

BIO 2150- Chapter 23 Notes

I. Phylogeny

- A. **Phylogeny**: attempts to classify organisms based on their genetic relatedness.
- B. **Phylogenetic Trees**: a way of diagrammatically expressing this relatedness
 - 1. Branches on these trees represent species or populations.
 - 2. Nodes on these trees represent speciation events.
 - 3. **Clade**: a group that includes a common ancestor and all its decedents.
 - 4. **Monophyletic Group**: a group of branches on the tree that includes a common ancestor and all the decedents.
 - 5. **Paraphyletic group**: a group of branches on the tree that includes a common ancestor and some, but not all, of its decedents.
 - 6. **Polyphyletic Group**: A group of branches on the tree that doesn't include a common ancestor.

II. Assembling a Phylogenetic Tree

- A. These trees show a comparison of morphological traits.
 - 1. **Homology**: indicates a decent from a common ancestor.
 - 2. **Analogy**: evolves independently and has no common ancestor.
 - 3. **Ancestral**: came from a common ancestor.
 - 4. **Derived**: evolves independently.
- B. **Synapomorphy**: a trait derived homologous trait.

III. Other Way to Assemble Trees

- A. DNA sequences or amino acids change in proteins
 - 1. Fewer changes between species reflect a close relationship.
 - 2. This is useful for analyzing relationships.

IV. Extinct Species and Time Scales

- A. **Fossils:** Preserved remnants of extinct animals or their activities.
 - 1. **Trace fossil:** evidence of prehistoric life
- B. Absolute age of fossils is found using radiometric dating
- C. The fossil record can identify:
 - 1. The first appearance of a particular species or clade.
 - 2. The last appearance of extinct species or clade.
 - 3. The existence of intermediate forms (or “missing links”)