

Lecture 13: Vertebrates

-NPR possibly a new fungus/kingdom?

-micro fungus related organisms but very different from them.

- biologists can only really study microscopic organisms grown in lab,

Kryptomarcoto-several stages of life, lack a protein that is a defining trait of fungi, cryomycata, crypto-hidden mycata-fungi

Chordates-craniates-vertebrates-gnathostomes-tetrapods-amniotes-to mammals

Tiktaalik roseae-assyne eg 375 myo extinct fossil, ex of the theory of evolution

An aquatic animal lineage invading land encounters what problems/pressures?

DESSICATION-DRYING UP, GRAVITY

AMPHIBIANS

-early tetrapods

-3 groups

-frogs(and toads), salamanders, and caecilians.

-a monophyletic group sharing a common ancestor in Paleozoic

Surviving on land: Features of amphibians

Skin:

-water loss a problem on land

-amphibians living in or near water have moist skin with high rates of water influx

-more terrestrial forms (toads,etc) have thickened, drier skin with lower water influx

Why are terrestrial toads more "lumpshaped" than aquatic frogs, which are sleek and long-legged?

Toads have larger volume vs surface area that keep in water, frogs have larger surface area to volume, greater water influx,

Toads can further venture away for water

Locomotion on land

- Salamanders and caecilians use primitive lateral undulation inherited from aquatic ancestors
 - body bends back and forth; limbs apply force against substrate
- Frogs have derived jumping locomotion
 - stiff pelvis, vertebral column, and long hind limbs act together as a catapult

Amphibian feeding strategies

- Unlike fishes, tetrapods (including amphibians) have a “neck” and movable head. Who else does also?
 - fish operculum links skull to shoulder; lack of gills “frees” head
- Many aquatic amphibians retain primitive suction feeding method
 - Can suction feeding work in air?
- many terrestrial amphibians have evolved projectile, sticky tongues³

Frog Mating behavior: A good model for sexual selection

- Most male frogs vocalize to attract females
- Females often choose among many males

MALES MAKE LONGER CALLS OR LOWER PITCH, WHY? BECAUSE LARGER FROG MEANS HEALTHIER

Amphibian reproduction

- Most amphibians still tied to water for reproduction (ancestral condition)
 - aquatic larvae metamorphose into terrestrial juveniles
- Eggs require moist environment, from water or*
 - males or females carry on back, in mouth, or in stomach
 - females whip up frothy nest
 - females retain eggs in reproductive tract for development

*WHATEVER: the eggs have no shells

What would be a good invention? Egg shell!- with amniotic cavity, amniotic fluid, and egg

The Amniotic clade

The amniote clade

- characterized by features associated with better ability to survive in terrestrial (dry) environments
- includes reptiles (including birds) and mammals
- named for (part of) the egg that is now in a shell

[mammals dispense with shell and keep embryo in uterus]

- includes all tetrapods except amphibians

Derived features of amniotes

1. egg with shell
2. dry skin (types of protective covering?)
3. well developed ribs surrounding lungs
4. internal fertilization
5. faster, agile mobility

Most onnavian reptiles lay eggs tortoise-desert dwelling turtles-like water

All avian reptiles lay eggs

Birds of all reptiles are the most specious? Why?

Because wings, small can be

Embryonic development, who had already though of eggs with covers and internal fertilization

Dinosaurs

- Dinosaur clade includes birds
- Dominated the terrestrial environment for

most of the Mesozoic

- > 140 MY (far longer than mammals

have dominated since the end of the