

FUNGI – what *are* these doing in a ‘botany’ class anyway?

Some objectives for this lab:

1. Define the Kingdom Fungi and its phyla.
2. Recognize and classify correctly any of the more common members of the Kingdom.
3. Recognize and name correctly the major structures in the representatives of the various phyla studied in lab.
4. Oh yeah – life cycles too!

CLASSIFICATION AND DEFINING CHARACTERISTICS

Fungi (opisthokonta, along with Animalia...)

Heterotrophs which feed primarily by absorption of nutrients following extracellular digestion of food in the environment. All produce walled spores in great numbers.

Phylum Zygomycota

Terrestrial fungi with non-septate mycelia. The sexual spore is a zygospore.

Phylum Ascomycota

True fungi with septate mycelia and in which the sexual spore is an ascospore.

Phylum Basidiomycota

True fungi with septate mycelia and in which the sexual spore is basidiospore.

Phylum Deuteromycota

True fungi in which no sexual stage has been found and therefore they cannot be classified in any of the other established phyla.

OBSERVATIONS ON ZYGOMYCOTA

1. Observe the living *Rhizopus* sp. (Bread Mold) as it grows on the nutrient medium or food. Note the fluffy white **mycelium** and the tiny black or brown dots that are mature **sporangia**.
2. Study *Rhizopus* under the dissecting microscope and note the **stolons** that loop over the surface, the **sporangiophores** that bear the **sporangia**. Note that immature sporangia are white and as the sporangiospores mature they become darker.
3. Study prepared slides of *Rhizopus* and note the **sporangia**. Also note the sexual stages in the formation and fusion of two equal **gametangia** each of which contains a gamete. Note the zygote and the heavy walled, spiny **zygospore**. Are the hyphae septate or non-septate?

OBSERVATIONS ON ASCOMYCOTA

1. Make a wet mount of living yeasts. Note the small eucaryotic cells, each with a large **vacuole**, **nucleus** and **storage granules** visible. Note that some are reproducing by

budding (can you see it?).

2. Observe living *Penicillium* or *Aspergillus* growing on the agar in a petri plate. Note that each colony has a fluffy white mycelium which is covered in the central part by grey-green dust of conidia (conidium) or conidiospores. You may want to look at this under the dissecting microscope.
3. Study prepared slides of *Penicillium* showing **conidia** formation.
4. Study a prepared slide of a cross section of *Peziza* showing **asci** and **ascospores**.

OBSERVATIONS ON BASIDIOMYCOTA

1. Select a mushroom which is a fruiting structure produced by a large underground mycelium and note the **stipe** or stalk, the **pileus** or cap, the **gills** in the pileus and the annulus which is a ring of tissue on the stipe.
2. Study a prepared slide of a section through the cap of *Coprinus*. Note the gills made up of hyphae which have been cut through. Note the surface of each gill is covered with small cells arranged like pile on a carpet. Each of these is a **basidium**. Each basidium produces four **basidiospores** which are large, somewhat spiny, dark structures falling from the surface of the gills.

OBSERVATIONS ON LICHENS

1. Lichens are combinations of algae and fungi. Observe the lichens and note color and shape differences.
2. Observe slides showing this symbiotic relationship. Note the **hyphae**, **ascocarp** with **asci** and the **one celled algae**.