

Amniotes → amniota

-turtles - lepidosaurs - archosaurs & mammals

Anamniotes

-Non amniote vertebrates

include majority of fishes & all amphibians

Amniotes - dispensed w/ larval stage - can not lay eggs in water

Amniote Traits

1. Amniotic egg - egg w/ elaborate extraembryonic membranes surrounded by a shell
2. Impermeable skin - have a much thicker epidermis, w/ elaborate keratinous structures (scales, feathers & hair) * high levels of lipids in epidermis
3. Costal ventilation of lungs - have an advanced method of lung ventilation that involves the rib cage
4. Temporal Fenestration - skulls characterized by FENestra (openings) vary b/w groups (3 diff conditions)
 - a. Anapsid condition
 - i. No fenestra
 - ii. Early amniotes & turtles
 - b. Synapsid condition
 - i. Single fenestra behind orbit
 - ii. Synapsids (mammals & mamml like rep's)
 - c. Diapsid condition
 - i. 2 fenestae behind orbit
 - ii. Lepidosaurs (lizards snakes) & archosaurs (crocs dinos & birds)

Differences b/w anamniotic & amniotic egg

Shell - provides mechanical protection but is porous enough to allow movement of resp. gases & water vapor

-*fluid filled membranes also give mechanical protection

Shells can be soft & flexible or hard

Amniotic has 3 additional extraembryonic membranes

-amnion

-extraembryonic membrane - only surrounds embryo

-Cavity formed b/w embryo & amnion is called Amniotic Cavity (filled w/ amniotic fluid)

-Chorion

-Extraembryonic membrane - surrounds other extraembryonic membranes

-Outermost Membrane

-Allantois

-Develops as an extension of the hind gut

-Acts as a storage area for N waste produced by metab. Of embryo

Base of allantois contributes to formation of urinary bladder as adult

-Highly vascularized & serves as a respiratory organ during later development

- Left behind upon hatching

ADVantage of Amniotic Egg

- allows amniotes to dispense w/ the larval stage & have larger offspring upon hatch
- strong correlation b/w egg size & adult size

Amniote skin epidermis

- typically thicker than amphibians
- less vascularized (no subcutaneous resp)
- lesser diversity of glands

-Keratin – type of fibrous structural protein (sclera-protein) – contain large amounts of S – mature keratin is dead

- In great abundance in amniote skin (though present in all craniates)
- Outermost layer Stratum Corneum – composed of dead keratin rich cells

Keratinous structures

- derived from epidermis
- possible b/c skin is not involved in respiration
- armor of earlier vertebrates derived from DERMIS
- some amniotes have dermal armor

Lung Ventilation

- Costal – Rib cage expands & contracts lungs
- Tidal Flow – expansion of rib cage = Negative pressure, draws air into lungs via trachea

-contraction of rib cage forces air back out

Amphibians had buccal pump to force air into lungs

- relied heavily on throat muscles
- more energy consuming than costal ventilation

Synapsids vs Sauropsids

Diff methods of lung ventilation

- Synapsids – plesiomorphic tidal flow – air flows in & out of lungs through same passage known as – ALVEOLAR LUNG
- Derived Sauropsids birds & poss dino's evolved through system where air flow 1 direction FAVEOLAR LUNG

Read chapter 11

Section. 11.2

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