

KINGDOM FUNGI (MYCOPHYTA)

Crash Course Fungi <https://www.youtube.com/watch?v=m4DUZhnNo4s>

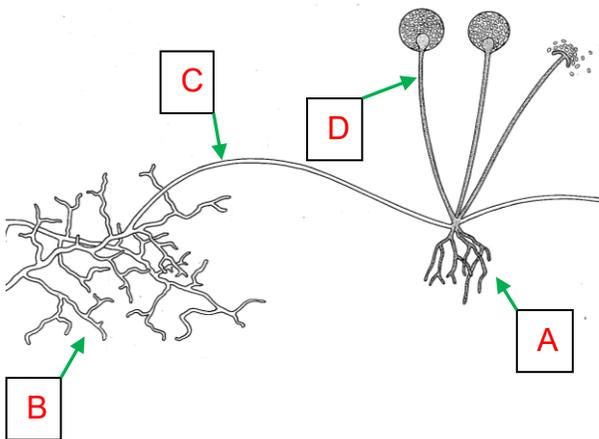
- **Mycology** = the study of fungi
- fossil record dates to 900 million years ago
- at one time classified in the Plantae Kingdom
- Recent molecular evidence suggests that fungi are probably more closely related to animals than either protists or plants!!!

- GENERAL CHARACTERISTICS:

- 1) **eukaryotic**
- 2) most are **multicellular** and macroscopic
- 3) **sessile**, most are terrestrial
- 4) have cell walls composed of "**chitin**" (a carbohydrate)
- 5) lack chlorophyll = **Heterotrophs**
- 6) require warmth, moisture and oxygen for growth; prefer darkness

- STRUCTURE:

- made up of thread-like filaments called "**hyphae**" that may be divided into cells by cross-walls called **septa**



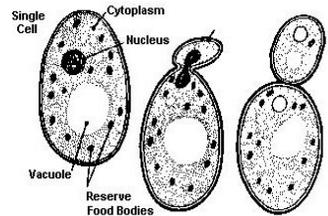
- A) **rhizoids**: descending hyphae : **anchor** the fungi and **absorb** predigested nutrients
- B) **mycelium**: branching filaments which make up the **fungus body**
- C) **stolons**: filaments which grow **horizontally** on the **surface** of the substrate
- D) **ascending hyphae**: filaments that grow **upwards** ending in reproductive structures (**spore cases**)

- **NUTRITION**:

- A) **Saprophytes**
= break down **material** extracellularly with secreted enzymes
: eg) mushrooms, molds
- B) **Parasites**
= pathogens, living off a **live host**
: eg) athlete's foot, ring worm, Dwarf mistletoe
- C) **Mutualistic**
= some fungi live in mutualistic relationships with another organism, such as a plant or an alga where **both** organisms benefit
: eg) Mycorrhizal fungi colonize the plant's root system drawing nutrients & water from the soil that the roots would not be able to access otherwise.

- **REPRODUCTION**

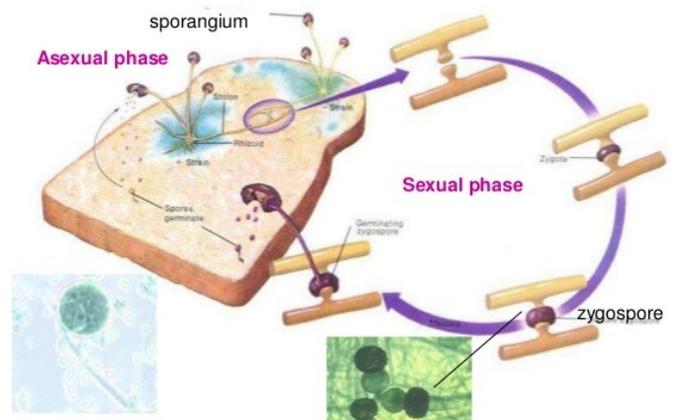
- most fungi are capable of reproducing both asexually and sexually
- Asexual: 1) most fungi producing **spores** on ascending hyphae
- 2) **fragmentation** (breaking) of mycelium
- 3) **budding** (a miniature organism forms as outgrowth of parent)
- Sexual: simple **conjugation** of hyphae from 2 different strains (+,-) unite to produce a structure that will develop a spore case
- fungi are divided into 5 phyla based on **their spore producing structures**



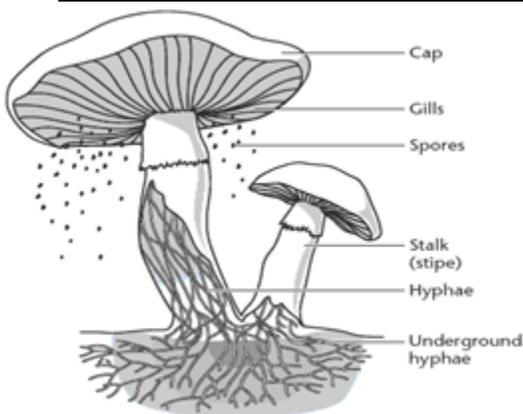
PHYLUM ZYGOMYCETES

- includes black bread mold
- Asexual Reproduction
 - : ascending hyphae called "**sporogiospheres**" produce **sporangiospores** in "**sporangia**"
- Sexual Reproduction
 - : a **zygospore** is produced via meeting of (+,-) hyphae
 - : the zygosporangium develops a sporangia which produces spores having **characteristics** of both fungi strains

Life cycle of *Rhizopus stolonifer*



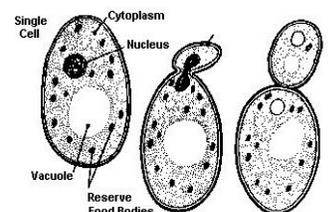
PHYLUM BASIDIOMYCETES (Club Fungi)



- includes mushrooms, puffballs, bracket fungi, rusts, smuts
- 4 spores called **basidiospores** are produced sexually on the surface of club-like structures called "**basidia**"
- basidia are located within the **gills** of the cap of the mushroom

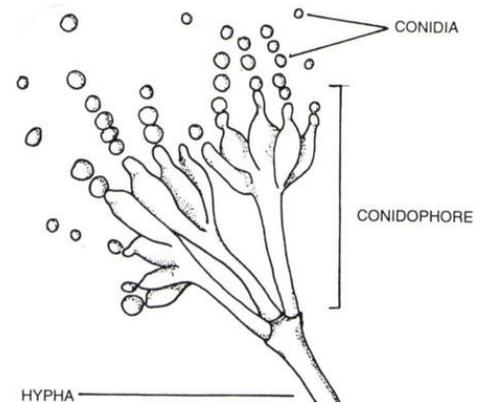
PHYLUM ASCOMYCETES (Sac Fungi)

- includes yeast, morels, mildews, Dutch elm disease
- produce **ascospores** in sac-like structures called "**ascus**" through sexual reproduction
- yeast commonly produce spores asexually by **budding**



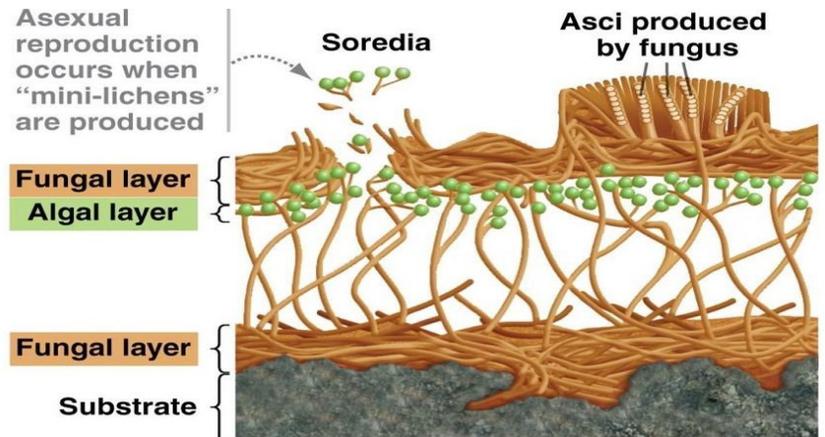
PHYLUM DEUTEROMYCETES (Imperfect Fungi)

- includes penicillin, athlete's foot, etc.
- reproduce asexually; no known method of sexual reproduction = **imperfect**
 - : will be reclassified if / when method of sexual reproduction identified



PHYLUM MYCOPHYCOPHYTA (Lichens)

- includes Reindeer moss
- are really 2 organisms in one (fungi and algae or cyanobacteria) = **Symbiosis**
 - : fungal hyphae provides the algae with **protection, H₂O & CO₂**
 - : algae provides the fungus with **food** produced through photosynthesis
- tend to reproduce by **fragmentation** but placed in the Fungi Kingdom because it may produce "**acospores**"



- good things about fungi:
 - 1) decomposers
 - 2) production of antibiotics (penicillin)
 - 3) food source; food production (mushrooms, bread, cheese)
 - 4) production of goods (leather, linen)
 - 5) monitor air quality (lichens)
- bad things about fungi:
 - 1) can cause diseases (athlete's foot, ring worm, rust, Dutch elm disease)
 - 2) destroy food
 - 3) some are poisonous