

Order Gymnophiona

- Caecilians
- Body long, slender, wormlike
- Limbs and limb girdles absent
- Many vertebrae, long ribs
- Tail short or absent



Order Gymnophiona

- Feed on worms, small invertebrates
- Fertilization internal, eggs deposited in moist soil near water
- Some species guard eggs (body folds)

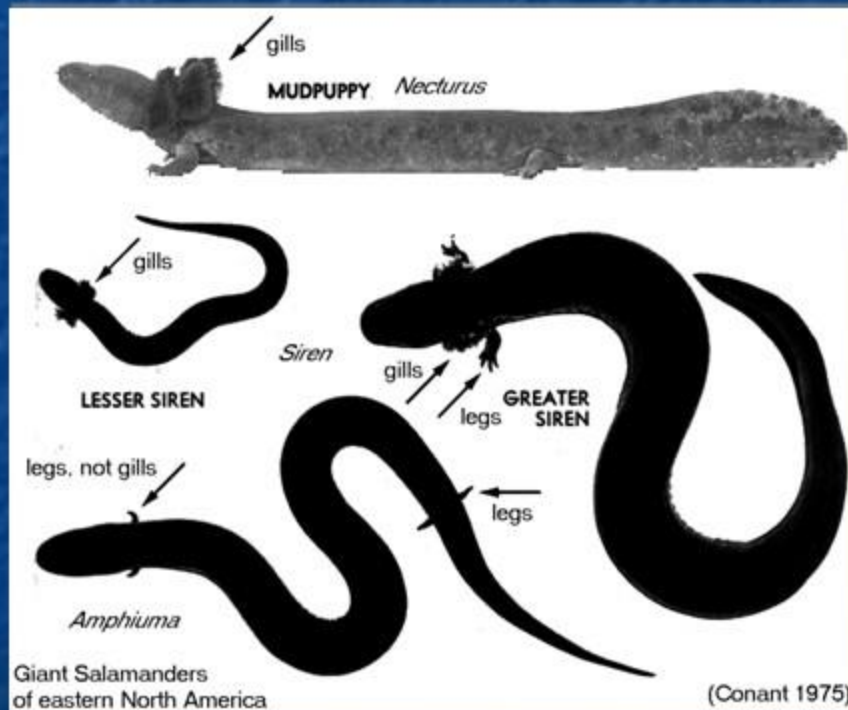


Order Caudata

- Typically small, most <15 cm long
- Aquatic species may be much larger
- Carnivorous
Japanese giant salamander may be >1.5 m long



Order Caudata



- Some species have rudimentary limbs
- *Amphiuma* has tiny limbs
- Sirens have minute forelimbs, no hindlimbs
- Different enough for separate order?

Order Caudata



- *Amphiuma*



- Siren

Order Caudata - no lungs

- Some salamanders don't bother developing lungs when they lose gills
- Family Plethodontidae - lungless salamanders - most of familiar N. Amer. salamanders



Order Caudata - no lungs

- Provides 90-95% of gas exchange
- Other 5-10% from capillaries inside mouth
- **Buccopharyngeal breathing**



Order Anura

- Frogs & toads
- >3400 species
- Most familiar, successful amphibians
- Obvious, common characteristic - lack of tail in adult
- All pass through tailed larval stage



Order Anura

- Specialized for jumping mode of locomotion



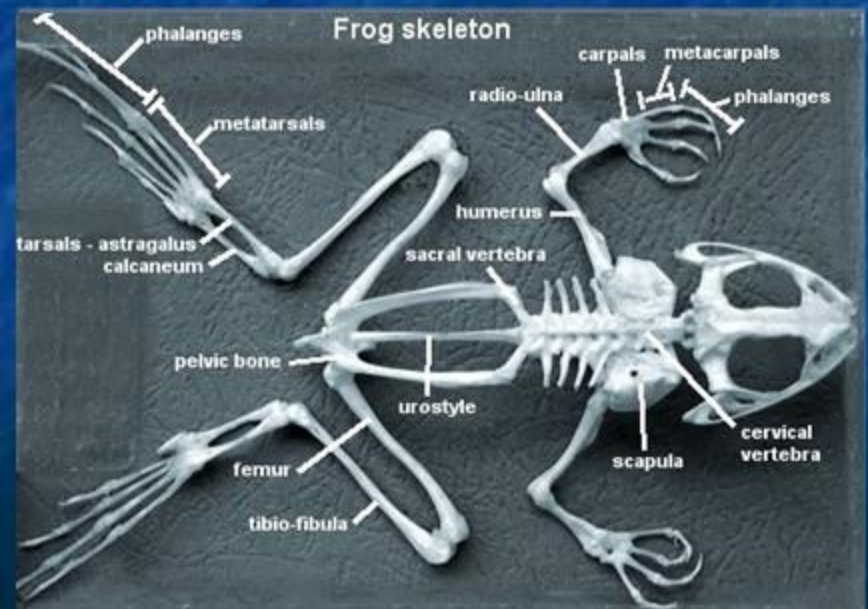
Order Anura

- Tadpole
 - Long, finned tail
 - Both internal, external gills
 - No legs
 - Specialized mouthparts for herbivory (salamander larvae are carnivorous)
 - Highly specialized internal anatomy



Order Anura

- No visible neck
- Caudal vertebrae fused (to form **urostyle**)
- Ribs generally absent
- Hindlegs much enlarged



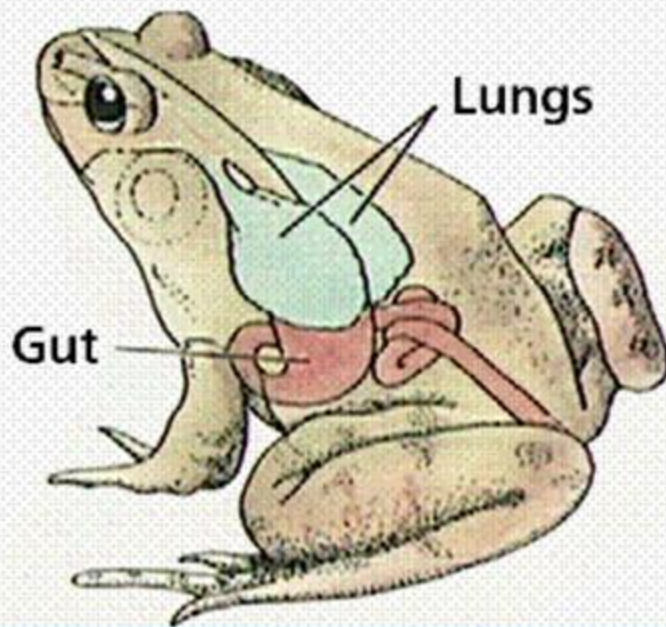
Order Anura

- 21 different families
- Common North American frogs
 - Ranidae - grass frogs
 - Hylidae - tree frogs



Order Anura - lungs

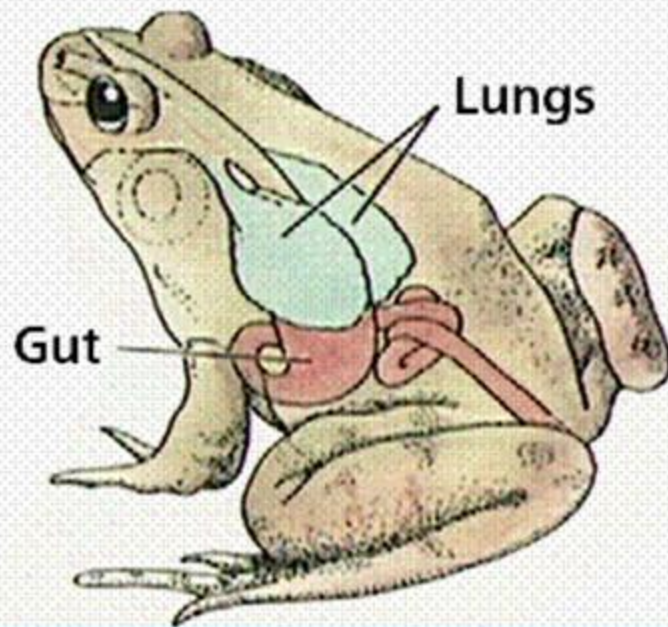
Amphibian lungs are ventral outpocketings of the gut, though they lie dorsal to it



- Frogs and toads are more highly dependent on lung breathing than are the salamanders
- Several disadvantages of cutaneous respiration

Order Anura - lungs

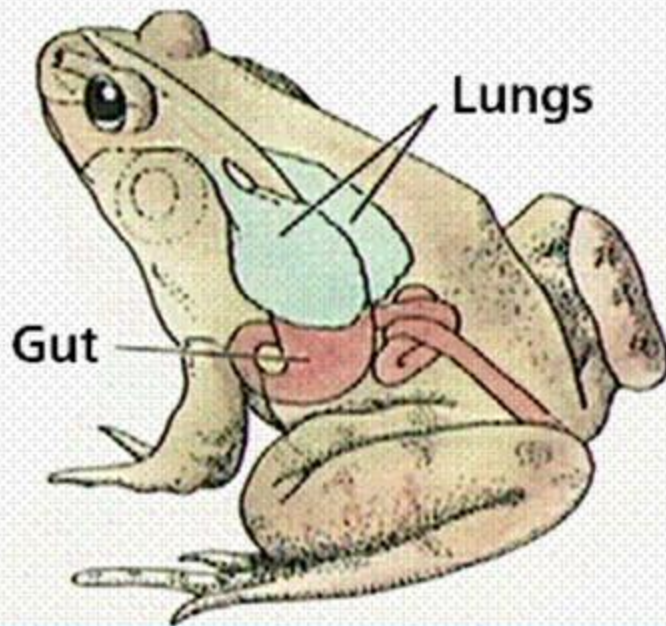
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- 1) skin must be kept thin, moist - too delicate for wholly terrestrial life
- 2) gas exchange rate across skin nearly constant - cannot vary with increased activity

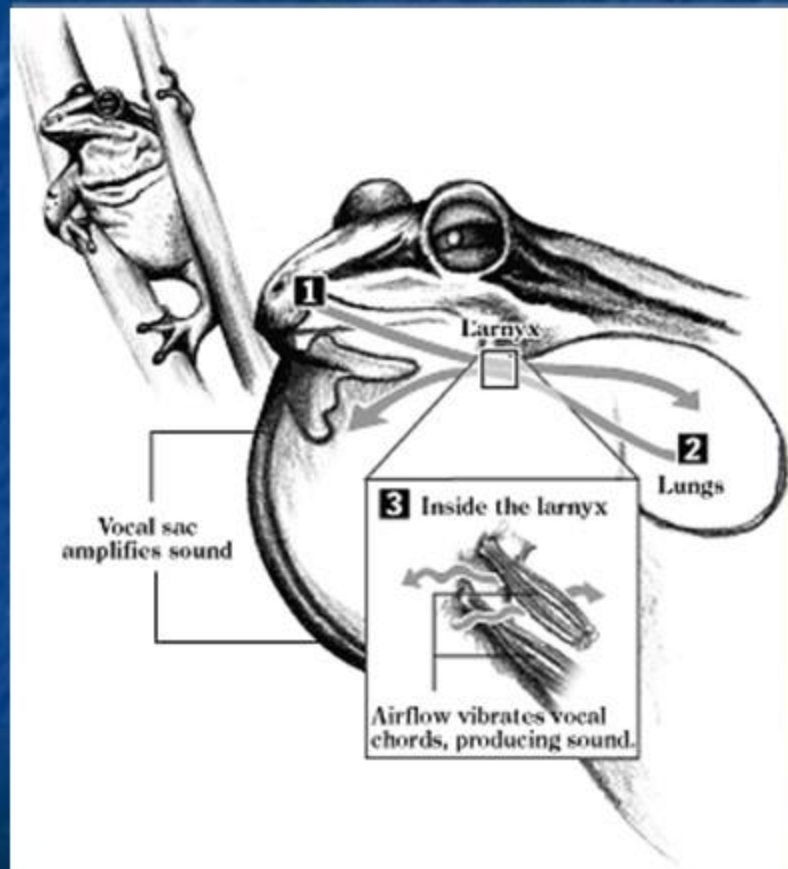
Order Anura - lungs

Amphibian lungs are ventral outpocketings of the gut, though they lie dorsal to it



- Cutaneous respiration important to anurans during winter hibernation
- Also, under normal conditions most CO_2 is lost across skin surface, most O_2 taken up by lungs

Order Anura - lungs



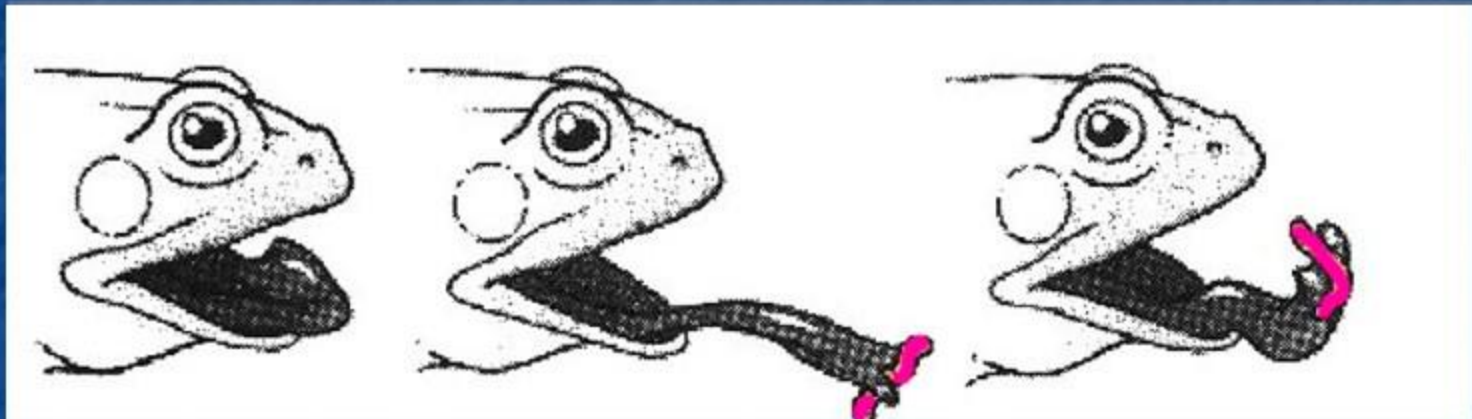
- Both male and female anurans have vocal cords
- Males are better developed
- Located in larynx - voicebox

Order Anura - feeding

- Adult frogs are carnivorous
- Feed on insects, spiders, worms, slugs, snails, millipedes, anything moving and small enough to eat



Order Anura - feeding



- Snap at prey with protrusible tongue
- Attach at front, free behind
- Free end very glandular, produces sticky secretion, adheres to prey