

## Cartilaginous fish: Sharks, sawfish and stingrays.

It may come as a surprise to some readers that there are sharks, sawfish and stingrays in the Mekong River, because most people connect these fishes with the big oceans. Most species in these groups are in fact strictly marine. However, several species have some tolerance to freshwater and have the ability to venture far up into rivers during their searches for food, while a few live their entire life in fresh water.

Sharks, sawfish and stingrays are all cartilaginous fishes (the class Chondrichthyes), while all the species we have presented in Catch and Cultures supplement series until this point have been bony fish (the class Osteichthyes). Let us therefore start by looking at the characters that distinguish cartilaginous fish from bony fishes.

As implied in the name, the skeleton in cartilaginous fish does not include bone but consists of cartilage, and all the fins are supported by horny structures rather than fin rays. None of the species possess a swimbladder, the organ most bony fish use to prevent them from sinking to the bottom. Many cartilaginous fish species are therefore either bottom dwellers or accomplish neutral buoyancy by maintaining a high fat or oil content in their tissues.

The gill openings in cartilaginous fish are not covered with operculae, and are seen as a series of slits on the side of the fish just behind the head, or on the underside of the fish.

Unlike bony fish cartilaginous fish do not have scales, but their body is sometimes covered with small tooth like structures (denticles), which make their skin feel like sandpaper.

Their jaws are short and the mouth is protrusible. The teeth, which are highly specialized, are positioned in rows and are continuously shed and replaced.

Cartilaginous fish have very keen senses, and in addition to the senses used by other fish they are able to sense electric impulses from prey-fish that are burrowed in the bottom.

While most bony fish breed by shedding egg and milt freely into the water, all cartilaginous fish reproduce through internal fertilization. In some species the eggs hatch while still in the abdomen of the female, other species lay very big hard-shelled eggs from which fully developed juveniles hatch. This kind of reproduction ensures a high survival rate of the young but also limits the number of offspring per female. Many species of cartilaginous fish are also long-lived (certain marine species may live more than 100 years), and they are slow to reach sexual maturity. Cartilaginous fish are therefore more sensitive to a high fishing pressure than many bony fish.

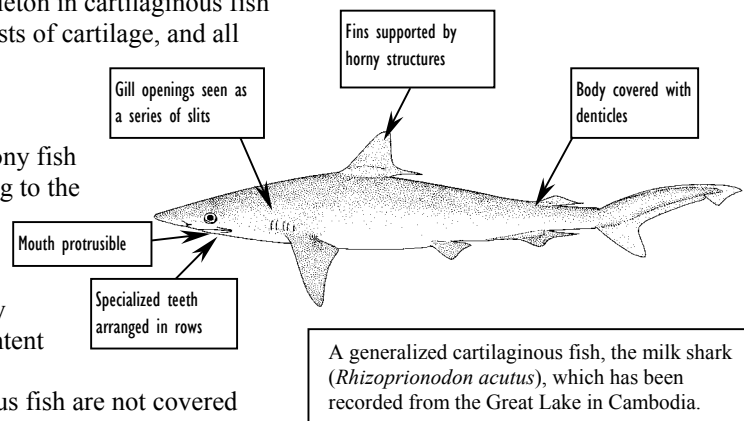
### MEKONG FAMILIES OF CARTILAGINOUS FISH

#### Requiem sharks (Carcharhinidae)

Most sharks are active pelagic hunters and are well equipped to fulfill this role. Sharks are elongate, fast swimming, and their jaws are densely packed often with bladelike teeth.

Requiem sharks can be distinguished from other sharks by the presence of an anal fin, two dorsal fins, and a series of five gill openings on each side of the body.

None of the sharks occurring in the Mekong are true freshwater fish, but several species of sharks regularly penetrate the estuarine zone. Sharks are quiet common on markets in the lower part of the Mekong Delta, but it is not known how many of these sharks that are actually caught in the Mekong. Only one shark species, the milk shark (*Rhizoprionodon acutus*), has been recorded with certainty from purely freshwater reaches as far upstream as the Great Lake in Cambodia. The milk shark is a relatively small shark, which grows to about 175 cm. It feeds on small fish and crustaceans and is completely harmless to people. The bull shark (*Carcharhinus leucas*), which is a species commonly seen in rivers is also expected to occur in the Mekong, but has not yet been recorded. The bull shark is an aggressive shark, which has been known to attack people in other parts of the world.



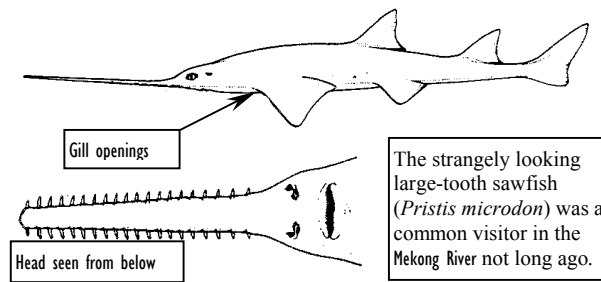
### Sawfish (Pristidae)

Sawfish are among the strangest looking vertebrates in existence. Their body resembles that of a shark, but the gill openings and the mouth however are positioned underneath the fish like in rays.

The snout is elongated and constitutes up to a third of the body length, and is provided with large teeth on each side featuring a double-edged saw. It is not known what the “saw” is used for. It has been suggested that the sawfish use it to

stun small fishes by swimming into a school waving their head vigorously from side to side. Other authors have suggested that it is used to dig for food in muddy bottoms.

Sawfish, like sharks, are not true freshwater species. They normally live in the estuarine zone, but frequently enter rivers. One species of sawfish, the large tooth sawfish (*Pristis microdon*), which grows the incredible size of 600 cm, were not uncommon in the Khone Falls area in the not so distant past, when the fishery was less intense. Sawfish are especially sensitive to drifting gillnets fisheries because the “saw” easily becomes entangled in the net.



### Stingrays (Dasyatidae)

The majority of the stingrays occurring in the Mekong are also marine intruders, but in contrast to the previously mentioned groups some stingrays live their entire life in fresh water. They are also the only cartilaginous fishes found upstream from the Khone Falls in Southern Lao PDR.

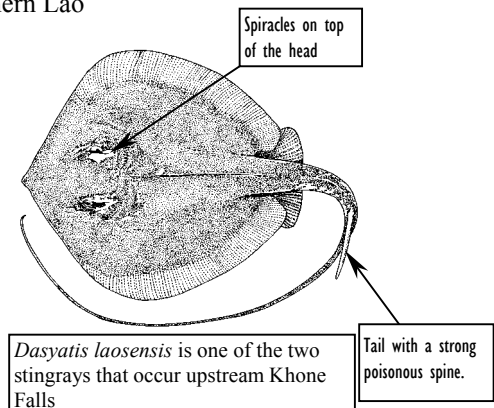
Data gathered through the local knowledge survey by the Fisheries Programme's Assessment of Mekong Fisheries component show that stingrays occur at least as far upstream as Chiang Khong in Northeast Thailand.

Rays are bottom-oriented fishes, and are well adapted to this habit with a flattened disc-like body with the mouth and gill-openings located on the underside. Water for respiration is taken in through large openings on the top of the head (spiracles), whereby the ray avoids getting sand in the gills.

The pectoral fins are greatly enlarged extending forward along the sides of the head, and the ray uses them for moving along the bottom and “flying” through the water.

Stingrays possess a spine with a venom gland on the tail. They use the spine to defend themselves, and it makes them very dangerous for people to handle or to step on.

The teeth in rays are not sharp as in sharks but are flattened rugged structures suitable to crush the hard-shelled invertebrates on which they feed.



At least two species of Mekong stingrays live their entire life in freshwater *Himantura chaophraya* and *Dasyatis laosensis*. *H. chaophraya* is one of the largest fish in the Mekong basin reaching a weight of six hundred kilogrammes and a disc-width of 2 m.

The importance of stingrays and other cartilaginous fishes in the Mekong fisheries is not known at the moment, but as food they are often considered inferior to bony fish. Stingrays are nevertheless regularly seen on fish markets in southern Lao PDR, in Cambodia and VietNam.