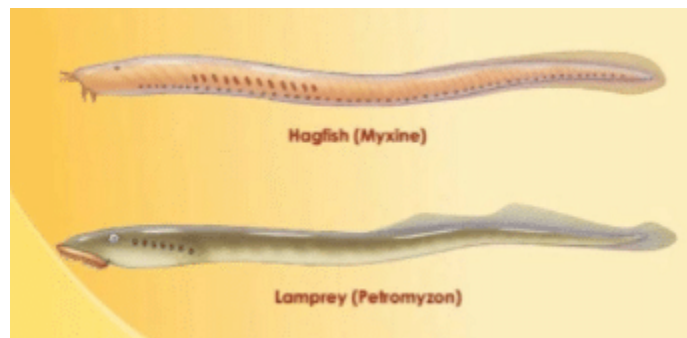


Cyclostomes -

Cyclostomata are parasitic vertebrates that comprise the living jawless fish, morphologically similar to eels. They are popularly known as Agnatha, due to their jawless mouth. They belong to [phylum chordata](#) of [kingdom Animalia](#). Cyclostomes are believed to have split off before the evolution of dentine and bone, hence making them jawless. However, many fossil agnathans, including conodonts found, possessed dentine and bones.

- Cyclostomes are the members of class Cyclostomata.
- It is a vertebrate group of animals which includes the living jawless fishes, lampreys and hagfishes.
- Joan Crockford-Beattie came up with the name 'Cyclostomata' since the members of this group had a round mouth.
- Such animals possess horny epidermal structures that act like teeth and branchial arches, positioned internally unlike related jaw fishes.
- Cyclostomes are [warm blooded vertebrates](#) found exclusively in marine environments.



Cyclostomata

Origin of Cyclostomata

- All living organisms are classified and identified based on the form and function of their bodies.
- Some features are more prone than others to cause wide-ranging alterations in body design.
- There is also a function of time in this.
- As a result, once a given body design is established, it will shape the impacts of all subsequent design alterations simply by existing.
- In other words, features that emerged earlier are more likely to be fundamental than characteristics that emerged later.
- Cyclostomata are living agnathans that are **rudimentary** in many ways but specialised in others.
- The suctorial mouth is ventral and circular, hence the name Cyclostomata.
- These are modified versions of the primitive vertebrates that are believed to have arisen in the Devonian period.

Characteristics of Cyclostomata

Some of the notable characteristics of Cyclostomes are:

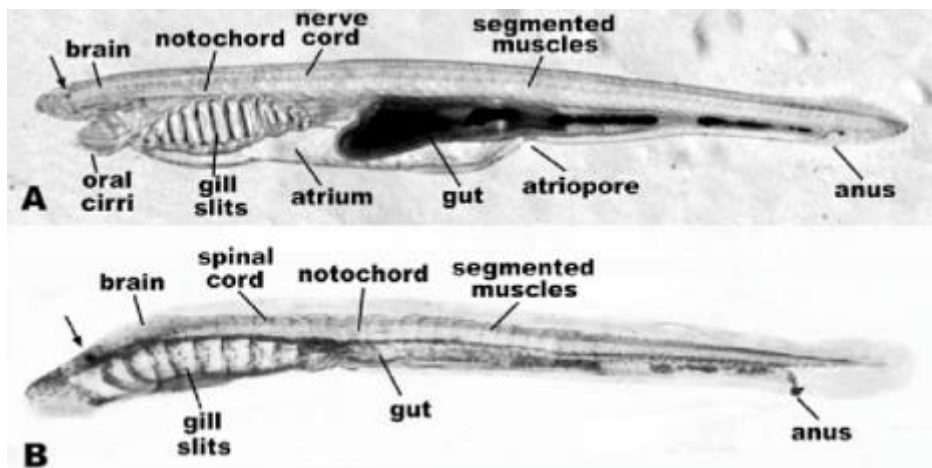
- Cyclostomes are early vertebrates with no jaws. Hagfish and lampreys are among them.
- The body is eel-like in length with a compressed tail and trunk.
- Paired fins are lacking. The cartilaginous fin-rays support the median fin.
- The skin is soft and smooth with a slimy texture and less scaling.

- The trunk and tail include Z-shaped myomeres. The tongue is moved by the protractor and retractor muscles.
- The stomach is missing and the oesophagus connects to the intestine.
- There is an endoskeleton present.
- Skull is a primitive and simplistic design.
- The notochord is present throughout one's life.
- Around the notochord, neural arches represent the vertebrae.
- In sac-like pouches, there are five to sixteen pairs of gills.
- The heart is divided into two chambers. There is a sinus venous, but no conus arteriosus.
- Leukocytes and irregular nucleated **erythrocytes** are found in the **blood**.
- The brain is visible.
- There are ten pairs or fewer cranial **nerves** present.
- The nasal sac is solitary and located in the middle of the **nose**.
- There is a lateral line sense organ.
- A pair of mesonephric kidneys are part of the excretory system.
- The sexes are distinct.
- **Gonad** is without a gonoduct and is solitary.
- Direct development or a protracted larval stage are also possibilities.

Characteristics of Cyclostomata Resembling Amphioxus

Below mentioned are the characteristics of Cyclostomata resembling the characteristics of Amphioxus:

- There are no jaws, exoskeleton, or paired fins.
- Continuous notochord but with an added sheath.
- Presence of myotomy, that is segmental musculature, but with minimal variation from head to tail.
- Straight ciliated food tract with little regional specialisation.
- The number of gill-slits is relatively large.
- Lamprey larvae with endostyle.
- No products and gonads.



Amphioxus

Difference between Cyclostomata and Fish

Mentioned below are the notable differences between Cyclostomata and Fish:

Cyclostomata	Fish
Cyclostomata has no biting jaws, hair, true teeth, true fin rays, girdles, ribs, stomach, spleen, or products.	Fish has well established, jaws, teeth, fins, girdles, stomach and spleen.
There is no break in the median dorsal fin.	Anatomy of fish has a break in the median dorsal fin.
Cyclostomata has no Diphysa Clic caudal fin	Fish has Diphysa Clic caudal fin
Cyclostomata has single nostrils in the middle	Fish has paired nostrils.
Cyclostomata has an incomplete cranium	Fish has a well-constructed cranium
It has weak or no vertebrae	It has a well-structured vertebrae
It has a rudimentary pancreas	It has a well evolved pancreas that carries out its functions.
It either has no spinal valve or has a week spinal valve in the gut.	Fish have spinal valve.
Cyclostomata has a tiny brain.	Fish have a well evolved brain.
Nerves are not medullated as ninth and tenth cranial nerves are not found.	Nerves are medullated.

Classification of Cyclostomata

There are two orders in the Cyclostomata class, namely,

1. Petromyzontida
2. Myxinoidea

Petromyzontia

The characteristics of Petromyzontida are:

- Lampreys are included in this category.
- The buccal funnel has suckorial teeth and is suckorial.
- In the buccal funnel, the mouth is present.
- The nasal sac is located on the back of the nose. There is no link between it and the pharynx.
- The eyes are useful.
- There are seven pairs of gill slits.
- There is a well-developed dorsal fin.
- The branchial basket is finished.
- The brain has reached its full potential.
- The pineal eye has a good amount of development.
- The [ear](#) canals are semicircular.

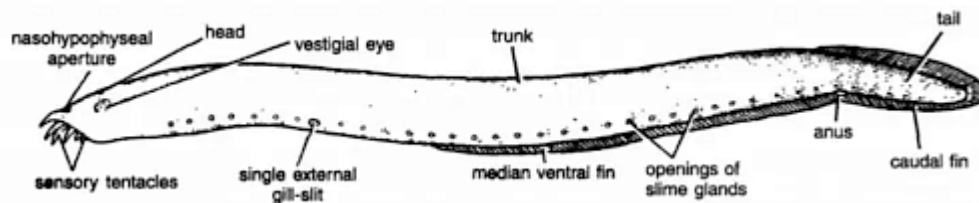


Lamprey

Myxinoidea

The characteristics of Myxinoidea are:

- Hag-fishes, sometimes known as slime eels, are among them.
- The buccal funnel is missing.
- A canal connects the nasal sac to the pharynx.
- Eyes are a relic of the past.
- The dorsal fin is either missing or very tiny.
- The branchial basket isn't as developed as it could be.
- The brain is a basic organ.
- The size of the pineal eye has shrunk.
- There is only one semicircular canal in the ear.
- All hag-fishes are found in the sea.



Myxinoidea

Things to Remember

- Cyclostomata are parasite fish that feed on them when they are adults. They have a morphology that is similar to that of eels.
- They are the only extant vertebrates lacking genuine jaws, which is why they are termed Agnatha. Hagfishes and lampreys are examples of Cyclostomata.
- The marine lamprey breeds in freshwater, which has been known for a long time. It does not, however, indiscriminately penetrate all streams within its range.
- Cyclostomata means 'round mouths' in Greek. They can't close their mouths because they don't have a jaw, so they have to constantly cycle water through it.
- Cyclostomes have a sucking and round mouth without the presence of a jaw.