

Phylum: Chytridiomycota

- 'Chytrids' are considered the **earliest branch of the true fungi** (Eumycota)
- Cell walls contain **chitin and glucan**
- Only true fungi that produce **motile, flagellated zoospores**
 1. Usually **single, posterior whiplash** type
 2. Some rumen species have **multiple flagella**
- **Zoospore ultrastructure is taxonomically important** within this phylum
- Commonly found in **soils or aquatic** environments,
- chytrids have a significant role in **degrading organics**
- Exhibit many of the same thallus structure types and arrangements as hyphochytrids (e.g., **eucarpic; rhizoidal; endobiotic; etc.**)
- A few are **obligate intracellular parasites** of plants, algae, and small animals (e.g., frogs)
- Very few economically important species (***Synchytrium endobioticum*** causes **potato wart disease**)
- More important (and fascinating) as **biological models** (e.g., *Allomyces*)
- Isolation of chytrids is not easy
 1. Requires **'baiting' techniques**
 2. Appears to be **species-substrate specificity**/ preference presumably due to specific receptor molecules on the zoospore surface membrane

Five orders within the chytrids, based largely on zoospore ultrastructure

1. Chytridiales
2. Spizellomycetales
3. Blastocladales
4. Monoblepharidales
5. Neocallimastigales

Chytridiales and Spizellomycetales

- Similar to one another
- Spizellomycetales live in soil
- Chytridiales live in aquatic environments
- These Orders do not produce hyphae
- Unique to the chytrids, Spizellomycetales zoospores exhibit amoeboid movement

Blastocladales

- Produces true hyphae and narrow rhizoids
- Some species (e.g., *Allomyces*) exhibit alternation of generations (i.e., rotating from haploid and diploid phases)
 1. Haploid thalli of *Allomyces* produce gametes in specialized gametangia
 2. Diploid thalli of *Allomyces* produce flagellated zoospores and resting sporangia
 3. *Allomyces* also exhibits anisogamy - two different sizes of gametes (small, highly mobile ['male'] and larger, less mobile ['female'])

Monoblepharidales

- Unique among the true fungi for its means of sexual reproduction via oogamy
- Not of economic importance
- Obligate anaerobes

Neocallimastigales

- No mitochondria, but instead produce energy via a hydrogenosome (Hydrogenosomes, membrane-bounded organelles that compartmentalize the terminal reactions of cellular energy metabolism, were first described in the parabasalid flagellate *Tritrichomonas foetus* (Protozoan) as subcellular compartments that produce hydrogen and ATP (adenosine triphosphate).
- Often found in animal rumens; highly cellulolytic
- Multiflagellated zoospores