Kingdom Protista

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Kingdom Protista

General Characteristics

Animal-Like Protists

Plant-Like Protists

Fungus-Like Protists
Protozoa - Greek name meaning “first animal”

- Eukaryotic - membrane bound organelles and a true nucleus
- Most unicellular
- Some autotrophic, some heterotrophic, some can switch between both types depending upon environmental conditions
Animal-Like Protists

The Protozoans

- unicellular
- most are motile - living in aquatic environments
- heterotrophic – food broken down in food vacuoles
- reproduce by binary or multiple fission or conjugation
- adaptations to survive in a variety of environments
  - Eyespot
  - Cyst
  - Contractile Vacuole
Animal-Like Protists

Rhizopods
- move by pseudopodia (cytoplasmic streaming)
- engulf food with pseudopodia
- some have mineral skeletons (tests)

Examples
- Amoeba
- Foraminifera (make up chalk)
- Radiolarians

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Animal-Like Protists

Ciliates

- move by beating cilia
- food is swept into cell’s gullet by cilia
- the most complex protozoans
  - require two or more nuclei

Example

- *Paramecium*
Animal-Like Protists

Flagellates
• move by beating flagella
• most live within other organisms

Examples
• parasitic - *Trypanosoma* - African Sleeping Sickness
• mutualistic - *Trichonympha* - termite digestion
Animal-Like Protists

Sporozoans
• do not move physically
• spores form for reproduction
  • spores move from host to host (parasitic)

Example
• *Plasmodium* - causes malaria - host mosquito
Plant-Like Protists

Plant-like Protists

- mostly autotrophic
- live in soil, on the bark of trees, in fresh water, and in salt water
- produce most of the atmospheric oxygen
- form the base of aquatic food chains
- reproduce asexually and sexually
- unicellular, multicellular, or live in colonies
Euglenoids

• unicellular
• contain plant and animal characteristics
  • plant characteristics
    • contain chloroplasts
    • usually autotrophic, may lose chloroplasts and become heterotrophic
  • animal characteristics
    • movement by flagella
    • no cell wall
**Dinoflagellates**

- (usually) unicellular
- flagellated
- photosynthetic protists
- transverse flagellum and longitudinal flagellum. This imparts a distinctive spiral to their swimming motion.
- a dinokaryotic nucleus (as opposed to eukaryotic or prokaryotic). The cell wall of many dinoflagellates is divided into plates of cellulose.
- heterotrophic and autotrophic (photosynthetic)
Plant-Like Protists

Algae

- most unicellular, some multicellular or in colonies
- important source of food and oxygen
- classified by color and structure
  - diatoms (*Bacillariophyta*)
  - golden algae (*Chrysophyta*)
  - green algae (*Chlorophyta*)
  - brown algae (*Phaeophyta*)
  - red algae (*Rhodophyta*)
Plant-Like Protists

**Bacillariophyta**
- unicellular, containing two shells called valves
- yellow-green to golden-brown
- dead organisms used as abrasives, reflectives, and filters
- make up much of ocean floor

**Example**
- diatoms
**Golden Algae (Chrysophyta)**

- mostly autotrophic, can form cysts
- most unicellular and flagellated, some filamentous and colonial
- grouped by color or carotenoid pigments and cell structure
- important in petroleum formation

**Example**

- *Synura, Dinobryon*
Plant-Like Protists

**Green Algae (Chlorophyta)**

- unicellular and multicellular
- most freshwater, some live on land
- thought to be ancestors of plants
  - contain the same chlorophyll, and cell walls
  - some have parts that resemble roots, stems, and leaves
  - may have life cycles similar to plants

**Examples**

- *Volvox*, *Chlamydomonas*, *Spirogyra*, *Ulva*

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Plant-Like Protists

Brown Algae (*Phaeophyta*)

- multicellular
- marine, containing fucoxanthin and other pigments
- have parts that resemble roots, stems, and leaves
- some are anchored - *Laminaria* kelp
- some float - “sea weed” - *The Wide Sargasso Sea*
- important source of iodine
  - used as food additives or food

Examples

- *Laminaria, Sargassum*

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Red Algae (*Rhodophyta*)

- multicellular - the most complex algae
- most marine - some live deeper than most algae
- phycobilin and other pigments trap “blue light”
- important for food, agar, cosmetics and food additives

Examples

*Porphyra, Gracilaria*
Fungus-Like Protists

Fungus-like protists

• heterotrophs, they secrete digestive juices and then absorb the organism
• have cell walls
• use spores from fruiting body to reproduce
• unlike fungus, they can move at some points in their life cycle
**Fungus-Like Protists**

*Oomycota* - *Water Molds and Mildews*
- named after large eggs that forms after fertilization
- niche - parasites and some saprophytic forms
- *Chytridiomycota* – now classified as fungi

**Example**

Blue Mold

*Xphytophthora infestans* - cause of potato blight and famine in Ireland
Fungus-Like Protists

Slime Molds

• *Acrasiomycota* - Cellular Slime Molds
  • act like amoebae, can fuse together
  • niche - fresh water, damp soil, rotting vegetation
• *Myxomycota* - Plasmodial Slime Molds
  • act like a large amoeba composed of many nuclei
  • niche - eat bacteria and organic matter, found in wet forest floors

Examples

Pretzel Slime Mold, Dog Vomit Slime Mold

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The End
Ciliates

Paramecium

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Flagellates

Trypanosoma

Trichonympha
Sporozoan

Plasmodium

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Euglenoids

Euglena

Peranema

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Dinoflagellates
Bacillariophyta

Diatoms

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Golden Algae

Synura

Dynobryon
Green Algae

Volvox

Spirogyra

Chlamydomonas

Ulva

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Brown Algae

Laminaria

Sargassum

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Red Algae

Porphyra

Gracilaria

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Water Molds & Mildews

Blue Mold

Powder Mildew

Phytophthora infestans
Slime Molds

Pretzel Slime Mold
*Hemitrichia serpula*
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Dog Vomit Slime Mold
*Fuligo septica*