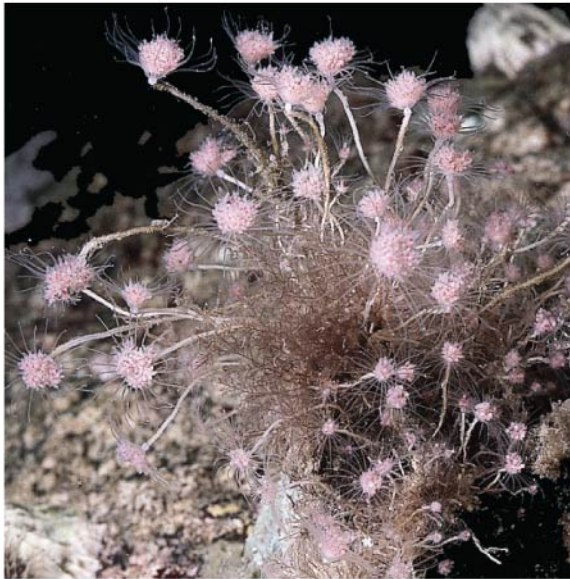


Azure vase sponge
(Callyspongia plicifera)



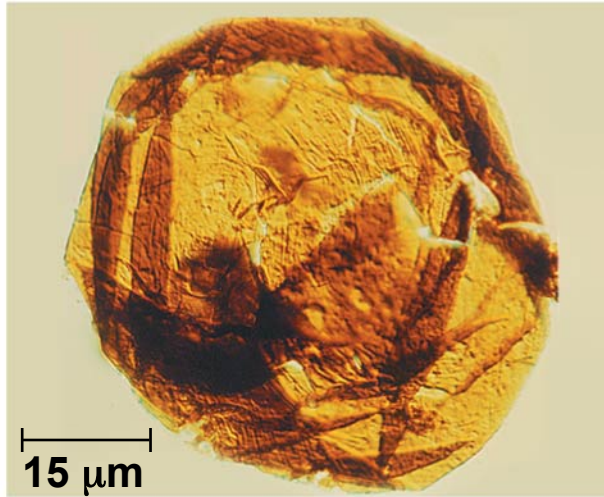
(a) Hydrozoa



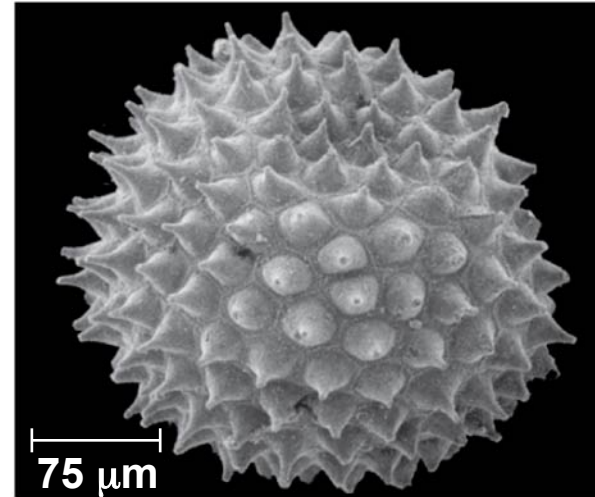
(b) Scyphozoa



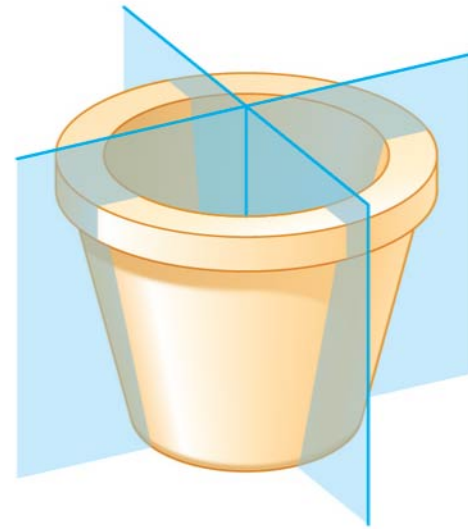
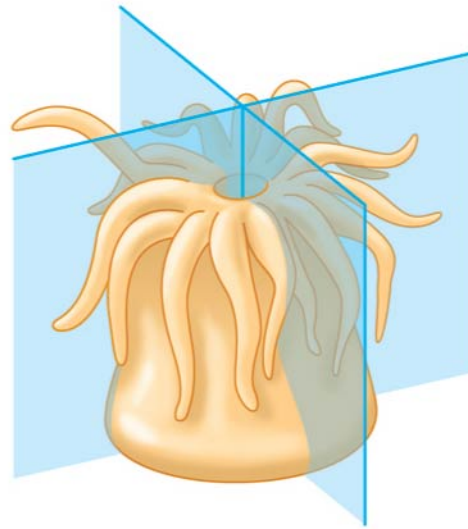
(c) Anthozoa



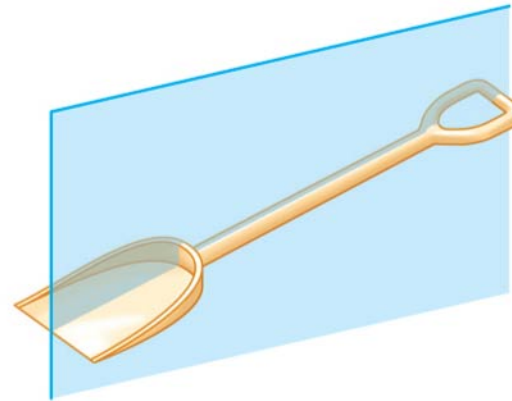
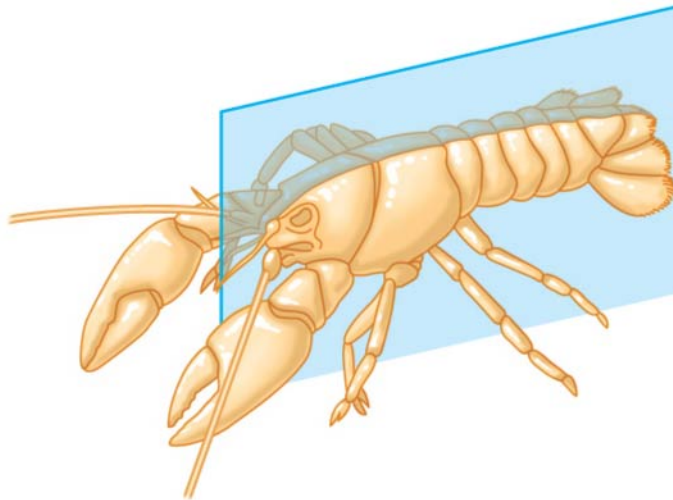
(a) *Valeria* (800 mya):
roughly spherical, no
structural defenses,
soft-bodied



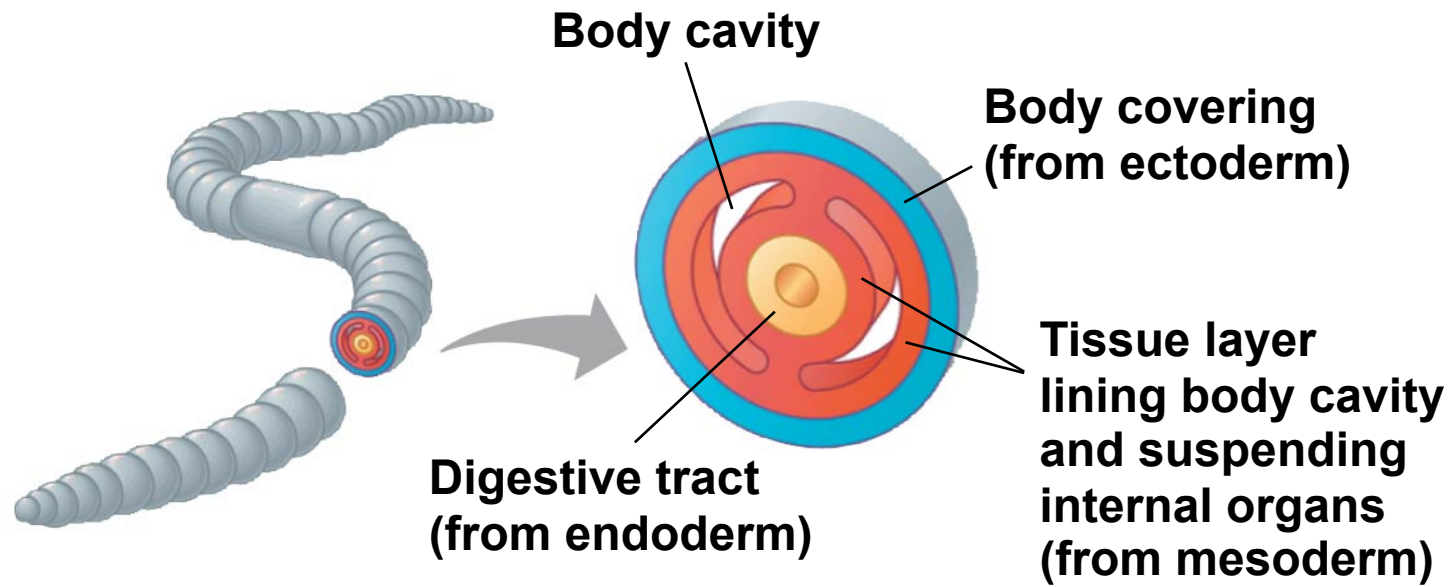
(b) Spiny acritarch
(575 mya): about five
times larger than
Valeria and covered in
hard spines

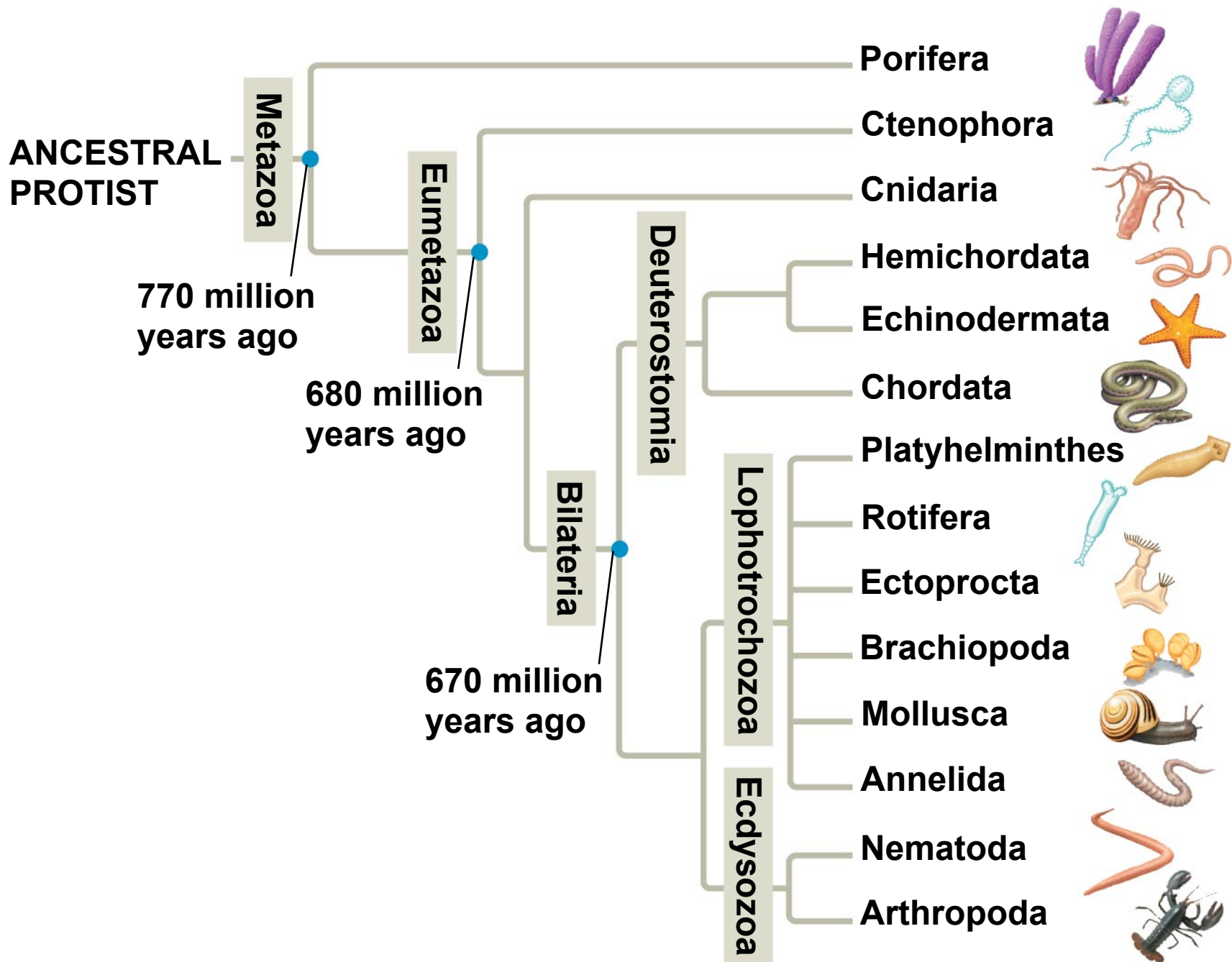


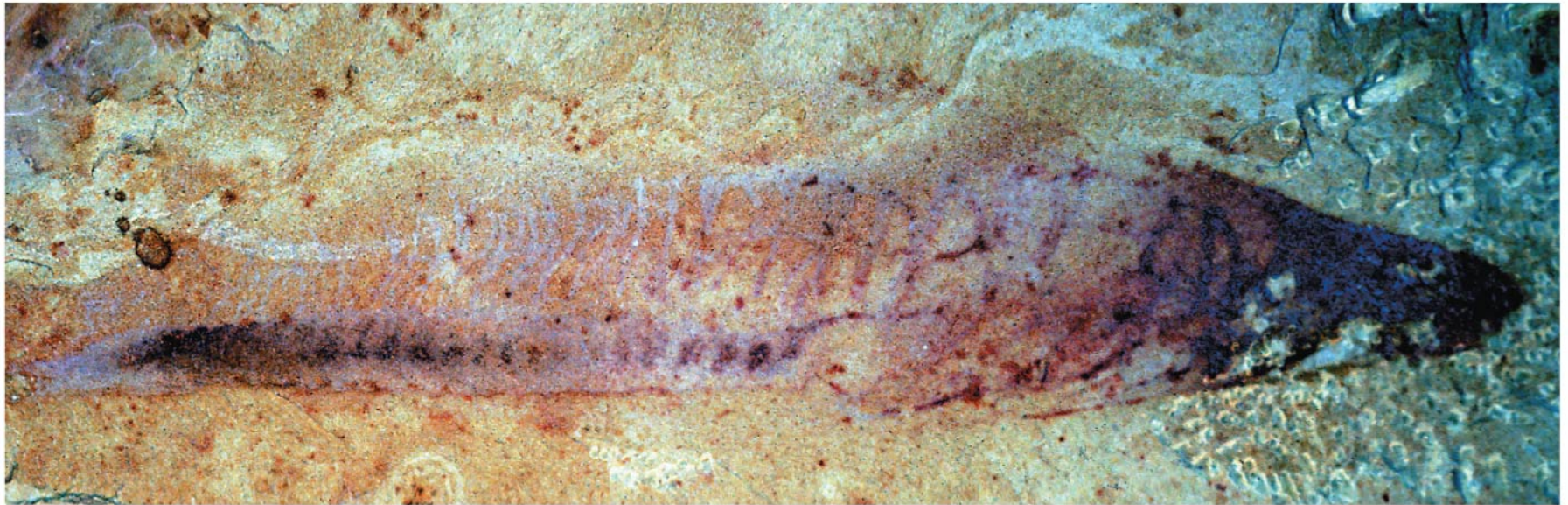
(a) Radial symmetry

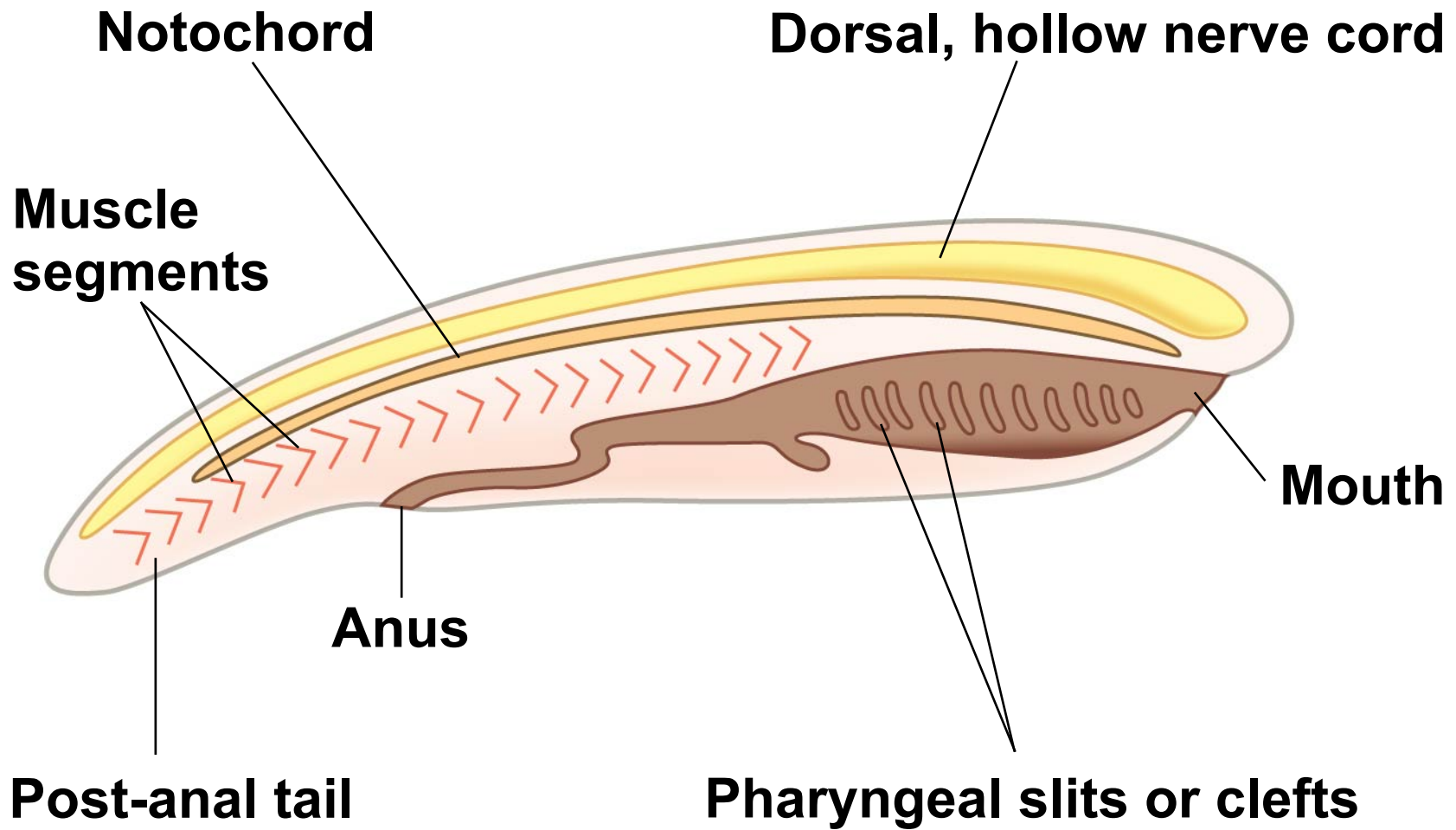


(b) Bilateral symmetry







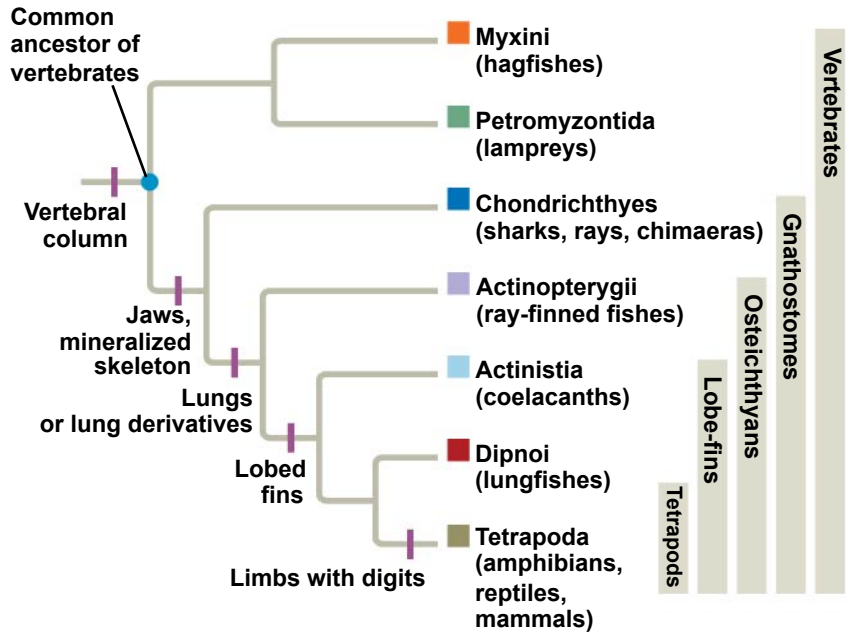




(a) Lancelet



(b) Tunicate



Myxini



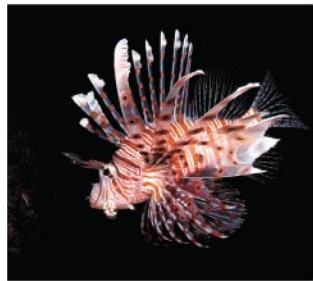
Dipnoi



Petromyzontida



Chondrichthyes



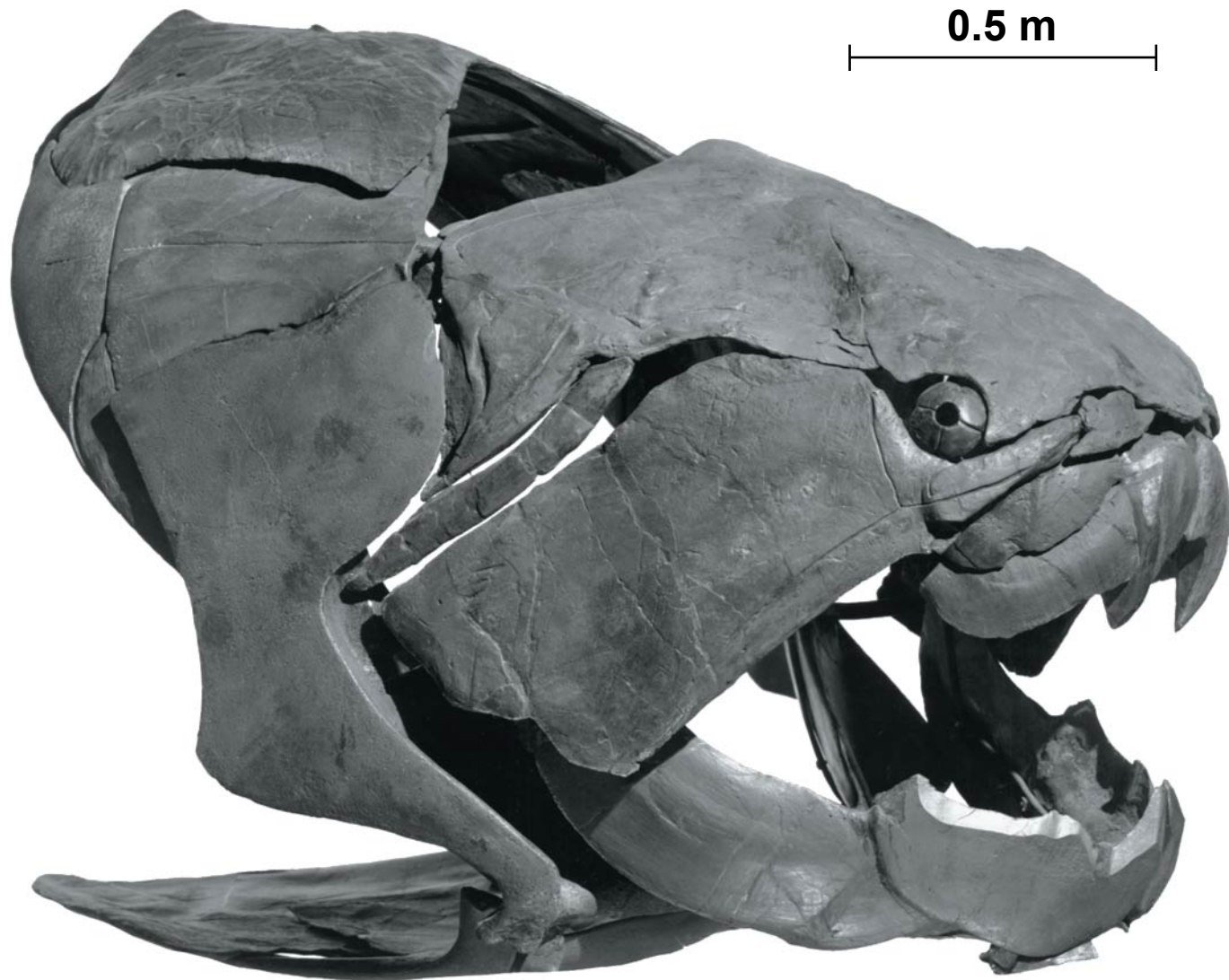
Actinopterygii


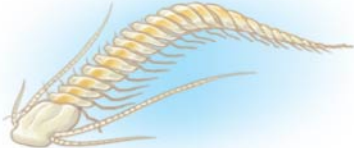

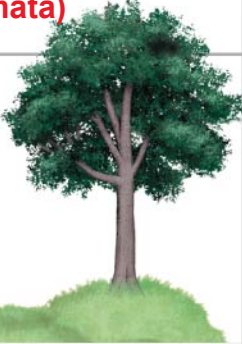

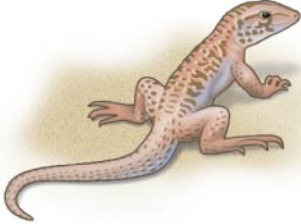


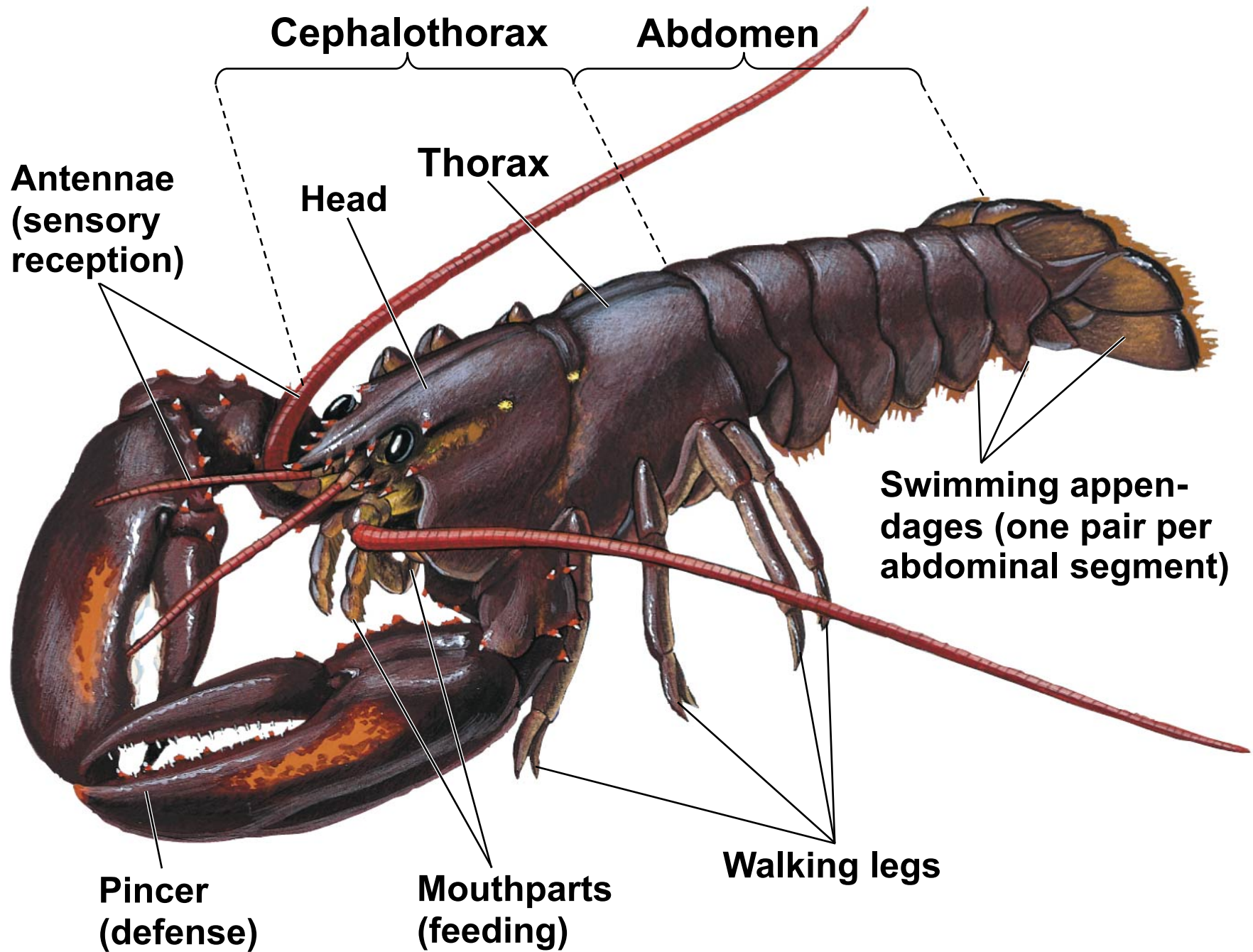
Actinistia



Tetrapoda



		GREEN ALGA	MARINE CRUSTACEAN	AQUATIC LOBE-FIN
AQUATIC ANCESTOR				
CHARACTER	Anchoring structure	Derived (roots)	N/A	N/A
	Support structure	Derived (lignin/stems)	Ancestral	Ancestral (skeletal system) Derived (limbs)
	Internal transport	Derived (vascular system)	Ancestral	Ancestral
	Muscle/ nerve cells	N/A	Ancestral	Ancestral
	Protection against desiccation	Derived (cuticle)	Ancestral	Derived (amniotic egg/scales)
	Gas exchange	Derived (stomata)	Derived (tracheal system)	Ancestral
TERRESTRIAL ORGANISM				
		LAND PLANTS	INSECTS	TERRESTRIAL VERTEBRATES



Cephalothorax

Abdomen

**Antennae
(sensory
reception)**

Head

Thorax

**Swimming appen-
dages (one pair per
abdominal segment)**

**Pincer
(defense)**

**Mouthparts
(feeding)**

Walking legs



Lepidopterans



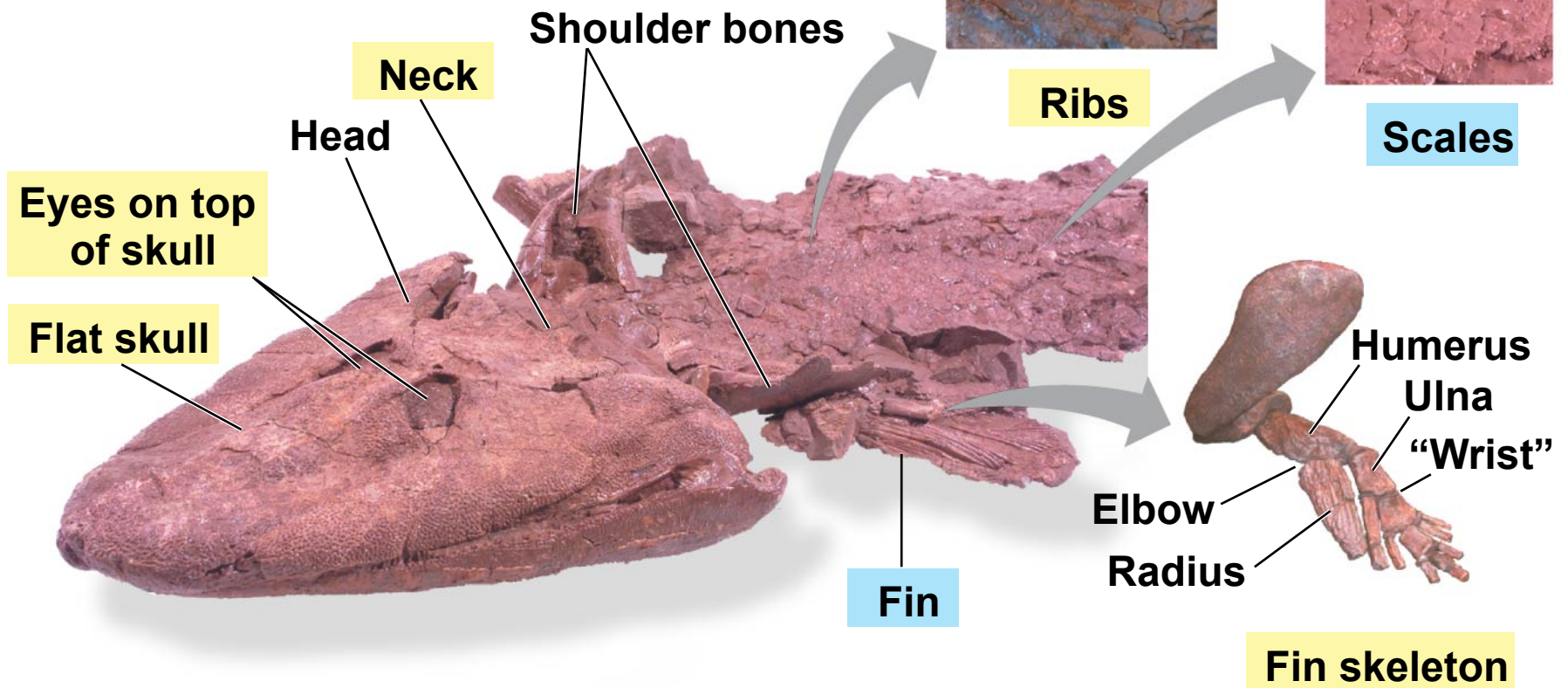
Hymenopterans

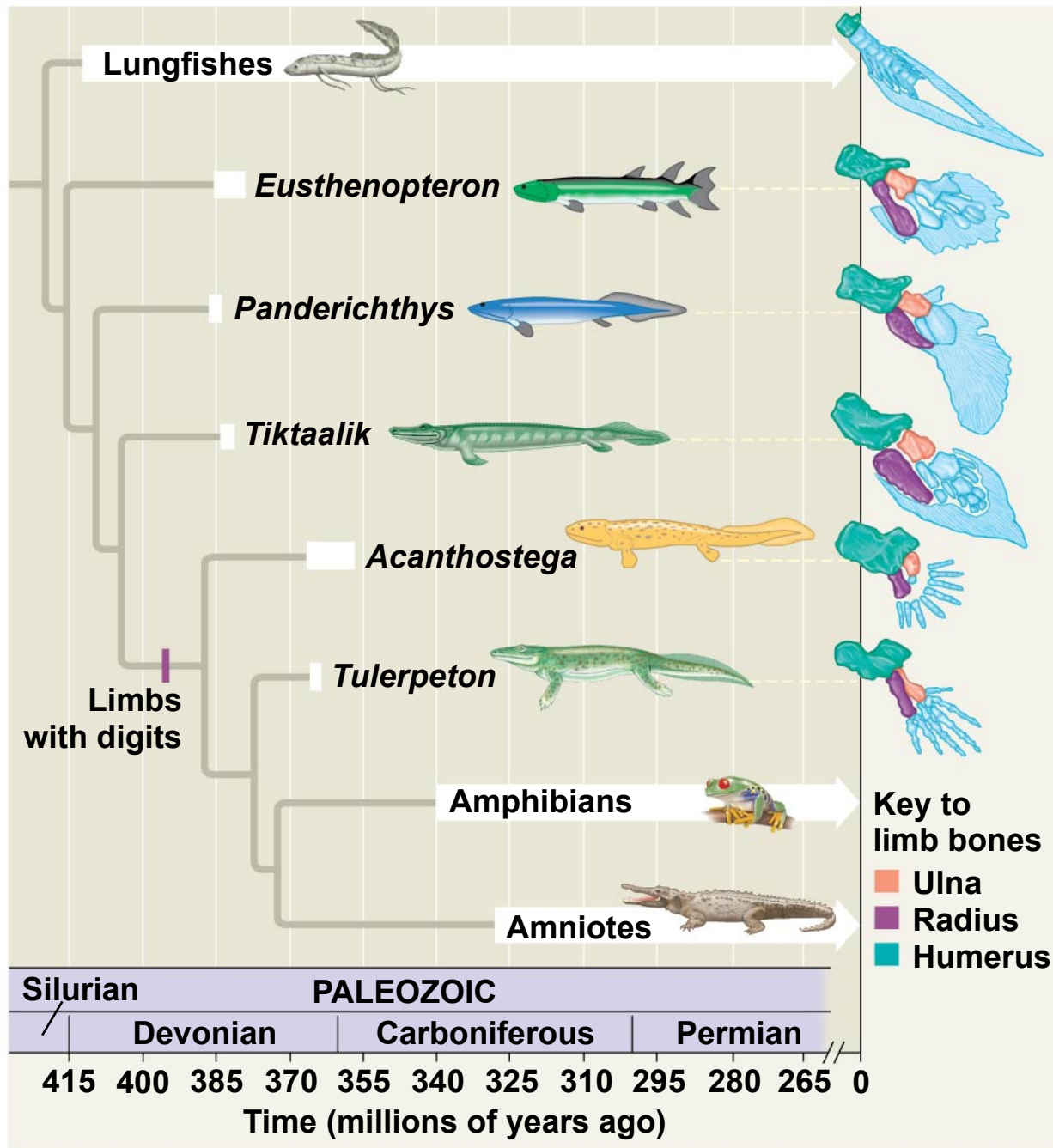


Hemipterans



Fish Characters	Tetrapod Characters
Scales	Neck
Fins	Ribs
Gills and lungs	Fin skeleton
	Flat skull
	Eyes on top of skull







▲ Salamanders retain their tails as adults.

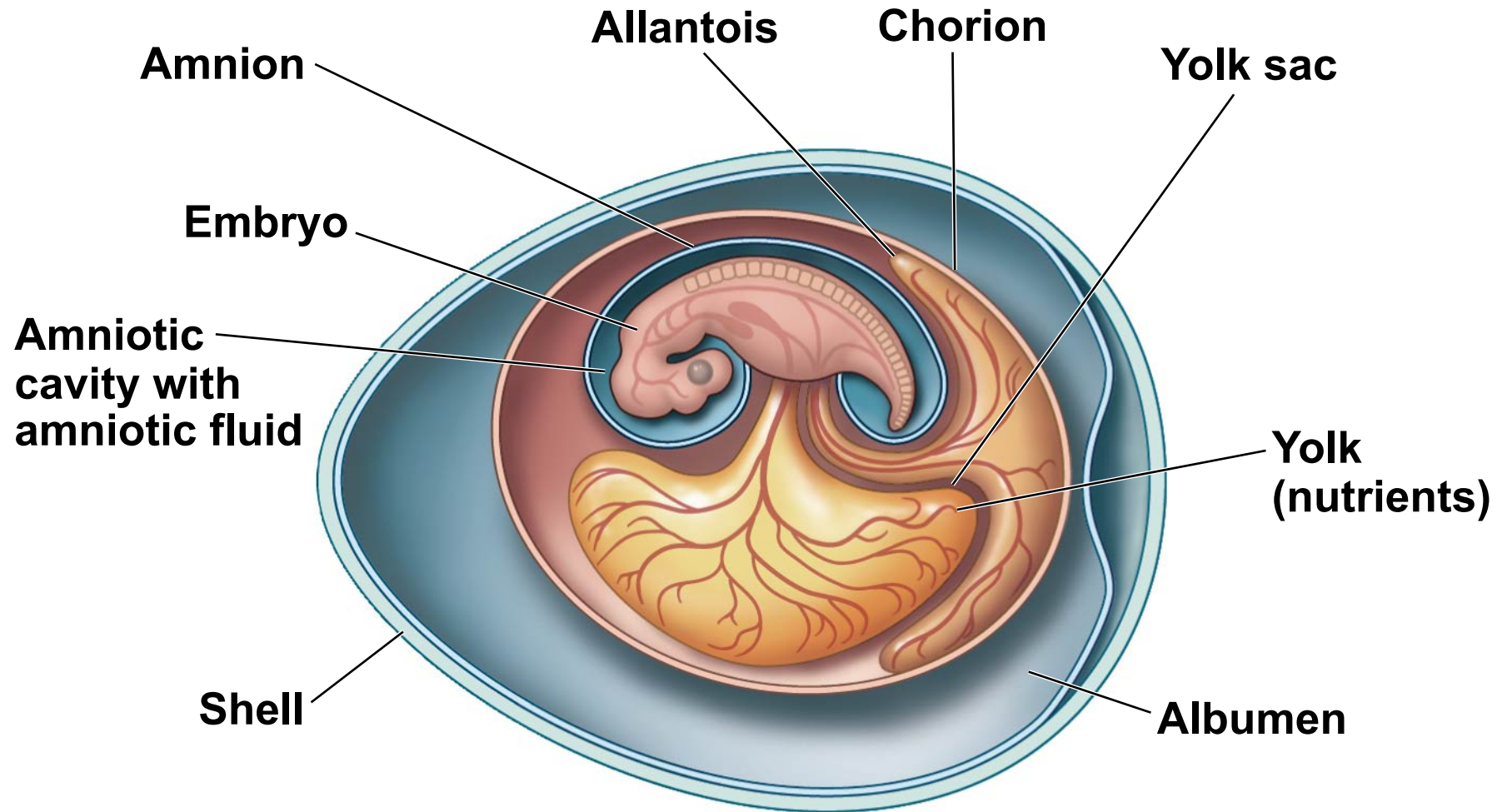


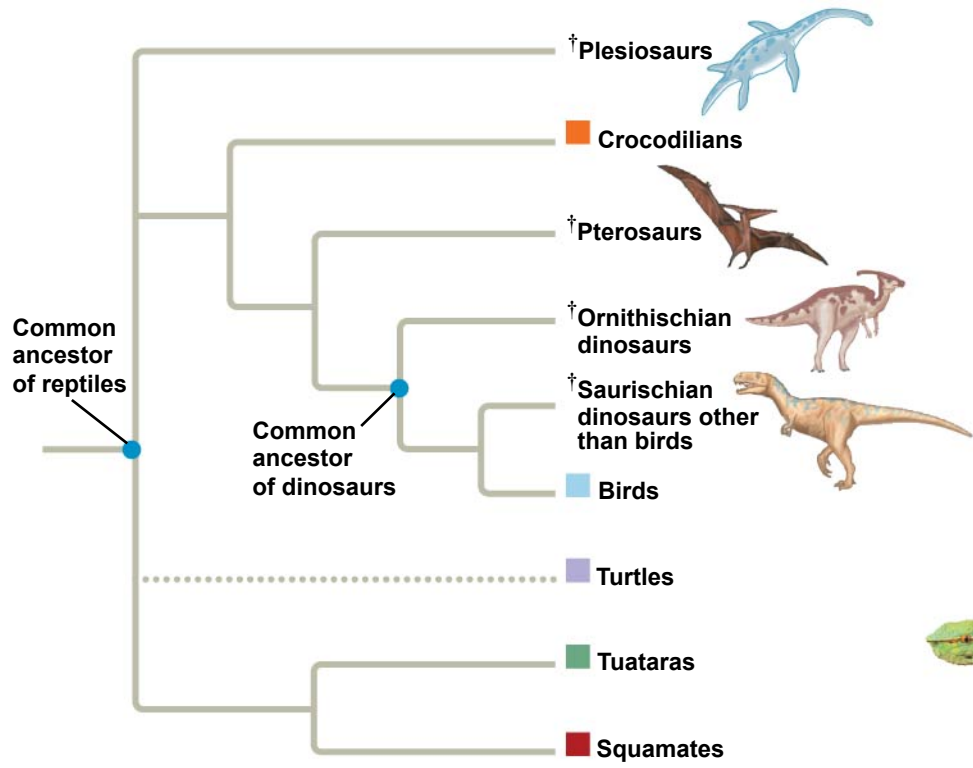
▲ Caecilians have no legs and are mainly burrowing animals.



◀ Frogs and toads lack tails as adults.

Extraembryonic membranes





Turtles



Squamates



Crocodylians



Birds



Tuataras

Monotremes

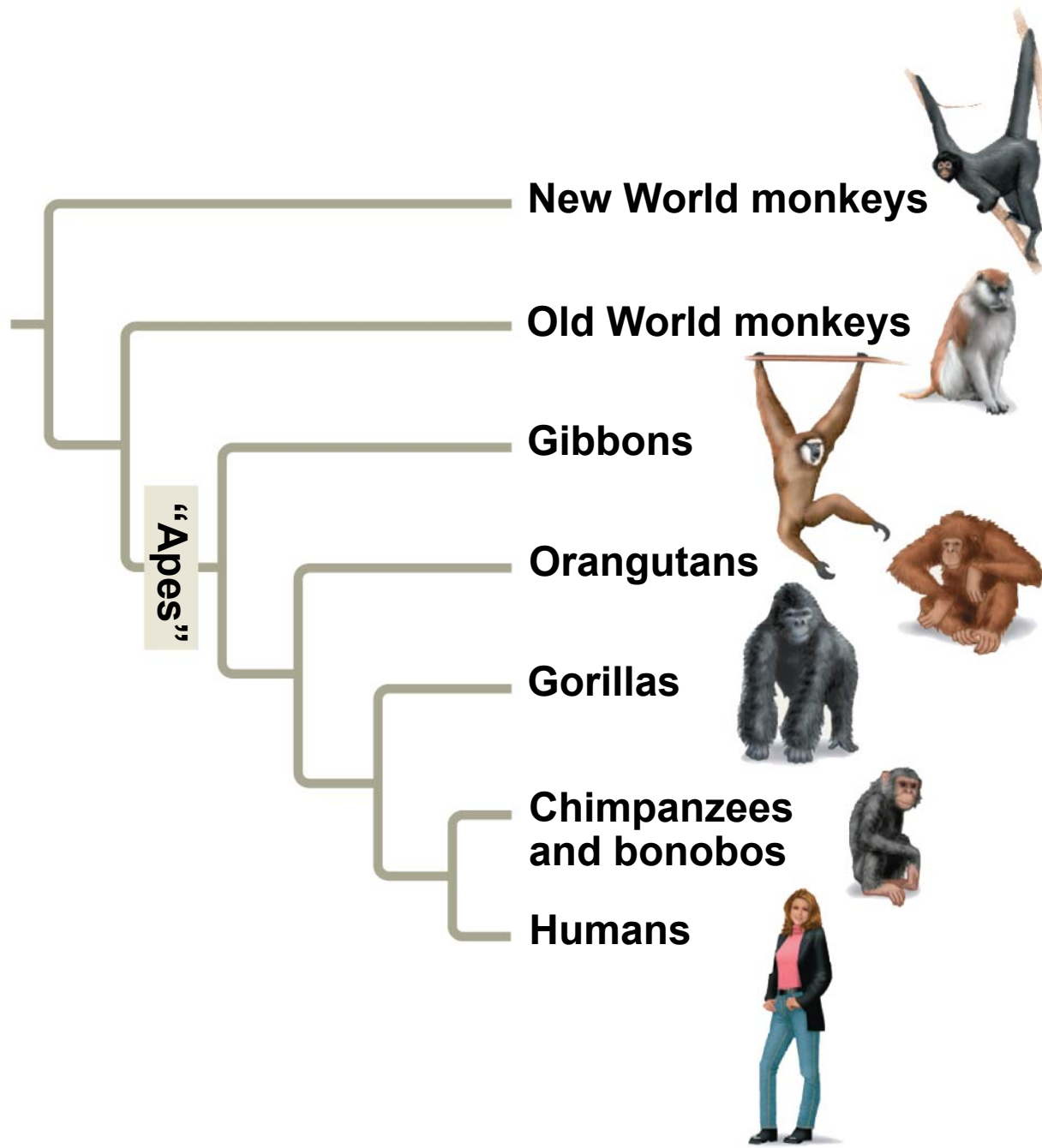


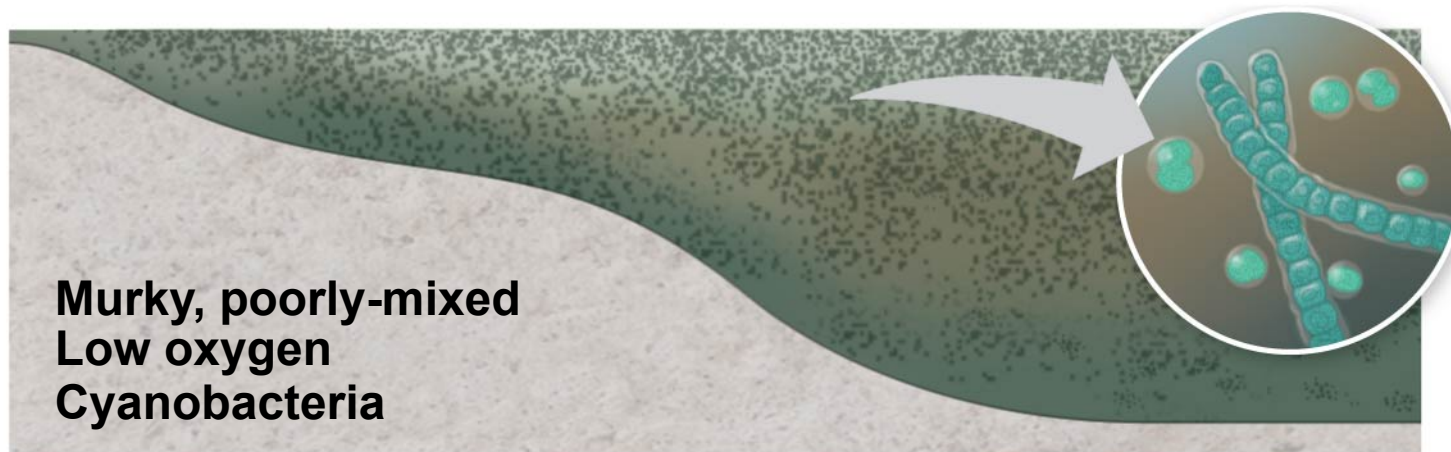
Marsupials



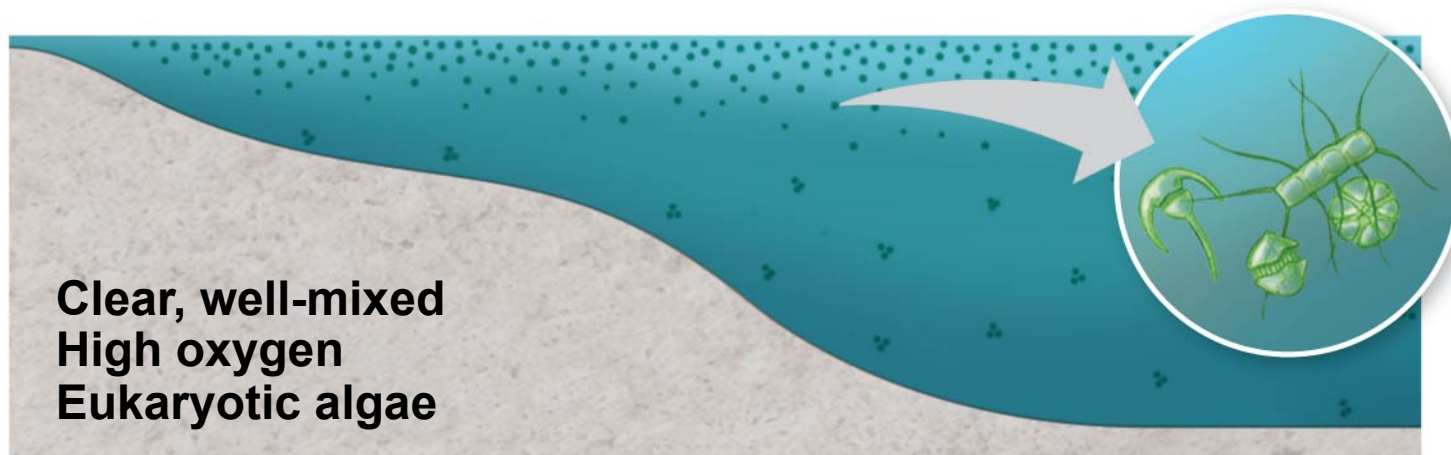
Eutherians



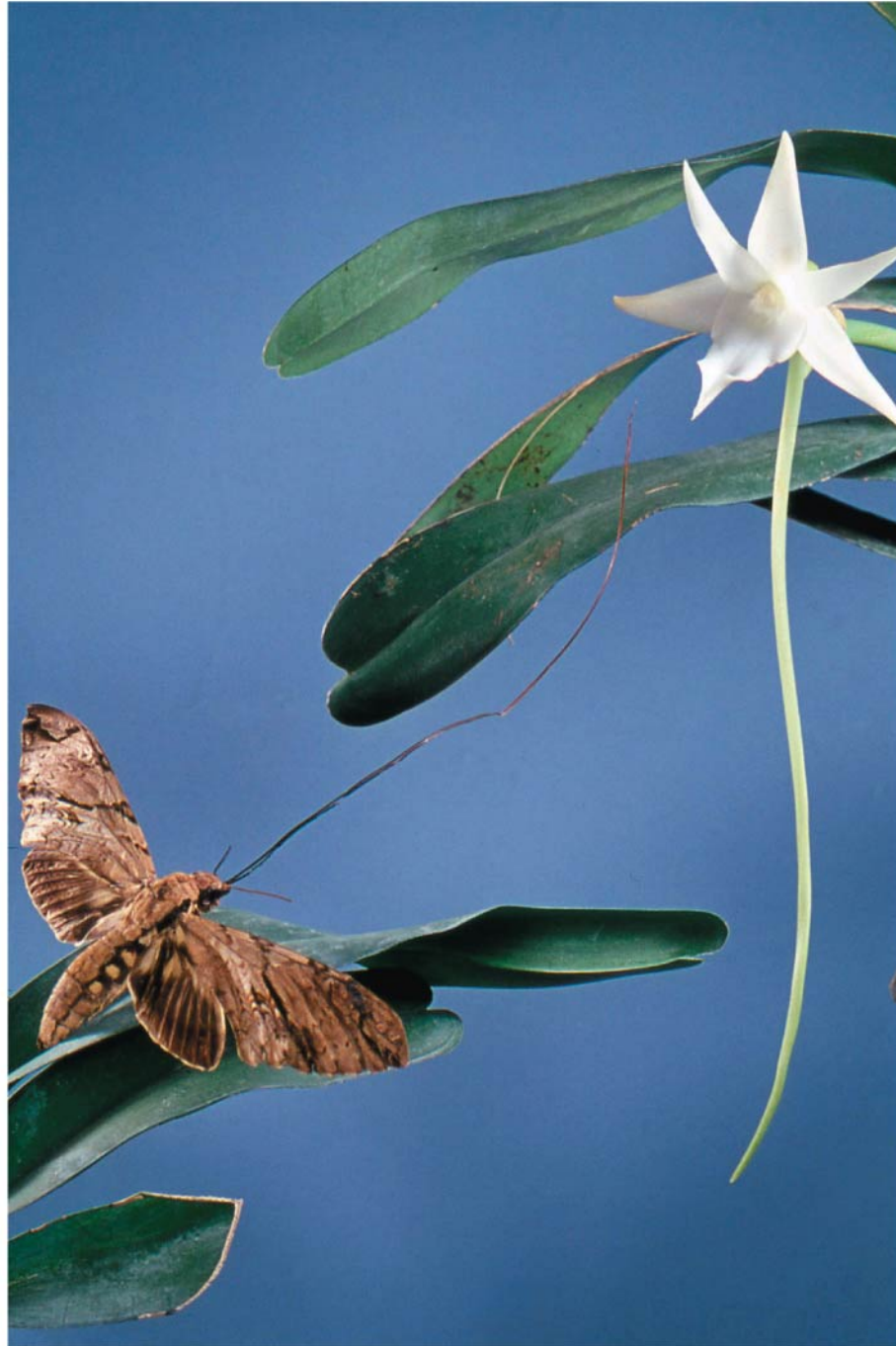


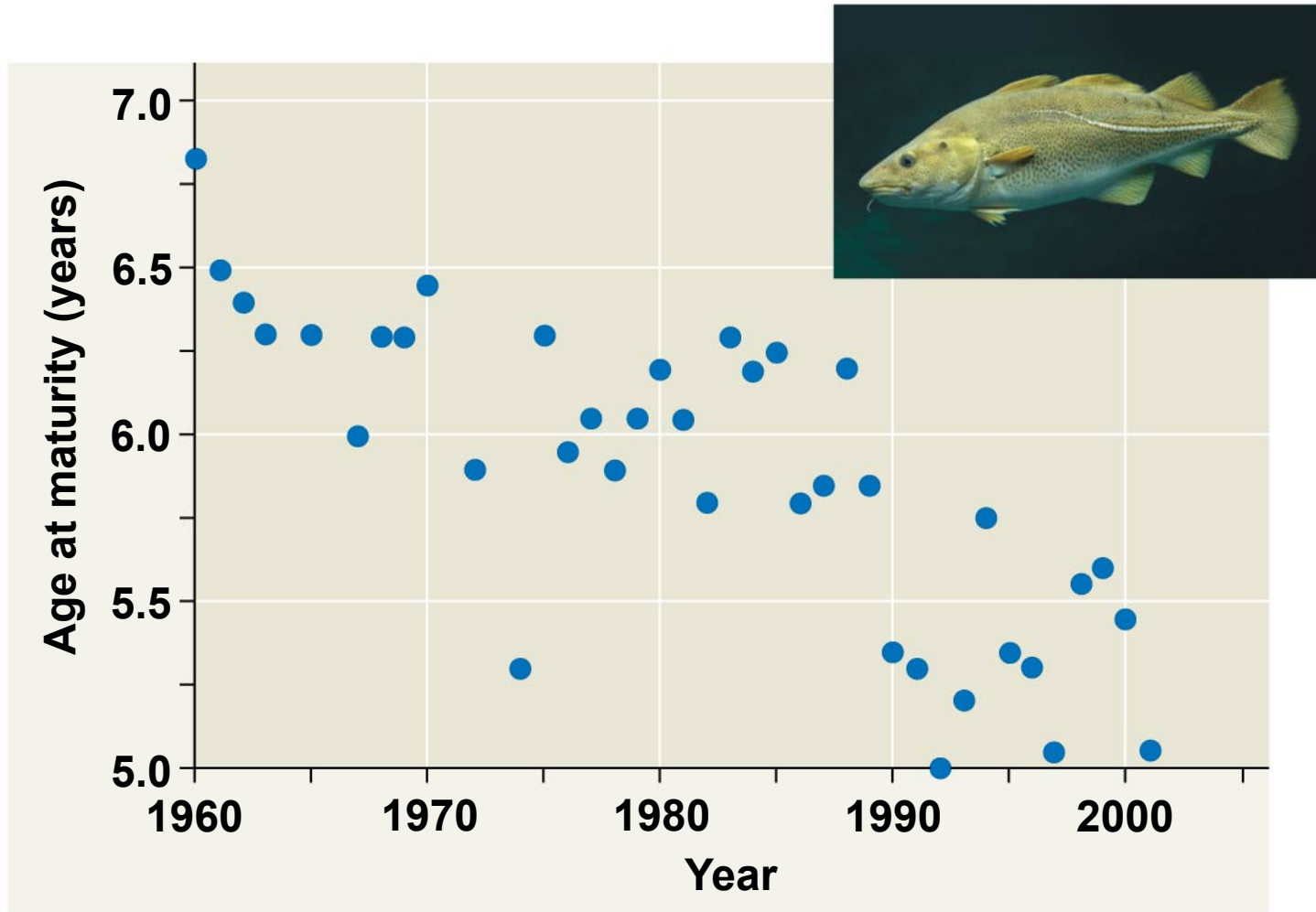


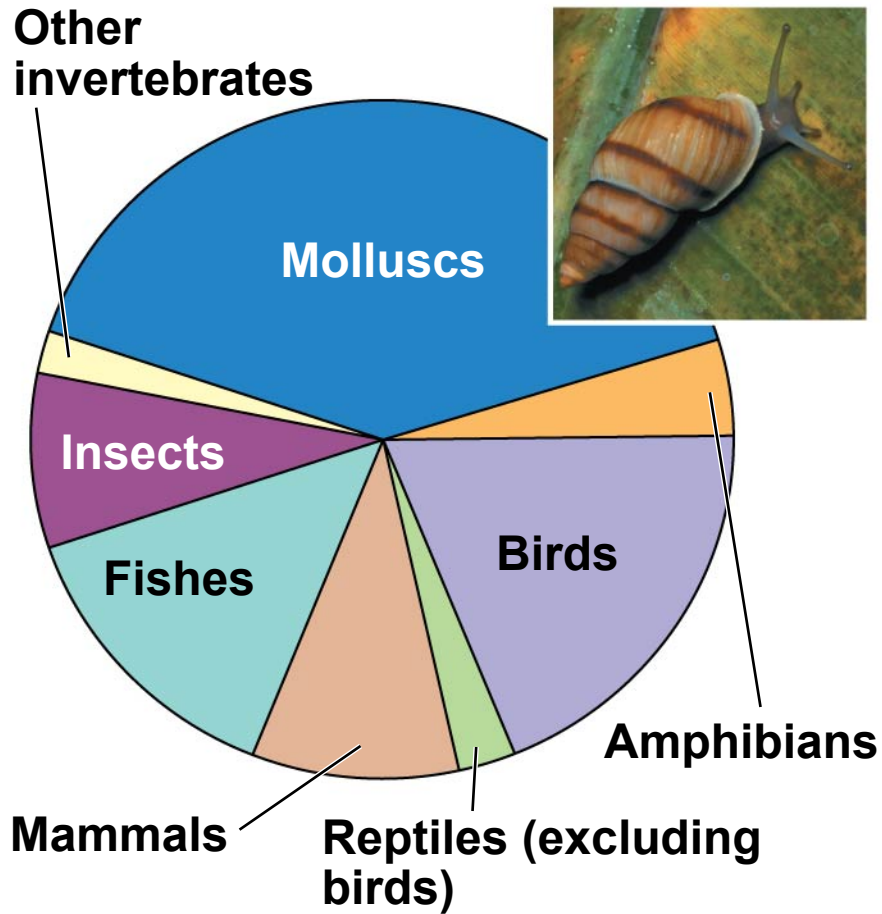
(a) Ocean conditions before 600 mya



(b) Changes to ocean conditions by 530 mya







An endangered Pacific island land snail, *Partula suturalis*



Workers on a mound of pearl mussels killed to make buttons (ca. 1919)

Recorded extinctions of animal species