

Amphibians

The First Terrestrial Vertebrates

The double life

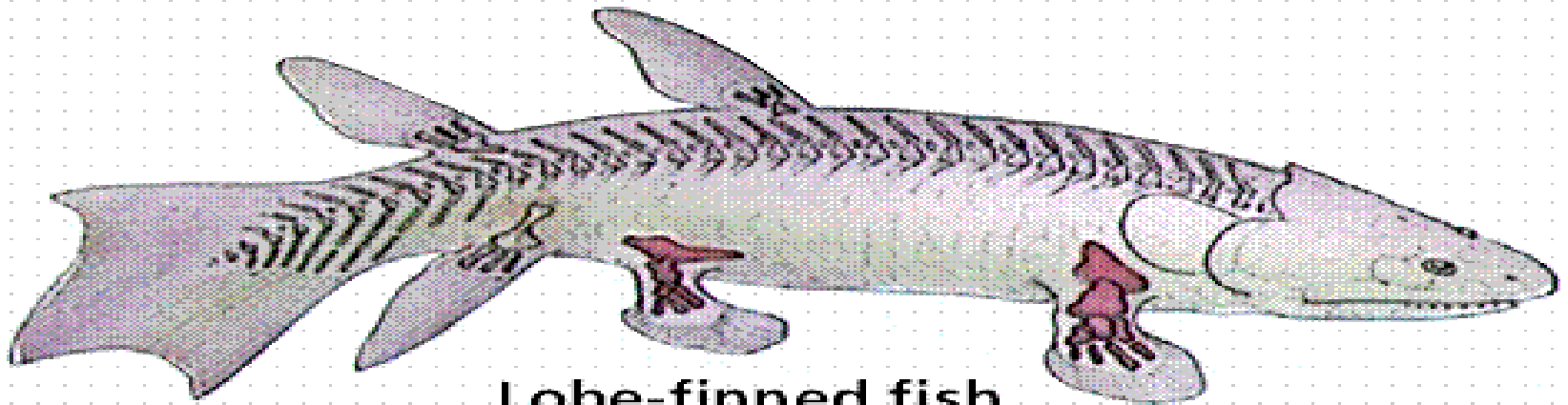
Origin and Evolution of Amphibians

- Lobe – finned fish
 - Bone structure within their fins allowed for them to function as “legs”
 - Modified pouches in digestive tract evolved into lungs of the lungfish and swim bladder of modern fish
 - Amphibians also share skull and vertebral column

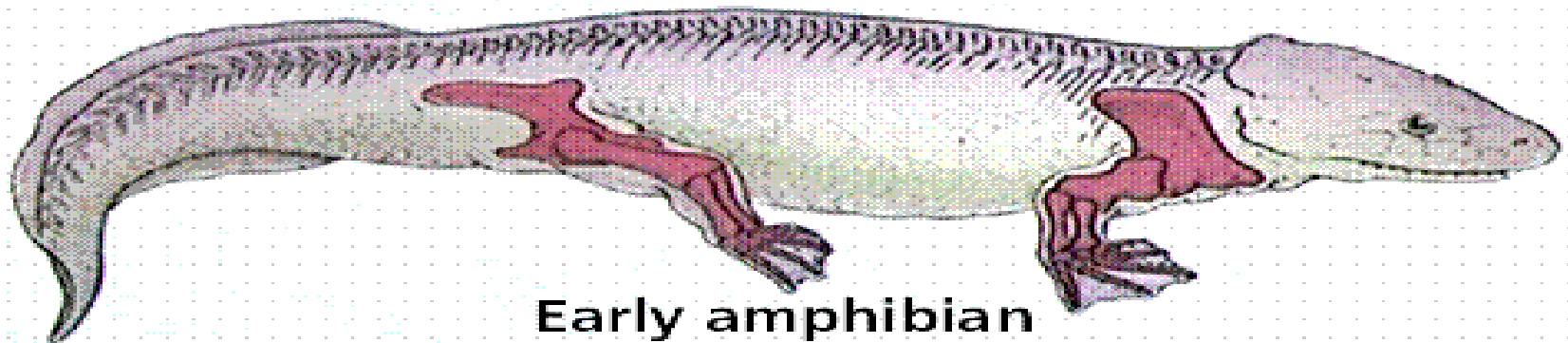
Lobed – finned fish: Coelocanth



Crossopterygians had no gills but they had internal nostrils and a primitive lung that may have enabled them then to respire for periods of time on land.



Lobe-finned fish



Early amphibian

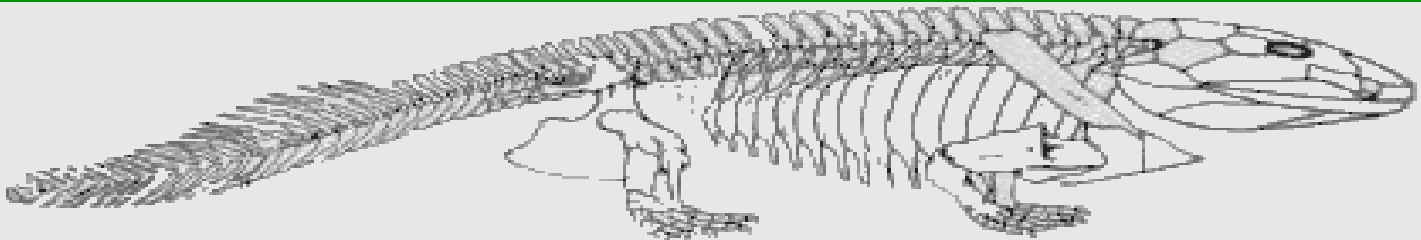
- Oldest amphibian fossils were dated to 360 m.y.a
- Between 359 – 299 m.y.a amphibians split into two main evolutionary lines
 - Modern amphibians
 - Ancestors of reptiles



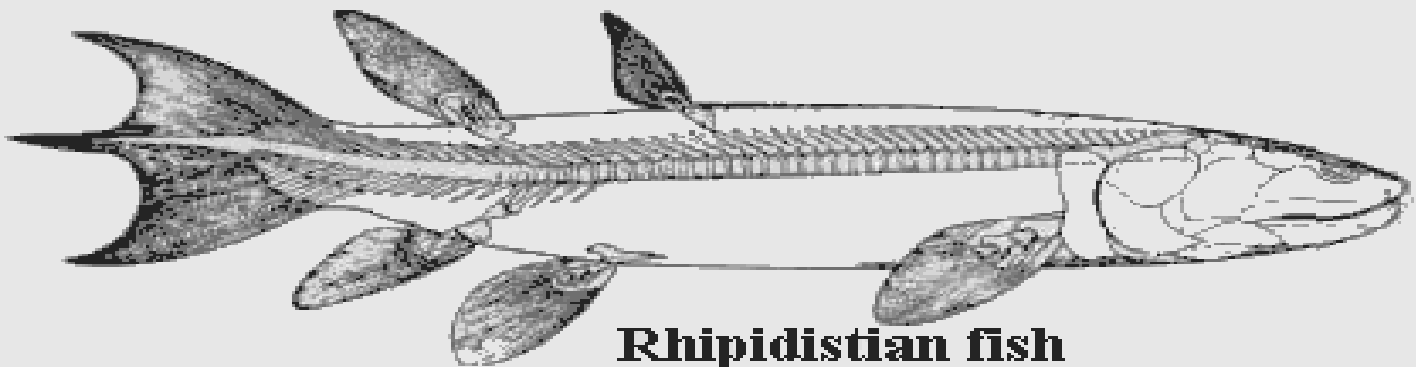
Phylogenetic Relationships

- Fossil record provides evidence of many extinct taxa and no one knows what animal was the first stegocephalian.
- Taxonomists agree that amphibians are monophyletic and closely related to reptiles, birds, and mammals.

Evolution of Amphibians



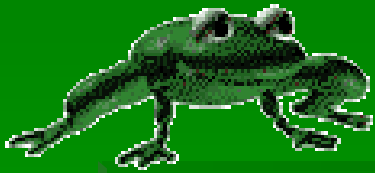
Ichthyostegid amphibian



Rhipidistian fish

Classification

- **Domain:** Eukarya
- **Kingdom:** Animalia
- **Phylum:** Chordata
- **Subphylum:** Vertebrata
- **Class:** Amphibia, 4500 species
 - **Order Anura**, largest order contains the frogs and toads
 - **Order Caudata**, contains salamanders
 - **Order Gymnophiona**, contains caecilians

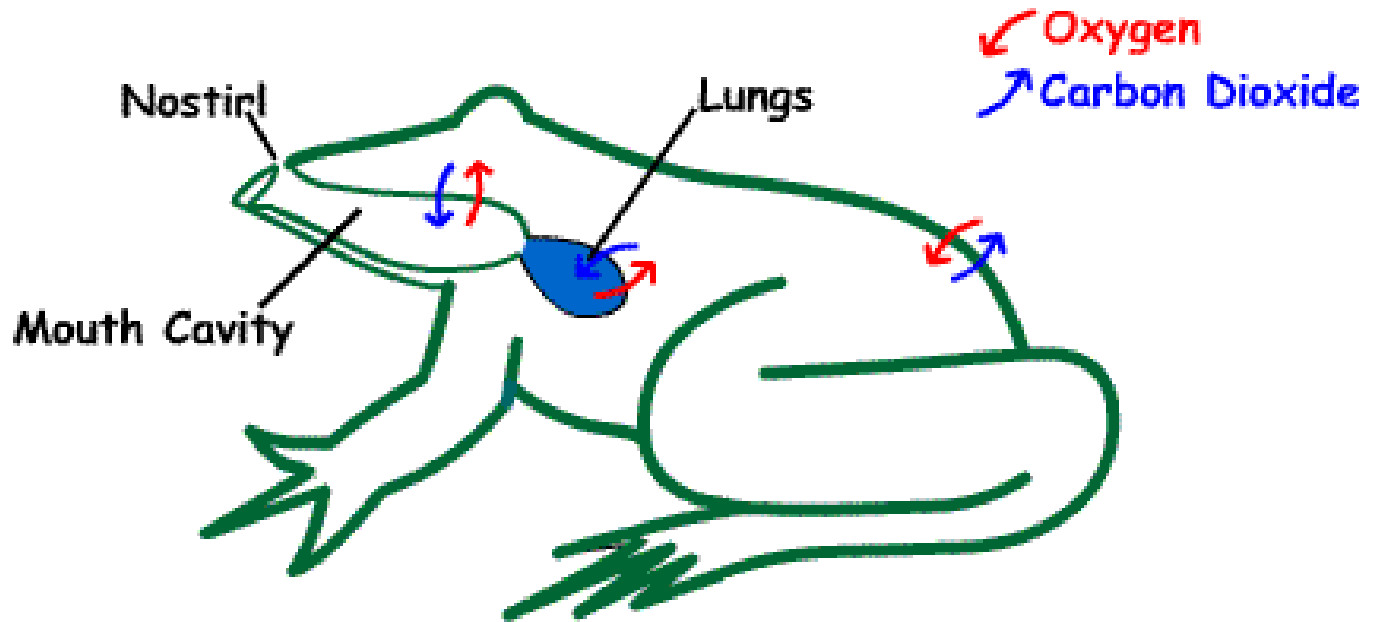


- "Amphibian" comes from the Greek meaning "both life". Amphibians can live on water and on land.
- Scientist infer that amphibians evolved from lobe-finned fishes called crossopterygians.

Amphibians are cold-blooded, which means their blood temperature rises and falls with that of the surrounding environment



They use gills, lungs, skin, and mouth cavity in respiration.

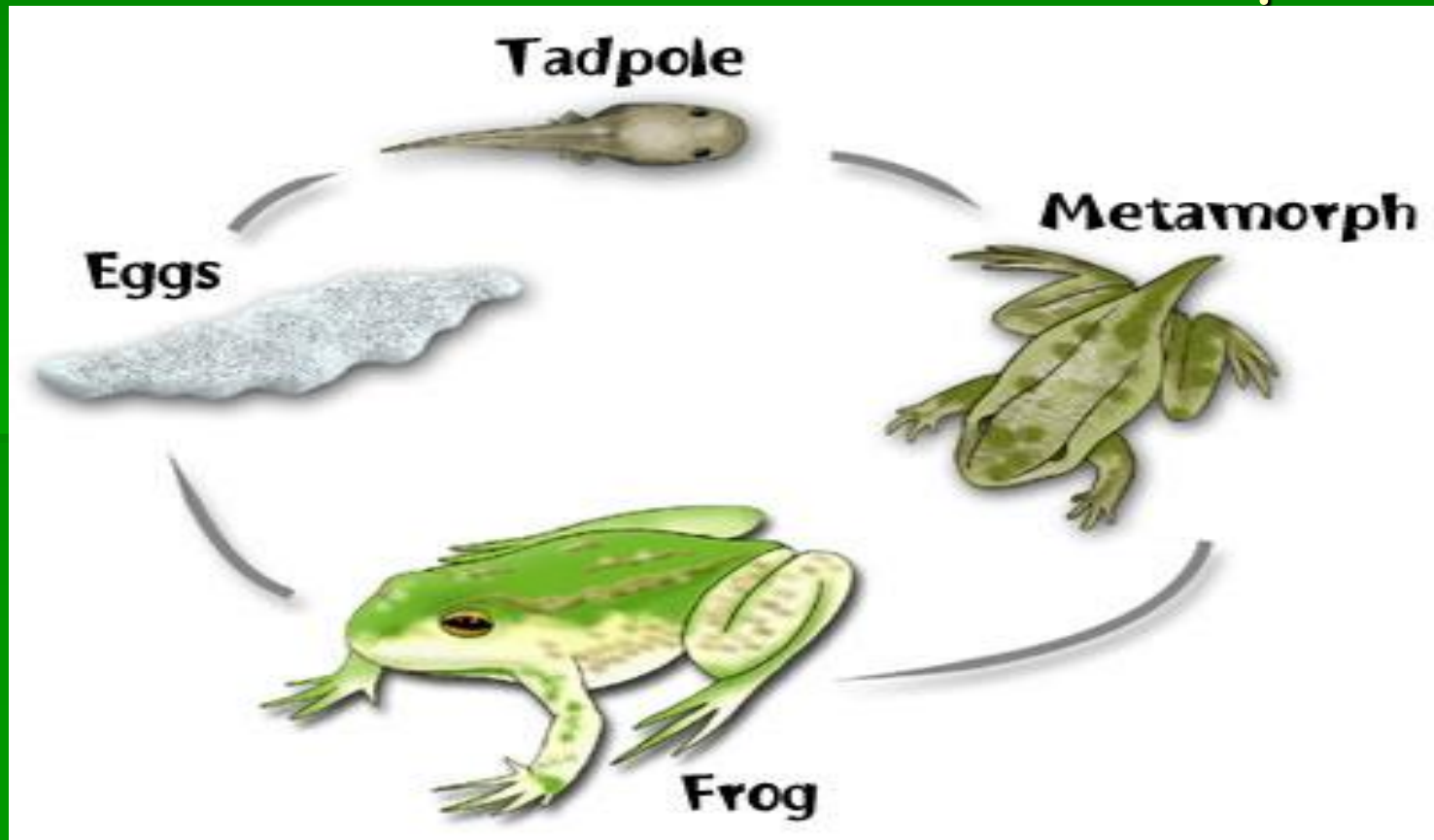


They have moist, smooth, thin skin with no scales. Feet are webbed and the toes lack claws.



Amphibians have many prominent characteristics that are adaptations to a life spent both on land and in water:

They change from an aquatic larval stage to a terrestrial adult form. This transformation is called metamorphosis





Amphibians enter a state of dormancy or torpor when conditions are unfavorable. They often bury themselves in mud or leaves, emerging when conditions are better.

Such states of inactivity
are known as known as:

- ❑ Hibernation when it occurs in the winter
- ❑ Estivation when it occurs in the summer

**Larvae have two-chambered hearts;
adults have three-chambered hearts
and well-developed circulation.**



Eggs lack multicellular membranes or shells. They are usually laid in water or in a moist environment and fertilized externally.

