

Organismal Diversity and Classification Systems

I. Classification

Classification of organisms helps us to understand relationships between them

A. Taxonomy vs. phylogeny

Taxonomy: organisms sorted by common physical characteristics

Phylogeny: organisms sorted by molecular similarity / evolutionary relationships

B. Taxa (plural of "taxon") = grouping

| | | |
|---------|--------------|---------------|
| Domain | more general | |
| Kingdom | ↓ | |
| Phylum | | |
| Class | | |
| Order | | |
| Family | | |
| Genus | | |
| Species | | more specific |

II. The Binomial System

A. Binomial Nomenclature

Carolus Linnaeus (1700s)

Genus species

Examples: *Homo sapiens* *Streptococcus pneumoniae*

B. Species definition

Group of individuals sharing common physical characteristics which breed with each other, but do not normally interbreed with members of other species

III. Modern Taxonomy

A. Carl Woese (1980s)

Used ribosomal RNA to construct modern cladogram

B. Phylogenetic trees and cladograms

C. 3-domain system

Bacteria → Eubacteria

Archaea → Archaeobacteria

Eukarya → Protista, Fungi, Plantae, Animalia

D. Classification of the human species