9.6 FAMILY HEMIGALEIDAE Hasse, 1879

HEMIG

Family Hemigalei or Hemigaleus Hasse, 1879, Natürl.Syst.Elasmobranch., pt. 1:4, 53.

Synonymy : Subfamily Hemipristinae Fowler, 1941 (Family Galeorhinidae).

FAO Names: En - Weasel sharks; Fr - Milandres; Sp - Tiburones comadreja.

Field Marks : mall to moderate-sized sharks with horizontally oval eyes, internal nictitating eyelids, no nasoral grooves or barbels, small spiracles, a short to long, arched mouth that reaches past anterior ends of eyes, moderately long labial furrows, small to moderately large bladelike teeth in the upper jaw, more or less cuspidate teeth in the lower jaw, two moderate-sized spineless dorsal fins and an anal fin, the first dorsal base well ahead of pelvic bases, the second dorsal fin about 2/3 as large as first, precaudal pits present, caudal fin with a strong ventral lobe and lateral undulations on its dorsal margin, intestine with a spiral valve, and usually no colour pattern.

Diagnostic Features: Head without laterally expanded blades; eyes horizontally oval, with lengths 1.1 to 1.9 times the height; nictitating eyelids internal; spiracles present and small anterior nasal flaps lobular and short, not barbel-like; internarial width about 1.9 to 3 times the nostril width; labial furrows moderately long; teeth small to large, with acute and narrow to moderately broad cusps, lateral cusplets; basal ledges and grooves strong to vestigial; teeth strongly differentiated in upper and lower jaws, uppers compressed and bladelike, lowers cuspidate and not compressed; posterior teeth not tomblike; tooth rows 25 to 36/28 to 43. Precaudal pits present. First dorsal fin moderately large and not keel-like, much shorter than caudal fin; first dorsal base well ahead of pelvic bases, equidistant between pectoral and pelvic bases or slightly closer to pectoral bases than to pelvics; midpoint of first dorsal base always in front of pelvic origins; 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 spiral valve of 4 to 6 turns. Colour usually uniform greyish, sometimes with horizontal stripes. Development viviparous.

Habitat, Distribution and Biology : The Hemigaleidae is a small family of common coastal tropical sharks of continental and insular shelf waters down to 100 m depth but usually in shoaler water. Although formerly of worldwide distribution, they currently are limited to the eastern Atlantic and continental Indo-West Pacific but not extending far into the central Pacific. Most of the approximately 7 species are small, and attain a length of 1.4 m or less, but the snaggletooth shark (Hemipristis elongatus) reaches about 2.3 to 2.4 m. The family is closely related to, and is a sister family of the Carcharhinidae, but is readily distinguishable.

Hemigaleids feed on a variety of small bony fishes, small elasmobranchs, cephalopods, crustaceans, and echinoderms. At least two species of small weasel sharks (Paragaleus pectoralis and Hemigaleus microstoma) specialize on a largely cephalopod diet and have small, short mouths, rather weak flat jaws, small upper cutting teeth and small erect lower teeth; while the largely fish-eating Hemipristis elongatus has a long mouth, powerful jaws, large, serrated upper teeth and long curved lower teeth. These structural differences may reflect differences in feeding behaviour between the cephalopod specialists and fish-eaters of this family. The shortened mouths of the cephalopod feeders could enhance suction feeding at the expense of grabbing and impaling ability, which may be more effective against squid, cuttlefish and octopi;. the rather small teeth of the cephalopod specialists may be adequate for holding and dismembering such soft, slippery prey. Conversely, the elongated mouth and impressive, rather mako-like teeth of the snaggletooth shark (and possibly also the hooktooth shark, Chaenogaleus macrostoma, with similar jaws and teeth) may be more effective against fish victims, in grabbing, impaling and slicing them after a chase. The snaggletooth shark (and the hooktooth) has much larger gill slits than the two known cephalopod specialists, and may be a more active swimmer; the short gill slits of the cephalopod eaters may be helpful in limiting backflow into the pharynx during suction feeding.

These sharks are not known to have attacked people, and for the most part are probably harmless; however, the snaggletooth shark is sufficiently large and powerfully armed to be considered at least potentially dangerous.

Interest to Fisheries: Members of this family are common catches in artisanal and small commercial inshore and near offshore fisheries where they occur, in the eastern Atlantic and Indo-West Pacific. They are utilized primarily for human consumption, but fins of the larger species may be used by the oriental sharkfin trade and liver oil for vitamins. They are however, of modest importance in such fisheries, as they are greatly outnumbered by various species of the Carcharhinidae and Sphyrnidae where they occur.

Remarks : he present arrangement of the Hemigaleidae follows Compagno (1979), Genera in this family have conventionally been placed in the Carcharhinidae.

Key to Genera

1a. Lower anterolateral teeth with long, hooked cusps that prominently protrude from the mouth. Gill slits long, longest 1.8 to 3 x eye length in adults (Fig. 1)

2a. Snout obtusely wedge-shaped in dorsoventral view. Lower jaw rounded at symphysis. No toothless space at midline of jaws. Mesial edges of teeth unserrated, sometimes a few cusplets on mesial edges of lower teeth. Fins not falcate, posterior margins of anal and second dorsal moderately concave, those of pectorals and pelvics straight or slightly concave (Fig. 2) ..... **Chaenogaleus**

2b. Snout bluntly rounded in dorsoventral view. Lower jaw truncated at symphysis. A toothless space between teeth at midline of both jaws. Mesial edges of upper teeth and most lowers serrated or with a few cusplets (except for young below 55 cm, in which they are smooth). Fins strongly falcate, posterior margins of anal, second dorsal, pectoral and pelvic fins deeply concave (Fig. 3) ..... **Hemipristis**

1b. Lower anterolateral teeth with short, straight or weakly hooked cusps that are concealed in the mouth or protrude slightly from it. Gill slits short, longest 1.1 to 1.3 x eye length in adults (Fig. 4)

3a. Upper anterolateral teeth with very short cusps. No cusplets on lower teeth, roots and crown feet deeply arched, giving teeth an inverted Y shape. Tooth row counts 25 to 34/37 to 43, 6 to 20 more lower rows than uppers. Pelvic and dorsal fins, and ventral caudal lobe strongly falcate (Fig. 5) ..... **Hemigaleus**

3b. Upper anterolateral teeth with long cusps. Distal and sometimes mesial cusplets present on some lower anterolateral teeth, roots and crown feet hardly arched, giving teeth an inverted T shape. Tooth row counts 26 to 30/27 to 33, with 1 less to 5 more lower rows than uppers. Pelvic and dorsal fins, and ventral caudal lobe not falcate (Fig. 6) ..... **Paragaleus**

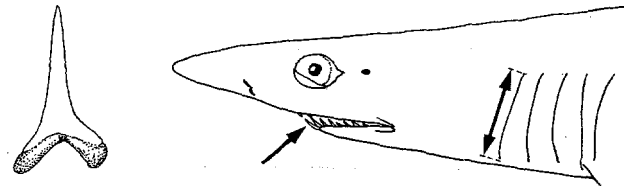
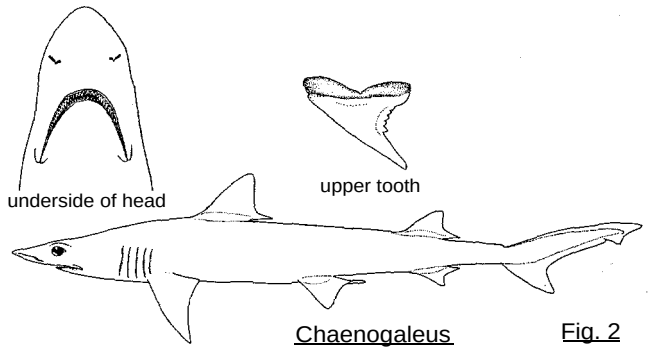
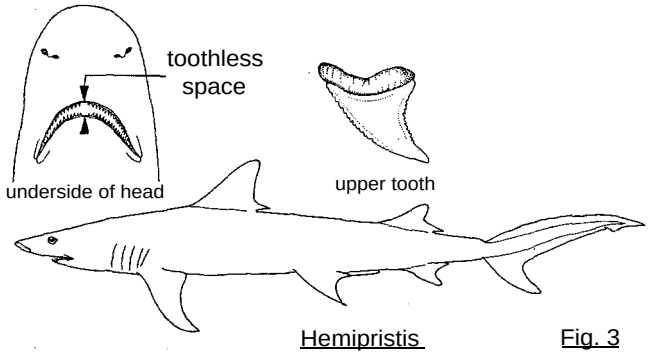


Fig. 1



Chaenogaleus Fig. 2



Hemipristis Fig. 3

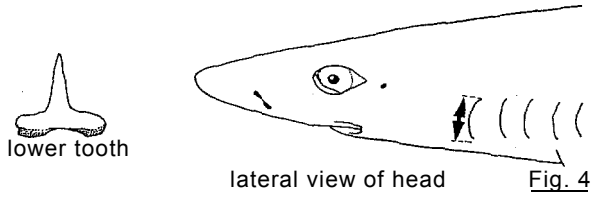
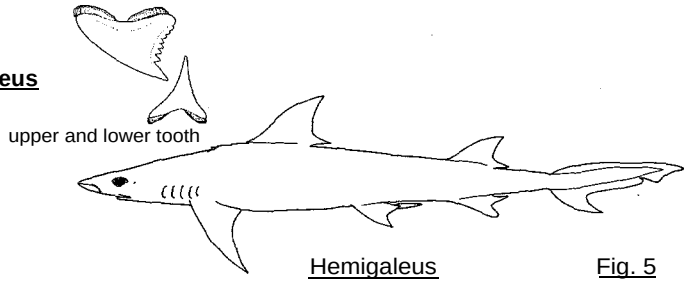
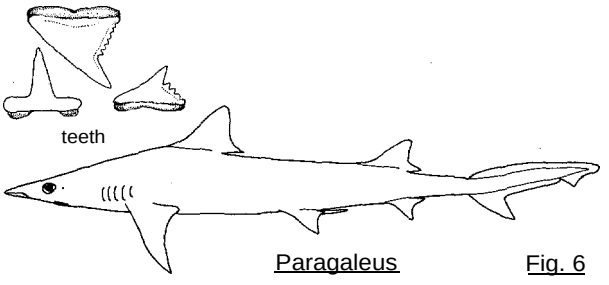


Fig. 4



Hemigaleus Fig. 5



Paragaleus Fig. 6

Chaenogaleus Gill, 1862

HEMIG Chaen

Genus : Chaenogaleus Gill, 1862, Ann.Lyceum Nat.Hist.N.Y., 7:402.

Type Species : "Chaenogaleus macrostoma Gill", by original designation, equals Hemigaleus macrostoma Bleeker, 1852.

Synonymy : None.

Diagnostic Features : Snout wedge-shaped in dorsoventral view; gill slits very long, 1.8 to 2.1 times the eye length in adults; mouth parabolic and very long, its length 66 to 82% of its width; lower jaw rounded at symphysis; ends of upper labial furrows behind rear corners of eyes; no toothless space at midlines of jaws; upper anterolateral teeth with smooth mesial edges and very long cusps; lower anterolateral teeth with very long, stout, strongly hooked cusps, and no cusplets; lower crown feet and roots deeply arched, giving teeth an inverted Y shape; lower teeth protrude prominently when mouth is closed; tooth row counts 33 to 38/34 to 36, with 2 more lower rows to 2 less than upper rows. Fins not falcate; second dorsal height 3/5 or more of first dorsal height.

Remarks : See Compagno (1979) for the rationale for separating this genus from Hemigaleus, with which it is usually synonymized.

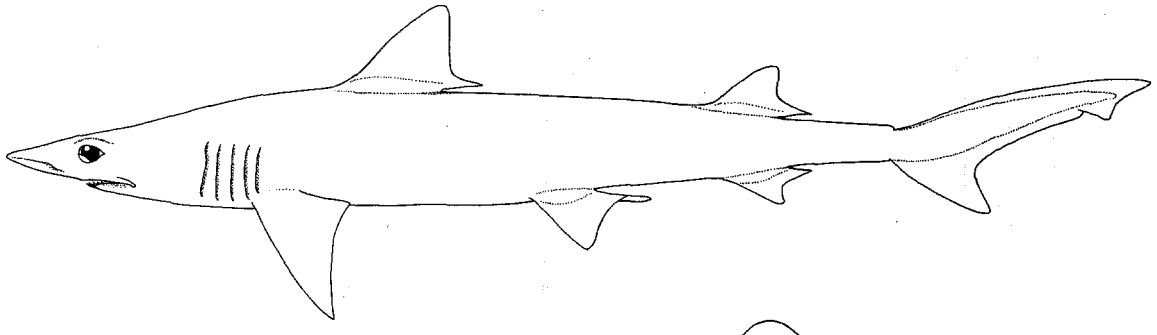
Chaenogaleus macrostoma (Bleeker, 1852)

HEMIG Chaen 1

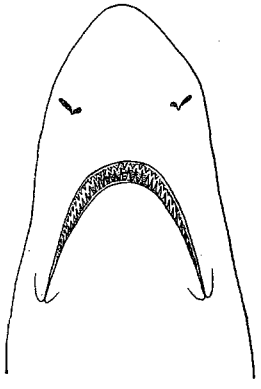
Hemigaleus macrostoma Bleeker, 1852, Verh.Batav.Genoot.Kunst.Wet., 24:46, pl. 2, fig. 10. Holotype: One specimen mentioned in Bleeker's original account, a male stated to be 690 mm long, is apparently in the British Museum (Natural History), BMNH 1867.11.28.197, 699 mm long as measured by the writer (Dr M. Boeseman, pers.comm., 1981). Type Locality: Java.

Synonymy : Hemigaleus balfouri Day, 1878.

FAO Names : En - Hooktooth shark; Fr - Milandre harpon; Sp - Comadreja ganchuda.



Field Marks: A small, slender shark with an angular, moderately long snout, large lateral eyes with nictitating eyelids, small spiracles, long gill slits about twice eye length or more, very long parabolic mouth with prominently protruding lower teeth, upper teeth with distal cusplets but no serrations, lower teeth with extremely long, hooked smooth-edged cusps, two spineless dorsal fins and an anal fin, second dorsal about 2/3 the size of first, second dorsal origin opposite or slightly ahead of anal origin, anal fin smaller than second dorsal and without preanal ridges, transverse, crescentic precaudal pits, and light grey or bronze colour with no prominent markings.



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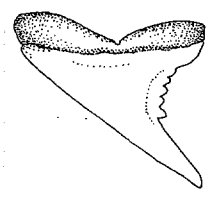
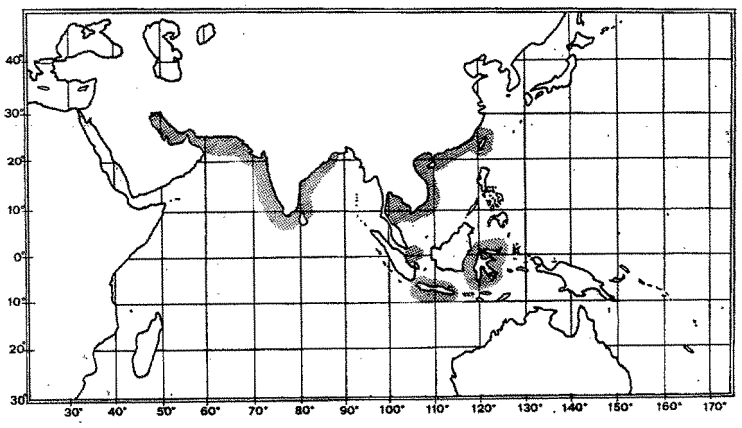


upper tooth

Diagnostic Features: See genus.

Geographical Distribution : Indo-West Pacific: The "Gulf", Pakistan, India, Sri Lanka, Singapore, Thailand, Viet Nam, China (including Taiwan Province), Java, Sulawesi.



Habitat and Biology : A common inshore tropical shark of the continental and insular shelves, caught at depths down to 59 m. Development viviparous, with a yolk-sac placenta; number of young 4 per litter. Diet unrecorded, but probably eats small fishes, cephalopods, and crustaceans.

Size : Maximum about 100 cm, adult males 68 to 97 cm. Size at birth at least 20 cm.

Interest to Fisheries : Commonly caught in inshore and offshore artisanal fisheries off Pakistan, India, Sri Lanka, and probably elsewhere in its range. Caught in drifting and bottom gillnets and on longlines and other line gear. Meat utilized fresh for human consumption; offal processed into fishmeal.

Literature : Fowler, (1941); Setna & Sarangdhar (1949c); Chen (1963); Misra (1969); Compagno (1979).

Remarks : Hemigaleus balfouri is apparently a synonym of this species, judging from its original description (Day, 1878); unfortunately its holotype is lost. Apparently this name has been used indiscriminately for the three species of hemigaleids in Indo-Pakistani waters other than Hemipristis elongatus. See Compagno (1979) for a discussion of this problem.

Hemigaleus Bleeker, 1852

HEMIG Hemig

Genus: Hemigaleus Bleeker, 1852, Verh.Batav.Genoot.Kunst.Wet., 24:45.

Type Species : Hemigaleus microstoma Bleeker, 1852, by subsequent designation of Gill (1862:402).

Synonymy : Genus Negogaleus Whitley, 1931.

Diagnostic Features: Snout rounded in dorsoventral view; gill slits short, 0.8 to 1.3 times eye length in adults; mouth broadly arched and very short, its length 31 to 43% of its width; lower jaw rounded at symphysis; ends of upper labial furrows extend in front of rear corners of eyes; no toothless space at midlines of jaws; upper anterolateral teeth with smooth mesial edges and very. short cusps; lower anterolateral teeth with short, slender, unhooked cusps, and no cusplets; lower crown feet and roots deeply arched, giving teeth an inverted Y shape; lower teeth not protruding when mouth is closed; tooth row counts 25 to 34/37 to 43, 6 to 20 more lower rows than uppers; dorsal and pelvic fins and ventral caudal lobe strongly falcate; second dorsal height 3/5 or more of first dorsal height.

Remarks : Whitley (1931:334) proposed Negogaleus as a replacement name for Hemigaleus, on the erroneous assumption that Hemigaleus is a junior homonym of Hemigalea Blainville, 1837 and Hemigalus Jourdain, 1837 in mammals (Viverridae), but under the present International Code of Zoological Nomenclature Hemigaleus is valid (Compagno, 1979).

Hemigaleus and its synonym Negogaleus have at one time or another included a total of nine species (balfouri, brachygnathus, longicaudatus, machlani, macrostoma, microstoma, pectoralis, pingi, and tengi). Under the revision by Compagno (1979), three of these fall in Paragaleus (longicaudatus, pectoralis and tengi), two (balfouri and macrostoma) in Chaenogaleus, one (pingi) in Triakis (as a synonym of T. scyllium), leaving three in Hemigaleus: H. brachygnathus Chu, 1960, H. machlani Herre, 1929, and H. microstoma Bleeker, 1852.

The account of the Chinese H. brachygnathus by Chu et al. (1963) and Bessednov (1964), when compared with specimens and data of Hemigaleus microstoma from Java, Singapore, and Thailand (including the surviving syntype), strongly suggests that Chu's species is a synonym of H. microstoma (see also Compagno , 1979). It is difficult to determine if H. machlani is a valid species from its brief, unillustrated account (the holotype if unfortunately lost; J.A.F. Garrick, pets. comm.), but dentitional characters and its falcate pectoral fins and white-tipped dorsal fins suggest that the species was based on H. microstoma. However, no Philippine specimens of Hemigaleus or hemigaleids were available for examination. .

Only one species is currently recognized in the genus Hemigaleus, H. microstoma. However, Stevens & Cuthbert (1983) noted that the Australian representative of this species, termed Negogaleus microstoma by Whitley (1939, 1940) and subsequent writers (surprisingly, Whitley did not propose a new name for this shark),

differs consistantly in vertebral counts, coloration (with black dorsal fin tips instead of white ones), and tooth counts from typical H. microstoma as described by Compagno (1979). In addition, Compagno (1979) noted that Indian and Sri Lankan H. microstoma examined by him differ from typical members of the species in having somewhat higher vertebral counts. Whether these differences represent populational differences within a species or indicate that more than one species of Hemigaleus is involved remains to be seen. What is necessary is adequate. collections of Hemigaleus from almost all the areas where these sharks occur, and sampling in little-known areas of the Indo-West Pacific to determine if they occur there.

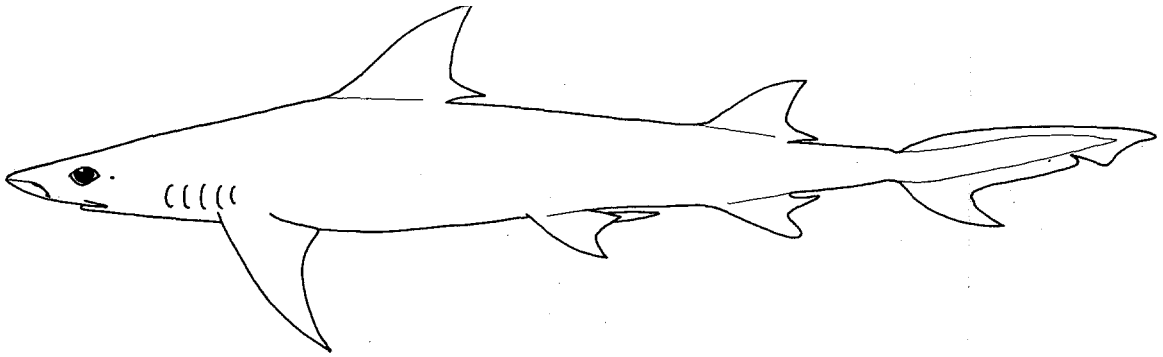
Hemigaleus microstoma Bleeker, 1852

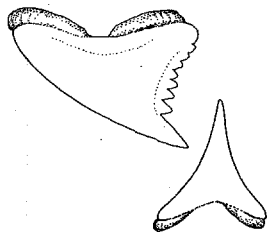
HEMIG Hemig 1

Hemigaleus microstoma Bleeker, 1852, Verh.Batav.Genoot.Kunst.Wet., 24:46, pl. 2, fig. 9. Syntypes: Two specimens, 625 and 701 mm females, are mentioned in Bleeker's (1852) original description. One of these is a specimen in the British Museum (Natural History), BMNH 1867.11.28.173, 703 mm female, but the other may be lost (Dr M. Boeseman, pers. comm.). Type Locality: Batavia (Djakarta), Java.

Synonymy : ? Hemigaleus machlani Herre, 1929; ? Negogaleus brachygnathus Chu, 1960.

FAO Names : En - Sicklefin weasel shark; Fr - Milandre faucille; Sp - Comadreja segadora.

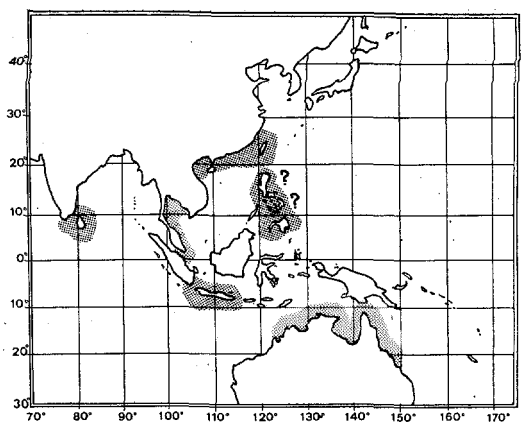




upper and lower tooth

Field Marks : A small slender shark with a rounded, moderately long snout, large lateral eyes with nictitating eyelids, small spiracles, short gill slits about 1.3 times eye length in adults (less in young), very short, small arched mouth with teeth not protruding, upper teeth with distal cusplets but no serrations, lower teeth shaped like inverted Ys, with short, straight, smooth-edged cusps, no cusplets, and highly arched roots, highly falcate fins, including two spineless dorsal fins and an anal fin, second dorsal about 2/3 size of first, second dorsal origin slightly ahead of anal origin, anal fin smaller than second dorsal and without preanal ridges, transverse, crescentic precaudal pits, and light grey or bronze colour with no prominent markings other than white or black fin tips and sometimes white spots on sides.

Diagnostic Features: See genus.



Geographical Distribution: Indo-West Pacific: Southern India, Sri Lanka, Thailand, Singapore, Java, China (including Taiwan Island), the Philippines, Australia (Queensland, northern and Western Australia).

Habitat and Biology : This is a small, relatively common inshore species of tropical continental seas. In Australian waters the Sicklefin weasel shark has been taken at depths of 12 to 167 m on the continental shelf on or near the bottom (bottom temperature 22° to 27.6° C).

Viviparous, with a yolk-sac placenta; litters from the Australian representative of the species range from 4 to 14 fetuses. Full-term fetuses with detached umbilical cords and placentae are 23.7 to 25.6 mm.

The sicklefin weasel shark is a specialist feeder on cephalopods, eating mostly octopi, cuttlefish, and squid, but also crustaceans and echinoderms:

Size : Maximum at least 91 cm, in non-Australian sharks, with mature males from 72 to 91 cm, and adult females 85 cm. In the Australian representative of the species males mature at about 60 cm and reach 94 cm; females are adolescent or subadult and possibly sexually active between 45 and 60 cm while pregnant females are as small as 68 cm, with all females above 75 cm and up to 97.2 cm being pregnant or spent. Size at birth about 26 to 28 cm. A length-weight power curve for the Australian representatives of this species (Stevens & Cuthbert, 1983) is:

$$WT = 2.647 \times 10^{-3} TL^{3.07}.$$

Interest to Fisheries: Taken regularly in inshore artisanal fisheries in the Indo-Pacific, but apparently not extremely abundant. Caught in gillnets and probably on line gear; meat utilized for human consumption.

Literature : Chen (1963); Chu et al. (1963); Compagno (1979); Stevens & Cuthbert (1983).

Hemipristis Agassiz, 1843

HEMIG Hemip

Genus : Hemipristis Agassiz, 1843, Rech.Poiss.Foss., 3:237.

Type Species : Hemipristis serra Agassiz, 1843, by subsequent designation of Woodward (1889:450).

Synonymy : Genus Dirrhizodon Kunzinger, 1871; Genus Heterogaleus Gohar & Mazhar, 1964.

Diagnostic Features : Snout broadly rounded in dorsoventral view; gill slits very long, 3 to 3.5 times the eye length in adults; mouth trapezoidal-parabolic and long, length 50 to 70% of its width; lower jaw truncated at symphysis; ends of upper labial furrows behind rear corners of eyes; a toothless space at midlines of both jaws; upper anterolateral teeth with serrated (smooth in young) mesial edges and short cusps; lower anterolateral teeth with very long, stout, strongly hooked cusps, and serrations and cusplets variably developed an the crown feet; lower crown feet and roots deeply arched, giving teeth an inverted Y shape; lower teeth protrude prominently when mouth is closed; tooth row counts 26 to 30/30 to 36, with 4 to 9 more lower rows than uppers. Fins strongly falcate, posterior margins of anal, second dorsal, pectoral and pelvic fins deeply concave; second dorsal height 2/5 to slightly less than 3/5 of first dorsal height.

Remarks : The genera Dirrhizodon and Heterogaleus are considered junior synonyms of Hemipristis (see Bass, D'Aubrey & Kistnasamy, 1975, Compagno, 1979), which has as its type the fossil H. serra. Fossil Hemipristis species were distributed worldwide in the Tertiary, but the living species is confined to the Indian and western Pacific Oceans. Some of the fossils apparently attained a larger size than the living H. elongatus, between 3 and 5 m.

Compagno (1973d) distinguished the living species as a separate genus, Dirrhizodon, by virtue of tooth histological differences from fossil Hemipristis he had examined, but later (Compagno, 1979) reunited these genera because these differences did not hold.

Apart from a number of fossils, there have been four nominal species of living sharks that fall in this genus, all of which are probably synonyms of H. elongatus (Klunzinger, 1871). In the case of Carcharias ellioti Day, 1878, the issue was confused by the juxtaposition of figure titles of this species with Carcharias acutidens (= Negaprion acutidens), but the description identifies the figure and both make the identity of this species clear. The same applies for Heterogaleus.ghardaguensis Gohar & Mazhar, 1964 and Paragaleus acutiventralis Chu, 1960 (which is apparent from descriptions and figures of the former in Gohar & Mazhar, 1964, and the latter in Chu et al., 1964), while Hemipristis pingali Setna & Sarangdar (1946) was synonymized with H. elongatus by its describers (Setna & Sarangdhar, 1949b).

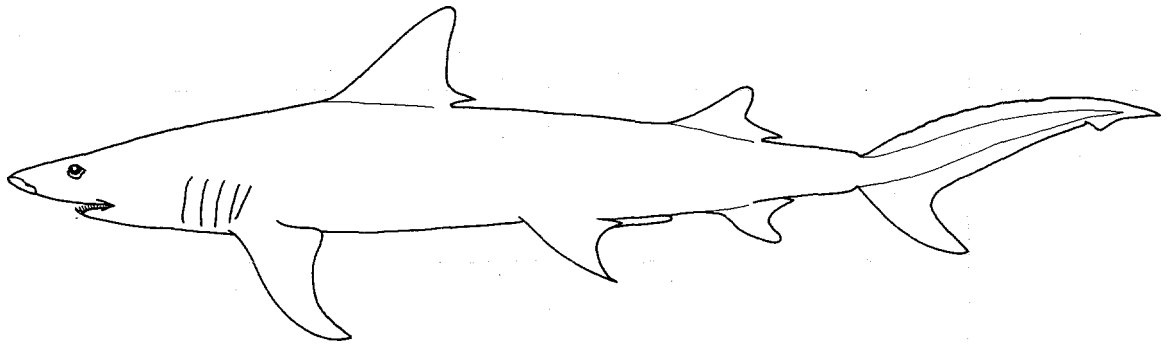
Hemipristis elongatus (Klunzinger, 1871)

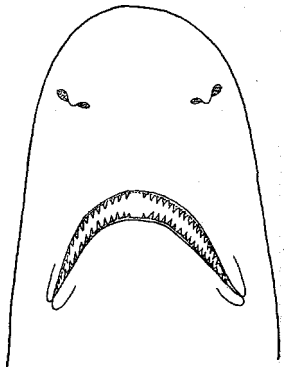
HEMIG Hemip 1

Dirrhizodon elongatus Klunzinger, 1871, Verh.K.K.Zool.-Bot.Ges.Wien, 21:665. Holotype: In Stuttgart Museum? Type Locality: Red Sea.

Synonymy : Carcharias ellioti Day, 1878; Hemipristis pingali Setna & Sarangdhar, 1946; Paragaleus acutiventralis Chu, 1960; Heterogaleus ghardaguensis Gohar & Mazhar, 1964.

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





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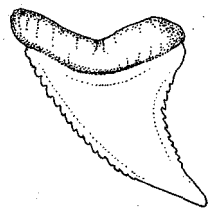
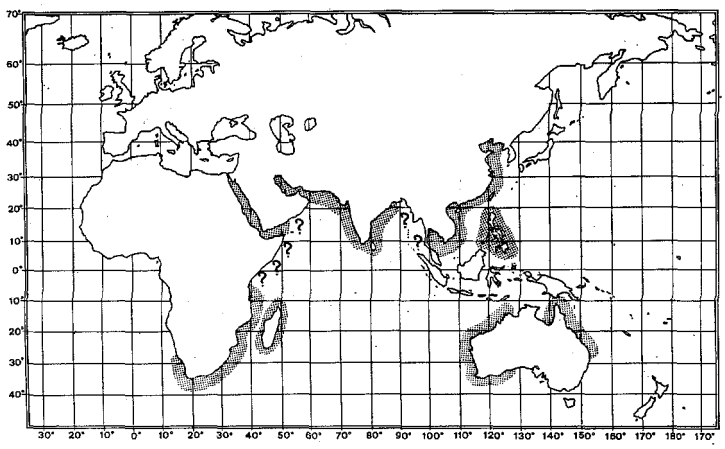


upper tooth

Field Marks : A moderately large, fairly slender shark with a broadly rounded (in dorsoventral view), moderately long snout, large lateral eyes with nictitating eyelids, small spiracles, long gill slits about three times eye length or more, long trapezoidal-parabolic mouth with truncated lower symphysis and prominently protruding lower teeth, upper teeth with distal cusplets and mesial serrations, lower teeth with extremely long, hooked cusps and cusplets and serrations at their bases, two spineless dorsal fins and an anal fin, second dorsal about 2/3 size of first, second dorsal origin somewhat ahead of anal origin, anal fin smaller than second dorsal and without extended preanal ridges, transverse, crescentic precaudal pits, and light grey or bronze colour with no prominent markings.

Diagnostic Features: See genus.



Geographical Distribution : Indo-West Pacific: South Africa, Madagascar, Mozambique, Tanzania, Aden, Red Sea, the "Gulf", Pakistan, India, Thailand, Viet Nam, China, Australia (Queensland, Western Australia), The Philippines.

Habitat and Biology : A rare to common tropical coastal shark, inshore and offshore on the continental and insular shelves at depths of 1 to 30 m.

Viviparous, with a yolk-sac placenta; 6 to 8 young per litter.

Eats a variety of fish prey, including anchovies, sea catfish, Bombay ducks (Harpadon), mackeral, croakers, grey sharks (Carcharhinus) and butterfly rays (Gymnura). Thought to be potentially dangerous because of its large, fearsome teeth and shallow-water habitat, but never recorded in an attack on people.

Size : Maximum from 230 to 240 cm; males adolescent at 73 to 106 cm and adult at 120 to 145 cm; females adult at 170 to 218 cm; size at birth about 45 cm.

Interest to Fisheries : Regularly taken in artisanal fisheries in the Indian Ocean and western Pacific (including the Red Sea), especially off Pakistan, India and Thailand. Caught with floating and fixed bottom gillnets, floating longlines, and probably on hook and line. Meat utilized fresh for human consumption, and in India considered one of the best sharks for food; liver processed for vitamins; fins used in the oriental sharkfin trade, and offal for fishmeal.

Literature : Setna & Sarangdhar (1946, 1949b); Smith (1957b); Fourmanoir (1961); Garrick & Schultz (1963); Gohar & Mazhar (1964); Fourmanoir & Nhu-Nhung (1965); Compagno (1970, 1979).

Paragaleus Budker, 1935

HEMIG Para

Genus : Paragaleus Budker, 1935, Bull. Mus.Natl.Hist.Nat., Paris, ser. 2, 7(2):107.

Type Species : Paragaleus gruveli Budker, 1935, by monotypy.

Synonymy : None.

Diagnostic Features: Snout rounded or slightly pointed in dorsoventral view; gill slits short, 1.1 to 1.3 times the eye length in adults; mouth broadly arched or parabolic and short to moderately long, its length 44 to 64% of its width; lower jaw rounded at symphysis; ends of upper labial furrows reach rear corners of eyes; no toothless space at midlines of jaws; upper anterolateral teeth. with smooth mesial edges and moderately long cusps; lower anterolateral teeth with short, fairly stout, unhooked or slightly hooked cusps and distal and sometimes mesial cusplets; roots and crown feet hardly arched, giving teeth an inverted T shape; lower teeth not protruding or slightly protruding when mouth is closed; tooth row counts 26 to 30/27 to 33, with 1 less to 5 more lower rows than uppers. Dorsal and pelvic fins, and ventral caudal lobe not falcate; second dorsal height 3/5 or more of first dorsal height.

Remarks : The scope of this genus was expanded by Compagno (1979) beyond that of Bigelow & Schroeder. (1948) to include an additional species, Negogaleus tengi Chen, 1963 (with N. longicaudatus Bessednov, 1964 as a synonym). In addition, there two undescribed species of Paragaleus in the western Indian Ocean, lone in the "Gulf" and Persian Gulf and from Pakistan down to southern and eastern India and Sri Lanka, and a second from South Africa and possibly off Madagascar. Both differ from named species of Paragaleus in vertebral counts (97, to 108 precaudal and 170 to 186 total centra, versus 72 to 83 precaudal and 131 to 150 centra in P. pectoralis and P. tengi; see also Compagno, 1979). The South African species will be described by Dr Malcolm Smale and the writer, the northwestern Indian Ocean species by the writer.

Key to Species

Upper labial furrows reaching anteriorly nearly or quite to level of upper jaw symphyses. Cusps of lower lateral teeth mostly with oblique cusps ..... **P. pectoralis**

Upper labial furrows falling well behind symphyses of jaws. Cusps of lower lateral teeth mostly with erect cusps ..... **P. tengi**

Paragaleus pectoralis (Garman, 1906)

HEMIG Para 1

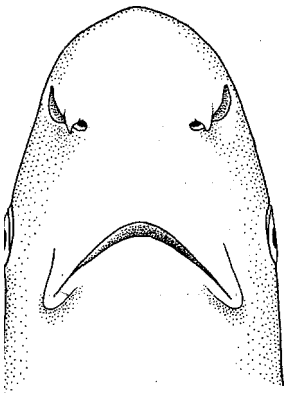
Hemigaleus pectoralis Garman, 1906, Bull.Mus.Comp.Zool.Harv.Coll., 46(11):203. Holotype: Museum of Comparative Zoology, Harvard University, MCZ-847, 651 mm female. Type Locality: "...from the 'Aquarial Gardens', for which the collections were made off the coasts of Massachusetts and Rhode Island." (Garman, 1906).

Synonymy : Paragaleus gruveli Budker, 1935.

FAO Names : En - Atlantic weasel shark; Fr - Milandre jaune; Sp - Tiburón comadiza.

Field Marks : A small slender shark with a rounded, moderately long snout, large lateral eyes with nictitating eyelids, smell spiracles, moderate-sized gill slits about 1.3 times eye length in adults (less in young), rather short arched mouth with upper labial furrows reaching anteriorly to symphyses of jaws, lower teeth not prominently protruding, upper teeth with distal cusplets but no serrations, lower anterior teeth with moderately

long, nearly straight smooth-edged cusps, lateral teeth with prominent cusplets and mostly oblique cusps, roots of lower teeth not strongly arched, anterior teeth T shaped, two spineless dorsal fins and an anal fin, second dorsal about 2/3 size of first, second dorsal origin slightly ahead of anal origin, anal fin smaller than second dorsal and without preanal ridges, transverse, crescentic precaudal pits, and light grey or bronze colour with longitudinal yellow bands on the body (not prominent in preserved specimens) and light posterior. fin margins.



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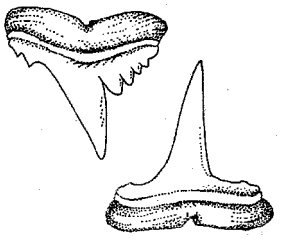
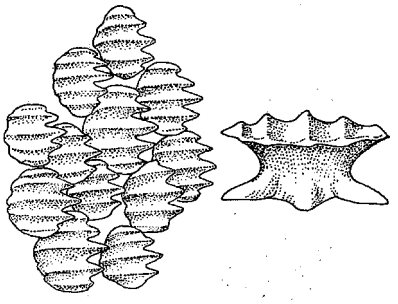


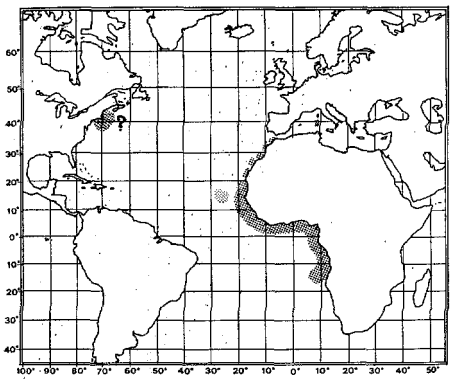
upper and lower tooth



dermal denticles

Diagnostic Features: Upper labial furrows reaching anteriorly to upper symphysis; lower anterior and lateral teeth with prominent cusplets present on distal and (especially in anterior teeth) mesial crown feet; lateral teeth with mostly oblique cusps. Caudal vertebral centra 62 to 73, total vertebral counts 135 to 149.

Geographical Distribution : Eastern Atlantic: Cape Verde Islands and Mauritania to Angola, possibly northward to Morocco. ?Western North Atlantic: New England (see remarks below).



Habitat and Biology : A very common inshore to offshore shark of the continental shelf of tropical and warm-temperate West and northwest Africa, inshore to offshore from a few metres to slightly over 100 m.

Viviparous, with a yolk-sac placenta; number of young per litter 1 to 4 but mostly (60% of 77 individuals) 2. Off Senegal most young are born in May and June.

As with Hemigaleus microstoma (or a close relative) off Australia, this species apparently is a specialist feeder that prefers cephalopods, including squid and octopi. Of a large number examined off Senegal 90% had cephalopods in their stomachs (Cadenat & Blache, 1982). The remainder of this species' diet is comprised of small bony fishes, including soles and sardines.

Size : Maximum 138 cm; males mature at about 80 cm, with adult males reported from 76 to 114 cm; females mature between 75 and 90 cm, with adult females reported from 83 to 117 cm; size at birth about 47 cm.

Interest to Fisheries : A common catch of artisanal and small commercial fisheries in the eastern Atlantic, but also taken by offshore international fisheries. It is caught on longlines, hook-and-line, gillnets, and bottom trawls; its meat is used fresh and dried salted for human consumption, and it is processed into fishmeal.

Literature : Cadenat (1950, 1957); Krefft (1968); Compagno (1979); Cadenat& Blache (1982).

Remarks : P. gruveli is considered a synonym of P. pectoralis, following Krefft (1968), Compagno (1979), and Cadenat & Blache (1982). The record of the holotype of this species from off New England may have been based on a waif that had crossed the Atlantic on the 'North Equatorial Current and rode the Gulf Stream up to where it was captured, since no further records of it have been reported from anywhere in the tropical western Atlantic. As probably suitable tropical habitat exists for this shark in the western Atlantic and such habitat has been extensively surveyed, the chances that a common, wide-ranging, eastern Atlantic shark such as this species has an undiscovered cryptic population in the western Atlantic are limited. Another possibility is that the locality data for the specimen as obtained by Garman is erroneous. It seems unlikely that the shark was transported alive from the eastern Atlantic by human agency to the "Aquarial Gardens", because of the slow transportation (steamships) and limited aquarial technology available at the turn of the century.

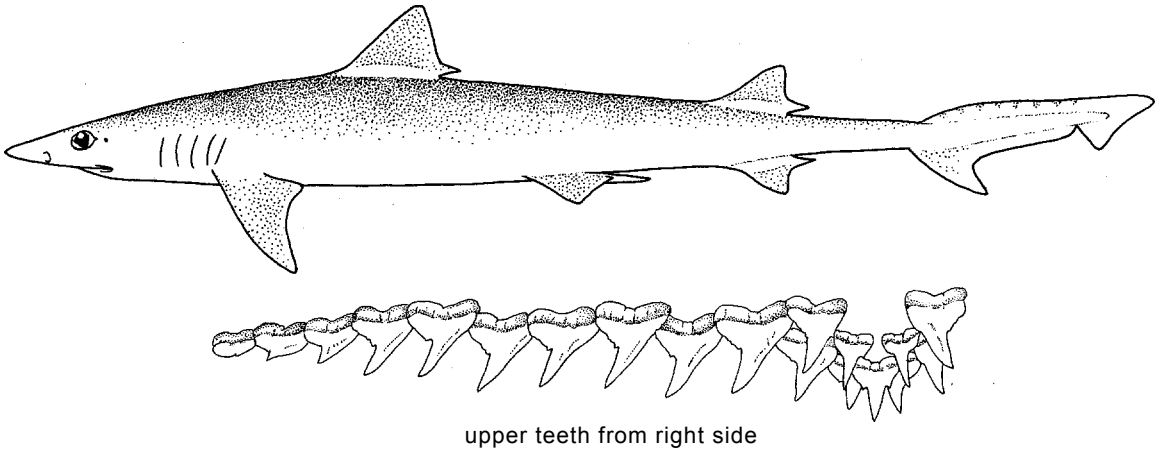
Paragaleus tengi (Chen, 1963)

HEMIG Para 2

Negogaleus tengi Chen, 1963, Biol.Bull.Dep.Biol.Coll.Sci.Tunghai Univ.(Ichthyol.Ser.1), (19):77, fig. 24. Syntypes: Tunghai University fish collection, Taiwan Island (Province of China), THUP 01802, 810 mm adult male, THUP 01803, 750 mm male, and THUP 01804, 770 mm male. Type Locality: Taichung Market, Taiwan, Province of China.

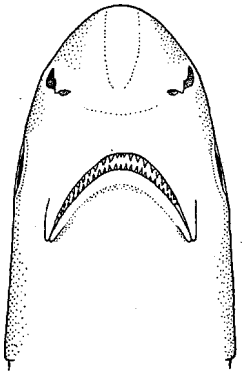
Synonymy : Negogaleus longicaudatus Bessednov, 1964.

FAO Names : En - Straight-tooth weasel shark; Fr - Milandre belette; Sp - Comadreja coluda.



upper teeth from right side

Field Marks: A small, slender shark with a rounded, moderately long snout, large lateral eyes with nictitating eyelids, small spiracles, moderate-sized gill slits about 1.2 to 1.3 times eye length in adults (less in young), rather short arched mouth with upper labial furrows falling well behind symphyses of jaws, lower teeth not prominently protruding, upper teeth with distal cusplets but no serrations, lower anterior teeth with moderately long, nearly straight smooth-edged cusps, lower lateral teeth with low cusplets and mostly erect cusps, roots of lower teeth not strongly arched, anterior teeth T shaped, two spineless dorsal fins and an anal fin, second dorsal about 2/3 size of first, second dorsal origin slightly ahead of anal origin, anal fin smaller than second dorsal and without preanal ridges, transverse, crescentic precaudal pits, and light grey colour without prominent markings.



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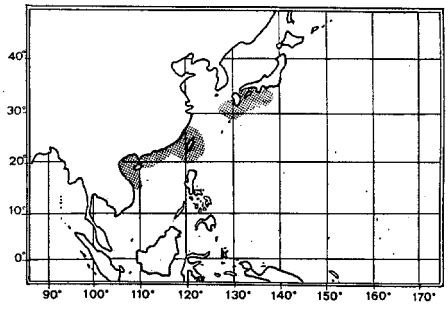
dermal denticles

Diagnostic Features : Upper labial furrows falling behind lower symphysis; lower anterior and lateral teeth with low cusplets present on distal crown feet; lateral teeth with mostly erect cusps. Caudal vertebral centra 55 to 56, total vertebral counts 131 to 135.

Geographical Distribution : ? Western Pacific: Viet Nam, southern China (off Hong Kong), and Taiwan Island, Japan.



Habitat and Biology : A little-known inshore shark, depth range not reported.

Size : Adult males 78 to 88 cm long.

Interest to Fisheries: Taken in Taiwan Island, Hong Kong, and Japanese fisheries, and probably elsewhere where it occurs.

Literature : Chen (1963); Bessednov (1964); Compagno (1979).

Remarks: Synonymy and generic placement of this species follows Compagno (1979). Fourmanoir (1961) described a tengi-like shark from off Madagascar as Paragaleus pectoralis, but this may be an undescribed Paragaleus recently collected from off South Africa.

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