

9.7 FAMILY CARCHARHINIDAE Jordan & Evermann, 18961

CARCH

Subfamily Carcharhininae Jordan & Evermann, 1896 (Family Galeidae), Bull.U.S.Nat.Mus., 48(1):28. The emended variant Family Carcharhinidae Garman, 1913 (original spelling Carcharinidae) was placed on the Official List of Family Group Names in Zoology by the International Commission on Zoological Nomenclature (1965, Opinion 723, 7b, Name no. 386).

Synonymy : Subfamily Triaenodontini Bonaparte, 1838 (Family Squalidae); Family Trianodontes Müller & Henle, 1839; Family Carchariae Müller & Henle, 1839 (placed on the Official Index of Rejected and Invalid Family-Group Names in Zoology by the International Commission on Zoological Nomenclature (1965, Opinion 723.8a, Name no. 413)); Family Nictitantes Owen, 1846 (no nomenclatural standing); Family Eulamiidae Fowler, 1928; Subfamily Galeoceratinae Whitley, 1934 (Family Galeidae); Subfamily Scoliodontidae Whitley, 1934 (Family Galeidae); Subfamily Loxodontinae Whitley, 1934 (Family Galeidae, not Subfamily Loxodontinae Osborn, 1918 in Family Elephantidae, Class Mammalia).

FAO Names: En - Requiem sharks; Fr - Requins; Sp - Cazones picudos, Tiburones, Tintoreras.

Field Marks: Small to large sharks with round eyes, internal nictitating eyelids, no nasoral grooves or barbels, usually no spiracles, a long, arched mouth that reaches past anterior ends of eyes, moderately long labial furrows, small to large, more or less bladelike teeth in both jaws, often broader in the upper jaw, two dorsal fins and an anal fin, the first dorsal fin moderate-sized to large and with its base well ahead of pelvic bases, the second dorsal fin usually much smaller than the first, precaudal pits present, caudal fin with a strong ventral lobe and lateral undulations on its dorsal margin, intestine with a scroll valve, and usually no colour pattern.

Diagnostic Features : Head. without laterally expanded blades; eyes circular, vertically oval, or horizontally oval, their lengths 1.5 times their height or less; nictitating eyelids internal; spiracles usually absent (except for Galeocerdo; occasionally present in Loxodon, Negaprion and Triaenodon); anterior nasal flaps varying from lobular and tube-shaped (Triaenodon) to vestigial, not barbel-like; internarial width usually about 3 to 6 times the nostril width (exceptionally 1.5 times in Nasolamia); labial furrows varying from moderately long and conspicuous, to short and hidden when mouth is closed; teeth small to large, with acute and narrow to moderately broad cusps, sometimes lateral cusplets, but with basal ledges and grooves low or absent; teeth variably differentiated in upper and lower jaws, uppers often more compressed and bladelike, lowers often more cuspidate and not compressed; posterior teeth not comblike; tooth rows 18 to 60/18 to 56. Precaudal pits present. First dorsal fin moderate-sized to very large but not keel-like, much shorter than caudal fin; first dorsal base ahead of pelvic bases, varying from closer to pectoral bases to closer to pelvics; midpoint of first dorsal base always in front of pelvic origins; second dorsal fin usually much smaller than first (Lamiopsis and Negaprion are exceptions); pectoral fins with radials extending into distal web of fins; ventral caudal lobe strong, undulations or ripples present in dorsal caudal margin. Neurocranium without supraorbital crests. Vertebral centra with strong, wedge-shaped intermedial calcifications. Valvular intestine with a scroll valve. Colour variable, usually no colour pattern. Development usually viviparous.

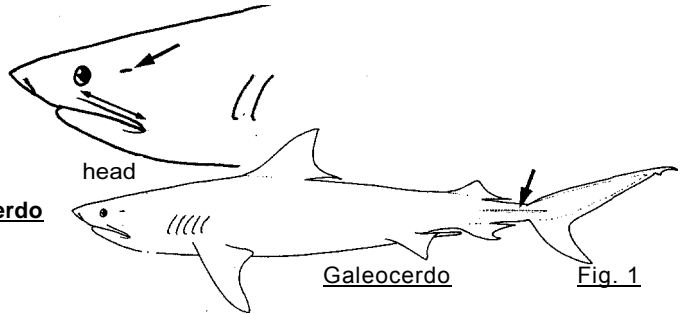
Habitat, Distribution and Biology : This is one of the largest and most important families of sharks, with many common and wide-ranging species found in all warm and temperate seas. These are the dominant sharks in tropical waters, often both in variety and in abundance and biomass. Most species inhabit tropical continental coastal and offshore waters; several species prefer coral reefs and oceanic islands while a few, including the blue, silky and oceanic whitetip sharks, are truly oceanic and range far into the great ocean basins. A minority of species range into temperate waters; one of these, the blue shark (Prionace glauca), has the greatest geographic range of any elasmobranch and one of the largest ranges of any marine vertebrate. Most requiem sharks are marine, ranging from close inshore to the outermost shelf edges near the bottom and the epipelagic zone, but none are truly specialized deepwater sharks, unlike many species of Squalidae and Scyliorhinidae. Although species in other families may enter river mouths and ascend rivers for a short distance, a few members of this family, particularly the bull shark (Carcharhinus leucas) but possibly also the little-known river sharks (Glyphis), apparently are the only living sharks that can live in fresh water for extended periods; the bull shark has a wide range in tropical and temperate rivers and lakes of the world. Requiem sharks are active, strong swimmers, occurring singly or in small to large schools. Some species are continually active, while others are capable of resting motionless for extended periods on the bottom. Many are more active at night or dawn and dusk than the daytime. At least some of the species have been shown to give specialized displays when confronted by divers or other sharks, which may be indicative of aggressive or defensive threat. Some species are relatively small, reaching about a metre long, but most requiem sharks are medium to large-sized, between 1 and 3 m long, and one species, the tiger shark, is one of the biggest sharks and may reach a length of 7.4 m. Except for the ovoviviparous tiger shark, all species are viviparous, with a yolk sac placenta, and have litters of young from 1 or 2 to 135. All are voracious predators, feeding heavily on bony fishes, other sharks, rays, squid, octopi, cuttlefishes, crabs, lobsters, and shrimp, but also sea birds, turtles, sea snakes, marine mammals, gastropods, bivalves, carrion, and garbage. Smaller species tend to select for a narrow range of prey, but certain very large species, especially the tiger shark (Galeocerdo) are virtually omnivorous. This family contains more dangerous species than any other; several of the larger requiem sharks have attacked people and boats while a few species (particularly the bull and tiger sharks) are among the most dangerous living sharks.

Interest to Fisheries: This is by far the most important shark family for fisheries in the tropics, and various species figure prominently in artisanal, commercial and sports fisheries. Most are utilized for human food, but also for the preparation of various subproducts, including oil and vitamin A from the liver, fishmeal, fins for the oriental soupfin market, and leather. Several species are the subjects of sports fisheries, and two species, the blue and tiger sharks, are listed as International Game Fish Association record species.

Remarks: The arrangement of this family follows Compagno (1979).

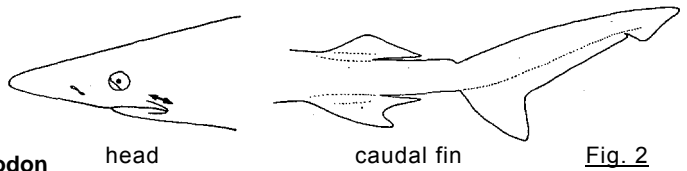
Key to Genera

1a. Upper labial furrows very long, extending to front of eyes. Spiracles present and relatively large. Prominent lateral keels on caudal peduncle (Fig. 1). Vertical black or dusky bars on back, obscure or absent on adults **Galeocerdo**



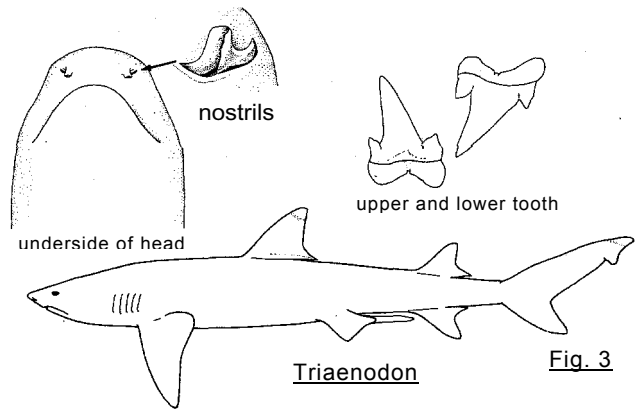
1b. Upper labial furrows long to very short, not extending in front of eyes. Spiracles usually absent. Lateral keels usually absent (except for weak ones in Prionace) (Fig. 2)

2a. High proximal and distal cusplets present on most teeth in both jaws. Expanded anterior nasal and mesonarial flaps forming a tube for the excurrent aperture (Fig. 3) **Triaenodon**

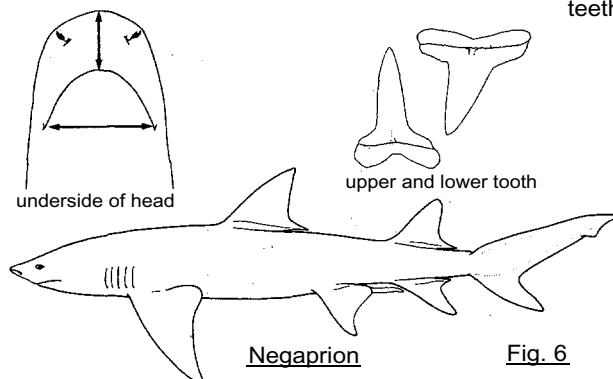
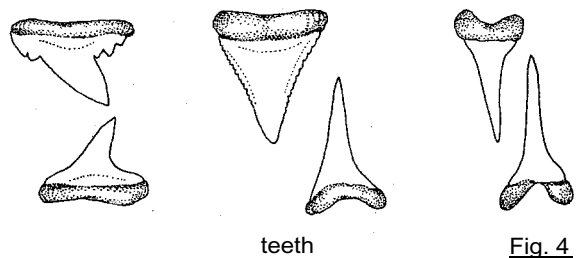
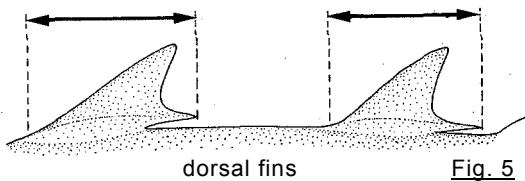


2b. Cusplets usually absent on lower teeth, low or absent on uppers. (Fig. 4) Nasal flaps not forming a tube

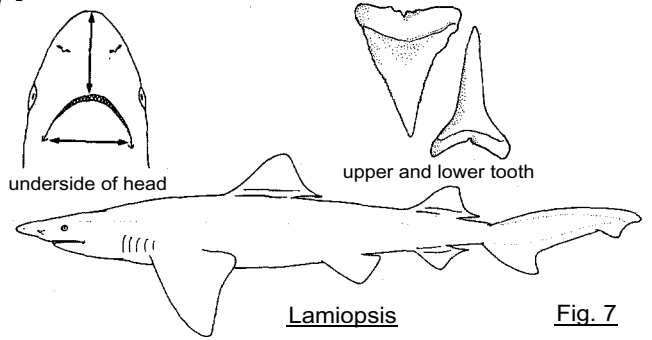
3a. Second dorsal fin nearly or quite as large as first dorsal (Fig. 5)



4a. Snout short, preoral length much less than mouth width. Upper and lower teeth with narrow, unserrated cusps (Fig. 6) **Negaprion**

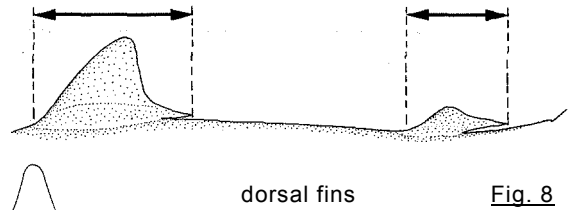


4b. Snout longer, preoral length about equal to mouth width. Upper teeth with broad, triangular, serrated cusps, lowers with narrow, smooth cusps (Fig. 7)..... **Lamiopsis**

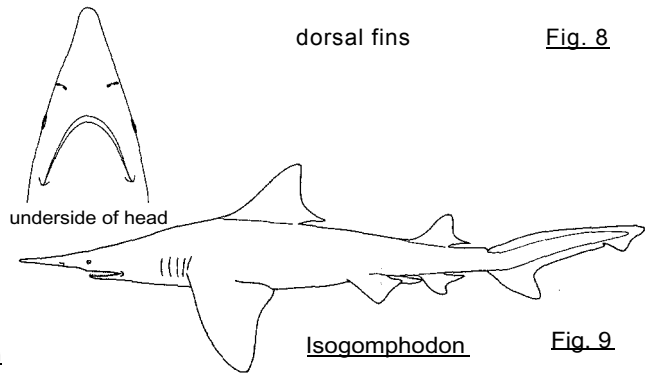


3b. Second dorsal fin considerably smaller than first (Fig. 8)

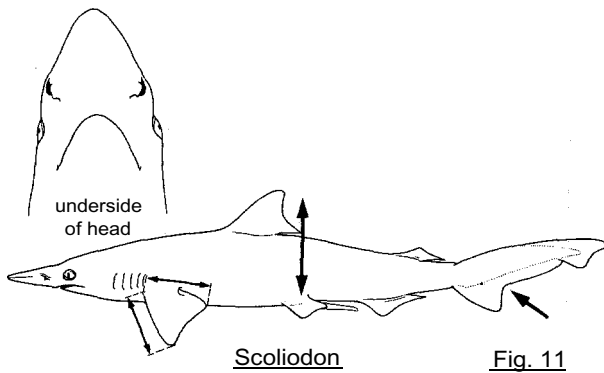
5a. Snout triangular and dagger-shaped in dorsoventral view, narrow and spearlike laterally (Fig. 9). Tooth rows 49 to 61/49 to 56..... **Isogomphodon**



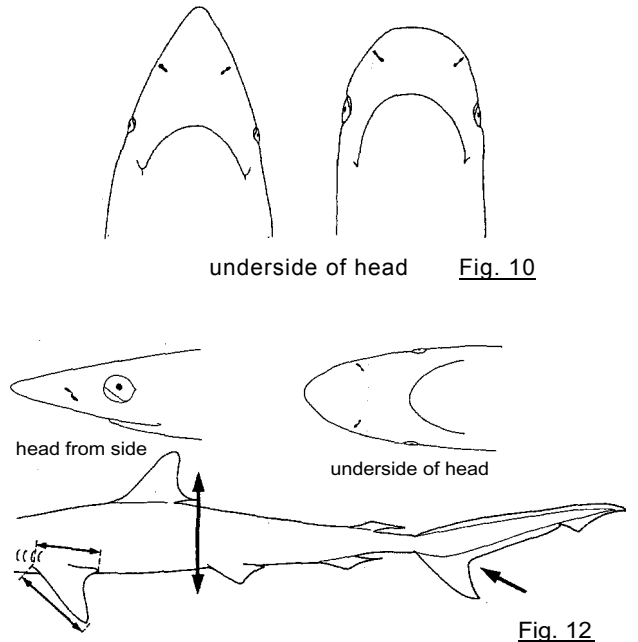
5b. Snout bluntly rounded to narrowly parabolic and pointed, not acutely triangular and spearlike (Fig. 10). Tooth rows 23 to 37/21 to 35 and usually less than 32/32



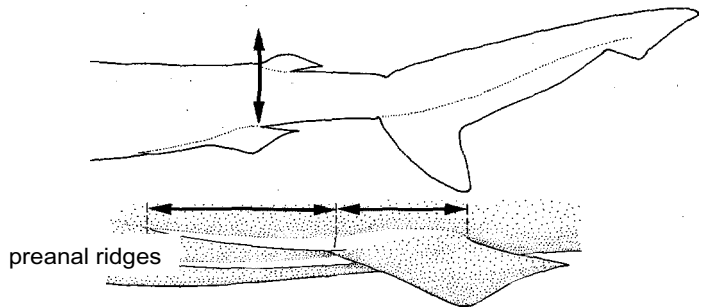
6a. Head greatly depressed and trowel-shaped. Pectoral fins broadly triangular, length from origins to free rear tips about equal to their anterior margins. Free rear tip of first dorsal about over mid-bases of pelvic fins. Post-ventral margin of caudal fin usually only shallowly concave (Fig. 11) **Scoliodon**



6b. Head varying from conical to slightly depressed. Pectoral fins narrower, length 4/5 or less of anterior margin (usually less). Free rear tip of first dorsal over or (usually) anterior to pelvic origins. Postventral margin of caudal deeply incised (Fig. 12)



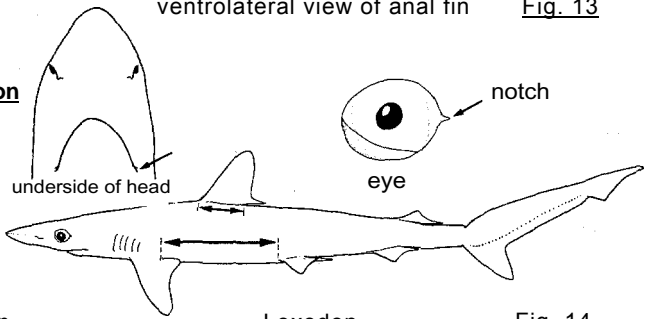
7a. Second dorsal origin well behind anal origin, usually over or slightly anterior to anal insertion. Preanal ridges very long and prominent, subequal to or greater in length than anal base. Anal posterior margin straight or shallowly concave (Fig. 13)



ventrolateral view of anal fin Fig. 13

8a. Posterior notches present on eyes. Labial furrows reduced and confined to mouth corners. First dorsal base 2 to 3 times in distance between pectoral and pelvic bases (Fig. 14) **Loxodon**

Loxodon

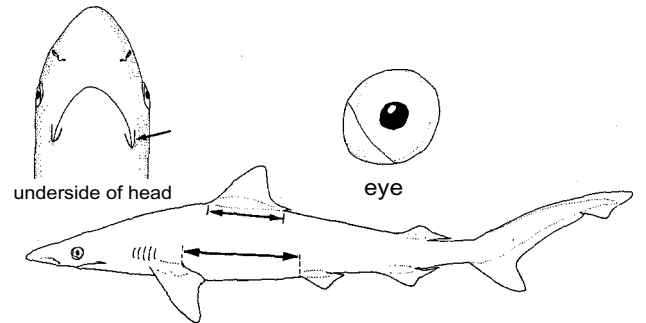


Loxodon

Fig. 14

8b. No eye notches. Labial furrows usually conspicuous and long, reduced in a few species (*R. taylori* and *R. oligolinx*). First dorsal base usually less than 2 times in distance between pectoral and pelvic bases (up to 2 in adult *R. acutus*) (Fig. 15) **Rhizoprionodon**

Rhizoprionodon



Rhizoprionodon

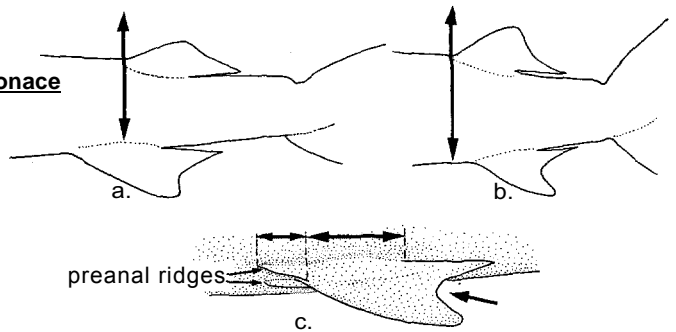
Fig. 15

7b. Second dorsal origin usually near anal origin, in some species posterior to it (Fig. 16a), but usually well anterior to anal insertion (Fig. 16b) and midbase of anal (*Carcharhinus borneensis* and *C. porosus* may have the second dorsal origin above the space between anal midbase and insertion). Preanal ridges variably developed, short and half the anal base length or less (Fig. 16c). Posterior margin of anal fin deeply concave or deeply notched

9a. Papillose gillrakers present on gill arches (Fig. 17a). Weak lateral keels present on caudal peduncle. First dorsal base much closer to pelvic bases than pectorals (Fig. 18). Colour brilliant dark blue above in life **Prionace**

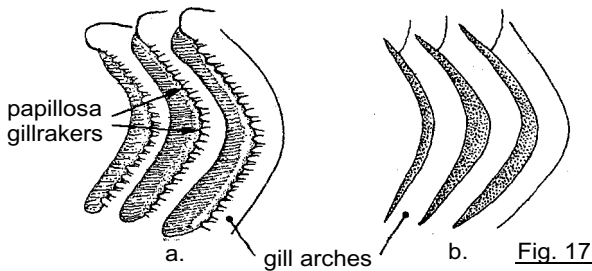
Prionace

9b. No papillose gillrakers on gill arches (Fig. 17b). No lateral keels on caudal peduncle. First dorsal base equidistant between pectoral and pelvic bases or (usually) closer to pectorals (Figs 19,20,21). Colour light to dark grey, grey-brown, brown, or grey-black above



anal fin

Fig. 16



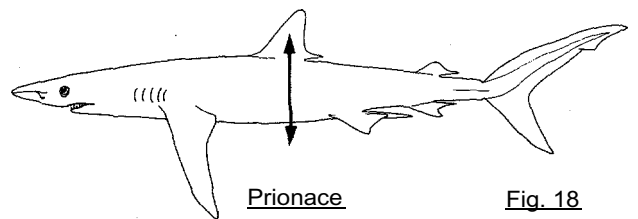
papillose gillrakers

a.

gill arches

b.

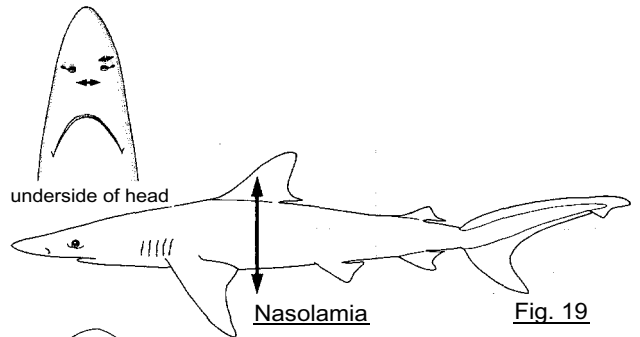
Fig. 17



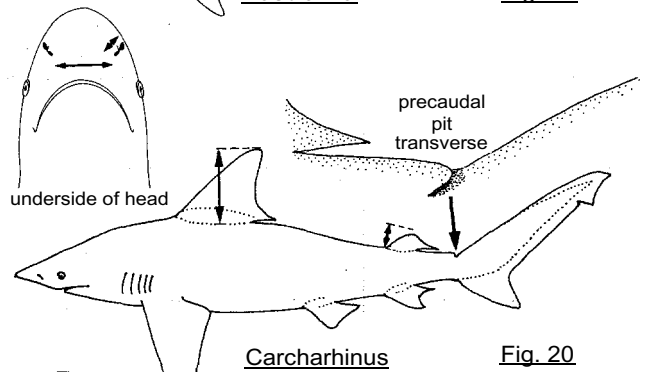
Prionace

Fig. 18

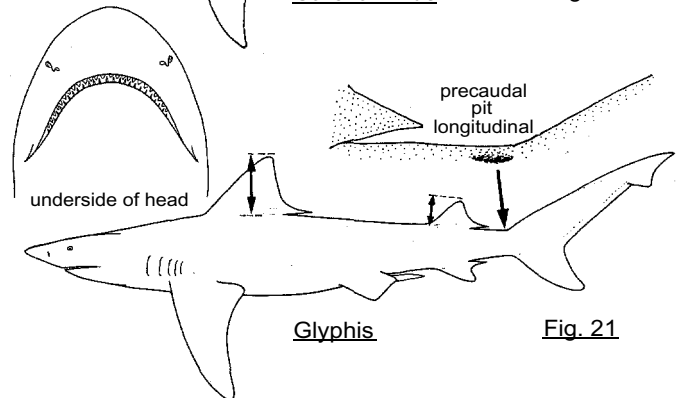
- 10a Snout very narrow, with nostrils large and close-set, internarial space 1.3 times nostril width or less (Fig. 19) **Nasolamia**
- 10b Snout broader, with nostrils smaller and more widely spaced, internarial space at least 3 times nostril width (Figs 20,21)



- 11a. Cusps of lower teeth not prominently protruding when mouth is closed. Second dorsal fin 2/5 height of first dorsal or less. Precaudal pits transverse and crescentic ... **Carcharhinus**



- 11b. Cusps of lower teeth prominently protruding when mouth is closed. Second dorsal fin 1/2 to 3/5 height of first dorsal. Precaudal pits longitudinal and not crescentic **Glyphis**



Carcharhinus Blainville, 1816

CARCH Carch

Genus: Subgenus Carcharhinus Blainville, 1816 (Genus Squalus Linnaeus, 1758), Bull. Soc. Philomat.Paris, 8:121.

Type Species : Carcharias melanopterus Quoy & Gaimard, 1824, by subsequent designation of the International Commission on Zoological Nomenclature, invoking the plenary powers to set aside all previous designations (Opinion 723.2c, 1965:32).

Synonymy: Subgenus Carcharias Cuvier, 1817 (Genus Squalus Linnaeus, 1758); also Subgenus Carcharias Risso, 1826 (Genus Squalus Linnaeus, 1758) and Genus Carcharias Müller & Henle, 1839 (placed on the Official Index of Rejected and Invalid Generic Names in Zoology by the International Commission on Zoological Nomenclature, Opinion 723.5c,d,e, Names nos. 1748, 1749 and 1750, respectively, 1965). Genus (? Subgenus) Carcharinus Cloquet, 1817 (placed on the Official Index of Rejected and Invalid Generic Names in Zoology by the International Commission on Zoological Nomenclature, Opinion 723.5h, Name no. 1753, 1965). Genus Aprion Müller & Henle, 1839 (a junior homonym of Aprion Cuvier & Valenciennes, 1830, in Osteichthyes). Subgenus Hypoprion Müller & Henle, 1839 (Genus Carcharias Müller & Henle, 1839). Subgenus Prionodon Müller & Henle, 1839 (Genus Carcharias Müller & Henle, 1839; a junior homonym of Prionodon Horsfield, 1822, in Mammalia and placed on the Official Index of Rejected and Invalid Generic Names in Zoology by the International Commission on Zoological Nomenclature, Opinion 723.5f, Name no. 1751, 1965). Genus Carcharorhinus Agassiz, 1843 (placed on the Official Index of Rejected and Invalid Generic Names in Zoology by the International Commission on Zoological Nomenclature, Opinion 723.5i, 1965). Genus Galeolamna Owen, 1853; Genus Aprionodon Gill, 1862 (replacement name for Aprion Müller & Henle, 1839); Genus Hypoprionodon Gill, 1862; Genus Eulamia Gill, 1862; Genus Platypodon Gill, 1862; Genus Isoplagiodon Gill, 1862; Genus Gymnorhinus Hilgendorf, in Hemprich & Ehrenberg, 1899 junior homonym of Gymnorhinus Maximilian, 1841, in Aves; Genus Gymnorhinus Hemprich & Ehrenberg, 1899; Genus Mapolamia Whitley, 1934; Genus Gillisqualus Whitley, 1934; Genus Galeolamnoides Whitley, 1934; Subgenus Ogilamia Whitley, 1939 (Genus Galeolamna Owen, 1853); Genus Longmania Whitley, 1939; Genus Uranga Whitley, 1943; Subgenus Uranganops Whitley, 1943 (Genus Galeolamna Owen, 1853); Subgenus Lamnarius Whitley, 1943 (Genus Galeolamna Owen, 1853); Subgenus Bogimba Whitley, 1943 (Genus

Galeolamna Owen, 1853). Genus Pterolamia Springer, 1950 (junior homonym of Pterolamia Breuning, 1942, in Insecta, and placed on the Official Index of Rejected and Invalid Generic Names in Zoology by the International Commission on Zoological Nomenclature, Opinion 723.58, Name no. 1752, 1965). Genus Pterolamiops Springer, 1951 (replacement name for Pterolamia Springer, 1950; placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature, Opinion 723.3e, Name no.1661).

Nomina Nuda Referred to Carcharhinus : These are nomina nuda included by Blainville (1816) in his Subgenus Carcharhinus, but which are of uncertain identity: Squalus (Carcharhinus) lividus Blainville, 1816; Squalus (Carcharhinus) ustus Blainville, 1816; Squalus (Carcharhinus) heterodon Blainville, 1816; Squalus (Carcharhinus) broussonetii Blainville, 1816; Squalus (Carcharhinus) megalops Blainville, 1816; Squalus (Carcharhinus) heterobranchialis Blainville, 1816.

Species Dubia Referred to Carcharhinus : These include names with descriptions but which are of uncertain identity. Most of them are discussed by Garrick (1982). Carcharias javanicus van Hasselt, 1823; Carcharias fissidens Bennett, 1830/31 (possibly = Rhizoprionodon acutus ?); Thalassorhinus platyrhynchus Müller. & Henle, 1839 (not based on a Carcharhinus ?); Carcharias (Prionodon) munsing Bleeker, 1849; Hypoprion/Hemigaleus heterodus Philippi, 1887; Carcharias brachyrhynchus Philippi, 1887; Carcharias (Prionodon) siamensis Steindachner, 1896; Carcharias robustus Philippi, 1896; Carcharias sanctae-thomae Engelhardt, 1912; Eulamia philippi Fowler, 1930 replacement for C. brachyrhynchus Philippi, 1887, not C. (Prionodon) brachyrhynchus Bleeker, 1859, = C. amboinensis).

Field Marks : Requiem sharks with small, wide-spaced nostrils, no spiracles, labial furrows confined to mouth corners, usually serrated upper teeth, no cusplets on lower teeth, no keels on caudal peduncle, transverse crescentic precaudal pits, first dorsal midbase closer to pectoral bases than to pelvics or at most about equidistant between them, second dorsal fin less than half the height of first, second dorsal origin usually about opposite anal origin, anal fin with preanal ridges short to absent and with a deeply notched posterior margin.

Diagnostic Features : Body fairly slender to very stout. Head narrow to broad, flattened but not trowel-shaped; snout varying from narrowly parabolic or subangular to bluntly rounded or nearly truncate in dorsoventral view, very short to long, with preoral length varying from about equal to much greater than internarial space and from much less to considerably greater than mouth width; eyes small to large, without posterior notches; spiracles absent; no papillose gillrakers on internal gill openings; nostrils small, internarial space 3 to 6 times nostril width; anterior nasal flaps short, varying from vestigial to narrowly or broadly triangular, but not tubular; labial furrows short, essentially confined to mouth corners, with uppers about as long as lowers or shorter, ends of uppers falling far behind eyes; teeth highly variable, anteroposteriors similar or strongly differentiated in upper and lower jaws; uppers usually with more or less erect, broad to narrow cusps, variably developed cusplets or blades, and serrations usually present; lowers without cusplets but with variably oblique to erect cusps and with serrations and blades present or absent; cusps of lower teeth no prominently protruding when mouth is closed; 24 to 37/23 to 35 rows of teeth, with most species not exceeding 33/33. Interdorsal ridge variably absent, present and prominent, or sometimes vestigial; no dermal keels on caudal peduncle; upper precaudal pit transverse and crescentic. First dorsal origin varying from over or slightly anterior to pectoral insertions to slightly behind their rear tips, midbase usually closer to pectoral bases than pelvics but sometimes equidistant between them, and free rear tip usually well in front of pelvic fins but occasionally opposite their origins; second dorsal fin much smaller than first, height 2/5 of first dorsal height or less; its origin usually about opposite anal origin but slightly anterior to it in some species and well behind it in others (but usually in front of anal insertion); pectoral fins varying from moderately broad and semifalcate, to narrow and falcate or broad-tipped, their lengths from origin to free rear tip about 1/3 to 2/3 of pectoral anterior margins; pectoral origins varying from about under 3rd to 5th gill slits; anal fin varying from considerably larger than second dorsal to about as large, with preanal ridges very short or absent and a deeply notched posterior margin. Colour variably grey, bronze, brownish above, without a colour pattern other than variable light or dark fin markings and lateral light stripes. Small to very large sharks, adults from below 1 to about 4 m.

Remarks : Following its revision by Garrick (1982), this is currently the largest genus of sharks, with some 29 species; although the writer predicts that it will be surpassed in number of species by the scyliorhinid genus Apristurus, and possibly by Mustelus. The arrangement of Carcharhinus adopted here follows Compagno (1979) and Garrick (1982) in most details. The genera Hypoprion and Aprionodon were recognized by most previous writers, but they are synonymized with Carcharhinus following the revisionary work on carcharhinid genera by Compagno (1979), and four species formerly included in these genera (A. isodon, H. macloiti, H. hemiodon and H. signatus) are placed in Carcharhinus. In addition, there is apparently a new western Pacific species of porosus and borneensis-like shark (placed by Garrick, 1982, in the Western Hemisphere C. porosus but clearly not conspecific with that species), and a new C. amblyrhynchoides-like shark from the western Indian Ocean (J.A.F. Garrick, pers. comm.).

The 'river sharks', C. glyphis and C. gangeticus, were placed by Compagno (1979) in Carcharhinus, but following Garrick's (1982) revision of Carcharhinus and examination of more material of these sharks, these species are referred to the genus Glyphis.

The following key to species is derived from that of Garrick (1982), with considerable modifications.

Key to Species

- 1a. Pectoral and first dorsal fins very broad distally and broadly rounded apically, only slightly tapering toward their apices. Most fin tips mottled white in adults, also black-tipped and with black dorsal saddle-marks on the caudal peduncle in juveniles **C. longimanus**
- 1b. Pectoral and first dorsal fins tapering distally and usually pointed or narrowly rounded. Fins not mottled white, often black tipped but without black saddles on the caudal peduncle
 - 2a. First dorsal, pectoral, pelvic and caudal fins with extremely conspicuous white tips and posterior edges **C. albimarginatus**
 - 2b. Fins not conspicuously tipped and edged with white, except first dorsal fin in **C. wheeleri**, plain, black-tipped, or with inconspicuous light edges
 - 3a. Second dorsal fin with a conspicuous black tip but other fins plain
 - 4a. First dorsal fin triangular, erect, and with a posteroventrally sloping posterior margin. Usually 13/13 to 14 rows of anteroposterior teeth, and 28/27 to 29 total rows of teeth; distal cusplets serrated on upper anterolateral teeth. Pectoral length 1.4 to 1.8 in anterior margin length. Mouth width 6.4 to 8.3% of total length. Precaudal centra 54 to 74 **C. dussumieri**
 - 4b. First dorsal fin falcate, with almost vertical posterior margin (apart from free rear tip). Usually 12/12 rows of anteroposterior teeth, and 26/25 total rows of teeth; distal cusplets smooth on upper anterolateral teeth. Pectoral length 1.7 to 2 in anterior margin length. Mouth width 4.2 to 6.6% of total length. Precaudal central 74 to 85 **C. sealei**
 - 3b. Second dorsal fin plain, white or black-tipped but never the only fin with markings
 - 5a. Caudal fin prominently edged with black along entire posterior edge. First dorsal fin plain or with a white tip but never black-tipped
 - 6a. First dorsal fin with distinct white tip and posterior edge **C. wheeleri**
 - 6b. First dorsal fin plain **C. amblyrhynchos**
 - 5b. Caudal fin either plain or prominently edged with black, but if black, first dorsal fin also prominently black-tipped
 - 7a. Upper anterolateral teeth with bent, hooked, narrow cusps **C. brachyurus**
 - 7b. Upper anterolateral teeth variably shaped, and broad or narrow, but with cusps nearly straight
 - 8a. Interdorsal ridge present
 - 9a. Snout very long, narrow and pointed, internarial space 1.7 to 1.9 in preoral snout **C. signatus**
 - 9b. Snout shorter, narrowly to broadly rounded, internarial space usually less than 1.6 in preoral snout
 - 10a. Second dorsal, pectoral, and ventral caudal lobe strikingly black-tipped
 - 11a. Second dorsal fin low, with very elongated inner margin over twice fin height. Upper anterolateral teeth with strongly serrated cusps; usually only 12 rows of upper anteroposterior teeth **C. sorrah**

- 11b. Second dorsal fin higher, with shorter inner margin 1.4 to 1.6 times fin height. Upper anterolateral teeth with smooth or weakly serrated cusps; 14 or 15 rows of upper anteroposterior teeth **C. hemiodon**
- 10b. Fins plain or dusky-tipped but not strongly black-tipped
- 12a. First dorsal origin well behind pectoral free rear tips. Very coarse serrations or small cusplets on feet of upper anterolateral teeth. Inner margin of second dorsal very long, usually over twice fin height (down to 1.6 times it) **C. falciformis**
- 12b. First dorsal origin over or anterior to pectoral free rear tips. Serrations on feet of upper anterolateral teeth small and not very coarse. Inner margin of second dorsal shorter and generally less than twice fin height (up to 2.1 times it in C. obscurus)
- 13a. Upper anterolateral teeth with narrow cusps; anteroposterior teeth in 13/12 rows or less **C. perezii**
- 13b. Upper anterolateral teeth with broad-based cusps, triangular in form; anteroposterior teeth in at least 14/13 rows
- 14a. First dorsal origin in front or over pectoral insertions or at least nearer to it than pectoral free rear tips
- 15a. Anterior nasal flaps usually low and inconspicuous. Distance from nostrils to mouth more than 2.4 times in mouth width. Upper anterolateral teeth moderately high; upper anterolateral teeth usually in 14 rows. First dorsal very high, with height about half predorsal space. Interdorsal ridge low **C. plumbeus**
- 15b. Anterior nasal flaps usually high and triangular. Distance from nostrils to mouth less than 2.4 times in mouth width. Upper anterolateral teeth very high; upper anterolateral teeth usually in 15 rows. First dorsal fin lower, with height much less than half predorsal space. Interdorsal ridge high..... **C. altimus**
- 14b. First dorsal origin opposite or somewhat in front of pectoral rear tips but closer to them than pectoral insertions
- 16a. Upper anterolateral teeth relatively high and narrow. Pectoral fins nearly straight. First dorsal fin higher and with a nearly straight anterior margin. Height of second dorsal fin 2.1 to 3.3% of total length and 1.3 to 1.7 times in inner margin length. Precaudal central 103 to 109 **C. galapagensis**
- 16b. Upper anterolateral teeth relatively low and broad. Pectoral fins more falcate. First dorsal fin lower and with a rounded anterior margin. Height of second dorsal fin 1.5 to 2.3% of total length and 1.6 to 2.1 times in inner margin length. Precaudal centra 89 to 95 **C. obscurus**
- 8b. Interdorsal ridge absent
- 17a. Entire posterior margin of caudal fin with a narrow but obvious black edge; pectoral, second dorsal and caudal fins with obvious black tips
- 18a. First dorsal fin with a broad black blotch at its apex, highlighted below with white **C. melanopterus**
- 18b. First dorsal fin with a narrow black edge on its anterior margin but without a black blotch at its apex **C. cautus**
- 17b. Posterior margin of caudal not black or only partly dusky or black; fins black-tipped or not

- 19a. Snout very short and broadly rounded, internarial space usually less than preoral length. Upper anterolateral teeth with very broad, triangular cusps and straight to concave distal margins; lower anterolaterals with strongly arched roots
- 20a. Usually 11 lower anteroposterior teeth, with extremely broad cusps. First dorsal height more than 3.1 times the second dorsal height. Second dorsal margin usually nearly straight. Angle of notch in anal posterior margin more acute, usually less than a right angle. Precaudal centra 89 to 95 **C. amboinensis**
- 20b. Usually 12 lower anteroposterior teeth, with moderately broad cusps. First dorsal height 3.1 times the second height or less. Second dorsal margin usually concave. Angle of notch in anal posterior margin more obtuse, usually a right angle or more. Precaudal centra 101 to 123 **C. leucas**
- 19b. Snout longer and parabolic or wedge-shaped to pointed, internarial space equal or greater than preoral length. Upper anterolateral teeth with narrow cusps and strongly notched distal margins; lower anterolaterals with nearly transverse roots
- 21a. Origin of second dorsal fin well behind anal origin, about opposite its midbase
- 22a. Upper anterolateral teeth with large mesial and distal cusplets and no serrations. Inner margin of first dorsal fin extremely long, about 2/3 of fin base. Rostrum expanded as a hypercalcified, hardened mass, easily detected by pinching or cutting into the snout **C. macloti**
- 22b. Upper anterolateral teeth with distal cusplets and serrations. Inner margin of first dorsal fin shorter, 1/2 fin base or less. Rostrum not hypercalcified
- 23a. Hyomandibular pores conspicuously enlarged alongside mouth corners. Anteroposterior teeth 11 to 12/11 to 12. Second dorsal lower, height 2.2 times or more in inner margin **C. borneensis**
- 23b. Hyomandibular pores not enlarged. Anteroposterior teeth 13 to 15/12 to 15. Second dorsal higher, height 1.9. times or less in inner margin **C. porosus**
- 21b. Origin of second dorsal fin about over anal origin
- 24a. Only 11 rows of anteroposterior teeth; lower anterolateral teeth with mostly oblique cusps. Snout tip with a dusky or black blotch **C. acronotus**
- 24b. Fourteen or more rows of upper anteroposterior teeth; lower anterolateral teeth with mostly erect cusps. Snout tip without a dark blotch
- 25a. Upper anterolateral teeth with semioblique cusps and strong cusplets. Gill slits shorter, longest 3% of total length. Pectoral fins rather broad and triangular, their lengths 1.5 in anterior margin length. Fins not black-tipped **C. fitzroyensis**
- 25b. Upper anterolateral teeth with erect or nearly erect cusps and no cusplets. Gill slits longer, longest usually at least 4% of total length. Pectoral fins narrower and falcate, their lengths 1.8 or more in anterior margin length. Fins often black-tipped
- 26a. Upper labial furrows noticeably elongated and prominent. Usually at least 16 rows of upper anteroposterior teeth. First dorsal fin lower, its height over 2.2 times in the interdorsal space; first dorsal origin over or just behind pectoral rear tips **C. brevipinna**
- 26b. Upper labial furrows shorter and less noticeable. Usually 15 or fewer rows of upper anteroposterior teeth. First dorsal fin higher, its height 2.2 times or less in interdorsal space; first dorsal origin over or just behind pectoral insertions
- 27a. Teeth with smooth edges in both jaws, except for weakly and irregularly serrated upper teeth of adults. Gill slits extremely long, longest about half of first dorsal base length. No black tips on fins **C. isodon**

27b. Teeth with serrated edges in both jaws. Gill slits shorter, much less than half of first dorsal base length. Fins usually black-tipped

28a. Snout rather short and wedge-shaped, internarial space 1 to 1.2 times in preoral snout. Second dorsal height 1 to 1.2 times in inner margin length **C. amblyrhynchoides**

28b. Snout longer and pointed, internarial space 1.3 to 1.7 times in preoral snout. Second dorsal height 1.1 to 1.6 times in inner margin length **C. limbatus**

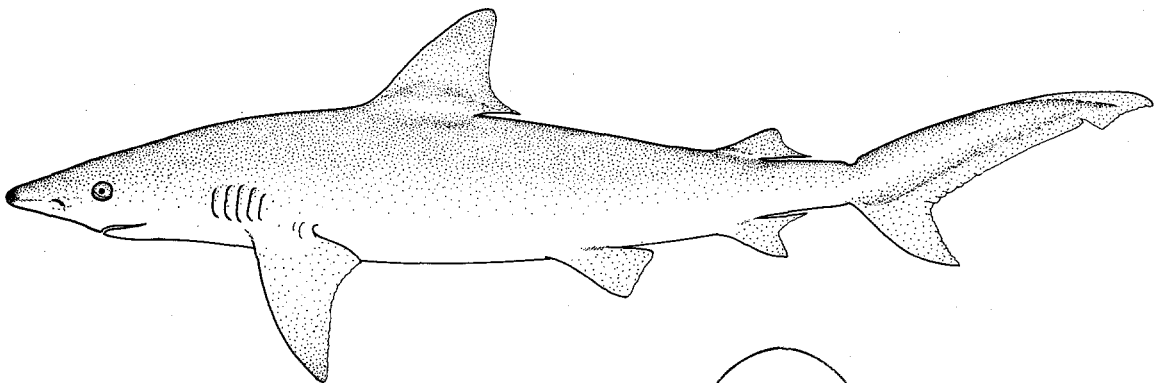
Carcharhinus acronotus (Poey, 1860)

CARCH Carch 1

Squalus acronotus Poey, 1860, Memorias, 2:335, pl. 19, fig. 3-4. Holotype: Adult or adolescent male 980 mm, extant? Type Locality: Cuba.

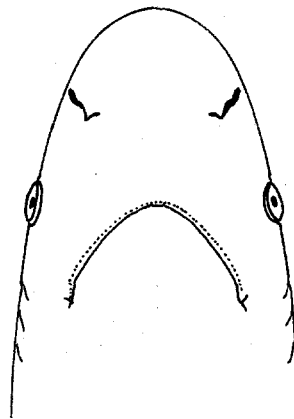
Synonymy : ? Prionodon curcuri Castelnau, 1855 (see Garrick, 1982); Carcharias (Prionodon) remotus Dumeril, 1865.

FAO Names: En - Blacknose shark; Fr - Requin nez noir; Sp - Tiburón amarillo.

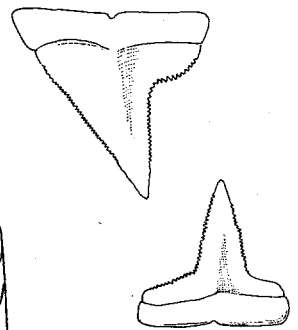


Field Marks : A small grey shark with a moderately long rounded snout, fairly large eyes, a black spot on the underside of the snout tip, oblique-cusped serrated teeth in both jaws, upper teeth without cusplets, usually 12/11 rows of anteroposterior teeth, no interdorsal ridge, small pectoral fins, a small first dorsal with a short rear tip and a moderately large second dorsal with a short rear tip, and dusky to blackish markings on the second dorsal and upper caudal tip.

Diagnostic Features : A small, relatively slender species (up to about 1.4 m). Snout moderately long and rounded; internarial width 1.4 to 1.7 times in preoral length; eyes horizontally oval or circular and moderately large, their length 1.6 to 1.7% of total length in specimens over 80 cm long; upper labial furrows short and inconspicuous; hyomandibular line of pores just behind mouth corners not conspicuously enlarged; gill slits short, third 2.7 to 3.2% 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 12 to 13/11 to 12; upper teeth with moderately narrow, strongly serrated, strongly oblique cusps, and crown feet with slightly coarser serrations but no cusplets; lower teeth with slightly oblique serrated cusps a transverse roots. No interdorsal ridge. First dorsal fin small and semifalcate, with pointed or narrowly rounded apex and posterior margin curving ventrally from fin apex; origin of first dorsal fin over pectoral free rear tip; inner margin of first dorsal short, less than a third of dorsal base; second dorsal fin moderately large, its height 2.6 to 2.9% of total length, inner margin short and 1.1 to 1.3 times height; origin of second dorsal over or slightly behind anal origin; pectoral fins small, falcate, with narrowly rounded or pointed apices, length of anterior margins about 15% of total length in individuals above 80 cm long; 161 to 181 total vertebral centra, 80 to 88 precaudal centra. Black or dusky tips present on second dorsal, dorsal caudal lobe, and sometimes preventral edge of ventral caudal lobe; underside of snout with a conspicuous dusky to black blotch.



underside of head



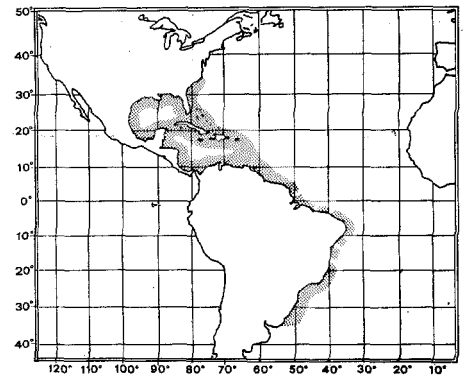
upper and lower tooth

Geographical Distribution : Western Atlantic: North Carolina to Florida, Bahamas, Gulf of Mexico, Virgin Islands, Puerto Rico, Antilles, Guyana, Venezuela, southern Brazil.

Habitat and Biology : A common coastal tropical and warm-temperate shark of the continental and insular shelves, mainly over sandy, shell and coral bottoms. Off southwestern Florida pregnant females occur from January to April, and most individuals are caught from March through November, indicating a local migration.

Viviparous, with a yolk-sac placenta; number of young 3 to 6 per litter. Thought to mature in about two years; mates in spring.

The blacknose shark feeds on small fishes, including pinfish (Sparidae) and porcupine fish. This small, harmless shark is eaten by larger sharks. In captivity the blacknose shark performs a "hunch" display, with back arched, caudal lowered and head raised, when confronted by divers or newly-introduced conspecifics. This is thought to be a possible threat display.



Size : Maximum possibly 200 cm, males maturing between 97 and 106 cm, females maturing at about 103 cm and reaching at least 137 cm; size at birth between 38 and 50 cm.

Interest to Fisheries: Caught mainly off southeastern Florida and northeastern Venezuela, but also caught elsewhere in its range. Caught mainly on surface longlines and utilized dried salted for human consumption.

Literature : Bigelow & Schroeder (1948); Clark & von Schmidt (1965); Myrberg & Gruber (1974); Compagno & Vergara (1978); Garrick (1982).

Carcharhinus albimarginatus (Rüppell, 1837)

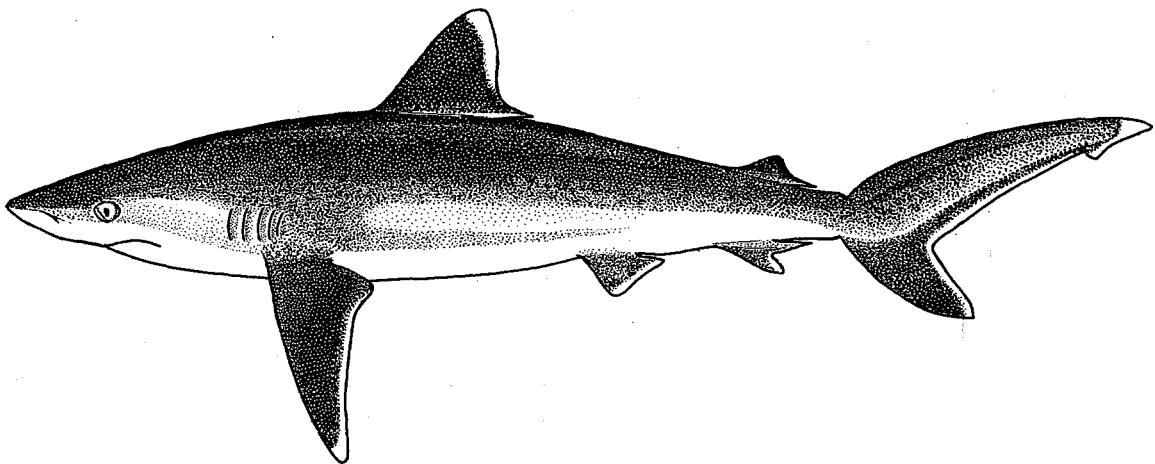
CARCH Carch 17

Carcharias albimarginatus Rüppell, 1837, Neues Wirbel.Fauna Abyssinien. Fische Rothen Meeres, (11):64, pl. 18, fig. 1. Lectotype: Naturmuseum Senckenberg, SMF 3582, 1025 mm stuffed immature male, designated by Klauswitz (1960:293). Type Locality: Ras Mehomet, Red Sea.

Synonymy : Eulamia (Platypodon) platyrhynchus Gilbert, 1892.

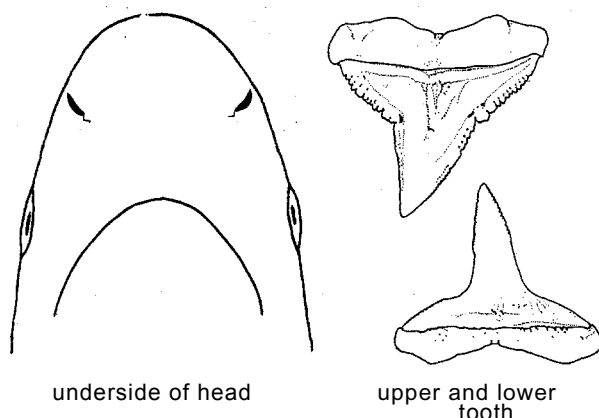
Other Scientific Names Recently in Use : Carcharhinus platyrhynchus (Gilbert, 1892).

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

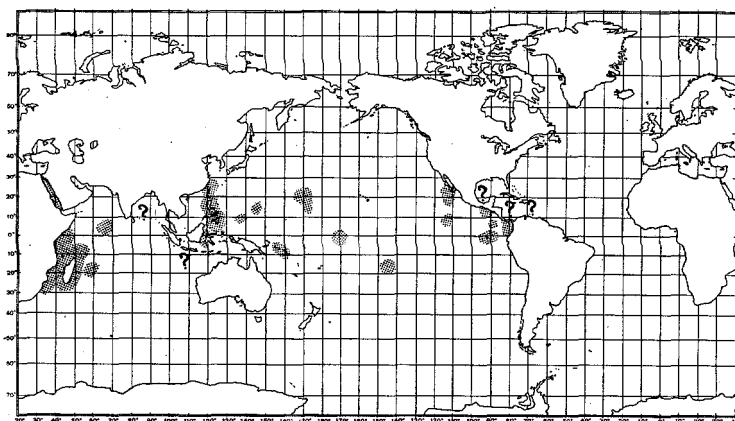


Field Marks : A large, dark grey shark with strikingly conspicuous white tips and posterior margins on all fins, pectoral fins narrow tipped, first dorsal apex narrowly rounded or pointed.

Diagnostic Features : A large, fairly slender species (up to about 2.7 m). Snout moderately long and broadly rounded; internarial width 1 to 1.4 times in preoral length; eyes circular and moderately large, their length 1.8 to 3% 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 short, the third 2.5 to 3.5% of total length and less than a third of first dorsal base; usually 13/12 rows of anteroposterior teeth in each jaw half, but varying from 12 to 14/12 to 14; upper teeth with moderately, broad, strongly serrated, erect to moderately oblique, triangular, high cusps, and crown feet with slightly coarser serrations or low cusplets; lower teeth with erect, fairly broad serrated cusps and transverse roots. An interdorsal ridge present. First dorsal fin moderately large and setae semifalcate, with pointed or narrowly rounded apex and posterior margin curving ventrally from fin apex; origin of first dorsal fin usually over or slightly anterior to pectoral rear tips; inner margin of first dorsal moderately short, 2/5 dorsal base or less; second dorsal fin moderately large and high, its height 1.5 to 2.3% of total length, its inner margin moderately long and 1.5 to 2.1 times height; origin of second dorsal over or slightly behind anal origin; pectoral fins large and semifalcate, with narrowly rounded or pointed apices, length of anterior margins about 16 to 22% of total length; 216 to 231 total vertebral centra, 115 to 125 precaudal centra. Colour dark grey above, sometimes with a bronze tinge, white below; all fins with conspicuous white tips and posterior margins; an inconspicuous white band on flank.



Geographical Distribution : Western Indian Ocean: Red Sea, South Africa, Mozambique, Kenya, Madagascar, Aldabra group, Mauritius, Seychelles, Chagos Archipelago. Western central Pacific: Indonesia, (Macassar Straits), Taiwan Island, Guam New Caledonia, The Philippines, Palau, Marshall, Solomon and Phoenix Islands, Tahiti. Eastern Pacific: Southern Baja California, Revillagigedo, Clipperton, Cocos and Galapagos Islands south to Guatemala and Colombia. ? Western North Atlantic: ? Mexico, Gulf of Mexico and Caribbean Sea.



Habitat and Biology: A common to abundant, coastal-pelagic tropical, inshore and offshore shark, over or adjacent to

continental and insular shelves and offshore banks, from the surface to 600 to 800 m depth. The silvertip shark has a strong preference for offshore islands, coral reefs and banks although it is not limited to them. It occurs from inside lagoons and near dropoffs to well offshore, but is not truly oceanic. It occurs along the water column from the surface to the bottom, and will often follow boats at the surface. Young silvertip sharks are restricted to shallower water closer to the shore while adults are more wide ranging, with little overlap with the young.

Viviparous, with a yolk-sac placenta; number of young 1 to 11 per litter, often 5 or 6. Young are born in the summer after a gestation period of about a year.

Feeds on a variety of midwater and bottom fishes, including lanternfish, flyingfish, gempylids, tuna, bonito, wahoo, bananafish, wrasses, soles, eagle rays, and octopi. At baits it is described as being more aggressive than *Carcharhinus galapagensis* and *C. limbatus*, with equal-sized silvertips dominating the Galapagos and blacktip sharks. It may swim at the periphery of a group of feeding sharks of other species, but suddenly dashes in to take some food.

Individuals of this species are said to be very aggressive to one another, and individuals often have evidence of combat scars. This species is regarded as dangerous to people, although few if any attacks can be attributed to it. Its large size, abundance around reefs and offshore islands, and boldness should invite respect and caution. A baited experiment in which a dummy dressed as a SCUBA diver had its leg removed by a large silvertip (Costeau & Costeau, 1970) suggests that it might be capable of fatally injuring a diver, especially when a food stimulus is in the water.

Size : Maximum about 300 cm, males maturing between 160 and 180 cm, females maturing between 160 and 199 cm; size at birth about 63 to 68 cm.

Interest to Fisheries : Specific information on fisheries for this species are lacking, but it is presumably taken in areas where it occurs (especially off the islands of the western Indian Ocean where it is abundant).

Literature : Beebe & Tee-Van (1941); Fourmanoir (1961); Wheeler (1962); Garrick & Schultz (1963); Limbaugh (1963); Gohar & Mazhar (1964); Kato, Springer & Wagner (1967); Kato & Carvalho (1967); Garrick (1967, 1982); Costeau & Costeau (1970); Bass, D'Aubrey & Kistnasamy (1973); Johnson (1978).

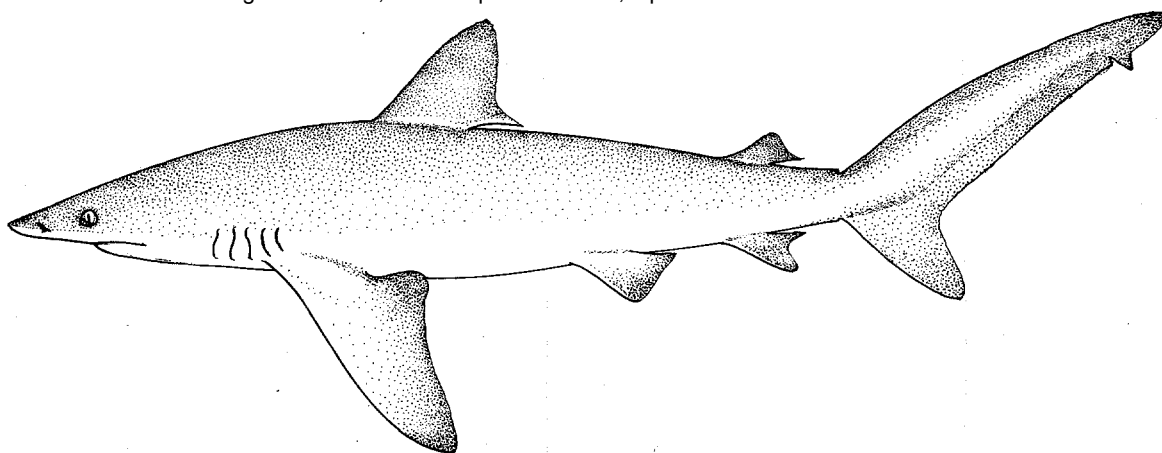
Carcharhinus altimus (Springer, 1950)

CARCH Carch 2

Eulamia altima Springer, 1950, *Am.Mus.Novit.*, (1451):9. Holotype: U.S. National Museum of Natural History, USNM 133828, 1320 mm immature female. Type Locality: Off Cosgrove Reef, Florida Keys, 174 m depth.

Synonymy : *Carcharhinus radamae* Fourmanoir, 1961.

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



Field Marks: A large, deep-benthic grey shark with a long rounded or bluntly pointed snout, prominent anterior nasal flaps, high, triangular, serrated teeth without cusplets in upper jaw, erect narrow-cusped serrated teeth in lower jaw, usually 15/14-15 rows of antero-posterior teeth, a high interdorsal ridge, moderately high first dorsal fin, long, nearly straight pectoral fins, a moderately high second dorsal with a short rear tip and no conspicuous markings.

Diagnostic Features : A large, fairly slender species (up to about 2.8 m). Snout moderately long and bluntly pointed to rounded; internarial width 1.3 to 1.4 times in preoral length; eyes circular and moderately large, their length 1.4 to 2.3% of total length; anterior nasal flaps rather high, triangular, and fairly broad; upper labial furrows short and inconspicuous; hyomandibular line of pores just behind mouth corners not conspicuously enlarged; gill slits moderately long, the third 3.1 to 3.9% of total length and about a third of first dorsal base; usually 15/14 to 15 rows of anteroposterior teeth in each jaw half but varying from 14 to 16/14 to 15; upper teeth with broad, strongly serrated, triangular, erect to slightly oblique, very high cusps that merge into the crown feet, the latter without coarse serrations or cusplets; lower teeth with erect, narrow serrated cusps and transverse roots. A prominent interdorsal ridge present. First dorsal fin moderately large and falcate, with bluntly pointed apex and posterior margin curving ventrally from fin apex; origin of first dorsal fin over pectoral insertion to about over midlength of pectoral inner margins; inner margin of first dorsal fin moderately long, half dorsal base or slightly less; second dorsal fin large and high, its height 2.8 to 3.4% of total length, its inner margin short and 1.1 to 1.4 times its height; origin of second dorsal slightly anterior to anal origin; pectoral fins large, hardly falcate, with narrowly rounded or pointed apices, length of anterior margins about 20 to 22% of total length; 194 to 206 total vertebral centra, 101 to 110 precaudal centra. Colour light grey above, sometimes bronzy, white below, with dusky fin tips (except for pelvics) but no conspicuous markings; white marking on flanks inconspicuous.

