PISCES: General character and classification

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The Super class 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 impaired fins. All are poikilothermous.

General Characters:

1. Aquatic, 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 in 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 my tomes, 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.

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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.

Classification:

About 40,000 species of fishes are known. Various workers have proposed different schemes of classification of fishes. However, no classification has been universally accepted because of confusion due to large number of fishes and great diversity in their shape, size, habits and habitat.

J. Muller (1844) gave first classification of the lower vertebrates and divided Pisces into six subclasses:

1. Dipnoi

2. Teleostei,

3. Ganoidei,

4. Elasmobranchii,

5. Marsipobranchii (Cyclostomi) and

6. Leptocardii (Amphioxini).

Chondrichthyes (Gr., chondros = cartilage; ichthys = fish):

Mostly marine and predaceous. The species of **cartilaginous fish** are subdivided into two subclasses: the first includes sharks, rays, and skates; the second includes chimaera, sometimes called ghost sharks. Fish from this group range in size from the dwarf lantern shark, at 6.3 inches, to the over 50-foot whale shark. Sharks obviously have jaws, as do the other cartilaginous fish. These fish evolved from the jawless fish.

Other characteristics of cartilaginous fish include:

- Paired fins.

- Paired nostrils.
- Scales.
- Two-chambered hearts.
- Skeletons made of **cartilage** rather than bone. Cartilage is supportive tissue that does not have as much calcium as bones, which makes bones rigid. Cartilage is softer and more flexible than bone.

Blood, Skin, and Teeth

Since they do not have bone marrow (as they have no bones), red blood cells are produced in the spleen, in special tissue around the reproductive organs, and in an organ called **Leydig's organ**, only found in cartilaginous fishes. The tough skin of this group of fish is covered with **placoid scales**, which are hard scales formed from modified teeth. The scales are covered with a hard enamel. The hard covering and the way the scales are arranged, gives the fish skin rough, sandpaper-like feel. The function of these scales is for protection against predators.

The shape of sharks' teeth differs according to their diet. Species that feed on mollusks and crustaceans have dense flattened teeth for crushing, those that feed on fish have needle-like teeth for gripping, and those that feed on larger prey, such as mammals, have pointed lower teeth for gripping and triangular upper teeth with serrated edges for cutting. Sharks continually shed and replace their teeth, with some shedding as much as 35,000 teeth in a lifetime.

THANKYOU