

## Flatfishes - Pleuronectiformes

The flatfish order mainly comprehends marine species, many of which are common in estuaries from where they occasionally venture into rivers in search of food. Several species, however, are confined to freshwaters.

Being mainly of marine origin; it is not surprising that the diversity of flatfish species is higher towards the Delta region, and that the importance of flatfishes in the fisheries is highest in this area. However, no Mekong fishery is directed specifically towards flatfishes, but they occasionally form an important component in non-specific fisheries like trawl, dai and barrage fisheries. Larger individuals are popular food fish in Cambodia and fetch a higher price than similar sized individuals of other species.

However, it is probably on the mud banks in the Mekong estuary that the largest amount of flatfish is harvested. Although these fish strictly speaking not are part of the Mekong fauna, they depend on the nutrients and sediments brought down by the Mekong to generate a nutrient rich and highly productive environment.

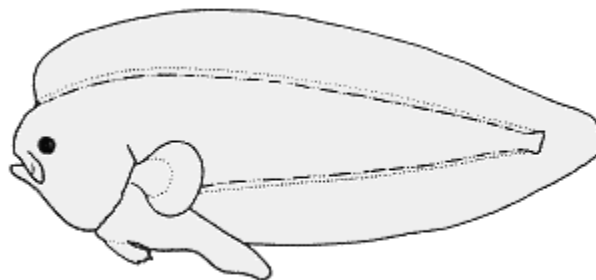
Freshwater flatfishes are much smaller than most of their marine relatives, with only few species reaching 25 centimetres. Only little is known about the biology of the freshwater species so the information below has mainly been compiled from what is known about marine species.

It is implicit in the name of the order that the body of the flatfishes is flattened, however, unlike the rays (presented in Catch and Culture Supplement # 9) the body of the flatfishes is compressed in the lateral rather than the vertical plane.

When a flatfish larva hatches, it is pelagic for a while (*i.e.* it lives in the open water) drifting with the current. Initially the flatfish larva is similar in appearance to larvae of other fish species. However, after a short period, the eye on one side of the head starts moving to the opposite side, and the two sides of the body develop differently. Whether it is the left or the right side that becomes blind varies among species. Apart from the anatomical alterations, there is also a change in colouration; the blind side becomes white, while the side with the eyes gradually becomes darker.

The larvae of most species lose their swimbladder, at this stage in the development, and

occupy a bottom oriented existence, and the juvenile and later stages are bottom living and are often hiding buried in mud or sand most of the time with only the eyes



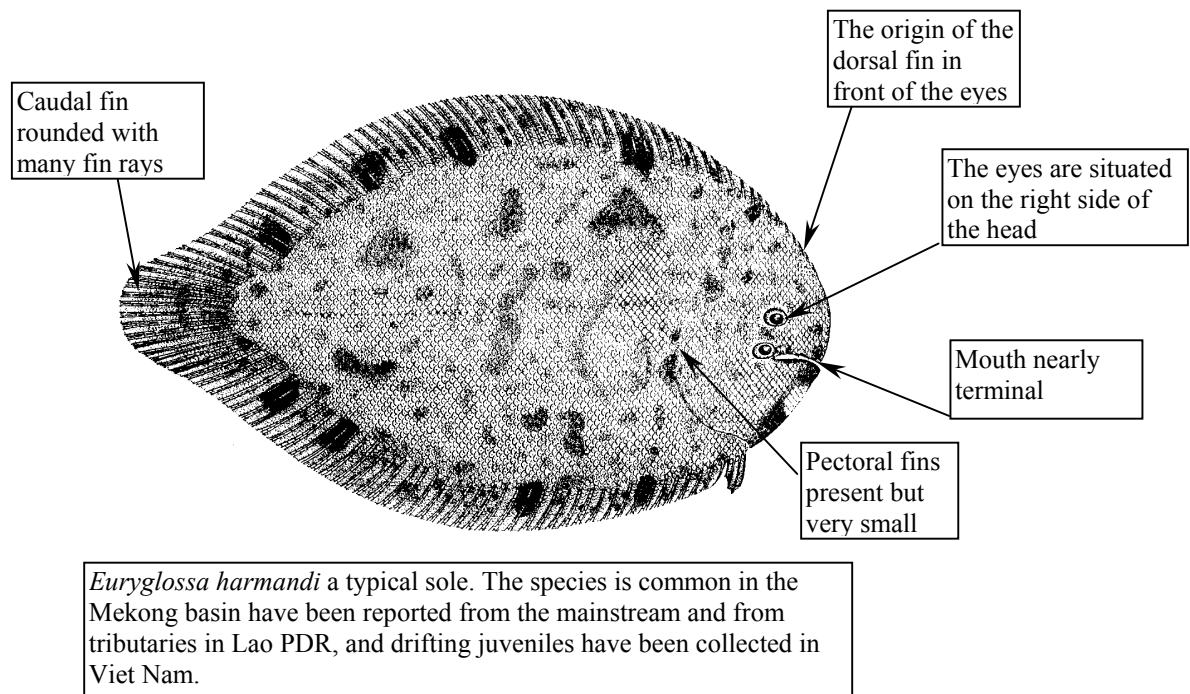
A larval tonguefish look similar to other fish larvae. Note however that dorsal, anal and caudal fins are confluent already at this stage.

protruding. Many species are famous for their ability to imitate their surroundings by changing colours. A flatfish on a chessboard will thus develop black and white squares after a while.

Flatfish are poor swimmers moving forwards by undulating movements of the body instead of using only the caudal fin like most other fish do. When feeding the flatfish remain motionless until their prey is close enough to be secured with a sudden leap or after a short pursuit. Good vision and the ability of the flatfish to raise and move their eyes independently is an advantage for fish with such a feeding technique. The diet includes a variety worms, snails, bivalves and other invertebrates. However, some species can be very selective in their choice of food.

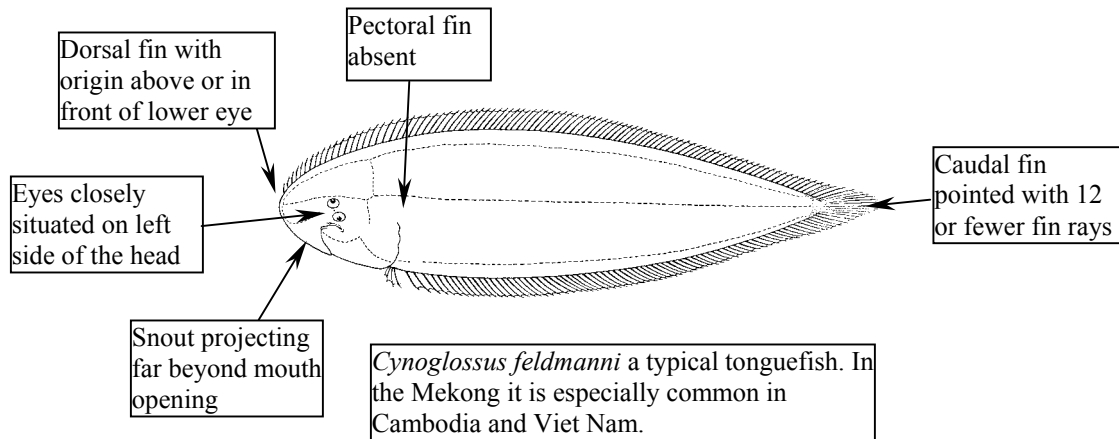
Some 18 species of two flatfish families Soleidae (soles) and Cynoglossidae (tonguefishes) have been recorded from the Mekong Basin.

Both soles and tonguefishes have a dorsal fin with origin above or in front of the eyes, both dorsal and anal fins are very long and confluent with the caudal fin even in the larval fish.



Soles are characterised by having their eyes on the right side of the head. The mouth is nearly terminal. Pectoral fins are normally present, but are often very small. The caudal fin is rounded with many fin rays in most species.

Tonguefishes have small closely situated eyes on the left side of the head. The snout projects well beyond the mouth opening, which is asymmetrical. Pectoral fins are always absent and the caudal fin is pointed with 12 or fewer fin rays.



Very little is known about the distribution of individual flatfish species in the Mekong Basin and to what degree they are able to reproduce in freshwater, but some species (for example *Euryglossa harmandi*) occur in the Mekong and in large tributaries at least 2000 km from the river mouth. It is unlikely that these species have any marine life stage, because, as already mentioned, none of the species are strong swimmers, and they would probably not be able to migrate such long distances. Larvae and small juveniles of several flatfish species have also been collected by AMFC in Viet Nam's An Giang province so far from the sea that they must have been spawned in purely freshwater.