

# Classification of Chordates

Phylum **chordata** is widely diversified in size, habits and habitat. All the chordates possess a supporting skeletal rod or **notochord**, a hollow dorsal **nerve cord** and paired **gill slits** at some stage of their life history. Chordata is the last phylum in the Animal Kingdom.

Phylum Chordata is subdivided into four subphylum, namely **Hemichordata**, **Urochordata**, **Cephalochordata** and **Vertebrata**. Phylum Chordata can be divided into two groups: **Acrania** (Protochordata) and **Craniata** based on the presence of a skull.

## Group A: Acrania

The subphylum Hemichordata, Urochordata and Cephalochordata are together called **Protochordata** or **Prochordata** because they are the first chordates. The protochordata do not possess a **cranium** and a **head**. So, they are called **Acrania**. All are marine, small, primitive or lower chordates. About 2000 species.

### 1) Subphylum I: Hemichordata or Adelochochordata

The body is divided into three regions: proboscis, collar and trunk. It is named Hemichordata because it has a notochord in the anterior half of the body. Hemichordata has no true notochord. The subphylum Hemichordata is divided into two classes namely:

- a) **Class 1: Enteropneusta:** Body large and worm-like. Gill slits numerous and paired. Commonly called Acorn or tongue worms. Alimentary canal straight. Enteropneusta includes 70 species. E.g. *Balanoglossus*, *Saccoglossus*.
- b) **Class 2: Pterobranchia:** Body small and compact. Gill slits one pair or none. Alimentary canal U-shaped. Pterobranchia includes 20 species. E.g. *Rhabdopleura*.

### 2) Subphylum II: Urochordata or Tunicata

The notochord is present in the tail region only. The body is covered by a test or tunic. Hence it is called Tunicata. Mostly hermaphrodite.

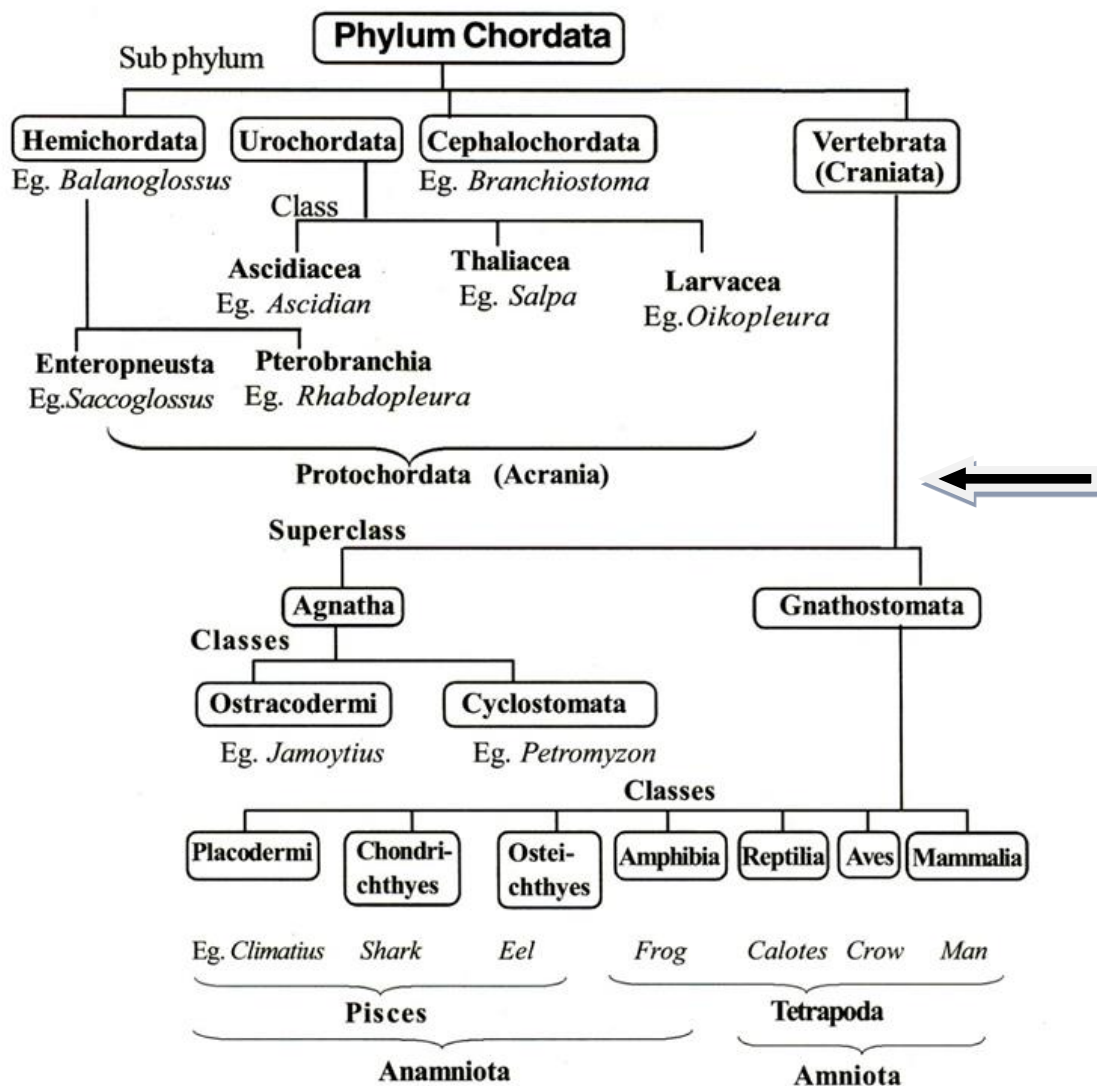
- a) **Class 1: Ascidiacea:** Sessile tunicates with scattered muscles in the tunic. Solitary or colonial. Gill-slits many, tunic well developed. Ascidiacea includes 1200 species. E.g. *Ascidian*, *Molgula*.

- b) **Class 2: Thaliacea:** Thaliacea includes barrel-like forms with circular muscle bands. Free swimming or pelagic. Two or many gill slits. It includes 30 species. *E.g. Salpa, Pyrosoma.*
- c) **Class 3: Larvacea:** Larvacea includes neotenous urochordates. Larval characters are retained throughout life. The test is temporary. Only two gill slits. It includes only 13 species. *E.g. Oikopleura.*

### 3) Subphylum III: Cephalochordata

Notochord and nerve cord are present throughout life along the entire length of the body. It includes only 30 species.

- a) **Class 1: Leptocardii:** Body fish-like, segmented with numerous gill slits. Free swimming and burrowing. Commonly called Lancets. **E.g. Amphioxus, Asymmetron.**



## Group B: Craniata

Aquatic or terrestrial, usually large-sized, higher chordate or vertebrate with a distinct head, a vertical column, jaws and brain protected by a cranium or skull. The craniata include a single subphylum Vertebrata.

### 1. Subphylum IV: Vertebrata

Notochord is replaced by a vertebral column comprising of overlapping vertebrae. Body divisible into head, neck, trunk and tail. Vertebrata is the largest chordate subphylum including about 45000 species. The subphylum vertebrata is divided into two superclasses: **Agnatha** and **Gnathostomata**.

#### Superclass: Agnatha

Jawless fish-like vertebrates without true jaws and paired limbs.

- a) **Class 1: Ostracodermi:** Several extinct orders of ancient primitive heavily armoured, world-first vertebrates. E.g. *Jamoytius*, *Pteraspis*.
- b) **Class 2: Cyclostomata:** Body eel-like, long, cylindrical, skin smooth, without scales and lateral fins. Mouth rounded and suctorial. About 50 species. E.g. *Petromyzon*, *Myxine*.

#### Superclassess: Gnathostomata

Jawed vertebrates have true jaws and paired limbs. Ganathostomata has been further divided into seven classes. Class Placodermi, Chondrichthyes and Osteichthyes include fishes, so they are called **Pisces**. Class Amphibia, Reptilia, Aves and Mammalia contain four limbs, so they are together called **Tetropoda**.

- 1. **Class 1: Placodermi:** Several extinct orders of primitive earliest jawed fishes of Palaeozoic with bony head shields. E.g. *Climatius*, *Dinichthys*.
- 2. **Class 2: Chondrichthyes:** Mostly marine. Cartilaginous endoskeleton. Skin with minute placoid scales. Gill-slits are not covered with operculum. It includes 600 species. E.g. *Scoliodon*, *Narcine*.
- 3. **Class 3: Osteichthyes:** Freshwater and marine. Bony endoskeleton. Skin has various types of scales like cycloid, ctenoid and ganoid. Gill-slits covered with operculum. Approximately 20000 species. E.g. *Eel*, *Hippocampus*, *Sardine*.

4. **Class 4: Amphibia:** Larval stage usually aquatic and breaths by gills. Adults are typically terrestrial and respire by lungs. Approximately 2500 species. *E.g. Rana, Bufo, Ambystoma.*
5. **Class 5: Reptilia:** Terrestrial and aquatic tetrapods. Skin dry and covered by ectodermal horny scales or scutes. Four limbs with 5 clawed toes. Approximately 7000 species. *E.g. Naja, Crocodile, Turtle.*
6. **Class 6: Aves:** Body covered with feathers. Forelimbs are modified as wings usually adopted for flight. Hindlimbs for walking, perching or swimming. No teeth in the beak. About 9000 species. *E.g. Pigeon, Crow, Ostrich.*
7. **Class 7: Mammalia:** The body is usually covered with hair and skin with various glands. Females with mammary glands which secrete milk for suckling the young. Approximately 4500 species *E.g. Rat, Rabbit, Man.*

