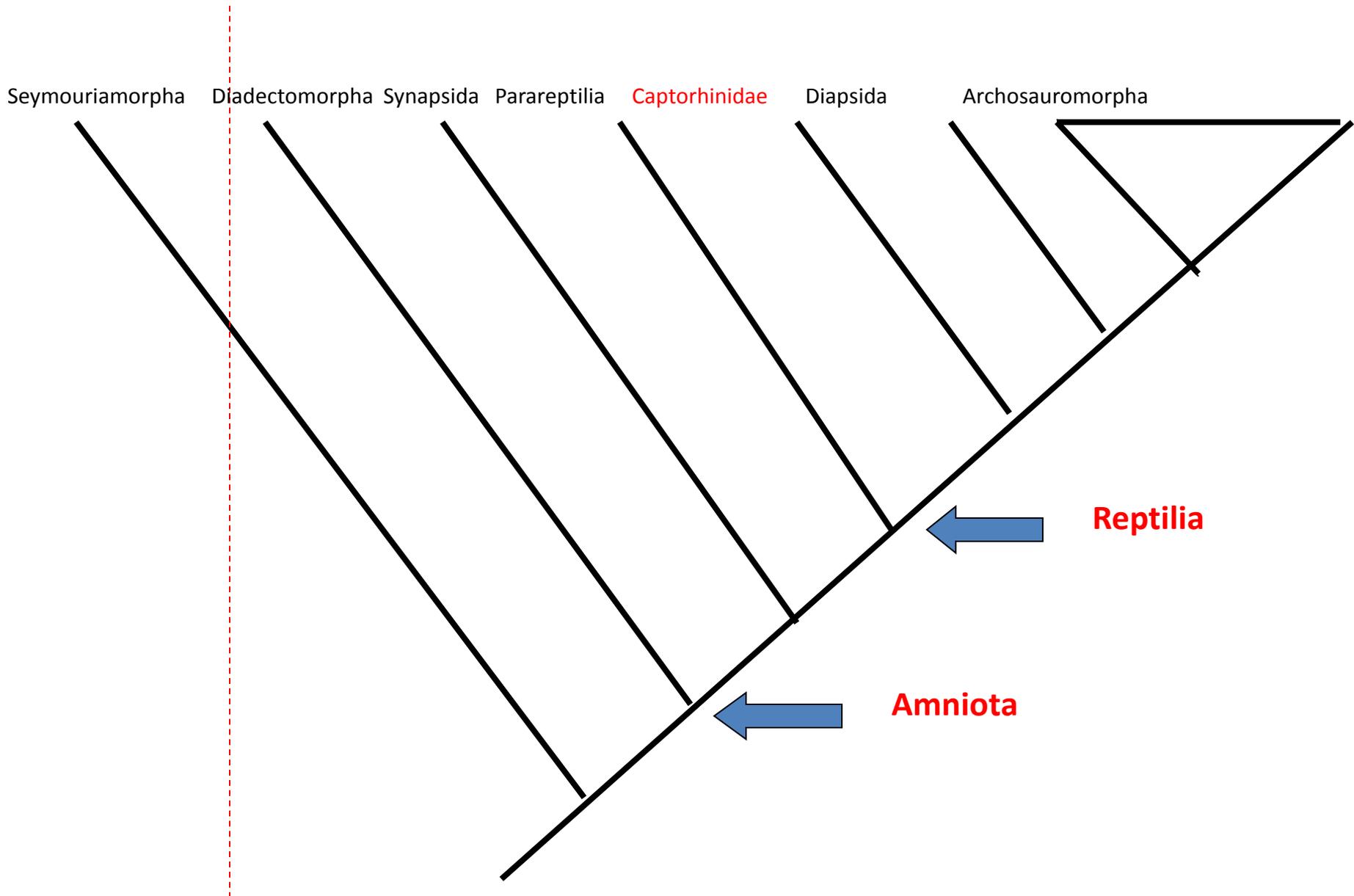


Stuart S. Sumida
Biology 342

Simplified Phylogeny of Squamate Reptiles

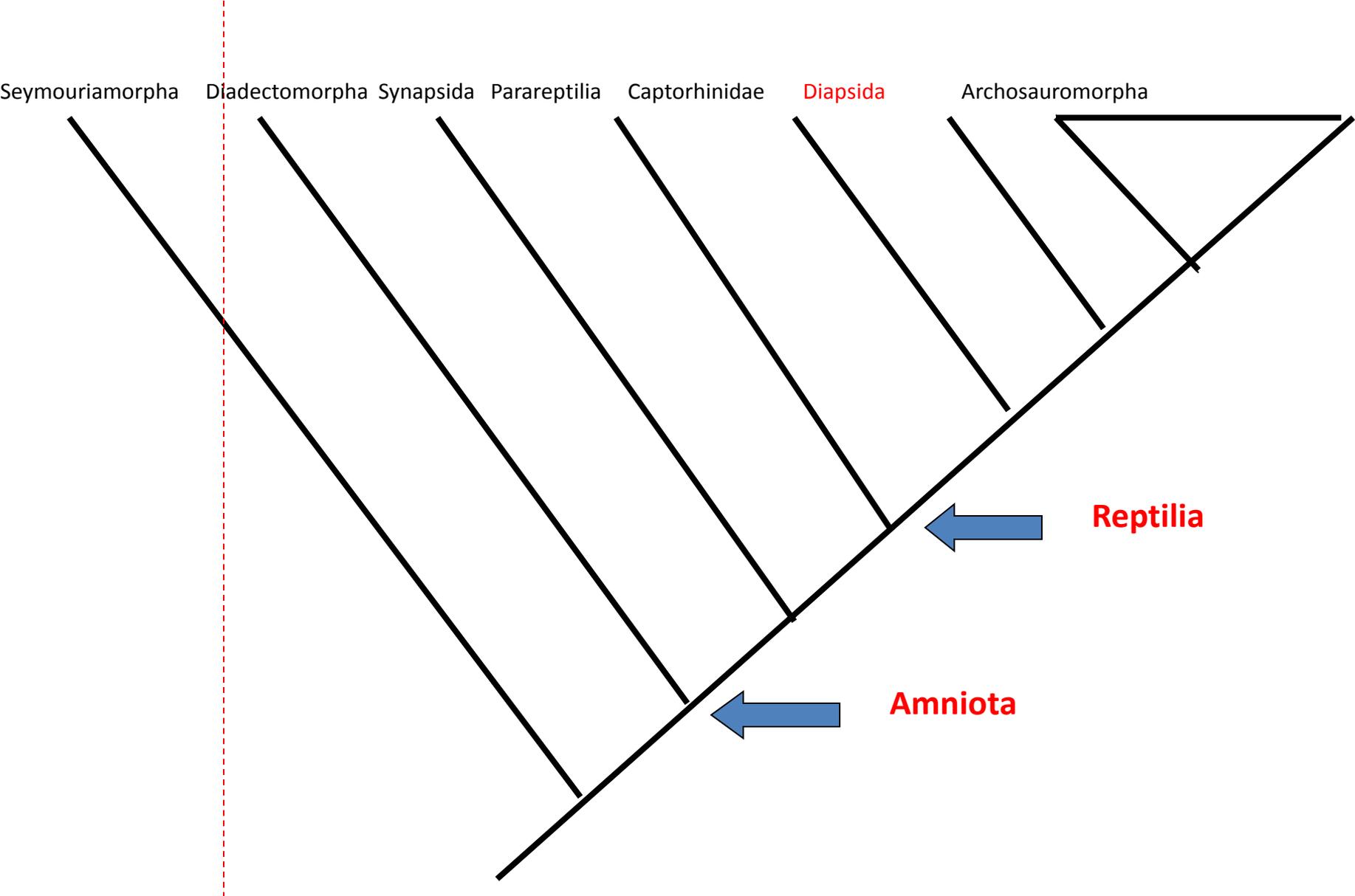
“Amphibia” Amniota



Reptilia

Amniota

“Amphibia” Amniota



Seymouriamorpha

Diadectomorpha

Synapsida

Parareptilia

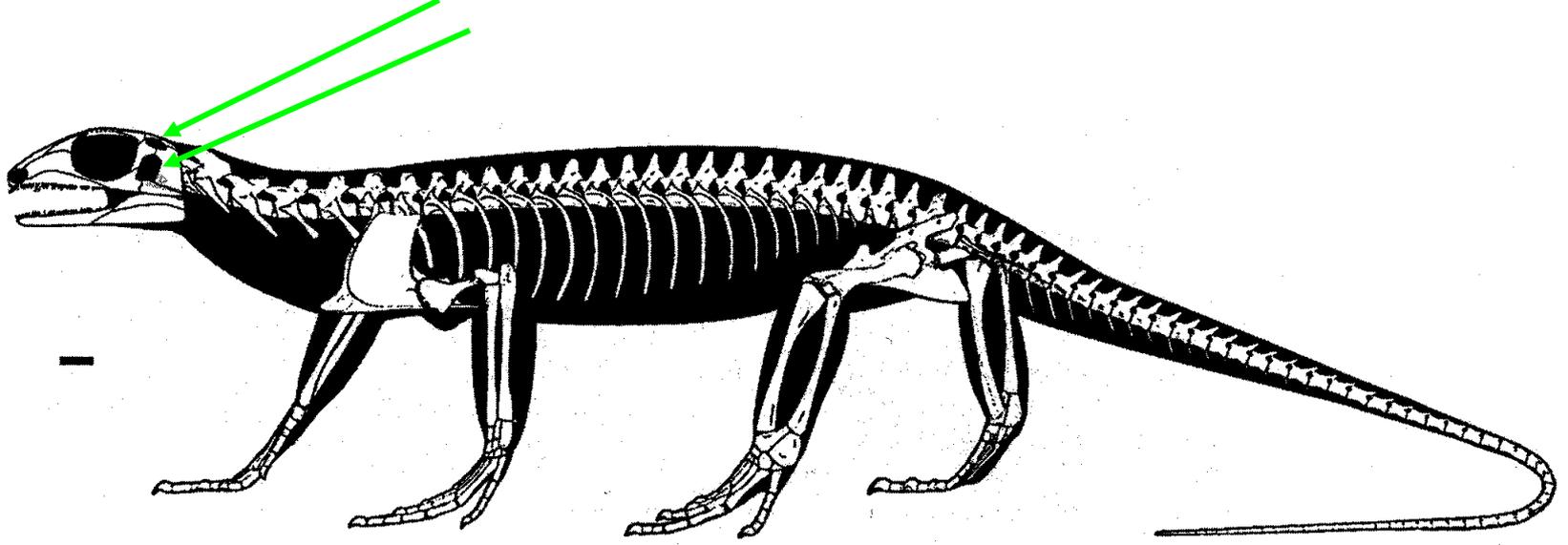
Captorhinidae

Diapsida

Archosauromorpha

Reptilia

Amniota



Basal Diapsid: *Petrolacosaurus*

Note: TWO holes (fenestrae) on side of skull

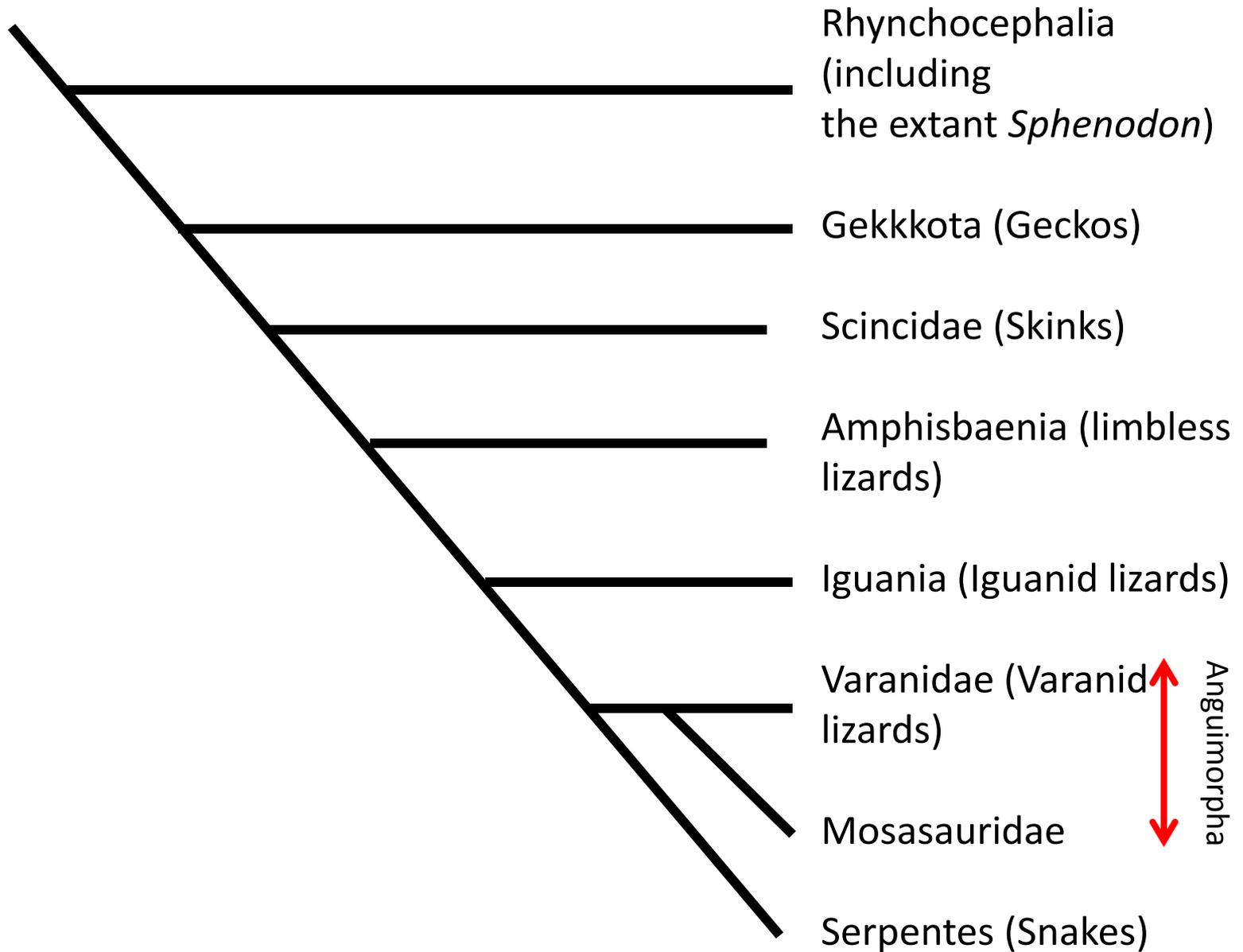
Known back to Late Pennsylvanian

Diapsida includes:

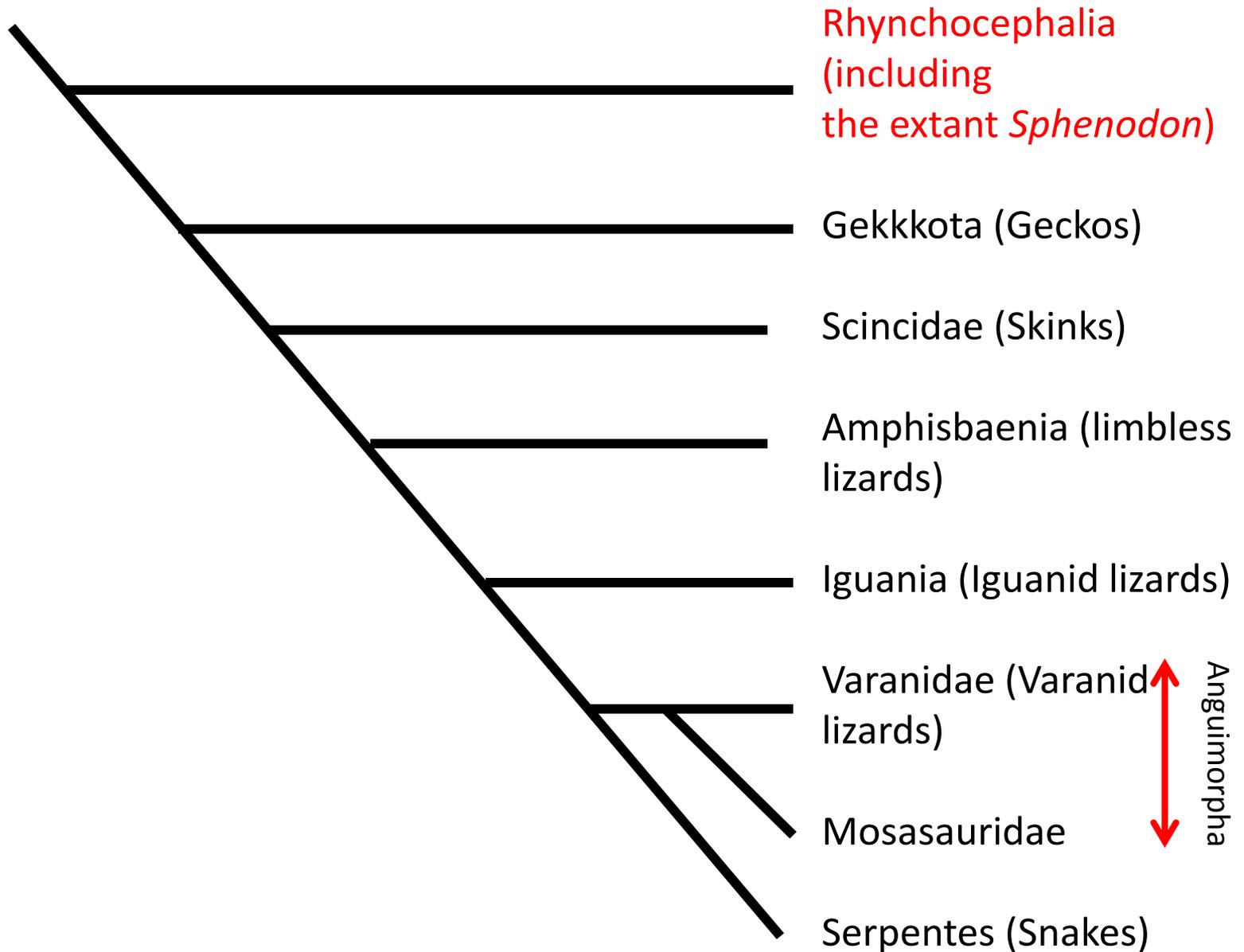
- Many extinct forms
- Squamata
- Archosauromorpha

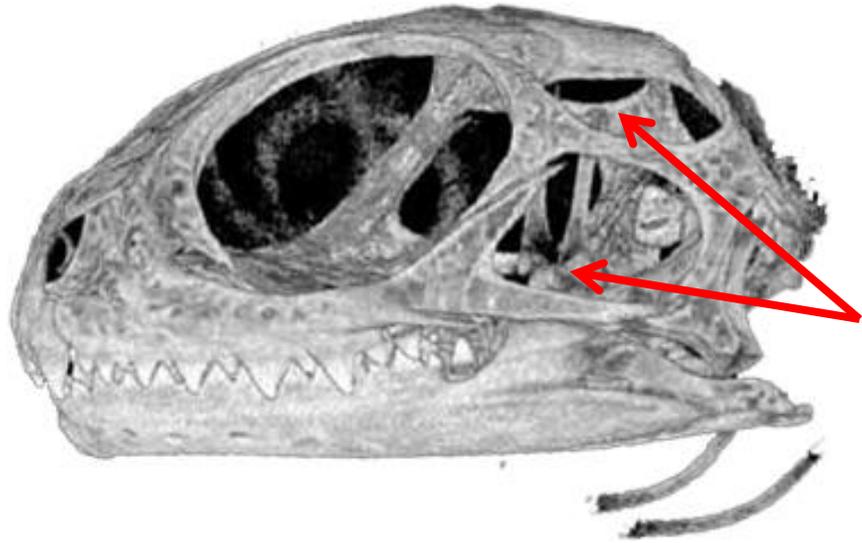
Squamata includes living lizards and snakes.

Phylogenetic Relationships of Squamate Reptiles



Phylogenetic Relationships of Squamate Reptiles





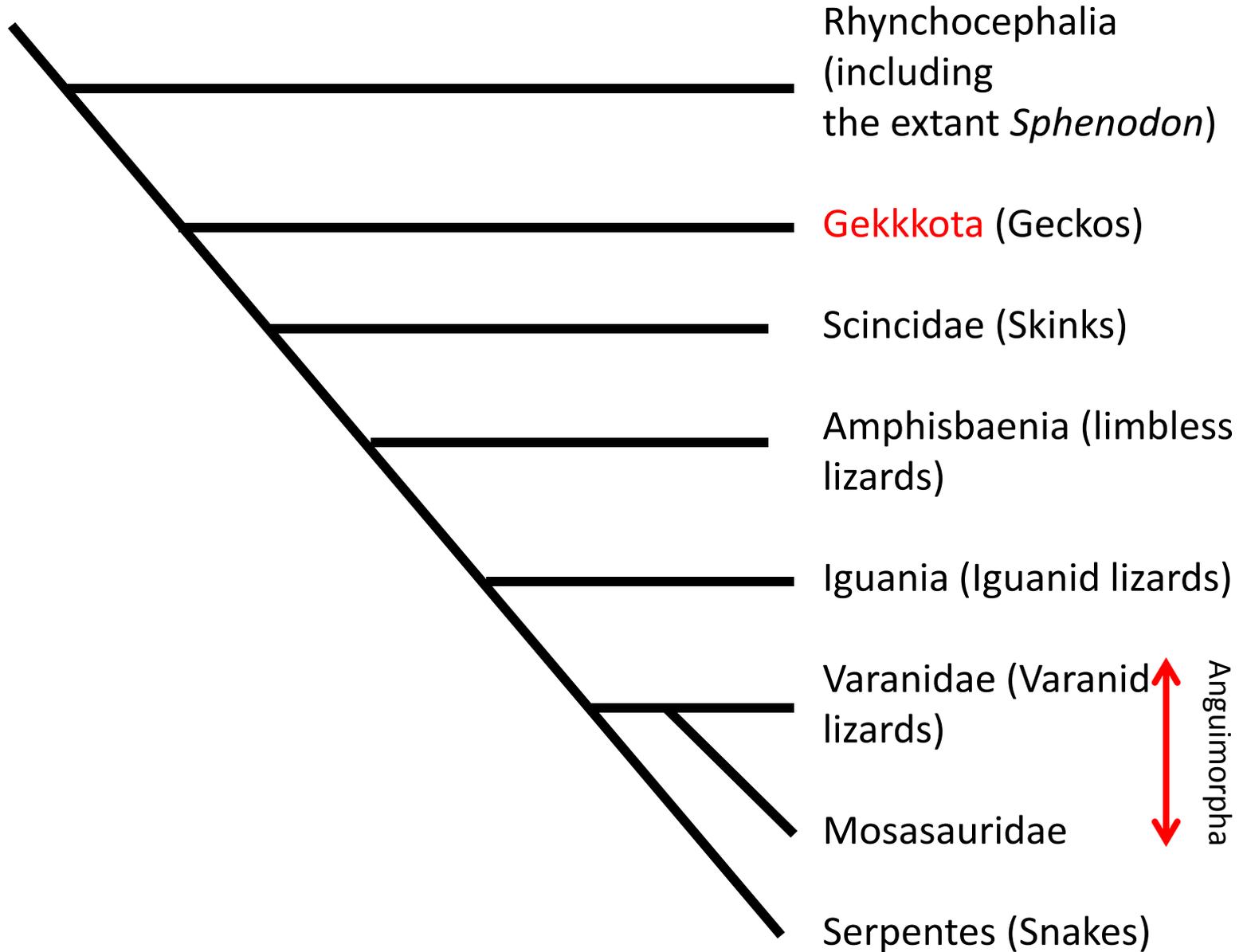
Sphenodon, also known as the “Tuatara”, last living member of Rhynchocephalia, and thus frequently used as an outgroup for phylogenetic analysis of living reptiles. Note primitive condition of two complete temporal openings.



Squamata:

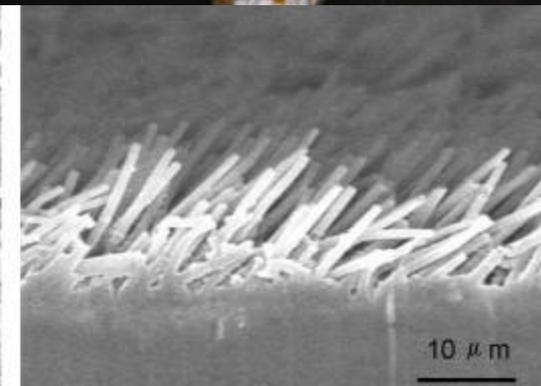
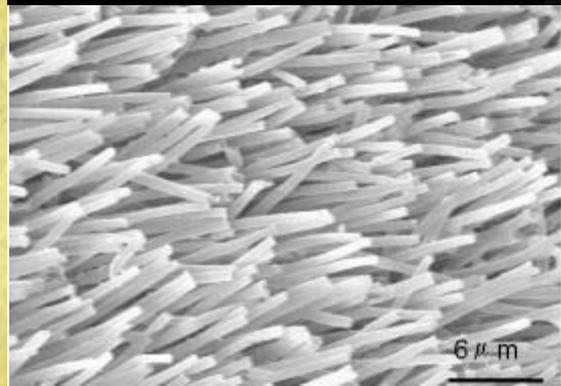
- Lizards (including limbless lizards)
- Snakes

Phylogenetic Relationships of Squamate Reptiles

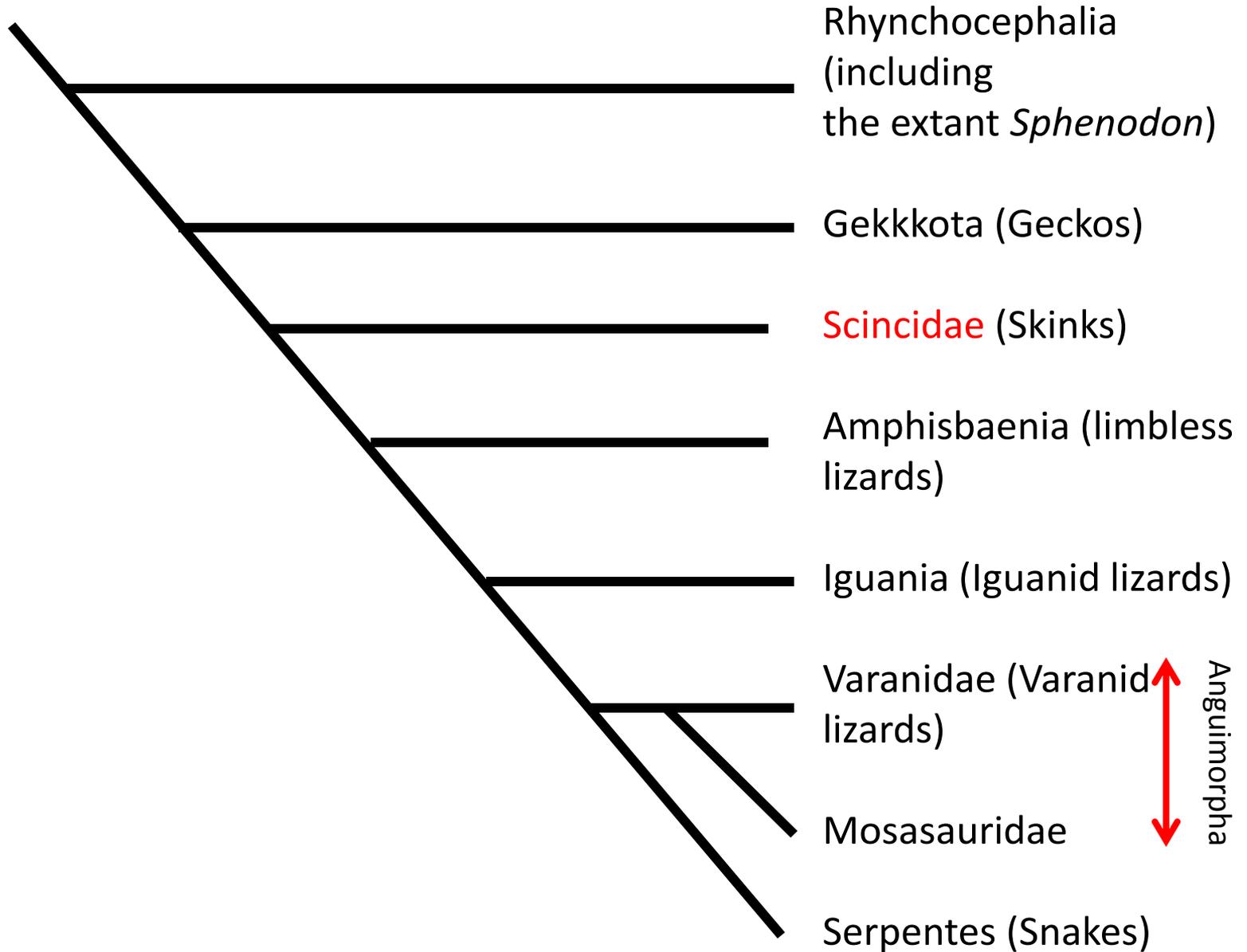


GEKKOTA

- Group of lizards characterized by feet with toes particularly adapted for clinging to surfaces.
- Toes are not “Sticky”, rather, they are a system of microfibers that engage with the surface when dragged along at ~ 45 degrees.
- Pressing straight down allows them to walk, whereas dragging them makes them adhere.



Phylogenetic Relationships of Squamate Reptiles



SCINCIDAE (“Skinks)

Lizard group characterized by extremely fusiform body, virtually no neck.

Known to be parthenogenetic, including the local species *Cnemidophorus tigris* (a local species at far right).

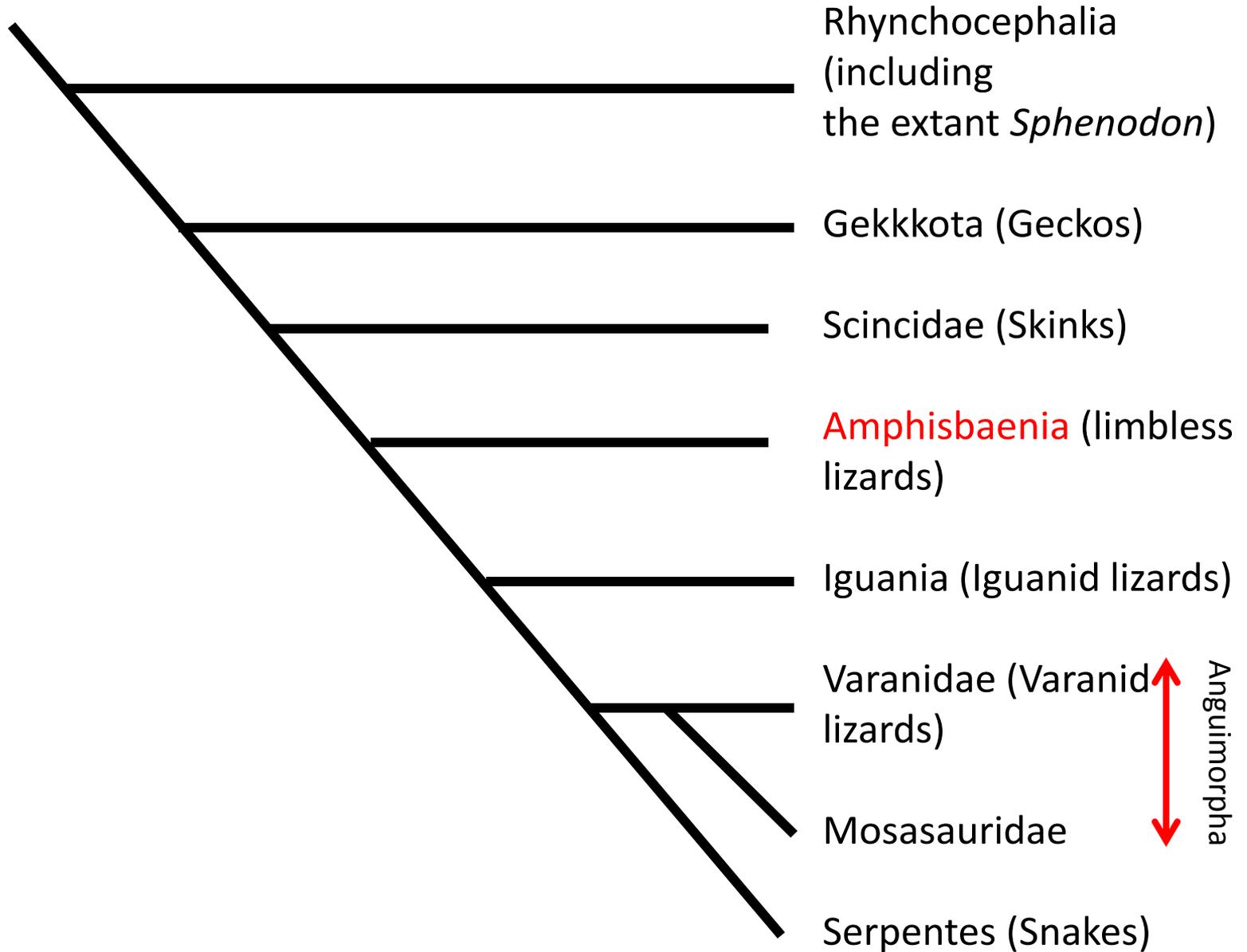
Southeastern 5-line skink



Local whiptail skink, *Cnemidophorus*



Phylogenetic Relationships of Squamate Reptiles

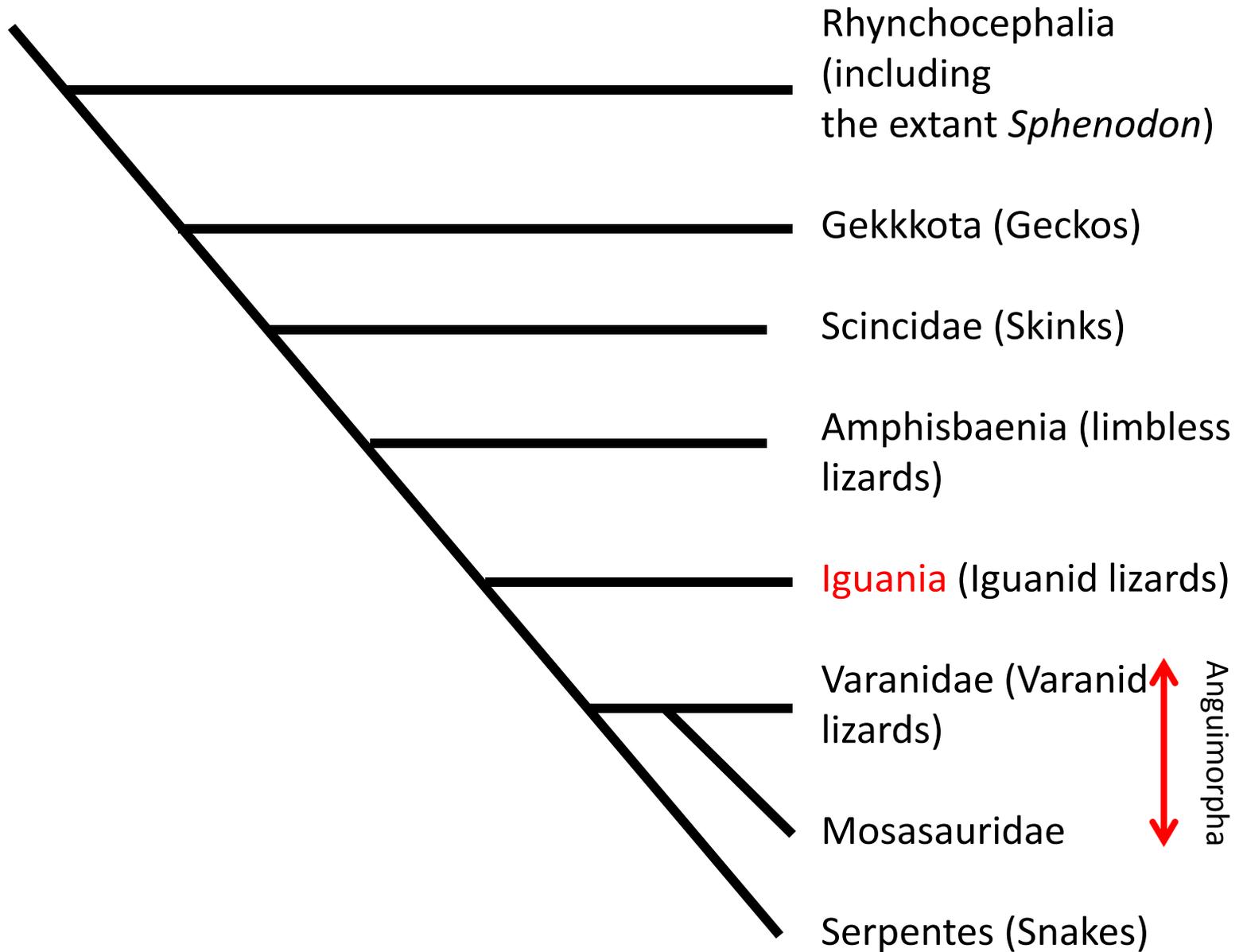


Amphisbaenia: Limbless Lizards

- Distinct from snakes. They have much more robust skulls for lifestyles that are primarily fossorial and living in leaf-litter.
- Limblessness has evolved numerous times within Lepidosauria, including the amphisbaenians, Anguidae (also known as glass lizards), Dibamidae, and Pygopodidae (limbless relatives of gekkos)



Phylogenetic Relationships of Squamate Reptiles



IGUANIDAE

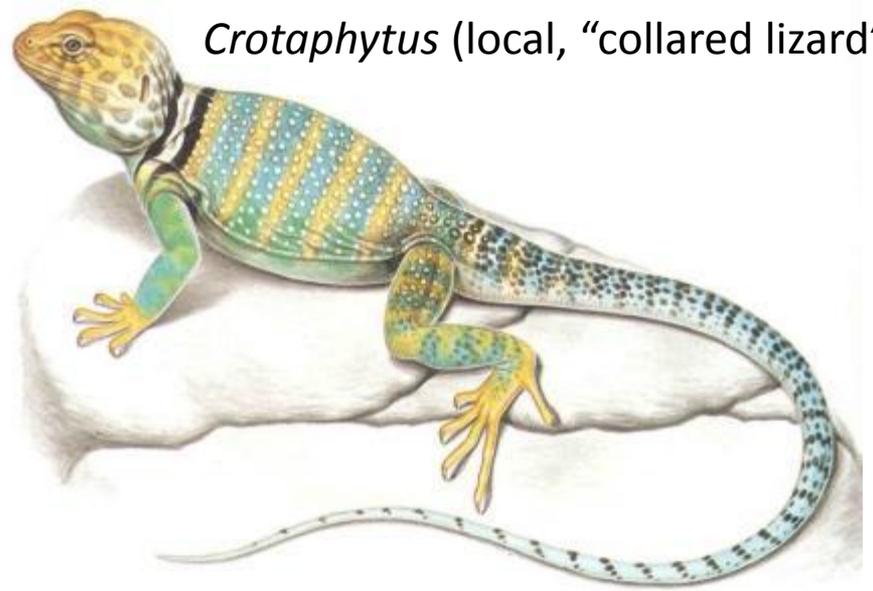
- Dominant group of extant new-world lizards
- Relatively stubbier snouts than the varanids
- Whereas varanids are generally carnivorous, and/or carrion eaters, iguanids are frequently herbivorous or omnivorous.



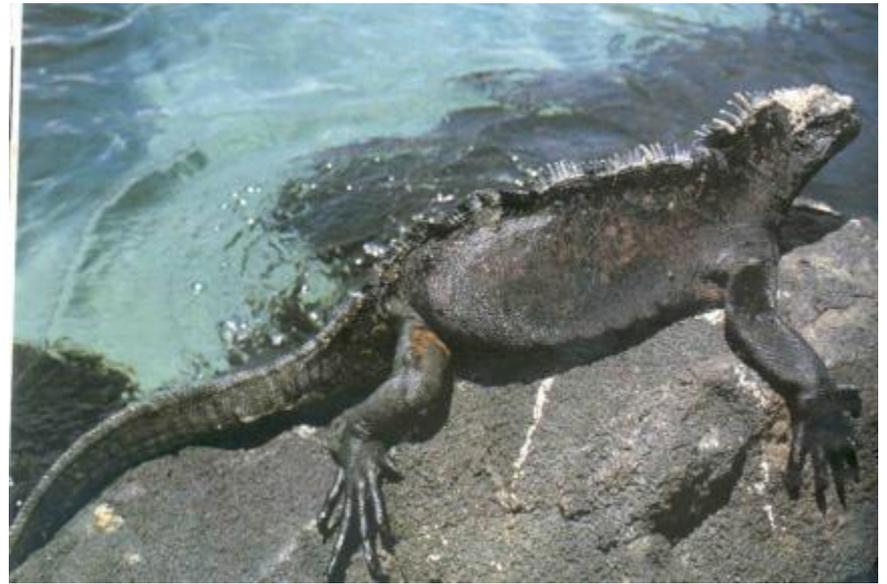
Basiliscus



Crotaphytus (local, "collared lizard")

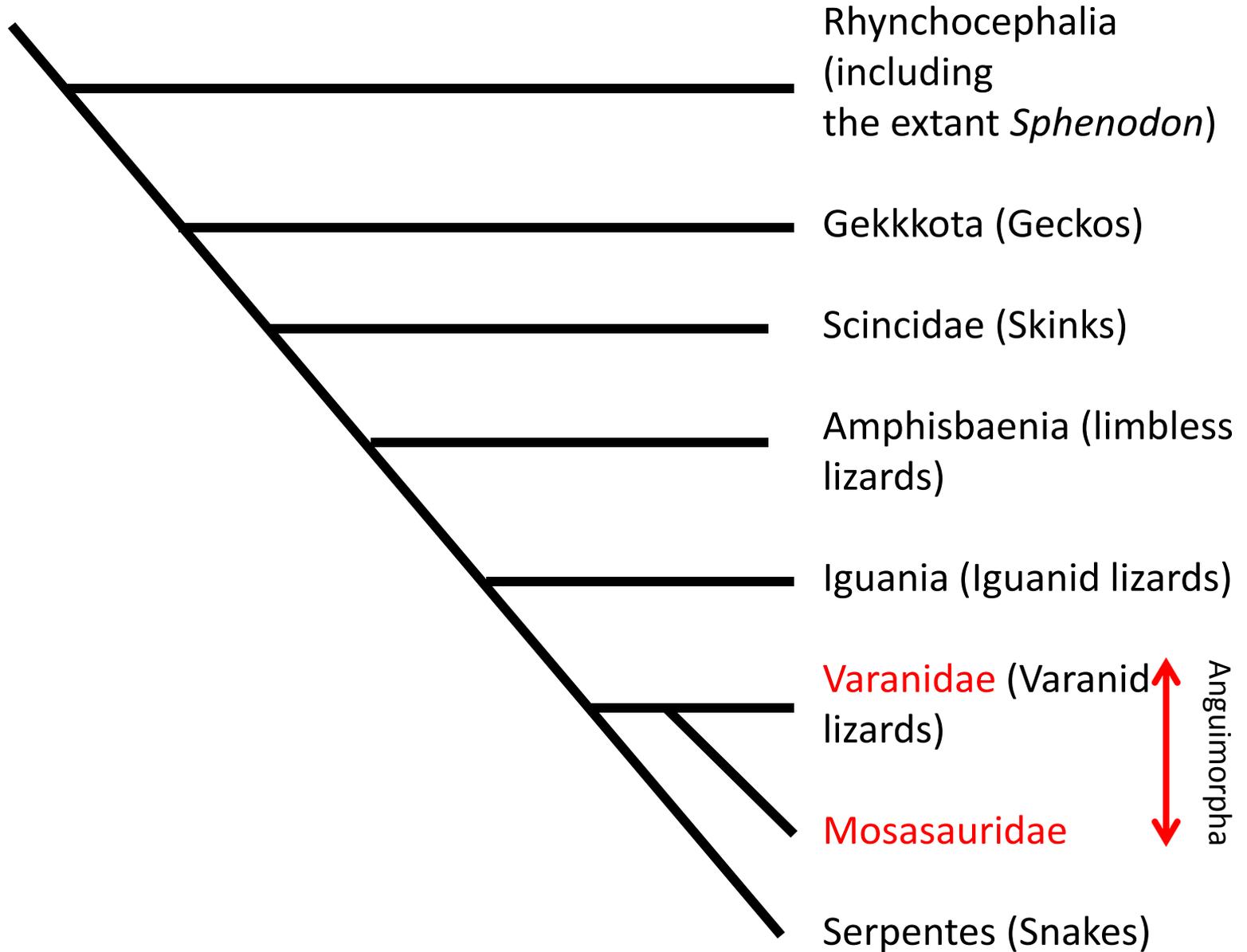


Phrynosoma - "Horny-toads" are not toads.



Galapagos marine iguana

Phylogenetic Relationships of Squamate Reptiles



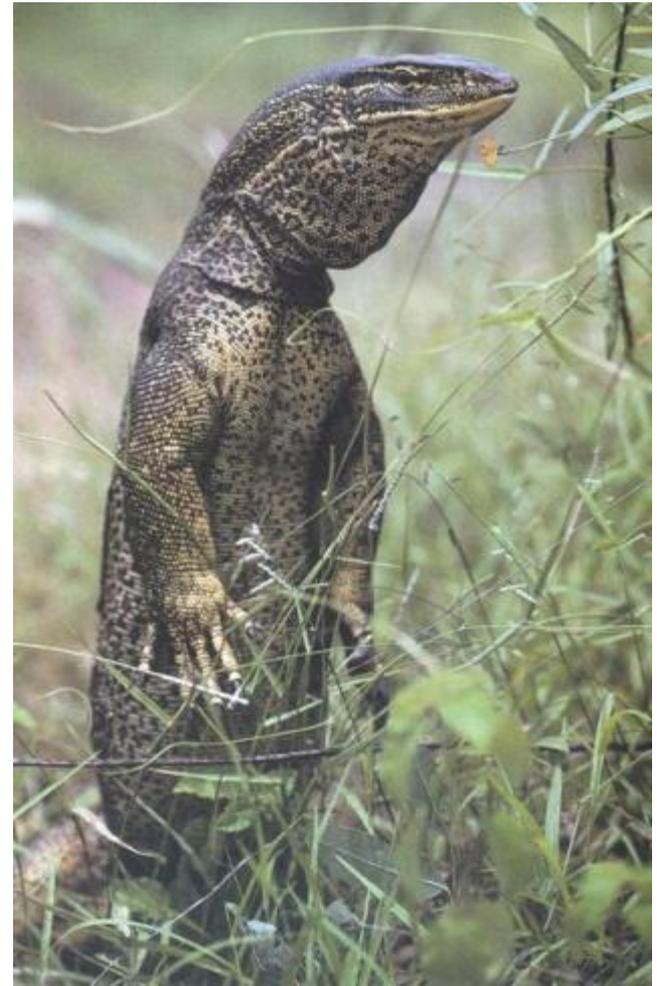
VARANIDAE

- Dominant group of extant old-world lizards
- Elongate snouts
- Generally carnivorous, and/or carrion eaters
- Group from which the extinct aquatic mosasaurs evolved.

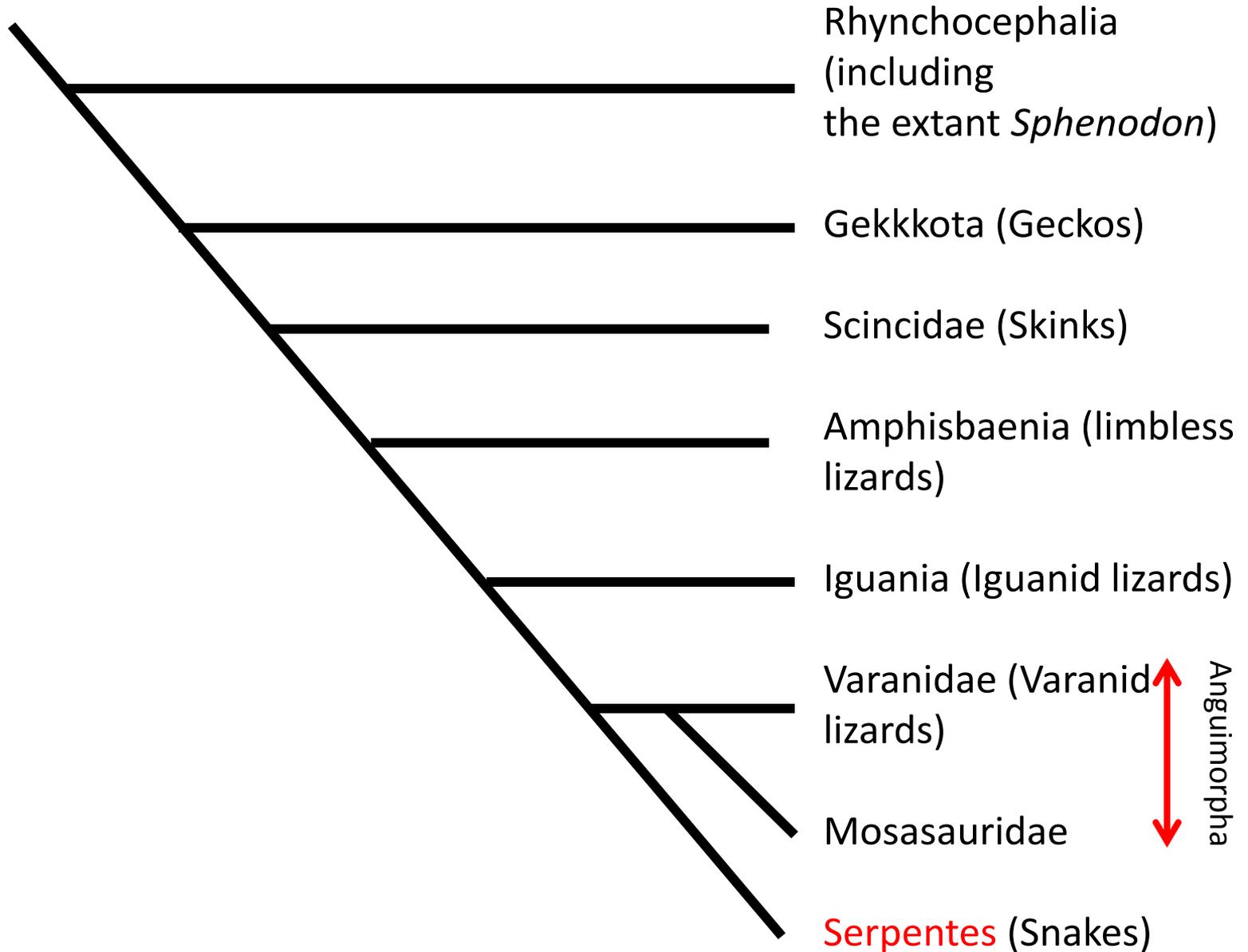
Komodo dragon – largest living lizard



Monitor lizard



Phylogenetic Relationships of Squamate Reptiles



SERPENTES (Snakes)

- Limbless, though most primitive groups (boids and some others) retain vestigial hip elements.
- Highly mobile (kinetic) skulls and jaws.
- Lack moveable eyelids
- Lack external auditory apparatus



Cobra



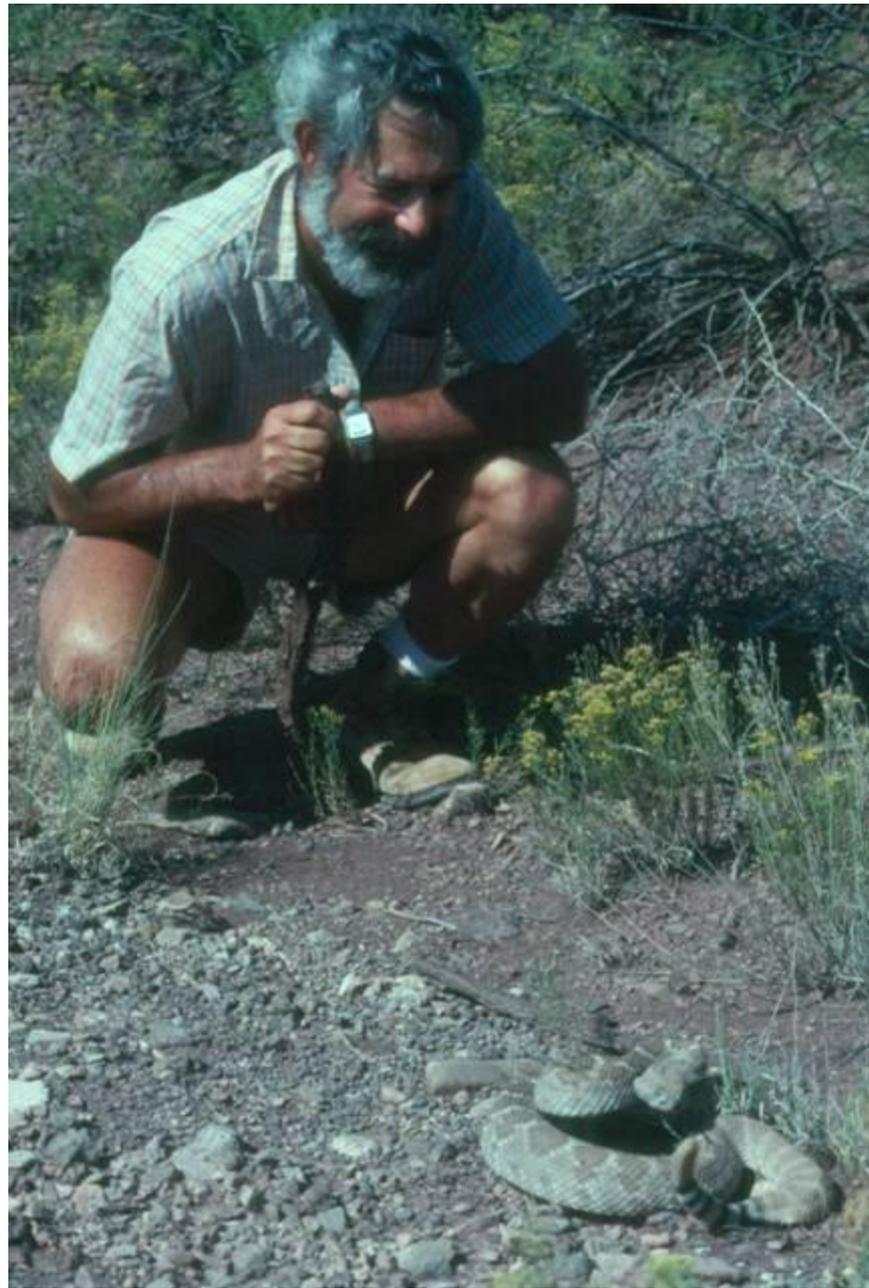
Hog-nosed pit viper



Long-nosed vine snake



Western Diamond-back Rattlesnake

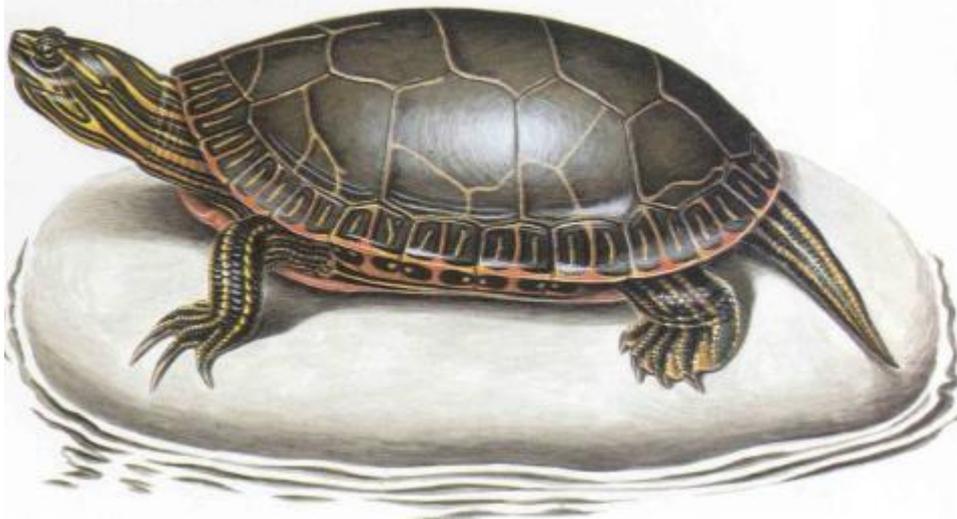


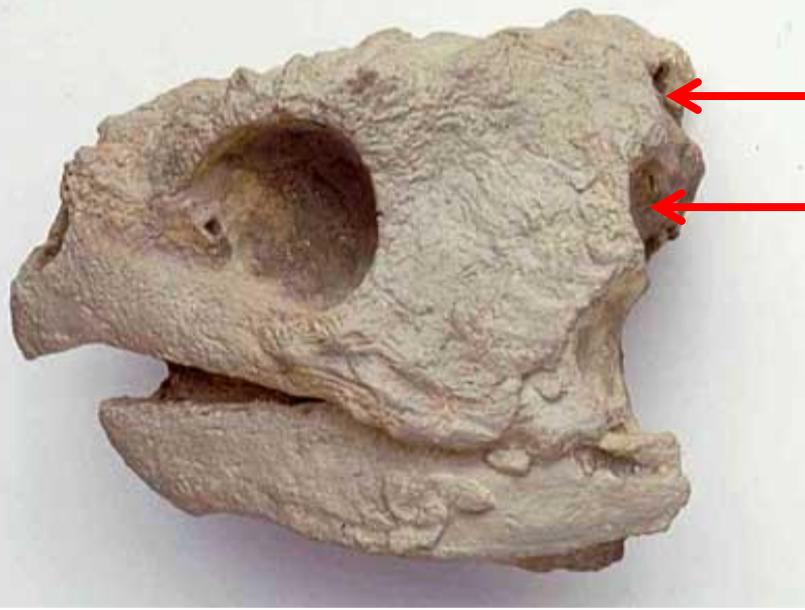
So...

...what the hell are turtles??

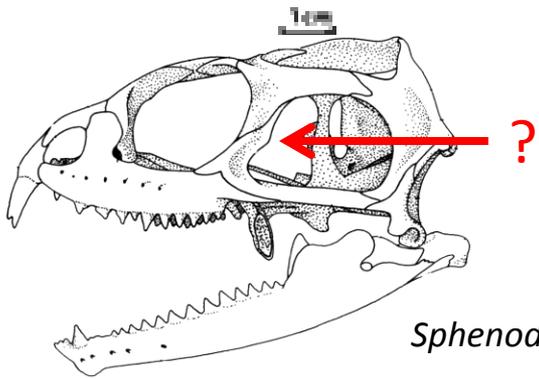
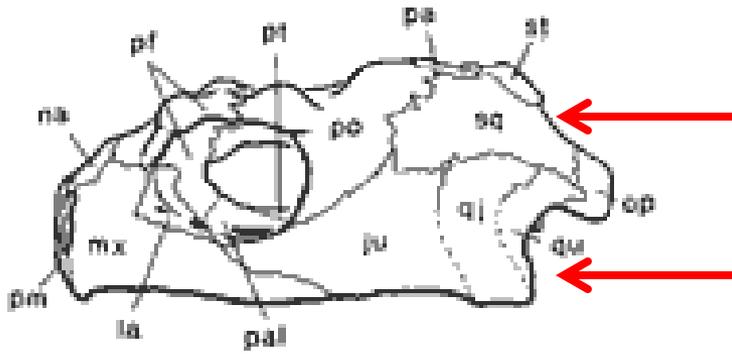
With their highly derived shell and plastron, they have been confusing, and placed with all sorts of groups: Their own; pariasauian reptiles, procolophonid reptiles, captorhinid reptiles, and even diapsids.

They are incredibly difficult to figure out as they are the only vertebrates with their ribs superficial to their limb girdles.





Skull of the primitive turtle *Proganochelys*. It is thought by some that the emarginations of the caudal end of the skull are equivalent to the partial margins of the old diapsid fenestrae, making them diapsids, or the sister-group to diapsids.



Sphenodon



