

Fungal Diversity: The “fungus amongus” is plentiful!

- ❑ More than 100,000 species of fungi are known and mycologists (people who study fungus for a living) estimate that there are actually about 1.5 million species worldwide.
- ❑ Molecular analyses supports the division of the fungi into four phyla.

Phylum Chytridiomycota:

A flagellated stage indicates a phylogenetic link between protists and fungi

- ❑ The **chytrids** are mainly aquatic.
- ❑ Some are saprobes, while others parasitize protists, plants, and animals.
- ❑ Recent molecular evidence supports the hypothesis that chytrids are *the most primitive fungi*.
- ❑ Like other fungi, chytrids use an absorptive mode of nutrition and have chitinous cell walls.
- ❑ While there are a few unicellular chytrids, most form coenocytic hyphae.
- ❑ Chytrids are the *only* fungi with a *flagellated stage*.

Phylum Zygomycota:

This phylum includes the common black bread mold

- ❑ Most of the 600 zygomycetes, or **zygote fungi**, are terrestrial, living in soil or on decaying plant and animal material.
- ❑ One zygomycete group of major importance form **mycorrhizae**, which are mutualistic associations with the roots of plants.
- ❑ Zygomycete hyphae are coenocytic, with septa found only in reproductive structures.
- ❑ *Rhizopus stolonifer*, also known as black bread mold, is an example of a common zygomycete.
- ❑ The zygomycete *Rhizopus* can reproduce either asexually or sexually, and during sexual reproduction, produces a resistant structure called a zygosporangium (*take a look at pg. 621 in your text on the life cycle of the zygomycete Rhizopus*).
- ❑ These zygosporangium are resistant to freezing and drying.
- ❑ When conditions improve, the zygosporangia release haploid spores that colonize new environments.
 - Some zygomycetes, such as *Pilobolus*, can actually aim their spores.

Phylum Ascomycota:

Fungi in this phylum produce sexual spores in saclike asci

- ❑ Mycologists have described over 60,000 species of ascomycetes, or **sac fungi**.
- ❑ They range in size and complexity from unicellular yeasts to elaborate cup fungi and morels.
- ❑ Ascomycetes live in a variety of marine, freshwater, and terrestrial habitats.
 - Some are devastating plant pathogens.
 - Many are important saprobes, particularly of plant material.
 - About half the ascomycete species live with algae in mutualistic associations called lichens.
 - Some ascomycetes form mycorrhizae with plants or live between mesophyll cells in leaves where they may help protect the plant tissue from insects by releasing toxins.
- ❑ The defining feature of the Ascomycota is the production of sexual spores in saclike **asci** (*take a look at pg. 623 in your text*).
 - In many species, the spore-forming asci are collected into macroscopic fruiting bodies, called the **ascocarp**.
 - Examples of ascocarps include the edible parts of truffles and morels.

Phylum Basidiomycota

- ❑ Approximately 25,000 fungi, including mushrooms, shelf fungi, puffballs, and rusts, are classified in the phylum Basidiomycota.
- ❑ The name of the phylum is derived from the **basidium**, latin for “little pedestal”, which is a transient diploid stage of this type of fungi (*take a look at pg. 625 in your text*).
 - The clublike shape of the basidium is responsible for the common name **club fungus**.
- ❑ Basidiomycetes are important decomposers of wood and other plant materials.
 - Of all fungi, these are the best at decomposing the complex polymer lignin, which is abundant in wood.
- ❑ Two groups of basidiomycetes, the rusts and smuts, include particularly destructive plant parasites.
- ❑ The four fungal phyla can be distinguished by their reproductive features.