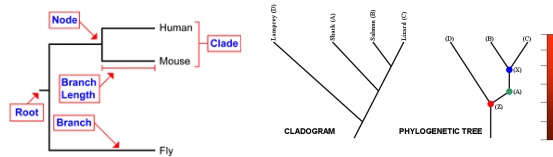


7.9 Phylogeny



ENDURING UNDERSTANDING EVO-3 Life continues to evolve within a changing environment.

The Ice Age

During the Ice Age, many large mammals roamed the earth, filling out deep branches on the mammal Tree of Life.

The Present

Since then, all the largest species have been chopped off the mammal Tree by extinctions.

The Future?

Surviving species will have to diversify for millions of years to restore the missing evolutionary history and regrow the Tree of Life.

EVO-3.B Describe the types of evidence that can be used to infer an evolutionary relationship

Phylogenetic trees and cladograms show evolutionary relationships among lineages

CLADOGRAM

PHYLOGENETIC TREE

EVO-3.B Describe the types of evidence that can be used to infer an evolutionary relationship

Phylogenetic trees and cladograms both show relationships between lineages, but phylogenetic trees show the amount of change over time calibrated by fossils or a molecular clock.

EVO-3.B Describe the types of evidence that can be used to infer an evolutionary relationship

Traits that are either gained or lost during evolution can be used to construct phylogenetic trees and cladograms

- Number of heart chambers in animals
- Opposable thumbs
- Absence of legs in some sea mammals

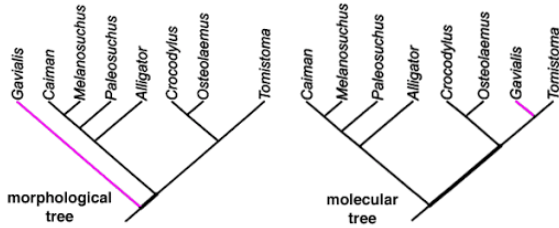
EVO-3.B Describe the types of evidence that can be used to infer an evolutionary relationship

- Shared characters are present in more than one lineage.
- Shared, derived characters indicate common ancestry and are informative for the construction of phylogenetic trees and cladograms.
- The out-group represents the lineage that is least closely related to the remainder of the organisms in the phylogenetic tree or cladogram

Cladograms or Phylogenetic Trees

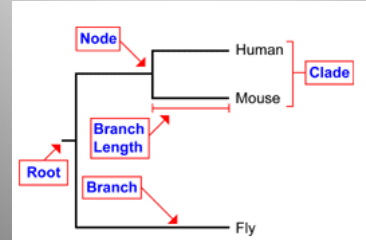
EVO-3.B Describe the types of evidence that can be used to infer an evolutionary relationship

- Molecular data typically provide more accurate and reliable evidence than morphological traits in the construction of phylogenetic trees or cladograms.



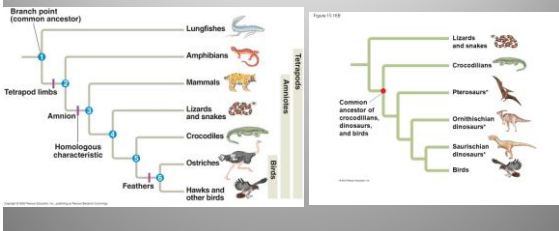
EVO-3.C Explain how a phylogenetic tree and/or cladogram can be used to infer evolutionary relatedness.

- Phylogenetic trees and cladograms can be used to illustrate speciation that has occurred. The nodes on a tree represent the most recent common ancestor of any two groups or lineages.



EVO-3.C Explain how a phylogenetic tree and/or cladogram can be used to infer evolutionary relatedness.

- Phylogenetic trees and cladograms can be constructed from morphological similarities of living or fossil species and from DNA and protein sequence similarities.



EVO-3.C Explain how a phylogenetic tree and/or cladogram can be used to infer evolutionary relatedness.

- Phylogenetic trees and cladograms represent hypotheses and are constantly being revised, based on evidence.

