

KINGDOM PROTISTA

I. General

- more complex than monerans (bacteria)
- eukaryotic
- grouped according to overall characteristics
 - animal-like, plant-like, and fungus-like

II. PROTOZOANS (Animal-like protists)

- unicellular heterotrophs
- grouped by the way they move or don't move
 - pseudopodia, cilia, or flagella
- Groups
 - A. Phylum Rhizopoda (amoebas)
 - move by pseudopodia ("false feet")
 - extensions of the cytoplasm
 - freshwater & marine environments
 - Foraminifera = amoebas with shells of calcium carbonate (CaCO₃)
 - Radiolaria = amoebas with shells of silica
 - Reproduction:
 - Asexual
 - If conditions are not good- form a cyst
 - Amoebic dysentery (severe watery diarrhea= extreme dehydration) is caused by a cyst-forming amoeba
 - B. Phylum Zoomastigina (Flagellates)
 - move by flagella (whip-like tail)
 - mostly parasites that cause disease in animals
 - some mutualistic = live in guts of termites
 - digest cellulose in wood which helps both the protist and the termite
 - C. Phylum Ciliophora (ciliates)
 - move by synchronized (at the same time) beating of cilia (hair-like structures)
 - Paramecium Structures
 - Anal pore – waste removal
 - Cilia - movement
 - Micronucleus – sexual reproduction
 - Macronucleus – everyday functions
 - Contractile vacuole – eliminates excess water
 - Oral groove – sweep food into the gullet
 - Gullet – digestive enzymes break down food
 - reproduction
 - asexual-division

- sexual-conjugation
- D. Phylum Sporozoa (sporozoans)
- parasitic, non-motile
 - reproduction – spores
 - Examples
 - *Plasmodium* – spread by the Anopheles mosquito; causes malaria
 - *Trypanosoma* – spread by the Tsetse fly; causes African sleeping sickness
 - *Giardia lamblia* – spread by contaminated drinking water; causes explosive diarrhea

III. ALGAE: Plant-like protists

- What are algae?
 - Photosynthetic protists (autotrophs!)
 - Range in size: single-celled to large, multi-celled
 - No roots, stems, or leaves
 - Classified by pigments
 - Base of food chain; major source of world's:
 - Nutrients
 - Oxygen (produces about 75% of O₂ for Earth)
- Phyla of algae
 - A. Euglenophyta (Euglenoids)
 - Unicellular; aquatic
 - Plant-like; have chlorophyll
 - Animal-like; move and can consume food if there's no light available
 - B. Bacillariophyta (Diatoms)
 - unicellular; aquatic
 - grouped by shape:
 - radial symmetry (no distinct left or right- like a starfish)
 - bilateral symmetry (distinct right and left halves – like a human)
 - shells
 - made of silica
 - 2 halves fit together like a box
 - very intricate decorations (swirls & grooves)
 - Reproduction
 - Asexual –
 - Each half produces a new half
 - When they reach ¼ original size, sexual reproduction takes place
 - Sexual-
 - Gametes (sex cells) are produced

- Fuse with another to form a zygote (diploid cell)
 - Zygote grows to full-sized diatom
 - Pigments-
 - Chlorophyll plus carotenoids – makes them golden/yellow colored
 - Some ocean sediments contain huge quantities of diatom shells – used for polishes and added to highway paint
- C. Dinoflagellates (spinning algae) = Phylum Pyrrophyta
- unicellular; aquatic
 - cell walls = thick cellulose plates
 - resemble helmets/suits of armor
 - move by two flagella that spin in grooves
 - important example! = red tide
 - huge quantities of algae produce toxin that kills fish and contaminates shellfish – can make people who eat them very sick
- D. Phylum Rhodophyta (Red Algae)
- multicellular; marine
 - adaptations:
 - attach to rocks by holdfasts (look like roots, but aren't)
 - red pigment (phycoerythrin) allows them to grow very deep in the oceans
- E. Phylum Phaeophyta (Brown Algae)
- Multicellular; marine
 - Have brown pigment (fucoxanthin)
 - Important example! = kelp
 - Body is called “Thallus” – simple plant without roots, stems or leaves
 - Can be very long (60 meters! = 180 ft.)
 - Consists of holdfasts, stipe, and blade; also air bladders to hold large body up toward light
 - Form underwater forests
 - Example = Sargasso
 - Forms extensive masses that cover the Sargasso Sea in the Atlantic
- F. Phylum Chlorophyta (green algae)
- Multicellular
 - Most diverse phylum
 - Habitats include:
 - Freshwater
 - Soil
 - Snow
 - Sloth fur!

- Some form colonies (groups of cells that live together in close association)
 - Example: *Volvox*

F. Reproduction of Algae

- Asexual = fragmentation
 - Breaks into pieces and each piece grows into a full algae
- Alternating Generations
 - Haploid generation = gametophyte
 - Makes gametes
 - Diploid generation = sporophyte
 - Makes the genetically unique diploid generation

IV. Fungus-like protists

- have characteristics of both plant-like and animal-like protists

A. Slime Molds

- 2 Phyla
 - Myxomycota = acellular
 - Acrasiomycota = cellular
- At some point in their life cycle, they are amoeba-like, have flagella and produce spores
- Live in cool, shady areas
- Grow on damp, organic matter (like decaying leaves)

B. Mildew and Water Molds

- Phylum Oomycota
- Some are plant parasites; others feed on dead organisms
- Some are parasites on live fish & fish eggs
- Generally live in water and have cell walls made of cellulose
- Responsible for economically disastrous diseases in plants
 - Irish Potato Famine was caused by a member of this group... killed 1.5 million people in the 1840's!!!