Classification

Defintion

Classification (taxonomy): arrangement of organisms into orderly groups based on their similarities

Taxonomists: scientists that identify and name organisms

Early Methods of Taxonomy

Aristotle's System

- Aristotle is believed to be the first taxonomist
- He classified living things first as plants or animals, it looks something like:

Aristotle's system

- Animal
  - Bloodless (Invertebrates)
    - Land
    - Water
    - Air
  - Blodded (Vertebrates)
    - Land
    - Water
    - Air
- Plant
  - Herbs
  - Shrubs
  - Trees

Criticisms of Aristotle's System

- Aristotle's system was good for categorizing, but did not account for evolutionary relationships
- Some organisms did not fit well into this system

John Ray's System

- Was a botanist
- **First person to use Latin** for naming
- The names were very long as specific

Linnaeus's System

- Linnaeus was a Swedish naturalist who lived from 1707–1778
- He broadened Aristotle's System and formalized it into a **scientific system**
- His system also focused on an organism's **structure**
- His system was the **first formal system** of taxonomic organization
- Developed the modern day naming system, the **two-name system** (Genus & species)
- Also known as the **Father of Taxomony**
- Developed **Binomial Nomenclature**, which differed from Aristotle's system

Binomial Nomenclature

- Two-name system, Genus and species
- Uses Latin because it is an old, unchanging language
- Always italicized or underlined
- Genus is capitalized, but not species
- Names are made to a central organization to prevent duplicate names

Classification Groups

> **Def**
>
> **Taxon (taxa)**: a category into which related

- A hierarchy of taxa exists from broadest to most specific

> **Hierarchy of taxonomic taxa**
>
> - Domain
> - Kingdom
> - Phylum
> - Class
> - Order
> - Family
> - Genus
> - Species

> Can be remembered with the phrase:
> **Dumb King Phillip Came Over For Gooseberry Soup!**

Modern Taxonomic Groups help represent

- Homologous Structures
- Embryo development
- Molecular similarity in
  - DNA
  - RNA
  - Amino Acids
  - Proteins

Def

Cladograms: Diagram showing how organisms are related based on shared, derived characteristics such as feathers, hair, or scales

Dichotomous Keying: All characteristics are dichotomous (have two options)
Ex:

- Dark
  - Big
    - Circular
    - Non-circular
  - Small
    - Circular
    - Non-circular
- Light
  - Big
    - Circular
    - Non-circular
  - Small
    - Circular
    - Non-circular

Every division is dichotomous

Taxa

Categories

> - Archaea
>   - Archaebacteria
> - Bacteria
>   - Eubacteria
> - Eukarya
>
> - Protista
> - Fungi
> - Plantae
> - Animalia
>
> ~~a~~
>
> Can be remembered with the phrase:
> **Dumb King Phillip Came Over For Gooseberry Soup!**

Archaea

- No nucleus
- No Membrane bound organelles

Archaebacteria

- Probably the first alive things
- Lives in very harsh environments

Bacteria

- No nucleus
- No Membrane bound organelles

Eubacteria

- May cause disease
- Found in all non-harsh environments
- Important decomposers for the environment
- Commercially used to produce cheese, yoghur, etc.

Eukarya

- Yes nucleus
- Yes Membrane bound organelles

Protista

- Ex:
  - Protozoans

    - Algae
- Mostly Unicellular
- Could be autotrophic or heterotrophic
- Aquatic

Fungi

- Ex:
    - Mushroom
    - Yeasts
- Multicellular except yeast
- Absorptive heterotroph
- Cell walls made of chitin

Plantae

- Multicellular Plants
- Autotrophic
- Absorbs sunlight
- Cell walls made of cellulose

Plantae

- Multicellular Plants
- Autotrophic
- Absorbs sunlight
- Cell walls made of cellulose

Animalia

- Multicellular Animals
- Ingestive heterotrophs
- Feed on plants or animals