

Protists

Introduction

- 3 distinct groups of Protists – Plantlike, Animal-like and Fungilike
- There is great diversity between protists, but they do share the following characteristics:
 - ↳ Unicellular (most)
 - ↳ Eukaryotic
 - ↳ Reproduce mostly through binary fission (although life cycles can be quite complex)
 - ↳ Thrive in moist environments

Plantlike Protists

- Contain chlorophyll for photosynthesis
- Organisms are autotrophic during the day (photosynthesis) but some become heterotrophic during the night
 - ↳ Organisms simply engulf solid food (like phagocytosis) and obtain complex nutrients
- They do not have cell walls; they do have a flexible coating called the pellicle
- Most have 2 flagella that are used to propel the organism through water
- Reproduce through longitudinal fission
 - ↳ Similar to binary fission, but since most protists are shaped cylindrically, the organism divides only lengthwise
- Examples:
 - ↳ Euglena
 - Has only 1 flagellum
 - Has an 'eyespot' that is found near the flagellum – acts as a sensory-motor system to direct organism towards light source
 - ↳ Algae
 - Green, brown and red algae
 - Green algae, aka phytoplankton, are photosynthetic
 - Red and brown algae are large and multicellular (aka seaweed)

Animal-like Protists (Protozoa)

- Proto – early, first
- Zoa – animal
- All heterotrophic; obtain nutrients by engulfing their food (bacteria, etc.) or absorbing nutrients through their membrane
- Protozoa are classified based on locomotion:
 - ↳ Amoeboids – constantly extend pockets of cytoplasm (pseudopods) for movement and feeding
 - Example: Amoeba
 - Have two layers of cytoplasm:
 - Ectoplasm – outer, protective layer
 - Endoplasm – inner layer with cell structures
 - Feed through phagocytosis
 - ↳ Flagellates – use whip-like tails
 - Example: Mastigophora
 - ↳ Ciliates – use hair-like cilia to swim
 - Example: Paramecium
 - The most advanced of all protozoa
 - Rudimentary digestive system: oral groove → gullet → food vacuole → anal pore
 - Contain hundred of poisoned barbs for defence
 - ↳ Sporozoans – strictly parasitic
 - Lack any method for locomotion – must rely on host's body fluids for mobility
 - Fewer organelles and specialized structures
 - Can reproduce asexually through spores

Fungilike Protists

- Referred to as slime moulds
- Like cool, shady and moist environments (under rotting leaves or trees)
- Complex life cycle
 - ↳ At times, they resemble protozoans (either amoeboids or flagellates)
 - ↳ At other times, they can produce spores (similar to fungi)
- Also, usually unicellular, but some species can merge together into a true multicellular plasmodial mass
 - ↳ This mass takes on a sluglike form and can creep around for food
 - ↳ Movement may be slow (2 – 3mm per day), but it is coordinated (can move around obstacle)

Importance

- Cause some of the most serious diseases
- Major nutritional foundation for almost all aquatic ecosystems (phytoplankton)
 - ↳ As well, heterotrophic protists (zooplankton) are the sole source of food for filter-feeding (baleen) whales

Termites cannot digest wood without a specific protist in its digestive tract