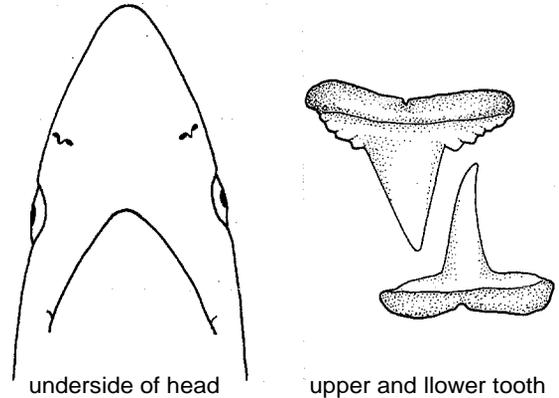


Field Marks: A small slender grey shark with a long narrowly rounded or somewhat pointed snout, fairly large eyes, oblique-cusped smooth-edged upper antero-lateral teeth with strong proximal and distal cusplets, no interdorsal ridge, small pectoral fins, a small first dorsal with an extremely long rear tip, a small low second dorsal with a long rear tip, and no conspicuous markings on fins. Also, this is the only member of its genus with a hypercalcified rostrum, which can easily be felt by pinching its snout.

Diagnostic Features : A small, slender species (length to less than 1 m). Snout long and narrowly rounded or slightly pointed; internarial width 1.5 to 1.9 times in preoral length; eyes circular and moderately large, their length 1.8 to 2.5% of total length; anterior nasal flaps expanded as a narrow nipple-shaped lobe;

upper labial furrows short and inconspicuous; hyomandibular line of pores just behind mouth corners not conspicuously enlarged; gill slits short, third 2.8 to 3.5% of total length and about a third of first dorsal base; about 13 to 14/10 to 14 rows of anteroposterior teeth in each jaw half; upper teeth with narrow, entirely smooth, mostly oblique or semioblique, moderately high cusps, and crown feet with strong distal and proximal cusplets but no serrations; lower teeth with oblique, moderately high smooth cusps and transverse roots. No interdorsal ridge. First dorsal fin moderate-sized and falcate, with a pointed or narrowly rounded apex and posterior margin curving ventrally from fin apex; origin of first dorsal fin usually over or somewhat anterior to the pectoral free rear tips; inner margin of first dorsal extremely long, about two-thirds of dorsal base; second dorsal fin small and low, its height 1.8 to 2% of total length, its inner margin elongated and 2.3 to 2.4 times its height; origin of second dorsal well behind anal origin, near anal midbase; pectoral fins small, falcate, with narrowly rounded or pointed apices, length of anterior margins about 14 to 16% of total length; 151 to 156 total vertebral centra. Colour grey or grey-brown above, white below, fins with light edges but not conspicuously marked; light flank marks not conspicuous.

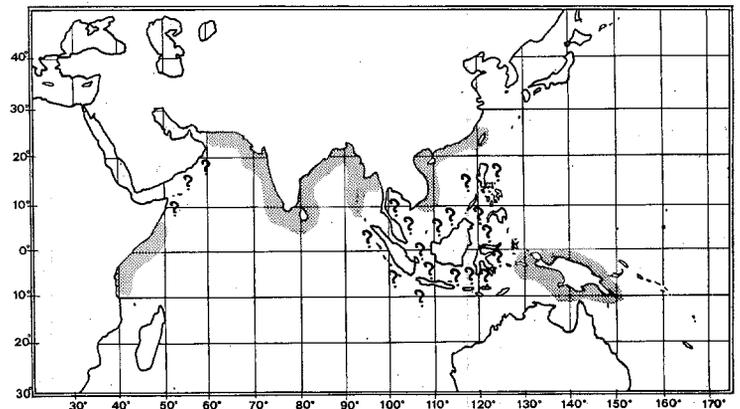


Geographical Distribution : Indo-West Pacific: Kenya, Tanzania, Pakistan, India, Sri Lanka, Andaman Sea, Burma, Viet Nam, China (including Taiwan Province), New Guinea.

Habitat and Biology : A small, common but little-known inshore shark of the continental and insular shelves.

In Bombay waters over 95% of the individuals caught are males, the rest females, indicating strong sexual segregation within its populations.

Viviparous, with a yolk-sac placenta; number of young 1 or 2 (usually 2) to a litter.



Probably feeds on small fishes, cephalopods and crustaceans, but diet apparently not reported.

Size : Maximum size probably below 100 cm, adult males maturing at about 69 cm and reaching 81 cm, adult females 76 to 89 cm; size at birth 45 to 50 cm.

Interest to Fisheries: Apparently regularly caught off Pakistan, Sri Lanka, India and China; caught by gillnet and by line gear, and utilized fresh and probably dried salted for human consumption.

Literature : Garman (1913); Fowler (1941); Setna & Sarangdhar (1949); Chen (1963).

Carcharhinus melanopterus (Quoy & Gaimard, 1824)

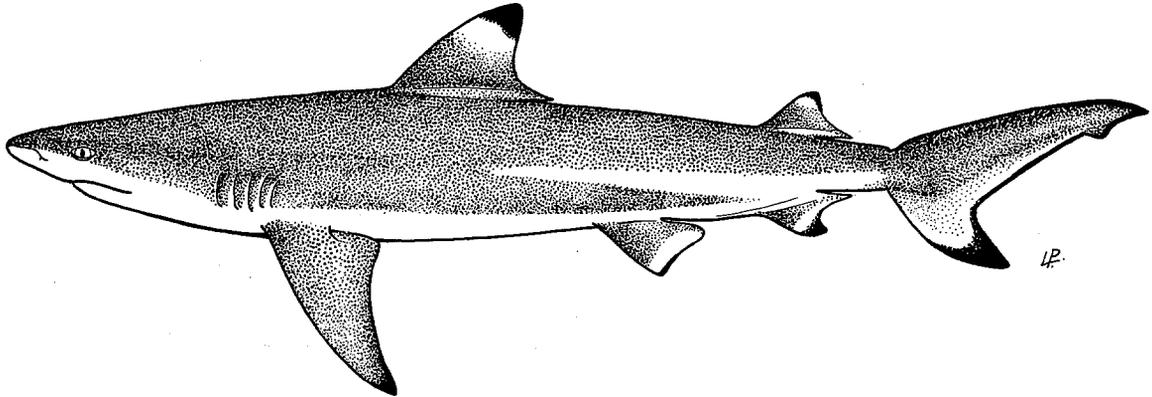
CARCH Carch 23

Carcharias melanopterus Quoy & Gaimard, 1824, Zoologie, Voy. uranie et Physicienne, 1877-20:194, pl. 43, figs 1-2. Holotype: Museum National d'Histoire Naturelle, Paris, MNHN 1129, 590 mm immature male. Type Locality: Waigeo Islands.

Synonymy : Squalus (Carcharhinus) commersoni Blainville, 1816 (nomen nudum); Carcharias playfairi Günther, 1870; Carcharias elegans Hemprich & Ehrenberg, 1899; Carcharias marianensis Engelhardt, 1912.

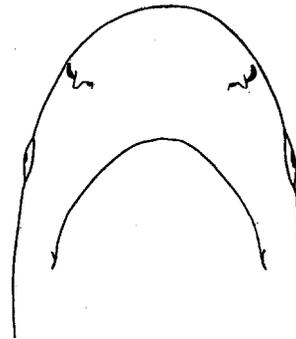
Other Scientific Names Recently in Use: *Mapolamia spallanzanii* (not Peron & LeSueur, in LeSueur, 1822, equals *C. sorrah*); *Hypoprion playfairi* (Günther, 1870).

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

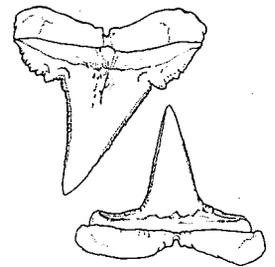


Field Marks : A moderate-sized, brownish 'grey shark' with a short, bluntly rounded snout, horizontally oval eyes, no interdorsal ridge, a moderately large second dorsal with a short rear tip, and brilliant black blotches on the first dorsal apex, lower caudal lobe, and black tips on other fins.

Diagnostic Features: A fairly stocky species (most adults less than 1.6 m). Snout short and bluntly rounded; internarial width 0.9 to 1.1 times in preoral length; eyes usually horizontally oval and fairly large, their length 2 to 3% of total length; anterior nasal flaps moderately elongated and expanded as nipple-shaped lobes; upper labial furrows short and inconspicuous; hyomandibular line of pores just behind mouth corners not conspicuously enlarged; gill slits moderate-sized, the third 2.6 to 4.2% of total length and less than a third of first dorsal base; usually 12/11 rows of anteroposterior teeth in each jaw half but varying from 11 to 13/10 to 12;



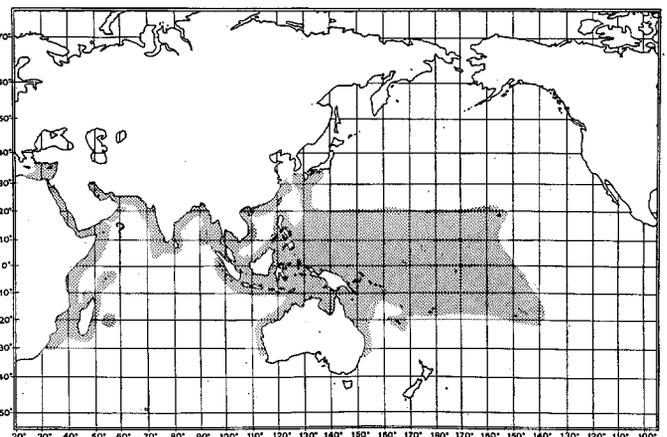
underside of head



upper and lower tooth

upper teeth with narrow, strongly serrated, erect to oblique, high cusps, and crown feet with coarser serrations and cusplets; lower teeth with erect to oblique, narrow serrated cusps and transverse roots. No interdorsal ridge. First dorsal fin large and falcate, with a rounded apex and posterior margin curving ventrally from fin apex; origin of first dorsal fin usually over pectoral free rear tips; inner margin of first dorsal moderately long, slightly more or less than half dorsal base; second dorsal fin large and high, its height 3.4 to 4.1% of total length, its inner margin short and 0.8 to 1.1 times its height; origin of second dorsal over anal origin; pectoral fins moderately large, narrow and falcate, with narrowly rounded or pointed apices, length of anterior margins about 17 to 19% of total length; 193 to 214 total vertebral centra, 111 to 122 precaudal centra. Colour usually light brown above, white below; first dorsal and ventral caudal lobe with a conspicuous black apical blotch, brilliantly highlighted proximally with white; other fins, generally with less prominent black fin tips; a conspicuous white band on flank.

Geographical Distribution : Eastern Mediterranean Sea (apparently as an invader through the Suez Canal from the Red Sea). Indian Ocean: South Africa, Mauritius, Seychelles, and Madagascar to Red Sea, the "Gulf", Pakistan, India, Sri Lanka, Andaman and Maldiva Islands. Western Pacific: Thailand (Gulf of Thailand) to China (including Taiwan Province), Japan, The Philippines, Australia (Queensland, Northern Territory and Western Australia), and New Caledonia. Wide-ranging in the island groups of the western central Pacific, from the Hawaiian and Marshall Islands south to the Tuamotu Archipelago. Apparently rare or absent in more easterly groups including the Marquesas, Pitcairn, Tubuai (Rapa) Islands, Austral Ridge, Johnston, Marcus and Easter Islands.



Habitat and Biology : This small, common, wide-ranging tropical Indo-Pacific shark prefers shallow water close inshore on coral reefs, at depths of only a few metres and commonly in the intertidal zone, often on reef flats in water 30 cm deep or less; also found near reef dropoffs and occasionally close offshore. This is one of the three commonest sharks on coral reefs in tropical Oceania (the other two being the whitetip reef shark, *Triacnodon obesus*, and the grey reef shark, *C. amblyrhynchos*). It apparently now inhabits warmer parts of the Mediterranean Sea, having invaded it through the Suez Canal. It is thought to penetrate into at least brackish lakes and estuaries in Madagascar and into fully fresh water in Malaysia, but its ability to tolerate fresh water for any length of time is uncertain; whatever the case, it apparently is not able to utilize fresh water to the extent that *Carcharhinus leucas* does. At the northern and southern extremes of its range the blacktip may be a migrant, but this is uncertain.

The blacktip reef shark is an active, strong-swimming shark, found near the bottom and at midwater in deeper water, and with its dorsal fins protruding in the shallows. It occurs singly or in small groups or aggregation, but is not strongly schooling.

Viviparous, with a yolk sac placenta; number of young 2 to 4, usually 4. Gestation period possibly 16 months, with birth season from late winter to early summer.

Eats small fish and invertebrates, including mullet, groupers, theraponids, jacks, mojarras, slipjaws, wrasses, surgeonfish, sillaginids, cuttlefish, squid, octopi, shrimp, and manis shrimp. Not an extremely dangerous species because of its small size and general timidity when approached by divers in unbaited situations, but definitely a hazard to spearfishers and to people wading in the water. It is often quite inquisitive when divers enter the water, but can be usually driven off. It often becomes aggressive when speared fish are about, which may be exacerbated by the presence of competing sharks, and will rush in to take wounded fish or baits, although in general it is less aggressive in this sort of activity than the grey reef shark (*Carcharhinus amblyrhynchos*). It must be ranked as a dangerous species because it is the shark most commonly encountered by people in the tropical Indo-Pacific, and has definitely been responsible for several unprovoked and provoked attacks on people (none fatal and most without major injury to people). Its danger is somewhat qualified by the nature of its attacks, primarily on people wading in shallow water. Most blacktip attacks appear to be 'mistaken identity' attacks, made on the legs of people the shark may be mistaken for its ordinary small, non-mammalian prey. Randall & Helfman (1973) note that Marshall Islanders swim rather than wade across shallow island passes to avoid blacktip attacks on their legs, and suggest that people who see an approaching blacktip while wading in shallow water and have nothing to defend themselves with should consider submerging as much of their body as possible to scare off the shark.

Enemies of this species include large groupers and probably other sharks.

Size : Maximum less than 200 cm, one specimen reported as 180 cm (an unusually large adult male), but most adults less than 160 cm; males maturing at 91 to about 100 cm and reaching 180 cm (most adult males up to 134 cm), females maturing between 96 and 112 cm and reaching 131 cm; size at birth between 33 to 52 cm.

Interest to Fisheries: Apparently regularly caught in fisheries where this common inshore shark occurs, including off of India and Thailand; but details of its utilization and gear used are lacking.

Literature : Fowler (1941); Bass, D'Aubrey & Kistnasamy (1973); Randall & Helfman (1973); Johnson (1978); Garrick (1982).

Remarks : *Carcharias playfairi* is synonymized with this species following Bass, D'Aubrey & Kistnasamy (1973). See Boeseman 1960) and Garrick (1982) for the nomenclatural history of *Squalus commersoni*.

Carcharhinus obscurus (LeSueur, 1818)

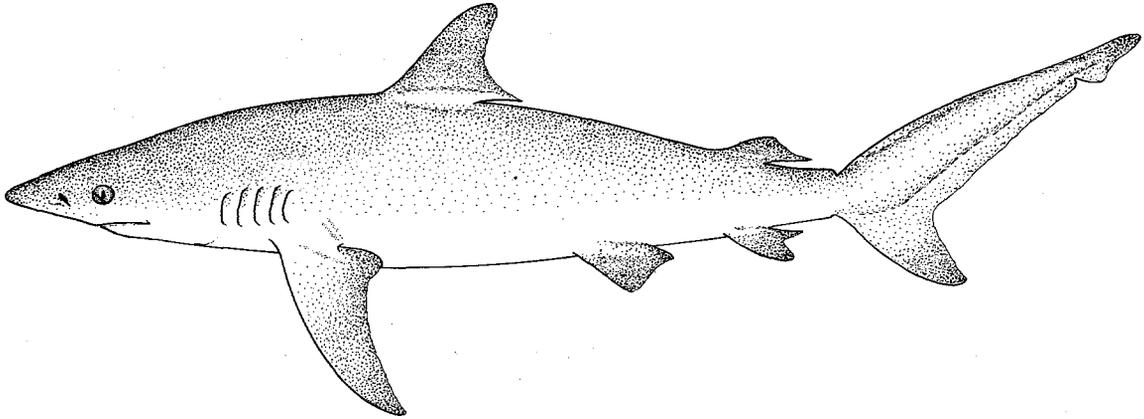
CARCH Carch 9

Squalus obscurus LeSueur, 1818, *J.Acad.Nat.Sci.Philad.*, 1(2):223, pl. 9. Holotype: None. Type Locality: North America.

Synonymy : ? *Prionodon obvelatus* Valenciennes, in Webb & Berholt, 1844; ? *Galeolamna greyi* Owen, 1853; *Carcharias macurus* Ramsay & Ogilby, 1887; *Galeolamna (Galeolamnoides) eblis* Whitley, 1944; *Carcharhinus iranzae* Fourmanoir, 1961; *Carcharhinus obscurella* Deng, Xiong & Zhan, 1981.

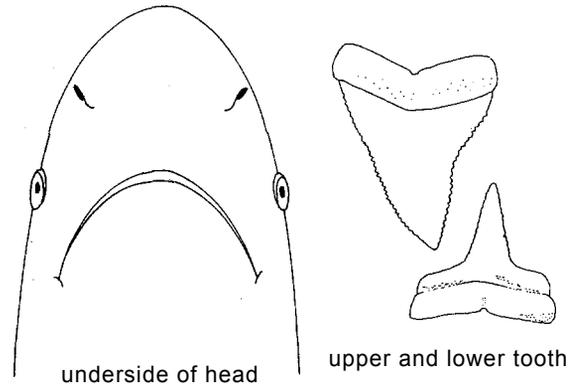
Other Scientific Names Recently in Use: *Carcharhinus lamiella* (not *Carcharias lamiella* Jordan & Gilbert, 1882, equals *C. brachyurus*); *Galeolamna macurus* Ramsay & Ogilby, 1887

FAO Names: En - Dusky shark; Fr - Requin sombre; Sp - Tiburón arenero.

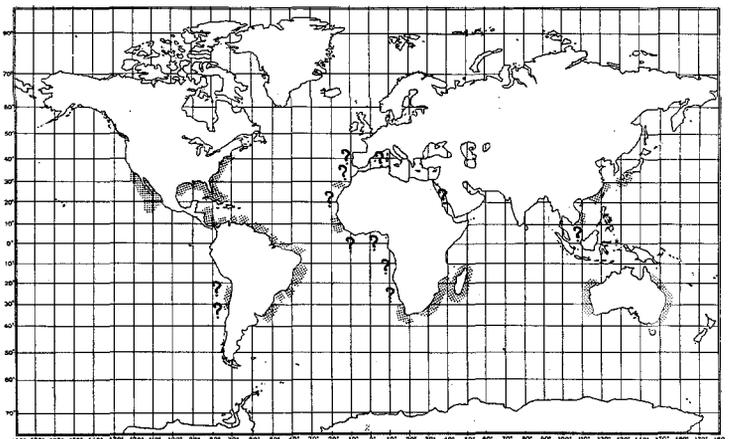


Field Marks : A large grey shark with a fairly short, broadly rounded snout, low anterior nasal flaps, fairly large eyes, broad, triangular, rather low, erect and semioblique-cusped serrated anterolateral teeth without cusplets in upper jaw, lower teeth erect and narrow-cusped, usually 14/14 rows of anteroposterior teeth, a low interdorsal ridge, large falcate pectoral fins, a moderate-sized first dorsal with a short rear tip and origin about opposite free rear tips of pectoral fins, a small, low second dorsal, and no conspicuous markings on fins.

Diagnostic Features: A fairly slender species (up to about 3.7 m). Snout short to moderately long and broadly rounded; internarial width 1 to 1.4 times in preoral length; eyes circular and moderately large, their length 1 to 2.1% of total length; anterior nasal flaps low and poorly developed; upper labial furrows short and inconspicuous; hyomandibular line of pores just behind mouth corners not conspicuously enlarged; gill slits moderately long, third 2.7 to 4% of total length and less than a third of first dorsal base; usually 14/14 rows of anteroposterior teeth in each jaw half but varying from 14 to 15/13 to 15; upper teeth with broad, triangular, strongly serrated, rather low erect to slightly oblique cusps, that smoothly merge into crown feet which have slightly coarser serrations but no cusplets; lower teeth with erect, moderately broad, serrated cusps and transverse or sometimes arched roots. A low interdorsal ridge present. First dorsal fin moderate-sized and semifalcate, with a pointed or narrowly rounded apex and posterior margin curving ventrally from fin apex; origin of first dorsal fin usually over or slightly anterior to the pectoral free rear tips; inner margin of first dorsal moderately short, a third of dorsal base or less; second dorsal fin small and low, its height 1.5 to 2.3% of total length, its inner margin fairly long and 1.6 to 2.1 times its height; origin of second dorsal about over anal origin; pectoral fins large and falcate, with narrowly rounded or pointed apices, length of anterior margins about 17 to 22% of total length; 173 to 194 total vertebral centra, 86 to 97 precaudal centra. Tips of most fins dusky but not black or white. An inconspicuous white band on flank.



Geographical Distribution : Western Atlantic: Southern Massachusetts and Georges Bank to Florida, Bahamas, Cuba, northern Gulf of Mexico, and Nicaragua; southern Brazil. Eastern North Atlantic: ? Portugal, ? Spain, ? Morocco, ? Madeira, ? western Mediterranean, Canary and Cape Verde Islands, Senegal, Sierra Leone. Western Indian Ocean: South Africa, Mozambique, Madagascar, ? Red Sea. Western Pacific: Japan, China, Viet Nam, Australia (New South Wales, Queensland, Western Australia), New Caledonia. Eastern Pacific: Southern California to Gulf of California, Revillagigedo Islands, possibly Chile.



Habitat and Biology: A common, coastal-pelagic, inshore and offshore warm-temperate and tropical shark of the continental and insular shelves and oceanic waters adjacent to them, that ranges from the surf zone to well out to sea and from the surface to 400 m depth. It does not prefer areas with reduced salinities and tends to avoid estuaries. Adults of the species occupy an overlapping intermediate offshore coastal habitat between other similar species of *Carcharhinus* such as more strictly inshore coastal species such as *C. plumbeus*, the offshore deep-benthic *C. altimus*, oceanic species such as *C. falciformis* and *C. longimanus*, and island species such as *C. albimarginatus* and *C. galapagensis*. Adult dusky sharks are often seen offshore and commonly follow ships.

This shark is strongly migratory in temperate and subtropical areas in the eastern North Pacific and western North Atlantic, moving north during the warmer months of summer and retreating south when the water cools. Off the southern coast of Natal, South Africa a nursery area occurs, where newborn sharks of 80 to 90 cm are resident; larger immature sharks over 90 cm move out of this area, with females tending to move north and males south, but there is some overlap in this partial sexual segregation. This pattern is complicated by seasonal, temperature-related migrations as elsewhere in the range of these sharks, going southward in spring and summer and northward in winter, and also a tendency for the sharks to move into deeper water during cooler months. Additionally, there may be other factors affecting the distribution of these young sharks, as may be true off Durban, South Africa, where they move into the surf zone in spring and summer and move offshore in autumn and winter, although inshore water temperatures are about the same. Still larger immature sharks up to 220 cm long may move south to southern Natal, but when they become adolescent at up to 280 cm, they tend to move north of Natal along with adults into waters of southern Mozambique. The young form large feeding schools or aggregations.

Viviparous, with a yolk-sac placenta; number of young per litter 3 to 14, with South African sharks averaging more young (about 10) than those from Florida; sex ratio approximately 1:1 in the fetuses of South African and Floridian sharks, and the same for adults in Florida. There may be no correlation between maternal size and litter size in this shark, unlike some other species of Carcharhinus. Birth may occur over a long time span of several months in a given region, and has been reported as occurring from late winter to summer. In South African waters birth may occur year-round with an increase in autumn. In pregnant female sharks caught off Florida in the winter there are two size-classes of young, those 43 to 70 cm and full or near full-term fetuses of 85 to 100 cm. These classes may indicate either biannual staggered birth seasons with a gestation period of 8 or 9 months or a long gestation period of about 16 months. Whatever the case, females apparently mate in alternate years; mating in the western Atlantic occurs in the spring. Females move inshore to drop their young, then depart the nursery area. Adults may mature at an age of about 6 years and live to at least 18 years. The young are readily kept in aquaria.

Dusky sharks eat a wide variety of reef, bottom, and pelagic bony fishes, including sardines, menhaden and herring, anchovies, eels, lizardfish, cuskeels, needlefish, mullet, barracuda, goatfish, groupers, porgies, grunts, croakers, bluefish, spadefish, jacks, hairtails, mackerel, tunas and spanish mackerel, soles, flounders and other flatfishes, flatheads, and gurnards, as well as angelsharks, sawsharks, spiny dogfish (Centrophorus and Squalus), catsharks (Halaelurus), smooth-hounds (Mustelus), other grey sharks (C. limbatus and C. brevipinna), skates, butterfly rays, crabs, lobsters, shrimp, octopi, cuttlefish, squid, starfish, barnacles, bryozoans, whale meat, and occasional garbage. Unlike the bull (C. leucas) and tiger (Galeocerdo cuvier) sharks mammalian carrion, oddities and garbage are apparently uncommon items in the diet of this species.

The dusky shark is apparently dangerous to people, although very few attacks by it have been recorded, and very little is known of its behaviour in relation to divers, swimmers or surfers. Because of its large size when adult, it should be considered a potential hazard where it occurs. Some attacks on people off islands such as Bermuda that were attributed to this species were probably caused by the closely 'similar Galapagos shark, (Carcharhinus galapagensis).

Young dusky sharks are readily preyed on by other big sharks, including sandtiger (Eugomphodus), great white (Carcharodon), bull (Carcharhinus leucas), and tiger (Galeocerdo) sharks, which help to regulate the population size of this species. Reduction of these species off Natal, South- Africa through an efficient shark gillnetting programme to protect bathing beaches has apparently resulted in an increase in juvenile dusky sharks there.

Size : Maximum size possibly over 400 cm, males maturing at about 280 cm and reaching at least 340 cm; females maturing between 257 and 300 cm and reaching at least 365 cm; size at birth 69 to 100 cm.

Interest to Fisheries: A common offshore shark regularly caught with longlines, also hook-and-line and set bottom nets. It is utilized fresh, dried salted, frozen and smoked for human consumption; hides used for leather; fins for shark-fin soup base; and liver oil extracted for vitamins.

Literature : Bigelow & Schroeder (1948); Springer (1960, 1963); Garrick & Schultz (1963); Randall (1963); Clark & von Schmidt (1965); Garrick (1967, 1982); Bass, D'Aubrey & Kistanasamy (1973); Compagno & Vergara (1978); Compagno (1981); Cadenat & Blache (1981); Van der Elst (1981).

Remarks : Some records of this species from Madeira and the Mediterranean Sea may be based on C. galapagensis, according to Garrick (1982).

Carcharhinus perezii (Poey, 1876)

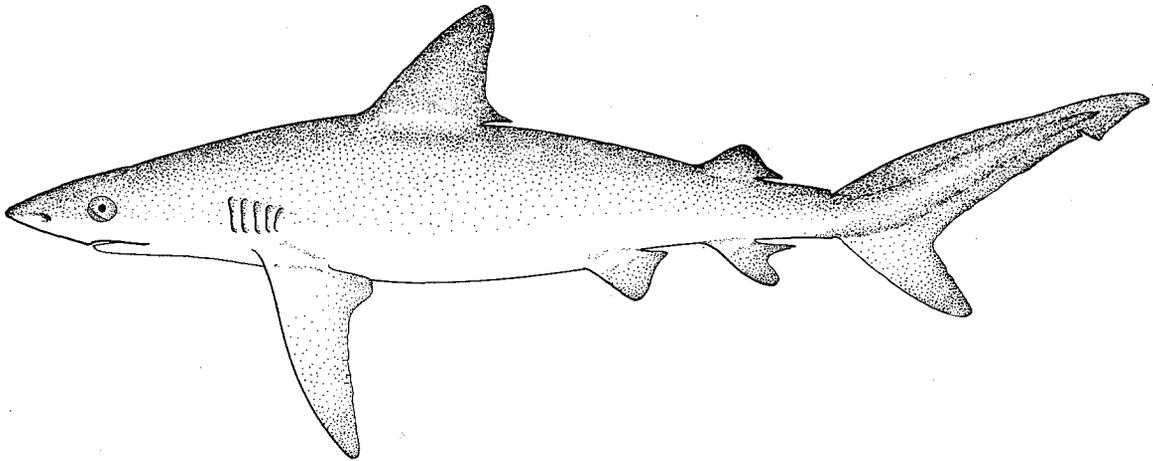
CARCH Carch 10

Platypodon perezii Poey, 1876, Ann.Soc.Esp.Hist.Nat.Madrid, 5:194, pl. 14, fig. 2-3. Holotype: Six original specimens, from 780 to 1300 mm and ca 2 m, extant? Type Locality: Cuba.

Synonymy : Eulamia springeri Bigelow & Schroeder, 1944.

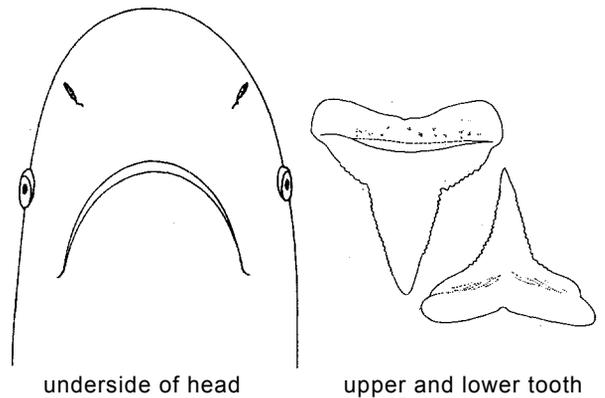
Other Scientific Names Recently in Use : Carcharhinus springeri (Bigelow & Schroeder, 1944).

FAO Names : En - Caribbean reef shark; Fr - Requin de récif; Sp - Tiburón coralino.



Field Marks : A large reef-living grey shark with short, bluntly rounded snout, narrow and semierect to oblique-cusped, serrated upper anterolateral teeth without cusplets, lower teeth with erect serrated cusps, usually 13/12 rows of anterolateral teeth, an interdorsal ridge, large narrow pectoral fins, a small first dorsal with a short rear tip and a moderately large second dorsal with a short rear tip, and no prominent markings on fins.

Diagnostic Features: A fairly stocky species (up to nearly 3 m). Snout moderately short and broadly rounded; internarial width 1 to 1.1 times in preoral length; eyes circular and moderately large, their length 1.2 to 2.5% of total length; anterior nasal flaps low and poorly developed; upper labial furrows short and inconspicuous; hyomandibular line of pores just behind mouth corners not conspicuously enlarged; gill slits moderately long, the third 2.8 to 4% of total length and less than half of first dorsal base; usually 13/12 rows of anteroposterior teeth in each jaw half but varying from 12 to 13/11 to 12; upper teeth with narrow, strongly serrated, semierect to oblique, high cusps, and crown feet with slightly coarser serrations but no cusplets; lower teeth with erect, narrow finely serrated cusps and transverse or weakly arched roots. A low interdorsal ridge present. First dorsal fin moderately large and falcate, with a pointed or narrowly rounded apex and posterior margin curving ventrally or anteroventroposteriorly from fin apex; origin of first dorsal fin over or slightly anterior to pectoral free rear tips; inner margin of first dorsal moderately long, about a third of dorsal base; second dorsal fin fairly large and high, its height 2.9 to 3.2% of total length, its inner margin short and 1.1 to 1.5 times its height; origin of second dorsal over or slightly anterior to anal origin; pectoral fins moderately large, falcate, with narrowly rounded or pointed apices, length of anterior margins about 20 to 22% of total length; 208 to 213 total vertebral centra, 103 to 108 precaudal centra. Colour dark grey or grey-brown above, white below, undersides of paired fins, anal and ventral caudal lobe dusky but fins not prominently marked; white band not conspicuous on flanks.



underside of head

upper and lower tooth

Geographical Distribution : Western Atlantic: Florida, Bermuda, northern Gulf of Mexico and Caribbean Sea including Yucatan, Mexico, Cuba, Jamaica, Bahamas Virgin Islands, Puerto Rico, Venezuela, and southern Brazil.

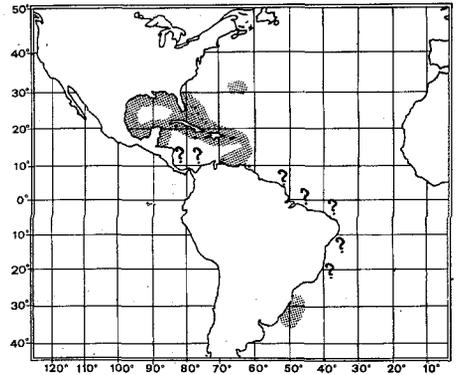
Habitat and Biology : This is the commonest shark associated with coral reefs in the Caribbean, a tropical inshore bottom-dwelling species of the continental and insular shelves, at depths down to at least 30 m. It is often found near dropoffs on the outer edges of reefs. It is capable of lying on the bottom motionless, with its pharynx and gills evidently capable of pumping adequate water for respiration, and has been found lying in caves. Despite its abundance, it is poorly known.

Eats bony fishes, including bigeyes (Priacanthidae). A dangerous shark, being definitely implicated in an abortive attack on a pair of divers in the Caribbean.

Size : Maximum about 295 cm, maturity at about 152 to 168 cm, adult females 200 to 295 cm; size at birth below 73 cm.

Interest to Fisheries : A common Caribbean shark primarily fished with longlines and utilized dried salted for human consumption; hides are used for leather, oil from its liver, and fishmeal from carcasses.

Literature : Bigelow & Schroeder (1948); Springer (1960); Limbaugh (1963); Randall (1963, 1967, 1968); Böhlke & Chapin (1968); Garrick (1967, 1982); Compagno & Vergara (1978).



Carcharhinus plumbeus (Nardo, 1827)

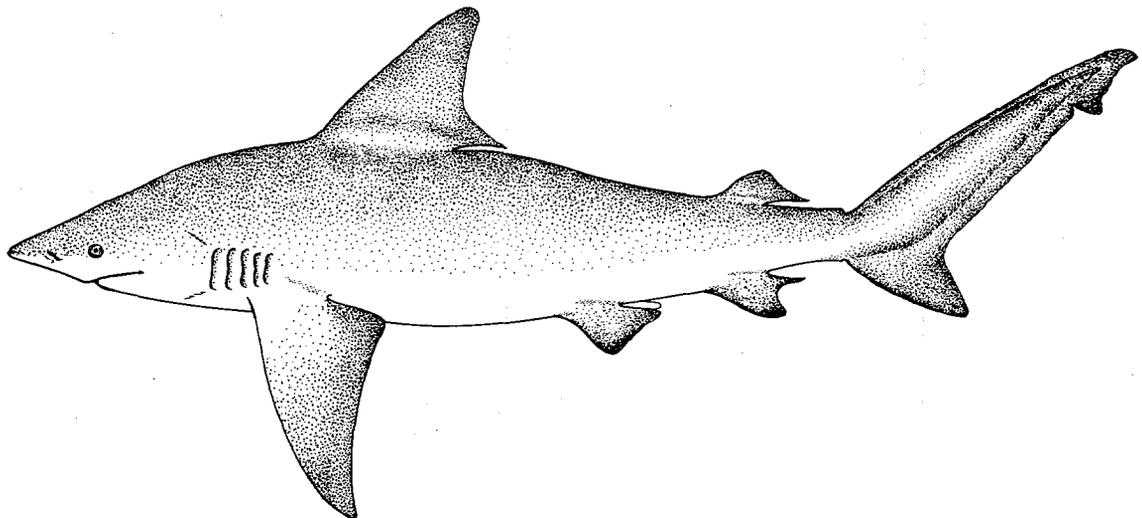
CARCH Carch 11

Squalus plumbeus Nardo, 1827, *Isis*, 20(6):477, 483. Holotype: No type material. Type Locality: Adriatic Sea.

Synonymy: Carcharias (Prionodon) milberti Valenciennes, in Müller & Henle, 1839; Carcharias ceruleus DeKay, 1842 (not Squalus (Carcharhinus) caeruleus Blainville, 1825 = Prionace glauca); Lamna caudata DeKay, 1842; Squalus caecchia Nardo, 1847; Carcharias (Prionodon) japonicus Schlegel, 1850; Carcharias obtusirostris Moreau, 1881; Carcharias stevensi Ogilby, 1911; Carcharias latistomus Fang & Wang, 1932; Galeolamna dorsalis Whitley, 1944.

Other Scientific Names Recently in Use : Carcharhinus milberti (Valenciennes, in Müller & Henle, 1839); Eulamia milberti (Valenciennes, in Müller & Henle, 1839); Galeolamna stevensi (Ogilby, 1911); Carcharhinus japonicus (Schlegel, 1850); Carcharhinus bleekeri (not Carcharias (Prionodon) bleekeri Dumeril, 1865 equals C. sorrah); Carcharhinus platyodon (not Squalus platyodon Poey, 1861 equals C. leucas).

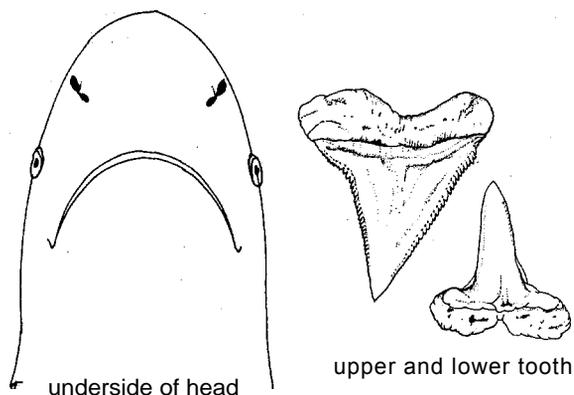
FAO Names : En - Sandbar shark; Fr - Requin gris; Sp - Tiburón trozo.



Field Marks : A medium-sized grey shark with short rounded snout, an extremely tall triangular first dorsal fin with its origin over or anterior to the pectoral insertions, broad- and high-cusped, triangular serrated upper teeth without cusplets, usually 14/13-14 rows of anterolateral teeth, an interdorsal ridge, large pectoral fins, a moderately large second dorsal with a short rear tip, and no conspicuous markings on fins.

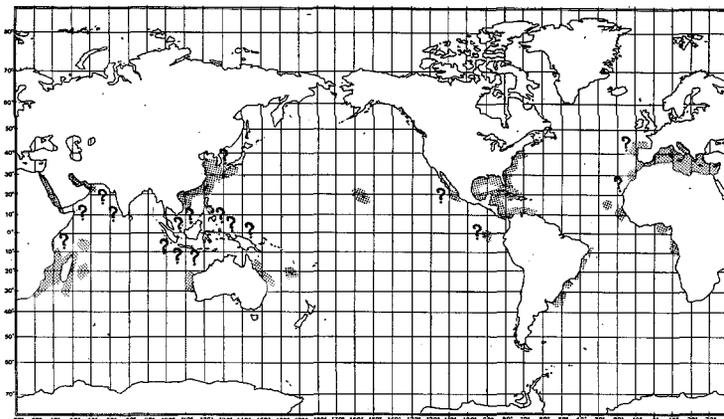
Diagnostic Features: A fairly stocky species (up to about 2.4 m, but mostly smaller). Snout short and broadly rounded or broadly parabolic; internarial width 0.9 to 1.3 times in preoral length; eyes circular and moderately large, their length 1.7 to 2.9% of total length; nostrils with very short, low, poorly developed anterior nasal flaps; upper labial furrows short and inconspicuous; hyomandibular line of pores just behind mouth corners not conspicuously enlarged; gill slits short, third 2.4 to 3.6% of total length and less than a third of first dorsal base;

usually 14/13 to 14 rows of anteroposterior teeth in each jaw half but varying from 14 to 15/12 to 15; upper teeth with broadly triangular, strongly serrated, semierect to slightly oblique cusps, merging smoothly into crown feet with slightly coarser serrations but no cusplets; lower teeth with erect, narrow serrated cusps and transverse roots. A narrow interdorsal ridge present. First dorsal fin very large and semifalcate, with pointed or narrowly rounded apex and posterior margin curving ventrally from fin apex; origin of first dorsal fin over or slightly anterior to pectoral insertions; inner margin of first dorsal moderately long, 2/5 of dorsal base, or slightly less; second dorsal fin moderately high, its height 2.1 to 3.5% of total length, its inner margin short and 1 to 1.6 times its height; origin of second dorsal over or slightly anterior to anal origin; pectoral fins large, semifalcate, with narrowly rounded or pointed apices, length of anterior margins about 17 to 22% of total length; 152 to 189 total vertebral centra, 82 to 97 precaudal centra. Colour grey-brown above, white below; tips and posterior edges of fins often dusky, but no conspicuous markings; an inconspicuous white band on flank.



Geographical Distribution :

Western Atlantic: Southern Massachusetts to Florida, northern and western Gulf of Mexico, Bahamas, Cuba, Nicaragua, Costa Rica, Venezuela, southern Brazil. Eastern Atlantic: Mediterranean Sea, Portugal, ? Canary Islands, ? Spain, Morocco, Senegal, Cape Verde Islands, Gulf of Guinea, Zaire. Western Indian Ocean: South Africa, Madagascar, Mozambique, Tanzania, Mauritius, Seychelles, Red Sea, the "Gulf", Gulf of Oman. Western Pacific: Viet Nam, China (including Taiwan Province), Japan, ? the Korea, Indonesia (Aru Island), Australia (Queensland, Western Australia), New Caledonia. Central Pacific: Hawaiian Island. ? Eastern Pacific: Galapagos and Revillagigedo Islands.



Habitat and Biology : An abundant, inshore and offshore, coastal-pelagic shark, of temperate and tropical waters, found on continental and insular shelves and in deep water adjacent to them, and oceanic banks; common at bay mouths, in harbours, inside shallow muddy or sandy bays, and at river mouths, but tends to avoid sandy beaches and the surf zone, coral reefs and rough bottom, and the surface. Depths range from the intertidal in water barely deep enough to cover it to 280 m depth. Although common in inshore environments, it does not ascend rivers into fresh water. It favours the bottom, and normally is not seen at the surface unless travelling in water so shallow that its large first dorsal fin comes out of the water.

As with several other wide-ranging carcharhinids, this species has a number of allopatric populations in different areas. In the western Atlantic Springer (1960) suggested that there are two stocks or subpopulations of sandbar sharks, a northern major one from the US Atlantic seaboard to the Gulf of Mexico and the eastern Caribbean, and a minor South American one from Trinidad eastward and southward to Brazil. Although this remains to be proven by tagging, Springer hypothesized that the separate eastern Atlantic population of this shark was capable of contributing to the South American population via migration with the equatorial current across the Atlantic.

This species has an annual migration cycle along the western North Atlantic seaboard of the United States, heading south for the winter and north for the summer. Seasonal temperature changes apparently are a prime cause of these migrations, but they are strongly influenced by the pattern of currents and locally by upwelling. Although young on nursery grounds form mixed-sex schools, adults are usually segregated. When engaged in southward migrations, males migrate earlier and deeper than females. Southward-migrating sharks often travel in

large schools. Off South Africa a similar southward migration in spring and summer and northward movement in winter appears to occur. Off the Hawaiian Islands these sharks are apparently year-round residents. Preferred temperatures in shallow water off Madagascar are 23° to 24°C; off the Hawaiian Islands these sharks occur in waters 24° to 27°C.

Viviparous, with a yolk-sac placenta; number of young 1 to 14 per litter, with 5 to 12 common. Litter size varies directly with size of the mother, and in populations with smaller adults the litter size averages smaller. The size of young at birth varies considerably among different allopatric populations of this shark, including adjacent ones in the western Atlantic, as does the size attained by adults. In this shark as in many other carcharhinids, the size range of adults is relatively narrow, indicating virtually determinate growth after maturity. The gestation period is estimated as 8 to 12 months, commonly 9 months off Florida, and 11 to 12 months off South Africa and in the South China Sea. Females may give birth every other year at most. Young are born at a ratio of 1:1, but in the western Atlantic off the US southeastern seaboard adult females far outnumber males by 5 or 6:1. However, only about 17 to 27% of adult females are gravid, which may be a reflection of the apparent scarcity of males but might be due to some other factor. Off the Hawaiian Islands such imbalances in sexes apparently do not occur, and about 42% of adult females are gravid. In the western North Atlantic pupping grounds are found in temperate waters, in shallow bays and estuaries of the east-central USA, into which gravid females come to drop their young in summer (June to August). Off Senegal in the eastern Atlantic young are born in April. Females are thought to be inhibited from feeding when they give birth and shortly afterwards, and leave the pupping grounds soon after giving birth. The young inhabit shallow coastal nursery grounds during the summer and move offshore into deeper, warmer water in winter. These nursery grounds are separate from the ordinary ranges of adults, except for females arriving to drop their young and shortly departing after doing so, which probably protects the young from cannibalism. Mating occurs in the spring and summer in various populations. The males apparently follow and bite the female in the back until they swim upside down, then mate with both claspers. Mating wounds are apparent on females during the mating season.

In captivity these sharks show growth rates that suggest maturation in as little as three years, but other estimates based on tooth replacement suggests 10 years for males and 13 for females. Springer (1960) suspected that sandbar sharks may mature in only two years, but on little real evidence. Presumably maturation time is somewhere between 3 and 10 years.

The sandbar shark is primarily a predator on relatively small bottom fishes, with some molluscs and crustaceans taken. Its diet includes sardines, shad, menhaden, anchovies, sea catfishes, moray and snake eels, pipefish, barracuda, mullets, goatfishes, hairtails, spanish mackerel, bonito, mackerel, jacks, groupers, croakers, grunts, porgies, flounders and soles, sea robins, toadfish, cusk eels, porcupine fish, sharpnose sharks (*Rhizoprionodon*), spiny dogfish (*Squalus*), bonnethead sharks, guitarfish, skates, stingrays, cow-nosed rays, squid, cuttlefish, octopi, bivalves and conchs, amphipods, shrimp and crabs. It does not consume garbage and mammalian carrion as a rule, unlike some other members of its genus. Evidence from fisheries indicates that very fresh fish bait is greatly preferred by these sharks to stale or even fresh-frozen fish, and fish greatly preferred to mammalian meat. These sharks feed by day and night, more actively at night. It is thought that this shark is far more successful in obtaining a regular supply of food than larger carcharhinids such as *Galeocerdo cuvier*, *Carcharhinus leucas* and *Carcharhinus obscurus*; this is reflected in greater number of sandbar sharks with full or nearly full stomachs, and liver weight, which shows much less fluctuation in sandbar sharks than in the three larger species. Data from captive individuals suggests that digestion is relatively rapid, and prey is largely digested after two days.

Although relatively large and common, and with large, triangular teeth, this species has never been indicted in attacks on people, and is thought to be not particularly dangerous because of its strong preference for live fish and invertebrate prey. It is thought that adult sandbar sharks are rarely eaten by other larger sharks and may be difficult prey for them (with the likely exception of the great white shark, which is known to eat adults of this species), but that the young are readily taken by other sharks, particularly the bull and tiger sharks, which feed on them in inshore areas.

Size : Maximum possibly to 3 m but otherwise to 239 cm or less for adults; males maturing at 131 to 178 cm and reaching 224 cm; females maturing at 144 to 183 cm and reaching 234 cm; size, at birth 56 to 75 cm.

Interest to Fisheries : This is an abundant inshore and offshore species where it occurs, and forms an important object of fisheries especially in the western North Atlantic, eastern North Atlantic, and South China Sea. It is caught with longlines, hook-and-line, and set bottom nets and is also fished with rod and reel by sports anglers as a game fish. It is utilized fresh, fresh-frozen, smoked and dried salted for human consumption; the hides are prized for leather and other products; the fins are prepared as the base for shark-fin soup; and the liver is extracted for oil (rich in vitamins).

Literature : Bigelow & Schroeder (1948); Springer (1960, 1963, 1967); Garrick & Schultz (1963); Cadenat (1957); Fourmanoir (1961); Wheeler (1962); Clark & von Schmidt (1965); Garrick (1967, 1982); Taniuchi (1971); Wass (1973); Bass, D'Aubrey & Kistnasamy (1973); Cadenat & Blache (1981).