

# Chapter 27-31

## Prokaryotic Diversity

- Prokaryotes dated at 3.5 billion years old
- Modern Prokaryotes are most abundant, lacking sexual reproduction

## Domain Bacteria

- Proteobacteria
  - "true bacteria"
- Cyanobacteria
  - "Blue-Green bacteria"

## Domain Archaea

- Have an "almost" nucleus
- specialized membranes
- surrounded by a cell wall
- old, can live in extreme conditions

## Eukaryotic Diversity (Ch 28)

## Kingdom Protista

- Earliest eukaryotes in fossil record
- most are microscopic and found in moist environments
- DNA many separate groups
- Most artificial category
  - "catch-all" category

# Subgroups

## Algae

- Plant-like organisms
- 10 groups
- autotrophic (self-feeding)
  - most are photosynthetic
  - few ingest food
- cell wall with

## Protozoans

- Animal-like
- mostly netraotrophic (food-eating)

## Slime Molds

- Fungal-like Protist
- Mostly saprothrophic (absorb-feeding)
- mostly multicellular

# Kingdom Fungi (Ch 31)

- Conspicuous portion of the organism in the mushroom/yeast/mold/etc
- Saprothrophic (some are heterotrophic)
- Natures recyclers
- Composed of:
  - Mycelium
    - compacted mass of tubular filaments called hyphae
  - Fruiting body
    - site of spore production
  - Cell wall
    - composed of muramic acid/chitin

# Kingdom Plantae (Ch 29 & 30)

- >330,000 species
- eukaryotic and multicellular
- autotrophic (mostly) self-feeding

- capture sunlight to produce energy by photosynthesis
- Food storage compound
  - starch
- cell wall
  - cellulose
- Are referred to as "land plants"
- fossils dated to ~400mybp (million years before present)
- Ancestor stock
  - probably a group of algae (green)
- Life on land requires special innovation
  - Must be able to get water
  - ROOTS!

## Phyla (divisions)

- 10 phyla
- Typically combine these into 4 broad categories for convenience

## Bryophytes

- Phylum Hepatophyta
  - Liverworts
  - ~6500 species
- Phylum Anthocerophyta
  - Hornworts
  - ~100 species
- Phylum Bryophyta
  - Mosses
  - ~12,000 species

Referred to as "mosses and their friends"

## Characteristics

- Reproduce by spores (not seeds)
- non-vascular plants
  - lack conducting tissues
    - xlem and phloem
- Small plants
- Require external H<sub>2</sub>O for reproduction

## Pteridophytes

- Phylum Lycopodiophyta
  - lychophytes

- 1000 species
- Phylum Pteridophytes
  - Ferns and allies
  - 12,000 species

## Characteristics

- Sporangia
  - Where the spores are produced
- Reproduce by spores
  - no seeds
- vascular plants
  - xylem
    - water and minerals
  - phloem
    - food and solutes
- true roots, stem, and leaves
  - due to being vascular
- vascular allows for larger size
- Require external H<sub>2</sub>O for reproduction

## Gymnosperms

- Phylum Cycadophyta
  - cycads
  - 300 species
- Phylum Ginkophyta
  - Ginko
  - 1 species
- Phylum Gnetophyta
  - gnetophytes
  - 300 species
- Phylum Coniferophytes
  - conifers
  - 500 species

Means "Naked seeds"

Seeds are not enclosed

Biggest group are the conifers  
(Cone bearing trees)

- Oldest
  - Bristle cone pine
    - Over 4600 years
- Biggest

- Giant Sequoia
  - estimated 600 tons
- Tallest
  - Coastal Redwood
  - 180 meters in height

## Characteristics

- Vascular
  - more advanced than Pteridophytes
- Advance seed
  - It has more survival value
  - Contains:
    - Embryo
      - Offspring
    - Stored food
    - Integument
      - Seed coating
- Does not require external H<sub>2</sub>O for reproduction
  - Pollen tubes deliver sperm to egg location

## Angiosperms

- Phylum Anthophyta
  - 300,000 species

## Characteristics

- Enclosed seed
- produces flowers and fruits
- most advanced vascular tissues
- Seeds advanced
  - Enclosed in a vessel (fruit)
    - no survival value
  - Embryo
  - Stored food
  - 2 integuments
    - Seed coats
- Does not require external H<sub>2</sub>O for reproduction
- Flowers
  - Attract pollinators
- Fruit
  - Enclose and protect the seed
  - assist with seed dispersal