

Biology of Fungi
P BIO 310/510 - 03
10-1 TTH 305 Porter

J. Cavender
309 Porter
593-4551, cavender@ohio.edu
11-1 MW
3-5 M-Th
TA - Thomas Jackson
sg277300@ohio.edu

Purpose: To study the biology of fungi as well as the common local mushrooms, microfungi and slime molds; their morphology, classification, ecology, cultivation, techniques for study and interrelationships with plants, animals and humans are covered.

Texts: Magical Mushrooms, Mischievous Molds, Hudler, 1998
Mushrooms of Northeastern North America, Bessette, Bessette and Fischer, 1997

Optional: Audubon Field Guide to North American Mushrooms, Gary Lincoff, 1981, for use in the field and for identification of Myxomycetes as well as mushrooms

Requirements:

- I. Collection and identification of 46 mushrooms and slime molds, 30 gilled mushrooms and boletes (Agaricales) (complete with dried specimens, descriptions and spore prints of the gilled mushrooms and boletes); 10 non-gilled mushrooms (Aphyllorphales, Auriculariales, Tremellales) 5 from coral, tooth, chanterelle, crust, or jelly groups (no spore prints required) and 5 Gasteromycetes from puffball, earthstar, birds nest, stinkhorn, groups; 3 Ascomycetes, from cup, earth tongue, earth club, Cordyceps, Hypomyces and carbon ball groups, 3 Myxomycetes (all with dried specimens and description only). Specimens should be organized by family and placed in a box so that they are easily viewed (e.g. in plastic bags) along with a list of the species, their location and date of collection. A graph of rainfall data and daily minimum-maximum temperature data should also be included. Due October 23.
- II. Photomicrographs of 8 prepared slides, the prints mounted in a notebook along with the host plant leaf for the parasites, with the total magnification, and the structures labeled: 1) rust, 2) powdery mildew, 3) Penicillium or Aspergillus conidiophore, 4) dictyostelid sorocarp, 5) basidiomycete hymenium, 6) ascomycete hymenium, 7) myxomycete capillitium, 8) VA or ecto-mycorrhiza. Due November 13.
- III. Oral report (15 min.) and 6-8 page paper (graduate student 20 min., 10-12 pages) on a particular fungus, fungus group, fungus activity or fungus interrelationship November 6, 13.
- IV. Three (3) hour exams, 2 on identification, morphology, ecology, nutrition and classification of basidiomycetes, ascomycetes and myxomycetes, 1 on life cycles (dictyostelid, myxomycete, ascomycete, basidiomycete, teliomycete [rust]), mycorrhizal relationships and mushroom cultivation.
Grading: Exams - 50%, average of 60 required to pass
Collection - 25%
Oral Report and Paper - 12%
Photomicrographs - 12%
Attendance - Maximum 3 unexcused absences

SCHEDULE

Week 1	Sept. 9	Introduction, The fungi as a major group of organisms, H pp. 3-4, Intro. To Mycology, B, B, & F pp. 1-8. Field Trip - Dow Lake Area or The Ridges.
	11	Fungal diversity, the major groups of fungi, How to identify mushrooms, Handouts, Major groups of mushrooms, B, B & F 9-24. H pp. 147-185, Internet sources. Field Trip - Dow Lake Area.
Week 2	16	Characteristics of mushroom genera: Chanetrelles and gilled mushrooms, B, B & F 27-122, Internet sources. Film: The Rotten World Around Us, Field Trip - Dow Lake Area.
	18	Characteristics of mushroom genera; gilled mushrooms, B, B & F 123-270. Film: The Rotten World Around Us, Field Trip Waterloo Wildlife Area.
Week 3	23	Characteristics of mushroom genera; Boletes, B, B & F 315-372. Field Trip - Waterloo Forest.
	25	Aphylophorales, (Polypores, Toothfungi, Corals, Crust and Parchment fungi) and Jelly fungi, B, B & F 373-444. Field Trip - Enderlin Forest.
Week 4	30	Gasteromycetes: Puffballs, Earthballs, Earthstars, Stinkhorns, B, B & F 445-470, Internet sources. Field Trip - Lake Hope Area.
	Oct. 2	Exam 1 - mushroom identification, classification, morphology and ecology. Field Trip - Rt. 278 Area - Collection of rusts and powdery mildews, H pp. 35-84.
Week 5	7	Ascomycetes: B, B & F 471-532. Field Trip - Hocking Hills Area
	9	Exam 2 - mushroom identification, classification, morphology and ecology, plasmodial slime molds, handouts. Field Trip - Dow Lake Area - Collection of soils for dictyostelids, Isolation of dictyostelids.
Week 6	14	Mutualistic symbionts, H pp. 202-234. Film: Dr. Bonner and the Slime Molds, isolation and study of dictyostelids.
	16	Mutualistic symbionts, Imperfect fungi, Field Trip-air sampling and air quality, H pp. 85-112.
Week 7	21	Fungi as food, mycotoxins, yeasts, H pp. 85-146, Cultivation of fungi, handouts. Film: Shitake Cultivation.
	23	Fungi as food. Field Trip: Mushroom cultivation. Collections due.
Week 8	28	Life Cycles, handouts. Photomicrography: myxomycetes, dictyostelids, rusts, powdery mildews, basidiomycete and ascomycete hymenia, conidiophores of <u>Aspergillus</u> or <u>Penicillium</u> , VA or ecto-mycorrhizae, wood decay, H pp. 186-201.
	30	Life Cycles, photomicrography
Week 9	Nov. 4	Photomicrography, Exam - Life Cycles, mycorrhizae, photomicrography.
	6	Oral reports, photomicrography
Week 10	11	No class.
	13	Oral reports, Photomicrographs due , papers due Nov. 17 at latest.