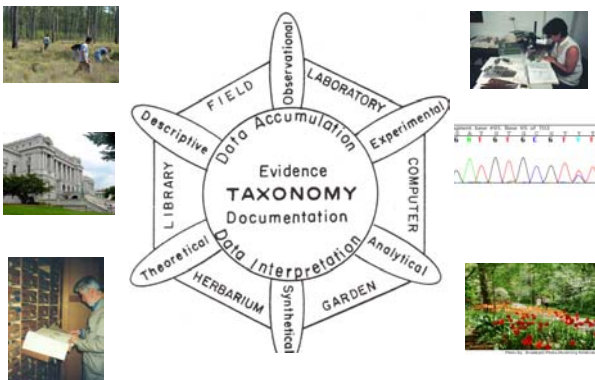


Taxonomy, Systematics & Classification

Taxonomic Evidence



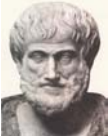
Traditional & Modern Aspects



Taxonomic Hierarchy

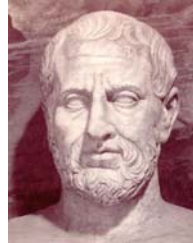
- Domain **Eukarya**
- Kingdom **Plantae**
- Phylum **Magnoliophyta**
- Class **Magnoliopsida**
- Order **Magnoliales**
- Family **Magnoliaceae**
- Genus **Magnolia**
- Species **Magnolia grandiflora**
- Subspecies, Variety, Forma
- **King Phillip Came Over Fearing Green Snakes**

Aristotle: Logical Division



- Espoused essentialism
 - *Scala naturae*
 - Chain of increasing perfection
- BUT used Logical Division
 - Incompatible with essentialism
- Nested Hierarchy
- Monothetic system

Theophrastus: Father of Botany



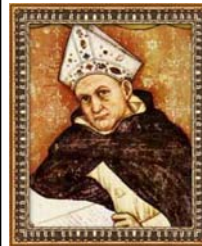
- Student of Aristotle
- *De Historia Plantarum*
- Named c. 500 plants
 - Many names still in use!
- “Form” classification
- *Fundamentum divisionis*

Pliny the Elder & Dioscorides



- Roman & Greek army, respectively
- 1st Century A.D.
- *Historia naturalis* & *Materia medica*, respectively

Albertus Magnus: St. Albert the Great



- c. 11th Century
- Recognized monocots vs. dicots
- 1st hand observations

Herbalists



Leonhard Fuchs

- Doctrine of Signatures
 - Rejected by many
 - God imprinted a signature on plants to tell us how to use them

Carolus Linnaeus: Father of Taxonomy



Binomial Nomenclature

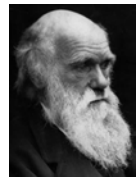
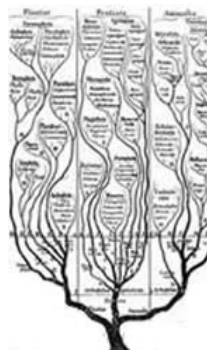
Apium graveolens L.

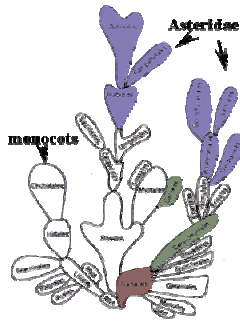
Apium *graveolens* L.

Genus Specific Epithet Authority

Species

Darwin's Tree of Life





PHYLOGENETIC

HABITAT (SEA)

Arthropoda

Mollusca

Mammalia

Aves

Reptalia

Amphibia

Pisces

Invertebrata

Plantae

Phylogenetic tree of the animal kingdom, showing relationships between various groups. The tree is rooted at the bottom left with 'HABITAT (SEA)' and branches out into major groups like 'MOLLUSCS', 'ARTHROPODS', 'MAMMALS', 'BIRDS', 'REPTILES', 'AMPHIBIANS', 'FISH', 'INVERTEBRATES', and 'PLANTS'. Each group is further subdivided into specific species or genera, such as 'Mollusca', 'Arthropoda', 'Mammalia', 'Aves', 'Reptalia', 'Amphibia', 'Pisces', 'Invertebrata', and 'Plantae'. The tree is labeled with 'PHYLOGENETIC' and 'HABITAT (SEA)'.

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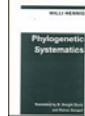
Phylogenetic tree of the plant kingdom showing relationships between major groups and their constituent orders. The tree is rooted at 100% and branches out to show the evolutionary relationships between various plant groups. The groups are color-coded: green for angiosperms, yellow for gymnosperms, and grey for other groups. The tree is divided into several major clades: angiosperms, gymnosperms, and other groups. The angiosperms clade includes orders like Ceratophyllales, Laurales, Magnoliales, Piperales, Acorales, Alismatales, Asparagales, Dioscoreales, Ranunculales, Liliales, Poales, Rosales, Commelinales, Euphorbiales, Cucurbitales, Proteales, Caryophyllales, Santalales, Saxifragales, Geraniales, Malpighiales, Oxalidales, and Asterales. The gymnosperms clade includes orders like Coniales, Ericales, Caryophyllales, Santalales, Ameliales, Solanales, Aquifoliales, and Apiales. The other groups clade includes orders like Ceratophyllales, Laurales, Magnoliales, Piperales, Acorales, Alismatales, Asparagales, Dioscoreales, Ranunculales, Liliales, Poales, Rosales, Commelinales, Euphorbiales, Cucurbitales, Proteales, Caryophyllales, Santalales, Saxifragales, Geraniales, Malpighiales, Oxalidales, and Asterales.

Cladistics:

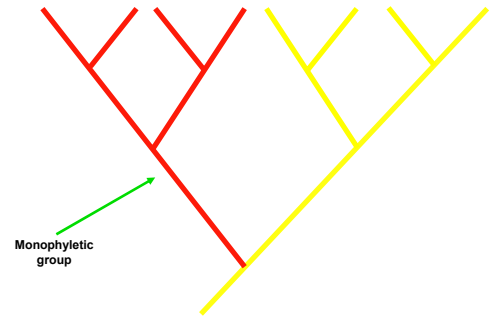
Classification by *shared, derived similarity*



Willi Hennig



Criterion of Monophyly



Paraphyly & Polyphyly

