Phylogenetic ancestors

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Abstract

The concept of ancestors in modern phylogenetics is particularly obscure. However, the interpretation of phylogenetic trees requires evolutionary concepts such as ancestry. The relationships that exist between cladistic analyses and phylogenetic information conveyed by cladograms (phylogenetic trees resulting from the application of cladistic theory) may be interpreted as follows:

- Cladistic analysis defines monophyletic entities, i.e. taxa and homologues that the theory of evolution must explain.
- The theory of evolution entirely justifies cladistic theory.

In both cases, the concept of evolutionary ancestor is critical. It is difficult to consider a historical account on taxic diversification without taking into account ancestor-descendant relationships. However, systematists have been elusive about the issue of ancestry. The problem of defining and understanding what an ancestor is is simply evacuated by considering it "hypothetical"; ancestors are assumed in historical narratives, but the ancestor is declared as unidentifiable in the fossil record, and either absent or implicit in phylogenetic trees. The concept of phylogenetic ancestor thus needs to be clarified.
Here I analyse the inconsistencies found in some of the best manuals of phylogenetics concerning the idea of ancestors. I provide a solution for eliminating these inconsistencies and clarifying the notion of phylogenetic ancestry. I give some of the consequences that a consistent idea of ancestor has on our representation of the taxic diversification process, on the information conveyed by phylogenetic trees, and on our own ancestry as humans. Finally, I show that the concept of ancestor is reducible to the concept of taxon.

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