

Class Amphibia

Introduction

Amphibia are **cold-blooded (poikilothermic) vertebrates** that live a **dual life**—partly in water and partly on land. They represent the **first vertebrates to adapt to terrestrial life**, though they remain closely associated with water.

Examples: *Rana* (frog), *Bufo* (toad), *Salamandra*, *Ichthyophis*

General Characteristics of Amphibia

1. Vertebrates adapted to **both aquatic and terrestrial habitats**.
2. Body usually divided into **head and trunk**; tail may be present or absent.
3. Skin is **smooth, moist, glandular and scaleless**.
4. **Two pairs of pentadactyl limbs** usually present.
5. Endoskeleton is mostly bony.
6. **Respiration** by gills (larva), lungs and skin (adult).
7. Heart is **three-chambered** (two atria and one ventricle).
8. Circulation is **double but incomplete**.
9. **Mesonephric kidneys** present.
10. Excretion mainly **ureotelic** in adults.
11. Sexes are separate.
12. Fertilization mostly **external** (frog) but may be internal.
13. Development is indirect with **metamorphosis**.
14. Eggs are **shell-less and laid in water**.

External Morphology

- Skin rich in mucous glands.
- Chromatophores present for colour change.
- No scales, claws, or feathers.
- Limbs adapted for walking, jumping, or swimming.

Digestive System

- Complete digestive tract.
- Tongue often protrusible and sticky (frog).
- Teeth present in upper jaw (absent in toads).

Respiratory System

- **Larva:** Respiration by gills.
- **Adult:** Respiration by lungs, skin, and buccopharyngeal cavity.

Circulatory System

- Heart with:
 - Two atria
 - One ventricle
- Mixing of oxygenated and deoxygenated blood occurs.

Nervous System

- Brain moderately developed.
- Ten pairs of cranial nerves.
- Sense organs include eyes with eyelids and tympanum (ear drum).

Excretory System

- Kidneys are mesonephric.
- Urinary bladder present.
- Adults excrete urea; larvae excrete ammonia.

Reproductive System

- Sexes separate.
- Fertilization usually external.
- Eggs laid in clusters or strings.
- Development includes **tadpole larva** followed by metamorphosis.

Classification of Amphibia

Order 1: Anura (Salientia)

- Tail absent in adults.
- Hind limbs well developed.
- Example: *Rana*, *Bufo*

Order 2: Urodela (Caudata)

- Tail present throughout life.
- Example: *Salamandra*, *Triturus*

Order 3: Apoda (Gymnophiona)

- Limbless and worm-like body.
- Example: *Ichthyophis*

Importance of Amphibia

Useful:

- Control insect population.
- Important in ecological balance.
- Used in biological research.

Harmful:

- Some species secrete poisonous substances.

Conclusion

Amphibia form an important connecting link between fishes and reptiles. Their unique adaptations mark the transition of vertebrate life from water to land.