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EEOB 563: Molecular Phylogenetics

Project Outline

**Question:**

What is the phylogenetic relationships between major Canidae species? At what points in time did they diverge and what geographical or ecological factors contributed to their speciation?

**Introduction:**

Many phylogenies resolving the family of Canidae have been published. However some variation among the phylogenies still exist. New attempts to build their phylogenetic tree would be helpful.

The Canidae family has been researched extensively. A paper in 2004 was published that investigates topics very similar to my inquiries (Wang). They cover the time periods in which different genuses have arisen and the differences in some aspects of their morphology. However, they don’t discuss the connection of these morphological characters to some of their ecological implications. I am interested in the how these anatomical differences could have lead to their divergence, along with their location and the geography at that point in time.

**Methods:**

Use previously made taxonomic trees to choose species.

* in pairs, to be able to inquire reasons for divergence
* including those that are not part of many trees and those that don’t frequently vary in position among the trees
* have genomic data available

Use GenBank for ribosomal genes.

Build a phylogenetic tree that has a molecular clock.

Look at points of divergence.

* Compare to existing publications

Research time period and location for each.

* Compare to existing publications

Research geography, ecology, known extinction events, etc.

Make inferences about what stimulated speciation.

**Sources:**

Wang, Xiaoming & H. Tedford, Richard & Van Valkenburgh, Blaire & K. Wayne, Robert. (2004). Phylogeny, classification, and evolutionary ecology of the Canidae.

<https://www.researchgate.net/publication/267156823_Phylogeny_classification_and_evolutionary_ecology_of_the_Canidae>