

Biology of Fungi  
PBIO 310/510 - 00  
10-1 TTH 305 Porter

J. Cavender  
309 Porter  
4551, [Cavender@ohio.edu](mailto:Cavender@ohio.edu)  
11-1 MW Office  
3-5 M-Th  
TA – Sarah Bashore  
[sb332892@ohio.edu](mailto:sb332892@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, strongly recommended.

Requirements:

- I. Collection and identification of 30 gilled mushrooms and boletes (Agaricales) (complete with dried specimens, descriptions and spore prints of the gilled mushrooms and boletes); 10 non-gilled mushrooms (Aphyllophorales, Auriculariales, Tremellales) 5 of these from coral, tooth, chanterelle, crust, or jelly groups; 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 non Agaricales with dried specimens and description only). Fifty one specimens altogether. 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 18.
- II. Photomicrographs of 8 prepared slides, the prints mounted in a notebook along with the host plant leaf for the parasites (rust and powdery mildew), 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 8.
- 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 8, 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 >60 required  
Collection - 25%  
Oral Report and Paper - 12%  
Photomicrographs - 12%  
Attendance - Maximum 3 unexcused absences

## SCHEDULE

Week 1	Sept. 4 6	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. Fungal diversity, the major groups of fungi, Internet sources*, 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	11 13	Characteristics of mushroom genera: Chantrelles and gilled mushrooms, B, B & F 27-122, Internet sources. Film: The Rotten World Around Us, Field Trip - Dow Lake Area. Characteristics of mushroom genera; gilled mushrooms, B, B & F 123-270, Internet sources. Film: The Rotten World Around Us, Field Trip Waterloo Wildlife Area.
Week 3	18 20	Characteristics of mushroom genera; Boletes, B, B & F 315-372, Internet sources. Field Trip - Waterloo Forest. Aphylophorales, (Polypores, Toothfungi, Corals, Crust and Parchment fungi) and jelly fungi, B, B & F 373-444, Internet sources. Field Trip - Enderlin Forest.
Week 4	25 27	Gasteromycetes: Puffballs, Earthballs, Earthstars, Stinkhorns, B, B & F 445-470, Internet sources. Field Trip - Lake Hope Area. 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	Oct. 2 4	Ascomycetes: B, B & F 471-532. Field Trip - Hocking Hills Area Exam 2 - mushroom identification, classification, morphology and ecology. Cellular and plasmodial slime molds, Internet sources, handouts. Field Trip - Dow Lake Area - Collection of soils for dictyostelids, Isolation of dictyostelids.
Week 6	9 11	Mutualistic symbionts, H pp. 202-234. Film: Dr. Bonner and the Slime Molds, isolation and study of dictyostelids. Mutualistic symbionts, isolation and study of mycorrhizae.
Week 7	16 18	Fungi as food, mycotoxins, yeasts, H pp. 85-146, Cultivation of fungi, handouts, Internet sources. Film: Shitake Cultivation. Fungi as food. Field Trip: Mushroom cultivation. Collections due.
Week 8	23 25	Life Cycles, handouts, Internet sources. Photomicrography: myxomycetes, dictyostelids, rusts, powdery mildews, basidiomycete and ascomycete hymenia, conidiophores of Aspergillus or Penicillium, VA or ecto-mycorrhizae, wood decay, H pp. 186-201, Internet sources. Life Cycles, photomicrography
Week 9	Oct. 30 Nov. 1	Exam - Life Cycles, mycorrhizae, photomicrography. Photomicrography
Week 10	5 8	Photomicrography Oral reports, Photomicrographs due
Week 11	13	Oral reports. Papers due.

\*Students will receive a handout of Internet sources for additional information and illustrations.