GENERAL BOTANY Lecture 30 - Algae (Part I)

I. General characteristics
- A. Algae - O_2-evolving photosynthesis, contain chlorophyll a, no vascular tissue, usually single-celled reproductive organs, usually aquatic
- B. Very diverse - includes organisms from two kingdoms
- C. "Algae" is an artificial group rather than a truly phylogenetic taxon

II. Kingdom Monera: procaryotic, including bacteria, usually lack cellulose
- A. Class Cyanobacteriae (Class Cyanobacteria (cyano)): blue-green algae, Chl a & phycobilins (give blue-green color)

III. Kingdom Protista: eucaryotic, often single-celled, and often possessing cellulose walls
- A. Phylum Rhodophyta (red algae) - mostly marine - used for agar and food
- B. Phylum Euglenophyta (like euglena - protozoans) - closely related to some protozoans
  1. Mostly unicellular, motile flagellates, fresh water species
  2. Lack a cell wall
  3. Can ingest food; photosynthesis not required
- C. Phylum Chlorophyta (green algae - chlorophyll): photosynthetic pigments similar to that of plants
- D. Phylum Dinophyta (dinoflagellates - pirate ship): work with Bacillariophyceae to make phytoplanktin and also cause "red tides"
  1. Unicellular, flagellated, cellulosic plates under plasma membrane
  2. Some forms luminescent and contribute towards glow of water when disturbed by passing ships
  3. Cause red tides - toxic
- E. Phylum Chromophyta (yellow-green algae, golden-brown algae, diatom and brown algae)
  1. Class Phaeophyceae (brown algae - name sounds like a fart): largest algae - used as food
  2. Class Chrysophyceae (golden-brown algae): in the plankton of bodies of fresh water, have two flagella and photoreceptor
  3. Class Bacillariophyceae (the diatoms - silica)): major components of phytoplankton
     a) Single cells, with silicified walls made of overlapping halves (looks like a petri dish)
     b) Major components of phytoplankton (float round on top of water)
     c) Used for filters, and as an additive to provide bulk and stability (cement and plaster)

IV. Generalized reproduction
- A. Asexual: spore formation - from mitosis (called mitospores)
- B. Sexual: spore formation - from meiosis (called meiospores)
  1. Sporophyte: diploid plant
  2. Meiocytes: cells that undergo meiosis
  3. Gametangia: where gametes are produced
     a) Antheridium: sperm-producing gamete
     b) Oogonium: egg-producing cell
  4. Sexual life cycles - algae have representatives in each
     a) Typical algae & fungi - zygotic (most life is haploid)
     b) Plants - sporic (half of life is haploid)
     c) Animals - gametic (most life is diploid)