

Biological Diversity  
BSCI 10110-1  
MWRF 1:10-2:00  
Dr. Mark Kershner

Week 10

11/5

Overview of Green Plants (Chapter 30)

- if plants had not colonized land, most animals would have remained in the water
- uses
  - clothing, cosmetics, pharmaceuticals
  - photosynthesis, oxygen
  - fossil fuels – peat moss
  - breakfast
- Fig 30.1
  - includes green algae
    - much debate – currently listed as protists
    - likely ancestor to land plants
  - major transitions between phylogenetic branches (major plant groups)

What is a plant?

- autotrophic
  - photosynthesis
    - pigments aid in their efforts
      - chlorophyll a, chlorophyll b
- complex life cycle
- possess cell walls
  - cellulose, polysaccharides
- multicellular
- eukaryotic
- contain chloroplasts, mitochondria
- approximately 2 billion years from prokaryotes to eukaryotes
  - additional 1 billion years for land plants to appear in fossil records
    - from green-alga-like protist
    - approximately 500 million years ago

Green algae (protists)

- chlorophytes
  - unicellular, multicellular (*Ulva* – sea lettuce)
  - desmids
  - freshwater, marine
- charophytes
  - Chara*
  - multicellular, some unicellular
  - most are freshwater
  - closest living relatives of land plants

Land plants

- bryophytes
  - mosses, liverworts, hornworts
  - non-vascular
    - no “internal plumbing” to move water/nutrients around
    - limits their size
- tracheophytes
  - vascularization
  - lycophytes (club mosses)
  - pteridophytes (ferns)
    - lycophytes and pteridophytes
      - lack well developed root systems
      - lack seeds
  - gymnosperms (conifers)
    - “naked” seed
  - angiosperms (flowering plants)
    - gymnosperms and angiosperms
      - seeds

What were some major challenges faced by plants from freshwater to land?

- stressful reproduction
  - self-pollination
  - seeds
    - protected embryos
    - modified for dispersal
  - other modes of pollination
    - insect, bird, wind . . .
- living without primary source of water
  - getting/retaining water
  - water retention structures/reservoir
  - waxy coating – cuticle
  - developed root system
    - water reservoirs
    - tapping into available water sources and transporting it up
  - stomata
    - open and close for gas exchange, water uptake/release
  - protective tissues
    - bark, fibrous tissue (cactus)
- gravity
  - cell wall at cellular level
    - rigidity/structure
  - vascular system help to alleviate effects of gravity on water transport
  - supportive tissues
    - woody tissues