




Biology I Chapter 14

Classification



Taxonomy is the scientific classification of organisms

- Ancient Greeks had two forms of life:
 - Plants
 - Animals
- Later Fungi was added as a third “Kingdom”

Carolus Linnaeus (1707-1778)

■ Hierarchy of levels of similarity

- ☐ Kingdom
- ☐ Phyla (Divisions)
- ☐ Classes
- ☐ Orders
- ☐ Families
- ☐ Genera (Genus)
- ☐ Species



Grizzly
bear



Black
bear



Giant
panda



Red
fox



Abert
squirrel



Coral
snake



Sea
star



KINGDOM Animalia



PHYLUM Chordata



CLASS Mammalia



ORDER Carnivora



FAMILY Ursidae



GENUS Ursus



SPECIES Ursus arctos



Binomial Nomenclature

- Fancy way of saying “Two Names:
- Every organism is given two names—one for the genus and one for the species
- The first is capitalized, the second is not
- This solves the problem of “Common names” such as dandy lions and cat fish

Italicized, bold, underlined and capitalization signifies name.



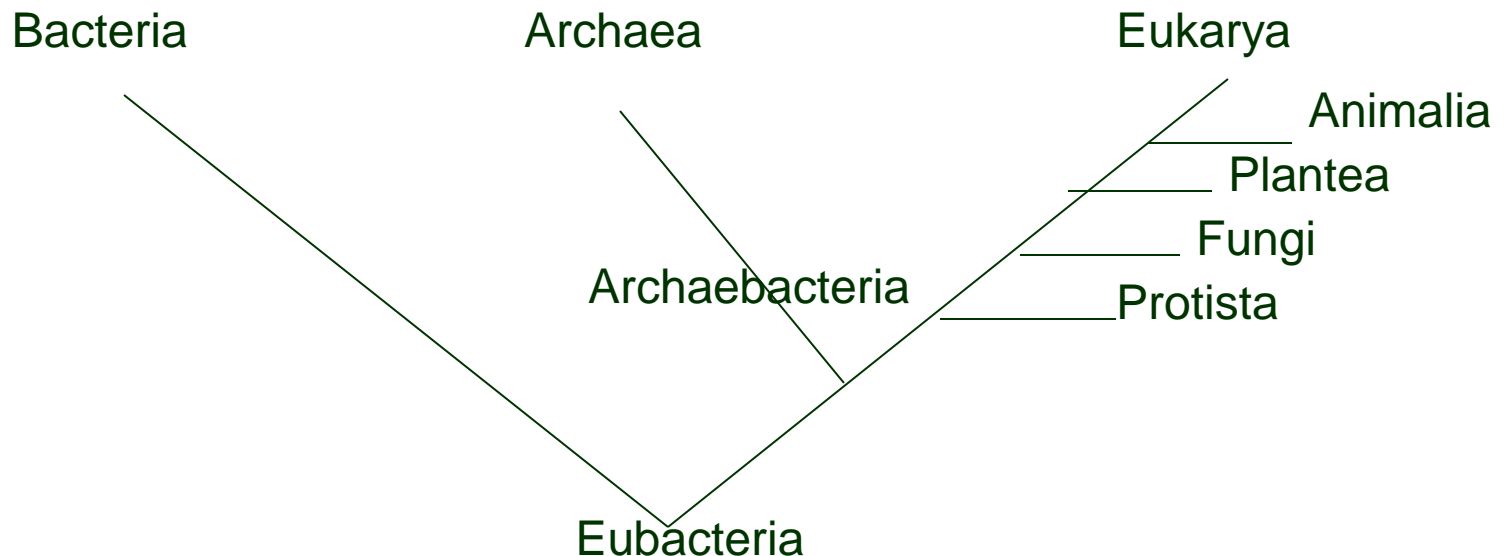
Marmota flaviventris
(Yellow-bellied marmot)



Pan troglodytes
(Chimpanzee),

Three Domain System of Classification

- Domain Archaea
- Domain Bacteria
- Domain Eukarya





6 Kingdom System of Classification

- Archaeobacteria (Monera)
- Eubacteria (Monera)
- Protista
- Fungi
- Plantae
- Animalia



What makes a species?

- A group of genetically similar organisms that can and do reproduce fertile offspring

Examples of things that are not species:

- A bunny and a prairie dog
- A horse and a donkey
- A dog and a wolf







Phylogeny

- The study of the evolutionary history of organisms
- Can be drawn on a diagram called a phylogenetic tree
- Can also be shown on a branching diagram called a cladogram

Cladogram:

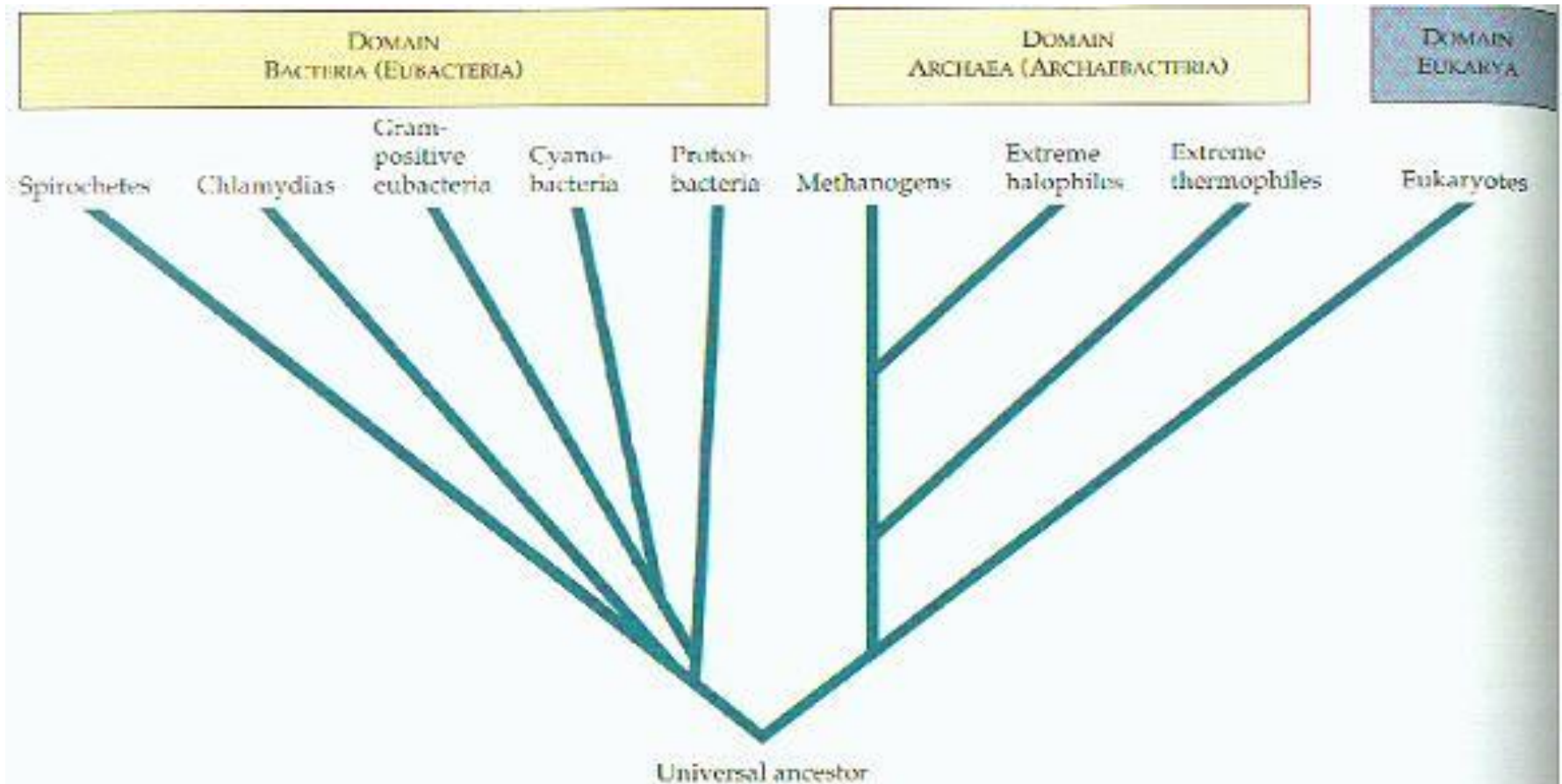


FIGURE 25.10

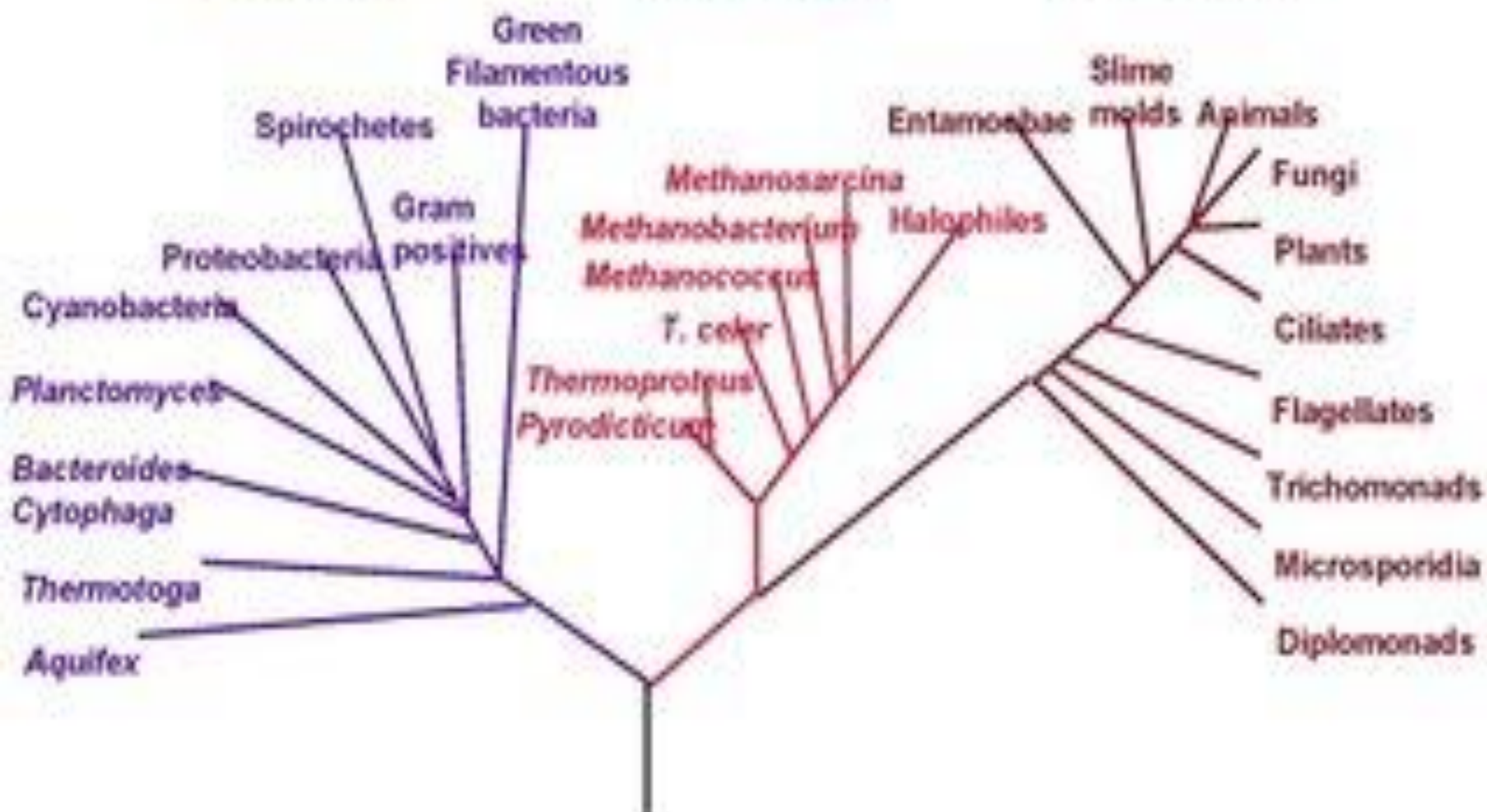
Evolutionary relationships of the prokaryotes: a review. This tentative phylogeny, like all such trees, is a hypothesis about evolutionary history. This particular hypothesis is based mainly on molecular systematics, particularly comparisons of rRNA signature sequences. (Of the approximately twelve eubacterial groups, only those featured in TABLE 25.1 are included in this simplified tree.)

Phylogenetic Tree of Life

Bacteria

Archaea

Eucarya





Systematics

- Systematics is the formal modern study of evolutionary relationships
- Could use for evidence:
 - Fossil record
 - Morphology (Body Shape)
 - Embryology (Patterns of development)
 - Chromosome numbers
 - Macromolecules such as hemoglobin
 - DNA

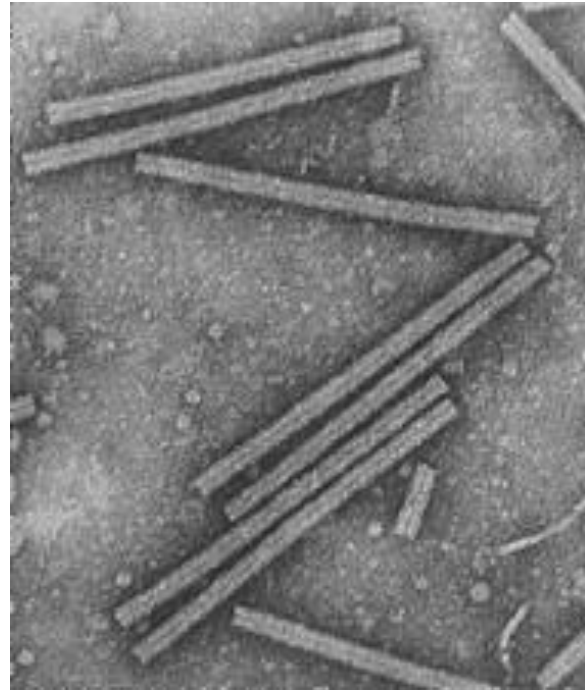
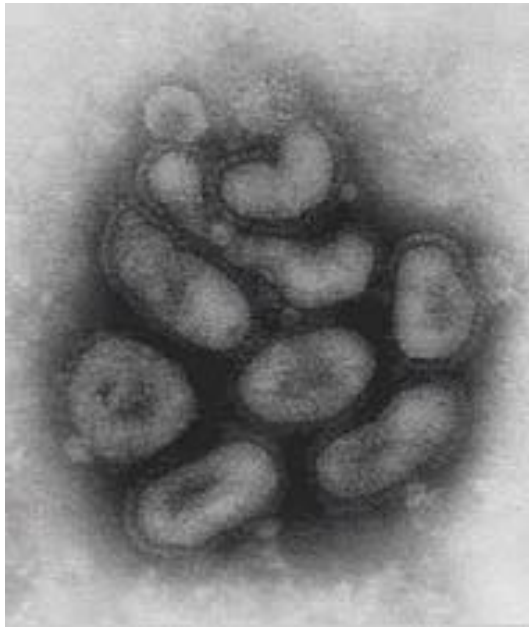



Ways of Differentiating life

- Eukaryotic/Prokaryotic
- Unicellular/multicellular
- Microscopic/Macroscopic
- Autotrophic/Heterotrophic
- Mobile/Sessile

What's Missing?

- Viruses!



- 
- Complete taxonomy key
 - Look at tsunami organisms: