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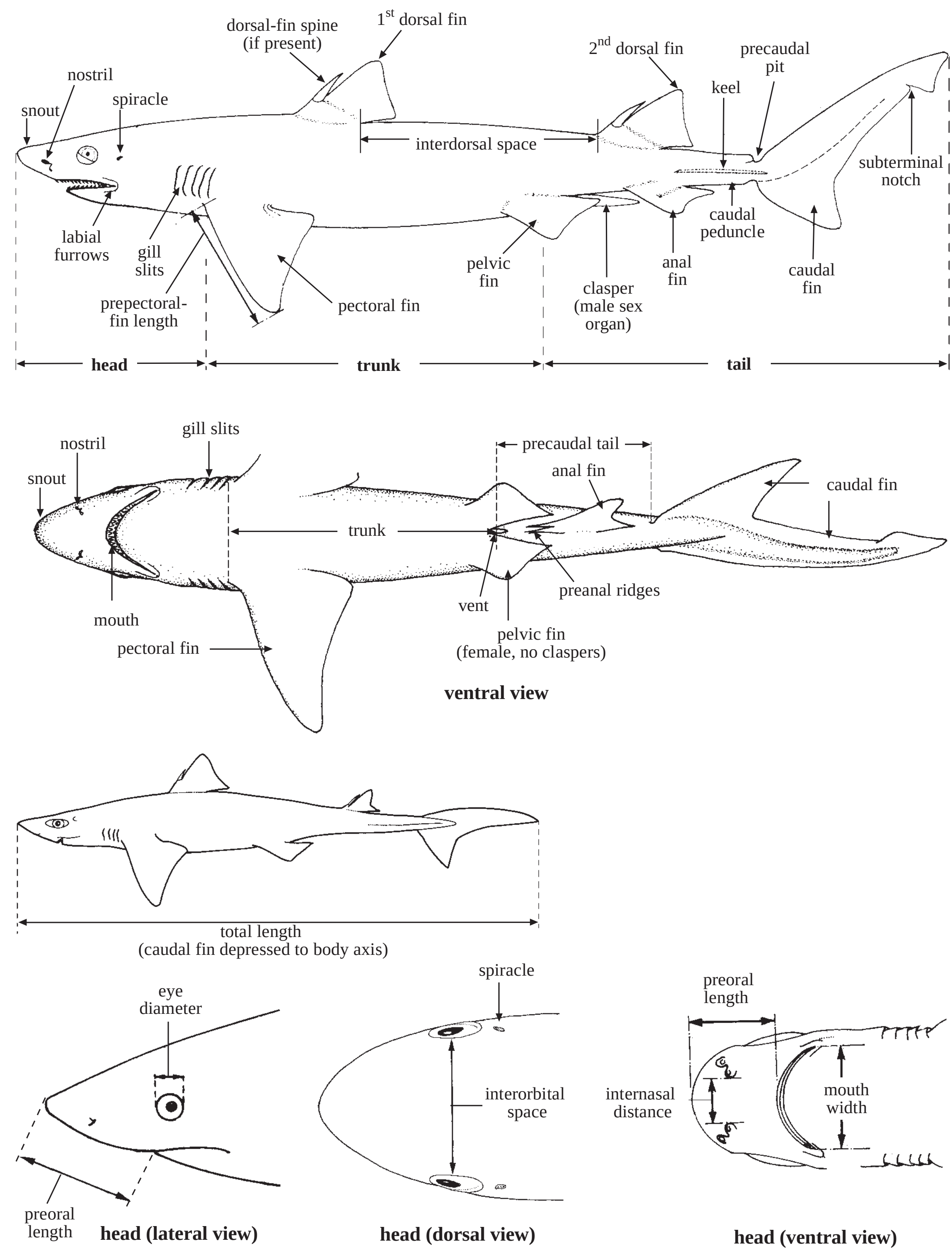
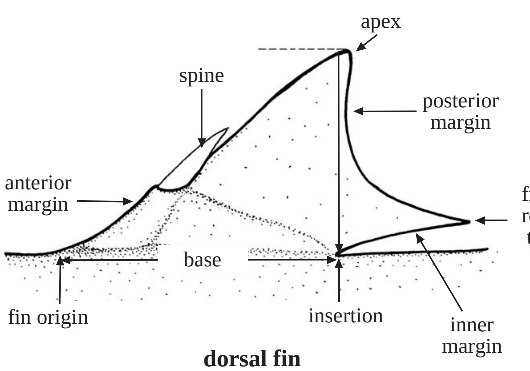
SHARKS

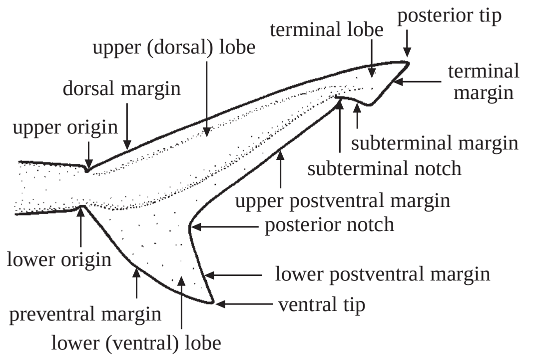
TECHNICAL TERMS AND MEASUREMENTS

(distance in straight line)

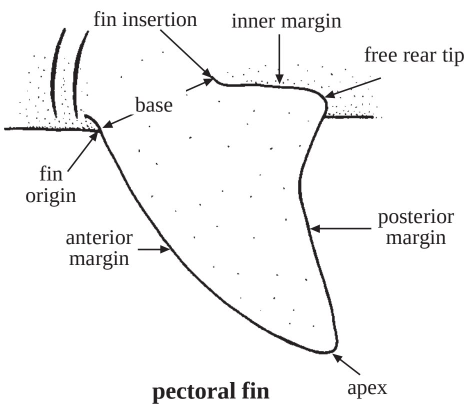




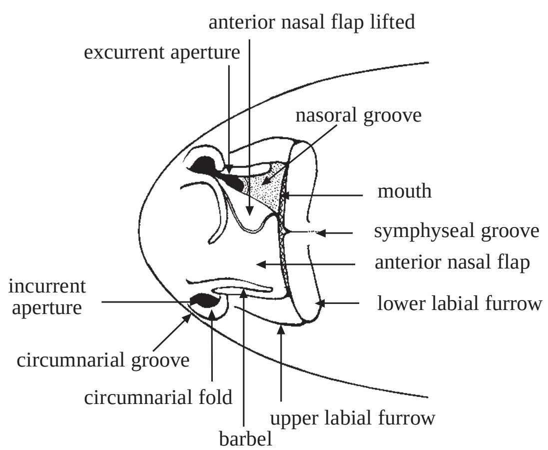
dorsal fin



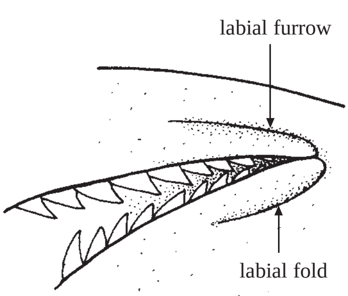
caudal fin



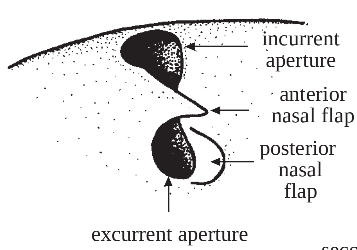
pectoral fin



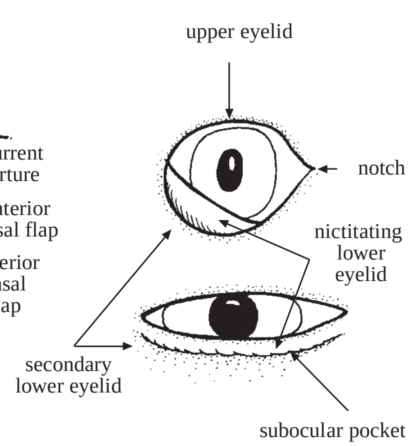
head of an orectoloboid shark (ventral view)



mouth corner



nostril



eye

GENERAL REMARKS

by L.J.V. Compagno

Sharks include a variety of usually cylindrical, elongated, or moderately depressed fishes which differ from the closely related rays or batoids in having lateral gill openings (or gill slits) and pectoral fins not fused to the sides of the head over the gill openings. The greatly depressed angelsharks (family Squatinidae) might be mistaken for rays at first sight; they have large, broad, ray-like pectoral fins that extend as triangular lobes alongside the gill openings, but are not connected to the head above them. Sharks have eyes on the dorsal surface or sides of the head and spiracles (when present) on its dorsal or dorsolateral surfaces. The tail and caudal fin are always well developed and serve to propel the animal by lateral undulations; the pectoral fins are mostly not used for propulsion through the water but aid in stabilizing and steering the shark. There are usually 5 gill openings on each side of the head, rarely 6 or 7. The mouth is usually ventral or subterminal on the head, but terminal or nearly so in a few species. Most sharks have 2 (rarely 1) dorsal fins, sometimes with spines on their front edges; an anal fin is usually present, but missing in several families. The teeth on the jaws are set in numerous transverse rows and are constantly replaced from inside the mouth. All shark species are more or less covered by small (occasionally enlarged) tooth-like placoid scales or dermal denticles.

Male sharks have cylindrical copulatory organs or claspers on their pelvic fins, used for internal fertilization of eggs in females; about 1/3 of the species of sharks have females that deposit eggs in rectangular or conical capsules, formed of a horn-like material (oviparity); the remainder are livebearers. Some livebearing sharks, including many houndsharks (Triakidae), most requiem sharks (Carcharhinidae), and all weasel sharks (Hemigaleidae) and hammerheads (Sphyrnidae) are viviparous (placental viviparous), with yolk sacs of fetuses forming a placenta with the maternal uterus for nutrient transfer; other livebearinq sharks are ovoviviparous (aplacental viviparous), without a placenta. Ovoviviparous lamnoid sharks of the families Odontaspididae, Alopiidae, Lamnidae, and Pseudocarchariidae practice uterine cannibalism, in which one or more fetuses in each uterus resorb their yolk sacs and then devour eggs passed down the oviducts for nutriment (oophagy) and grow to considerable size with massive yolk stomachs before birth. In the Odontaspididae (*Carcharias taurus*) the largest fetus kills and eats its siblings (adelphophagy) and only 1 fetus survives in utero, while several young may cohabit the uterus in the other families. Members of 2 families of carcharhinoid sharks (Proscylliidae and Pseudotriakidae) practice oophagy, but fill their yolk sacs with yolk that they consume. Mature sharks vary in total length from about 15 to 19 cm (dwarf species of Squalidae and Proscylliidae) to 12.1 m or more (whale shark, family Rhincodontidae) and range in weight from between 10 and 20 g to several metric tons. Most sharks are of small or moderate size; about 50% are small, between 15 cm and 1 m; 32% between 1 and 2 m; 14% between 2 and 4 m; and only 4% are over 4 m in total length.

All sharks are predators, with their prey ranging widely, from planktonic crustaceans and benthic invertebrates to pelagic cephalopods, small to large bony fishes, other sharks and rays, marine mammals, and other marine and terrestrial vertebrates. Sharks are primarily marine, but a few requiem sharks (Carcharhinidae, members of the genera *Carcharhinus* and *Glyphis*) have broad salinity tolerances, and one species (bull shark, *Carcharhinus leucas*) is wide-ranging in tropical lakes and rivers with sea access as well as shallow inshore waters. No sharks are known to be confined to fresh water, unlike several species of stingrays (families Dasyatidae and Potamotrygonidae). Sharks are widely distributed in all oceans, from the Arctic to subantarctic islands, and from close inshore on reefs, off beaches, and in shallow, enclosed bays to the lower continental slopes, the abyssal plains, sea mounts and ridges, and the high seas. They are most diverse in continental waters of tropical and warm-temperate seas, from inshore waters down to upper continental slopes, but are less so in colder waters, at great depths (below 1 500 to 2 000 m), in the open ocean and off oceanic islands. The richest shark faunas occur in the Indo-West Pacific from South Africa and the Red Sea to Australia and Japan. The Western Central Pacific (Fishing Area 71 and the southwestern part of Fishing Area 77) has one of the most diverse shark faunas in the world, including approximately 23 families, 69 genera, and between 164 and 188 species. Worldwide there are 33 families, 101 genera, and between 379 to 478 species of sharks (estimate as of 8 August 1995). Several genera and families are poorly known and require further taxonomic study. Many species of sharks are endemic to the area and have restricted ranges within it, several species (including inshore species) are known from 1 or a few museum specimens only, and a wealth of new species have been revealed in deep water, offshore continental, and even inshore habitats in the past forty years (many of which are still undescribed). Undoubtedly more new species and many records of described species will be discovered with further collecting in poorly known parts of the area. Knowledge of the coastal shark fauna of Area 71 beyond Australia is very sketchy, and many maritime countries need further surveys to determine which species occur there. The deep-water shark fauna is very poorly known in the area, except for off northern Australia and a few other localities (such as New Caledonia) where systematic deep-water exploration for fisheries resources is proceeding apace. Basic knowledge of the biology of many species is often very deficient or entirely lacking, and can be supplemented by new information gathered by fisheries workers in the area.

The shark attack hazard has been grossly exaggerated in recent years. Large carcharhinids, sphyrnids and lamnids, and less frequently other sharks, pose a potential threat to people in the water or boats. Large gill nets have been regularly set in the vicinity of popular bathing beaches off Queensland, Australia during the past 3 decades to reduce the number of potentially dangerous sharks. This 'shark meshing' has presumably reduced shark attacks there although few attacks were recorded off Queensland prior to the onset of meshing (unlike New South Wales, where the practice originated, and off South Africa). About 9% of known shark species are definitely known to be dangerous (that is, are known to have been implicated in at least 1 shark attack worldwide), and about 10% more are large enough and sufficiently well-armed to be potentially so; the rest are mostly too small and poorly armed to be a hazard to people. 'Dangerous' is highly relative; perhaps less than 100 shark attacks (and less than 20 fatalities) occur worldwide each year. Sharks are not very dangerous compared to any number of other causes of death or injury to people, including drownings and near-drownings and large terrestrial predators. The 3 shark species most frequently implicated in shark attacks (white shark, tiger shark, and bull shark) do not automatically attack when confronted by people in the water. Great white sharks usually do not attack in such situations. And if biting does occur it is usually restricted to single bites delivered with minimal force. 'Man-eating' does not appear to be an important source of nutrients for any shark. Unfortunately, the shark attack issue has tended to obscure the 'human attack' problem and its implications for shark conservation in the face of burgeoning fisheries driven by the expanding world human population and enormous markets for shark products. It was recognized over the past 4 decades that aspects of the life history strategy of sharks (long lives, long maturation times, and low fecundity, plus relatively large size) made them very vulnerable to overexploitation, and that several targeted shark fisheries had suddenly collapsed after recruitment had been impaired by overexploitation of the breeding stocks. However, only in the past 5 years has there been widespread concern about world trends in fisheries for sharks and other cartilaginous fishes. After the second world war world fisheries for chondrichthyan fishes essentially tripled in reported catches to FAO, which has not kept pace with the approximately fourfold increases in total fisheries worldwide. Much of the catch is as bycatch in fisheries driven by larger catches of exploitation-resistant bony fishes with far higher fecundity. World catches of cartilaginous fishes reported to FAO have leveled off in the 5-year period 1988 to 1992 to about 690 thousand metric tonnes, which may indicate that there is little scope for further increases in catches. Some sharks have been accorded limited or total protection in a number of developed countries, yet on a world basis shark exploitation is mostly unregulated and out of control nationally and regionally. In the next decade international agreements, including CITES listings, will likely occur to protect a variety of sharks and other cartilaginous fishes from excessive exploitation.

In the Western Central Pacific, sharks are used mainly for human food; shark meat is marketed fresh, frozen, and especially dried-salted. Sharks are utilized on the oriental market for fins; also for liver oil, fishmeal, and possibly for leather, although details of utilization in the area are sketchy. The total catch of sharks reported from Fishing Area 71 is uncertain; total catches of cartilaginous fishes in the area was approximately 119 000 t in 1995, of which about 59 000 t were reported as rays (batoids), 52 000 t mixed sharks and rays and about 8 000 t were sharks. If the mixed sharks and rays included 55% sharks the 1995 shark catch is roughly 37 000 t; the actual landings of sharks in the area are doubtlessly much higher. Catches in the section of Area 77 included in this work were relatively small and may add roughly 6 000 t of chondrichthyans to the 1995 total. The present area had the second highest catches of cartilaginous fishes worldwide in 1995, being surpassed only by FAO Area 51 (Western Indian Ocean, with 145 000 t). The present area includes Indonesia, which in 1995 had the second highest cartilaginous fish catch of any nation (75 000 t, compared to India with 86 000 t), the next highest countries being Pakistan, Taiwan Province of China, and the USA. Malaysia had a catch of about 19 000 t, Thailand and Philippines had catches of about 9 000 t each, and the Korean Republic took about 10 000 t in the area in 1995. Data on gear used in the area is sketchy, but line gear (including pelagic longlines), fixed and floating gill nets, bottom trawls, fixed fish traps, and purse seines are used to target sharks or take sharks as a bycatch. Sharks are taken in artisanal fisheries, by local inshore and offshore commercial fisheries, and by large fishing fleets in offshore waters. Requiem sharks (Carcharhinidae) are especially important, but considerable numbers of threshers (Alopiidae) and makos (Lamnidae, genus *Isurus* are fished offshore, and a number of other families, including longtailed carpetsharks (Hemiscylliidae), zebra sharks (Stegostomatidae), nurse sharks (Ginglymostomatidae), weasel sharks (Hemigaleidae), and hammerheads (Sphyrnidae) are commonly taken in inshore fisheries. Dogfish (family Squalidae) are important in offshore deep-set longline fisheries targeting sharks for liver oil.

KEY TO FAMILIES OCCURRING IN THE AREA

1a. No anal fin (Figs 1 to 4) . . . . → **2**

1b. Anal fin present . . . . → **5**

2a. Body strongly depressed and ray-like; pectoral fins greatly enlarged, with anterior triangular lobes that overlap gill slits; mouth terminal (Fig. 1) . . . . **Squatinidae** (p. 1235)

2b. Body cylindrical, compressed, or slightly depressed, not ray-like; pectoral fins small, without anterior lobes; mouth ventral . . . . → **3**

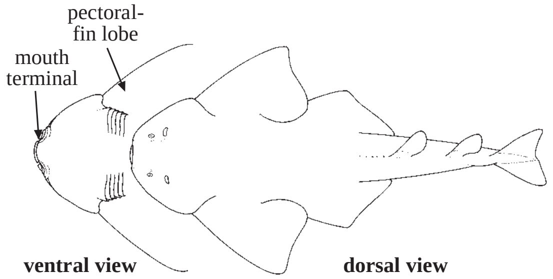


Fig. 1 Squatinidae

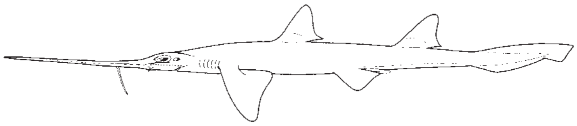


Fig. 2 Pristiophoridae

3a. Snout flattened and elongated, saw-like (Fig. 2) . . . . **Pristiophoridae** (p. 1233)

3b. Snout normal, not saw-like . . . . → **4**

4a. First dorsal fin behind pelvic-fin origins; dermal denticles moderately large or very large, thorn-like (Fig. 3) . . . . **Echinorhinidae** (p. 1211)

4b. First dorsal fin partially or entirely in front of pelvic-fin origins (Fig. 4); dermal denticles small to moderately large, variable in shape . . . . **Squalidae** (p.1213)

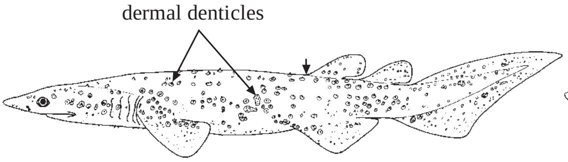


Fig. 3 Echinorhinidae

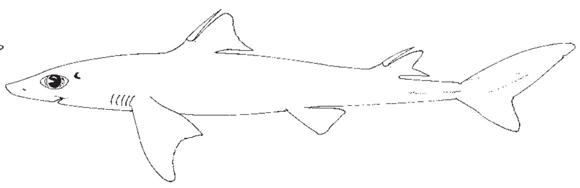


Fig. 4 Squalidae

5a. Only 1 dorsal fin, far posterior on back; 6 or 7 gill slits on each side (Fig. 5) . . . . **Hexanchidae** (p. 1208)

5b. Two dorsal fins (except the scyliorhinid *Pentanchus profundicolus* with 1 dorsal fin); 5 gill slits on each side . . . . → **6**

6a. A strong spine on each dorsal fin (Fig. 6) . . . . **Heterodontidae** (p. 1238)

6b. Dorsal fins without spine . . . . → **7**

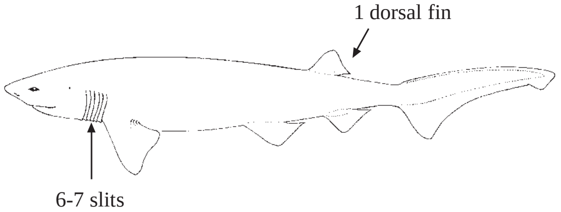


Fig. 5 Hexanchidae

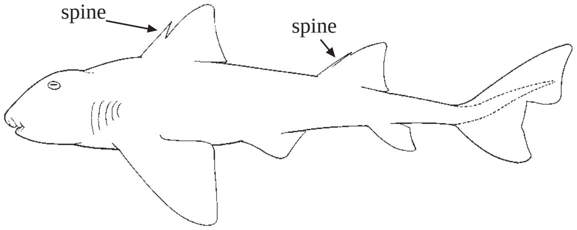


Fig. 6 Heterodontidae

7a. Head with lateral expansions or blades, like a double-edged axe (Fig. 7) . . . **Sphyrnidae** (p. 1361)
7b. Head normal, not expanded laterally . . . . → **8**

8a. Eyes behind mouth; deep nasoral grooves connecting nostrils and mouth (Fig. 8a) . . . . → **9**
8b. Eyes partly or entirely over mouth; nasoral grooves usually absent (Fig. 8b), when present (*Atelomycterus* in family Scyliorhinidae) broad and shallow . . . . → **15**

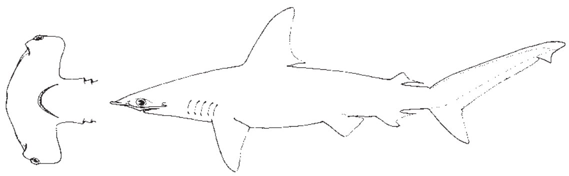


Fig. 7 Sphyrnidae

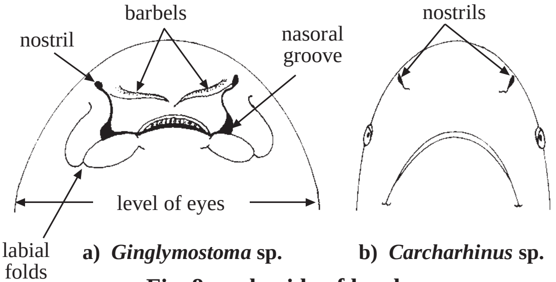


Fig. 8 underside of head

9a. Mouth huge and nearly terminal; external gill slits very large, internal gill slits inside mouth cavity with filter screens; caudal peduncle with strong lateral keels; caudal fin with a strong ventral lobe, but without a strong terminal lobe and subterminal notch (Fig. 9) . . . . **Rhincodontidae (= Rhiniodontidae)** (p. 1263)
9b. Mouth smaller and subterminal; external gill slits small, internal gill slits without filter screens; caudal peduncle without strong lateral keels; caudal fin with a weak ventral lobe or none, but with a strong terminal lobe and subterminal notch (Fig. 10) . . . . → **10**

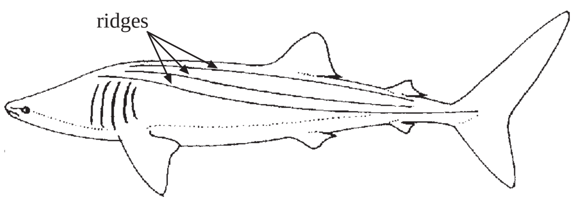


Fig. 9 Rhincodontidae

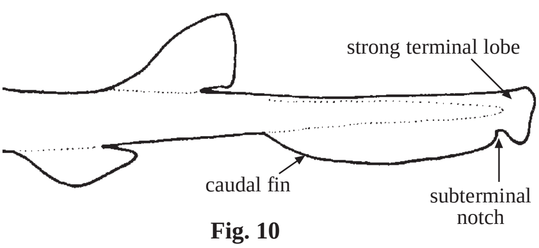


Fig. 10

10a. Caudal fin about as long as rest of shark (Fig. 11) . . . . **Stegostomatidae** (p. 1262)
10b. Caudal fin much shorter than rest of shark . . . . → **11**

11a. Head and body greatly flattened, head with skin flaps on sides; 2 rows of large, fang-like teeth at symphysis of upper jaw and 3 in lower jaw (Fig. 12) . . . . **Orectolobidae** (p. 1245)
11b. Head and body cylindrical or moderately flattened, head without skin flaps; teeth small, not enlarged and fang-like at symphysis . . . . → **12**

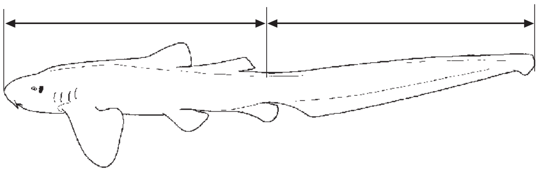


Fig. 11 Stegostomatidae

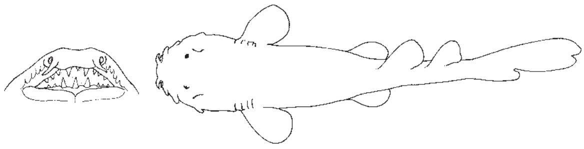


Fig. 12 Orectolobidae

12a. No lobe and groove around outer edges of nostrils (Fig. 13) . . . . **Ginglymostomatidae** (p. 1260)

12b. A lobe and groove around outer edges of nostrils (Fig. 14) . . . . → **13**

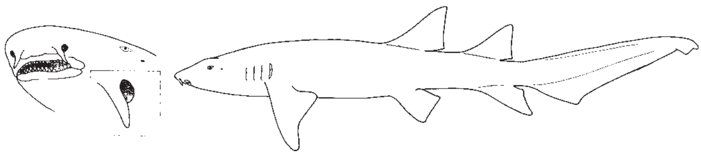


Fig. 13 Ginglymostomatidae

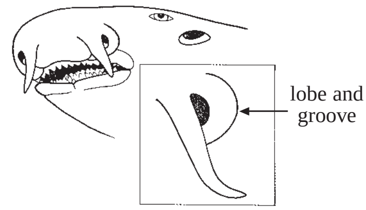


Fig. 14

13a. Spiracles minute; origin of anal fin well in front of second dorsal-fin origin, separated from lower caudal-fin origin by space equal or greater than its base length (Fig. 15) . . . . **Parascylliidae** (p. 1241)

13b. Spiracles large; origin of anal fin well behind second dorsal-fin origin, separated from lower caudal-fin origin by space less than its base length . . . . → **14**

Fig. 15 Parascylliidae

14a. Nasal barbels very large; anal fin high and angular; distance from vent to lower caudal-fin origin shorter than distance from snout to vent (Fig. 16) . . . . **Brachaeluridae** (p. 1243)

14b. Nasal barbels short; anal fin low, rounded and keel-like; distance from vent to lower caudal-fin origin longer than distance from snout to vent (Fig. 17) . . . . . **Hemiscylliidae** (p. 1249)

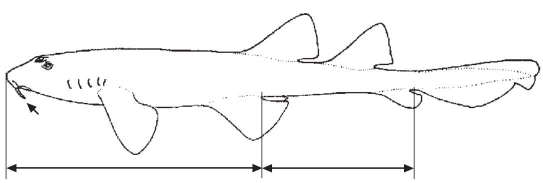


Fig. 16 Brachaeluridae

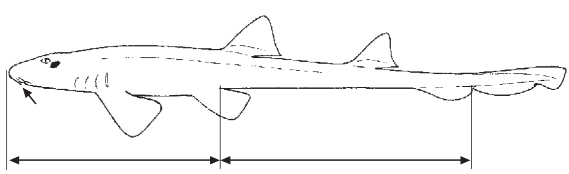


Fig. 17 Hemiscylliidae

15a. A strong keel present on each side of caudal peduncle; caudal fin crescentic and nearly symmetrical, with a long lower lobe (Fig. 18) . . . . **Lamnidae** (p. 1274)

15b. No keels on caudal peduncle, or weak ones (*Pseudocarcharias* in Pseudocarchariidae, *Galeocerdo* and *Prionace* in Carcharhinidae); caudal fin asymmetrical, not crescentic, with ventral lobe relatively short or absent . . . . → **16**

16a. Caudal fin about as long as rest of shark (Fig. 19). . . . . **Alopiidae** (p. 1269)

16b. Caudal fin less than half the length of rest of shark . . . . → **17**

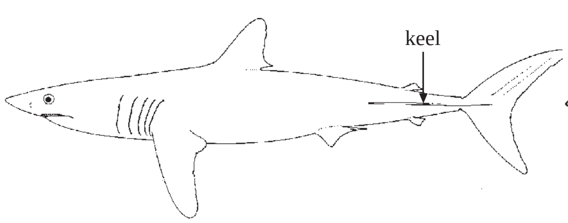


Fig. 18 Lamnidae

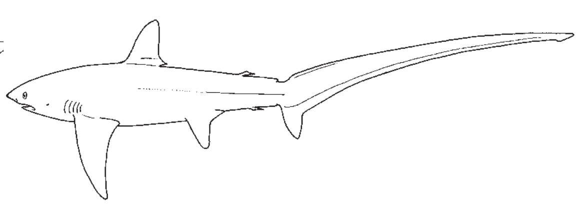
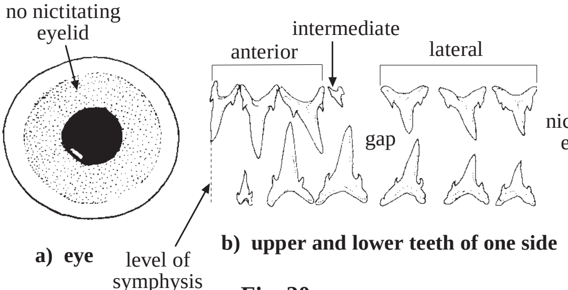


Fig. 19 Alopiidae

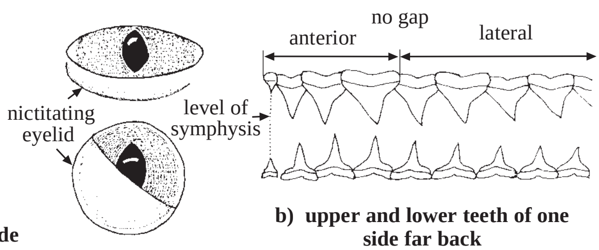
17a. No nictitating eyelids (Fig. 20a), largest teeth in mouth are 2 or 3 rows of anteriors on either side of lower jaw symphysis; upper anteriors separated from large lateral teeth at sides of jaw by a gap that may have 1 or more rows of small intermediate teeth (Fig. 20b); all gill slits in front of pectoral fins (Figs 22 and 23) . . . . → **18**

17b. Nictitating eyelids present (Fig. 21a); largest teeth in mouth are well lateral on dental band, not on either side of symphysis; no gap or intermediate teeth separating large anterior teeth from still larger teeth in upper jaw (Fig. 21b); last 1 or 2 gill slits over pectoral-fin bases . . . . → **19**



a) eye **b) upper and lower teeth of one side**

Fig. 20



a) eyes **b) upper and lower teeth of one side far back**

Fig. 21

18a. Eyes very large; gill slits extending onto upper surface of head; both upper and lower precaudal pits present; a low keel on each side of caudal peduncle (Fig. 22) . . . . **Pseudocarchariidae** (p. 1268)

18b. Eyes smaller; gill slits not extending onto upper surface of head; lower precaudal pit absent; no keels on caudal peduncle (Fig. 23) . . . . **Odontaspididae** (p. 1264)

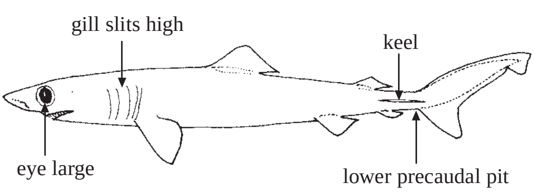


Fig. 22 Pseudocarchariidae

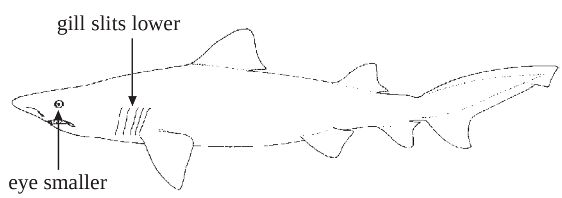


Fig. 23 Odontaspididae

19a. Origin of first dorsal fin over or behind pelvic-fin bases (Fig. 24) . . . . **Scyliorhinidae** (p. 1279)

19b. Origin of first dorsal fin well ahead of pelvic-fin bases . . . . → **20**

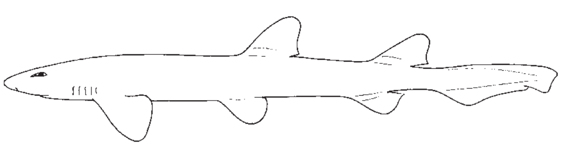


Fig. 24 Scyliorhinidae

20a. No precaudal pits, dorsal caudal-fin margin smooth (Fig. 25) . . . . → **21**

20b. Precaudal pits and rippled dorsal caudal margin present (ripples sometimes irregular in *Scoliodon* and *Triaenodon* of family Carcharhinidae) (Fig. 26) . . . . → **23**

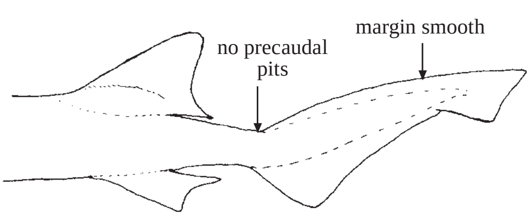


Fig. 25

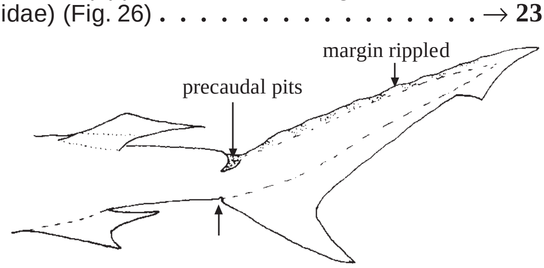


Fig. 26

21a. First dorsal fin long, about the length of caudal fin, and formed as a low, rounded keel; adults with over 200 rows of teeth in each jaw; spiracles nearly or quite as long as eyes (Fig. 27) . . . **Pseudotriakidae** (p. 1296)

21b. First dorsal fin short, about 2/3 of caudal fin or less; subtriangular in shape; adults with less than 110 rows of teeth in each jaw; spiracles much smaller than eyes . . . . → **22**

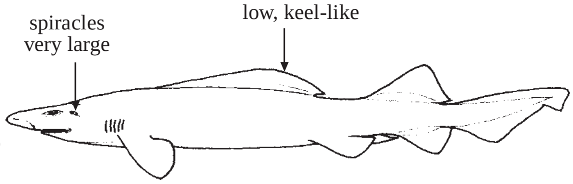


Fig. 27 Pseudotriakidae

22a. Labial furrows very short or absent, confined to extreme mouth corners; posterior teeth comb-like; base of first dorsal fin closer to pelvic-fin bases than to pectoral-fin bases (Fig. 28) . . . . **Proscylliidae** (p. 1293)

22b. Labial furrows longer, extending anteriorly for a greater or lesser distance on lips; posterior teeth not comb-like; base of first dorsal fin either equidistant between pectoral and pelvic-fin bases or closer to pectoral-fin bases (Fig. 29) . . . . **Triakidae** (p. 1297)

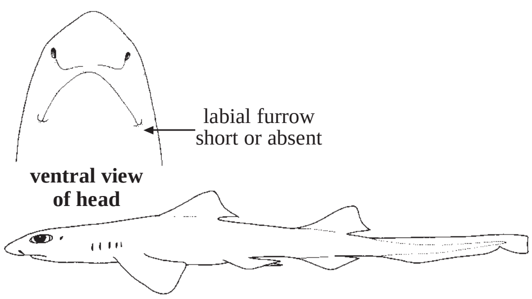


Fig. 28 Proscylliidae

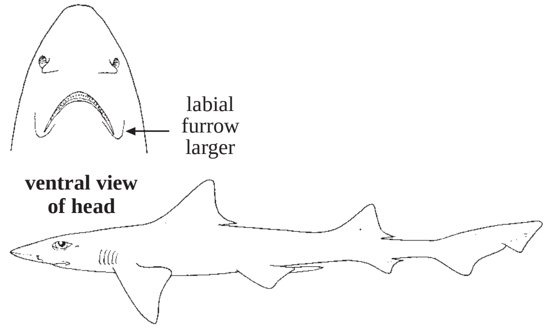


Fig. 29 Triakidae

23a. Intestine with a spiral valve (Fig. 30a) having 4 to 6 turns . . . . **Hemigaleidae** (p. 1305)

23b. Intestine with a scroll valve (Figs 30b and 32) . . . . **Carcharhinidae** (p. 1312)

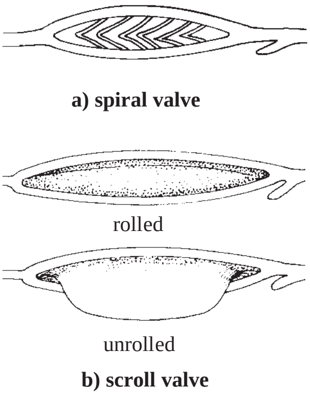


Fig. 30

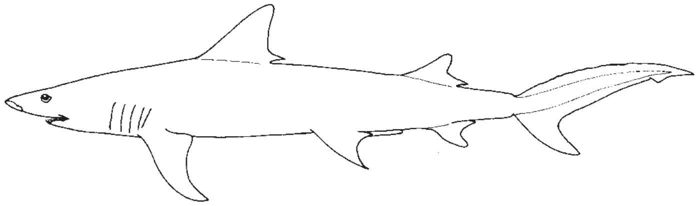


Fig. 31 Hemigaleidae

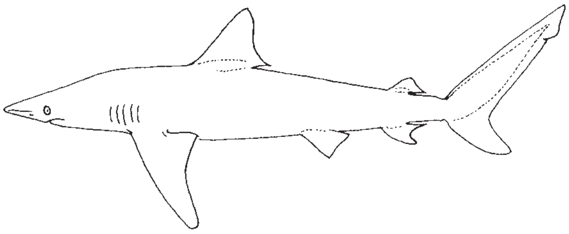


Fig. 32 Carcharhinidae

LIST OF FAMILIES AND SPECIES OCCURRING IN THE AREA

The symbol is given when species accounts are included. A question mark indicates that presence in the area is uncertain.

HEXANCHIDAE: Sixgill and sevengill sharks, cow sharks

Heptranchias perlo (Bonnaterre, 1788)

Hexanchus griseus (Bonnaterre, 1788)
Hexanchus nakamurai Teng, 1962

ECHINORHINIDAE: Bramble sharks

Echinorhinus brucus (Bonnaterre, 1788)
Echinorhinus cookei Pietschmann, 1928

SQUALIDAE: Dogfish sharks

Centrophorus atromarginatus Garman, 1906
Centrophorus granulosus (Bloch and Schneider, 1801)
? *Centrophorus isodon* (Chu, Meng, and Liu, 1981)
? *Centrophorus lusitanicus* Bocage and Capello, 1864
Centrophorus moluccensis Bleeker, 1860
Centrophorus niaukang Teng, 1959
Centrophorus squamosus (Bonnaterre, 1788)
Centrophorus sp. [New Caledonia]

Centroscyllium cf. *kamoharai* Abe, 1966

Centroscymnus coelolepis Bocage and Capello, 1864

Cirrhigaleus barbifer Tanaka, 1912

Dalatias licha (Bonnaterre, 1788)

? *Deania calcea* (Lowe, 1839)
Deania profundorum (Smith and Radcliffe, 1912)
Deania quadrispinosa (McCulloch, 1915)

? *Etmopterus baxteri* Garrick, 1957
Etmopterus brachyurus Smith and Radcliffe, 1912
? *Etmopterus decacuspidatus* Chan, 1966
? *Etmopterus granulosus* (Günther, 1880)
Etmopterus lucifer Jordan and Snyder, 1902
Etmopterus molleri Whitley, 1939
? *Etmopterus princeps* Collett, 1904
Etmopterus splendidus Yano, 1988
? *Etmopterus unicolor* (Engelhardt, 1912)
? *Etmopterus* sp. C [Last and Stevens, 1994]
Etmopterus sp. D [Last and Stevens, 1994]
Etmopterus sp. F [Last and Stevens, 1994]

Euprotomicrus bispinatus (Quoy and Gaimard, 1824)

Isistius brasiliensis (Quoy and Gaimard, 1824)

Scymnodon squamulosus (Günther, 1877)

? *Somniosus pacificus* Bigelow and Schroeder, 1944

Squaliolus aliae Teng, 1959
Squaliolus laticaudus Smith and Radcliffe, 1912

Squalus japonicus Ishikawa, 1908
Squalus megalops (Macleay, 1881)
Squalus melanurus Fourmanoir and Rivaton, 1979
Squalus mitsukurii Jordan and Snyder, 1903
Squalus rancureli Fourmanoir and Rivanton, 1979
Squalus sp. A [Last and Stevens, 1994]
Squalus sp. B [Last and Stevens, 1994]
Squalus sp. F [Last and Stevens, 1994]

PRISTIOPHORIDAE: Sawsharks
- *Pristiophorus* sp. B [Last and Stevens, 1994] (Australia)
- *Pristiophorus* sp. (Philippines)

SQUATINIDAE: Angelsharks
- *Squatina australis* Regan, 1906
- *Squatina japonica* Bleeker, 1858
- *Squatina* sp. A [Last and Stevens, 1994]

HETERODONTIDAE: Bullhead sharks
- *Heterodontus galeatus* (Günther, 1870)
- *Heterodontus portusjacksoni* (Meyer, 1793)
- *Heterodontus zebra* (Gray, 1831)

PARASCYLLIIDAE: Collared carpetsharks
- *Cirrhoscyllium expolitum* Smith and Radcliffe, 1913
- *Parascyllium collare* Ramsay and Ogilby, 1888

BRACHAELURIDAE: Blind sharks
- *Brachaelurus waddi* (Bloch and Schneider, 1801)
- *Heteroscyllium colcloughi* (Ogilby, 1908)

ORECTOLOBIDAE: Wobbegongs
- *Eucrossorhinus dasypogon* (Bleeker, 1867)
- *Orectolobus japonicus* Regan, 1906
- *Orectolobus maculatus* (Bonnaterre, 1788)
- *Orectolobus ornatus* (de Vis, 1883)
- *Orectolobus wardi* Whitley, 1939

HEMISCYLLIIDAE: Longtail carpetsharks
- *Chiloscyllium griseum* Müller and Henle, 1839
- *Chiloscyllium hasselti* Bleeker, 1852
- *Chiloscyllium indicum* (Gmelin, 1789)
- *Chiloscyllium plagiosum* (Bennett, 1830)
- *Chiloscyllium punctatum* Müller and Henle, 1838
- *Hemiscyllium freycineti* (Quoy and Gaimard, 1824)
- *Hemiscyllium hallstromi* Whitley, 1967
- *Hemiscyllium ocellatum* (Bonnaterre, 1788)
- *Hemiscyllium strahani* Whitley, 1967
- *Hemiscyllium trispeculare* Richardson, 1845

GINGLYMOSTOMATIDAE: Nurse sharks
- *Nebrius ferrugineus* (Lesson, 1830)

STEGOSTOMATIDAE: Zebra sharks
- *Stegostoma fasciatum* (Hermann, 1783)

RHINCODONTIDAE: Whale sharks
- *Rhincodon typus* Smith, 1828

ODONTASPIDIDAE: Sand tiger sharks
- *Carcharias taurus* Rafinesque, 1810
- ? *Odontaspis ferox* (Risso, 1810)

PSEUDOCARCHARIIDAE: Crocodile sharks
- *Pseudocarcharias kamoharai* (Matsubara, 1936)

ALOPIIDAE: Thresher sharks
- *Alopias pelagicus* Nakamura, 1935
- *Alopias superciliosus* (Lowe, 1839)
- *Alopias vulpinus* (Bonnaterra, 1788)

LAMNIDAE: Mackerel sharks

Carcharodon carcharias (Linnaeus, 1758)

Isurus oxyrinchus Rafinesque, 1810
Isurus paucus Guitart Manday, 1966

SCYLIORHINIDAE: Catsharks

? *Apristurus acanutus* Chu, Meng, and Li in Meng, Chu, and Li, 1985
? *Apristurus gibbosus* Meng, Chu, and Li, 1985
Apristurus herklotsi (Fowler, 1934)
Apristurus longicephalus Nakaya, 1975
? *Apristurus macrostomus* Meng, Chu, and Li, 1985
? *Apristurus micropterygeus* Meng, Chu, and Li in Chu, Meng, and Li, 1986
Apristurus sibogae (Weber, 1913)
? *Apristurus sinensis* Chu and Hu in Chu, Meng, Hu, and Li, 1981
Apristurus spongiceps (Gilbert, 1895)
Apristurus verweyi (Fowler, 1934)
Apristurus sp. A [Last and Stevens, 1994]
Apristurus sp. B [Last and Stevens, 1994]
Apristurus sp. G [Last and Stevens, 1994]
Apristurus sp. [Seret] (New Caledonia)
Apristurus sp. [Seret] (Philippines)
Apristurus sp. [Seret] (Indonesia)

Asymbolus sp. E [Last and Stevens, 1994]
Asymbolus sp. [Seret] (New Caledonia)

Atelomycterus fasciatus Compagno and Stevens, 1993
Atelomycterus macleayi Whitley, 1939
Atelomycterus marmoratus (Bennett, 1830)

Aulohalaelurus kanakorum Seret, 1990

Cephaloscyllium fasciatum Chan, 1966
Cephaloscyllium sp. [Compagno, 1984, 1988]
Cephaloscyllium sp. [J.Randall, pers. comm. 1994] (Papua New Guinea)
Cephaloscyllium sp. [Seret] (New Caledonia)
Cephaloscyllium sp. B [Last and Stevens, 1994]
Cephaloscyllium sp. C [Last and Stevens, 1994]
Cephaloscyllium sp. D [Last and Stevens, 1994]
Cephaloscyllium sp. E [Last and Stevens, 1994]

Galeus boardmani (Whitley, 1928)
Galeus eastmani (Jordan and Snyder, 1904)
Galeus gracilis Compagno and Stevens, 1993
Galeus sauteri (Jordan and Richardson, 1909)
Galeus schultzi Springer, 1979
Galeus sp. B. [Last and Stevens, 1994]

? *Halaelurus immaculatus* Chu and Meng, 1982
Halaelurus boesemani Springer and D'Aubrey, 1972
? *Halaelurus buergeri* (Müller and Henle, 1838)

Parmaturus melanobranchius (Chan, 1966)
Parmaturus sp. A [Last and Stevens, 1994]
? *Parmaturus* sp. [Seret] (Indonesia)

Pentanchus profundicolus Smith and Radcliffe, 1912

Scyliorhinus garmani (Fowler, 1934)
Scyliorhinus torazame (Tanaka, 1908)

PROSCYLLIIDAE: Finback catsharks

Eridacnis radcliffei Smith, 1913

Gollum attenuatus (Garrick, 1954)

Proscyllium habereri Hilgendorf, 1904

PSEUDOTRIAKIDAE: False catsharks

Pseudotriakis microdon Capello, 1968

TRIAKIDAE: Houndsharks

Galeorhinus galeus (Linnaeus, 1758)

Gogolia filewoodi Compagno, 1973

Hemitriakis abdita Compagno and Stevens, 1993
? *Hemitriakis japanica* (Müller and Henle, 1839)
Hemitriakis leucoperiptera Herre, 1923
Hemitriakis sp. [Compagno, 1988] (Philippines)

Hypogaleus hyugaensis (Miyosi, 1939)

Iago garricki Fourmanoir, 1979

Mustelus antarcticus Günther, 1870
Mustelus griseus Pitschmann, 1908
Mustelus manazo Bleeker, 1854
Mustelus cf. *manazo* [Seret, pers. comm. 1994]
Mustelus sp. A [Last and Stevens, 1994]
Mustelus sp. B [Last and Stevens, 1994]

? *Triakis scyllium* Müller and Henle, 1839

HEMIGALEIDAE: Weasel sharks

Chaenogaleus macrostoma (Bleeker, 1852)

Hemigaleus microstoma Bleeker, 1852
Hemigaleus sp. aff. “*microstoma*”

Hemipristis elongata (Klunzinger, 1871)

Paragaleus tengi (Chen, 1963)

CARCHARHINIDAE: Requiem sharks

Carcharhinus albimarginatus (Rüppell, 1837)
Carcharhinus altimus (Springer, 1950)
Carcharhinus amblyrhynchos (Bleeker, 1856)
Carcharhinus amboinensis (Müller and Henle, 1839)
Carcharhinus borneensis (Bleeker, 1859)
Carcharhinus brachyurus (Günther, 1870)
Carcharhinus brevipinna (Müller and Henle, 1839)
Carcharhinus cautus (Whitley, 1945)
Carcharhinus dussumieri (Valenciennes in Müller and Henle, 1839)
Carcharhinus falciformis (Bibron in Müller and Henle, 1839)
Carcharhinus fitzroyensis (Whitley, 1943)
Carcharhinus galapagensis (Snodgrass and Heller, 1905)
Carcharhinus hemiodon (Valenciennes in Müller and Henle, 1839)
Carcharhinus leucas (Valenciennes in Müller and Henle, 1839)
Carcharhinus limbatus (Valenciennes in Müller and Henle, 1839)
Carcharhinus longimanus Poey, 1861)
Carcharhinus melanopterus (Quoy and Gaimard, 1824)
Carcharhinus obscurus (LeSueur, 1818)
Carcharhinus plumbeus (Nardo, 1827)
Carcharhinus sealei (Pietschmann, 1916)
Carcharhinus sorrah (Valenciennes in Müller and Henle, 1839)
Carcharhinus tilstoni (Whitley, 1950)
Carcharhinus sp. (= “*Carcharhinus porosus*”)

Galeocerdo cuvier (Peron and LeSueur in LeSueur, 1822)

Glyphis sp. A [Last and Stevens, 1994] (Queensland)
Glyphis sp. B [Compagno] (Borneo)
Glyphis sp. C [Compagno] (New Guinea, Australia)

Lamiopsis temmincki (Müller and Henle, 1839)

Loxodon macrorhinus Müller and Henle, 1839

Negaprion acutidens (Rüppell, 1837)

Prionace glauca (Linnaeus, 1758)

Rhizoprionodon acutus (Rüppell, 1837)
Rhizoprionodon oligolinx Springer, 1964
Rhizoprionodon taylori (Ogilby, 1915)

Scoliodon laticaudus Müller and Henle, 1838

Triaenodon obesus (Rüppell, 1837)

SPHYRNIDAE: Hammerhead sharks
Eusphyra blochii (Cuvier, 1817)

Sphyrna lewini (Griffith and Smith in Cuvier, Griffith and Smith, 1834)
Sphyrna mokarran (Rüppell, 1837)
Sphyrna zygaena (Linnaeus, 1758)

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