Week 6 Phylogenies

Learning Goal: Understand the role of phylogenies as hypotheses of evolutionary relationships between different groups of organisms.

After completing the pre-class assignments, students will be able to…
- Define terms relevant to interpreting a phylogenetic tree.
- Identify sister and monophyletic groups on a phylogenetic tree.
- Define synapomorphy, common ancestor, homologous character, and analogous character.
- Relate characters, morphologic and molecular, to branching patterns on a phylogenetic tree.
- Explain the relationship between phylogenies and the fossil record.
- Explain the role of mass extinctions to diversification after the extinction event.
- Identify the role of fossil evidence and phylogenies to our understanding of evolutionary patterns.
- Determine the age of a fossil based on C-14 dating.

After this week's class meeting students will be able to…
- Recognize how phylogenies are hypotheses of evolutionary relationships
- Evaluate the relationships between various groups of organisms based on a phylogeny.
- Construct a phylogenetic tree given a character matrix
- Predict levels of genetic divergence based on relationships illustrated on a phylogenetic tree
- Differentiate between the three common representations of phylogenies and correctly interpret the data presented in them
- Interpret patterns of speciation and divergence based on the branching patterns represented on a phylogenetic tree
- Use the principle of parsimony to evaluate phylogenetic hypotheses
- Predict phylogenetic tree topologies in the presence or absence of convergent evolution
- Define the terms synapomorphy, homoplasy, node, sister taxa, monophyletic and paraphyletic group, and phylogenetic tree.