# GENERAL BOTANY Lecture 31 - Algae (Part II)

I. Additional characteristics and uses of algae
- A. Generalized structure - thallus (plant body without true roots, stems, or leaves)
- B. Algae account for about 50% of oxygen released into atmosphere by photosynthesis
- C. High levels of N and P cause dense mat of algae
  1. Much oxygen is consumed during respiration - fish die
  2. Red tides synthesize a poison
- D. Blue-green algae fix nitrogen

II. Continuation of survey of algae
- A. Last time
  1. Kingdom Monera: Class Cyanobacteriae (Class Cyanobacteria (cyano))
  2. Kingdom Protista: Phylum Euglenophytya (euglena), Phylum Chromophyta (Class Chrysophyceae and Class Bacillariophyceae (silica)), and Phylum Dinophyta (pirate ship)
- B. This time
  1. Kingdom Protista: Phylum Rhodophyta (red), Phylum Chlorophyta (chlorophyll), Phylum Chromophyta (Class Phaeophyceae (fart))
- C. Phylum Rhodophyta (red algae - red): mostly marine - use agar for food
  1. Eucaryotic, cellulosic walls, complex life cycles
  2. Found at great depths
  3. Used in agar, in baked goods to prevent drying out and running of icing, as an ice cream thickener, and in toothpaste
- D. Phylum Chlorophyta (green algae - chlorophyll): photosynthetic pigments similar to that of plants
  1. Green algae found predominantly in fresh water
  2. Contain chlorophyll a and b, cellulosic walls, and stored starch
  3. Ancestors of higher plants?
  4. Diverse morphology - unicellular, filamentous, colonial, sheetlike
- E. Phylum Chromophyta (Class Phaeophyceae) (brown algae - fart): largest algae, used as food
  1. Brown algae that contain cellulose in cell wall
  2. Largest algae, conducting stuff from above (near sun) to below
  3. Most complex algae
  4. Dominant generation, in some cases, is diploid

III. More on reproduction
- A. Asexual - can be vegetative or by spores
- B. Generalized sexual: gametes ==> diploid zygote ==> meiosis - meiospores ==> gametophyte ==> gametes in gametangia
  1. Isogamy - gametes are identical (what you see is the same)
  2. Anisogamy - gametes are not identical (can "see" the difference)
  3. Oogamy - antheridia produce sperm and oogonia produce egg
- C. Types of life cycles
  1. Algae can show zygotic (Chlorophyta); gametic (Chromophyta / Chrysophyceae) - diatoms); and sporic (Chromophyta / Phaeophyceae)
  2. In zygotic, the zygote is the only diploid cell (example - green algae)
  3. In gametic, meiotic division directly leads to formation of gametes (diatoms)
  4. In sporic, there is alternation between haploid and diploid generations (example - a brown alga - <u>Fucus</u>)
     a) Haploid generation is a bunch of cells, diploid generation is big (conspicuous)
     b) Thallus (diploid) - has cavities called conceptacles
     c) Conceptacles have microsporangia and megasporangia
     d) Meiosis forms haploid microgameteophyte and megagametophyte - these gametophytes are distinct haploid "plants"
     e) They divide some more, reproduce, and release fertilized eggs