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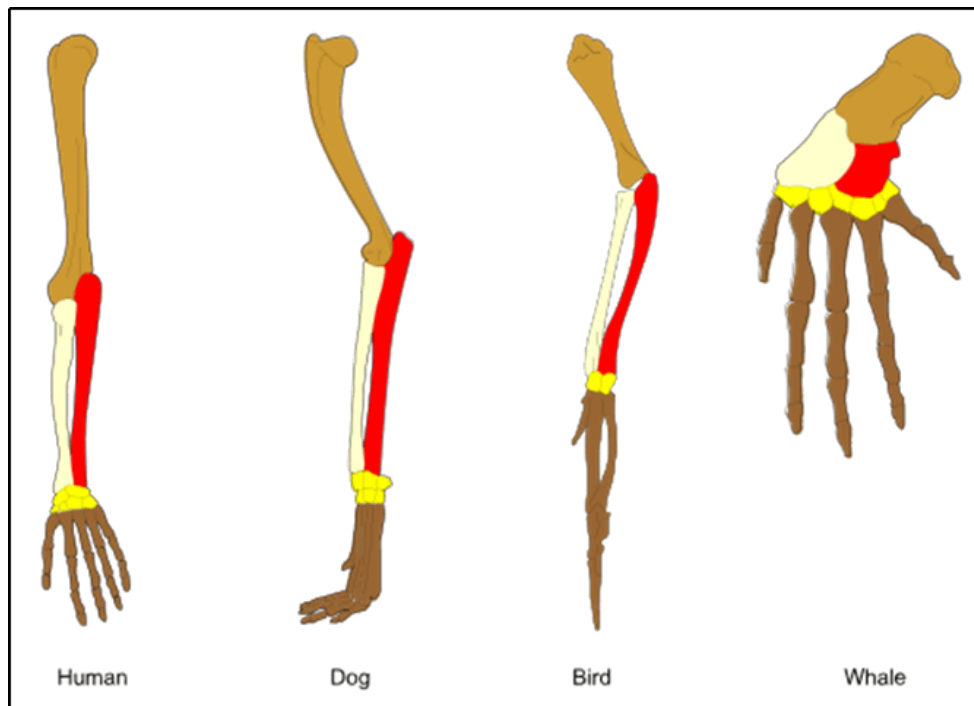
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Comparative Anatomy: Meaning of Comparative Anatomy, Analogous Structures (For CBSE, ICSE, IAS, NET, NRA 2022)

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Meaning of Comparative Anatomy

- It is the study of similarities and differences in the anatomy of different species.
- It has provided evidence of common descent and has assisted in the classification of animals.
- In simple terms one can say that Comparative anatomy is a comparison of the body structures of two species.
- It is closely related to evolutionary biology and phylogeny (the evolution of species) .
- The genetic change occurring in a population over time is called evolution.
 - The offspring has a different look than that of the parent.

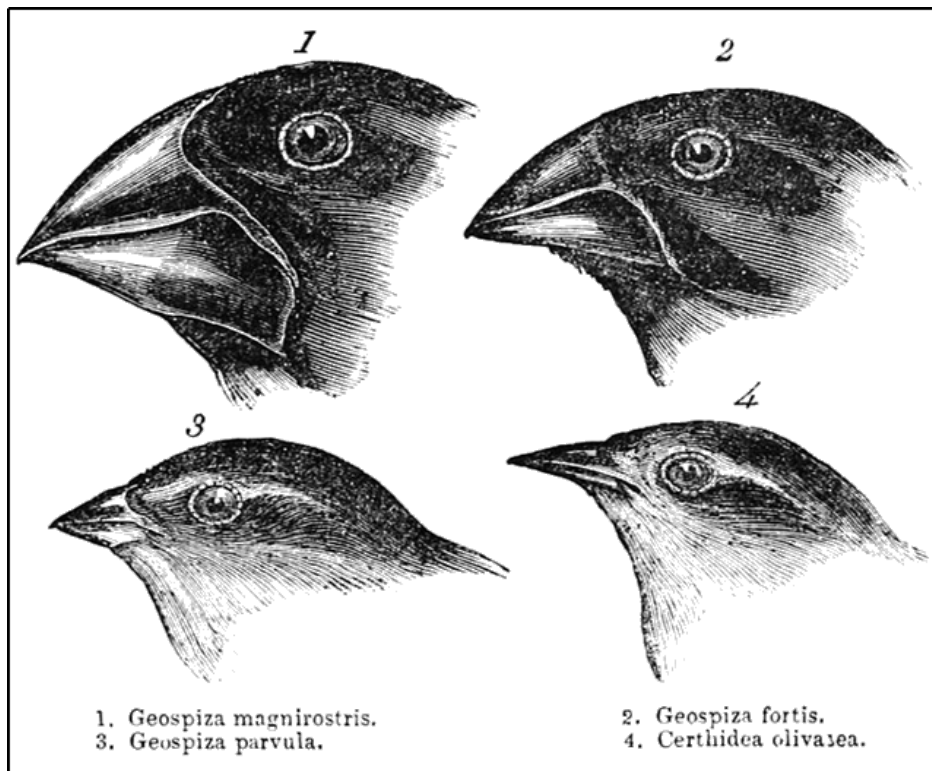


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Two Major Concepts

Analogous Structures

- These structures are similar in different organisms.
- They evolved in a similar environment in convergent evolution.
 - Rather than were inherited from a recent common ancestor.
- Usually the same or similar purposes are served.
- The streamlined torpedo body shape of porpoises and sharks is an example.
- The evolution is from different ancestors.



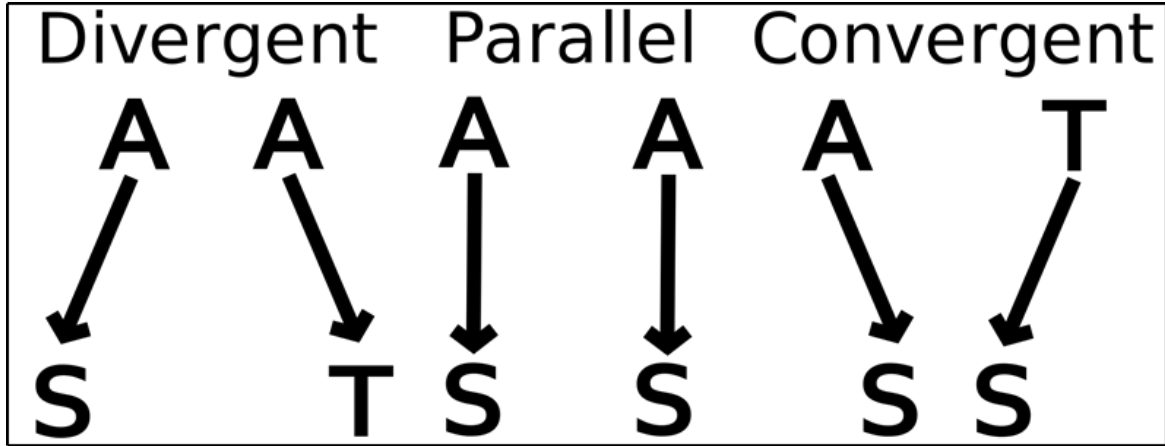
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Homoplasy

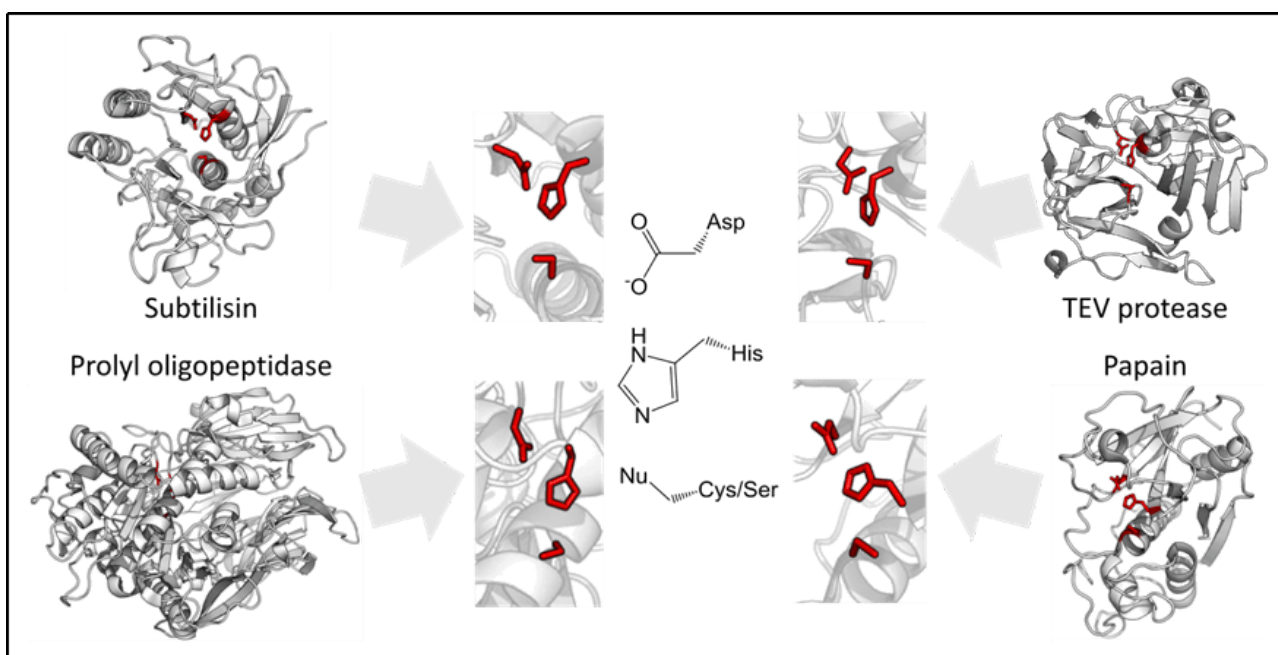
Porpoises and sharks developed analogous structures because of their evolution in the same aquatic environment.

Convergent Evolution

- It is the independent evolution of similar features in species of different periods or epochs in time.
- It creates analogous structures that have similar form or function.
- Independently evolved the useful capacity of flight:
 - Flying insects
 - Birds
 - Pterosaurs
 - Bats



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Homologous Structures

- These are similar in different species because the species have common descent.
- The evolution is usually divergently, from a shared ancestor.
- Same function may or may not be performed.
- The forelimb structure shared by cats and whales is an example.

Uses of Comparative Anatomy

- It simply indicates that the organism shares a common ancestor.
- It has long served as an evidence for evolution, now joined in that role by comparative genomics.
- It further assists scientists in classifying organisms based on similar characteristics of their anatomical structures.
- The similar bone structures in forelimbs of cats, whales, bats, and humans is one of the best examples.

FAQs

Q 1. Define homologous structure.

Answer:

Homologous structure is an organ or body part that appears in different animals and is similar in structure and location.

Q 2. List out the names of some independently evolved species involving Convergent Evolution.

Answer:

Some of the independently evolved species involving Convergent Evolution are:

- i) Flying insects
- ii) Birds
- iii) Pterosaurs
- iv) Bats

Q 3. What are some of the uses of Comparative Anatomy?

Answer:

Some of the uses of Comparative Anatomy are:

- i) It simply indicates that the organism shares a common ancestor.
- ii) It has long served as an evidence for evolution, now joined in that role by comparative genomics.
- iii) It further assists scientists in classifying organisms based on similar characteristics of their anatomical structures.

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