

Phylogenetic Tree and Cladogram Practice

1. Figure 1: Use the phylogenetic tree shown to complete the following
 - a. Explain how many clades are indicated
 - b. Explain which branch point occurred most recently
2. Figure 2: Use the data presented in the table to label the small circles in the cladogram with the derived traits
3. "Parsimony" is a term used to describe how the analysis completed in the above question would resolve the complications of adding more traits and more organisms to phylogenetic analysis. Describe what "parsimony" means in this context.
4. Though their body shapes are similar, snakes and worms have substantially different evolutionary histories. Discuss how this convergence might have occurred and suggest additional data that could be sought in determining the differences in evolutionary heritage.
 - a. Explain why phylogenetic trees based on gene sequences are more accurate in showing evolutionary relationships than are phylogenetic trees based on morphology.
5. Figure 3: Explain how this phylogenetic tree shows that the term "protists" does not refer to a formal taxonomic group.
 - a. Would protists be considered monophyletic, polyphyletic, or paraphyletic? Explain
6. Figure 4: Use the phylogenetic tree to answer the questions
 - a. Explain why the animal phyla are considered to be monophyletic.
 - b. Identify 3 characteristics found in both echinoderms and ctenophores.
 - c. Identify 4 characteristics found in both chordates and arrow worms.
7. Figure 5: The hagfish and lampreys were lumped together as "jawless fishes" in early classification efforts. Based on the diagram, explain why they are no longer classified together.