

Topic 06 – The Varied Uses of Cladograms & the Cladistics Revolution

Phylogeny reconstruction is a major enterprise of systematic biologists. These phylogenies have obvious immediate applications to systematics, but it is not often appreciated how the theory and practice of phylogenetic inference (cladistics), developed by systematists, has transformed biology and the world we live in at large.

I. Disease Origins & Epidemiology

- A. HIV Origins
- B. HIV Epidemiology

II. Character Evolution

- A. Homology Assessment
- B. Testing Adaptational Hypotheses
- C. Ancestor Reconstruction

III. Conservation Planning

- A. Prioritizing Species
- B. Prioritizing Areas

IV. Taxonomies

- A. Revision of Existing Classification Schemes
- B. New Classifications

V. Economic Botany

- A. How to target new drug discovery
- B. Targeting Breeding Efforts and the Conservation of Useful Germplasm

VI. Speciation

- A. Allopatric vs. Sympatric or Parapatric Speciation
- B. Key Innovations

VII. Dating Species & Clades

- A. Age of Clades & Species
- B. Tempo & Mode of Speciation

VIII. Biogeography

- A. Geographic Origins
- B. Vicariance vs. Dispersal

Readings for this topic:

Baum DA, SE Smith, SSS Donovan. 2005. The tree-thinking challenge. *Science* 310: 979-980.

Daly DC, KM Cameron, DW Stevenson. 2001. Plant systematics in the Age of Genomics. *Plant Physiology* 127: 1328-1333.

Worobey M, ML Santiago, BF Keele, J-BN Ndjanga, 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.]