

# Phylogeny and the history of life

Phylogeny

The history of life

Processes of diversification

# Outline

## Phylogeny

Interpreting phylogenetic trees

Constructing phylogenetic trees

Example: the evolution of whales

## The history of life

The shape of the tree

The fossil record

Putting the timeline together

## Processes of diversification

Adaptive radiations

Mass extinctions

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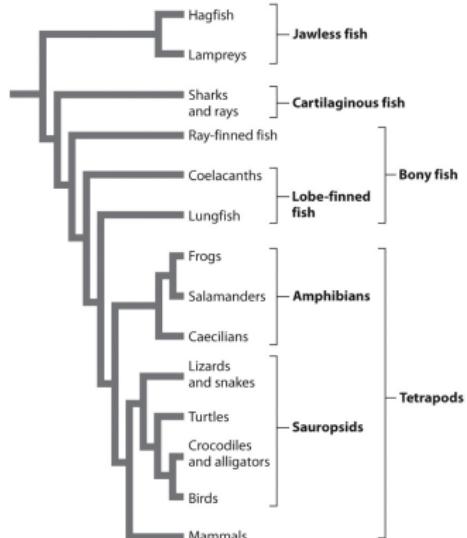
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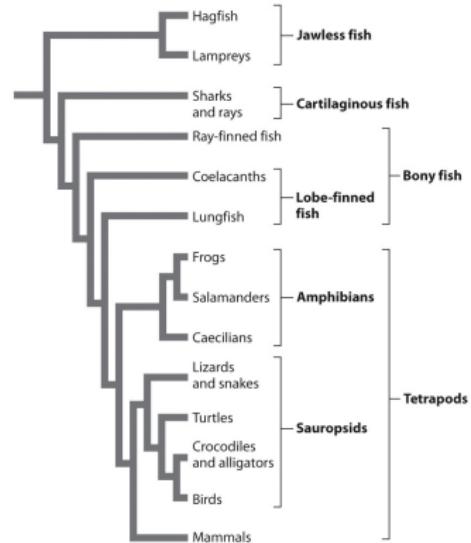


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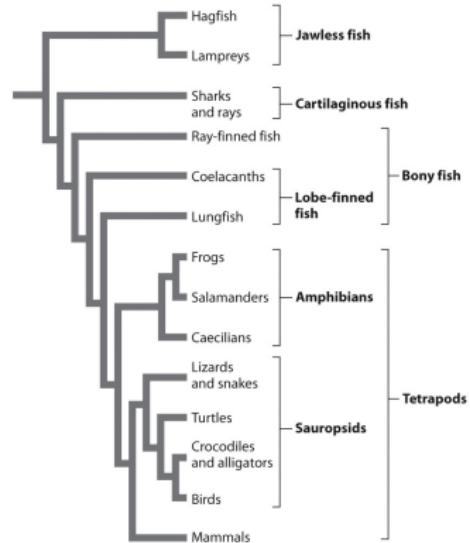


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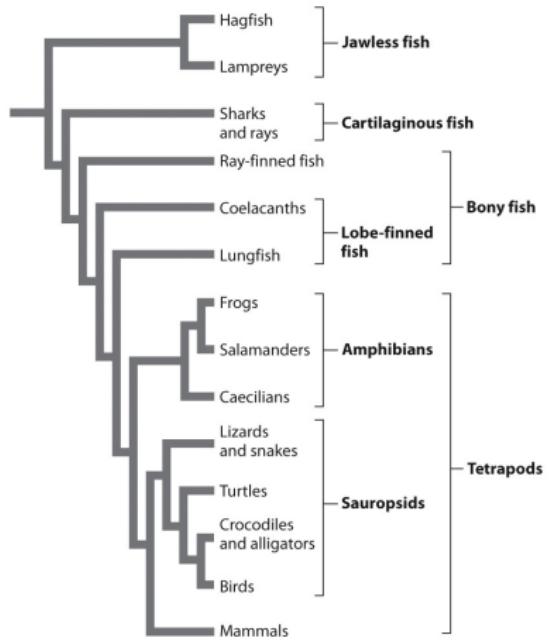


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# Sister taxa

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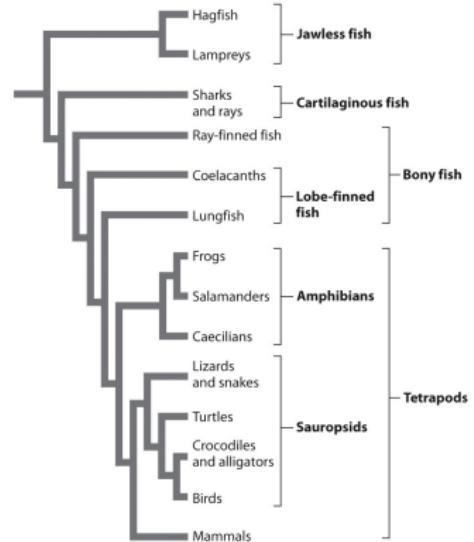


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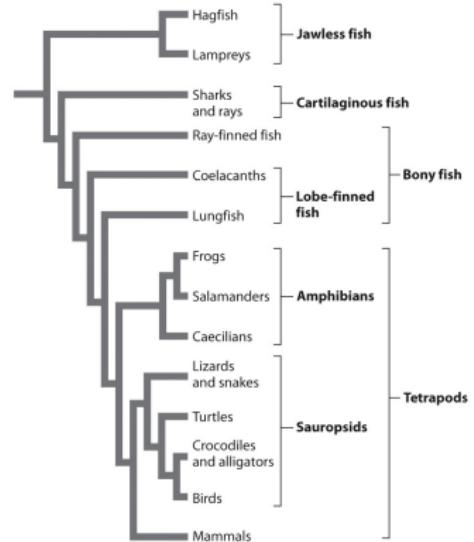


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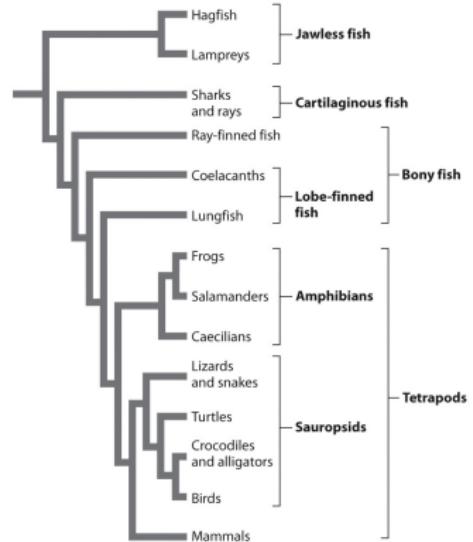


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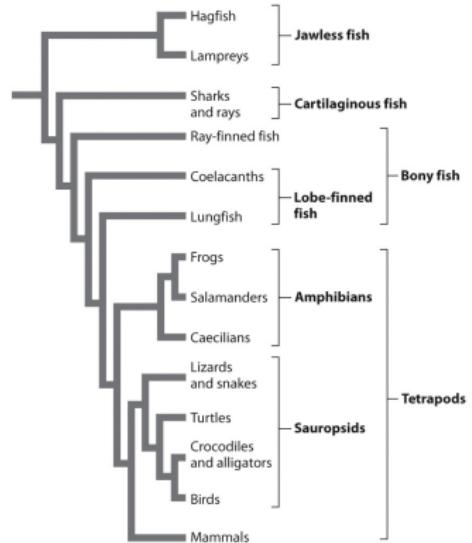


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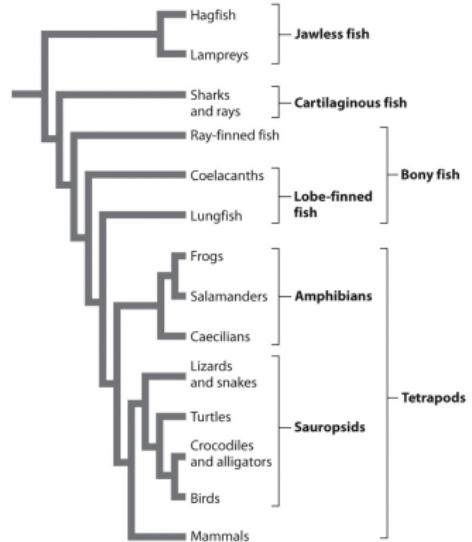


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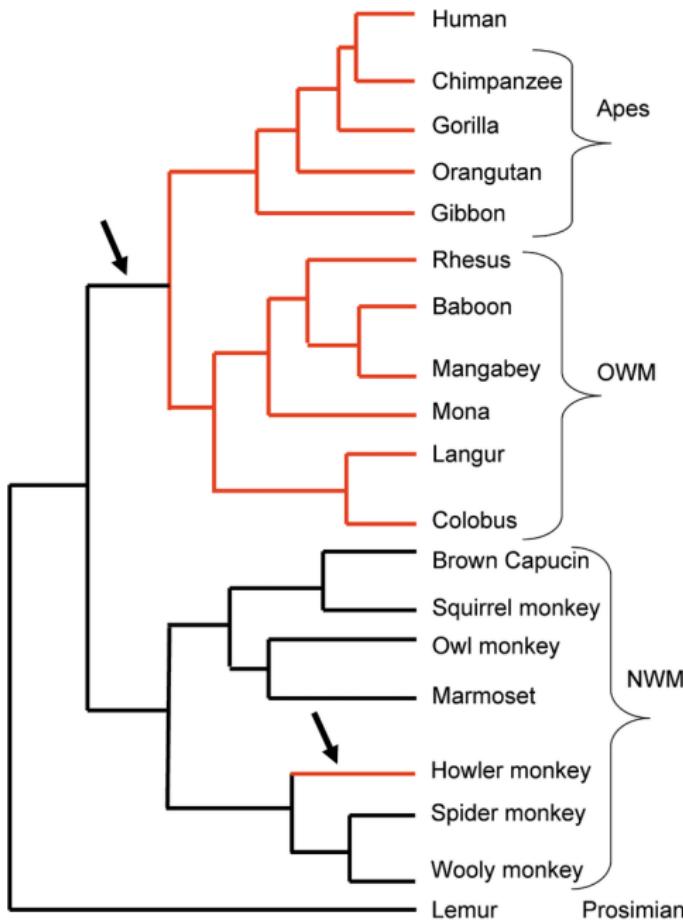
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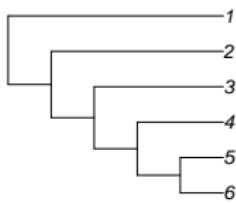
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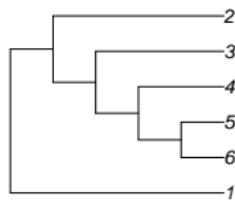


# Activity: which of these things is not like the others?

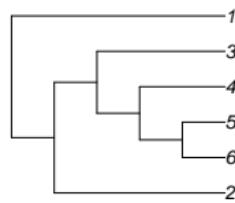
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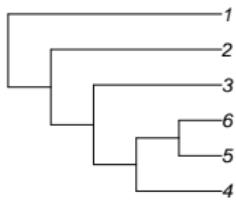
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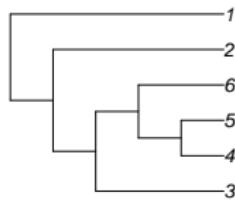
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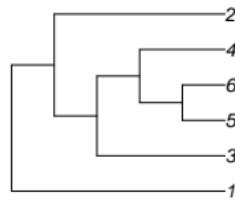
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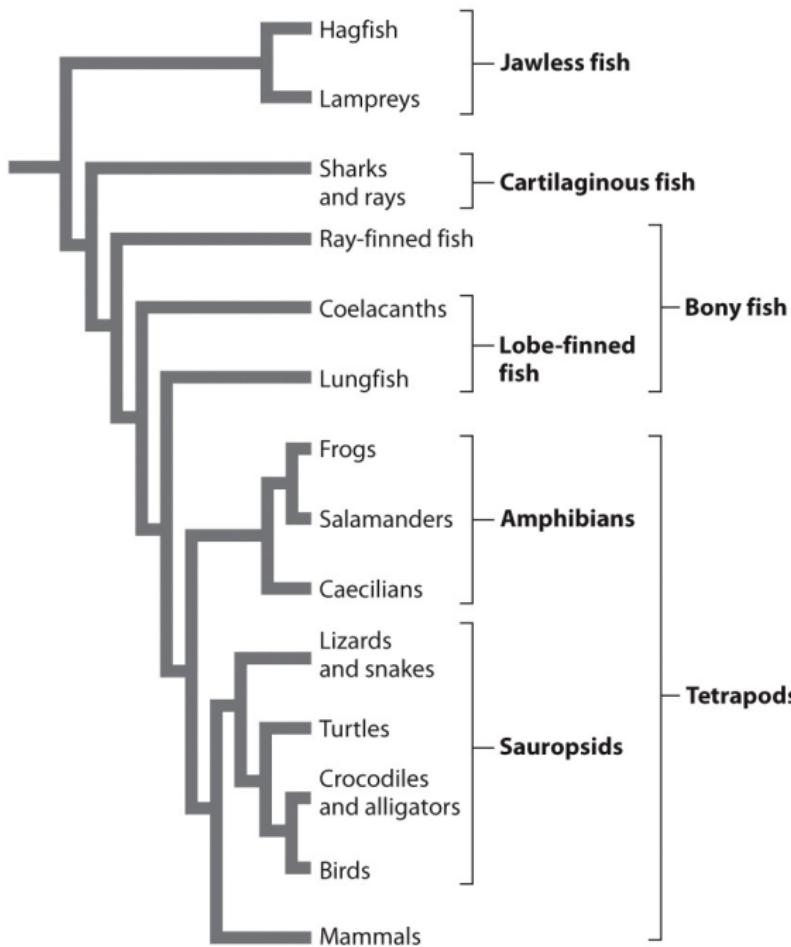
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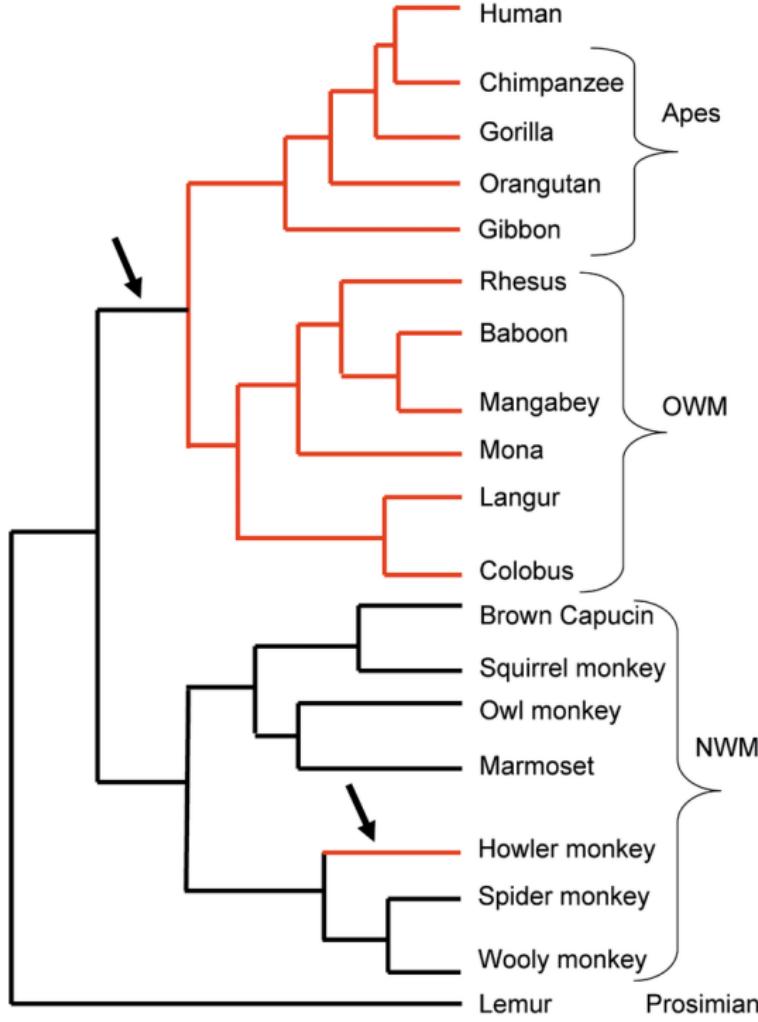
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### **Tortoise in a box**

A tortoise's shell is made of two bone plates - the plastron on the underside and the carapace on the underside. The carapace is covered in scales called scutes, each of

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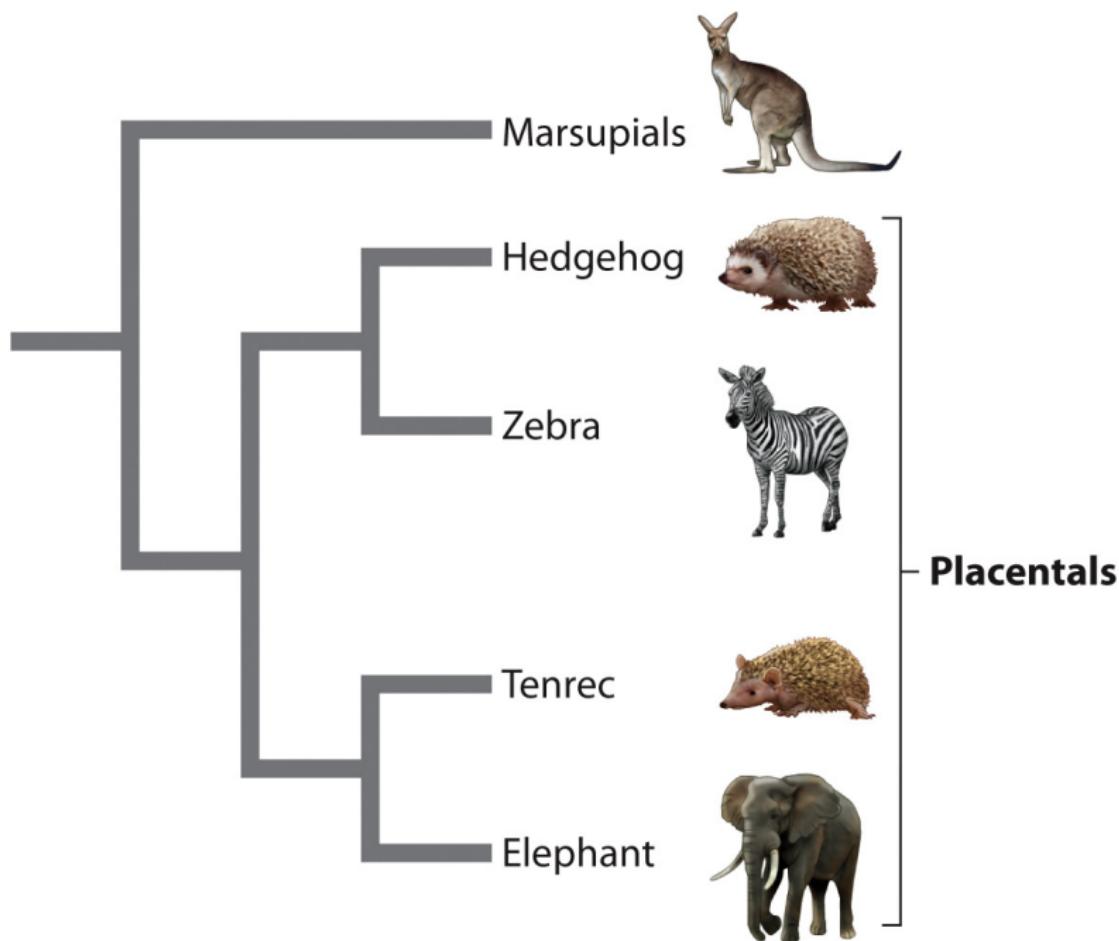
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**Figure 22.7**  
*Biology: How Life Works*  
© Macmillan Learning





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# Outline

## Phylogeny

Interpreting phylogenetic trees

Constructing phylogenetic trees

Example: the evolution of whales

## The history of life

The shape of the tree

The fossil record

Putting the timeline together

## Processes of diversification

Adaptive radiations

Mass extinctions

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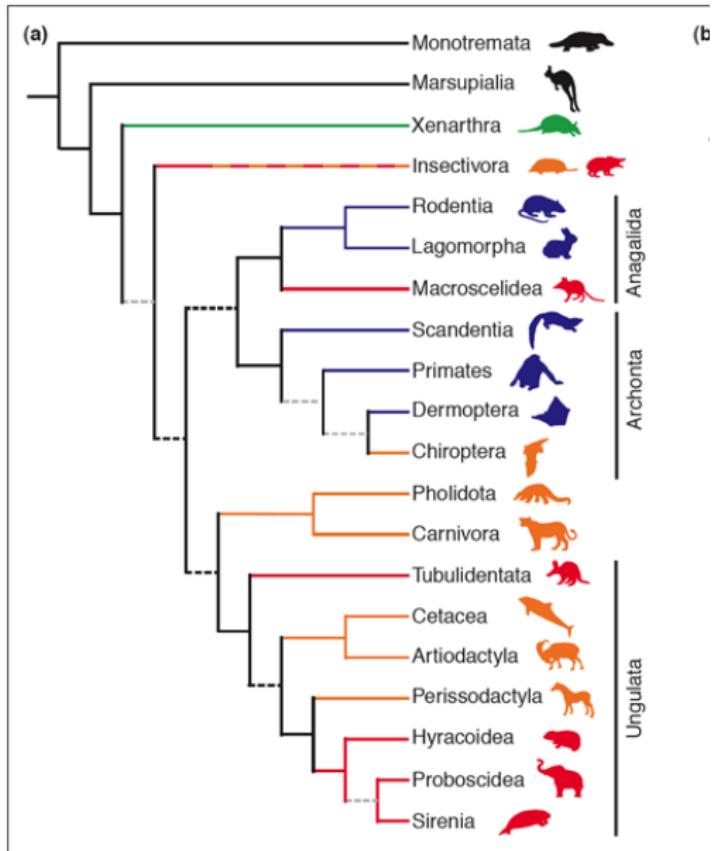
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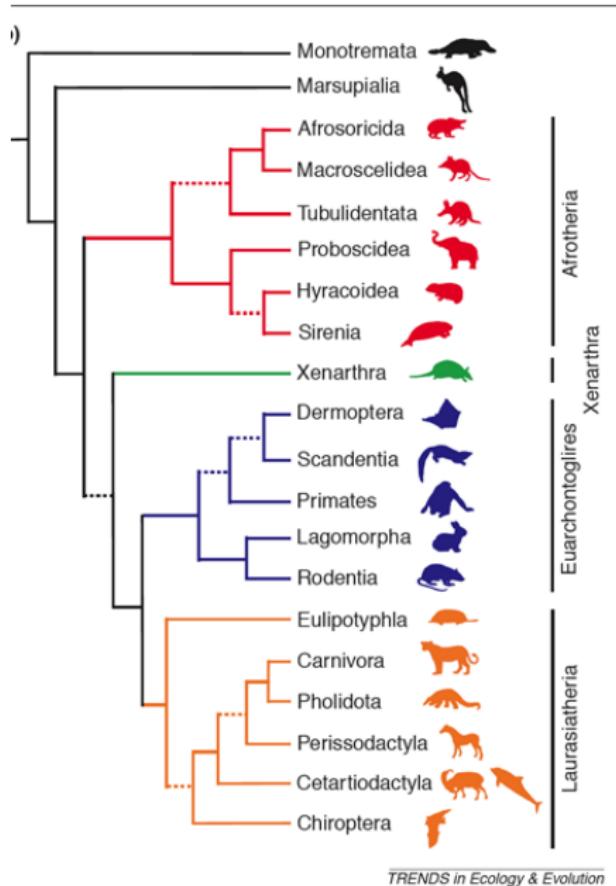
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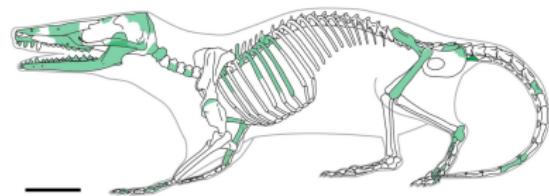
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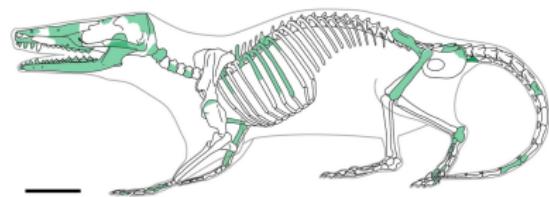


# Confirmation



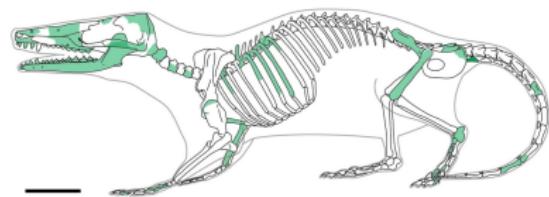
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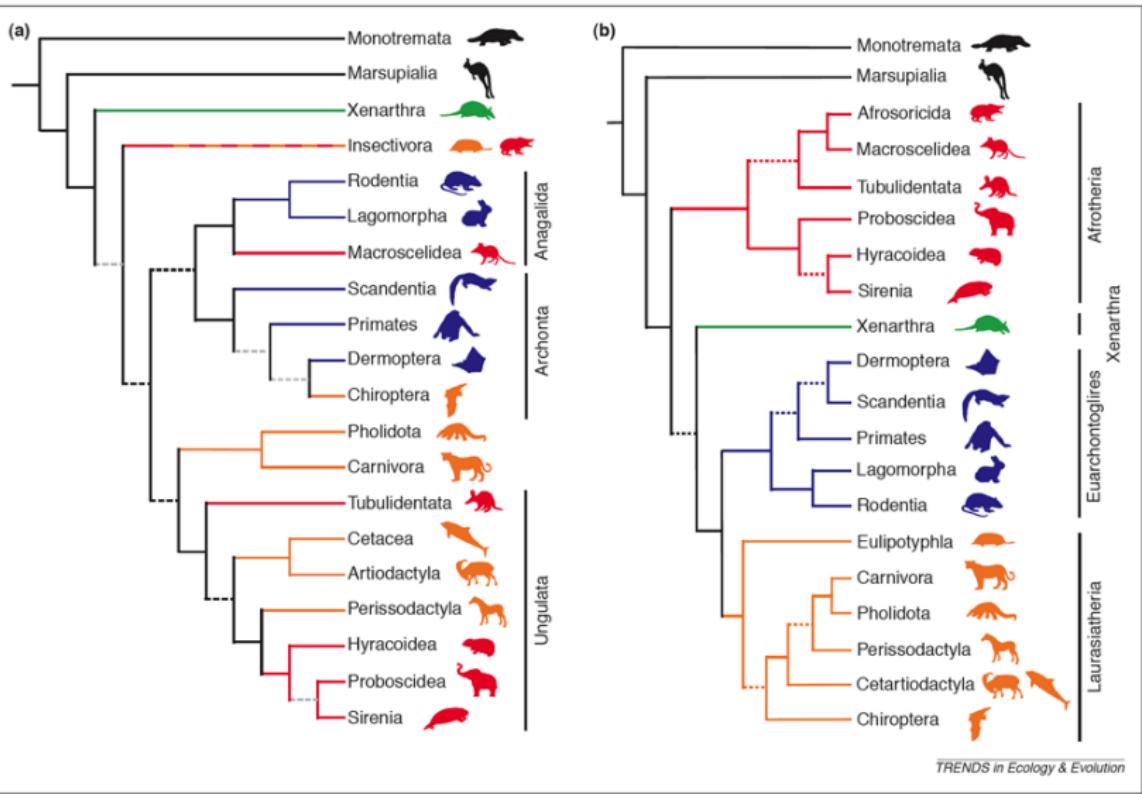
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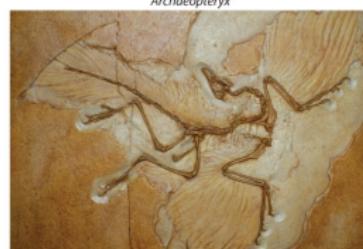
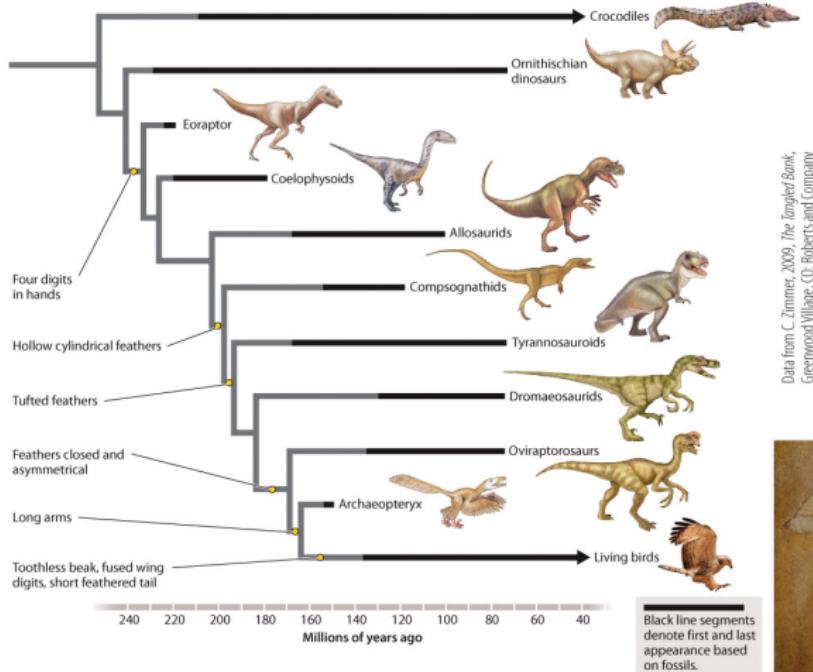
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**Figure 22.21**  
*Biology: How Life Works*  
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Data from C. Zimmer, 2009, *The Tangled Bank*, Greenwood Village CO: Roberts and Company.

Jason Edwards/National Geographic/Getty Images

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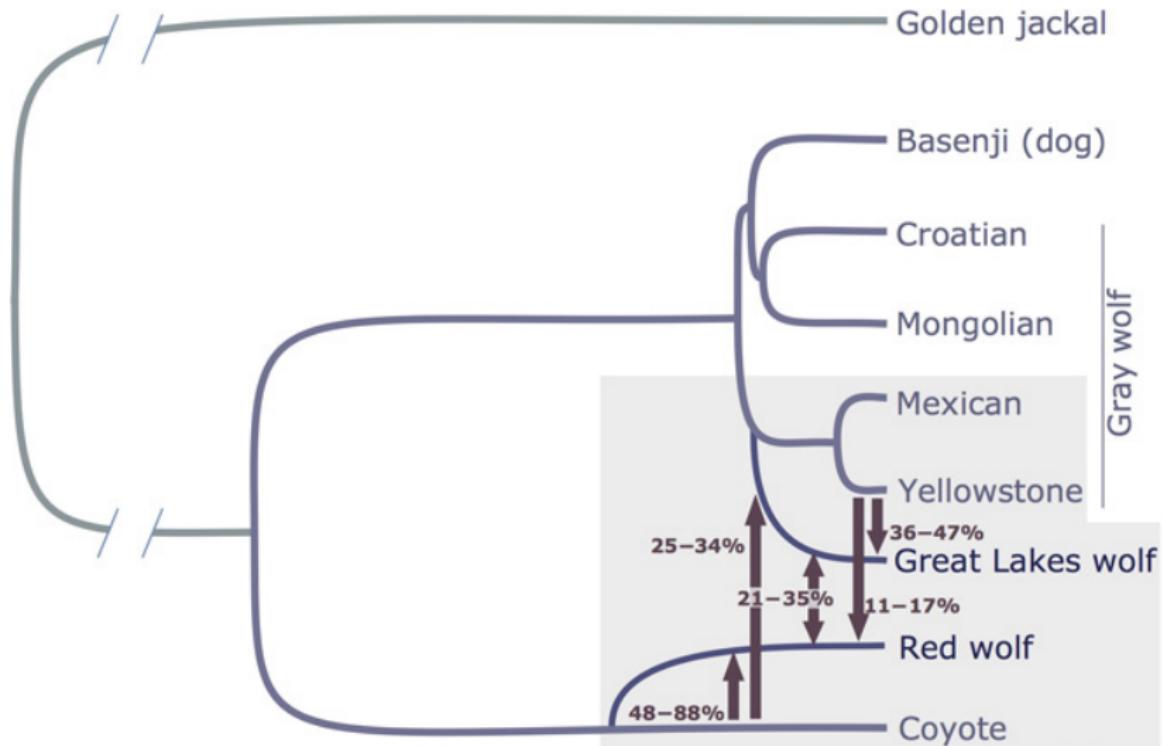
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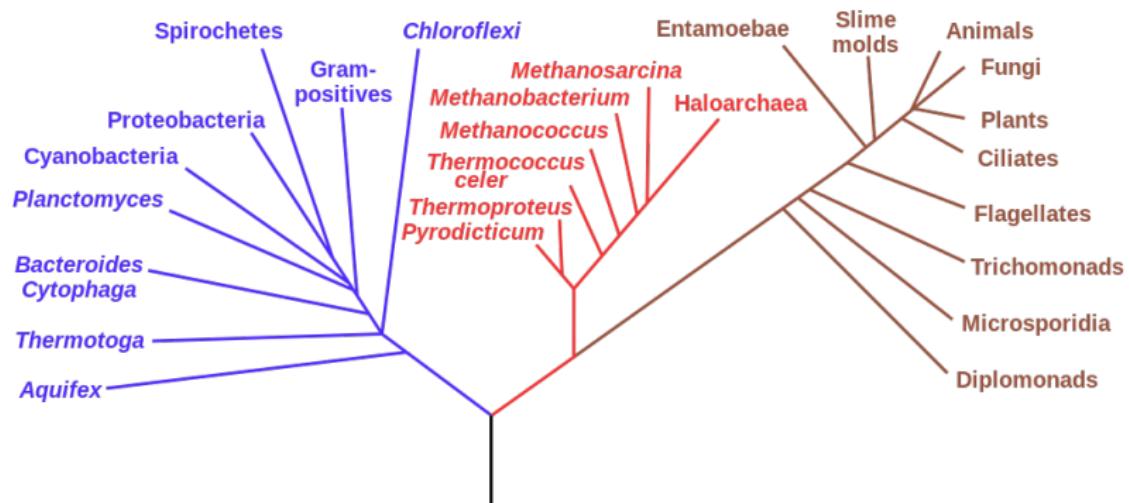
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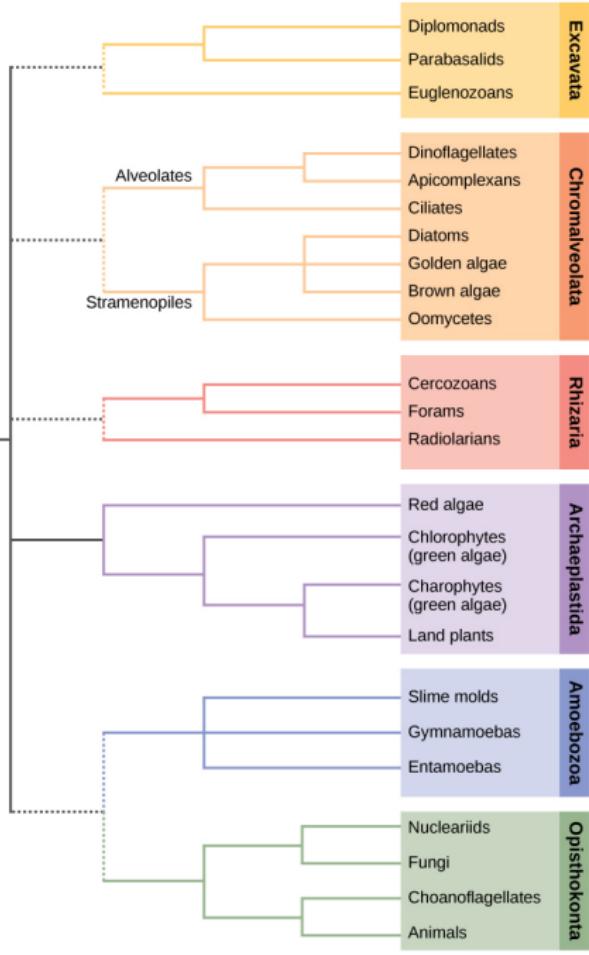
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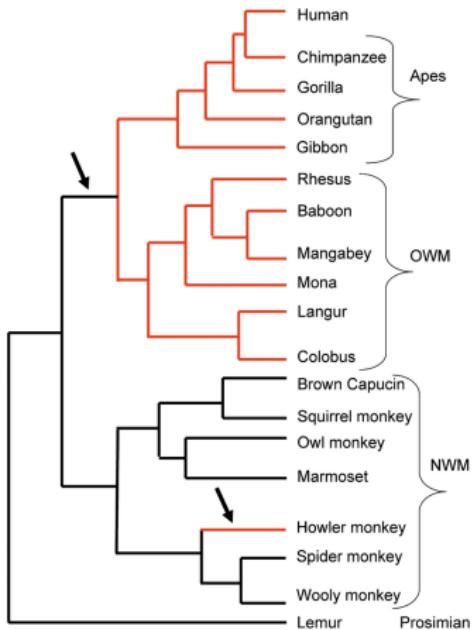


## Eukaryotic Supergroups

Common eukaryotic ancestor

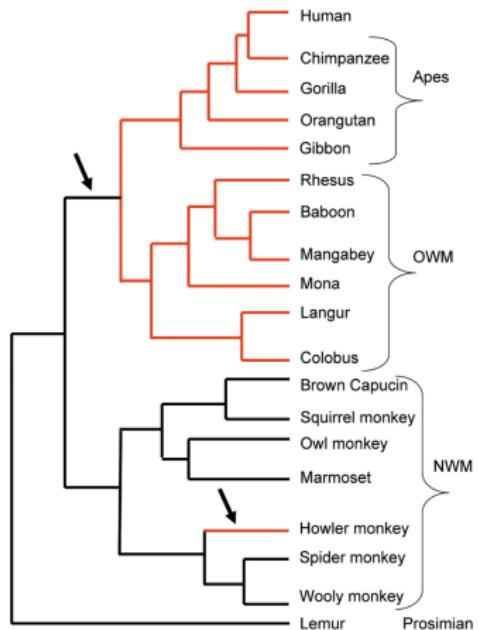


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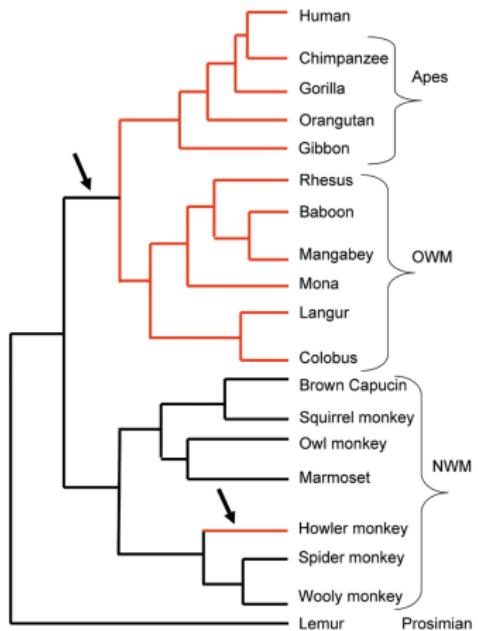
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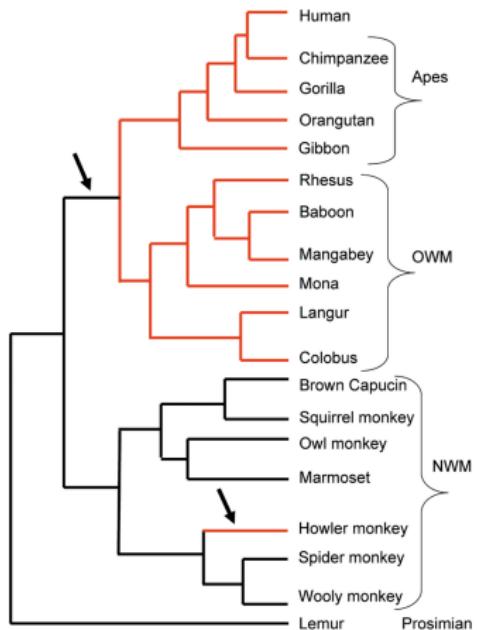
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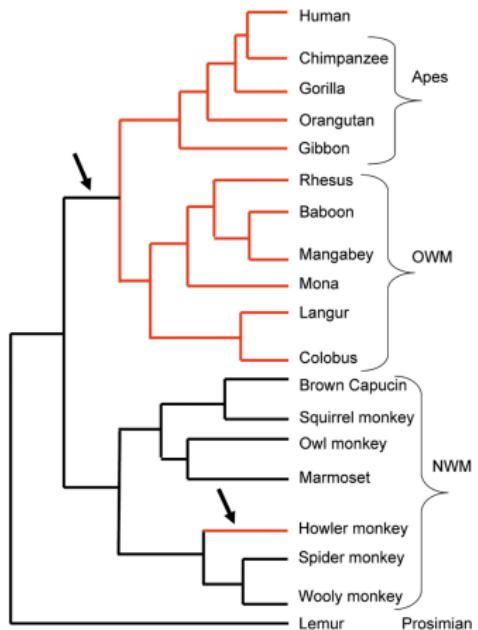
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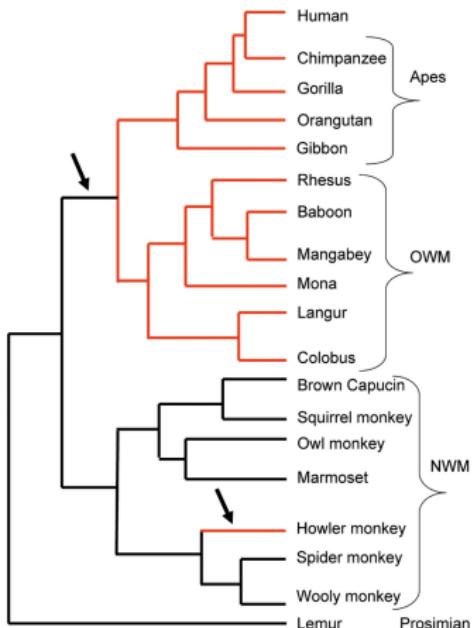
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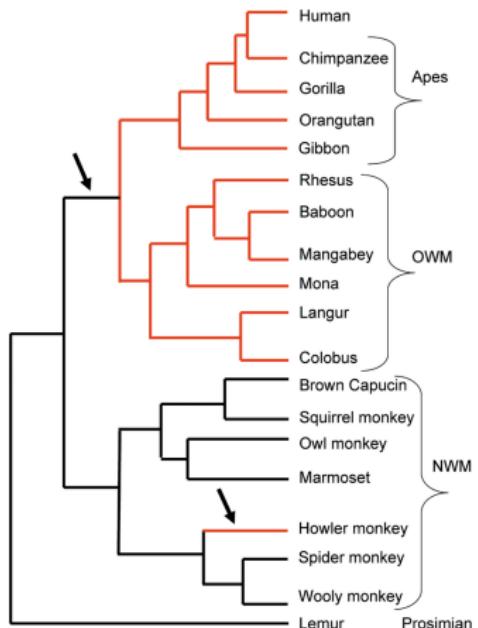
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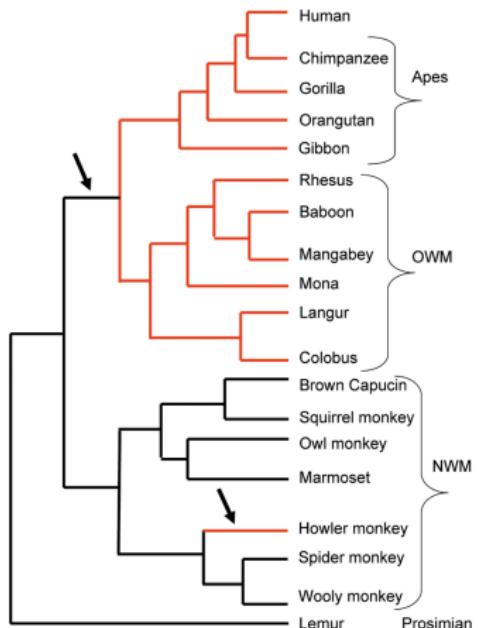
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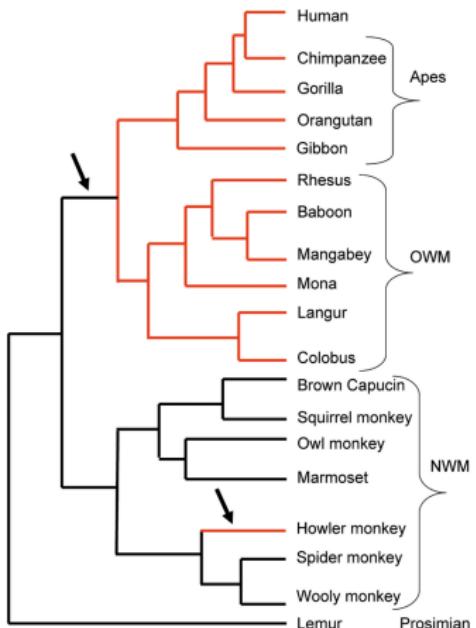
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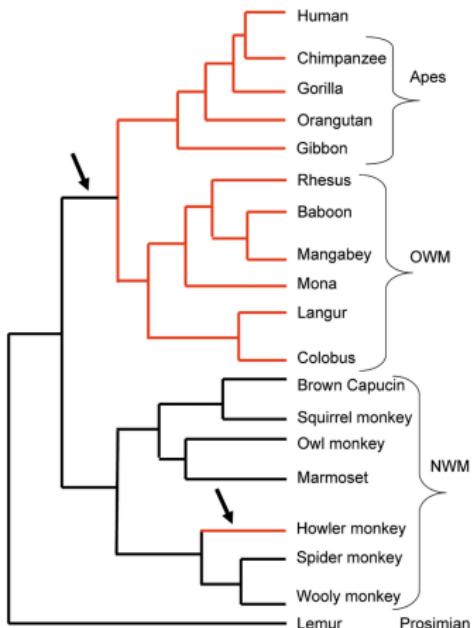
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Limestone accumulated in the oceans about 335 million years ago, burying marine animals and preserving their skeletons.

Slopes made of mud laid down in a shallow sea about 500 million years ago contain fossils of early arthropods called trilobites.

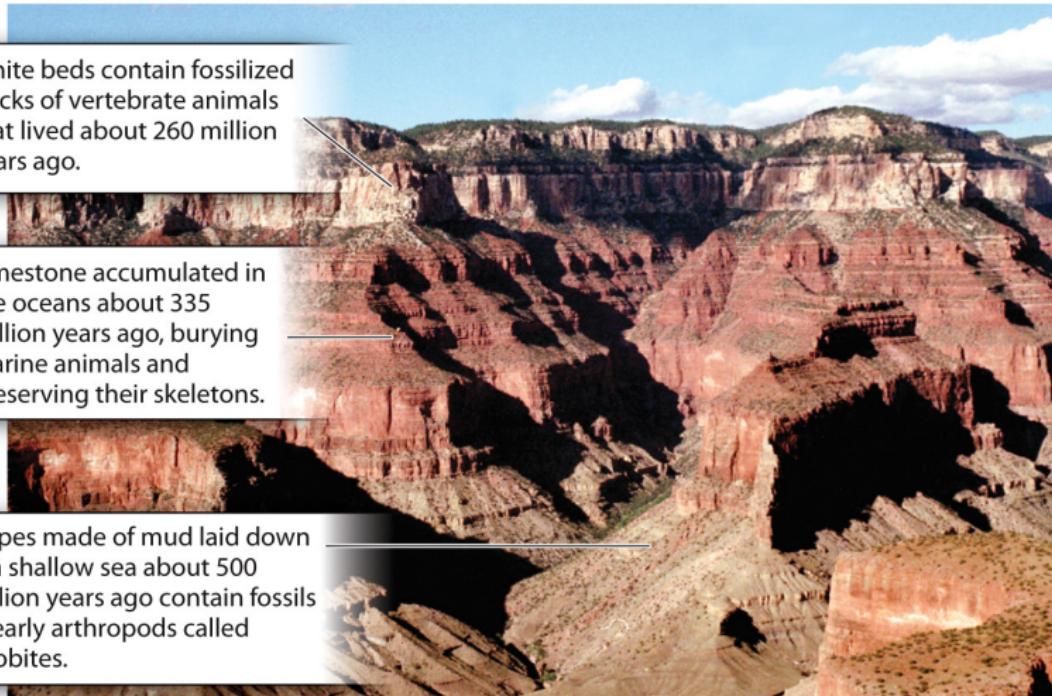


Figure 22.14

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**Figure 22.15**  
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José Antonio Hernaiz/AGENCE FOTOSTOCK



**Figure 22.16**  
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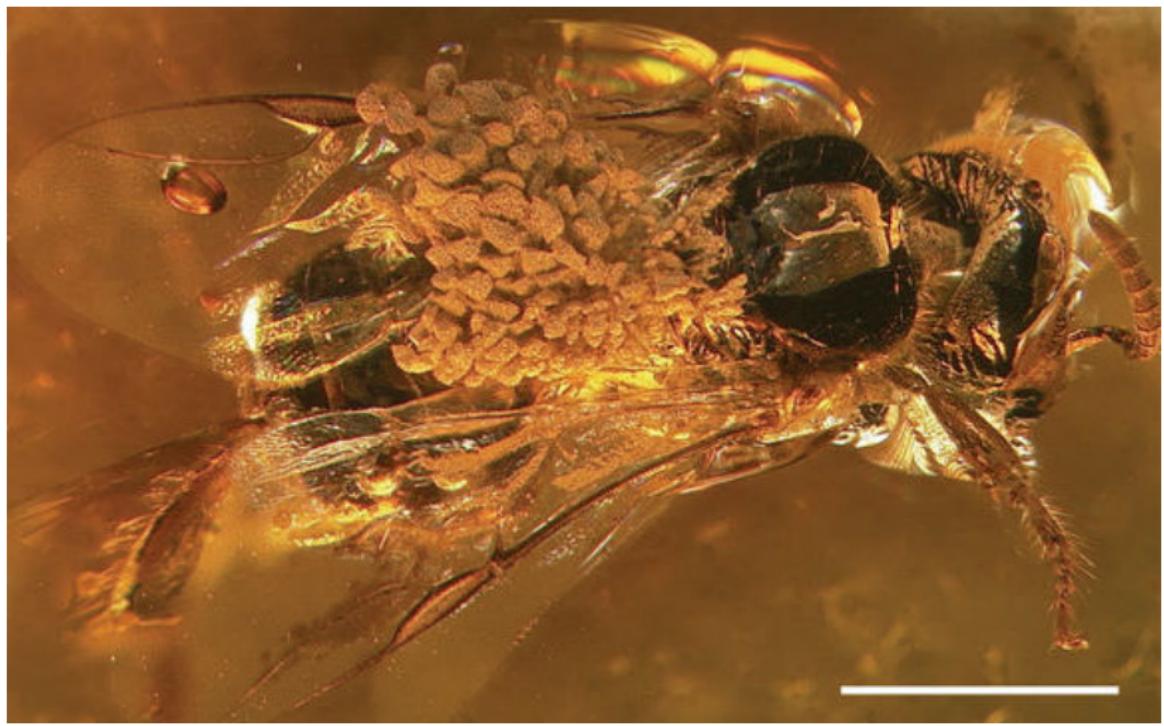
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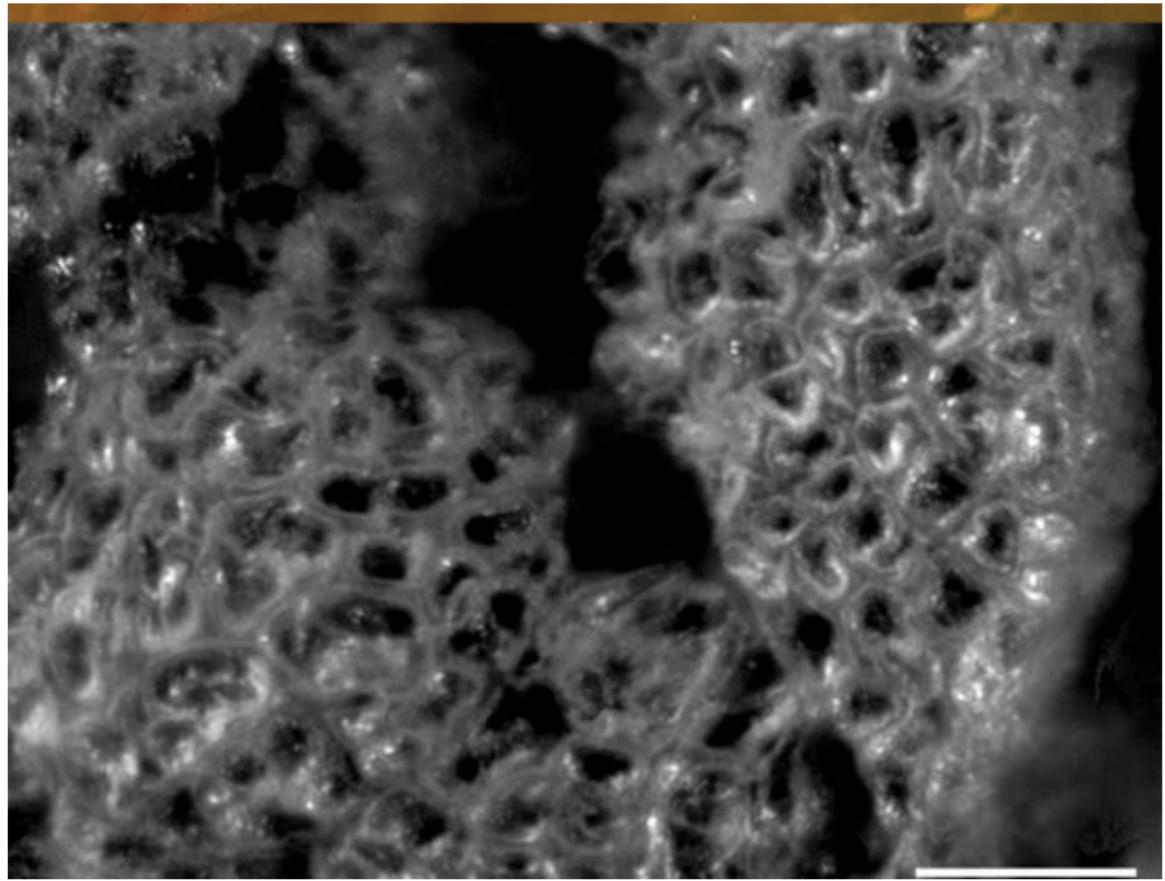
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Constructing phylogenetic trees

Example: the evolution of whales

## The history of life

The shape of the tree

The fossil record

**Putting the timeline together**

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