

GENERAL BOTANY Lecture 28 - Lower Fungi

- I. Characteristics of the "(lower) fungi"
- A. **IMPORTANCE:** decomposition, disease, symbiotic relationships
 - B. Heterotrophic, eukaryotic, lack photosynthesis, reproduce by spores
- II. Flowering plants vs. "fungi"
- A. Flowering plants (SPOROPHYTES) produce haploid spores by meiosis - called MEIOSPORES
 - B. "Fungi" (MAIN UNIT IS MYCELIUM: composed of hyphae) have sporangia which produce "SPORES"
 1. Spores from fungi are asexually reproductive structures that can develop into an adult "PLANT" without gametic fusion
- III. Less sophisticated "fungi" that may be considered as members of Kingdom Mycota
 ** NOTE: SOMETIMES THESE ORGANISMS ARE CLASSIFIED IN KINGDOM PROTISTA **
- A. Phylum Dictyosteliomycota
 1. Sometimes referred to as Phylum Myxomycota (slime molds)
 - a) "Animal" characteristics
 - 1) Main unit (chitin wall) is called a plasmodium
 - a)) Shows amoeboid movement
 - b)) Can take in solid food
 - b) Fungus because of spores in sporangia
 - c) Life cycle - amoeba-like w/spores ==> meiosis, spores germinate, live, fuse, and repeat cycle
 - B. Phylum Oomycota
 1. Sometimes referred to as the water molds
 - a) Produce egg cells during sexual reproduction
 - b) Produce swimming flagella
 - c) Vegetative body (mycelium) is cellulose
 - d) Life cycle
 - 1) Asexual: sporangia, spores (zoospores), hypha, mycelium
 - 2) Sexual: hyphae specialize to become oogonia & antheridia, "mate," zygote becomes an oospore
 - e) Examples: *Phytophthora infestans* (potato blight)
- IV. Kingdom Mycota - the REAL FUNGI - never motile, always chitinous walls
 **NOTE: USUALLY CLASSIFIED IN KINGDOM MYCOTA **
 Most fungal bodies composed of filaments called hyphae; many hyphae make mycelium
- A. Phylum Zygomycota (zygote fungi)
 1. Hyphae have no cross walls between nuclei
 2. Reproduce asexually by spores in sporangia or sexually by production of zygospores
 3. Asexual: sporangia on tips of hyphae, haploid spores formed by mitosis
 4. Sexual: hyphae specialized to become "+", "-", zygote becomes a zygospore, zygospore sits around until it is time to undergo meiosis, meiosis produces a new sporangium (on hypha)
 5. Most are saprophytes and attack stored foods
 - B. Phylum Ascomycota (sac fungi) - HIGHER FUNGI BEGIN HERE (BECAUSE OF COMPLEXITY)
 1. Mycelium is divided into cells by cross-walls (septate hyphae)
 2. Each hypha contains one haploid nucleus
 3. Reproduce asexually by conidia or sexually by fusion of haploid hyphae of different strains
 4. Asexual: spores produced mitotically at tips of aerial hyphae (conidiophores) to produce conidia
 5. Sexual: fusion of different hyphae, nuclei pass from one to the other to make an "N + N" (dikaryotic) cell (ascoma), ascogenous hyphae grow and branch and then make asci at tips of hyphae, fusion of nuclei follows meiosis, then mitosis to yield eight haploid ascospores
 6. Examples: powdery mildew, Dutch elm disease, chestnut blight, ergot poisoning, and yeasts (which also do "budding")