

Kingdom Fungi

General Features

- Cell Structure comprised of threadlike hyphae that form a mycelium
- Non-photosynthetic
- Cell walls of cellulose or chitin
- Heterotrophic
 - Saprobes
 - Parasites
- Important Decomposers in the Environment
- Classification based on Sexual Reproduction Methods

Phyla

Motile spores or gametes

- **Chytridiomycota**

Non-motile spores or gametes

- **Zygomycota**
- **Glomeromycota**
- **Ascomycota**
- **Basidiomycota**

Plus

- **Deuteromycota (non-sexual)**
- **Lichens**

Microsporidia

- Animal Intracellular parasites
- Among smallest eukaryotic organisms
- Infect host via polar tube

Water Molds (Chytridiomycota)

- Non-septate hyphae
- Motile asexual spores (zoöspores)
- Cell walls of chitin
- Microscopic water molds
- Many parasitic forms
- Many unicellular forms

Bread Molds (Zygomycota)

- Non-septate vegetative hyphae
- Vegetative reproduction with Sporangia, producing non motile spores
- Haploid generation usually dominant
- Gametangia (Zygosporangia) produce zygospores
- Examples
 - Bread mold

Arbuscular Endomycorrhizae (Glomeromycota)

- Separated from Zygomycota by genomic differences
- All form endomycorrhizal associations (About 90% of all plants form mycorrhizal associations)
- Form highly branched hyphae called arbuscules (tiny trees) within root cells
- Example
Glomus

Sac Fungi (Ascomycota)

- Septate hyphae with perforated walls
- Vegetative hyphae with one nucleus/cell
- Sexual reproduction in the **ascus**
- Ascogynous hyphae 2 nucleate (**Dikaryon**)
- Dikaryon cell reproduction by crozier formation
- Asexual spores called conidia
- Examples
Powdery mildews
Peziza
yeasts
morels

Club Fungi (Basidiomycota)

- Hyphae septate with perforations
- Most hyphae are dikaryotic
- Sexual reproduction in **Basidia**
- Basidiospores borne on surface of Basidium
- Cell reproduction by clamp connections
- Basidiospores are non-motile
- Some life cycles complex with many stages, hosts and spore types
Example = Wheat rust with aecia, telia and uredia spores
- Examples
Mushrooms
puffballs
smuts
rusts
bracket fungi

Deuteromycota

- All fungi for which no sexual structures have been found
- Includes many soil fungi
Penicillium originally classified here, now suspected to be an Ascomycete, because of conidia formation

Allied Groups of Organisms

Lichens

- Mutualistic group of organisms
- Most often an Ascomycete and Cyanobacterium or green alga
- Classified by shape
 - Crustose
 - Foliose
 - Fruiticose
- Inhabitants of nutrient poor substrates, require harsh conditions for survival
- Example
 - Reindeer moss

Mycorrhizae

- Association of fungi with vascular plant roots, especially roots of Conifers
- Fungus actively absorbs minerals from soil and transfers minerals to roots
- Vascular plant provides carbohydrate for fungus