BIOL 325 – Plant Systematics
Fall 2012

Topic 05 - Cladistics

I. Terms and Concepts

A. Phylogeny vs. Cladogram
    1. Cladogram branches and nodes; internal vs. terminal branches
    2. Styles and interpretation of cladograms
B. Phylogeny vs. tokogeny
C. Clades and monophyletic groups
D. Sister groups
E. Evidence of phylogenetic relationship
    1. Characters and character states; sources of data
    2. Apomorphies vs. plesiomorphies
        a. autapomorphy vs. synapomorphy
        b. synapomorphy vs. symplesiomorphy
        c. hashmarks
    3. Homology, analogy and homoplasy

II. Cladogram Construction

A. Defining your scope: outgroup vs. ingroup selection
B. Data matrix construction
C. Parsimony
    1. For one character at a time
    2. For multiple characters (what's done in practice)
        e.g., Fitch optimization
D. Revisiting of outgroup and rooting.

III. Some Uses of Cladograms

A. Taxonomies (Classifications)
B. Disease origins and Disease Forensics
C. Conservation
D. Ancestor Reconstruction
E. Testing Adaptational Hypotheses

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Reading for this topic:

Worobey M, ML Santiago, BF Keele, J-BN Ndjango, JF Joy, BL Labamall, BD Dhed'a, A Rambaut, PM Sharp, GM Shaw, BH Hahn. 2004. Contaminated polio vaccine theory refuted. *Nature* 428: 820.

[note: when requesting this, request a color copy]