

Pisces: General Characteristics

The Superclass Pisces (L. Piscis = fish) are the truly jawed vertebrates. They have organs of respiration and locomotion related to a permanently aquatic life. The respiratory organs are the gills and the organs of locomotion are paired and unpaired fins. All are poikilothermous.

General Characters:

1. Aquatic, either freshwater or marine, herbivorous or carnivorous, cold blooded, oviparous or ovoviviparous vertebrates.
2. Body usually streamlined, spindle-shaped, some are elongated snake-like and a few are dorsoventrally compressed, and differentiated into head, trunk and tail.
3. Locomotion by paired pectoral and pelvic fins along with median dorsal and caudal fins, supported by true dermal fin-rays. Muscular tail used in propulsion.
4. Exoskeleton of dermal scales, denticles or bony plates (in Placodermi) covering body surface. Placoid in Chondrichthyes and ganoid, cycloid or ctenoid in Osteichthyes.
5. Endoskeleton is cartilaginous or bony. The notochord is usually replaced by vertebrae, either bone or cartilage. Presence of well-developed skull and a system of visceral arches, of which the first pair forms the upper and lower jaws, the latter movably articulated with the skull.
6. Muscles arranged into segments called myotomes, with separate dorsal and ventral parts.
7. Alimentary canal with definite stomach and pancreas and terminates into cloaca or anus.
8. Organs of respiration are gills. Gill-slits 5 to 7 pairs, naked or covered by an operculum.
9. Heart is venous and two chambered, i.e., one auricle and one ventricle. Sinus venosus and renal and portal systems present. Erythrocytes nucleated. Poikilothermous.
10. Kidneys mesonephros. Excretions ureotelic.
11. Brain with usual five parts. Cranial nerves ten pairs.
12. Nostrils are paired but do not open into pharynx except Dipnoi. Nasal capsules are partly separate in Chondrichthyes and completely separate in Osteichthyes.
13. Tympanic cavity and ear ossicles are absent.
14. Internal ear with three semicircular canals.

15. Lateral line system is well developed.
16. Sexes separate. Gonads typically paired. Gonoducts open into cloaca or independently.
17. Fertilisation internal or external. Females of Chondrichthyes are oviparous or ovoviviparous and of Osteichthyes are mostly oviparous and rarely ovoviviparous or viviparous. Eggs with large amount of yolk. Cleavage meroblastic.
18. Extra-embryonic membranes are absent.
19. Development usually direct without or with little metamorphosis.

Chondrichthyes: Characters:

- These fish are found only in the marine environment.
- The exoskeleton is like placoid scales.
- The endoskeleton is cartilaginous.
- The jaw suspension is amphistylic.
- Gills are the respiratory organs.
- The caudal fin is heterocercal.
- Claspers are the reproductive organs in males.
- These fish do not have air-bladders.
- e.g., Heteroloatas, Scoliodon

Osteichthyes: Characters

- These fish are found in marine water, freshwater or brackish water.
- They have a bony endoskeleton.
- Autostylic jaw suspension.
- They have no claspers.
- The gills are covered with an operculum.
- The air bladders are present in most of them.
- e.g., Proptopterus, Lepidosiren