

MJC 2 UG Sem 2 Notes

Dr. Bibha Verma
PG Department of Zoology
Maharaja College Ara

Unit: Diversity of Chordates

IDENTIFICATION:

Petromyzon

Classification :

Phylum Chordata

Group Craniata

Subphylum Vertebrate

Division Agnatha

Class Cyclostomata

Order.....Petromyzontia

Genus.....*Petromyzon*

Dorsal tubular nerve cord, gill-slits and notochord present. Definite head. Cranium with simple brain present. Vertebral column present. Jaws and paired appendages absent. Mouth circular, suctorial, without jaws. Mouth with funnel, without tentacles. Nasopharyngeal pouch blind. Gills 7 pairs, open

independently to exterior. Branchial basket well developed.

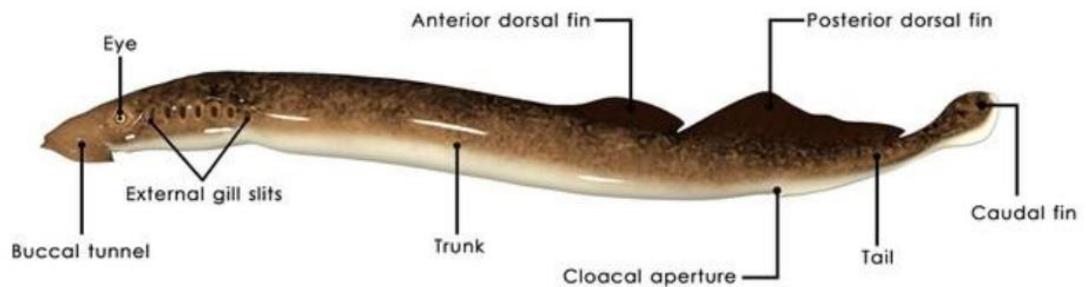
Geographical distribution :

Petromyzon marinus is found in world-wide sea waters, coastal regions, streams and lakes of North America, Europe, West Africa, Australia, Chile, Japan, New Zealand, Tasmania.

Habit and habitat : *Petromyzon* is found both in salt and fresh-water. They lead an ectoparasitic life on other fishes, attaching to the body of host by buccal funnel and secreting an anticoagulant for continuous flow of blood. They are also anadromous i.e., ascending river for spawning. Carnivorous and predators.

Comments :

(1) Commonly called as lamprey [Fig. below]



(2) Body is eel-like, measuring about 90 cm, and differentiated into head, trunk and tail. First dorsal fin, second dorsal fin and caudal fin confluent.

(3) Skin is without scales, slimy, green, brown and with strong metallic lustre.

(4) Head contains mouth but no jaws. Mouth is surrounded by a large, ventral, suctorial funnel with numerous horny teeth. The 'tongue' is toothed and piston-like.

(5) Dorsal nasal sac and mouth are unconnected. Paired eyes are present behind nasal-aperture.

(6) Gill-slits are 7 pairs and branchial basket is well developed.

(7) Sexes are separate. Female with large anal fin. Male with urinogenital or copulatory papilla. The development includes ammocoete larva which is very important phylogenetic ally as it is regarded a connecting link between Amphioxus and cyclostomes.

Economic importance : (i) Lampreys have very little food value, (ii) They injure and destroy fishes by sucking blood and causing secondary infection, (iii) Larval lampreys are used as bait for sport fishing and commercial fishing.

Special features : Lampreys are the lowest jawless vertebrates and their nearest allies are the ancient ostracoderms of Silurian and Devonian periods. There are no fossil representatives of this group to indicate their course of evolution.

Identification : Since the animal has 7 pairs of gill pores and is without jaws and has above features, hence it is Petromyzon.

Myxine

Dorsal tubular nerve cord, gill-slits and notochord present. Definite head. Cranium with brain present. Vertebral column present. Jaws and paired appendages absent. Mouth circular, suctorial, without jaws.

Phylum Chordata

Group Craniata

Subphylum Vertebrate

Division Agnatha

Class Cyclostomata

Order Myxinoidea.

Mouth without funnel, with 8 tentacles. Gills 10 to 14 pairs. Branchial basket feebly developed.

Genus Myxine

Geographical distribution : Myxine is distributed along seacoasts of the Atlantic and Pacific oceans in North European, North Atlantic, American and Japanese sea waters.

Habit and habitat : Hagfishes or Myxine sometimes descend to a depth of 300 fathoms. They are purely marine, nocturnal and lie buried in the muddy bottom. They are parasitic or quasiparasitic and generally found attached to the body of fishes, especially around gill area. They bore their way into host body to eat viscera and muscles.

Comments :

- (1) Commonly called as hagfish or borer.
- (2) Body is soft, without scales, worm-like, measuring about 60 cm in length and differentiated into head, trunk and tail.
- (3) Anterior extremity contains four tentacles supported by skeletal rods.

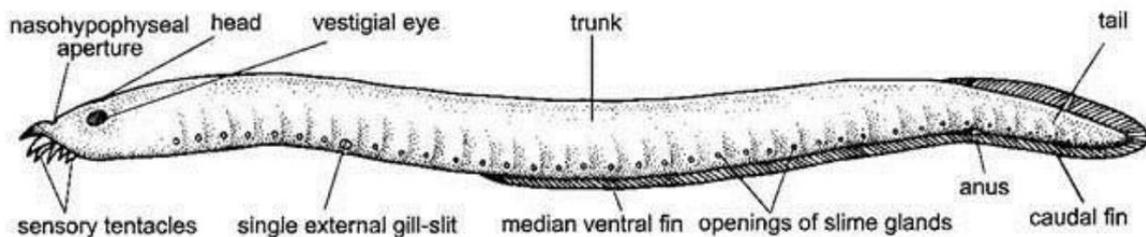


Fig: Myxine

Fig: Myxine

- (4) Mouth is terminal and surrounded by lips. Buccal funnel, and jaws are absent.
- (5) There is a single nostril present close to the mouth. On ventrolateral sides mucous pores are distinct.
- (6) Dorsal fin indistinct caudal fin and ventral fin confluent.
- (7) Eyes vestigial, due to dark and bottom dwelling habit, photoreceptor organ is reduced.
- (8) Secrete enormous mucus through mucous pores.
- (9) 10 to 14 pairs of gills open into a branchial chamber, which opens to the exterior by a single branchial opening.

(10) Hermaphroditic and protandrous. Eggs are enclosed in horny shell, bearing hooks by which they attach themselves to the weeds.

Economic importance : Hagfishes damage fish caught in nets. Sometimes hagfishes enter into the body of other fishes and eat entire soft parts leaving only a bag of skin and the bones.

Special features: In hagfishes same individual produces sperms and then eggs later on. Development is direct. The hagfishes are injurious to fish industry. They are important from evolutionary point of view. The evolution of jawed vertebrates from agnathans could be hypothesized as the latter needed only jaws. Although no direct link is available to understand evolution of gnathostomes, but some armoured agnathan might have served as ancestor to the jawed vertebrates.

Identification : Since the animal has 4 tentacles, single gill aperture and no buccal funnel and above features, hence it is Myxine.

Pristis: Saw Fish

Classification:

Phylum Chordata

Group Craniata

Subphylum Vertebrata

Division Gnathostomata

Superclass Pisces

Class Chondrichthyes

(= Elasmobranchi)

Sub-class Selachi

Order Hypotremata

(= Batoidea)

Family Pristidae

Genus *Pristis*

Geographical distribution : *Pristis* is found in tropical and sub-tropical regions. Indian form ascends beyond tidal zones. It is reported from America, Gulf of Mexico, Lower Mississippi, the Mediterranean sea and Atlantic waters. Upper Jurassic to Recent.

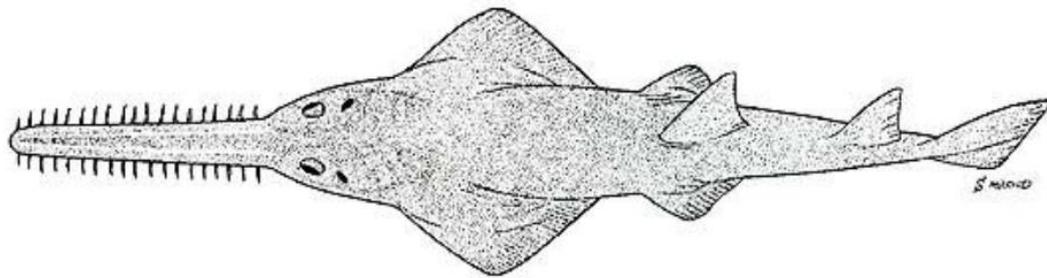
Habit and habitat : *Pristis* is a warm water marine type. It is predacious, feeding on small fishes and other marine

animals by slashing them with its saw. It often ascends the river.

Comments :

(1) Commonly called as saw-fish, weighing 350 to 1200 Lbs and measuring 3 to 6 metres in length.

- (2) Elongated, shark like body is slightly depressed and divided into head, trunk and tail.
- (3) Body shape is midway between a shark and a ray. The anterior part is flattened dorsoventrally and is ray-like while the posterior part, for more than half, is shark-like. It exhibits close relationship with rays.
- (4) Head contains a pair of eyes and a pair of spiracles behind the eyes. Water passes through the spiracles and goes out through the gill-slits.



(after Last and Stevens, 1994)

Fig: *Pristis*

- (5) Snout is anteriorly produced into a saw-like rostrum with large and small weakly embedded teeth.
- (6) Mouth is on the ventral side of the head.
- (7) Tail is well developed and ends in a heterocercal caudal fin.
- (8) Dorsal fins are large. First dorsal fin is opposite to pelvic fin. Second dorsal fin is called as adipose fin. Paired fins are pectoral and pelvic. Tail contains caudal fins.

Economic importance : The fish is also economically very beneficial as its liver oil is rich in vitamin value and its skin for making scale boards.

Special features : (i) The important structure is 'saw-like' snout, which is formed by the elongation of head and skull. They are flattened in the form of a rostrum, which contains a series of tooth-like 16 to 32 pairs of denticles on the lateral margins, (ii) The teeth are fixed in sockets, in the calcified rostral cartilage, (iii) The rostrum acts as an organ of offence and defence, (iv) *Pristis* is capable for retaining urea in fresh-water while ascending in rivers.

Identification : Since this fish has saw-like toothed snout and above features, hence it is *Pristis*.

Exocoetus: Flying Fish

Classification :

Phylum Chordata

Group Craniata

Subphylum Vertebrata

Division Gnathostomata

Superclass Pisces

Class Osteichthyes

Sub-class Actinopterygii

Superorder. Teleostei (Bony fish proper).

Order Synentognatbi (Flying fish, Dorsal fin above anal. Pectorals high on body.)

Genus Exocoetus

Geographical distribution : Distributed in tropical and warmer Atlantic, Pacific and Indian oceans.

Habit and habitat : Exocoetus is found in sea, often skittering near the boats. It is pelagic and feeding on

prawns and young fishes and their eggs. Small fishes live in sandy shoal-places near the coast.

Comments :

- (1) Commonly known as flying fish.
- (2) Elongated body with silvery white sides measures 30 to 45 cm in length and divided into head, trunk and tail.
- (3) Body covered with overlapping cycloid scales (usually 38 to 60 in lateral line).
- (4) Head contains large eyes. The upper part of snout is produced into a process and contains nostril.
- (5) Mouth opening is small but teeth in both jaws.
- (6) Lower pharyngeals unite as a single bone. Lateral line and operculum present.

Fig: *Exocoetus*

- (7) Dorsal and anal fins are short and supported by 8 to 16 soft fin-rays each and are opposite to each pelvic fin.
- (8) Pectoral fins are exceptionally large, spread like wings and make gliding flights.
- (9) Ventral fin well developed and adapted to life the body. The caudal is bilobed. Lower lobe larger than upper lobe. By powerful stroke of the caudal fin the fish is able to leave water with force.
- (10) Tail is hypoblastic. Oviparous.

Economic importance : The flying fish also serves as food.

Special features : Exocoetus is not a true flying fish. Specially in warm seas, it emerges to glide over the water. Pectorals act as wings. It also leaves water to escape from larger fishes, such as Tunas and Mackerels. The fish can glide over the surface of the water for about 400 metres.

Identification: Since this fish has large pectoral fins and above features, hence it is *Exocoetus*.

Reference: Practical Zoology Vertebrate. S.S.Lal.