

Lecture #4 – Trunk of the Tree

I. Taxonomy: Science of classification

A. Carolus Linnaeus

1. *Systema Naturae*

a. Father of Biological Nomenclature

2. Nomenclatural Ranks

a. Kingdom, Phylum, Class, Order, Family, Genus, Species

1) Hierarchical, but subjective

2) Fits hierarchical patterns of evolution

3. **Monophyletic** vs. **paraphyletic** groups.

a. Taxonomic groups previously named may be found to be natural or unnatural.

b. Taxonomy predated evolution.

II. Classification of Life

A. Traditional Breakdown of Life

1. Five Kingdoms

a. Plantae

b. Animalia

c. Fungi,

d. Protista

e. Monera

B. Current Views

1. **Bacteria**: true bacteria

2. “**Archaea**”: prokaryotes differing from bacteria in membrane and RNA structure

3. **Eucarya**: all eukaryotes (= Eukarya)

III. Prokaryotic and Eukaryotic Cellular Anatomy

A. **Prokaryotes**

1. No true nucleus

2. Reproduction by binary fission

3. Usually not multicellular

4. Lack of organelles

B. **Eukaryotes**

1. Well-defined nucleus

2. True mitotic division and sexual reproduction

3. Can be multicellular

4. Organelles

C. Origin of Eukaryotic Cellular Life

1. **Endosymbiosis**

Reading: Chapter 5 – pages 88-111

Questions: Page 108 – 1, 8, 9, 10, and 15.