

AMPHIBIA

Dr Anita Kumari

Assistant Professor (Guest Faculty)

Dept. of Zoology

L. S. College BRABU, Muzaffarpur

Characteristic features and Representative types

Amphibia refers to "double life", or life in water and on land. **Amphibians** are ectothermic, tetrapod vertebrates of the class Amphibia. Approximately 8,100 species of living amphibians are known. Modern **amphibians** are all Lissamphibia. First appeared about 340 million years ago during the [Middle Mississippian Epoch](#), they were one of the earliest groups to diverge from ancestral fish-tetrapod stock during the [evolution](#) of animals from strictly aquatic forms to terrestrial types. Today amphibians are represented by [frogs](#) and [toads](#) (order [Anura](#)), [newts](#) and [salamanders](#) (order [Caudata](#)), and caecilians (order [Gymnophiona](#)). These three orders of living amphibians are thought to derive from a single radiation of ancient amphibians, and although strikingly different in body form, they are probably the closest relatives to one another. As a group, the three orders forming Sub Class- Lissamphibia. Includes the salamanders, frogs, toads, and caecilians with approximately 3,900 spp.

Characterized by:

- Being tetrapod (4 limbs) that facilitate moving about on land - these limbs evolved from the pectoral and pelvic fins
- Skin is thin, soft, glandular and magid (lack scales except in the caecilians) - skin of caecilians with scales similar to those of fish
- Ectothermic
- Both gill and lung breathers - usually gills in the larval stage, replaced by lungs in the adult; cutaneous respiration in many amphibians
- Three-chambered heart with two atria and one ventricle

Amphibian reproduction variable

- Fertilization may be internal or external.
- Egg-layers (oviparous) but may have modifications associated with development.
- Egg an amniotic - doesn't have a shell but covered with a series of gelatinous layers

- Hatchling in aquatic larval form which breath by gills.
- most larvae herbivorous, some omnivorous to carnivorous
- larval stage may last from 10 days to 20+ years

Amphibians are

- unable to regulate body temperature
- skin types limit distribution to warm, moist climates (i.e. tropics, subtropics, and temperate zones)
- most US species in the south; not found in dry areas
- generally limited to freshwater lakes, streams, ponds - none are true marine forms

Amphibians are represented by three subclasses

- Subclass Labrinthodontia - looked like a salamander
- represented by genus *Ichthyostega* (fish with feet or legs)
- identified by specific labronthodont tooth
- Subclass Lepospondyli
- named for vertebral type with three fused parts
- Subclass Lissamphibia - contains all living specimens
- where living amphibians evolved is not clear - modern (living) amphibians appeared in Triassic

Three primary orders of Amphibia within the Subclass Lissamphibia

- Caudate (Urodela) - Salamanders
- Anuran (Salientia) - Frogs and toads
- Apoda (Gymnophiona) - Caecilians

Representative types

Ichthyophis (Blind Worm):

It is limbless. Dermal scales are embedded in the skin. Male copulates with female by a protrusible cloaca and thus fertilization is internal. The female shows parental care by carefully coiling her body around the eggs till they hatch.

Necturus – Mud Puppy, Water Dog:

Eyes are without eye-lids. Tympanum is absent. There are three pairs of external gills. Tail bears caudal fin which is without fin rays. It is nocturnal.

Axolotl:

The larva of Ambystoma (tiger salamander) is known as Axolotl. It has three pairs of external gills and a tail having a caudal fin. It exhibits the phenomenon of neoteny. When there is iodine deficiency in water, the Axolotl does not change into an adult, but remains in the larval form and becomes sexually mature to start sexual reproduction. Axolotl is found in mountain regions of Mexico.

Proteus (European Blind Cave Salamander):

The broad head has rudimentary eyes, so that it is blind. Three pairs of external gills, laterally flattened tail with a caudal fin and weak fore and hind limbs are present. Fore-limbs have three digits and hind limbs have two digits. Hind limbs are smaller than the fore limbs.

Salamandra (Salamander):

Salamandra (European spotted or fire salamander). The male discharges sperms in capsule called spermatophore which is picked up by the female with cloacal lip to fertilize her eggs (ova) internally. It is viviparous. Gills are absent in the adults. The trunk bears fore and hind limbs with four fingers and five toes respectively.

Triturus verrucosus (formerly described as Tylototriton verrucosus):

It is also called Himalayan newt because it lives in the Eastern Himalayas. In India, it is found in the Darjeeling Hills, Meghalaya, Sikkim, Manipur and Arunachal Pradesh. Head is with rounded snout and a pair of parotoid glands. Arms and legs are equal in size. It is nocturnal, carnivorous and possesses very good power of regeneration. It hibernates in winter.

Pipa (The Surinam Toad):

It is famous for the unique method of parental care. The female Surinam toad carries the tadpoles in special pits on its back till tadpoles become toads.

Alytes (The Mid-Wife Toad):

Male shows parental care. The male mid-wife toad carries the eggs around his thighs and stays in damp places until tadpoles hatch to enter water.

Hyla arborea (Tree Frog):

It is adapted for life in trees. Large vocal sacs help in making a very loud voice. Hyla faber shows parental care by making enclosures in shallows water on the border of the pond for protection.

Rhacophorus (Flying Frog):

The limbs are thin and long with well developed webs between the digits. It lives in trees and glides from tree to tree or from tree to the ground. It also exhibits parental care by depositing eggs in the nest near water.

Bufo melanostictus (**Indian Toad**):

It inhabits on land in moist and dark shady places, such as the corners of gardens and under the leaves and stones, etc. It is a terrestrial and nocturnal animal.

The secretion of its skin glands contains bufonin and bufotalin, which probably have healing property. For breeding it goes to water where it lays eggs in strings. Since it bears poisonous glands (parotoid glands), it is not generally eaten by other animals like snakes, birds, etc.

