# Actinopterygii

| S.No | Infraclass chondrostei | Infraclass Holostei | Infraclass Teleostei |
|---|---|---|---|
| 1. | Primitive ray-finned fishes | Intermediate ray-finned fishes | Advanced ray-finned fishes |
| 2. | Inhibit fresh water | Inhibit fresh water | Inhibit all types of aquatic habitats |
| 3. | Endoskeleton is mostly cartilaginous | Endoskeleton is moderately ossified | Endoskeleton is bony |
| 4. | Scales are usually ganoid | Scales are ganoid or cycloid | Scales are cycloid or ctenoid |
| 5. | Caudal fin is heterocercal(diphycercal in Bichir) | Caudal fin is abbreviated heterocercal | Caudal fin is homocercal |
| 6. | Mouth is large | Mouth is smaller than in chondrostei | Mouth is small |
| 7. | Intestine has spiral valve | Intestine has a vestigial spiral valve | Intestine has no spiral valve |
| 8. | Spiracles are present | Spiracles are absent | Spiracles are absent |
| 9. | Air bladder works like a lung and connected to the gut | Air bladder is mainly hydrostatic and is connected to the gut | Air bladder is usually not connected to the gut |
| | Eg : * ***Polypterus*** – Bichir<br>* ***Acipencer*** – Sturgeon | Eg : * ***Amia*** – Bowfin<br>* ***Lepisosteus*** – Garpike | Eg : * ***Exocoetus***– Flying fish<br>* ***Hippocampus*** – Seahorse (male has a brood pouch )<br>• ***Echinis*** - Sucker fish ( ectocommensal , the first dorsal fin is modified into sucker)<br>• ***Anguilla*** – Eel ( Exhibits catadromous migration ) |

## SUBCLASS LISSAMPHIBIA ( SMOOTH EXTANT AMPHIBIANS )

| S.No | Order Apoda or Gymnophiona | Order Urodela or caudata | Order Anura or Salientia |
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| 1. | These are caecilians or blind worms | These are Salamandars and Newts | These are Frogs and Toads |
| 2. | Inhibit tropical regions like India,Pakista,Srilanka ,Africa and tropical America | Tropical and temperate parts of the Northern hemisphere ; North America is " headquarters of urodeles ". | Tropical and temperate parts of the world. |
| 3. | Worm like body | Lizard like body | Body is short and broad |
| 4. | Body is divided into head and trunk , tail is absent | Body is divided into head ,trunk and tail | Body is divided into head and trunk , tail is absent in adult |
| 5. | Dermal scales are present embedded in the skin | Scales absent | Scales absent |
| 6. | Limbs and limb girdles are absent | Limbs are weak and equal | Hind limbs are longer than fore limbs and adapted for swimming and leaping ( feet are webbed) |
| 7. | Vertebrae are numerous and amphicoelous | Vertebrae are numerous and usually opisthocoelous (amphicoelousin some) | Vertebrae are mostly procoelous fewer in number (generally 9) , caudal vertebrae are fused together to form " urostyle " |
| 8. | Long ribs are present | Ribs are present | Ribs are reduced or absent |
| 9. | Sternum is absent | Sternum is poorly developed (absent in some ) | Sternum is present |
| 10. | Teeth are present on both the jaws | Teeth are present on both the jaws | Teeth are present only on the upper jaw or absent |
| 11. | Gills and gill-slits are absent in adults ; Lungs are asymmetrical ; left lung is rudimentary | Gills and gill-slits may persist in adults | Gills and gill-slits are absent in adults |
| 12. | Ductus arteriosus (ductus botali) connects systemic and pulomonary arches | Ductus arteriosus is present in terrestrial forms | Ductus arteriosus is absent in adults |
| 13. | Eversible wall of cloaca acts as a copulatory organ | Copulatory organ is absent | Copulatory organ is absent |
| 14. | Fertilization is internal | Fertilization is usually internal ( Female picks up the spermatophore with the lips of cloaca | Fertilization is external in most of the species |
| | Eg : ***Ichthyophis*** – parental care by female<br>***Geganophis*** – Scales are absent<br>***Typhlonectes*** – Aquatic and ovoviviparous<br>***Uraeotyphlus*** | This order includes two groups : 1) **Perinnibranchiata** – persistent gills and gill-slits<br>Eg : ***Necturus*** - Mudpuppy<br>***Proteus*** - Cave-dwelling blind salamander<br>***Siren*** - Mud eel<br>2) **Cauducibranchiata** – Gills are lost in adults<br>Eg : ***Amphiuma*** – Congo eel<br>***Ambystoma mexicanum*** – axolotl larva is paedomorphic<br>***Tylototriton*** – Himalayan newt | Eg :***Rana tigrina*** – Common Indian frog<br>***Bufo melanosticus*** – Common toad<br>***Alytes obstetricians*** – Midwife toad (Parental care by male)<br>***Hyla*** – Tree frog<br>***Rhacophorus*** – Flying frog<br>***Ascaphus*** ( A permanent tubular extension of the cloaca resembles tail and acts as a copulatory organ ) |
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