

A view from inside a cave looking out at a starry night sky. The cave's rocky interior frames the scene. In the center, a large, colorful spiral galaxy is visible, with a bright star shining on the right side, creating a lens flare effect. The sky is filled with numerous smaller stars.

Rock Dove

Pigeon

Vs.

Vampire

Bat

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Goal: Explore Convergent Evolution

- Taxonomies - Classification
- Biogeography - Location
- Homologues - Similar structure & function
- Fossils - Remains
- DNA - DNA/Convergent Evolution
- Phylogenies - Evolutionary development

Why Study...



Rock Dove Pigeon - *Columba livia*

- Domesticated 5,000 years ago.
- 3 types of domesticated birds.
- Monogamous
- Herbivore, Granivore
- Polymorphic



Vampire Bat - *Desmodus Rotundus*

- Mammal
- Carnivore/hematophagous bat
- Nocturnal
- Razor-sharp front teeth
- Heat sensor on end of nose
- Blood clotting preventing saliva

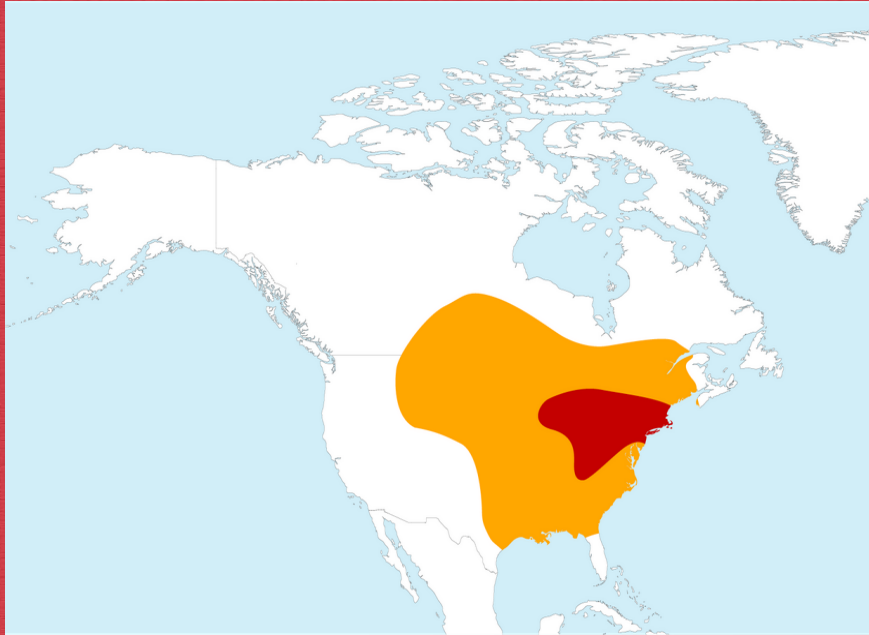


Taxonomy/classification

Common Vampire Bat (<i>Desmodus Rotundus</i>)	<i>Binomial name</i>	Rock dove pigeon (<i>Columba livia</i>)
Animalia	Kingdom	Animalia
Chordata	Phylum	Chordata
Mammalia	Class	Aves
Chiroptera	Order	Columbiformes
Phyllostomidae	Family	Colobinae
Desmodus	Genus:	Colomba
<i>D. rotundus</i>	Species:	C. Livia

Biogeography

Rock Dove Pigeon - North America



Vampire Bat - Western Hemisphere

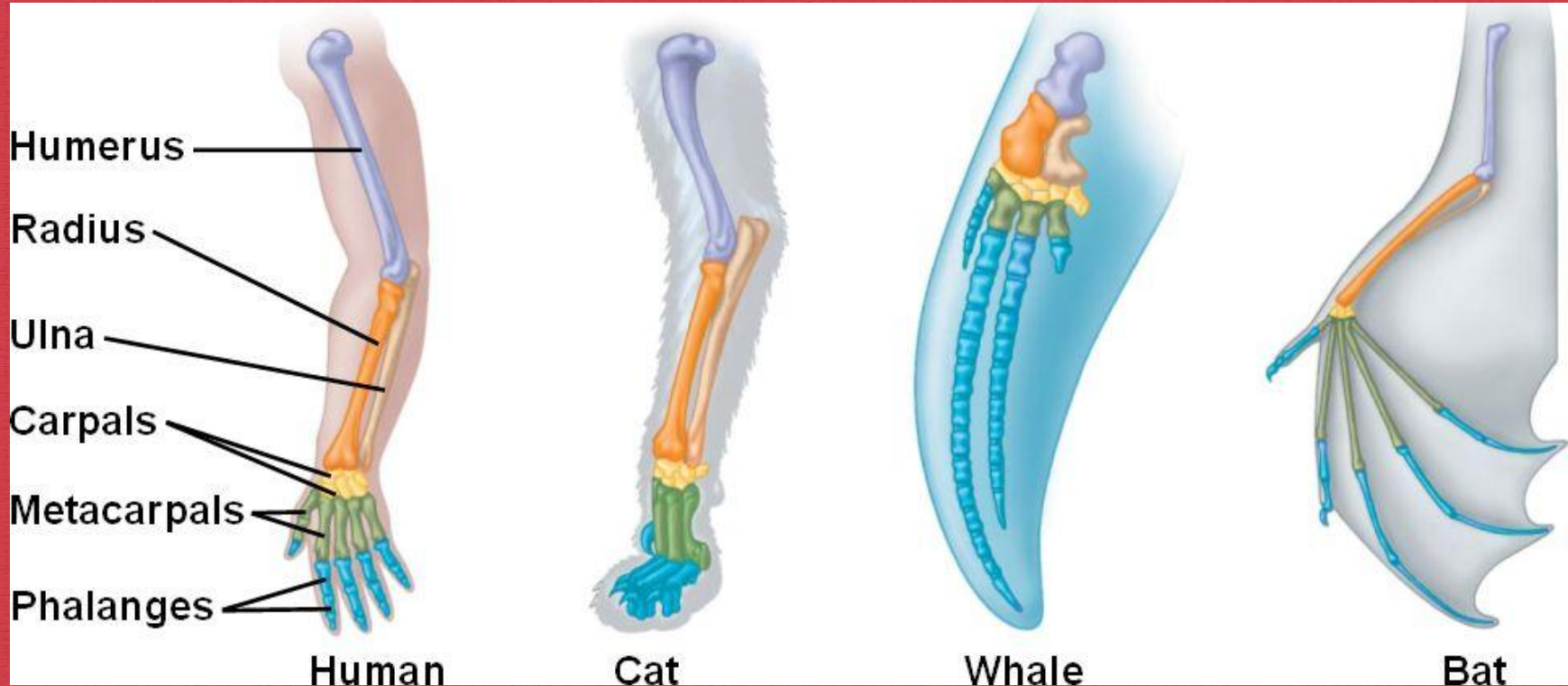


Comparative anatomy – homologies

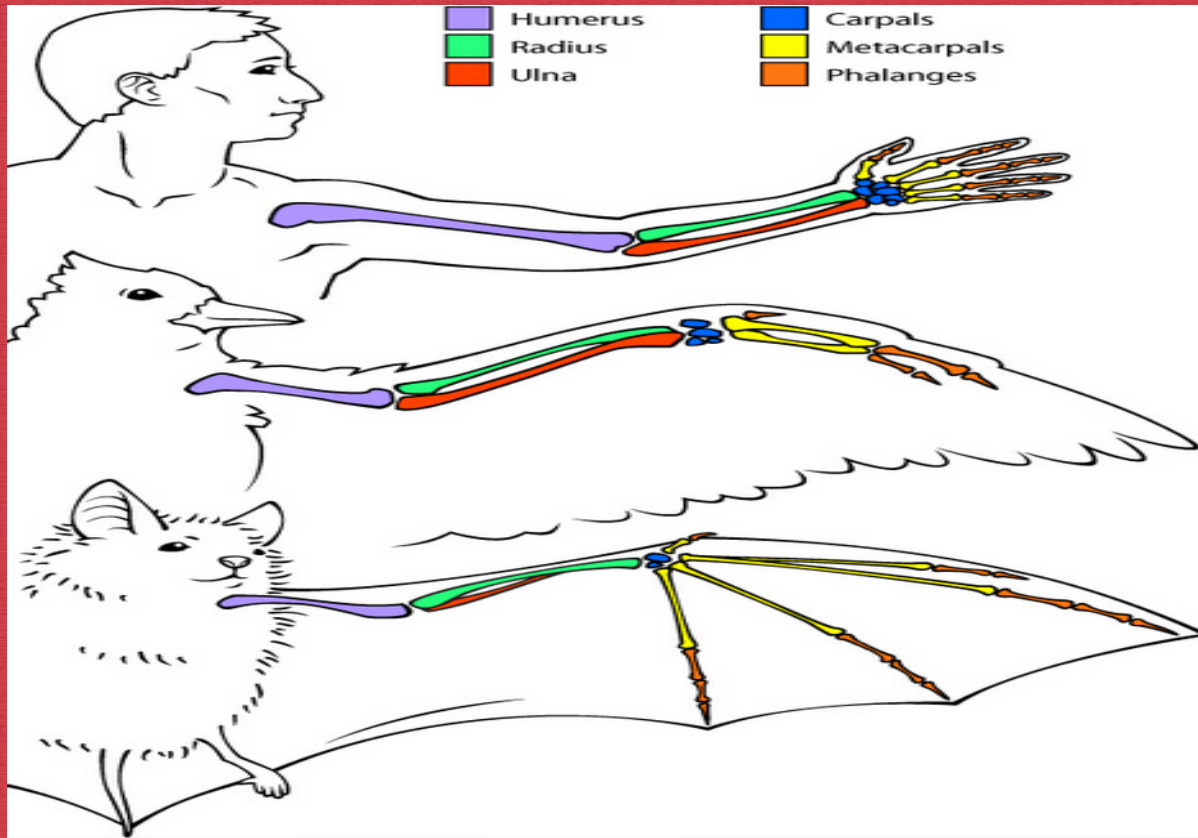
Physical Features – Wings



Homologies



Homologies and Analogies



Homologies – Rock Dove Wing

Humerus I

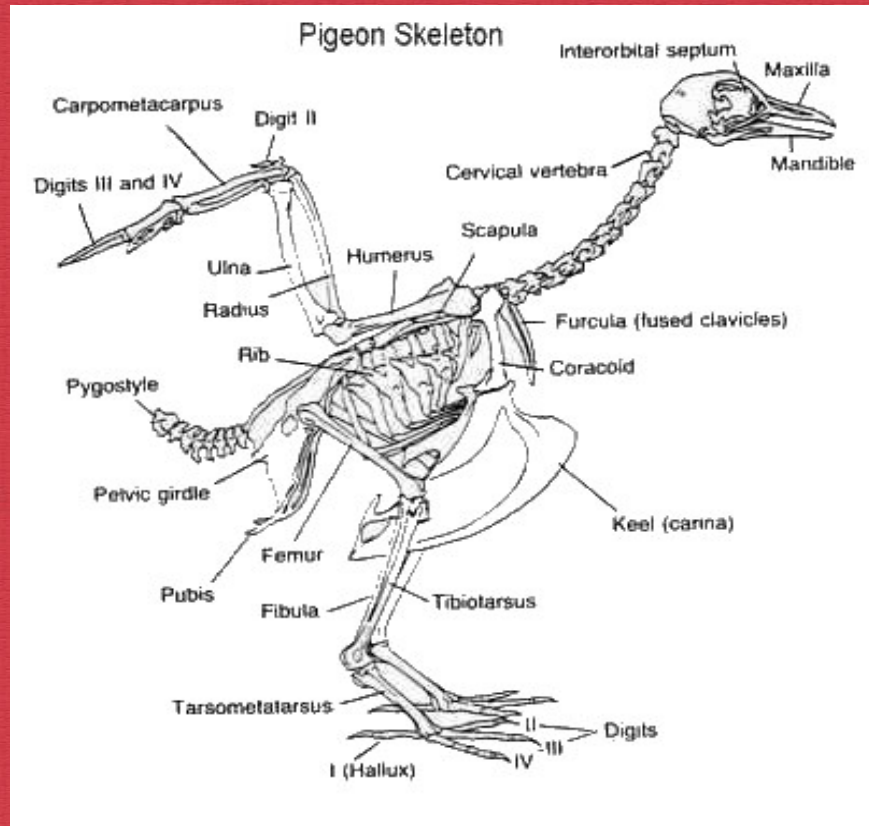
Radius I

Ulna I

Carpals I

Metacarpals I

Phalanges III



Homologies – Vampire Bat Wing

Humerus I

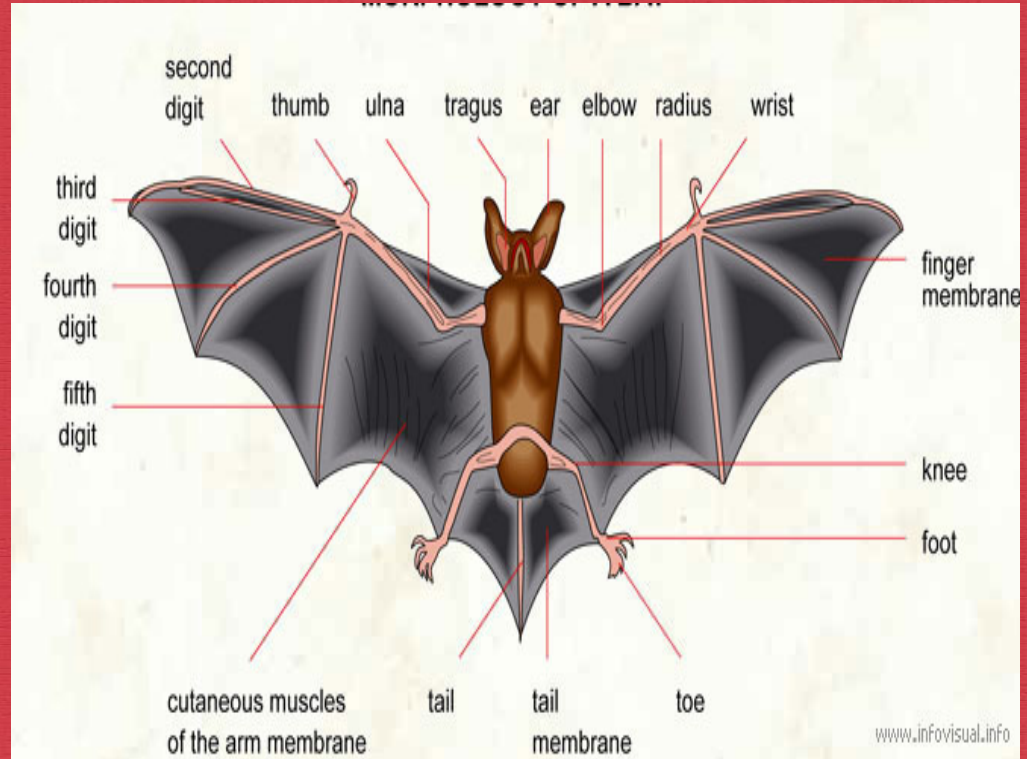
Radius I

Ulna I

Carpals II

Metacarpals I

Phalanges V

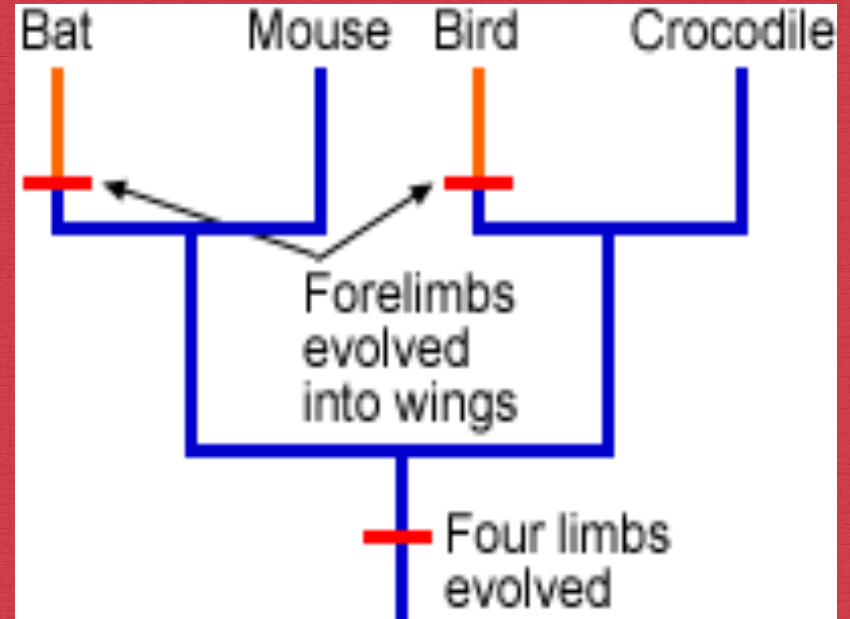
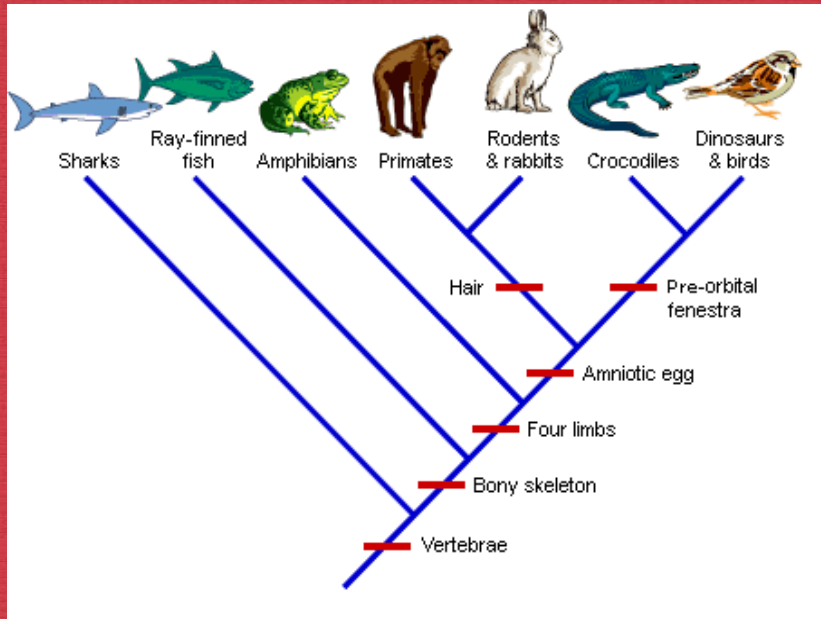


Fossil – *Icaronycteris*

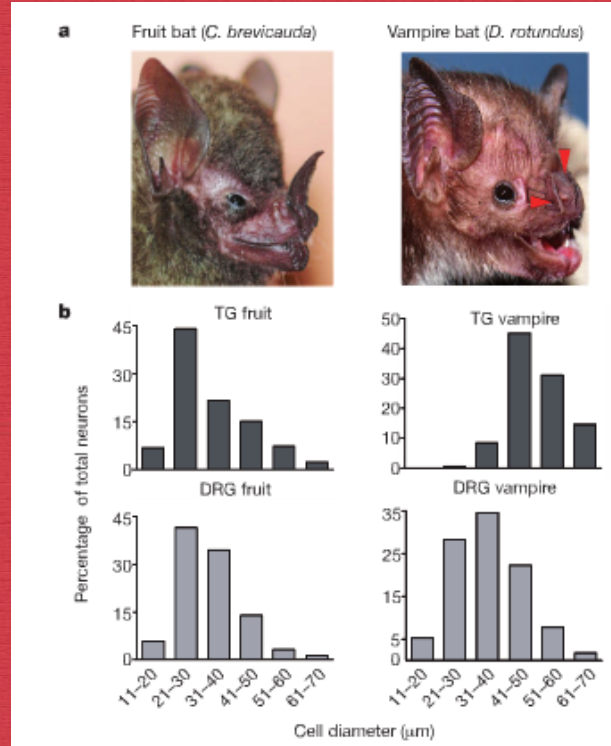
- North America, 1960
- Eocene bat,
52.2 million years ago
- Microchiroptera



Phylogeny & DNA



Phylogeny – Evolutionary diagram





Conclusions

- Biogeography, homologies, fossils & DNA can be used to compare evolution of species.
- What fossils led to vampire bat and rock dove divergence?
- How does the existences of the vampire bat and rock dove affect their habits?



Reflections

- Examine the teeth of bats.
- Evolution of echolocation within bats.

A view of a starry night sky with a galaxy, seen through a rocky cave opening. The sky is filled with numerous stars of various colors, including blue, white, and yellow. A prominent spiral galaxy is visible, with a bright yellow core and a blue and white spiral pattern. The cave opening is framed by dark, textured rock walls. The text "Thank You" is centered in the sky.

Thank You

Key Terms

➤ Taxonomies

➤ Biogeography

➤ Homologues

➤ Phylogenies

➤ Monogamous

➤ Convergent Evolution

➤ Polymorphic

➤ Carnivore

➤ Nocturnal

➤ Microchiroptera

➤ Mammal

➤ Hematophagy