

Chiloscyllium hasselti* Bleeker, 1852*Fig. 139**

Chiloscyllium hasselti Bleeker, 1852, *Verh. Batav. Genoots. Kunst. Wet.* 24: 14. Syntypes: Five specimens, 480 to 590 mm, off Java, Sumatra, and Moluccas, in British Museum (Natural History) and Rijksmuseum van Natuurlijke Historie, Leiden. Lectotype: British Museum (Natural History), BMNH-1867.11.28.196, 594 mm TL male, Moluccas, designated by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.* 176(1): 17.

Synonyms: *Scyllia griseum* van Hasselt, 1823: 315 (*nomen nudum*); also *Scyllium griseum* van Hasselt, 1824: 89, cf. Dingerkus and DeFino (1983: 17). *Chiloscyllium obscurum* Gray, 1851: 35 (*nomen nudum*). Holotype: British Museum (Natural History), BMNH-1845.6.22.122, 487 mm TL, Indonesia. *Chiloscyllium indicum* var. *obscura* Günther, 1870: 413 (new combination); also Ogilby, 1888: 8 (new combination), cf. Dingerkus and DeFino (1983: 17). *Chiloscyllium dolganovi* Kharin, 1987: 367?, fig. 5 (original in Russian), also Kharin, 1987: 67, fig. 5 (English translation). Holotype: Zoological Institute, Leningrad, ZIL-46984, 9° 12' N, 104° 34' E, Viet Nam, 12 m.

Other Combinations: None.

FAO Names: En - Indonesian bamboo shark; Fr - Requin-chabot indonésien; Sp - Bamboa indonesia.

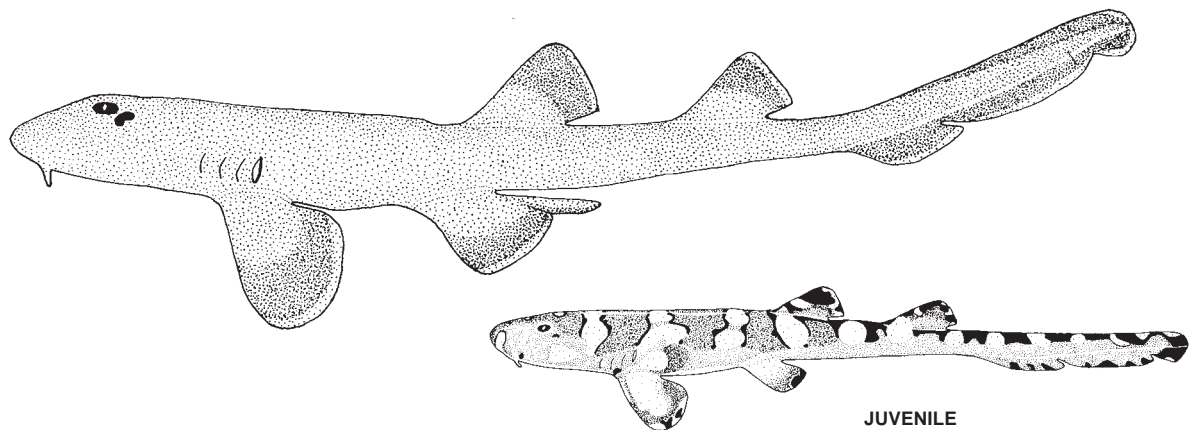
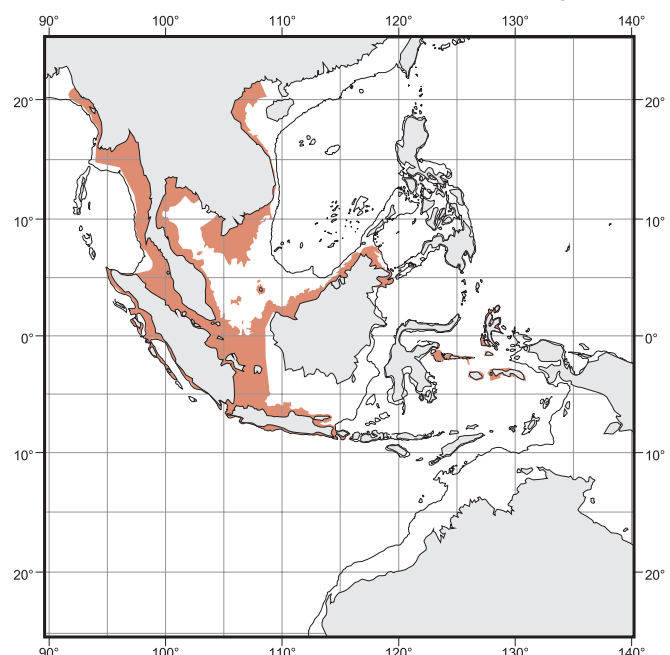


Fig. 139 *Chiloscyllium hasselti*

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, greatly elongated thick precaudal tail, long and low anal fin just anterior to caudal fin, no lateral ridges on trunk, dorsal fins with straight or convex posterior margins, first dorsal-fin origin about opposite rear halves of pelvic-fin bases; often no colour pattern in adults, but young with transverse dark bands that have prominent black edging.

Diagnostic Features: Prepectoral length 16.5 to 20.3% of total length. Snout rounded anteriorly. Eyes moderately large, lengths 1.5 to 2.4% of total length. Body and tail fairly stout. No lateral ridges on trunk and predorsal and interdorsal ridges not prominent. Interdorsal space fairly short, slightly greater than first dorsal-fin base and 6.6 to 11.1% of total length. Snout to vent length 33.2 to 37.7% of total length; distance from vent to tail tip 58.9 to 64.3% of total length. Dorsal fins fairly large and rounded, subequal in size to pelvic fins, and without concave posterior margins and projecting free rear tips. First dorsal-fin origin over rear halves of pelvic-fin bases, first dorsal-fin base slightly longer than second dorsal-fin base, first dorsal-fin height 4.8 to 8.1% of total length. Second dorsal-fin height 7.4 to 9.1% of total length. Origin of anal fin slightly behind free rear tip of second dorsal fin, anal-fin length from origin to free rear tip less than hypural caudal lobe from lower caudal-fin origin to subterminal notch, anal-fin base less than six times anal-fin height. Total vertebral count between 156 and 175 (mean = 166.1, n = 11). Intestinal valve count 15 (n = 1). **Colour:** colour pattern absent in adults except for dusky fins, but young with prominent saddle marks consisting of broad dusky patches with conspicuous black edging and separated by light areas and blackish spots and black or dusky blotches on all fins.

Distribution: Indo-West Pacific: Burma, Thailand, Malaysia, Singapore, Indonesia (Sumatra, Java, between Celebes and New Guinea), Borneo (Sarawak), Viet Nam.



Habitat: Probably mostly close inshore, depth to 12 m.

Biology: Oviparous, eggs hatching in about December. Eggs attached to benthic marine plants.

Size: Maximum total length at least 61 cm. Size at hatching between 94 and 120 mm. Males maturing between 44 and 54 cm, and adult males 54 to at least 59 cm.

Interest to Fisheries and Human Impact: Fished in Singapore, Thailand, and probably wherever else it occurs. Conservation status uncertain.

Remarks: I follow Dingerkus and DeFino (1983) in recognizing this species, and tentatively synonymize *Chiloscyllium dolganovi* Kharin (1987) from Viet Nam with it. The latter species agrees with *C. hasselti* rather than *C. griseum* in its low dorsal fins and short interdorsal space. Among other *Chiloscyllium* with plain or nearly plain adults, the holotype of *C. dolganovi* agrees with *C. hasselti* and differs from *C. burmensis* in its larger eyes, differs from *C. arabicum* in its shorter second dorsal fin and low interdorsal ridges, and differs from *C. punctatum* in lacking concave posterior margins and produced free rear tips on its dorsal fins.

Literature: Dingerkus and DeFino (1983); Kharin (1987); Cook and Compagno (1994).

***Chiloscyllium indicum* (Gmelin, 1788)**

Fig. 140

Squalus indicus Gmelin, in Linnaeus and Gmelin, 1788, *Syst. Nat.*, ed. 13, *Pisces* 1(3): 1503. Holotype: British Museum (Natural History), BMNH-1853.11.12.205, 274 mm TL female (dried skin), "Oceano Indico", Gronow collection. Eastern Indian Ocean. Status confirmed by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.* 176(1): 22.

Synonyms: [*Squalus*] *colax* Meuschen, 1781: (no pagination). Meuschen's Index to Gronovius' *Zoophylacium* was rejected by the International Commission on Zoological Nomenclature (1950: 504) as being nonbinomial. Holotype: British Museum (Natural History), BMNH-1853.11.12.205, 274 mm TL female (dried skin), "Oceano Indico", Gronow collection. Status confirmed by Dingerkus and DeFino (1983: 22). *Squalus tuberculatus* Bloch and Schneider, 1801: 137. Based on "Le Squale dentele" of Lacépède, 1798: 281, pl. 11, fig. 1, no locality. Syntypes: British Museum (Natural History), BMNH-1853.11.12.205, 274 mm TL female (dried skin), "Oceano Indico", Gronow collection (status confirmed by Dingerkus and DeFino, 1983: 22); ?BMNH-1845.7.3.143, 419 mm, Cape Sea, South Africa (locality doubtful). Also *Squalus (Scyliorhinus) tuberculatus* Blainville, 1816: 121 (*nomen nudum*), and *Chiloscyllium tuberculatus* Müller and Henle, 1838d: 20. *Squalus gronovianus* Shaw, 1804: 353 (on Gronow's *Squalus caudatus*; see Gronow, in Gray, 1854: 8). Holotype: British Museum (Natural History), BMNH-1853.11.12.205, 274 mm TL female (dried skin), "Oceano Indico", Gronow collection. Status confirmed by Dingerkus and DeFino (1983: 22). ?*Squalus (Scyliorhinus) dentatus* Blainville, 1816: 121, (*nomen nudum*), possibly based on "Le Squale dentele" of Lacépède, 1798: 281, pl. 11, fig. 1, no locality, according to Fowler (1941: 90). *Chiloscyllium phymatodes* Bleeker, 1852: 21. Holotype: Probably Rijksmuseum van Natuurlijke Historie, Leiden, RMNH-7406, one of two, 410 mm female, Semarang, Java, according to Dingerkus and DeFino (1983: 22). *Squalus caudatus* Gronow, in Gray, 1854: 8. Holotype: British Museum (Natural History), BMNH-1853.11.12.205, 274 mm TL female (dried skin), "Oceano Indico", Gronow collection. Status confirmed by Dingerkus and DeFino (1983: 22). *Chiloscyllium colax* Whitley, 1939: 228. Also *Hemisicyllium colax* Fowler, 1941: 89. Revival of [*Squalus*] *colax* Meuschen, 1781.

Other Combinations: *Hemisicyllium indicum* (Gmelin, in Linnaeus and Gmelin, 1788).

FAO Names: **En** - Slender bamboo shark; **Fr** - Requin-chabot élégant; **Sp** - Bamboa elegante.

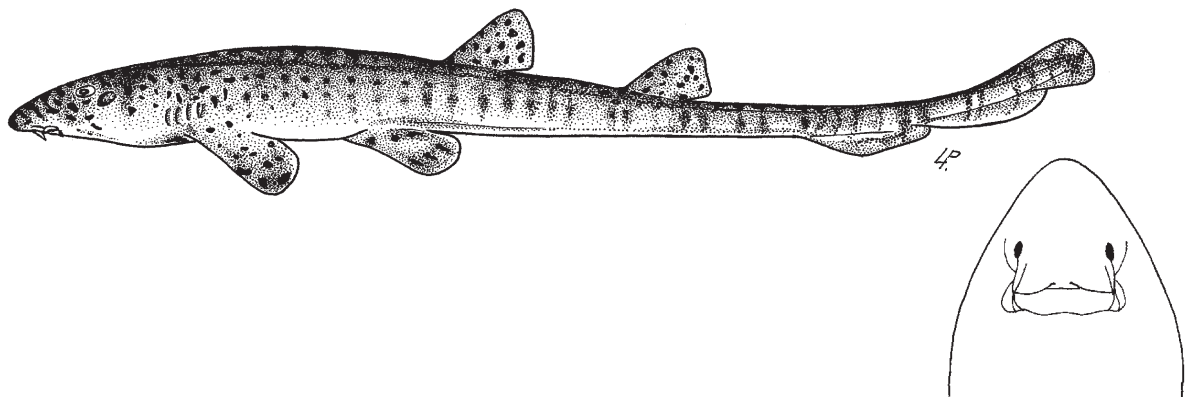


Fig. 140 *Chiloscyllium indicum*

UNDERSIDE OF HEAD

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, greatly elongated slender precaudal tail, long and low anal fin just anterior to caudal fin, lateral ridges on trunk, dorsal fins with straight or convex posterior margins, first dorsal-fin origin opposite or just behind pelvic-fin insertions; colour pattern of numerous small dark spots, saddles, and dashes.

Diagnostic Features: Prepectoral length 15.2 to 18.0% of total length. Snout narrowly rounded anteriorly. Eyes moderately large, lengths 1.4 to 1.9% of total length. Body and tail very slender. A lateral ridge present on each side of trunk, and strong predorsal and interdorsal ridges on midline of back. Interdorsal space fairly long, nearly twice first dorsal-fin base and 10 to 12% of total length. Snout to vent length 32.4 to 35.1% of total length; distance from vent to tail tip 62.3 to 67.0% of total length. Dorsal fins small and rounded, subequal to or smaller than pelvic fins, and without concave posterior margins and projecting free rear tips. First dorsal-fin origin over or behind pelvic-fin insertions, first dorsal-fin base slightly longer than second dorsal-fin base, first dorsal-fin height 3.9 to 5.4% of total length. Second dorsal-fin height 3.9 to 5.1% of total length. Origin of anal fin far behind free rear tip of second dorsal fin, anal-fin length from origin to free rear tip about equal to or greater than hypural caudal lobe from lower caudal-fin origin to subterminal notch, anal-fin base over six times anal-fin height. Total vertebral count between 166 and 170 (mean = 167.0, n = 4). Intestinal valve count 14 to 15 (n = 6). **Colour:** colour pattern of numerous dark brown or blackish spots, dashes and bars on light brown background present in juveniles and adults; saddle-markings or bars of young without prominent black edging.

Distribution: Indo-West Pacific: Possibly Arabian Sea and India, Sri Lanka, Singapore, Thailand, ?Malaysia, Indonesia, Viet Nam, Taiwan Island (Province of China), China, ?Republic of Korea, ?Japan, ?Philippines, ?Solomon Islands.

Habitat: A common but little-known inshore bottom shark. It possibly may occur in fresh water in the lower reaches of the Perak River in peninsular Malaysia.

Biology: Oviparous.

Size: Maximum total length about 65 cm; freelifving individual 13 cm but size at hatching unknown; males maturing between 39 and 42 cm and reaching at least 54 cm; adult female 43 cm.

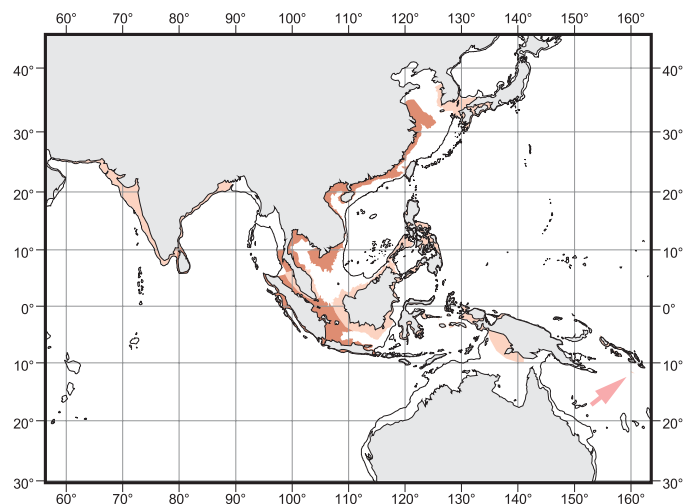
Interest to Fisheries and Human Impact: Interest to fisheries considerable. Regularly taken in inshore fisheries in India, Sri Lanka and Thailand, and utilized for human food. Conservation status unknown.

Local Names: Ridgebacked bamboo shark, Slender bamboo shark, Ridge back shark (Sri Lanka); Corungun sorrah, Karikkan schura (Tamil); Ettee (Malabar, India); Bokee sorrah, Ra sorrah (Telugi); Poos hee (Baluchistan); Balavala (Marathi); Nga man ing-myong (Burma); Ca cha beo, Ca nham, Ca cheo beo (Viet Nam); Yu tokele, Yu belangkas, Yu bodoh, Ikan tjutjot kumbang, Ikan tjutjot tekeh (Malaysia); Chalarn gope or Frog shark, Chalarn hin or Stone shark (Thailand); Kau kang sha or Time teller shark (China); Ridgeback catshark, Catshark, Nurse shark, Tenjikuzame (Japan).

Remarks: Whitley (1939) proposed that *Squalus colax* Meuschen, 1781 was the earliest name for this species. However, Meuschen's work (1781) indicates that although *colax* apparently refers to the Gronow species later named *Squalus indicus*, it was never proposed in the binomial form *Squalus colax* but simply listed as *colax*. Apparently *colax* is not available for this species.

Dingerkus and DeFino (1983) listed specimens from South Africa, Indonesia (Java; Semarang-Riau Archipelago; Bintan Island; Bangka Island; Muntok), Malaysia (Penang Island), Thailand (Gulf of Thailand), Singapore, and China, and did not verify the wider distribution accorded this species by previous writers. They mentioned a stuffed specimen from "Cape Seas, South Africa" collected by Dr Andrew Smith (British Museum [Natural History], BMNH-1845.7.3.143, 419 mm), but no *Chiloscyllium* have been collected off southern Africa despite extensive collecting over the past two centuries. The specimen might have been a waif, but it is more likely to have been procured in India or the Far East and shipped to South Africa.

Literature: Garman (1913); Smith (1913); Fowler (1941); Herre (1953); Taniuchi (1979); Gubanov and Schleib (1980); Dingerkus and DeFino (1983); Compagno (1984); Nakaya and Shirai (1984).



***Chiloscyllium plagiosum* (Bennett, 1830)**

Fig. 141

Scyllium plagiosum Bennett, 1830, *Fishes*, in S. Raffles, 1830, *Mem. Life Pub. Serv. Sir Thomas Stamford Raffles*, London: 694. Holotype: British Museum (Natural History), probably lost, Sumatra. Neotype: California Academy of Sciences,

CAS-36046, 503 mm TL adult male, 5° 58' S, 106° 48' E, Java Sea, Indonesia, designated by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 24. Also *Chiloscyllium indicum* var. *plagiosa* Günther, 1870, *Cat. Fish. British Mus.*, 8: 412; and *Chiloscyllium indicum* var. *plagiosum* Ogilby, 1888, *Cat. Fish. coll. Aust. Mus. Pt. 1, Recent Palaeichthyan Fishes*, White, Sydney: 8 (new combination), cf. Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 23.

Synonyms: *Scyllium ornatum* Gray, 1830, pl. 98, fig. 2. Name and illustration only. Holotype: British Museum (Natural History), BMNH-1982.2.26.1, 653 mm TL skin, China Seas. Status of holotype confirmed by Dingerkus and DeFino (1983: 24). ?*Scyllium plagiosum* var. *interruptum* Bleeker, 1852: 18. Types: None known according to Eschmeyer (1998: CD-ROM), type locality Batavia (Jakarta) and Semarang (Samarang), Java, Indonesia. *Chiloscyllium margaritiferum* Bleeker, 1863: 243. Also *Chiloscyllium indicum* var. *margaritifera* Günther, 1870: 412. Holotype (both species): Rijksmuseum van Natuurlijke Historie, Leiden, RMNH-7404, 250 mm immature male, Obi Island, Moluccas, Indonesia. Status of holotype confirmed by Dingerkus and DeFino (1983: 24). ?*Chiloscyllium caerulopunctatum* Pellegrin, 1914: 230. Holotype: Museum National d'Histoire Naturelle, Paris, MNHN-14-9, 670 mm TL female, Fort Dauphin [Taolanaro], Madagascar. Status of holotype confirmed by Bass, D'Aubrey and Kistnasamy (1975c: 49, fig. 23); and Dingerkus and DeFino (1983: 24).

Other Combinations: *Hemiscyllium plagiosum* (Bennett, 1830).

FAO Names: En - Whitespotted bamboo shark; Fr - Requin-chabot á taches blanches; Sp - Bamboa punteada.

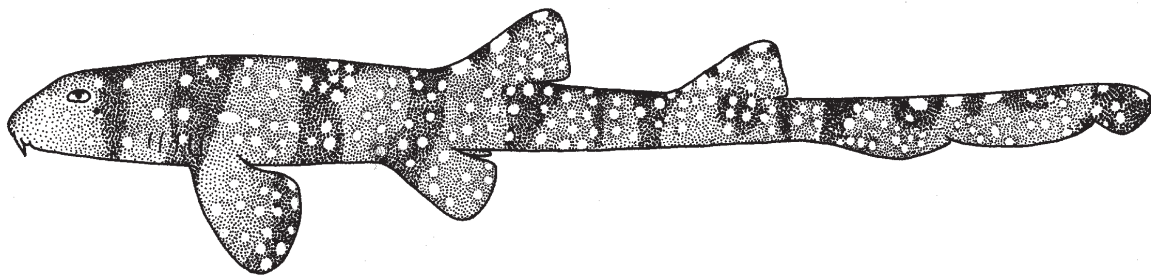


Fig. 141 *Chiloscyllium plagiosum*

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, greatly elongated thick precaudal tail, long and low anal fin just anterior to caudal fin, lateral ridges on trunk, dorsal fins with straight or convex posterior margins, first dorsal-fin origin opposite or just behind pelvic-fin insertions; colour pattern of numerous white or bluish spots and dark spots, dark bands and saddles on a light background.

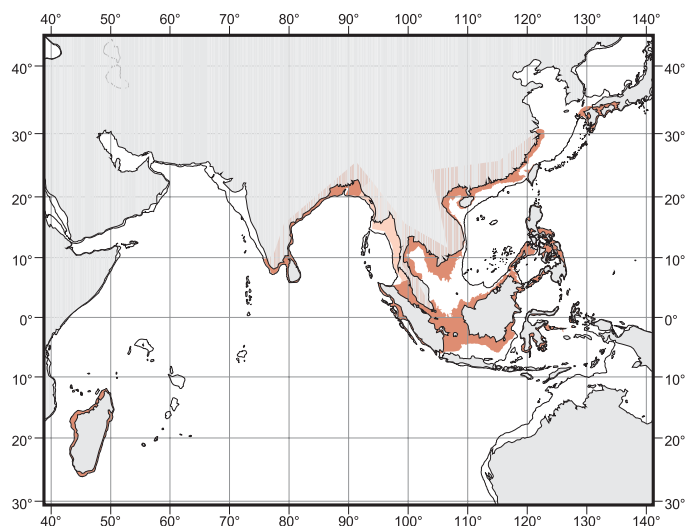
Diagnostic Features: Prepectoral length 15.0 to 19.4% of total length. Snout rounded or truncated anteriorly. Eyes moderately large, lengths 1.4 to 2.2% of total length. Body and tail fairly stout. A lateral ridge present on each side of trunk, and strong predorsal and interdorsal ridges present on midline of back. Interdorsal space short, slightly greater or less than first dorsal-fin base and 9.3 to 11.6% of total length. Snout to vent length 31.1 to 35.1% of total length; distance from vent to tail tip 61.8 to 67.1% of total length. Dorsal fins moderately large and rounded or angular, subequal to or larger than pelvic fins, and without concave posterior margins and projecting free rear tips. First dorsal-fin origin varying from slightly anterior to slightly behind pelvic-fin insertions, first dorsal-fin base slightly longer than second dorsal-fin base, first dorsal-fin height 5.4 to 7.3% of total length. Second dorsal-fin height 4.7 to 6.8% of total length. Origin of anal fin somewhat behind free rear tip of second dorsal fin, anal-fin length from origin to free rear tip somewhat less than hypural caudal lobe from lower caudal-fin origin to subterminal notch, anal-fin base less than six times anal-fin height. Total vertebral count between 161 and 185 (mean = 173.9, n = 8). Intestinal valve count 16 to 17 (n = 2). **Colour:** a prominent pattern of numerous white spots on a dark brown background in juveniles and adults, with small dark spots and darker brown or blackish transverse bands or saddles that are not conspicuously edged with black.

Distribution: Indo-West Pacific: Madagascar, India, Sri Lanka, Malaysia (Sandakan, Sarawak, Borneo), Singapore, Thailand, Indonesia (Obi Island, Moluccas; Manado, Celebes; Sumatra), Viet Nam, China, including Taiwan Island (Province of China), Japan, and Philippines.

Habitat: A little-known inshore bottom shark. Occurs on reefs in the tropics.

Biology: Common but biology poorly known. Nocturnal, rests in reef crevices during the day, but feeds at night. Oviparous. Eats bony fishes and crustaceans.

Size: Maximum total length 95 cm; possible hatchlings or free-living specimens 9.8 to 12.5 cm; adolescent males up to 64 cm, adult males 50 to 83 cm; an adult female 95 cm.



Interest to Fisheries and Human Impact: Interest to fisheries considerable. Regularly taken in inshore fisheries in India, Thailand, China, and utilized for human consumption. Marketed in Madagascar, for human consumption. A particularly handsome and popular aquarium species, kept in public aquaria in Europe and the United States. Conservation status uncertain.

Local Names: Whitespotted bamboo shark, Cat shark; Bluespotted bamboo shark, Requin-chabot à taches bleues, Bamboa estrellada; Ikan tujot matjan (Malaysia, Indonesia); Chalarm hin or Stone shark, Chalarm seour or Tiger shark, Chalarm lye or Striped shark (Thailand); Pan chu sha or Striped bamboo shark, Ta sha (China); Whitespotted cat shark, Catshark, Shiroboshi-tenjiku (Japan).

Remarks: There is a question as to whether *Chiloscyllium caerulopunctatum* Pellegrin, 1914, known from a single specimen from Madagascar, is a valid species or a synonym of the wide-ranging but disjunct *C. plagiosum* from the northern Indian Ocean east to Japan and Philippines. Fowler (1941) synonymized *C. caerulopunctatum* with *C. plagiosum*, but Bass, D'Aubrey and Kistnasamy (1975c) retained it as a valid species without comparing it with *C. plagiosum* or other *Chiloscyllium* species. After comparing the redescription of the holotype of *C. caerulopunctatum* in Bass, D'Aubrey and Kistnasamy (1975c) with specimens of *C. plagiosum* Compagno (1984) tentatively recognized this species as being valid, because it seemed to differ from *C. plagiosum* in having larger dorsal fins, a shorter blunter snout, possibly wider mouth, and a different coloration, with smaller blue rather than white spots and lighter ground colour. Dingerkus and DeFino (1983), in a comprehensive review of the genus, synonymized *C. caerulopunctatum* with *C. plagiosum* without comment. I follow their synonymy here tentatively and with some reluctance, but suggest that a multivariate comparison of specimens of Madagascar "*C. caerulopunctatum*" with *C. plagiosum* from elsewhere (including comparison of vertebral and intestinal valve count as well as morphometrics) is required to resolve the issue. M.-L. Bauchot and G. Bianchi, pers. comm. to Compagno (1984) and Bauchot and Bianchi (1984) noted the presence of *C. caerulopunctatum* in fish markets in Madagascar, confirming Pellegrin's initial record.

Dingerkus and DeFino (1993) mentioned a stuffed specimen of *Chiloscyllium plagiosum* from "Cape Seas, South Africa" collected by Dr A. Smith (British Museum [Natural History] BMNH-1845.7.3.140, 745 mm), but extensive collecting over the past two centuries did not reveal the presence of any *Chiloscyllium* in South Africa. As with Smith's specimen of *C. indicum* from "Cape Seas" the specimen of *C. plagiosum* might have been a waif from the northern Indian Ocean (or Madagascar), but it is possible that the specimen was procured in India or the Far East and shipped to South Africa.

Literature: Garman (1913); Pellegrin (1914); Fowler (1941); Herre (1953); Chen (1963); Bessednov (1969); Bass, D'Aubrey and Kistnasamy (1975c); Gubanov and Schleib (1980); Dingerkus and DeFino (1983); Compagno (1984); Nakaya and Shirai (1984); Bauchot and Bianchi (1984); Michael (1993); Cook and Compagno (1994); M.-L. Bauchot and G. Bianchi, (pers. comm.).

***Chiloscyllium punctatum* Müller and Henle, 1838**

Fig. 142

Chiloscyllium punctatum Müller and Henle, 1838d, *Syst. Besch. Plagiost.*, pt. 1: 18, pl. 3, 4 (pls 4 labelled as *C. griseum*). Holotype: Rijksmuseum van Natuurlijke Histoire, Leiden, probably lost, Java. Neotype: American Museum of Natural History, AMNH-38153, 352 mm TL female, Batavia (Djakarta), Java, Indonesia, designated by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 30. Fowler, 1941, *Bull. U. S. Natl. Mus.*, (100) 13: 85 gave an earlier reference to this species as "*Scyllium punctatum* van Hasselt, *Algemein Konst., Letterbode*, May 1823, p. ___", but this could not be confirmed. Müller and Henle, 1838d, *Syst. Besch. Plagiost.*, pt. 1: 18, list "*Scyllium punctatum*. Kuhl et v. Hasselt" under their new *Chiloscyllium punctatum*.

Synonyms: None.

Other Combinations: *Hemiscyllium punctatum* (Müller and Henle, 1838).

FAO Names: **En** - Brownbanded bamboo shark; **Fr** - Requin-chabot bambou; **Sp** - Bamboa estriada.

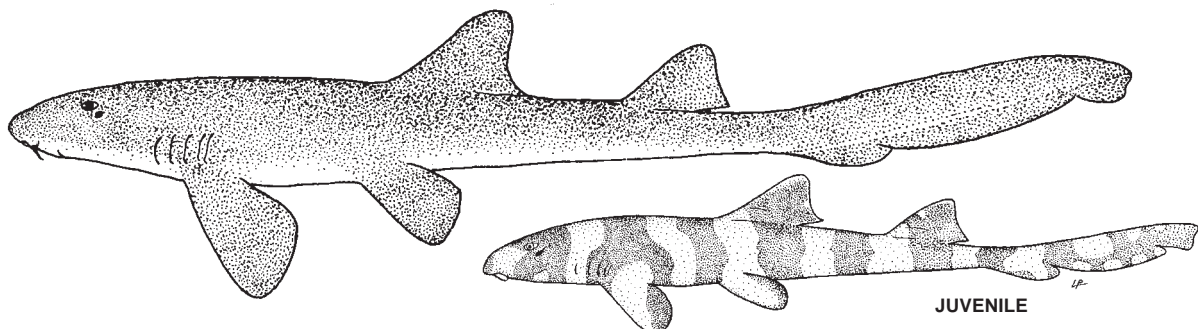


Fig. 142 *Chiloscyllium punctatum*

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, greatly elongated thick precaudal tail, long and low anal fin just anterior to caudal fin, no lateral ridges on trunk, dorsal fins with concave posterior margins and elongated free rear tips, first dorsal-fin origin opposite anterior halves of pelvic-fin bases; usually no colour pattern in adults but young with bold dark transverse bands and a few dark spots.

Diagnostic Features: Prepectoral length 16.2 to 18.4% of total length. Snout rounded anteriorly. Eyes moderately large, lengths 1.5 to 2.4% of total length. Body and tail moderately slender. No lateral ridges on trunk, and predorsal and interdorsal ridges not prominent. Interdorsal space fairly short, slightly greater than first dorsal-fin base and 9.1 to 12.7% of total length. Snout to vent length 32.7 to 35.8% of total length; distance from vent to tail tip 61.1 to 64.4% of total length. Dorsal fins large and angular, larger than pelvic fins, and with concave posterior margins and prominently projecting free rear tips. First dorsal-fin origin varying from slightly anterior to pelvic-fin origins to over anterior halves of pelvic-fin bases, first dorsal-fin base longer than second dorsal-fin base, first dorsal-fin height 6.8 to 9.9% of total length. Second dorsal-fin height 6.4 to 8.4% of total length. Origin of anal fin somewhat behind free rear tip of second dorsal fin, anal-fin length from origin to free rear tip less than hypural caudal lobe from lower caudal-fin origin to subterminal notch, anal-fin base less than six times anal-fin height. Total vertebral count between 136 and 170 (mean = 154.7, n = 6). Intestinal valve count 20 (n = 4). **Colour:** light brown in adults, usually without a colour pattern, but young with broad dark transverse bars and usually a scattering of small blackish spots, bars not prominently edged with black.

Distribution: Indo-West Pacific: India (east coast, Andaman Islands), Malaysia, Singapore, Thailand, Indonesia (Java, Sumatra, Sulawesi, Komodo), Viet Nam, China, Taiwan (Province of China), Japan, Philippines, south coast of New Guinea (Papua-New Guinea and Irian Jaya, Indonesia), north coast of Australia (Northern Territory, Western Australia, Queensland).

Habitat: An inshore bottom shark found on coral reefs, often in tidepools, on tidal flats, and on reef faces, but probably also present on soft bottom offshore. Found in the intertidal down to at least 85 m.

Biology: A common shark but not often seen; young hide in crevices at the bases of coral heads, and adults under table corals. Very tenacious of life, can survive out of water for a long period (half a day). Oviparous, eggs deposited in rounded egg cases about 11 by 5 cm. Feeds on bottom invertebrates and possibly small fishes, but biology little-known despite its abundance in some parts of its range. Gills sometimes infested by larval isopods (*praniza*-larvae of the isopod *Gnathia*).

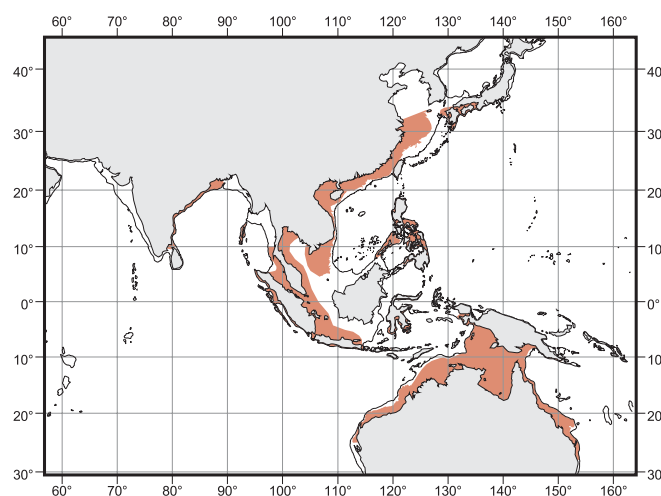
Size: Maximum total length about 105 cm; hatchlings about 13 to 17 cm; adult males about 68 to 76 cm; an adult female 62.9 cm.

Interest to Fisheries and Human Impact: Regularly taken in inshore fisheries in India, Thailand, probably Singapore, Malaysia, and Philippines, and utilized for human food. It was seen in large numbers by the writer in the fish market at Samut Sakon, near Bangkok, Thailand, in 1993. In Australia it is taken in beach seines and on hook-and-line and is said to prefer squid bait; it is little utilized but regarded as good eating. It may nip divers if provoked. It also is taken in the aquarium trade and displayed in numerous public aquaria in Australia, Canada, Mexico, Europe, and the United States; breeds in captivity. The live young are particularly handsome, with brilliant black and whitish bands on the body and fins. Conservation status uncertain.

Local Names: Brownbanded bamboo shark, Gray carpet shark, Brown-banded catshark or Cat shark, Brownbanded catshark, Spotted catshark, Brown-banded bamboo shark, Brownspotted catshark, Inuzame (Japan).

Remarks: Müller and Henle (1839) listed "*Scyllium punctatum* Kuhl and van Hasselt" under their *Chiloscyllium punctatum*, but I was unable to examine Kuhl and van Hasselt's account of their species and so could not determine if *Scyllium punctatum* as proposed by Kuhl and van Hasselt was a valid species and not a *nomen nudum*. As per Dingerkus and DeFino (1983) and Compagno (1984), Müller and Henle's account is retained as the first valid description of this species. Fowler (1967a:103) termed this species *Chiloscyllium russellianum*, because the *Squalus (Scyliorhinus) russellianus* of Blainville (1816) was "assumed as based on Bokee sorah Russell, F. of Coromandel I 1803, 10 pl. 16. Vizagapatam, India". However, Fowler (1941) had previously hesitated to replace the extensively-used *C. punctatum* with Blainville's *nomen nudum*.

Literature: Garman (1913); Smith (1913); Whitley (1940); Herre (1953); Stead (1963); Marshall (1964); Gubanov and Schleib (1980); Whitley and Pollard (1980); Dingerkus and DeFino (1983); Compagno (1984); Nakaya and Shirai (1984); Michael (1993); Last and Stevens (1994); Cook and Compagno (1994).



<i>Hemiscyllium</i> Müller and Henle, 1837

Genus: *Hemiscyllium* Müller and Henle, in Smith, 1837, *Proc. Zool. Soc. London*, 5: 86 (name only, with one species, "*Squalus ocellatus* Bloch", equals *Squalus ocellatus* Bonnaterre, 1788); Müller and Henle, 1838a, *Mag. Nat. Hist., new ser.*, 2: 34 (definition, no species); Müller and Henle, 1838c, *Arch. Naturg.*, 4: 83 (definition, one species, *Squalus ocellatus*); Müller and Henle, 1838d, *Syst. Besch. Plagiost.*, pt. 1: 16 (definition, one species, *Hemiscyllium ocellatum*).

Type Species: *Squalus ocellatus* Bloch and Schneider, 1801, by monotypy, equals *S. ocellatus* Bonnaterre, 1788; also by subsequent designation of Gill, 1862b, *Ann. Lyceum Nat. Hist. New York*, 7(32): 408, as "*Hemiscyllium ocellatum* Müll. and Henle".

Number of Recognized Species: 5 or possibly 6.

Synonyms: None.

Diagnostic Features: Snout relatively short, preoral length less than 3% of total length. Eyes and supraorbital ridges well elevated. Nostrils virtually terminal on snout tip. Nasal barbels very short, length less than 1.3% of total length. Mouth slightly closer to snout tip than to eyes. Lower labial folds not connected across chin by a dermal fold. Pregill length less than 13.3% of total length. Preanal tail from vent to anal-fin origin usually more than 38% of total length. Pectoral and pelvic fins thick and heavily muscular. Pectoral-fin skeleton with propterygium fused to mesopterygium. Total vertebral count usually more than 180 centra and up to 195. Colour pattern with large black or dusky epaulette spots on shoulders above pectoral fin, sometimes partially merged with dark shoulder-saddle.

Local Names: Epaulette sharks, Speckled cat sharks, Yu tadek (Malaysia).

Remarks: The arrangement of this genus follows Whitley (1940, 1967), Fowler (1941), Compagno (1984) and the revision by Dingerkus and DeFino (1983). Data published in Dingerkus and DeFino suggests that *Hemiscyllium* species cannot be readily distinguished by vertebral count, morphometrics or differences in fin and body shape but are easily distinguishable by coloration. Coloration does, however, vary with growth as in *Chiloscyllium*, and changes in colour pattern can be dramatic. Two of the five described species are known only from adults and subadults (*H. strahani* and *H. trispeculare*), and the juvenile colour pattern remains to be described for them.

Dingerkus and DeFino (1983: 54, fig. 37) reported a juvenile *Hemiscyllium* (USNM-123025, 148 mm female) from Amsterdam Island, Irian Jaya, New Guinea, Indonesia, that is of uncertain identity. It is distinguished by broad dark transverse stripes on a white background, a partial dark hood covering the region of the eyes and spiracles but not the snout, and a large black saddle blotch extending from the gills to the back and flank just behind the pectoral fins. It could be an undescribed species as it does not agree with the juvenile colour patterns of *H. freycineti*, *H. hallstromi* or *H. ocellatum*. Alternatively, it may represent the juvenile colour pattern of *H. strahani* (or, much less likely, *H. trispeculare*). In either case the colour change with growth would be more extreme than those of other members of the genus. Resolution of the problem awaits further collections of *Hemiscyllium* from New Guinea.

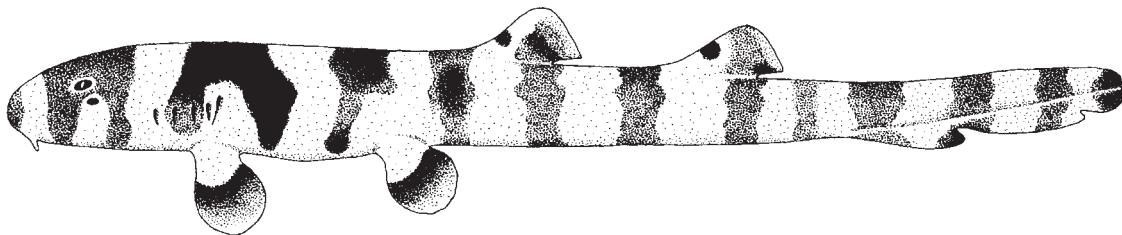


Fig. 143 *Hemiscyllium* sp.

There is an outlier record of a *Hemiscyllium* from Seychelles (Dibelius, 1993: 15, as the "Seychelles bamboo shark", *H. cf. ocellatum*; and Dibelius, pers. comm.), of an adult male specimen photographed by a diver (Norbert Wu) and far west of any other records of the genus. This has no black hood-marking and has a few scattered small to large dark spots on the preorbital snout, no white spots, large and small scattered black spots on the head, body and tail, a large conspicuous black epaulette spot with a light margin, smaller black spots around the epaulette-spot, numerous large spots on the pectoral and pelvic fins, and spots and possibly dark bands on the underside of the tail. It matches *H. freycineti* and *H. trispeculare* in the key below by having spots on the preorbital snout, but does not quite agree with either of them in coloration. It is closest in coloration to *H. freycineti* but differs in having a more prominent epaulette spot and spots and banding on the underside of the tail. It also resembles *H. hallstromi* and differs from *H. ocellatum* in having mostly large dark spots on its body, but differs from both in its spotted preorbital snout, spotted pectoral fins and spotted and banded tail. It is said to reach about 100 cm and was photographed at a depth of 20 to 30 m on coral branches (Dibelius, 1993). The record probably represents an undescribed species of *Hemiscyllium* but its status needs to be confirmed by collection and deposition of material in a museum collection.

Key to Species:

1a. Prebranchial head and snout with an abrupt black hood or mask, black spots and bands on the underside of the head; black epaulette spots of shoulder partially merged with black shoulder saddle; body and fins with numerous, conspicuous small to large white spots (Fig. 144) ***Hemiscyllium strahani***

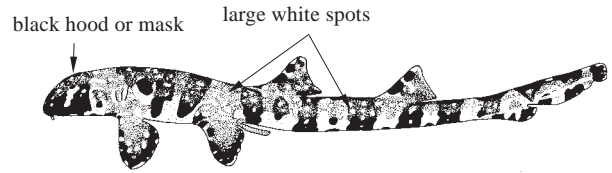


Fig. 144 *Hemiscyllium strahani*

1b. Head and snout light to dusky, without a black hood, underside of head uniformly light; black epaulette spots of shoulder strongly marked; white spots inconspicuous or absent on fins and body → 2

2a. Preorbital snout with numerous dark spots (Fig. 145) → 3

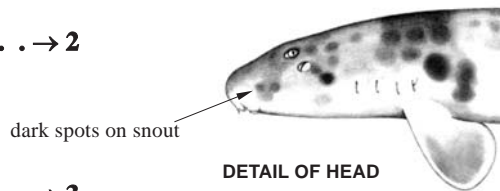


Fig. 145

2b. Preorbital snout uniformly light, without spots (Fig. 146) → 4

3a. Dark spots on preorbital snout mostly less than half eye length, body and fins covered with numerous small and large dark spots that form a reticular network of light background colour between them; black epaulette spot of shoulder large, in the form of a conspicuous white-ringed ocellus with a central large black spot and two curved black marks surrounding the posterior half of the spot (Fig. 147) ***Hemiscyllium trispeculare***

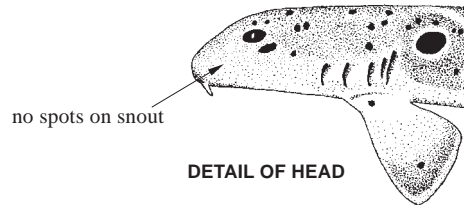


Fig. 146

3b. Dark spots on preorbital snout mostly subequal to eye length, dark spots on body and fins mostly large and sparse, not forming a reticular network of light background colour; black epaulette spots of shoulder small to moderately large, not in the form of a conspicuous white-ringed ocellus, dark ocellar spot without curved black marks surrounding its posterior half (Fig. 148) ***Hemiscyllium freycineti***

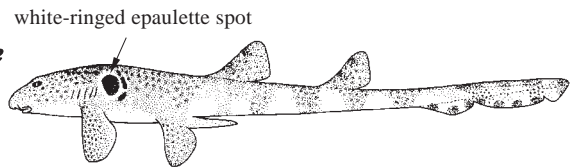


Fig. 147 *Hemiscyllium trispeculare*



Fig. 148 *Hemiscyllium freycineti*

4a. All spots on body distinctly smaller than epaulette spot; epaulette spot not surrounded by large black spots (Fig. 149) ***Hemiscyllium ocellatum***

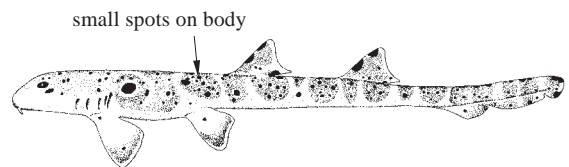


Fig. 149 *Hemiscyllium ocellatum*

4b. Some body spots subequal to or larger than epaulette spot; epaulette spot surrounded by large black spots (Fig. 150) ***Hemiscyllium hallstromi***



Fig. 150 *Hemiscyllium hallstromi*

Hemiscyllium freycineti* (Cuvier, 1824)*Fig. 151**

Scyllium freycineti Cuvier, in Quoy and Gaimard, 1824, *Zoologie, Poissons, in L. de Freycinet, Voyage aut. monde l'uranie et la physicienne*. Syntypes: Museum National d'Histoire Naturelle, Paris, MNHN-A.7792, 323 mm TL male, and MNHN-B.2962, 290 mm TL male, Waigiou (Waigeo), Indonesia. MNHN-A.7792 designated as lectotype by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 38.

Synonyms: *Scyllium malaisianum* Lesson, 1830: 94. pl. 6. Lectotype: Museum National d'Histoire Naturelle, Paris, MNHN-7767, 685 mm TL, baie d'Offack, Waigiou, Irian Jaya, Indonesia, type status verified by Dingerkus and DeFino (1983: 38); designated as lectotype by Eschmeyer (1998: CD-ROM). *Chiloscyllium malaianum* Müller and Henle, 1838d: 20. Holotype: Museum National d'Histoire Naturelle, Paris, 73 cm (calculated from quoted length of 27 in, assuming 27 mm per contemporary German inch) specimen, "Meerbusen von Offack. Insel Waigiou", possibly MNHN-7767 (see above). Also *Hemiscyllium malayanum* Bleeker, 1852: 6 (variant spelling).

Other Combinations: *Chiloscyllium freycineti* (Cuvier, 1824).

FAO Names: **En** - Indonesian speckled carpet shark; **Fr** - Requin-chabot grivelé; **Sp** - Bamboa jaspeada.

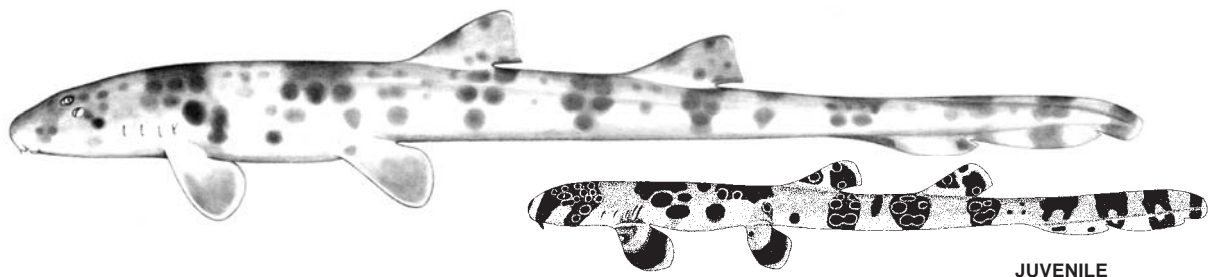


Fig. 151 *Hemiscyllium freycineti*

Field Marks: Mouth well in front of eyes, spineless dorsal fins far posterior on tail, extremely elongated thick pre-caudal tail, long and low anal fin just anterior to caudal fin, large dark spots on snout, dark wide-spaced spots on body, a moderately large black spot on flanks above pectoral fins, no black hood or white spots.

Diagnostic Features: Colour: prebranchial head and snout without a black hood; underside of head uniformly light and without dark spots in adults, but with two broad dark bands in young; several small to large dark spots mostly subequal to eye length present on preorbital snout. Black epaulette spot of shoulder moderately large, not in the form of a conspicuous white-ringed ocellus, nor with two or more additional round or oblong dark spots surrounding the posterior half of the epaulette spot. White spots absent from fins and body; fins and body covered with small to large and sparse dark spots that do not form a reticular network of light background colour between them; pectoral and pelvic fins with conspicuous dark webs and light margins in young, changing to scattered small and large dark spots in adults. Dark saddles on dorsal surface and sides of tail extending as dark crossbands onto ventral surface of the preanal tail (from pelvic-fin bases to anal-fin origin) in young, but saddles and crossbands are lost in adults which have uniform light ventral surfaces on their preanal tails.

Distribution: Western South Pacific: Indonesia (Irian Jaya, Waigeo), Papua New Guinea (Trobriand Islands from Kuia Island, Milne Bay, and east of Oro Bay).

Habitat: A little-known bottom shark, occurs on coral reefs, on sand, and in seagrass in shallow water.

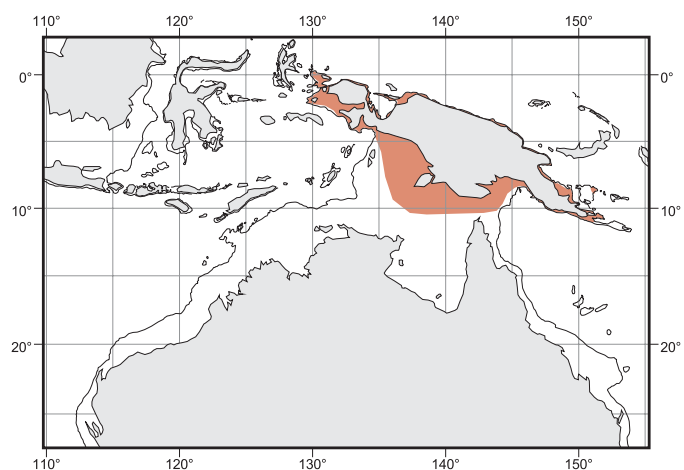
Biology: Common in parts of New Guinea. Biology poorly known. It hides in reef crevices during the day and feeds at night.

Size: To at least 72 cm total length. Smallest freelifving individual recorded 18.7 cm; males maturing between 37 and 62 cm; adult female 72.2 cm.

Interest to Fisheries and Human Impact: Interest to fisheries none at present. It is not known if this shark is being affected by the aquarium trade. Its conservation status urgently needs to be assessed because part of its limited range is being impacted by expanding fisheries, including dynamite and poison fisheries that are destroying coral reefs, and possibly localized toxic pollution from riverine mining activities.

Local Names: Freckled carpet shark.

Literature: Garman (1913); Fowler (1941); Dingerkus and DeFino (1983); Compagno (1984); Michael (1993).



Hemiscyllium hallstromi* Whitley, 1967*Fig. 152**

Hemiscyllium hallstromi Whitley, 1967, *Australian Zool.*, 14(2): 178. Syntypes: Australian Museum, Sydney, AMS-I.15717-001, 730 mm adult male, and AMS-I.15584-001, 765 mm TL adult male, vicinity of Port Moresby, Papua-New Guinea. AMS-I.15717-001 designated as lectotype by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 40.

Synonyms: None.

Other Combinations: None.

FAO Names: En - Papuan epaulette shark; Fr - Requin-chabot épaulette; Sp - Bamboa hombrera.

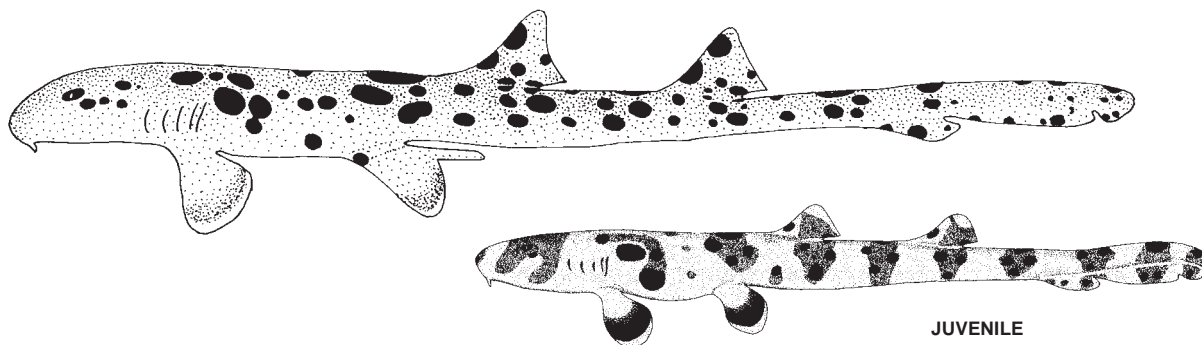


Fig. 152 *Hemiscyllium hallstromi*

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, extremely elongated thick precaudal tail, long and low anal fin just anterior to caudal fin; no dark spots on snout, dark wide-spaced spots on body, a conspicuous large black ocellar spot on flanks above pectoral fins, surrounded by smaller black spots, no black hood or white spots.

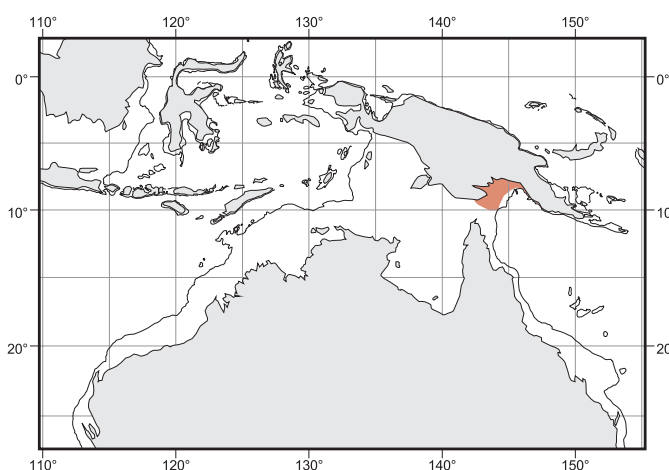
Diagnostic Features: **Colour:** prebranchial head and snout without a black hood; underside of the head uniformly light and without dark spots; preorbital snout without spots. Black epaulette spot of shoulder strongly marked, large, in the form of a conspicuous white-ringed ocellus and two or three large round black spots surrounding the posterior and dorsal part of the ocellus. White spots absent from fins and body; body and unpaired fins with small to large dark spots, some as large as epaulette spot, dark spots loose-set and not forming a reticular network of light background colour between them; pectoral and pelvic fins with conspicuous black webs and light margins in young, fading in adults to dusky, no light or dark spots on paired fins. Dark saddles on dorsal surface and sides of tail extending as dark crossbands onto ventral surface of preanal tail in young, but saddles and crossbands lost in adults which have uniform light ventral surfaces on their preanal tails.

Distribution: Western South Pacific: Papua-New Guinea (Port Moresby Area, Torres Strait, Murray Island).

Habitat: A little-known inshore bottom shark, possibly on coral reefs.

Biology: Essentially unknown. A 188 mm specimen (Australian Museum, Sydney, AMS IB.7938) was reported by Dingerkus and DeFino (1983: 40) as having been "born in the Taronga Zoo Park Aquarium; received 1967 (one of the syntypes was father)", but they did not specify if the species was ovoviviparous rather than oviparous as with other hemiscylliids.

Size: To about 77 cm total length. Smallest freelifving specimen 18.8 cm; males maturing between 47.6 and 63.9 cm; two adult males 73.0 and 76.5 cm.



Interest to Fisheries and Human Impact: Interest to fisheries none at present. It is not known if this shark is being affected by the aquarium trade. Its conservation status urgently needs to be assessed because of its rarity and restricted range. It is not known if it is being affected by pollution or destructive fisheries practices such as dynamiting or poisoning of coral reefs.

Literature: Whitley (1967); Dingerkus and DeFino (1983); Compagno (1984).

Hemiscyllium ocellatum* (Bonnaterre, 1788)*Fig. 153**

Squalus ocellatus Bonnaterre, 1788, *Tabl. Encyclop. Method. Trois Reg. Nat., Ichthyol.*, Paris: 8. Holotype: Museum National d'Histoire Naturelle, Paris, MNHN-1003, 353 mm TL (immature) male, "La mer du sud", vicinity of Cookstown, Queensland, Australia. Status of type confirmed by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 40.

Synonyms: *Squalus oculatus* Banks and Solander in Gray, 1827: 436. Holotype: Museum National d'Histoire Naturelle, Paris, MNHN-1003, 353 mm TL (immature) male, vicinity of Cooktown, Queensland, Australia. Status of type confirmed by Dingerkus and DeFino (1983: 40).

Other Combinations: *Scyllium ocellatum* (Bonnaterre, 1788), *Hemiscyllium oculatum* (Gray, 1827).

FAO Names: **En** - Epaulette shark; **Fr** - Requin-chabot ocellé; **Sp** - Bamboa ocelada.

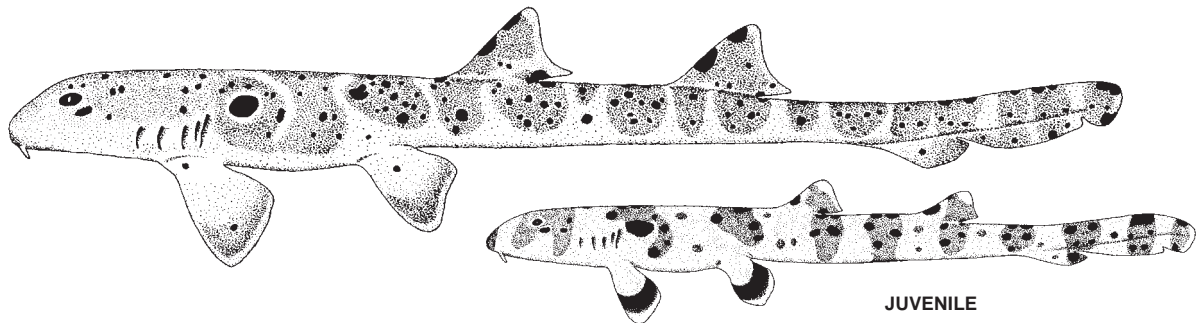


Fig. 153 *Hemiscyllium ocellatum*

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, extremely elongated thick precaudal tail, long and low anal fin just anterior to caudal fin; no spots on snout, small dark wide-spaced spots on body, a conspicuous white-ringed black ocellus, without surrounding black spots, on flanks above pectoral fins, no black hood or white spots.

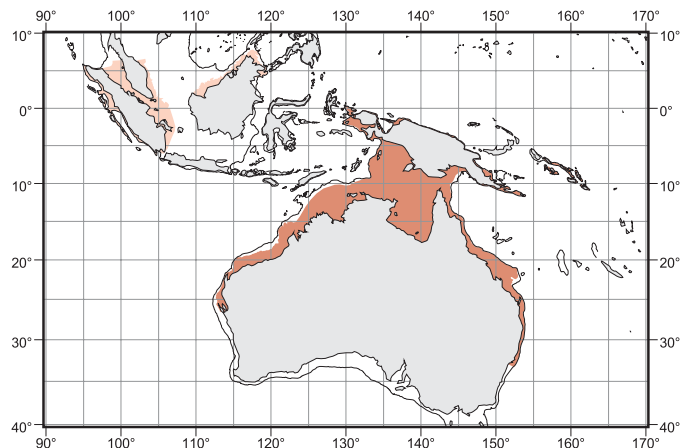
Diagnostic Features: **Colour:** prebranchial head and snout without a black hood; underside of the head uniformly light and without dark spots; preorbital snout without spots. Black epaulette spot of shoulder strongly marked, large, in the form of a conspicuous white-ringed ocellus, with scattered and inconspicuous small dark spots surrounding the posterior and dorsal part of the epaulette spot. White spots absent from fins and body; body and unpaired fins with small to medium-sized dark spots that are much smaller than the epaulette spot, dark spots loose-set and not forming a reticular network of light background colour between them; pectoral and pelvic fins with conspicuous black webs and light margins in young, fading in adults, sometimes a few small dark spots on paired fins of adults. Dark saddles on dorsal surface and sides of tail extending as dark crossbands onto ventral surface of preanal tail in young, but saddles and crossbands lost in adults which have uniform light ventral surfaces on their preanal tails.

Distribution: Western South Pacific: New Guinea (Papua New Guinea and Irian Jaya, Indonesia), Australia (Northern Territory, Western Australia, Queensland, New South Wales), Solomon Islands, possibly also Malaysia and Sumatra.

Habitat: An abundant, small, harmless tropical shark found on coral reefs in shallow water, often in tidepools and sometimes in water barely covering it. It prefers staghorn coral stands on reef faces, coral flats, and tide pools.

Biology: Particularly common on the Great Barrier Reef, where it can be seen crawling and clambering about and swimming on the bottom. It is more active after dark, particularly at dusk, but also coordinates its activities with tidal cycles, preferring to feed when the tide is out. It is unafraid of people and will come up to the feet of a 'reef-fossicker' (a person picking over a coral reef) and pick up small food items disturbed by the person. When disturbed it may make frantic attempts to find shelter under coral debris and in crevices, but is apparently satisfied, like the ostrich myth, if its head and pectoral region is covered and its tail is exposed. When captured and firmly held by hand the epaulette shark squirms violently without being able to escape, but may nip its captor.

Oviparous, eggs taking about 120 days to hatch. The male grabs the female by her pectoral fin while mating.



Eats primarily polychaete worms and small decapod crabs (Xanthidae, Portunidae and Ocypodidae), but also pistol shrimps (Alpheidae), mantis shrimps (Stomatopoda), amphipods, and teleost fishes (including dragonettes, Callyonimidae); also shelled molluscs. Young eat more worms, small fishes and amphipods than adults, which eat more crabs and shrimps, while adults eat larger crabs than young. While hunting for food it swims near the bottom, and may stop, and wave its snout back and forth over sandy bottom to locate prey (possibly using both electroreception and olfaction). In shallow water on sandy patches between coral heads the epaulette shark may arch its body, force its snout into the sand, and vigorously thrash its tail out of water while seeking and rooting out prey, then stops and masticates its catch.

This species is frequently infested with *praniza* larvae of gnathiid isopods. The parasites have a preference for the cloaca and clasper regions, but are also found in the buccal and branchial cavities. Heupel and Bennett (1999) believe the parasites do not adversely affect the health of the host.

Size: Maximum total length about 107 cm. Hatchlings are about 15 cm long; smallest freelifving specimen recorded at 16.7 cm; males maturing between 59 and 62 cm, with immature or adolescents up to 62 cm and adults as small as 59 cm; an adult female was 64.3 cm.

Interest to Fisheries and Human Impact: Interest to fisheries limited at present. Its importance to the aquarium trade needs to be assessed. It is a popular aquarium shark and is displayed in numerous public aquaria in Australia, Canada, and the United States. The conservation status of this shark is uncertain, but at least part of its habitat is protected in Australia. It is one of the sharks observed by divers and reef-fossickers on the Great Barrier Reef. It may nip people when provoked.

Local Names: Epaulette shark, Itar shark.

Remarks: Although this species has been reported from a fairly wide range in the Indo-Australian Archipelago, the review of Dingerkus and DeFino (1983) listed specimens only from Australia (mostly from Queensland but also northwestern Australia and New South Wales) and Solomon Islands. Last and Stevens (1994) mapped its distribution as including tropical Australia and both coasts of New Guinea. Nominal records from Malaysia and Sumatra (Stead, 1963) need confirmation.

Literature: Garman (1913); Whitley (1940); Fowler (1941); Stead (1963); Marshall (1964); Whitley and Pollard (1980); Grant (1982); Dingerkus and DeFino (1983); Compagno (1984); Michael (1993); Last and Stevens (1994); Heupel and Bennett (1998, 1999).

***Hemiscyllium strahani* Whitley, 1967**

Fig. 154

Hemiscyllium strahani Whitley, 1967, *Australian Zool.*, 14(2): 176, fig. 1. Holotype: Australian Museum, Sydney, AMS-IB.7938, 735 mm adult female, vicinity of Port Moresby, New Guinea. Status of type confirmed by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 46.

Synonyms: None.

Other Combinations: None.

FAO Names: En - Hooded carpet shark; Fr - Requin-chabot moine; Sp - Bamboa capuchona.

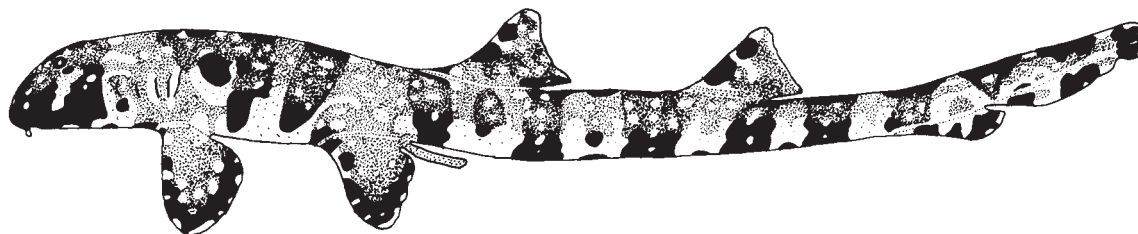


Fig. 154 *Hemiscyllium strahani*

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, extremely elongated thick precaudal tail, long and low anal fin just anterior to caudal fin; white spots on body, and unique black hood on head.

Diagnostic Features: Colour: juvenile coloration unknown; prebranchial head and snout of adults with a unique black 'executioner's hood'; black spots and bands present on the underside of the head; no discrete small dark spots on snout. Black epaulette spot of shoulder partially merged with black shoulder saddle, no white ring or posterior curved spots surrounding it. Body and fins with numerous, conspicuously small to large white spots on dark saddles and blotches; no reticular network of fine dark spots on body and fins; pectoral and pelvic fins with conspicuous black webs and white-spotted margins and webs. Dark saddles on dorsal surface and sides of preanal tail extending onto ventral surface.

Distribution: Western South Pacific: Papua-New Guinea (Port Moresby area and Massas (Masas) Island).

Habitat: A little-known inshore bottom shark of singular and unique appearance, found on coral reefs on reef faces and flats and favouring areas with abundant hard corals. It may occur down to 18 m deep but Michael (1993) mostly observed it at depths of 3 to 13 m.

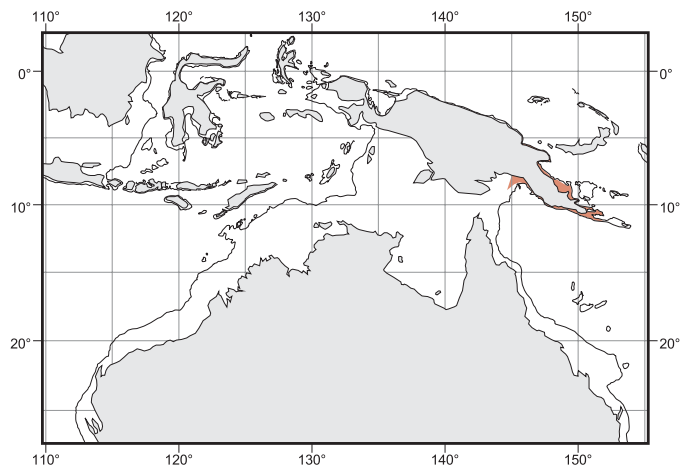
Biology: Apparently moderately common but with biology little-known. It is nocturnal, and hides in crevices and under table corals during the day. The holotype survived seven years in the Taronga Park Zoo aquarium among a breeding colony of *Hemiscyllium ocellatum*, but it apparently did not hybridize with them.

Size: To about 80 cm total length. Formerly known only from two adult museum specimens (Dingerkus and DeFino, 1983), an adult male 59.4 cm long and an adult female 73.5 cm. Michael (1993) observed this species on night dives and reported specimens 75 to 80 cm long.

Interest to Fisheries and Human Impact: Interest to fisheries none at present. It is not known if this very attractive little shark is being affected by the aquarium trade. Its conservation status urgently needs to be assessed because of its rarity and because its limited range could be subject to problems including destructive reef fisheries and localized toxic pollution.

Remarks: Dingerkus and DeFino (1983) reported a juvenile *Hemiscyllium* from Irian Jaya, Indonesia, that is of uncertain identity but could be the young of this species (see discussion above).

Literature: Whitley (1967); Dingerkus and DeFino (1983); Compagno (1984); Michael (1993).



***Hemiscyllium trispeculare* Richardson, 1843**

Fig. 155

Hemiscyllium trispeculare Richardson, 1843, *Icones Piscium, Pl. Rare Fish*: 5, pl. 1, fig. 2. Holotype: Apparently not saved, Turtle Island, northwest Australia. Neotype: British Museum (Natural History), BMNH-1953.5.10.1, 576 mm adult male, northwestern Australia, the basis of a redescription of this species by Richardson, 1846, *Zool. Erebus Terror*, 2, Fishes: 43-44, pl. 28, and designated as neotype by Dingerkus and DeFino, 1983, *Bull. American Mus. Nat. Hist.*, 176(1): 51.

Synonyms: None.

Other Combinations: *Chiloscyllium trispeculare* (Richardson, 1843).

FAO Names: **En** - Speckled carpet shark; **Fr** - Requin-chabot marqu terie; **Sp** - Bamboa moteada.

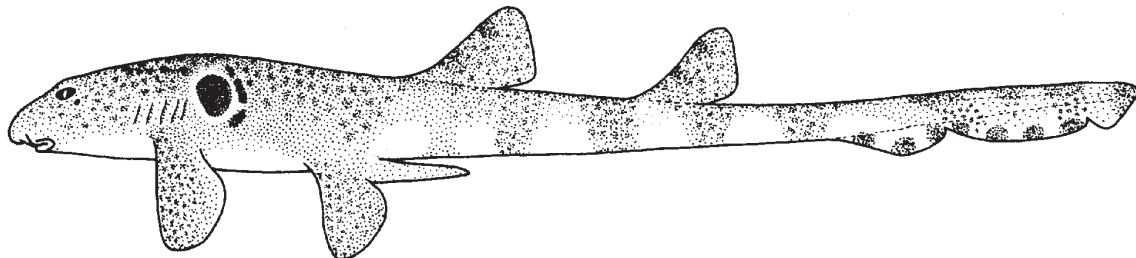


Fig. 155 *Hemiscyllium trispeculare*

Field Marks: Mouth well in front of eyes; spineless dorsal fins far posterior on tail, extremely elongated thick precaudal tail, long and low anal fin just anterior to caudal fin; small dark spots on snout, numerous dark close-set spots forming a reticular pattern on body, a conspicuous white-ringed large black ocellus on flanks above pectoral fins, partly surrounded by smaller black spots, no black hood or white spots.

Diagnostic Features: **Colour:** juvenile coloration unknown; prebranchial head and snout of adults without a black hood; underside of the head uniformly light and without dark spots; numerous small dark spots mostly less than half eye length present on preorbital snout. Black epaulette spot of shoulder strongly marked, large, in the form of a conspicuous

white-ringed ocellus and two curved black marks surrounding the posterior half of the spot. White spots absent from fins and body; fins and body covered with numerous small and large, densely spaced dark spots that form a reticular network of light background colour between them; pectoral fins with dusky webs and numerous small dark spots. Dark saddles on dorsal surface and sides of preanal tail extending as dark crossbands onto ventral surface.

Distribution: Western South Pacific: ?Indonesia (Moluccas), Australia (Northern Territory, Western Australia, Queensland).

Habitat: A tropical continental shelf shark that is found on coral reefs in shallow water, including tide pools.

Biology: A common small shark, with biology poorly known. Often observed under table corals.

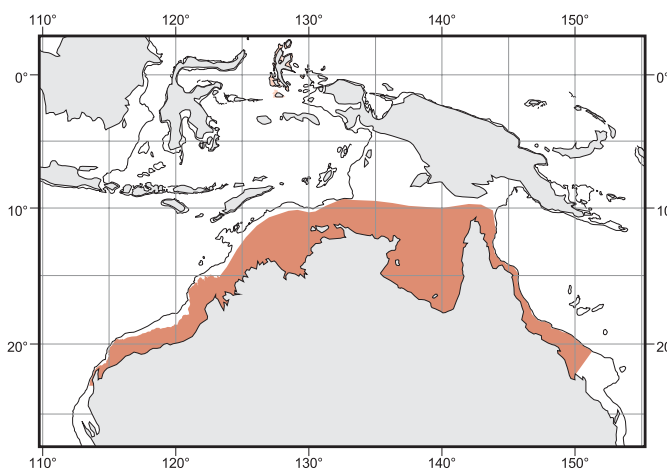
Size: Maximum total length 79 cm. Size at hatching unknown; adult males 57 to 64 cm total length; adult female 56 cm. Possibly a smaller species than *H. ocellatum*.

Interest to Fisheries and Human Impact: Interest to fisheries none at present. The importance of this shark to the aquarium trade needs to be assessed. The conservation status of this shark is uncertain, but at least part of its habitat is protected in Australia.

Local Names: Speckled carpet shark, Speckled catshark or Cat shark.

Remarks: Indonesian (Moluccas) records of this species need confirmation.

Literature: Garman (1913); Fowler (1941); Stead (1963); Whitley and Pollard (1980); Grant (1982); Dingerkus and DeFino (1983); Compagno (1984); Michael (1993); Last and Stevens (1994).



2.3.5 Family STEGOSTOMATIDAE

Family: Subfamily Stegostomatinae Gill, 1862b, *Ann. Lyceum Nat. Hist. New York*, 7(32): 407, 408 (Family Scylliorhinoidea Gill, 1862). Also subfamily Stegostomatinae Fowler, 1934, *Proc. Acad. Nat. Sci. Philadelphia*, 85: 239 (Family Orectolobidae).

Type Genus: *Stegostoma* Müller and Henle, 1837.

Number of Recognized Genera: 1.

Synonyms: Family Stegostomatidae Applegate, 1974: 748. Type genus: *Stegostoma* Müller and Henle, 1837. Independently proposed as a family. Family Stegostomatidae Last and Stevens, 1994: 138. Apparent error for Stegostomatidae.

FAO Names: **En** - Zebra sharks; **Fr** - Requins zébrés; **Sp** - Tiburones acebrados.

Diagnostic Features: Head broad, conical and somewhat flattened, without lateral flaps of skin. Snout very broadly rounded or truncated. Eyes laterally situated on head and without strong subocular ridges below them. Eyes without movable upper eyelids or subocular pockets and ridges. Spiracles large and subequal to eyes, without prominent raised external rims; spiracles behind but not below eyes. Gill slits small, fifth gill slit overlapping fourth; internal gill slits without filter screens. Nostrils with short pointed barbels but without circumnarial folds and grooves around incurrent apertures. Nasoral grooves long and strongly developed. Mouth moderately large, nearly transverse and subterminal on head. Lower lip trilobate and with lateral orolabial grooves connecting edge of lip with medial ends of lower labial furrows, no longitudinal symphyseal groove on chin. Lower labial furrows ending medially far lateral to symphysis, not connected medially by a mental groove or groove and flap. Teeth not strongly differentiated in upper and lower jaws, with symphyseal teeth not enlarged nor fang-like. Tooth row count 28 to 33/22 to 32. Teeth with a strong medial cusp, a pair of short lateral cusplets, and weak labial root lobes. Teeth orthodont with a central pulp cavity and no plug of osteodentine. Body cylindrical, with strong ridges on sides. Precaudal tail shorter than body. Caudal peduncle without lateral keels or precaudal pits. Pectoral fins large, broad and rounded. Pectoral fins semiplesodic and with fin radials partly expanded into fin web. Pectoral propterygium small and separate from mesopterygium and metapterygium; pectoral-fin radial segments three to nine, and with longest distal segments up to 1.3 times the length of longest proximal segments. Pelvic fins smaller than first dorsal fin but larger than

second dorsal fin and as large or larger than anal fin, much smaller than pectorals and with anterior margins 0.4 to 0.6 times the pectoral-fin anterior margins. Claspers poorly known but probably without mesospurs, claws or dactyls. Dorsal fins with second dorsal much smaller than first. First dorsal-fin origin expanded well ahead of pelvic-fin origins and with insertion about over pelvic-fin bases. Anal fin larger than second dorsal fin, with broad base, angular apex, origin about opposite second dorsal-fin midbase or insertion, and insertion separated by a space or narrow notch much less than base length from lower caudal-fin origin. Caudal fin greatly elongated horizontally and not crescentic, weakly heterocercal with its upper lobe at a low angle above the body axis; dorsal caudal-fin margin about half as long as the entire shark. Caudal fin with a strong terminal lobe and subterminal notch but without a ventral lobe, preterminal and postterminal margins not differentiated and forming a continuous curve. Vertebral centra with well-developed radii. Total vertebral count 207 to 243, monospondylous precaudal count 43 to 49, diplospondylous precaudal count 38 to 50, diplospondylous caudal count 120 to 154, and precaudal count 81 to 101. Cranium broad and expanded laterally. Medial rostral cartilage moderately long and not reduced to a low nubbin. Nasal capsules elevated and not greatly depressed or fenestrated, internarial septum moderately high and slightly compressed. Orbits with small foramina for preorbital canals, medial walls not fenestrated around the optic nerve foramina. Supraorbital crests present on cranium and laterally expanded and pedicellate. Suborbital shelves moderately broad and not greatly reduced. Cranial roof solid, without a continuous fenestra from the anterior fontanelle to the parietal fossa. Basal plate of cranium with a pair of stapedial foramina widely separated from medial carotid foramina. Adductor mandibulae muscles of jaws with two divisions. Preorbitalis muscles extending onto posterodorsal surface of cranium. No anterodorsal palpebral depressor, rostromandibular, rostronuchal or ethmonuchal muscles. Valvular intestine of ring type with 18 turns. Development oviparous. Size large with adults between 147 and 233 cm and exceptionally over 300 cm total length while young are hatched at about 20 to 36 cm. A unique colour pattern of black saddles with light lines in young, changing to dark spots on a light background in juveniles and adults.

Remarks: The arrangement of this family follows Compagno (1973, 1984) and Applegate (1974), in recognizing a monotypic family Stegostomatidae for the highly distinctive zebra shark, *Stegostoma fasciatum* (Herman, 1783). Dingerkus (1986) included *Stegostoma* in an aggregate family Rhincodontidae for 'higher' orectoloboids (also including *Rhincodon*, *Pseudoginglymostoma*, *Ginglymostoma* and *Nebrius*) but the earlier arrangement is followed here pending further work on the interrelationship of orectoloboids. Dingerkus (1986) suggested that *Stegostoma* was the immediate sister group of the whale shark, *Rhincodon*, while Compagno (1988) suggested that *Stegostoma* was either the immediate sister group of *Pseudoginglymostoma* or of a group comprising *Rhincodon* plus *Ginglymostoma* and *Nebrius*.

The present account follows most previous researchers in recognizing a single species of zebra shark. At least one early author, Gmelin (1788), apparently recognized separate species on the strikingly distinct juvenile (*Squalus tigrinus*) and subadult-adult (*S. longicaudatus*) colour patterns respectively. However, the zebra shark needs to be subjected to detailed morphological and biochemical comparisons over its vast range, to determine if it is a single species.

The earliest name for the zebra shark is *Squalus varius* Seba, 1758, which has been used by various writers (Garman, 1913; Klausewitz, 1960; and Bass, D'Aubrey and Kistnasamy, 1975a) as *Stegostoma varium*. However, an examination of Seba's (1758) descriptions of fishes showed that his nomenclature was haphazardly uninomial, binomial, and polynomial, although the name of the zebra shark could be construed as binomial: "Squalus varius; naribus ori proximis; foraminibus pare oculos; spiraculis utrinque quaternis; cauda longifilis." (Seba, 1758).

In addition to the above name and diagnosis, Seba includes a long, accurate Latin description of the zebra shark, and a legend caption in French for a good illustration of a juvenile zebra shark with barred colour pattern (Seba, 1758, pl. 34, no. 1). I did not use Seba's name previously (Compagno, 1984) or here for this shark because his nomenclature was not consistently binomial, and the first valid usage of the name "varius" is *Stegostoma varium* Garman, 1913. The International Commission on Zoological Nomenclature would have to make a special ruling to make the name available. Extensive usage of *Stegostoma fasciatum*, *S. tigrinum*, and other names for the zebra shark in the literature make such an action unnecessary in the writer's estimation.

***Stegostoma* Müller and Henle, 1837**

Genus: *Stegostoma* Müller and Henle, 1837a, *Ber. K. preuss. Akad. wiss. Berlin*, 2: 112.

Type Species: *Squalus fasciatus* Bloch and Schneider, 1801, by original designation, equals *Squalus fasciatus* Hermann, 1783.

Number of Recognized Species: 1.

Synonyms: Genus *Stegostonea* Regan, 1929: 293. Probable error for *Stegostoma* Müller and Henle, 1837. Genus *Stegastoma* Herre, 1934: 10. Probable error for *Stegostoma* Müller and Henle, 1837. Genus *Stegastoma* Last and Stevens, 1994: 138. Apparent error for *Stegostoma* Müller and Henle, 1837.

Diagnostic Features: See family Stegostomatidae above.