

BIODIVERSITY I BIOL 1051 TAXONOMY

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Definitions

- **Taxonomy:** Science of biological classification.
 - **Classification:**
 - « Natural »: mutual similarities
 - **Phylogenetic:** evolutive relationship.
 - **Nomenclature:**
 - attribution of names to taxonomic groups in accordance with the published rules.
 - **Identification:**
 - **Practical aspect** of taxonomy. Process by which it is determined that a particular isolate belongs to a known taxon.

Main taxonomic ranks

Empire	<i>Eukaryota</i>	<i>Eukaryota</i>	<i>Eukaryota</i>
Kingdom	<i>Alveolata</i>	<i>Opisthokonta</i>	<i>Archaeplastida</i>
Phylum	<i>Ciliophora</i>	<i>Basidiomycota</i>	<i>Chlorophyta</i>
Class	<i>Nassophorae</i>	<i>Hymenomycetes</i>	<i>Chlorophyceae</i>
Order	<i>Peniculada</i>	<i>Agaricales</i>	<i>Volvocales</i>
Family		<i>Amanitaceae</i>	<i>Chlamydomonadaceae</i>
Genus	<i>Paramecium</i>	<i>Amanita</i>	<i>Chlamydomonas</i>
Species	<i>Paramecium aurelia</i>	<i>Amanita virosa</i>	<i>Chlamydomonas eugametos</i>

Main taxonomic ranks

- **EMPIRES:**
- **ARCHAEA**
- **BACTERIA**
- **EUKARYA**
- **GENUS**
- **SPECIES**

Criteria for the classification of organisms


- Morphological
- Physiological
- Metabolic
- Ecological
- **Genetic***
- **Molecular***

Main organisms classification systems

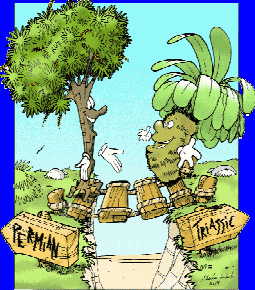
- Two Kingdoms System
- Five Kingdoms System
- Six Kingdoms System
- Eight Kingdoms System
- Universal Phylogenetic Tree (The Tree of LIFE)

Two Kingdoms System

Animalia



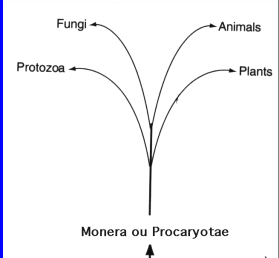
Plantae





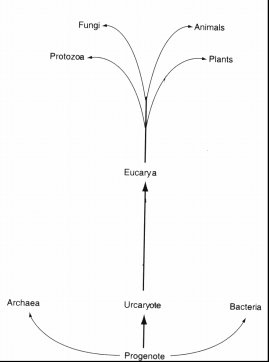
Five Kingdoms System

- CLASSIFICATION CRITERIA
- Mode of Nutrition
- Metabolism
- Mode of Reproduction
- Type of Motility
- Morphology



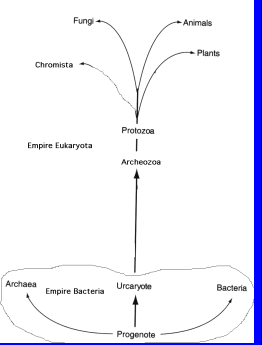
Six Kingdoms System

- *Monera* or *Prokaryotae* were divided into two kingdoms:
- *Eubacteria*
- *Archaea*

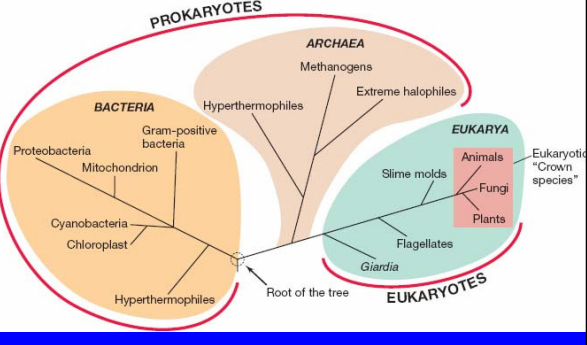


Eight Kingdoms System

- Two Empires and eight Kingdoms.
- **Empire Bacteria:** *Eubacteria* & *Archaea*.
- **Empire Eukaryota:** Six eukaryotic Kingdoms. Two new Kingdoms:
- *Archezoa:* Unicellular eukaryotes (*Giardia*) no Golgi, mitochondria, chloroplasts or peroxysomes.
- *Chromista:* photosynthetic, chloroplasts in the lumen of RER. (Diatoms, Brown algae, Cryptomonads & Oomycetes).

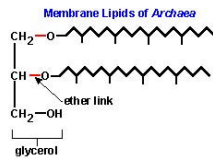
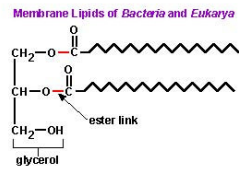


RECENT CLASSIFICATION

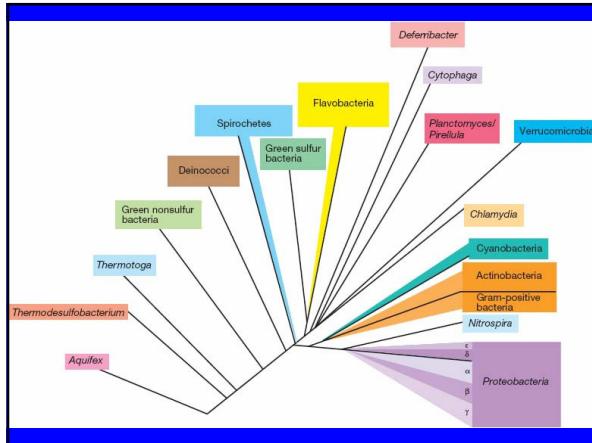


Universal phylogenetic tree

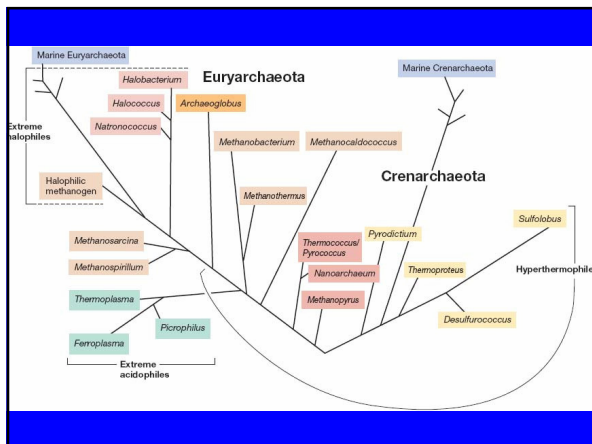
- **Bacteria:**
 - prokaryotes,
 - membrane lipids : diesters of diacyl-glycerol,
 - rRNA :16S.
- **Archaea:**
 - prokaryotes,
 - membrane lipids : tetraethers of diglycerol or diethers of isoprenoid-glycerol,
 - rRNA: 16S.
- **Eukaryota:**
 - eukaryote,
 - membrane lipids : diesters of acyl-glycerol,
 - rRNA: 18S.



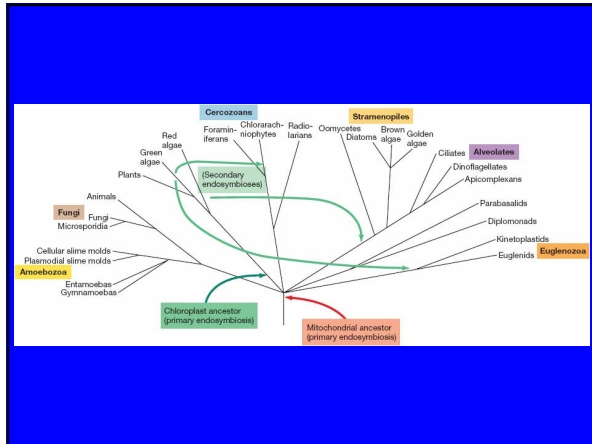
BACTERIA



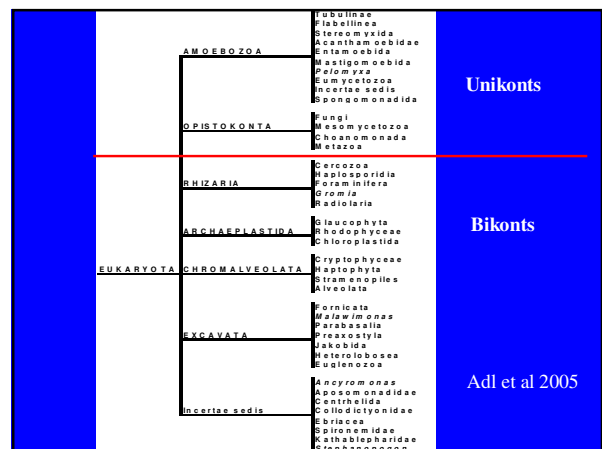
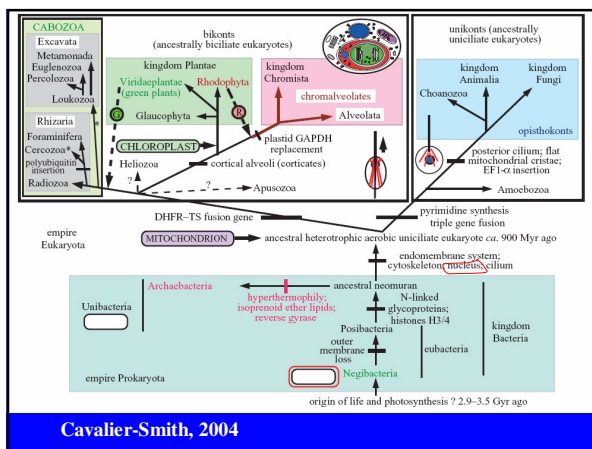
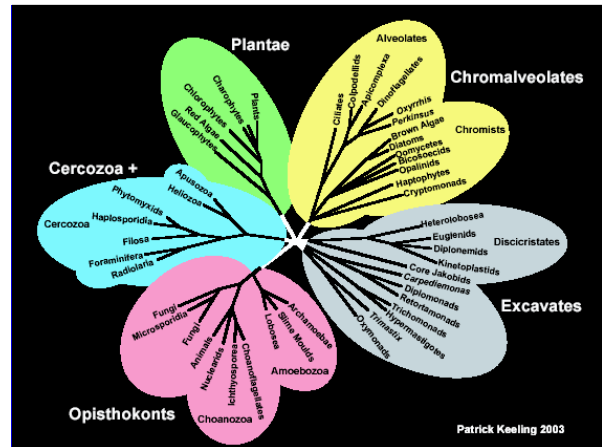
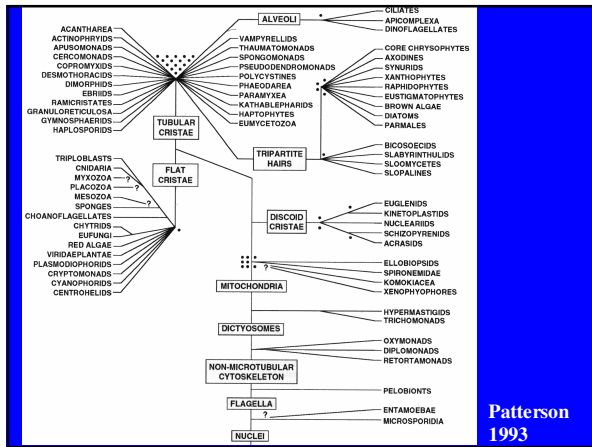
ARCHAEA



EUKARYA



Classification based on the acquisition of organelles



SIX CLUSTERS OF EUKARYOTES

- 1. AMOEBOZOA
- 2. OPISTHOKONTA
- 3. RHIZARIA
- 4. ARCHAEPLASTIDA
- 5. CHROMALVEOLATA
- 6. EXCAVATA

