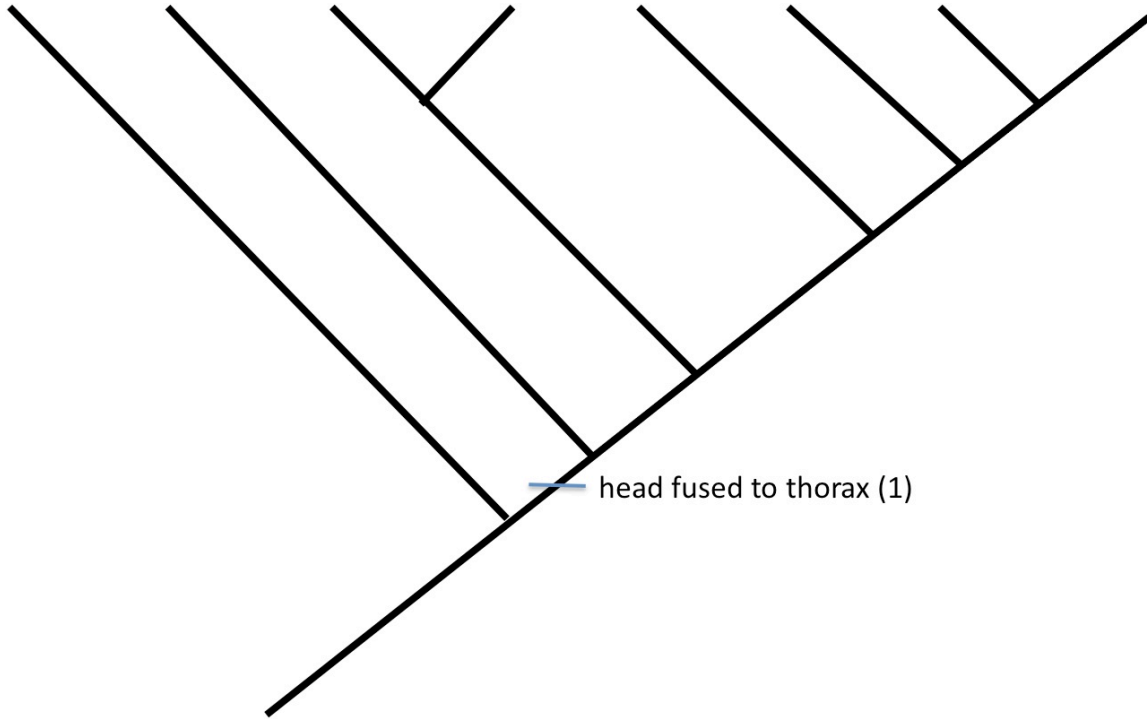
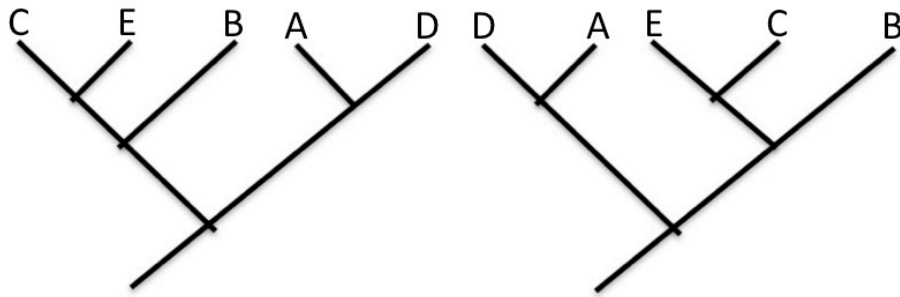


PHYLOGENY WORKSHEET



1. Referring to the data matrix and nested sets you completed in lab for the cladisticules, label the branch tips of the cladogram above with the names of the cladisticule representing that species for the most parsimonious tree. Then mark each trait from the data matrix on the cladogram where it would have arisen (see example above for trait 1). Draw circles around two non-overlapping monophyletic groups (two groups that do not share any members). Draw a rectangle around a third monophyletic group that shares members with one of your circled groups. What shared derived character defines the monophyletic group enclosed by the rectangle? _____ . Look back at the pictures of the cladisticules. Name one shared ancestral character. _____. Why isn't this character included in the analysis? (Answer briefly).
2. You continue to study the cladisticules. Although you did not make any mistakes in your original analysis, after a year of study you publish a new phylogeny hypothesizing somewhat different relationships among the cladisticule groups. Generally speaking, what could have led you to alter your hypothesis? (Answer briefly using no more than two sentences.)

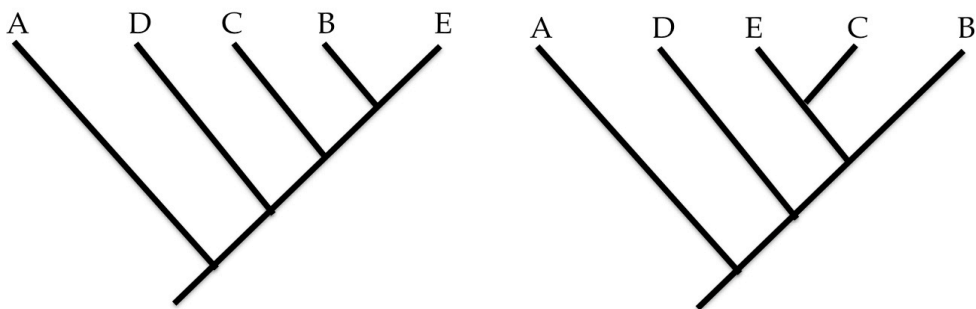
3. Compare the two phylogenetic trees shown below. Taxa are indicated by capital letters.



A. Do the two phylogenies depict the same or different hypotheses about evolutionary relationships? _____. Explain your answer.

B. Examine the tree on the left; is A more closely related to C, B or E or equally closely related to all three taxa? _____. Indicate with an arrow the node representing the most recent common ancestor that A shares with B and circle the node representing the most recent common ancestor that A shares with C.

4. Compare the two phylogenetic trees shown below. Taxa are indicated by capital letters.



A. Do the two phylogenies depict the same or different hypotheses about evolutionary relationships? _____. Explain your answer.

B. Examine the tree on the left; is C more closely related to B or D or equally closely related to both? _____. Indicate with an arrow the node representing the most recent common ancestor that C shares with D and circle the node representing the most recent common ancestor that C shares with B. A is the outgroup in this analysis. Why is it useful to include an outgroup?

C. Examine the tree on the right. Encircle a paraphyletic group. From a biologist's perspective, why is a paraphyletic grouping problematic?