

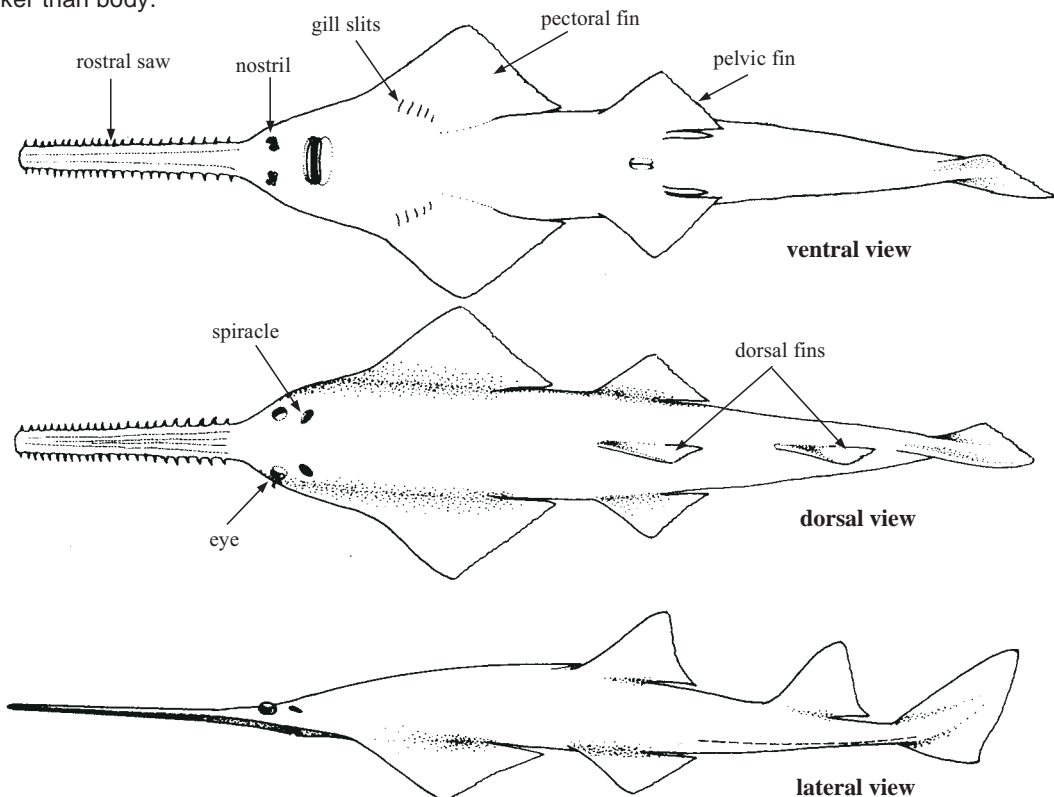
Order PRISTIFORMES

PRISTIDAE

Sawfishes

by L.J.V. Compagno and P.R. Last

Diagnostic characters: Large to gigantic shark-like batoids (adults reaching 2.4 to 5 m total length or more, with specimens of 6 to 8 m or more reported). Body covered with tiny dermal denticles or placoid scales; no enlarged denticles, thorns, or spines on dorsal surface of trunk or tail. Trunk moderately depressed, thick and shark-like. Precaudal tail moderately depressed, with lateral ridges on sides, tail not abruptly narrower than trunk, no barbed sting (stinger or stinging spine) on dorsal surface of tail behind dorsal fins and no electric organs in tail. Head narrow, but moderately depressed; snout supported by a stout rostral cartilage, **greatly elongated into a flat, narrow blade or rostral saw with a single row of large, transverse teeth on each side** that grow continuously from their bases; saw without small teeth or paired dermal barbels on its underside and without smaller teeth between the large ones on its sides; posteriormost rostral teeth well anterior to nostrils. Five small gill slits on underside of front half of pectoral-fin bases, not visible in lateral view; no gill sieves or rakers on internal gill slits. Eyes dorsolateral on head and well anterior to spiracles. Mouth transverse and straight, without knobs and depressions. **Nostrils well anterior and completely separated from mouth**, far apart from each other and not connected to the mouth by nasoral grooves; anterior nasal flaps short, not connected with each other and not reaching mouth. Oral teeth very small, rounded-oval in shape and without cusps on their crowns, not laterally expanded and plate-like, similar in shape and in 60 or more rows in either jaw. **Pectoral fins small, originating well behind mouth, attached to posterior part of head over gills, and ending well anterior to pelvic-fin origins.** No large electric organs at bases of pectoral fins. Pelvic fins angular, not divided into anterior and posterior lobes. **Two large equal-sized and widely separated dorsal fins present**, these of similar angular or rounded-angular shape with distinct apices, anterior, posterior, and inner margins, and well-developed free rear tips, varying in shape from triangular to strongly falcate. First dorsal-fin base far anterior and over junction between trunk and tail, over or partially in front of the pelvic fins. **Caudal fin large, shark-like, strongly asymmetrical**, with vertebral axis raised above body axis; lower caudal lobe strong to weak, or absent. **Colour:** dorsal surface yellowish, brownish or grey-brown, or greenish above and on flanks, white below, no prominent markings on body or fins though fins may be darker than body.

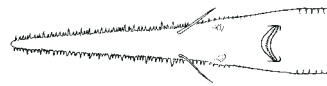


Habitat, biology, and fisheries: Sawfishes are a small group of inshore tropical batoids of circumglobal distribution in warm-temperate to tropical shallow, inshore continental waters, often in muddy enclosed bays, in estuaries, off river mouths, and off large continental islands, and in fresh water in rivers and lakes. They are slow but strong-swimming bottom-dwellers, resting on soft mud or sandy bottoms, but also swimming just above it or well off it near the surface. All species are ovoviviparous as far as is known, with fetuses having large yolk sacks. They feed on invertebrates and small schooling fishes which are stunned and disabled before ingestion by lateral swipes of the toothed saw. The saw can also be used for digging up invertebrates in soft bottoms. Sawfishes are mostly caught as bycatches of small local inshore and fresh-water fisheries (although targeted fisheries have occurred in places such as Lake Nicaragua where they were extremely abundant) and can be captured in a variety of gear including gill and trammel nets, beach seines, longlines, handlines, and bottom trawls. They are mostly inoffensive to people, but can inflict injuries on fishermen who try to remove large, live struggling individuals from their gear. Their meat is utilized fresh, dried-salted and frozen for human consumption, and their dried saws are in demand as curiosities for tourists. Sawfishes have declined greatly in numbers in several areas, including parts of the Western Central Pacific. They have restricted habitats close inshore and in fresh water, and are extremely vulnerable to gill nets and other widely-utilized fishing gear. Sawfishes may be endangered or critically endangered by overexploitation and habitat degradation (including problems from dam-building), and may require CITES protection in the near future to restrict their trade use.

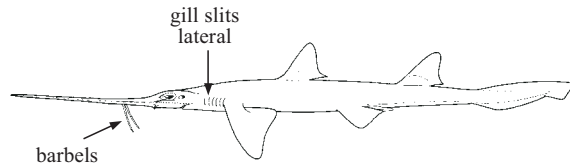
Similar families occurring in the area

No other batoids in the area have a rostral saw, and no other batoids in the area, except the Rhinobatidae and Rhinidae, are shark-like in appearance.

Sawsharks (Pristiophoridae, a family of sharks), also occur in the area, but mostly do not overlap sawfishes in habitat because they occur in deeper offshore waters and in more temperate regions. They also have a rostral saw, but differ from the sawfishes in having: the gill openings lateral on the head and anterior to the pectoral-fin bases; a longer, slenderer, and less depressed trunk; the first dorsal-fin origin behind the pelvic fins, a rostral saw with numerous small and medium-sized teeth between the larger rostral teeth; rostral teeth that do not grow but are periodically replaced; lines of rostral teeth on the underside of the rostrum; small lateral rostral teeth that extend posteriorly to below the eyes; and a pair of conspicuous long, ventral rostral barbels.



ventral view of head



Pristiophoridae (Sawfishes)

Key to the species of Pristidae occurring in the area

- 1a. Posteriormost teeth on rostral saw well anterior to base of saw; rostral teeth greatly flattened, blade-like, and triangular, with single sharp anterior and posterior edges in adults and a posterior barb in young; broad incurrent grooves on underside of snout between edges of head and nostril incurrent apertures; nostrils long, narrow, and diagonal, anterior nasal flaps small and narrow; pectoral fins narrow-based, high and short; first dorsal fin with origin over or slightly posterior to pelvic-fin insertions; a secondary caudal keel below the first one on the caudal-fin base; caudal fin with a shallow subterminal notch and a long, prominent ventral lobe *Anoxypristis cuspidata*
- 1b. Posteriormost tooth on rostral saw just anterior to base of saw; rostral teeth moderately flattened, elongated, and peg or awl-like, with rounded anterior edge and double posterior edges with a groove between them in adults of all species and young of some species (*Pristis microdon*); no incurrent grooves on underside of snout between edges of head and nostril incurrent apertures; nostrils short, broad, and transverse, anterior nasal flaps large and broad; pectoral fins broad-based, low, and long; first dorsal fin with origin anterior, over or somewhat posterior to pelvic-fin origins but ahead of pelvic-fin insertions; no secondary caudal keel below the main one on the caudal-fin base; caudal fin without a subterminal notch and with ventral lobe short or absent (*Pristis*) → 2

- 2a.** Caudal fin with a short but conspicuous ventral lobe; origin of first dorsal fin considerably anterior to pelvic-fin origins *Pristis microdon*
- 2b.** Caudal fin without definite ventral lobe; origin of first dorsal fin varies from over or slightly anterior to pelvic-fin origins, to slightly behind midbases of pelvic fins → **3**
- 3a.** Origin of first dorsal fin over or anterior to pelvic-fin origins (20 to 32, usually 25 or more, pairs of rostral teeth) *Pristis pectinata*
- 3b.** Origin of first dorsal fin behind pelvic-fin origins → **4**
- 4a.** First dorsal-fin origin posterior to midbases of pelvic fins; 23 to 34 pairs of rostral teeth; size to 610 cm or more. *Pristis zijsron*
- 4b.** First dorsal-fin origin anterior to the midbases of pelvic fins; 18 to 22 pairs of rostral teeth; size possibly to about 140 cm *Pristis clavata*

List of species occurring in the area

The symbol ◆ is given when species accounts are included.

- ◆ *Anoxypristis cuspidata* (Latham, 1794)
- ◆ *Pristis clavata* Garman, 1906
- ◆ *Pristis microdon* Latham, 1794
- ◆ *Pristis pectinata* Latham, 1794
- ◆ *Pristis zijsron* Bleeker, 1851

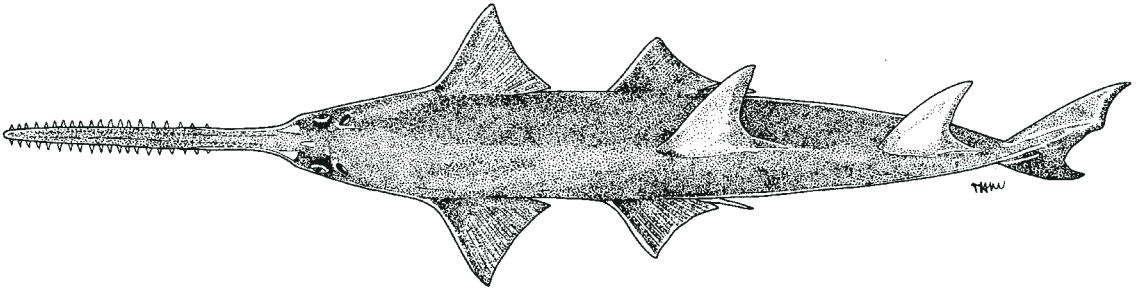
References

- Annandale, N. 1909. Report on the fishes taken by the Bengal fisheries steamer "Golden Crown". Part I: Batoidei. *Mem. Ind. Mus.*, 2:1-60.
- Last, P.R. and J.D. Stevens. 1994. *Sharks and rays of Australia*. Australia, CSIRO, 512 p.
- Monkolprasit, S. 1984. The cartilaginous fishes (class Elasmobranchii) found in Thai waters and adjacent areas. Thailand, Kasetsart Univ., 175 p.

Anoxypristis cuspidata (Latham, 1794)

Frequent synonyms / misidentifications: None / ?*Pristis zijsron* Bleeker, 1851.

FAO names: En - Narrow sawfish.

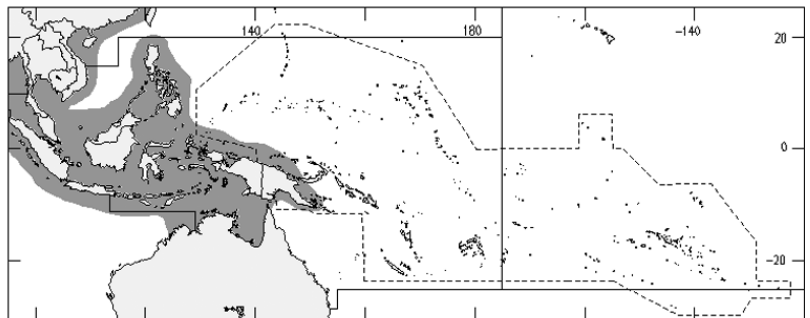


Diagnostic characters: A moderate-sized sawfish (adult at 240 to 470 cm); rostral saw with 16 to 29 pairs of teeth, counts vary individually, regionally, and by sex (males averaging less than females). **Posterior-most teeth on rostral saw well anterior to base of saw.** Rostrum with sides divergent anteriorly but nearly parallel posteriorly, rostrum very slender, width at posteriormost tooth 10 to 12 in length to base. **Rostral teeth greatly flattened, blade-like, and triangular**, posterior edges with a single edge and no groove in adults and subadults and with a small but prominent barb in young. Interspace between posteriormost 2 rostral teeth 4 to 9 times space between first 2 rostral teeth. **Broad incurrent grooves on underside of snout** connecting edges of head and incurrent apertures of nostrils. **Nostrils long, narrow, and diagonal**, anterior nasal flaps small and narrow. Pectoral fins narrow-based, high and short, and shark-like in shape. First dorsal-fin base well posterior on base of precaudal tail, with origin over or slightly posterior to pelvic-fin insertions. **A secondary caudal keel below the first one on the caudal-fin base.** **Caudal fin with a shallow subterminal notch and a long, prominent ventral lobe.** **Colour:** grey above, white or greyish below, fins dusky, young dark grey, adults much paler and with greenish tinge.

Size: Maximum total length at least 470 cm, with larger specimens of 550 to 610 cm unconfirmed and possibly not based on this species; females can be pregnant at 246 to 282 cm but are recorded up to 470 cm; one male adolescent at only 166 cm and males (maturity not reported) reaching at least 245 cm; size at birth about 43 to 61 cm.

Habitat, biology, and fisheries: Apparently close inshore in the intertidal to a depth of 40 m, frequents river deltas and estuaries, also said to penetrate well up rivers in India, Myanmar, and Thailand, but its occurrence in fresh water needs to be verified. A common or formerly common inshore species, possibly more active and less benthic than *Pristis* sawfishes because of its more streamlined shark-like form, smaller shark-like pectoral fins, stouter tail, and semilunate caudal fin. Described as thrashing about violently and vigorously when captured. Diet little known, feeds on small fish and cuttlefish. Ovoviviparous, litters from 6 to 23, lower in small females, young born in spring. Caught in bottom trawls, in fixed bottom gill nets, and probably with line gear. In the area it was regularly taken in inshore fisheries off Thailand, and utilized for human consumption.

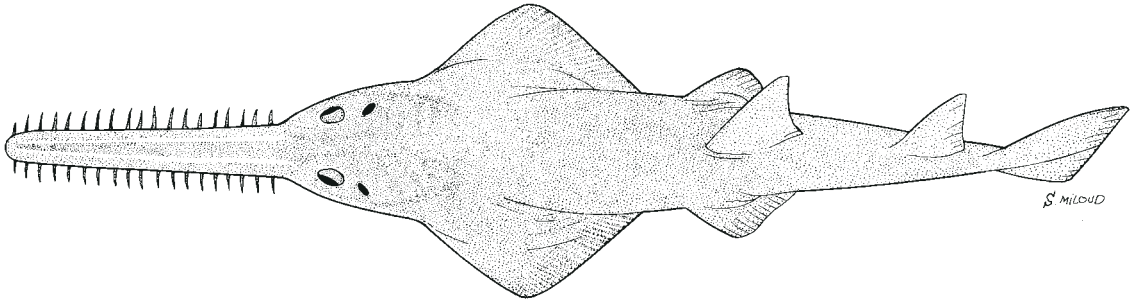
Distribution: Confined to the Indo-West Pacific, from the Red Sea, Persian Gulf, Pakistan, India, Sri Lanka, Andaman Islands, Myanmar, Malaysia, Thailand, Singapore, Indonesia, Viet Nam, southern China, Taiwan Province of China, Korea, southern Japan, Philippines, New Guinea, and Australia (Northern Territories and Queensland).



Pristis clavata Garman, 1906

Frequent synonyms / misidentifications: ?*Pristis pristis* (Linnaeus, 1758) / *Pristis pectinata* Latham, 1794.

FAO names: En - Dwarf sawfish.



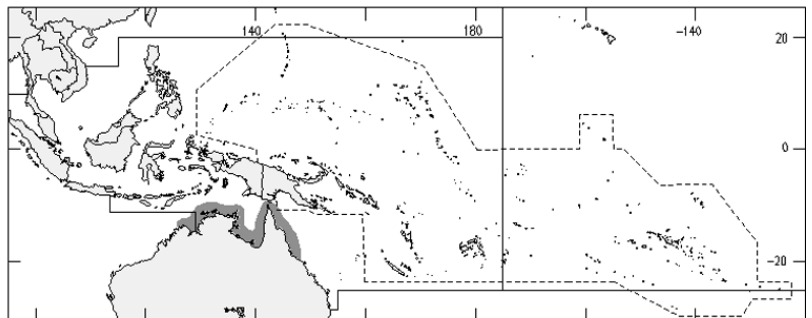
(after Last and Stevens, 1994)

Diagnostic characters: Said to be a small sawfish (less than 250 cm total length), but size at maturity unknown. **Rostral saw with 18 to 22 pairs of teeth.** Posteriormost tooth on rostral saw just anterior to base of saw. **Rostrum with sides slightly divergent posteriorly;** rostrum moderately broad and stout, width at posteriormost tooth 6 in length to base. **Rostral teeth moderately flattened, elongated, and peg or awl-like,** with double edges and a groove on the posterior margin at younger stages and without a barb in young. **Interspace between posteriormost 2 rostral teeth twice the space between first 2 rostral teeth.** No incurrent grooves on underside of snout between edges of head and nostril incurrent apertures. Nostrils short, broad and transverse, anterior nasal flaps large and broad. Pectoral fins broad-based, long but relatively low. **First dorsal fin with origin about opposite or slightly behind pelvic-fin origins** and insertion far posterior to pelvic-fin origins. No secondary caudal keel below the main one on the caudal-fin base. **Caudal fin without a subterminal notch or a short ventral lobe.** **Colour:** greenish brown or yellowish above, white below, fins paler.

Size: Maximum total length at least 140 cm, possibly larger.

Habitat, biology, and fisheries: Inshore and intertidal, occurs in estuaries and on tidal mudflats and ascends rivers for a short distance in brackish water, but currently not known from pure fresh water. A locally common bottom dweller with biology little known. Fishing gear and utilization in the area not recorded.

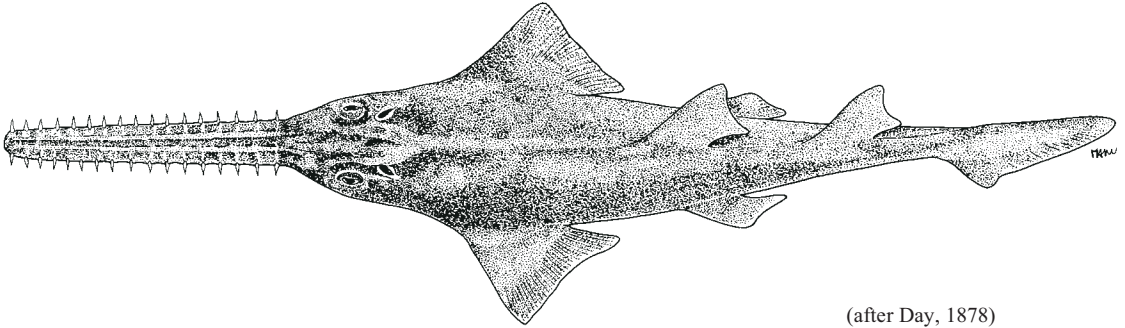
Distribution: As presently known to be confined to tropical Australia (Queensland, Western Australia, and Northern Territory), but possibly with a wider Indo-West Pacific range. A nominal record from Canary Islands in the eastern Atlantic may not be this species, but the sketchily known *Pristis pristis* from the eastern Atlantic is similar and needs comparison to determine if the 2 species are distinct.



Pristis microdon Latham, 1851

Frequent synonyms / misidentifications: ?*Pristis perotteti* Müller and Henle, 1841; ?*Pristis zephyreus* Jordan and Starks in Jordan, 1895; ?*Pristis leichhardti* (Whitley, 1945) / None.

FAO names: En - Largetooth sawfish.



(after Day, 1878)

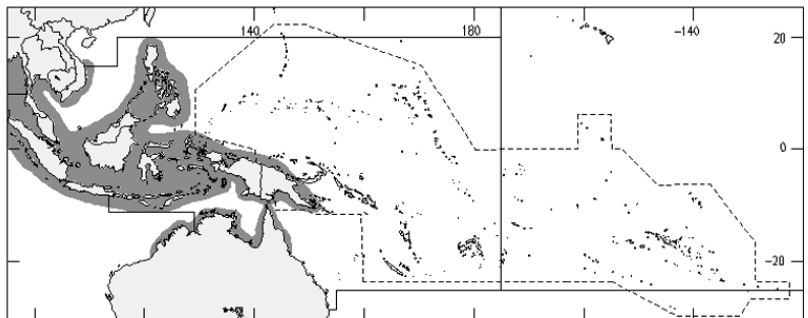
Diagnostic characters: A large sawfish (adult at over 250 cm); **rostral saw with 14 to 23 pairs of teeth**, varying regionally, sexually (males average more teeth than females), and individually. Posteriormost tooth on rostral saw just anterior to base of saw. **Rostrum with sides markedly divergent posteriorly; rostrum broad and stout**, width at posteriormost tooth 5 to 6 in length to base. **Rostral teeth moderately flattened, elongated, and peg or awl-like**, with double edges and a groove on the posterior margin at all stages and without a barb in young. **Interspace between posteriormost 2 rostral teeth 1 to 2 times space between first 2 rostral teeth.** No incurrent grooves on underside of snout between edges of head and nostril incurrent apertures. Nostrils short, broad, and transverse, anterior nasal flaps large and broad. Pectoral fins broad-based, long but relatively high. **First dorsal fin with origin well anterior to pelvic-fin origins** and insertion close behind pelvic-fin origins. No secondary caudal keel below the main one on the caudal-fin base. **Caudal fin without a subterminal notch but with a short ventral lobe.** **Colour:** yellow to greyish above, white below, fin webs yellow-brown.

Size: Maximum total length between 600 and 700 cm, definitely known to reach 656 cm, maturing between 240 and 300 cm in the western Atlantic; size at birth about 76 cm.

Habitat, biology, and fisheries: Inshore and intertidal, and wide-ranging in fresh-water rivers and lakes. A common or formerly common, sluggish inshore and fresh-water bottom dweller, more closely associated with fresh water than any other sawfish. Probably breeds in fresh water, feeds on small fishes and bottom invertebrates. Biology little known in the area. In the western Atlantic, it has 1 to 11 young per litter; gestation period about 5 months. Age at maturity is about 10 years with a lifespan of 30 years in western Atlantic. Utilization in the area little known, but probably is or was commonly caught by inshore fisheries. Apparently declining catastrophically in several areas, and possibly adversely affected by fisheries and habitat modification by human activities.

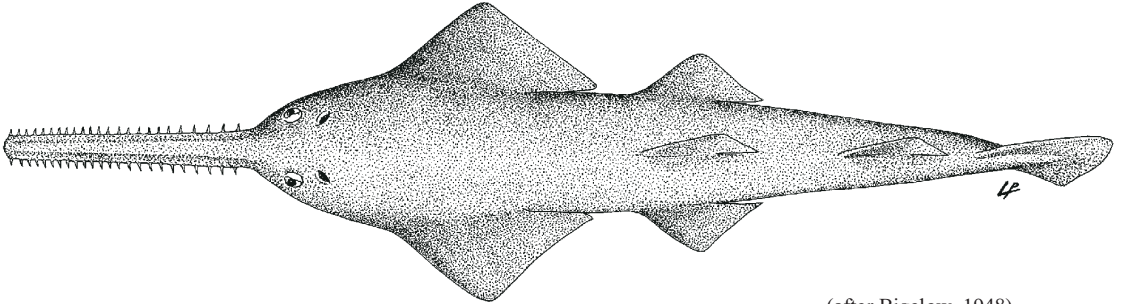
Distribution: Essentially circumtropical in all warm seas and in tropical and warm-temperate rivers and lakes; penetrates far up tropical rivers. In the Indo-West Pacific ranges from South Africa to Mozambique, Madagascar, Malawi, Tanzania, Réunion Is., India, Malaysia, Cambodia, Thailand, Indonesia (Java, Borneo, Sumatra), Viet Nam, Philippines (Luzon), New Guinea, and Australia (Western Australia, Northern Territory, and Queensland). Also Atlantic and eastern Pacific, if *Pristis perotteti* and *P. zephyreus* are synonymized with this species.

Remarks: The original description of *P. microdon* did not give a locality, but most authors have used the name *P. microdon* for Indo-West Pacific sawfishes of this species group as contrasted by the Atlantic *P. perotteti* and eastern Pacific *P. zephyreus*. The status of these species is uncertain.



Pristis pectinata Latham, 1794

Frequent synonyms / misidentifications: None / *Pristis zijsron* Bleeker, 1851; *P. clavata* Garman, 1906.
FAO names: En - Smalltooth sawfish.



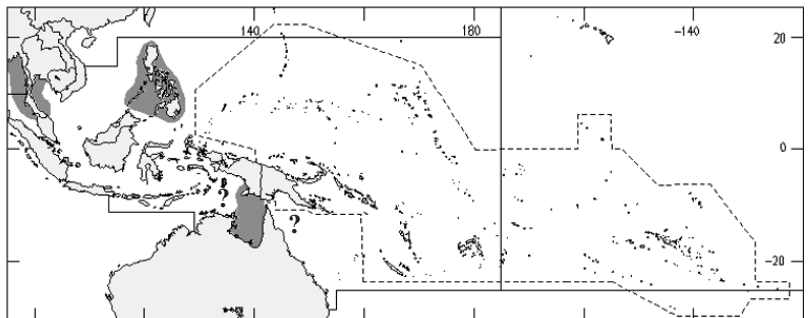
(after Bigelow, 1948)

Diagnostic characters: A large sawfish (adult at over 400 cm); **rostral saw usually with 25 to 29 pairs of teeth, but ranging from 20 to 32.** Posteriormost tooth on rostral saw just anterior to base of saw. **Rostrum with sides nearly parallel and relatively narrow, width at posteriormost tooth 6 to 8 in length to base. Rostral teeth moderately flattened, elongated, and peg or awl-like, with double edges and a groove on the posterior margin in adults but smooth and without a barb in young. Interspace between posteriormost 2 rostral teeth 2 to 4 times space between first 2 rostral teeth.** No incurrent grooves on underside of snout between edges of head and nostril incurrent apertures. Nostrils short, broad and transverse, anterior nasal flaps large and broad. Pectoral fins broad-based, low, and long. **First dorsal fin with origin slightly anterior to pelvic-fin origins** but with insertion well behind pelvic-fin origins. No secondary caudal keel below the main one on the caudal-fin base. **Caudal fin without a subterminal notch and with no ventral lobe. Colour:** grey, sometimes bluish on sides, white, or yellowish below.

Size: Maximum total length at least 554 cm in the western Atlantic, possibly to 610 cm or even 760 cm; female pregnant at 458 cm; size at birth about 61 cm.

Habitat, biology, and fisheries: Inshore and intertidal to a depth of a few metres, but may cross deep water to reach offshore islands; also ascends rivers and can readily tolerate fresh water. A common or formerly common sawfish in the Atlantic; status uncertain in the area. A sluggish inshore bottom dweller, migratory in higher latitudes. Uses its saw to stir the bottom when feeding on bottom invertebrates, and slashes sideways with its saw to kill schooling pelagic fish. 15 to 20 young per litter, pupping grounds in inshore marine waters and in fresh water, probably reproducing all year round in the tropics but during the spring and summer in higher latitudes and not at all at the northernmost periphery of its range. Utilization in the area little known. In the western Atlantic, the young are eaten and large specimens are occasionally hooked by anglers or harpooned, but not regularly sought as a game fish. Formerly regarded as a problem because it damages net gear when caught. Numbers have catastrophically declined off the USA.

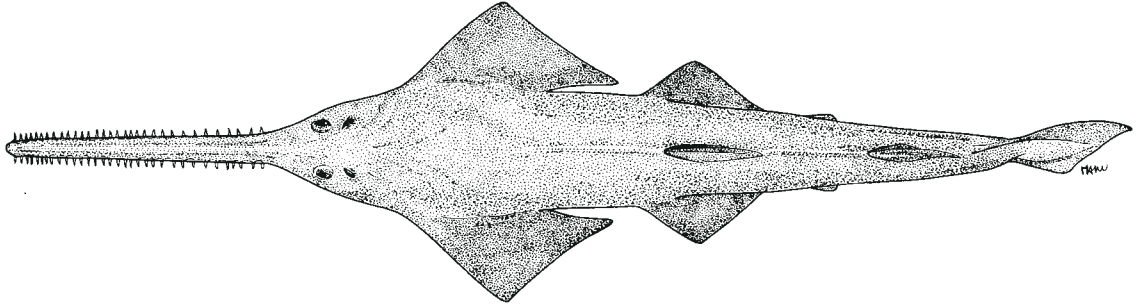
Distribution: Circumglobal in most warm-temperate to tropical, continental inshore seas, and in lakes and rivers. In the Indo-West Pacific nominally from Mozambique and South Africa, Madagascar, the Red Sea, Oman, Pakistan, India, Sri Lanka, Myanmar, possibly Thailand, Philippines, and possibly tropical Australia (Northern Territory); described as a separate species (*Pristis anandalei*) from India (status uncertain). Few Indo-West Pacific records have been substantiated by specimens or by identifiable accounts (India and southern Africa are possible exceptions), and at least some records (from the Red Sea and southern Africa) were based on *P. zijsron*. Also Atlantic, possibly Mediterranean Sea, and eastern Pacific.



Pristis zijsron Bleeker, 1851

Frequent synonyms / misidentifications: None / *Pristis pectinata* Latham, 1794.

FAO names: En - Longcomb sawfish.



Diagnostic characters: A large sawfish (adult at over 400 cm); **rostral saw with 23 to 34 pairs of teeth.** Posteriormost tooth on rostral saw just anterior to base of saw. **Rostrum with sides nearly parallel posteriorly; rostrum slender,** width at posteriormost tooth 7 to 10 in length to base. **Rostral teeth moderately flattened, elongated, and peg or awl-like,** with double edges and a groove on the posterior margin in adults but smooth and without a barb in young. **Interspace between posteriormost 2 rostral teeth 2 to 7 times space between first 2 rostral teeth.** No incurrent grooves on underside of snout between edges of head and nostril incurrent apertures. Nostrils short, broad and transverse, anterior nasal flaps large and broad. Pectoral fins broad-based, low and long. **First dorsal fin with origin somewhat posterior to pelvic-fin origins but ahead of pelvic-fin insertions.** No secondary caudal keel below the main one on the caudal-fin base. **Caudal fin without a subterminal notch and with no ventral lobe.**
Colour: greenish brown or olive above, white below.

Size: Maximum total length possibly 730 cm or more; males mature at 430 cm.

Habitat, biology, and fisheries: Inshore and intertidal to a depth of at least 5 m, known from fresh water in Indonesia (Borneo, Java, and Ternate), Australia, and possibly Thailand. A common or formerly common, sluggish inshore bottom dweller, often sits on the bottom with saw elevated at an angle to the body axis. Utilization in area little known, presumably utilized for human consumption. Caught in gill nets, trawls, and probably other net gear, can be a problem to fishers attempting to remove large live individuals from fishing gear. Apparently declined catastrophically off South Africa and possibly in parts of the present area.

Distribution: Confined to the Indo-West Pacific, from the Red Sea, South Africa, Mozambique, Persian Gulf, Gulf of Oman, Iran, Pakistan, India, Sri Lanka, Myanmar, Malaysia, Cambodia, Thailand, Indonesia, Viet Nam, southern China, New Guinea, and Australia (South and Western Australia, Northern Territory, Queensland, and New South Wales).

