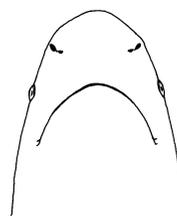
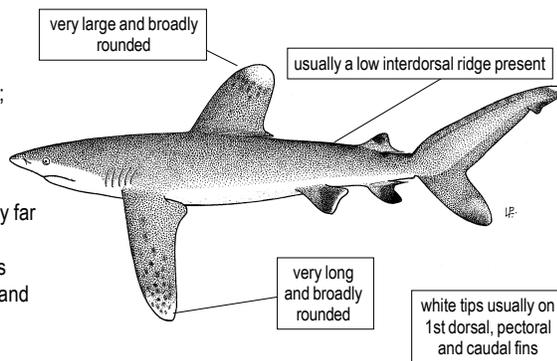
Local names:

Size: To 3.5 m, common to 2.7 m.

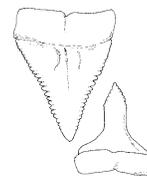
Habitat and biology: An oceanic-epipelagic species found mostly far offshore but occasionally in coastal waters. Viviparous; with 1-15 embryos per litter and a gestation period of about one year. Feeds mainly on pelagic fishes and squids, but also on seabirds, turtles and crustaceans.

Importance to fisheries: Caught with floating longlines, drifting gillnets, and handlines; an important bycatch of many tropical tuna fisheries. Utilized fresh for human consumption, its fins highly appreciated in the oriental shark-fin soup market.

Distribution: Widespread in all tropical and subtropical seas of the world.



underside of head



upper and lower front teeth

***Carcharhinus melanopterus* (Quoy and Gaimard, 1824)**

Frequent synonyms / misidentifications: *Hypoprion playfairi* (Günther, 1870) / *Carcharhinus brevipinna* (Müller and Henle, 1839); *C. limbatus* (Valenciennes, 1839).

FAO names: En - Blacktip reef shark; Fr - Requin pointes noires; Sp - Tiburón de puntas negras.

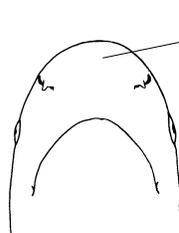
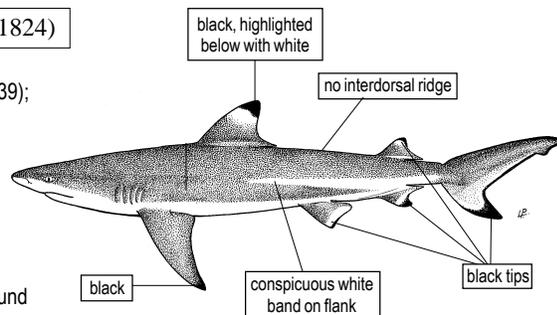
Local names:

Size: To about 2 m, common to 1.6 m.

Habitat and biology: Found inshore and sometimes offshore on continental and insular shelves; prefers shallow water on and around coral reefs. Viviparous; with 4 young per litter. Feeds mainly on bony fishes (carangids, leiognathids, monacanthids) and cephalopods.

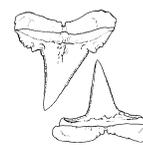
Importance to fisheries: Caught with longlines and gillnets in coastal fisheries. Utilized fresh or salt-dried for human consumption.

Distribution: Wide-ranging in all the Indian Ocean including the Red Sea, and the western and Central Pacific.



underside of head

snout short and bluntly rounded



upper and lower front teeth

Carcharhinus plumbeus (Nardo, 1827)

Frequent synonyms / misidentifications: *Carcharhinus milberti* (Valenciennes, 1839) / *Carcharhinus altimus* (Springer, 1950).

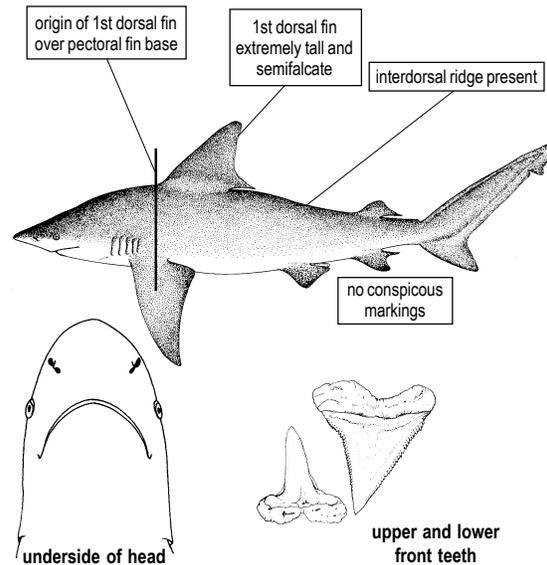
FAO names: En - Sandbar shark; Fr - Requin gris; Sp - Tiburón trozo.

Size: To possibly 3.0 m, common to 2.4 m.

Habitat and biology: Coastal-pelagic, on continental and insular shelves and in deeper water adjacent to them; from the intertidal zone to a depth of 280 m. Highly migratory in some areas. Viviparous; 1-14 young; nursery areas in coastal lagoons. Eats sardines, shad, menhaden, mullets, flatfish, and other small fishes, small sharks and batoids, crustaceans, and cephalopods.

Importance to fisheries: An important species for fisheries, caught with longlines, hook-and-line, and bottom gillnets. Also sought by sport fishermen. Utilized fresh, frozen, smoked or salt-dried for human consumption. Highly appreciated for its fins in the oriental shark-fin soup market. Liver and hides also much appreciated.

Distribution: Found in all tropical and warm-temperate seas of the world with the possible exception of the eastern Pacific (unconfirmed records).

***Carcharhinus sealei*** (Pietschmann, 1916)

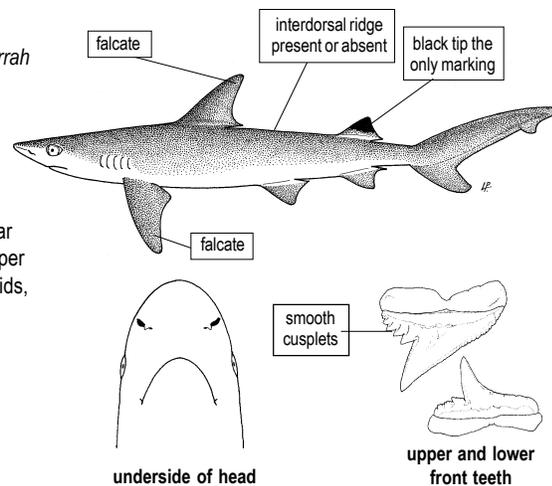
Frequent synonyms / misidentifications: *Carcharhinus menisorrh* (Valenciennes, 1839) / *Carcharhinus dussumieri* (Valenciennes, 1839).

FAO names: En - Blackspot shark; Fr - Requin a taches noires; Tiburón alinegro.

Size: To 95 cm.

Habitat and biology: A coastal shark of the continental and insular shelves, from the surfline to a depth of 40 m. Viviparous; 2 young per litter; gestation period about 9 months. Feeds on small fishes, squids, and prawns.

Importance to fisheries: Caught with line gear and gillnets. Sometimes locally important in small-scale fisheries. Its meat is utilized dried and fresh for human consumption.

***Carcharhinus sorrah*** (Valenciennes, 1839)

Frequent synonyms / misidentifications: *Carcharhinus bleekeri* (Dumeril, 1865) / *Carcharhinus brevipinna* (Müller and Henle, 1839), *C. limbatus* (Valenciennes, 1839)

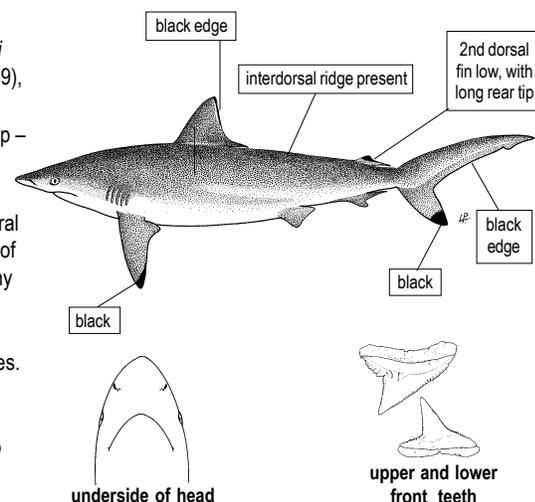
FAO names: En - Spottail shark; Fr - Requin a queue tachetée; Sp - Tiburón rabo manchado.

Size: To 1.6 m.

Habitat and biology: Common in inshore waters often around coral reefs, sometimes found also offshore; from the surface to a depth of 140 m. Viviparous; 2-6 young per litter. Feeds mainly on small bony fishes (e.g. mugilids, clupeids, siganids, teraponids) but also on cephalopods, crabs and shrimps.

Importance to fisheries: Caught with floating gillnets and longlines. Sometimes locally important in small-scale fisheries. Its meat is utilized dried and fresh for human consumption.

Distribution: From Madagascar to the Gulf of Aden, eastwards to Japan, tropical Australia, and the Solomon Islands.



Galeocerdo cuvier (Peron and Le Seuer, 1822)

Frequent synonyms / misidentifications: *Galeocerdo arcticus* (Faber, 1829) / None.

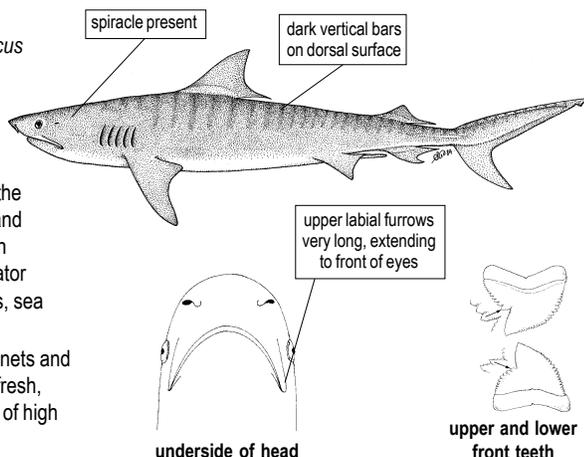
FAO names: En - Tiger shark; Fr - Requin tigre commun; Sp - Tintorera.

Size: Exceptionally to 7.4 m, common to 4 m.

Habitat and biology: An inshore and offshore species, near the surface and bottom; often in shallow waters, including rivers and estuaries. Ovoviviparous; with 10-82 young per litter; gestation possibly slightly over a year. A voracious, indiscriminate predator feeding on all kinds of fish, marine mammals, turtles, seabirds, sea snakes, squids, molluscs, and crabs.

Importance to fisheries: Caught with floating and bottom gillnets and longlines. Also sought by sport fishermen. Its meat is utilized fresh, salt-dried, and smoked for human consumption, hide and fins of high quality, liver rich in oil and vitamin A.

Remarks: One of the most dangerous sharks; attacks divers, swimmers, and even boats.

***Loxodon macrorhinus*** Müller and Henle, 1839

Frequent synonyms / misidentifications: *Scoliodon acutus* (Rüppell, 1837); *S. ceylonensis* Setna and Sarangdhar, 1946 / *Scoliodon laticaudus* (Müller and Henle, 1838).

FAO names: En - Sliteye shark; Fr - Requin sagrin; Sp - Tiburón ojuelo.

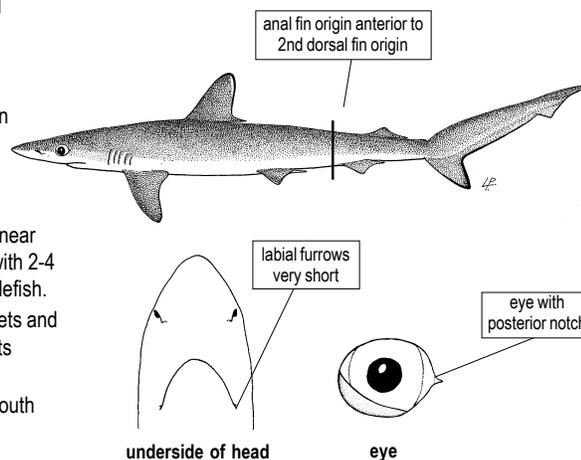
Local names: Libax, Jeer-Jeer.

Size: To 90 cm.

Habitat and biology: Occurs in tropical, coastal, clear waters, near the surface and bottom; at depths from 7 to 80 m. Viviparous; with 2-4 young per litter. Feeds on anchovies, croakers, shrimp and cuttlefish.

Importance to fisheries: Caught with floating and bottom gillnets and line gear. Locally important for small-scale fisheries in parts of its range. Utilized fresh for human consumption.

Distribution: Indian Ocean and western Pacific Ocean; from South Africa to Red Sea, eastward to Japan and eastern Australia.

***Negaprion acutidens*** (Rüppell, 1837)

Frequent synonyms / misidentifications: None / *Lamiopsis temmincki* (Müller and Henle, 1839).

FAO names: En - Sicklefim lemon shark; Fr - Requin limon faucille; Sp - Tiburón segador.

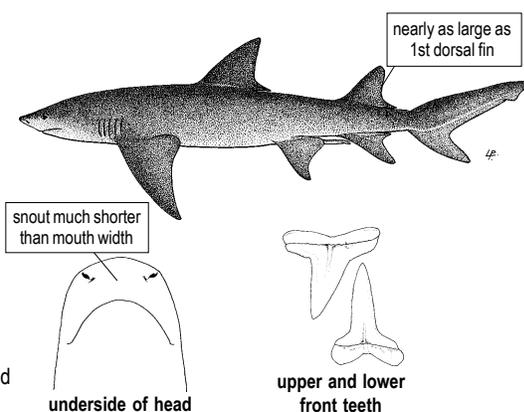
Local names: Libax, Farluuq.

Size: To 3.1 m.

Habitat and biology: Demersal in shallow inshore and offshore waters; often around coral reefs and sandy plateaus near coral, at depths down to at least 23 m. Viviparous; 1-13 young per litter; gestation 10 or more months. Feeds on bottom fishes including porcupine fish and stingrays.

Importance to fisheries: Caught with floating and bottom gillnets and line gear. Its meat used fresh or salt-dried for human consumption, fins for in the oriental shark-fin soup market, and liver for oil and vitamin A extraction.

Distribution: Indian and Western Pacific Oceans, from South Africa to the Red Sea, eastward to Cambodia, Papua-New Guinea, tropical Australia, and Palau, Marshall Islands, and Tahiti.



***Rhizoprionodon acutus* (Rüppell, 1837)**

Frequent synonyms / misidentifications: *Scoliodon acutus* (Rüppell, 1837); *S. palsorra* (Bleeker, 1853); *S. walbeehmi* (Bleeker, 1856) / *Rhizoprionodon oligolinx* Springer, 1964; *Loxodon macrorhinus* Müller and Henle, 1839; *Scoliodon laticaudus* Müller and Henle, 1838.

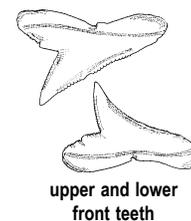
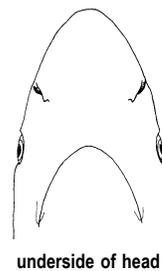
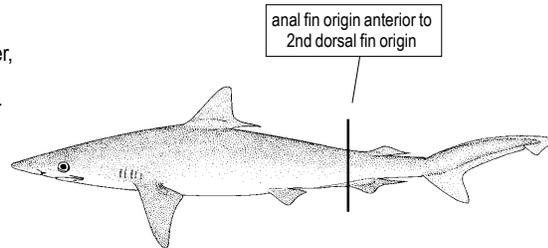
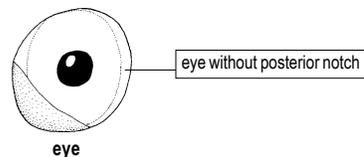
FAO names: En - Milk shark; Fr - Requin museau pointu; Sp - Tiburón lechoso.

Size: Common to less than 1.1 m, exceptionally to 1.78 m.

Habitat and biology: An abundant inshore and offshore shark, from the surfline to depths of about 200 m. Viviparous: 2-8 young per litter; gestation period about 1 year. Feeds on small bony fishes (lizardfish, goatfish, threadfins, wrasses, haritails, sardines, croakers, mojarra), squids, octopi, cuttlefish, shrimps, crabs and sea snails.

Importance to fisheries: An important species for inshore small-scale fisheries across its range. Caught with longlines, gillnets and trawls. Utilized fresh and salt-dried for human consumption.

Distribution: In tropical and subtropical waters of the south eastern Atlantic, the Indian (including the Red Sea and Gulf of Aden), and the western Pacific Oceans.

***Triaenodon obesus* (Rüppell, 1837)**

Frequent synonyms / misidentifications: *Triaenodon apicalis* Whitley, 1939 / *Carcharhinus albimarginatus* (Rüppell, 1837).

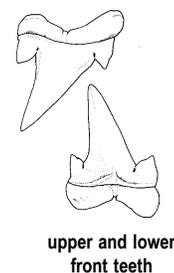
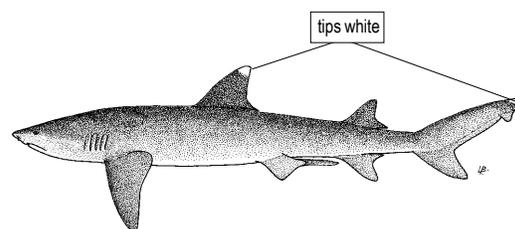
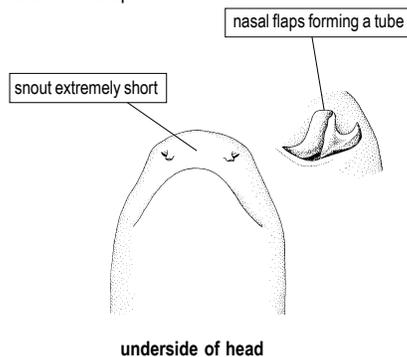
FAO names: En - Whitetip reef shark; Fr - Requin corail; Sp - Cazón coralero fiato.

Local names: Libaax, Daaha.

Size: Common to 1.7 m; said to attain 2.13 m.

Habitat and biology: Occurs in coastal clear waters, very commonly associated with coral reefs, lying inside holes or crevices. Viviparous; 1-5 young per litter. Eats a wide variety of reefs fishes (moray eels, parrot fishes, snappers, squirrelfishes, etc.), but also octopus, lobsters and crabs.

Importance to fisheries: Caught with floating and bottom gillnets, and line gear. Its meat utilized fresh or salt-dried for human consumption.



SPHYRNIDAE

Sphyrna lewini (Griffith and Smith, 1834)

Frequent synonyms / misidentifications: *Sphyrna diplana* Springer, 1941 / *Sphyrna mokarran* (Rüppell, 1837).

FAO names: En - Scalloped hammerhead; Fr - Requin-marteau halicorne; Sp - Cornuda común.

Local names: Manyaso.

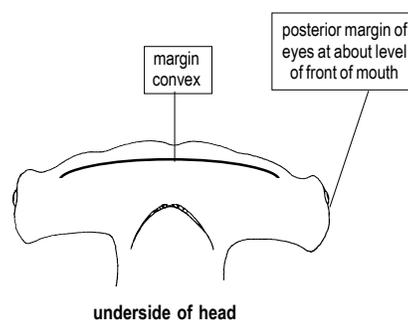
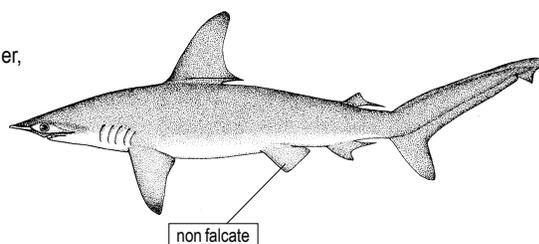
Size: Common to 3.7 m, exceptionally to 4.2 m.

Habitat and biology: From inshore to offshore and semi-oceanic waters. Newborns and juveniles common in estuaries and shallow bays; adults form large schools around offshore sea mounts.

Viviparous; 15-31 young per litter. Eats a variety of pelagic and demersal fishes (sardines, anchovies, mackerel, jacks, flatfish, sea catfish, parrotfish, and others) as well as several sharks and rays, squid, lobsters and other crustaceans.

Importance to fisheries: An important species for small and large scale fisheries throughout its range. Caught with most kinds of longlines and gillnets and particularly vulnerable to the latter around the seamounts where large schools of the species congregate. A common bycatch of tuna and billfish fisheries when operating in coastal waters. Its meat used fresh or salt-dried for human consumption; fins highly appreciated in the oriental shark-fin soup market; hides good for leather production.

Distribution: In all tropical and warm-temperate seas of the world.



Sphyrna mokarran (Rüppell, 1837)

Frequent synonyms / misidentifications: None / *Sphyrna tudes* (Valenciennes, 1822); *S. lewini* (Griffith and Smith, 1834).

FAO names: En - Great hammerhead; Fr - Grand requin-marteau; Sp - Cornuda gigante.

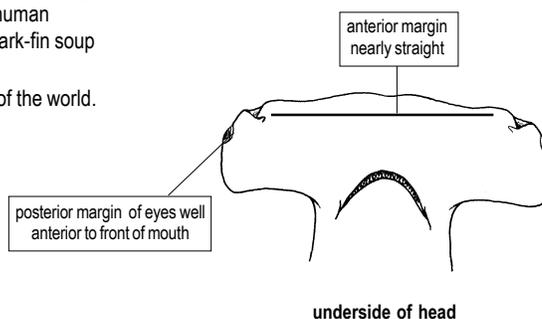
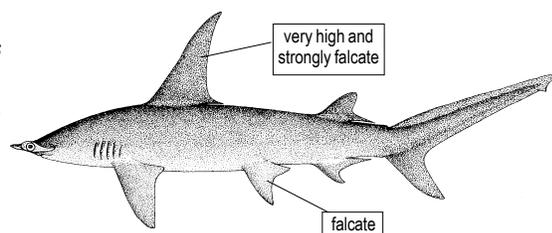
Local names: Cawar.

Size: To 6 m.

Habitat and biology: Semi-oceanic, also in inshore waters, often found around and on coral reefs. Viviparous; 13-42 young per litter; gestation at least 7 months. Feeds mainly on skates, rays, groupers and sea catfishes, but takes also other bony fishes, small sharks, squids, and lobsters.

Importance to fisheries: Caught with floating gillnets and floating longlines. Its meat used fresh, frozen, or salt-dried for human consumption. Fins highly appreciated in the oriental shark-fin soup market. Livers and hides also utilized.

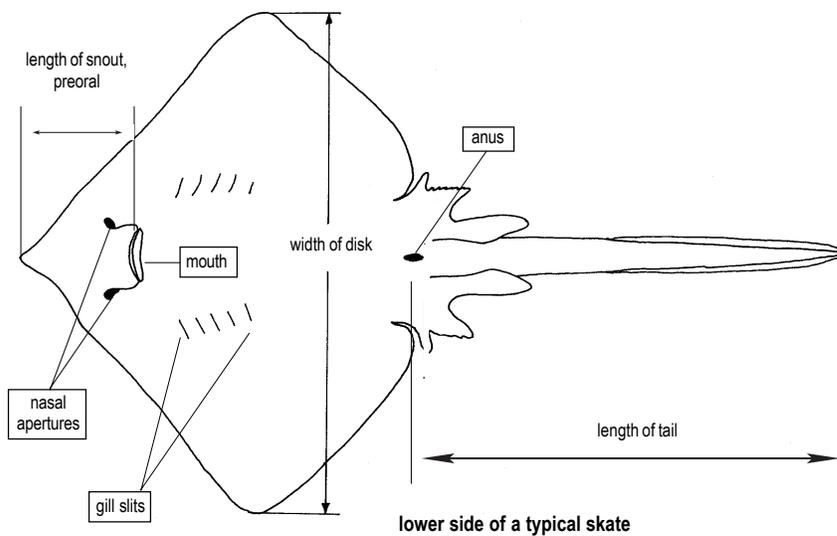
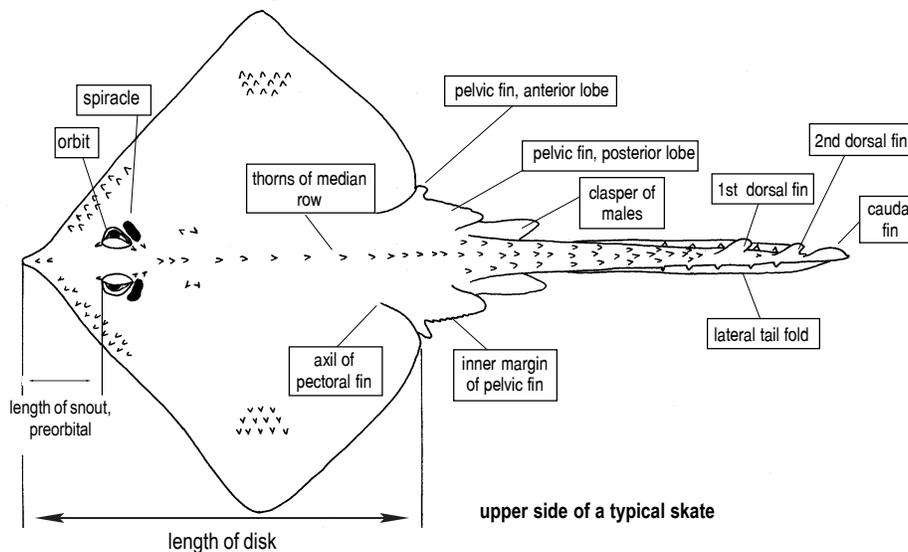
Distribution: In all tropical and warm-temperate seas of the world.



BATOID FISHES

Rays, Skates, Guitar Fishes and Mantas

Technical terms and measurements



LIST OF FAMILIES AND SPECIES OCCURRING IN THE AREA

An asterisk is given when species accounts are given. A question mark indicates that presence in the area needs confirmation.

Order Pristiformes

Family Pristidae

- * *Anoxypristis cuspidata*
- * *Pristis pectinata*
- * *Pristis zijsron*

Order Torpediniformes

Family Torpedinidae

- * *Torpedo panthera*
- * *Torpedo sinuspersici*

Family Narkidae

- Heteronarce bentuviai*

Order Rhinobatiformes

Family Rhinobatidae

- ? *Rhinobatos cemiculus*
- ?* *Rhinobatos granulatus*
- * *Rhinobatos halavi*
- ? *Rhinobatos obtusus*
- * *Rhinobatos punctifer*
- ?* *Rhinobatos salalah*
- ?* *Rhinobatos schlegelii*
- ?* *Rhinobatos thouin*

Family Rhynchobatidae

- * *Rhina ancylostoma*
- ? *Rhynchobatus australiae?*
- * *Rhynchobatus djiddensis*

Order Myliobatiformes

Family Dasyatidae

- * *Dasyatis kuhlii*
- ? *Dasyatis pastinaca*
- * *Himantura fai*
- * *Himantura gerrardi*
- * *Himantura imbricata*
- * *Himantura uarnak*
- * *Pastinachus sephen*
- ? *Taeniura grabata*
- * *Taeniura lymma*
- * *Taeniura meyeri*
- * *Urogymnus asperrimus (africanus?)*

Family Gymnuridae

- Aetoplatea tentaculata*
- * *Gymnura poecilura*

Family Myliobatidae

- * *Aetobatus flagellum*
- * *Aetobatus narinari*
- ? *Aetobatus ocellatus* (Kuhl & van Hasselt, 1823) (= *A. narinari* ?)
- * *Aetomylaeus milvus*
- * *Aetomylaeus vespertilio*

Family Rhinopteridae

- * *Rhinoptera javanica*
- ? *Rhinoptera jayakari*?

Family Mobulidae

- * *Manta birostris*
- * *Mobula eregoodootenkee*
- * *Mobula japanica*
- ? *Mobula kuhlii*
- * *Mobula tarapacana*

Guide to the Orders and Families of batoid fishes found in the Red Sea and Gulf of Aden

How to use this guide

Readers are strongly advised to follow these simple steps in order to successfully identify any shark or batoid found in the region. First, read **carefully** through the description of key characters listed under each Order. Use the illustrations of the Families under each Order only as a secondary aid in making certain that the right Order has been found. Once the right Order has been identified, proceed to narrow down on the Family of the specimen using the illustration for the Family and key characters for the Family annotated in each illustration; make use of the size data included for each Family. Once the Family has been identified, move to the corresponding pages where the species for that Family are illustrated. These illustrations and the key characters marked on them should allow proper identification of all sharks and batoids known from the region.

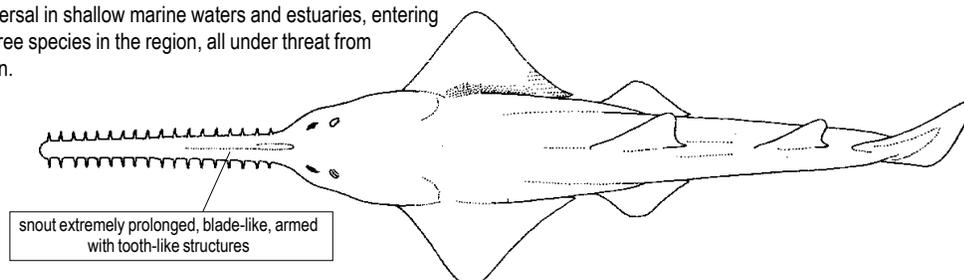
ORDER PRISTIFORMES - Sawfishes

Body shark-like with a saw-like elongated snout bearing a row of strong lateral teeth on each side, gill slits on the underside of the head.

PRISTIDAE

Sawfishes. Page 33

To 7.3 m. Demersal in shallow marine waters and estuaries, entering freshwater. Three species in the region, all under threat from overexploitation.



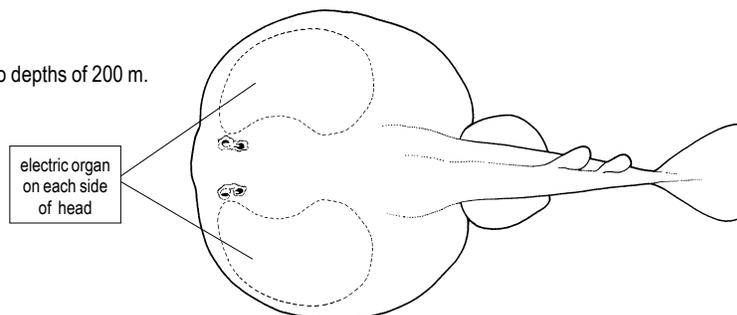
ORDER TORPEDINIFORMES – Electric rays

Pectoral fins greatly expanded and fused with head and trunk, forming a large oval disc; tail stout and shark-like, without any spines, a large electric organ on each side of head, usually visible through the skin as a pattern of hexagonal markings.

TORPEDINIDAE

Electric rays. Page 34

To 1.3 m. Demersal, from shallow waters to depths of 200 m. Probably two species in the region.



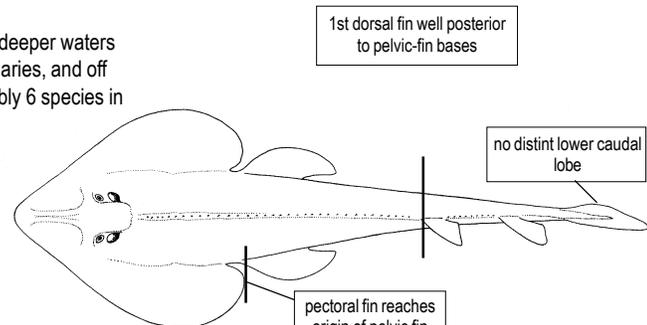
ORDER RHINOBATIFORMES – Guitarfishes, wedgefishes and shark-rays

Body elongated and shark-like with pectoral fins expanded and fused with head and trunk; two sub-equal and well separated dorsal fins; no saw-like snout.

RHINOBATIDAE

Guitarfishes. Page 34

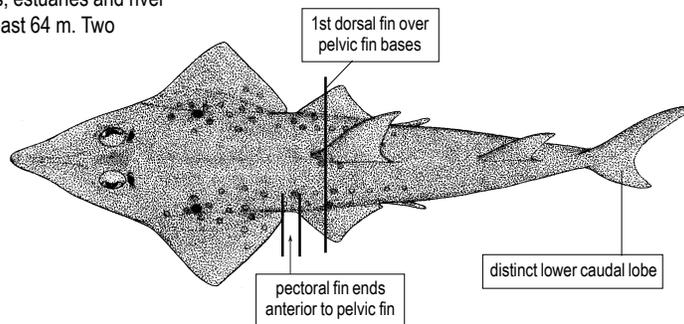
To 3 m. Demersal, in inshore waters and sometimes in deeper waters of the upper slope; off sandy beaches, muddy bays, estuaries, and off river mouths. From the intertidal down to 366 m. Possibly 6 species in the region.



RHYNCHOBATIDAE

Wedge fishes and shark-rays. Page 37

To 3 m. Demersal, in inshore waters, muddy bays, estuaries and river mouths, and coral reefs; from the intertidal to at least 64 m. Two species in the region.



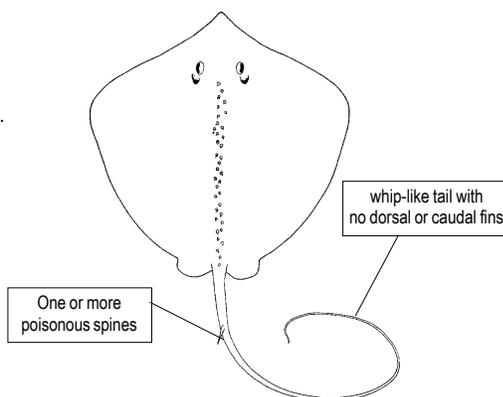
ORDER MYLIOBATIFORMES – Stingrays, butterfly rays, eagle rays and mantas

Body flattened with pectoral fins greatly expanded and fused with head and trunk; tail slender or whiplike, usually with one or several spines; usually with a single dorsal fin, but no caudal fin. No electric organ.

DASYATIDAE

Stingrays. Page 37

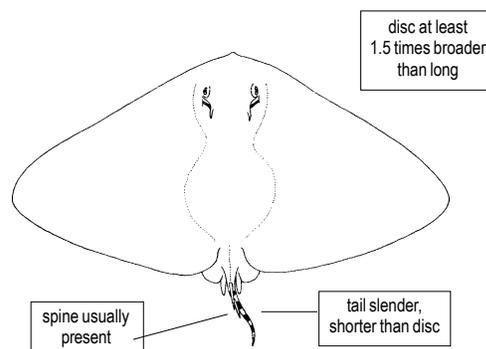
To 2 m disc width. Mostly demersal, with one species pelagic. In marine, estuarine and fresh-water habitats, down to 480 m of depth. At least nine species in the region.



GYMNURIDAE

Butterfly rays. Page 41

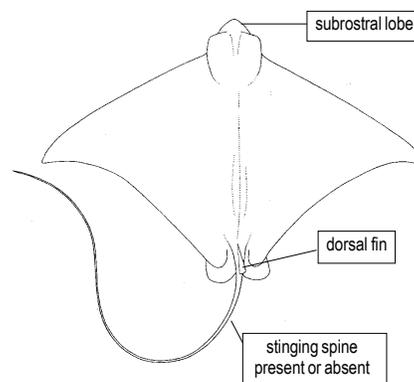
To 2.5 m disc width. Demersal, inshore waters off sandy beaches, estuaries, enclosed bays and lagoons, and offshore banks down to a depth of 110 m. A single species in the region.



MYLIOBATIDAE

Eagle rays. Page 41

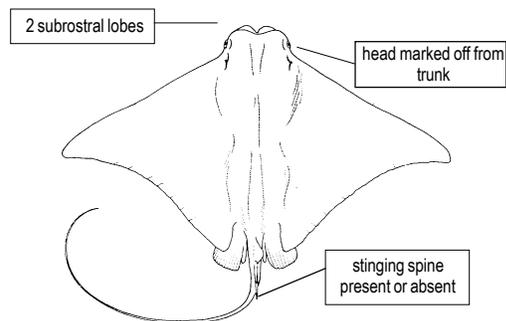
To 3 m disc width. Semi-pelagic in inshore waters, around coral or rocky reefs, kelp beds, estuaries and enclosed bays and lagoons, but often found also in the epipelagic zone. From the intertidal to a depth of 527 m. Four species in the region.



RHINOPTERIDAE

Cownose rays. Page 42

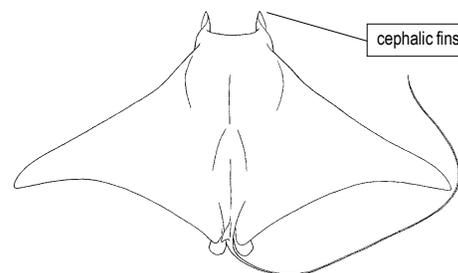
To 1.5 m disc width. Semi-pelagic inshore and offshore, off sandy beaches, estuaries, enclosed bays and lagoons, and offshore banks; from the intertidal to at least 26 m of depth. One species in the region, possibly two.



MOBULIDAE

Mantas and devil rays. Page 43

To at least 6.7 m disc width. Pelagic, in coastal and oceanic waters from the intertidal to the epipelagic zone; around coral and rocky reefs, in lagoons and enclosed and open bays. Possibly four species in the region.



PRISTIDAE

Anoxypristis cuspidata (Latham, 1794)

Frequent synonyms / misidentifications: None / *Pristis pectinata* Latham, 1794; *P. zijsron* Bleeker, 1851.

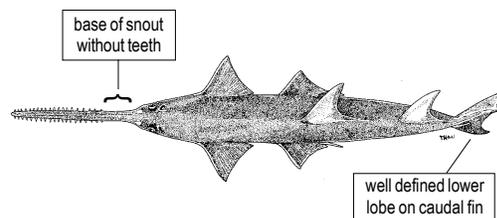
FAO names: En – Narrow sawfish.

Size: To at least 4.7m.

Habitat and biology: Found close inshore in the intertidal to a depth of 40 m, frequents river deltas and estuaries, and may go upstream in rivers. Ovoviviparous; litters of 6-23 young. Feeds on small fish and cuttlefish.

Importance to fisheries: Caught in bottom trawls, in fixed bottom gill nets, and probably with line gear. Meat utilized for human consumption. Severely depleted throughout its range. In need of strong conservation measures.

Distribution: Confined to the Indo-West Pacific, from the Red Sea to southern Japan, New Guinea and tropical Australia.

*Pristis pectinata* Latham, 1794

Frequent synonyms / misidentifications: None / *Anoxypristis cuspidata* (Latham, 1794); *Pristis zijsron* Bleeker, 1851.

FAO names: En - Smalltooth sawfish; Fr - Poisson-scie commun; Sp - Pez sierra comun.

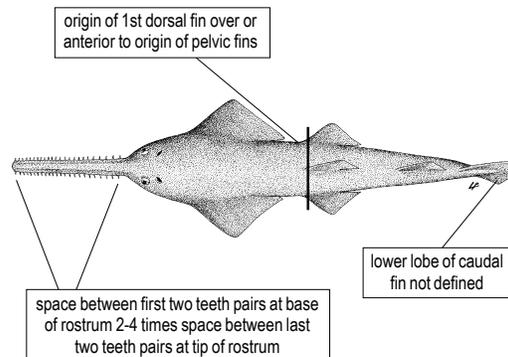
Local names: Libaax-Miinshaar, Zaraacimo.

Size: Probably to 7.6 m, common to 5.5 m.

Habitat and Biology: In shallow bays, lagoons and estuaries, also enters freshwater.

Importance to fisheries: Caught with line gear and bottom trawls. Flesh of good quality. Severely depleted throughout its range. In need of strong conservation measures.

Distribution: Possibly found in all warm-temperate and tropical seas of the world, but status of nominal records uncertain. Presence in the Red Sea needs confirmation.

*Pristis zijsron* Bleeker, 1851

Frequent synonyms / misidentifications: None / *Anoxypristis cuspidata* (Latham, 1794); *Pristis pectinata* Latham, 1794 .

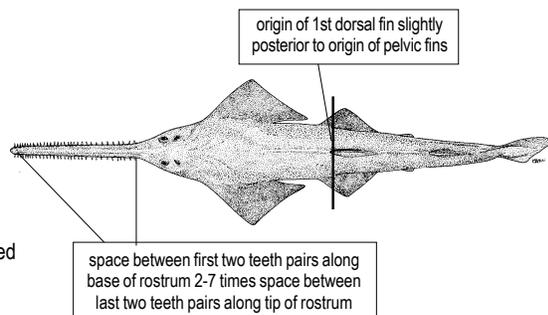
FAO names: En – Longcomb sawfish.

Size: Reported to reach 7.3 m.

Habitat and biology: In shallow waters, also enters freshwater.

Importance to fisheries: Caught with line gear and bottom trawls. Flesh of good quality. Severely depleted throughout its range. In need of strong conservation measures.

Distribution: Confined to the Indian and western Pacific Oceans. From South Africa north to the Red Sea and eastwards to southern China, New Guinea and Australia.



TORPEDINIDAE

Torpedo panthera Olfers, 1831

Frequent synonyms / misidentifications: None/*Torpedo sinuspersici* Olfers, 1831.

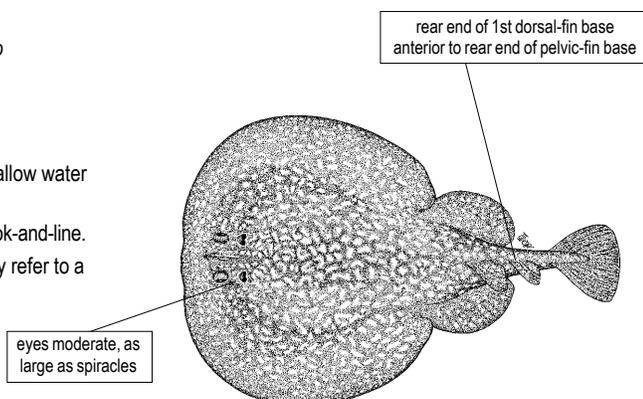
FAO names: En – Panther electric ray.

Size: To 1 m.

Habitat and biology: On mud or sandy bottoms, from shallow water to depths of 110 m. Can deliver a strong electric shock.

Importance to fisheries: Caught with bottom trawls and hook-and-line.

Distribution: Red Sea. Reports from other areas probably refer to a different species.



Torpedo sinuspersici Olfers, 1831

Frequent synonyms / misidentifications: None/*Torpedo panthera* Olfers, 1831.

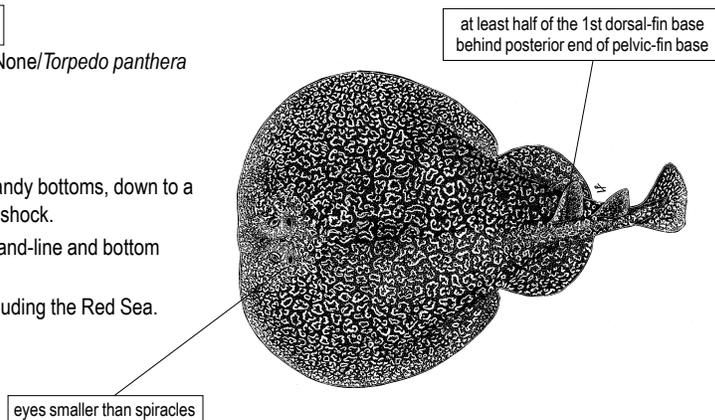
FAO names: En - Marbled electric ray.

Size: To 1.3 m total length, 90 cm disc with.

Habitat and biology: Inshore waters over sandy bottoms, down to a depth of 200 m. Can deliver a strong electric shock.

Importance to fisheries: Caught with hook-and-line and bottom trawls. Flesh edible.

Distribution: From South Africa to India, including the Red Sea.



RHINOBATIDAE

Rhinobatos granulatus Cuvier, 1829

Frequent synonyms / misidentifications:

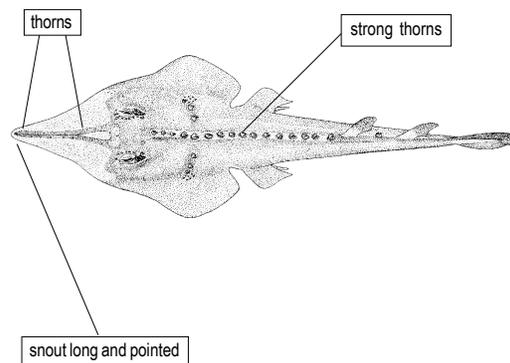
FAO names: En – Sharpnose guitarfish.

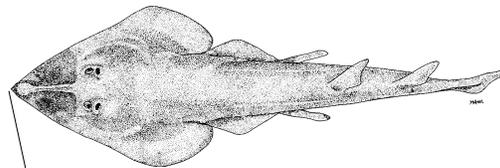
Size: To at least 1.8, possibly to 2.15 m.

Habitat and biology: Found inshore and offshore from the intertidal to the outer continental shelves down to 119 m. Biology little known.

Importance to fisheries: Utilized where it occurs, but details lacking.

Distribution: Occurs in the Indo-West Pacific from the Persian Gulf and off India east to Viet Nam and New Guinea. Presence in the region needs to be confirmed.



Rhinobatos halavi (Forsskal, 1775)**Frequent synonyms / misidentifications:****FAO names:** En - Halavi guitarfish.**Size:** To 150 cm.**Habitat and biology:** An inshore species of sandy bottoms. Up to ten young per litter. Eats prawns and other crustaceans.**Importance to fisheries:** Utilized where it occurs, but details lacking.**Distribution:** Occurs in the Indo-West Pacific from the Red Sea to the Gulf of Oman. Possibly east to the Persian Gulf, India, Myanmar, Philippines, Viet Nam, and China.

snout moderately long and broad,
sides nearly straight

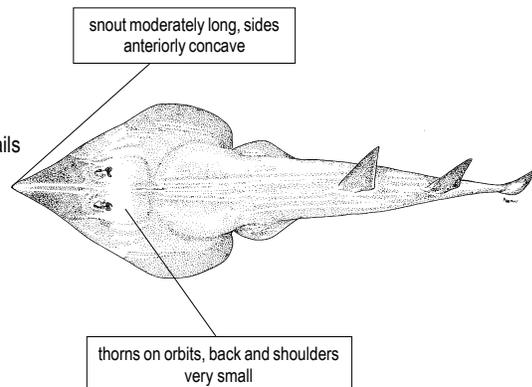
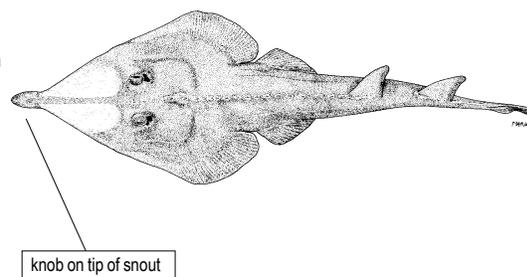
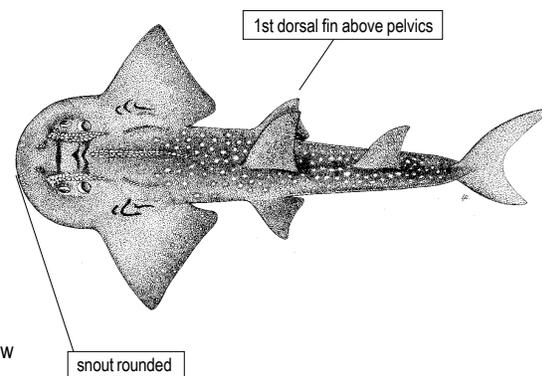
Rhinobatos punctifer Compagno and Randall, 1987**Frequent synonyms / misidentifications:** None/*Rhinobatos schlegelii* Müller and Henle, 1841**FAO names:** En - ; Fr - ; Sp -

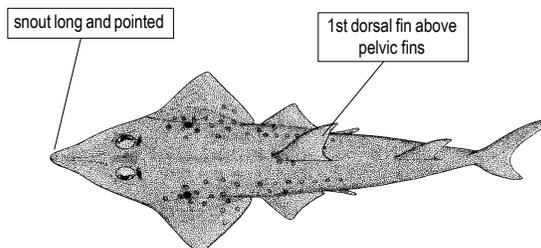
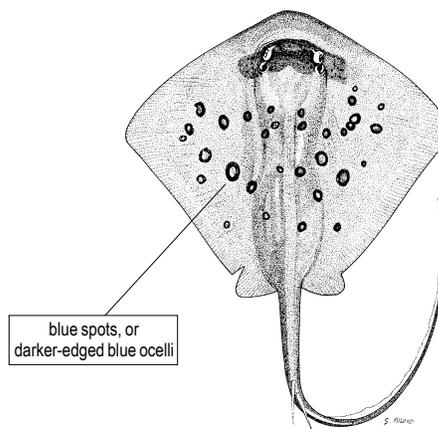
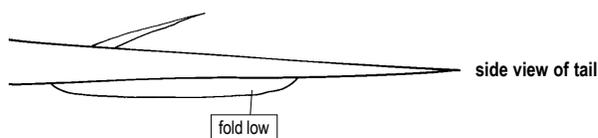
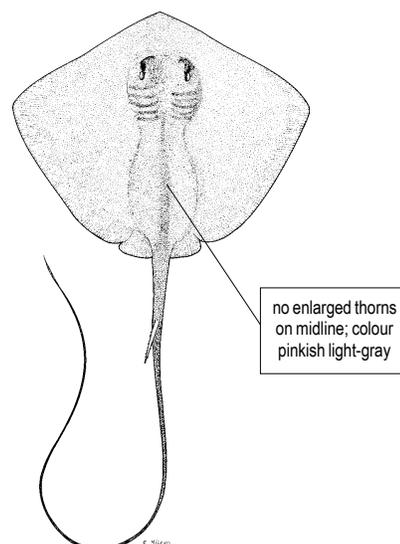
Local names:

Size: To at least 88 cm total length.**Habitat and biology:** Presumably a bottom dwelling species like other guitarfishes, but details of its biology unknown.**Importance to fisheries:** Caught incidentally with bottom trawls in the northern Red Sea; utilized fresh for human consumption.**Distribution:** From the northern Red Sea to Oman.***Rhinobatos salalah*** Randall and Compagno, 1995**Frequent synonyms / misidentifications:** None/*Rhinobatos obtusus* Müller and Henle, 1841**FAO names:** En - ; Fr - ; Sp -

Local names:

Size: To at least 88 cm total length.**Habitat and biology:** Presumably a bottom dwelling species like other guitarfishes, but details of its biology unknown.**Importance to fisheries:** Little know, the only specimen collected at a fish market in Oman.

Rhinobatos schlegelii Müller and Henle, 1841**Frequent synonyms / misidentifications:****FAO names:** En - Brown guitarfish.**Size:** To at least 75 cm.**Habitat and biology:** An inshore species. Biology little known.**Importance to fisheries:** Probably utilized where it occurs, but details lacking.**Distribution:** Occurs in the western Pacific off China, Korea, and Japan, also Viet Nam and Philippines; westward records from India and Oman may not be this species.***Rhinobatos thouin*** (Anonymous, in Lacepede, 1798)**Frequent synonyms / misidentifications:****FAO names:** En - Clubnose guitarfish.**Size:** To 2.5 and possibly 3.0 m.**Habitat and biology:** Found inshore. Biology little known.**Importance to fisheries:** Caught in inshore and offshore fisheries in trawls and probably gill nets and line gear. Utilized for human consumption fresh and probably dried-salted.**Distribution:** Occurs in the Indo-West Pacific from the Red Sea, Malaysia, Singapore, Thailand, Viet Nam, Indonesia, New Guinea, and Japan.**RHYNCHOBATIDAE*****Rhina ancylostoma*** Bloch and Schneider, 1801**Frequent synonyms / misidentifications:****FAO names:** En - Bowmouth guitarfish; Fr- Angelot.**Local names:** Oolo-Oolo, Tuurey.**Size:** Reported to reach 2.7 m.**Habitat and biology:** A bottom living species that occurs close inshore and on offshore reefs, from depths of 3 to 90 m. Feeds on crabs and shellfish.**Importance to fisheries:** Caught with bottom trawl. Commercially caught off Asia.**Distribution:** Confined to the Indian and western Pacific Oceans. From South Africa north to the Red Sea and eastwards to Japan, New Guinea and Australia

Rhynchobatus djiddensis (Forsskal, 1775)**Frequent synonyms / misidentifications:****FAO names:** En - Giant guitarfish; Fr - Poisson paille a pois.
Sp- Pez cuna manchado.**Local names:** Oolo-Oolo, Shabeelley.**Size:** To at least 3 m.**Habitat and biology:** Occurs in shallow inshore waters, on sandy bottoms, from depths of 2 to 50 m. Feeds on benthic invertebrates.**Importance to fisheries:** Caught with line gear gillnets and bottom trawls. An important species in small-scale fisheries throughout its range. Meat used for human consumption; fins highly appreciated in the oriental shark-fin soup market.**Distribution:** Known from the western Indian Ocean including the Red Sea and Gulf of Aden. Possibly also in the eastern Indian and western Pacific Ocean but records need confirmation.**DASYATIDAE*****Dasyatis kuhlii*** (Müller and Henle, 1841)**Frequent synonyms / misidentifications:** None / None.**FAO names:** En - Bluespotted stingray.**Size:** To 38 cm disc width and about 67 cm total length.**Habitat and biology:** In coastal waters, to a depth of 90 m.**Importance to fisheries:** Caught with line gear and bottom trawls.**Distribution:** Indian and western Pacific Oceans. From South Africa north to the Red Sea and eastwards to Japan, Melanesia and Micronesia, and including Australia.***Himantura fai*** Jordan and Seale, 1906**Frequent synonyms/misidentifications:** None / *Himantura jenkinsii* (Annandale, 1909).**FAO names:** En - Pink whipray; Fr - ; Sp -**Local names:****Size:** To at least 500 cm total length and more than 150 cm disc width.**Habitat and biology:** Occurs in the inner continental shelf, often in aggregations over soft substrates. Biology poorly known.**Importance to fisheries:** Caught as a bycatch with bottom trawl nets, and presumably utilized for human consumption but details unknown.**Distribution:** Poorly known due to confusion with *H. jenkinsii*. Likely widespread in the Indian and western Pacific Oceans, from South Africa to Micronesia including Australia. Found in the Red Sea.

Himantura gerrardi (Gray, 1851)

Frequent synonyms / misidentifications: *Himantura macrurus* (Bleeker, 1852) / None.

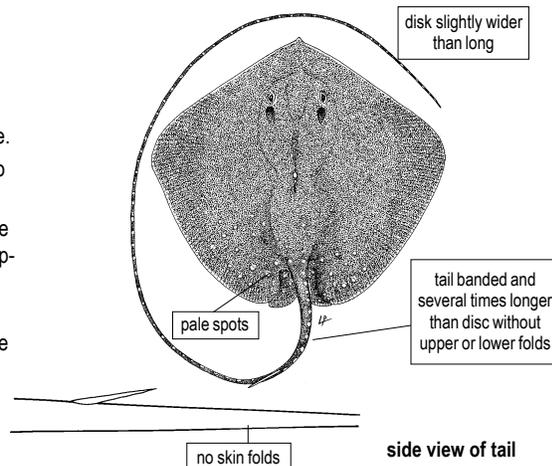
FAO names: En – Whitespotted whipray.

Size: Length to at least 200 cm; maximum disc width 90 cm or more.

Habitat and biology: Depth distribution limits unknown, but likely to be confined to inner continental shelf.

Importance to fisheries: An important commercial stingray in some areas and the most regularly landed. Meat used for human consumption salt-dried, the skin also used to produce leather.

Distribution: Widespread in the Indo-Pacific from the Red Sea to New Guinea, north to Taiwan (Province of China). Reported from the south and east African coasts, but records need to be validated.

***Himantura imbricata*** (Bloch and Schneider, 1801)

Frequent synonyms / misidentifications:

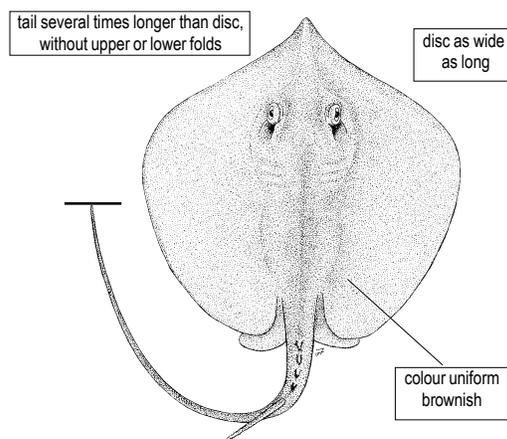
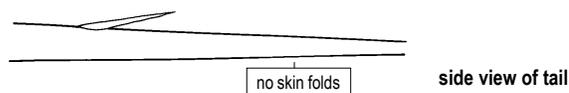
FAO names: En - Scaly whipray.

Size: Maximum total length about 65 cm; maximum disc width 22 cm.

Habitat and biology: Demersal in inshore coastal waters. Ovoviviparous. Feeds on bottom invertebrates.

Importance to fisheries: Caught in bottom trawls. Utilization unknown.

Distribution: Found in the Indo-Malay Archipelago but distribution not well defined. Thought to occur from the Red Sea to Java.

***Himantura uarnak*** (Forsskal, 1775)

Frequent synonyms / misidentifications: *Himantura punctata* (Günther, 1870); *Himantura* sp. 1 [Gloerfelt-Tarp and Kailola, 1984] / None.

FAO names: En - Reticulate whipray.

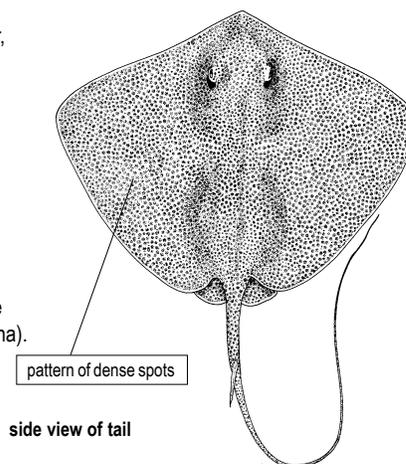
Size: Maximum total length at least 450 cm; maximum disc width about 150 cm.

Habitat and biology: Occurs inshore on soft substrates; often intertidal but to depths of at least 50 m.

Importance to fisheries: Caught with bottom trawls. Important commercial species through some of its range.

Distribution: Widespread in the Indo-Pacific; from South Africa and the Mediterranean and Red Seas, to Australia and Taiwan (Province of China).

Remarks: Several colour morphs exist, some of which may prove to be distinct species.



Pastinachus sephen (Forsskal, 1775)

Frequent synonyms / misidentifications: *Dasyatis gruveli* Chabanaud, 1923 / None.

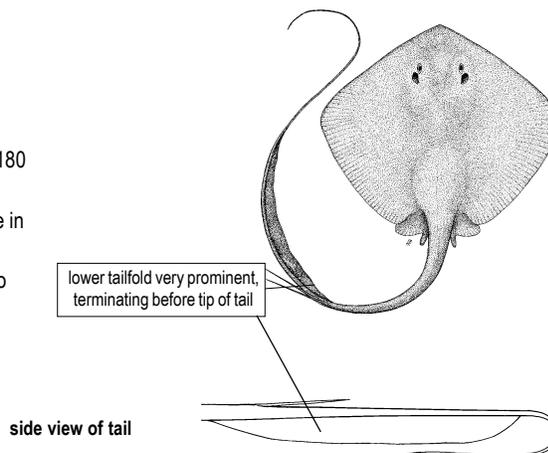
FAO names: En - Cowtail stingray.

Size: Maximum total length at least 300 cm; maximum disc width 180 cm.

Habitat and biology: Common inshore to a depth of 60 m or more in coral and sedimentary habitats. Enters estuaries and fresh water.

Importance to fisheries: Marketed throughout its range in small to moderate quantities.

Distribution: Widespread in the tropical Indo-Pacific from the Red Sea, north to Japan, east to Australia, including Melanesia and Micronesia. Also reported from South Africa.

***Taeniura lymma*** (Forsskal, 1775)

Frequent synonyms / misidentifications: None / None.

FAO names: En - Bluespotted ribbontail ray; Fr- Pastenague queue a ruban; Sp- Raya latigo rabo cinta.

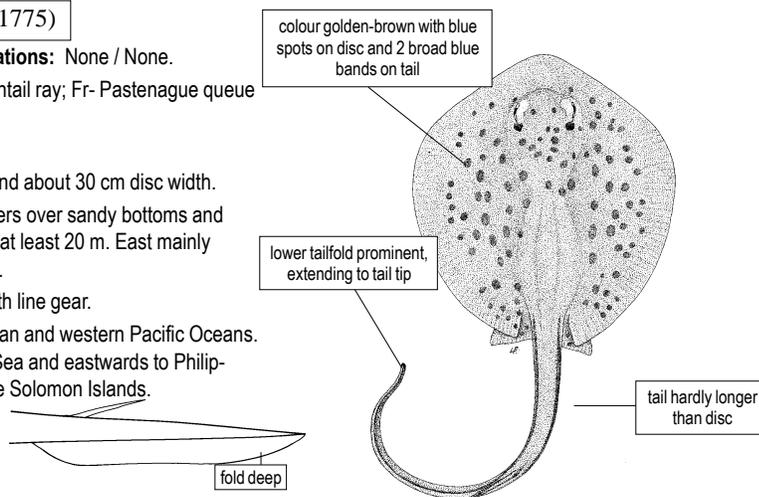
Local names: Shafane.

Size: To at least 70 cm total length and about 30 cm disc width.

Habitat and biology: In coastal waters over sandy bottoms and specially on coral reefs, to depths of at least 20 m. East mainly molluscs, worms, shrimps and crabs.

Importance to fisheries: Caught with line gear.

Distribution: Widespread in the Indian and western Pacific Oceans. From South Africa north to the Red Sea and eastwards to Philippines, Australia, New Guinea and the Solomon Islands.

***Taeniura meyeni*** Müller and Henle, 1841

Frequent synonyms / misidentifications: *Taeniura melanospilos* Bleeker, 1853 / None.

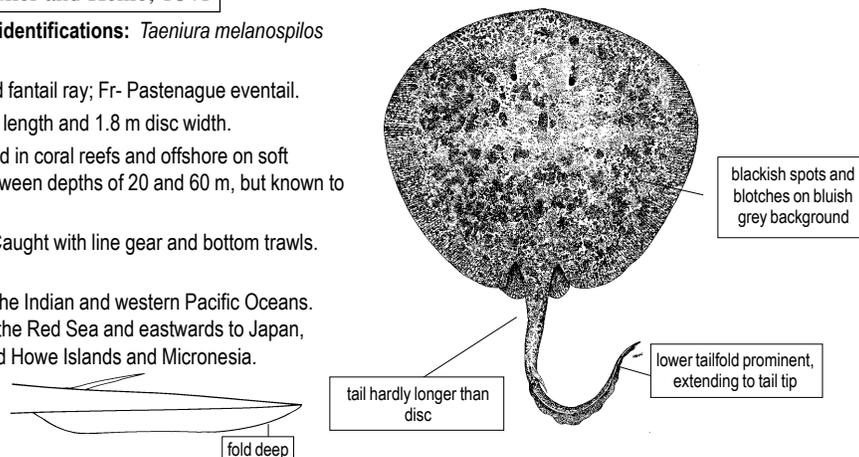
FAO names: En - Blotched fantail ray; Fr- Pastenague eventail.

Size: To at least 3.3 m total length and 1.8 m disc width.

Habitat and biology: Found in coral reefs and offshore on soft bottoms. Most common between depths of 20 and 60 m, but known to occur in a depth of 450 m.

Importance to fisheries: Caught with line gear and bottom trawls. Utilization unknown.

Distribution: Known from the Indian and western Pacific Oceans. From South Africa north to the Red Sea and eastwards to Japan, Australia, New Guinea, Lord Howe Islands and Micronesia.



***Urogymnus asperrimus* (Bloch and Schneider, 1801)**

Frequent synonyms / misidentifications: *Urogymnus africanus* (Bloch & Schneider, 1801); *U. rhombeus* (Klunzinger, 1871) / None.

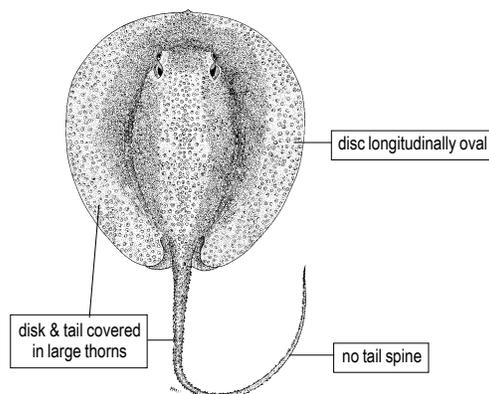
FAO names: En - Porcupine ray.

Size: Up to at least 1 m disc width.

Habitat and biology: Demersal in shallow inshore waters, associated to coral reefs and also found in brackish waters and sandy bottoms, often in caves. Eats polychaetes, bottom crustaceans and some bony fishes.

Importance to fisheries: Of very little or no importance to fisheries but often caught in trawls and beach seines. Utilised seasonally for its liver in some localities in the Red Sea (Farasan Islands, KSA).

Distribution: Coast of East Africa and Red Sea eastward to Marshall Islands and Fiji, and south to northern Australia. Also found in West

**GYMNURIDAE*****Gymnura poecilura* (Shaw, 1804)**

Frequent synonyms / misidentifications:

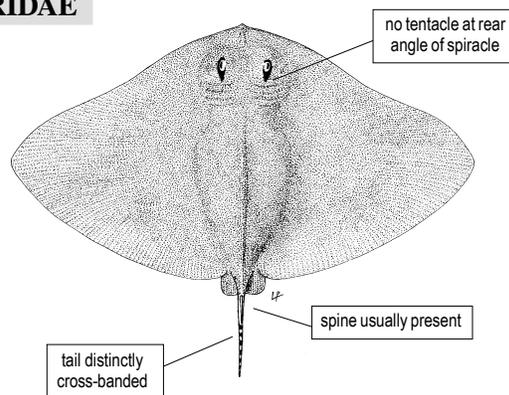
FAO names: En - Longtail butterfly ray.

Size: To a length of at least 66 cm and width of at least 82 cm.

Habitat and biology: Locally common, found in shallow inshore waters over sandy and muddy bottoms. Ovoviviparous. Feeds mainly on crustaceans and clams.

Importance to fisheries: Caught as bycatch in bottom trawls and sometimes by hook-and-line. Utilized for human consumption in some parts of its range.

Distribution: From the Red Sea eastward to the Society Islands, China, and southern Japan.

**MYLIOBATIDAE*****Aetobatus narinari* (Euphrasen, 1790)**

Frequent synonyms / misidentifications:

FAO names: En - Spotted eagle ray; Fr - Aigle de mer leopard.

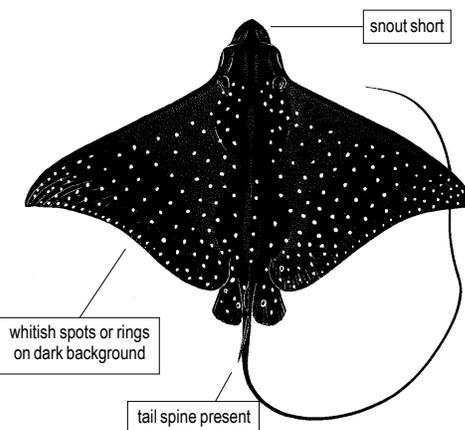
Local names: Maylan.

Size: To at least 8.8 m total length when tail undamaged and 3.3 m disc width.

Habitat and biology: Inshore semi-pelagic found in coral reefs, estuaries, off beaches, and enclosed bays; to depths of 60 m. Can form large schools and can leap out of the water. Number of young usually 4. Feeds mainly on bivalves, but also on shrimps, crabs, octopi, and worms.

Importance to fisheries: Caught with hook-and-line and harpoons. Flesh edible but seldom utilized. Ideal for display in Aquaria.

Distribution: Apparently found in all tropical and sub-tropical seas of the world, but records from the Atlantic Ocean might be an undescribed species.



Aetobatus flagellum (Bloch and Schneider, 1801)

Frequent synonyms / misidentifications:

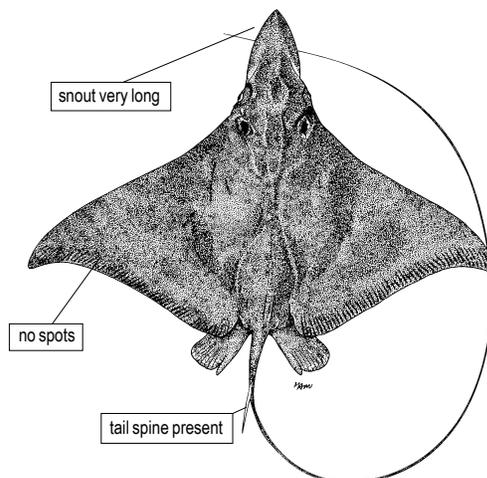
FAO names: En – Longheaded eagle ray.

Size: To at least 126 cm in length, width to 47 cm.

Habitat and biology: An inshore species. Biology not well known.

Importance to fisheries: Details of utilization unknown, but it is regularly landed in the fish markets of Jakarta.

Distribution: From the Red Sea, India, Indonesia, and southern China; records from the eastern Atlantic and Hawaii need validation.



Aetomylaeus milvus (Valenciennes, 1841)

Frequent synonyms / misidentifications:

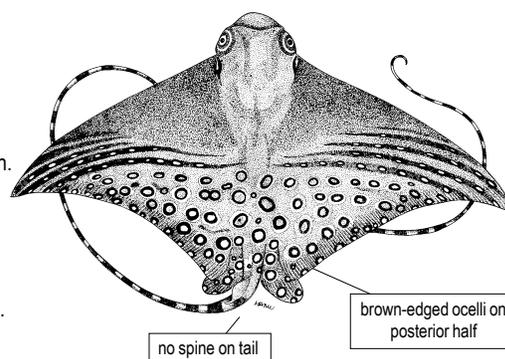
FAO names: En- Ocellate eagle ray.

Size: To at least 37 cm disc width.

Habitat and biology: An inshore eagle ray, with biology poorly known.

Importance to fisheries: Details of utilization sketchy; utilized for human consumption in some parts of its range.

Distribution: Thought to occur in the Indo-West Pacific from the Red Sea, Pakistan, India, Malaysia, Indonesia and Thailand, Philippines, and China. May be the juvenile of either *Aetomylaeus maculatus* or *A. vespertilio*.



Aetomylaeus vespertilio (Bleeker, 1852)

Frequent synonyms/misidentifications: *Aetomylaeus reticulatus* (Teng, 1962)/ None.

FAO names: En – Ornate eagle ray; Fr – ; Sp –

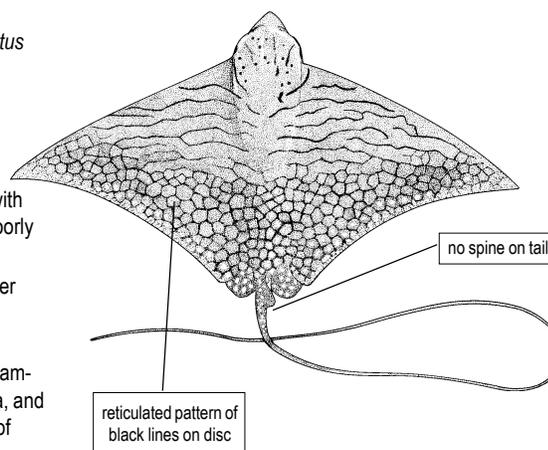
Local names:

Size: To 160 cm disc width and 385 cm total length.

Habitat and biology: Occurs inshore and offshore associated with muddy bays and coral reefs; to a depth of 110m. Biology poorly known.

Importance to fisheries: Caught with gill nets and probably other gear. Utilized for human consumption in Thailand and probably elsewhere, but details lacking.

Distribution: Found in Indian and western Pacific Oceans; Mozambique, the Red Sea, the Maldives, Malaysia, Thailand, Indonesia, and northern Australia, the South China Sea, and Taiwan (Province of China).



RHINOPTERIDAE

Rhinoptera javanica Müller and Henle, 1841

Frequent synonyms / misidentifications: None / *Rhinoptera adspersa* Valenciennes, 1841.

FAO names: En – Javanese cownose ray; Fr – Mourine javanaise

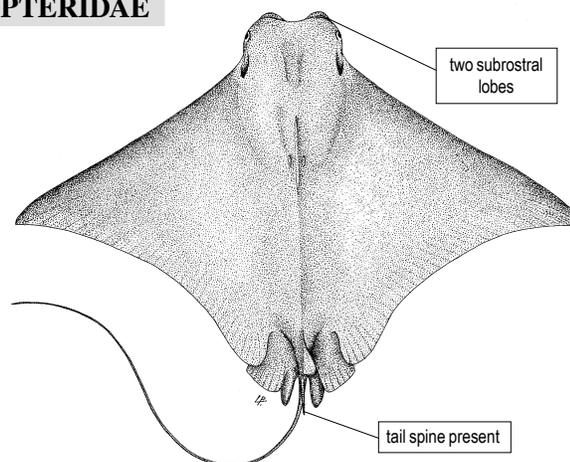
Local names: Mayla-Cadde

Size: to 1.5 m disc width.

Habitat and biology: In coastal waters. Gregarious, often occurring in large numbers. Ovoviviparous. Feeds mainly on clams, oysters and crustaceans.

Importance to fisheries: Caught in gillnets, hook-and-line, and beach seines; edible but seldom utilized. Fished by sportfishermen, and also displayed in public aquaria.

Distribution: Nominally from South Africa and Mozambique and eastward to Southeast Asia and tropical northern Australia; recorded by the author in the Gulf of Aden.



MOBULIDAE

Manta birostris (Donndorff, 1798)

Frequent synonyms / misidentifications:

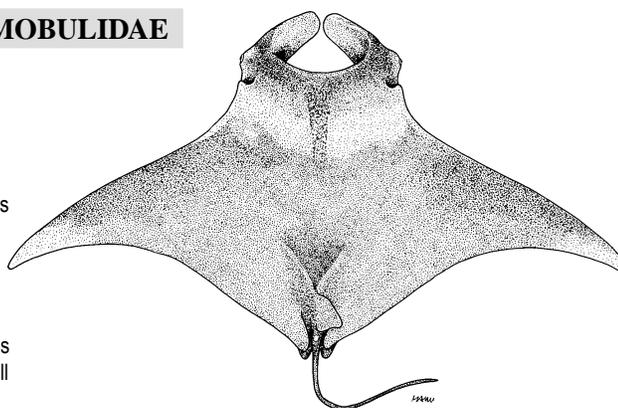
FAO names: En – Giant manta; Fr – Mante geante; Sp – Manta voladora.

Size: Disc width at least 6.70 m, with unsupported citations to 7.63 m and about 9.10 m in width.

Habitat and biology: A common inshore and offshore inhabitant of all temperate and tropical seas, found in shallow muddy bays and the intertidal as well as river mouths and off coral reefs. Occurs individually, or in groups probably highly migratory. Feeds on zooplankton and small to moderate-sized fishes.

Importance to fisheries: Caught with harpoons. Utilized for human consumption in some parts of its range. Easy to be approached by divers and willing to investigate them. A preferred species for eco-touristic diving operations.

Distribution: Found in all warm seas of the world. Recognition of a single species in the genus *Manta* is provisional, and needs to be critically examined.



Mobula eregoodootenkee (Bleeker, 1859)

Frequent synonyms / misidentifications:

FAO names: En- Pygmy devilray.

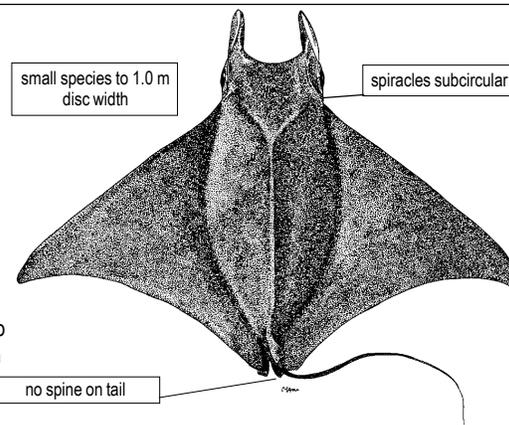
Size: Disc width to about 1.0 m.

Habitat and biology: Lives inshore and offshore in continental coastal waters, not known to penetrate the epipelagic zone and not recorded from oceanic islands. Biology little known.

Importance to fisheries: Utilization pattern in the area poorly known, marketed in some parts of its range.

Distribution: Occurs in the Indo-West Pacific from South Africa north to the Red Sea, eastwards to Viet Nam, New Guinea and tropical northern Australia.

Remarks: Use of the species name is provisional, according to



Mobula japonica (Müller and Henle, 1841)

Frequent synonyms/misidentifications: None / None.

FAO names: En – Spinetail mobula; Fr – Mante aiguillat; Sp – Manta de agujón

Local names:

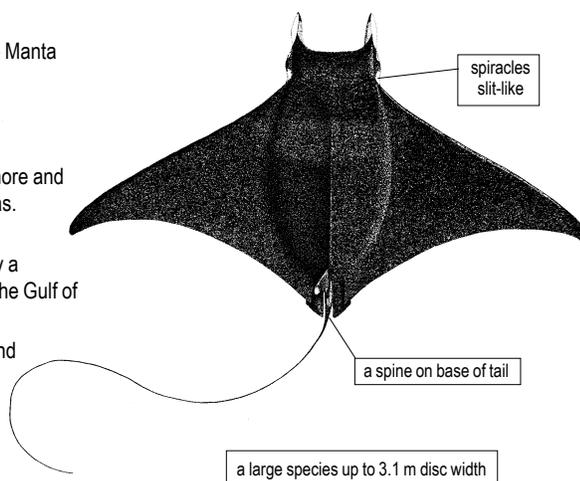
Size: To 310 cm of disc width, and probably larger.

Habitat and biology: Occurs singly or in groups inshore, offshore and probably in oceanic waters in warm-temperate and tropical seas.

Biology poorly known, birth size about 85 cm.

Importance to fisheries: Poorly known, but likely to be mostly a bycatch species. Caught incidentally with floating longlines in the Gulf of Aden and presumably utilized there for human consumption.

Distribution: Probably circumtropical in all warm-temperate and tropical seas.



Mobula tarapacana (Philippi, 1892)

Frequent synonyms / misidentifications:

FAO names: En – Chilean devilray; Fr – Mante chilienne; Sp – Manta comuda.

Size: Disc width to about 3.7 m

Habitat and biology: An uncommon inshore and offshore species. Biology poorly known, feeds on planktonic crustaceans. Sometimes strands on beaches in temperate areas.

Importance to fisheries: Utilization pattern in the area little known.

Distribution: Probably in all tropical seas of the world, but recorded from scattered localities including the western Atlantic (off Venezuela), eastern Atlantic (Ivory Coast), Atlantic and Indian Ocean coasts of South Africa, the northwestern Red Sea, the western Pacific (Japan, Taiwan (Province of China), and probably tropical Australia), and eastern Pacific (Gulf of California and Chile).

