

Mushroom Identification, Foraging, (and Selling)

MCAFDO 2025

Chelsea Harbach, Ph.D.

Director of Diagnostics, ISU Plant & Insect Diagnostic Clinic

Certified FunGAL

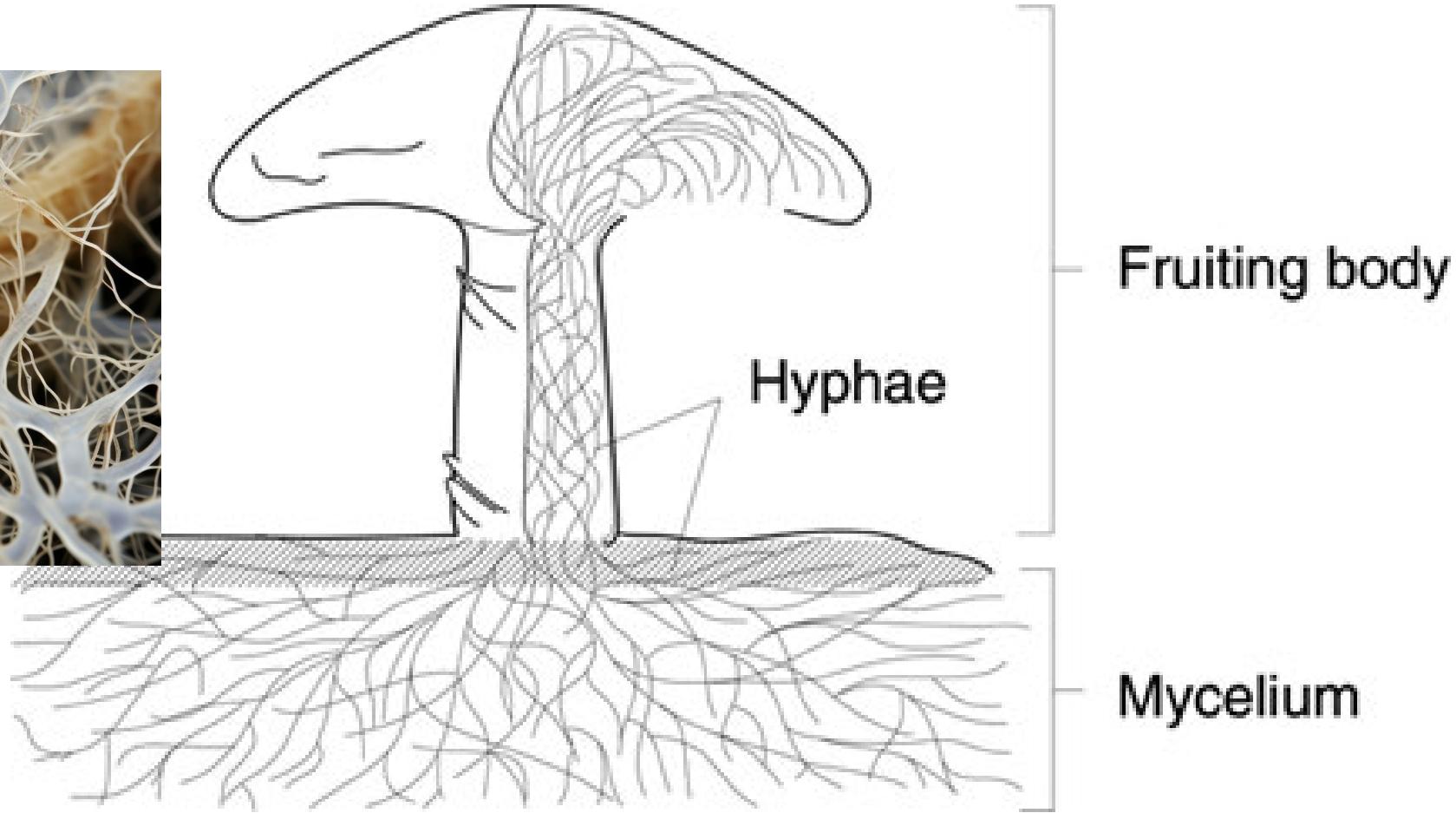


What are Fungi?



Fungi: made of hyphae (filaments)

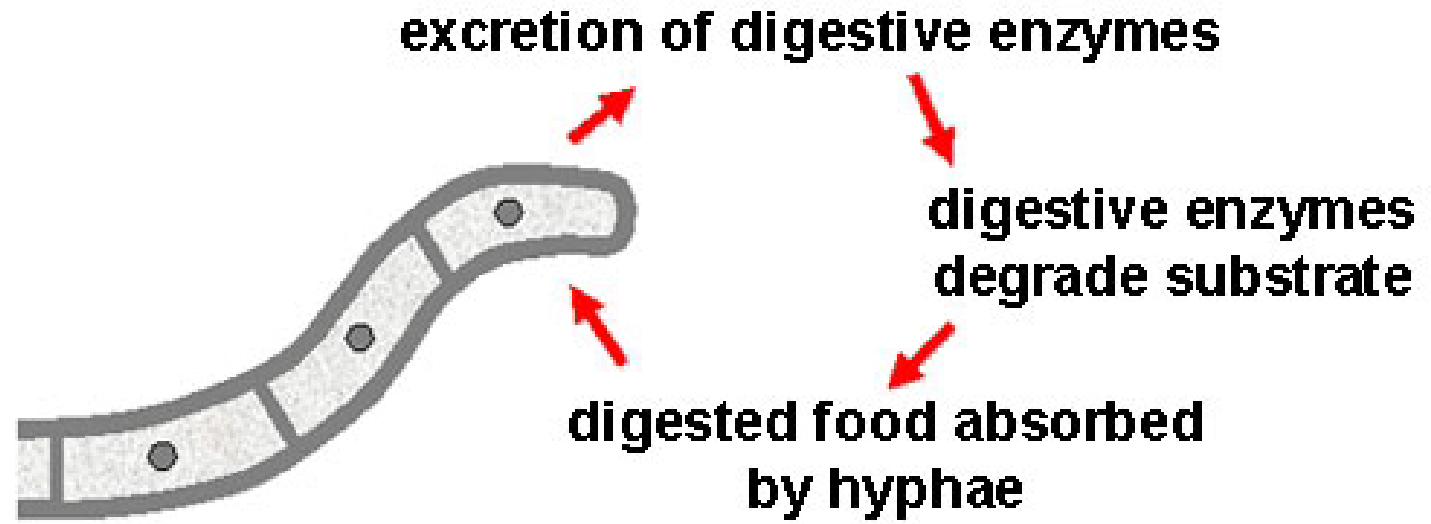
Mycelium = network of hyphae



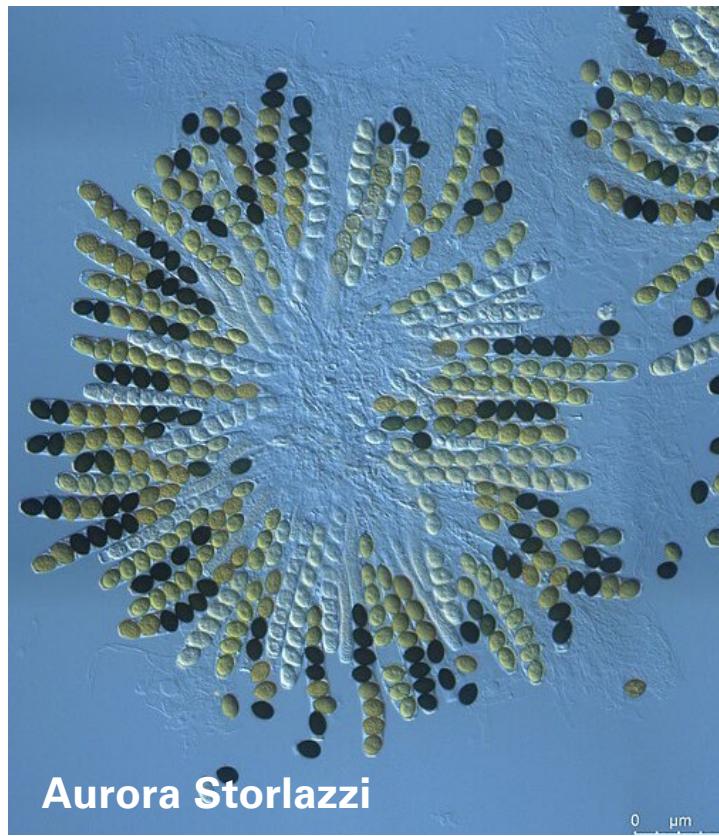
Fungi: can't make their own food



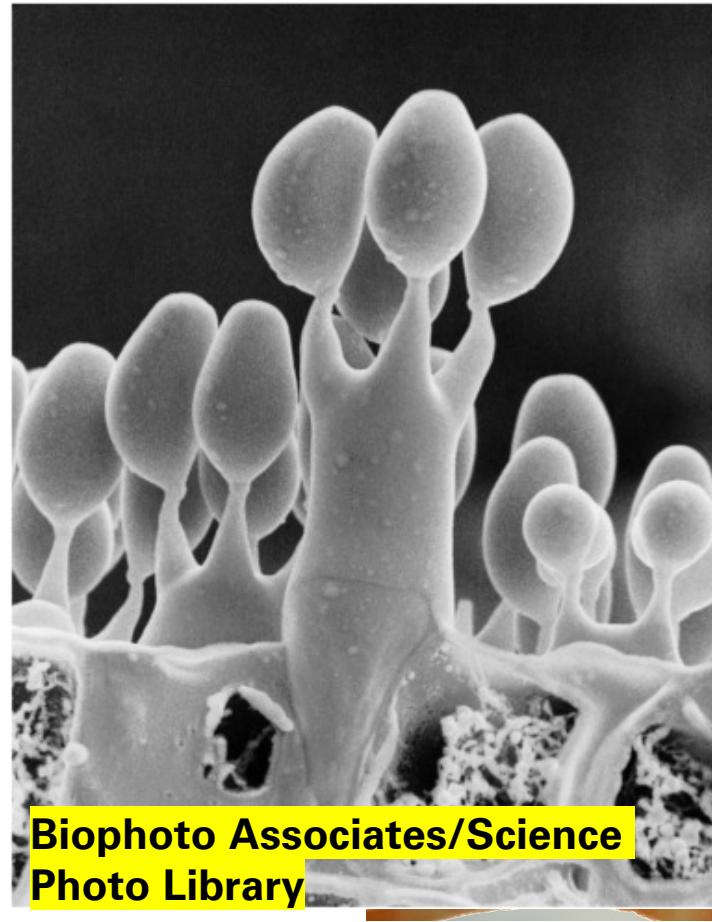
Fungi: Absorb their nutrition through hyphae



Fungi: Reproduce by producing spores



Aurora Storlazzi



Fungi: have many roles in nature



**Mutualist/
beneficial**



**Saprobe/
decomposer**



**Parasite/
harmful**

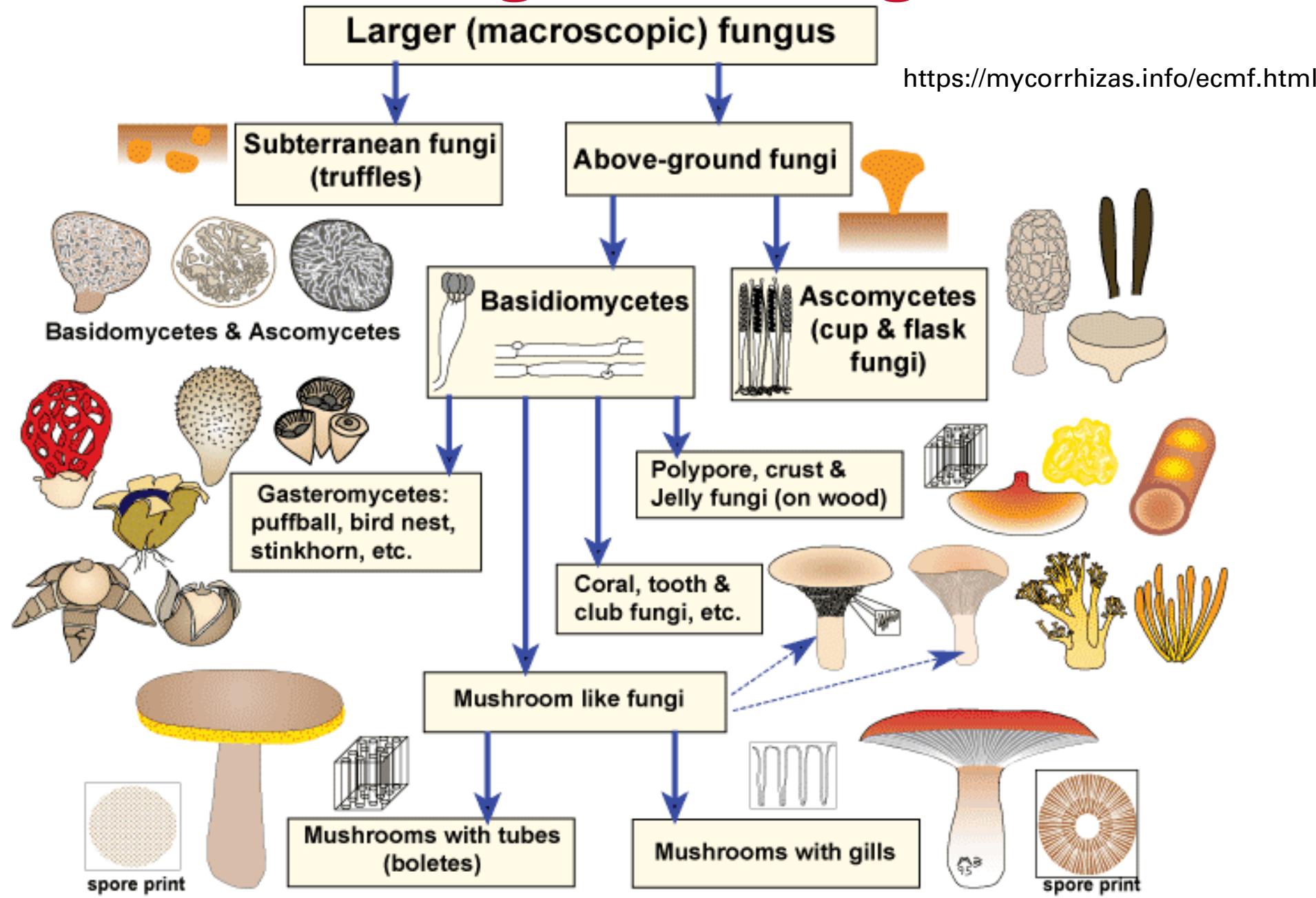


**Unknown
ecology**



Fungi: can form large fruiting bodies

All mushrooms
are fungi...
BUT
not all fungi are
mushrooms

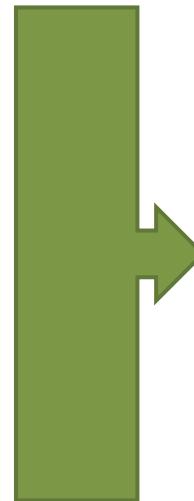


What are 'mushrooms'?

- Fruiting bodies of certain Fungi

Kinds

- Mushrooms (caps with gills)
- Boletes (caps with pores)
- Cup Fungi
- Puffballs ...



'Mushrooms' in general sense



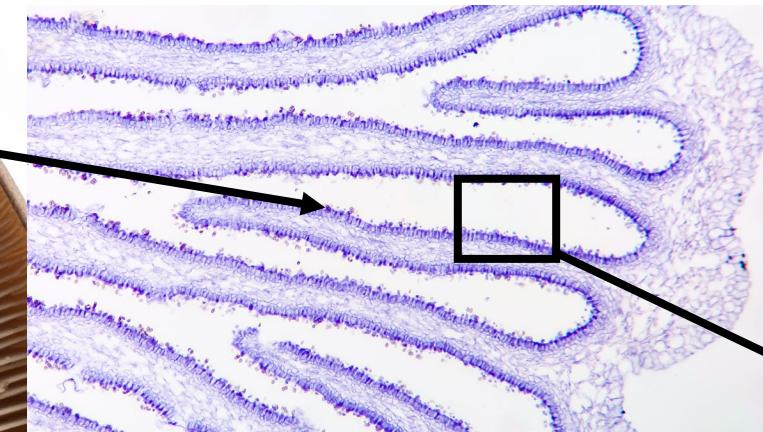
Basidiomycota

Group that contains mushrooms and many other fungi

Spores outside club-shaped cells

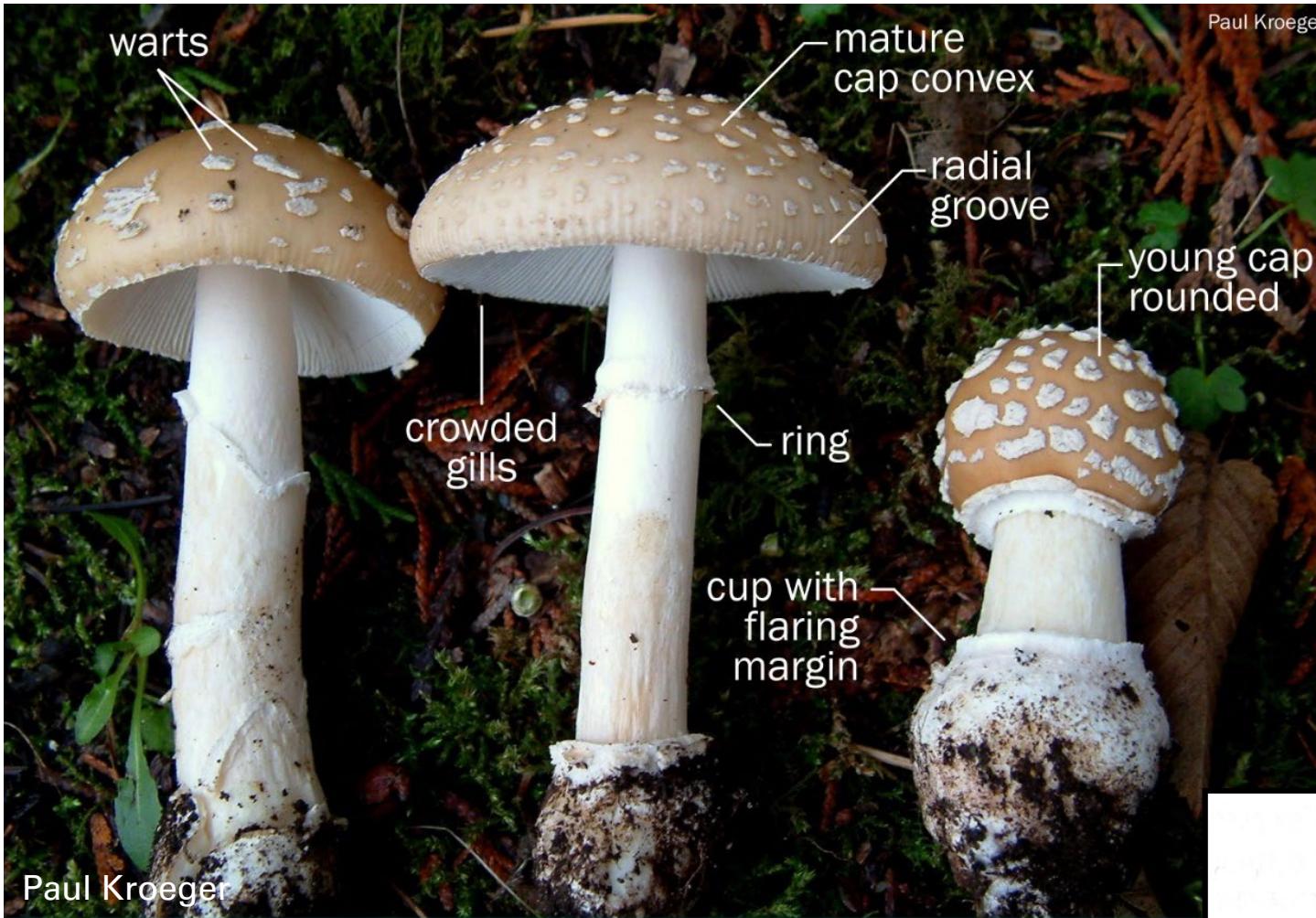


Mushrooms: cap and stalk, gills, fleshy



Basidiospores lining the surface of gills





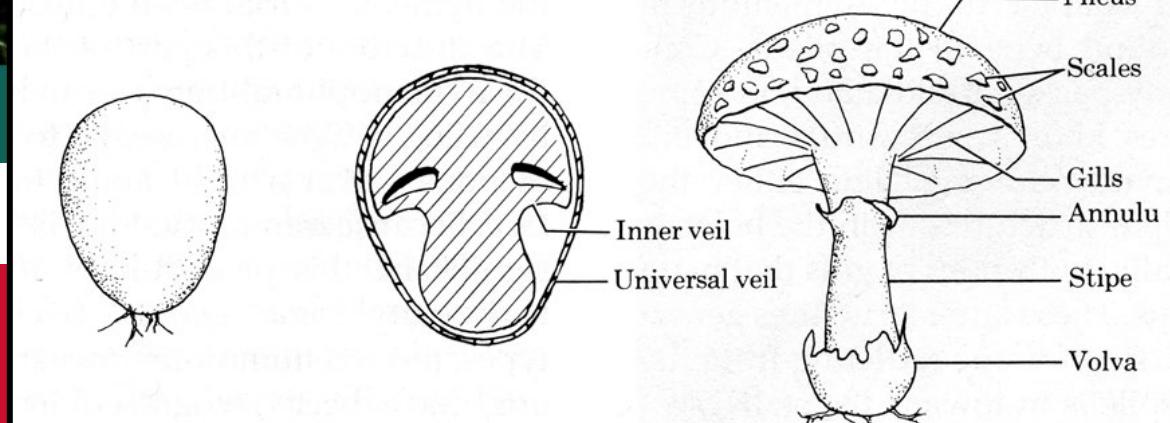
Amanita pantherinoides

Amanita
Annulus (ring)

Volva (cup)

Free gills

**White spores
on ground**





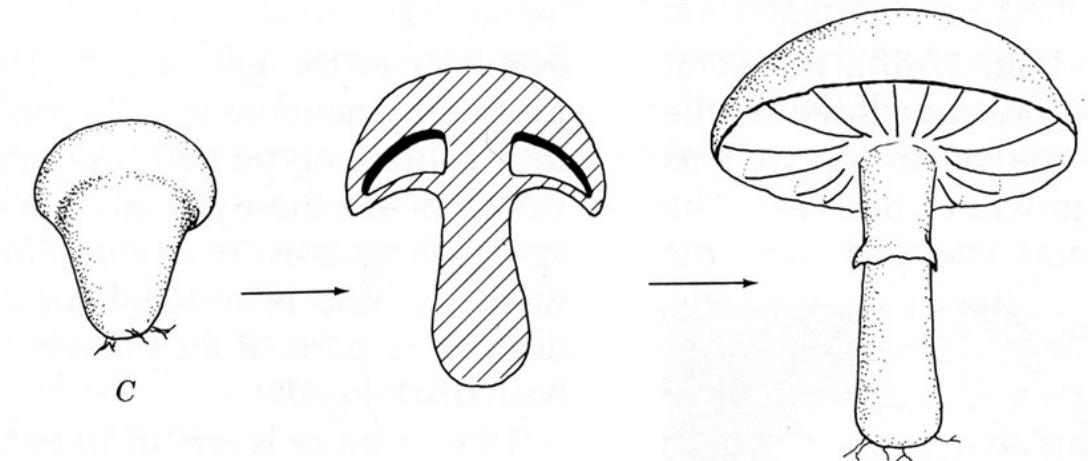
Agaricus

annulus,

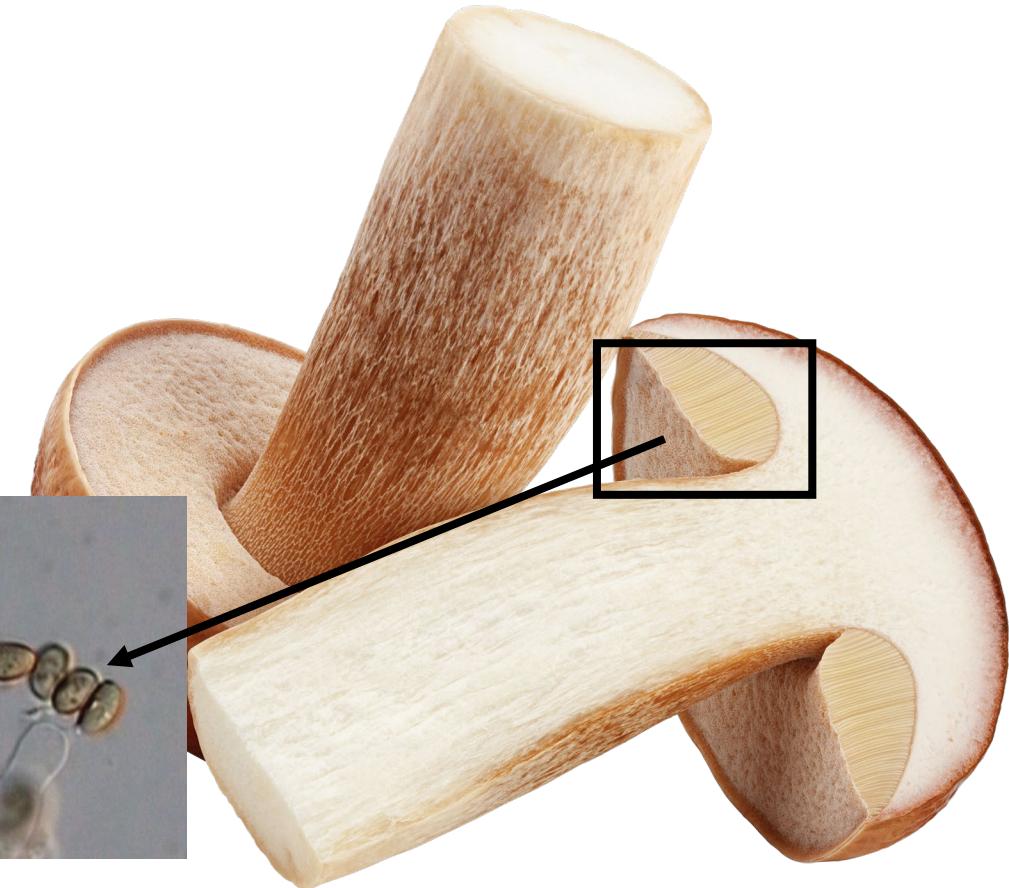
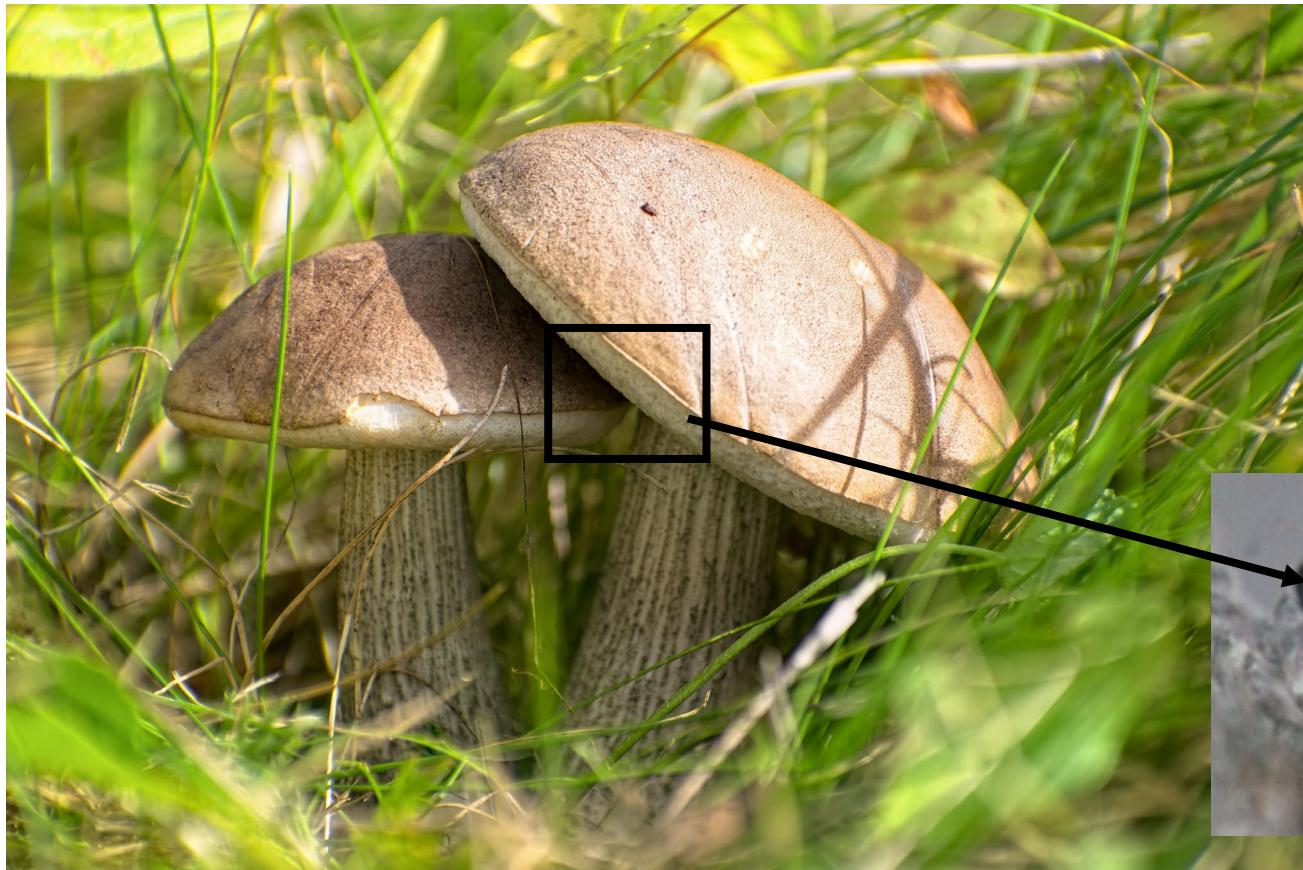
free gills

chocolate-brown spores

on ground



Boletes: cap and stalk, tubes (pores), fleshy



Basidiospores line inside of pores

Other fruiting bodies of Basidiomycota



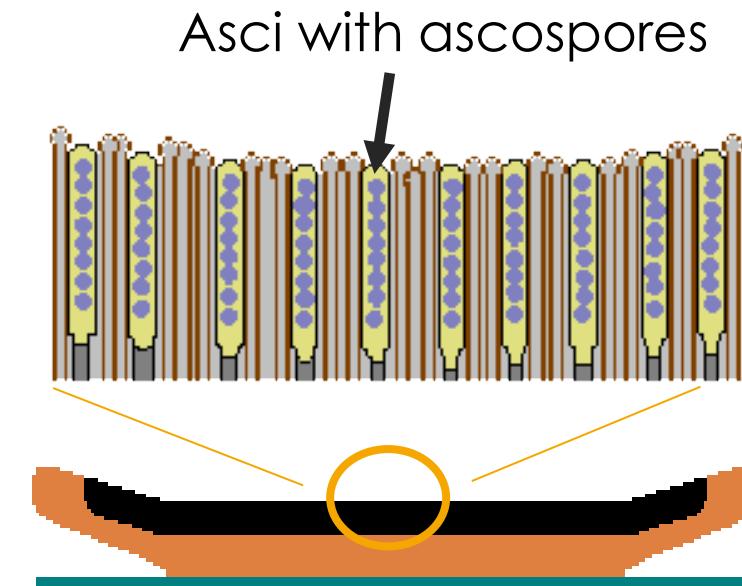
Ascomycota

Group that include
cup fungi, morels and
truffles

Spores inside sacs

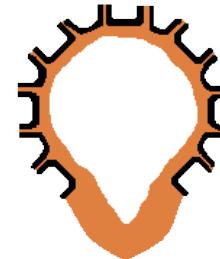
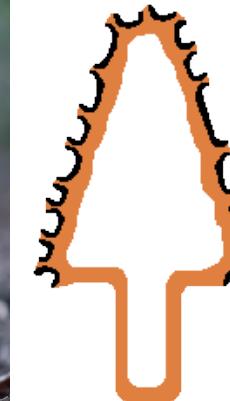


Cup or sac fungi



Apothecia = cup or saucer-shaped fruiting body;
ascospores discharged into air

Variations on cup-shaped apothecia



Identification is KEY

- Complex process, great hobby! Great risks!
- Take lots of photos before collecting
- Observe the habitat and collect information
 - Location: near a tree? On lawn? Woodchips? Dung?
 - Growing: on soil? Tree stump? Living tree?

Identification is KEY

- Important characteristics include
 - Shape
 - Parts (stem, caps: gill teeth, pores)
 - Spore prints
 - Odor
 - Chemical reaction
 - ...
 - Become familiar with dichotomous keys (books and online)



Latin binomials

Morchella esculenta

↓
Genus

↓
species

↓
First name

↓
Last name

and

Nicknames

Yellow morel

common names



A successful wild-harvested mushroom program

- Has a well-defined list of legal-to-sell species



Choice edibles and poisonous lookalikes

Morels vs. "false morels"



Gyromitra spp. - Gyromitrin toxin

"beefsteak morel"

"false morel"



Verpa spp. - GI upset
"early morel"



M. punctipes (true) vs. *V. bohemica* (false)



Cap attached below top of stalk



Cap attached at top of stalk



Choice edibles and poisonous lookalikes

Chanterelles vs. lookalikes



Cantherellus cibarius
group- choice edible



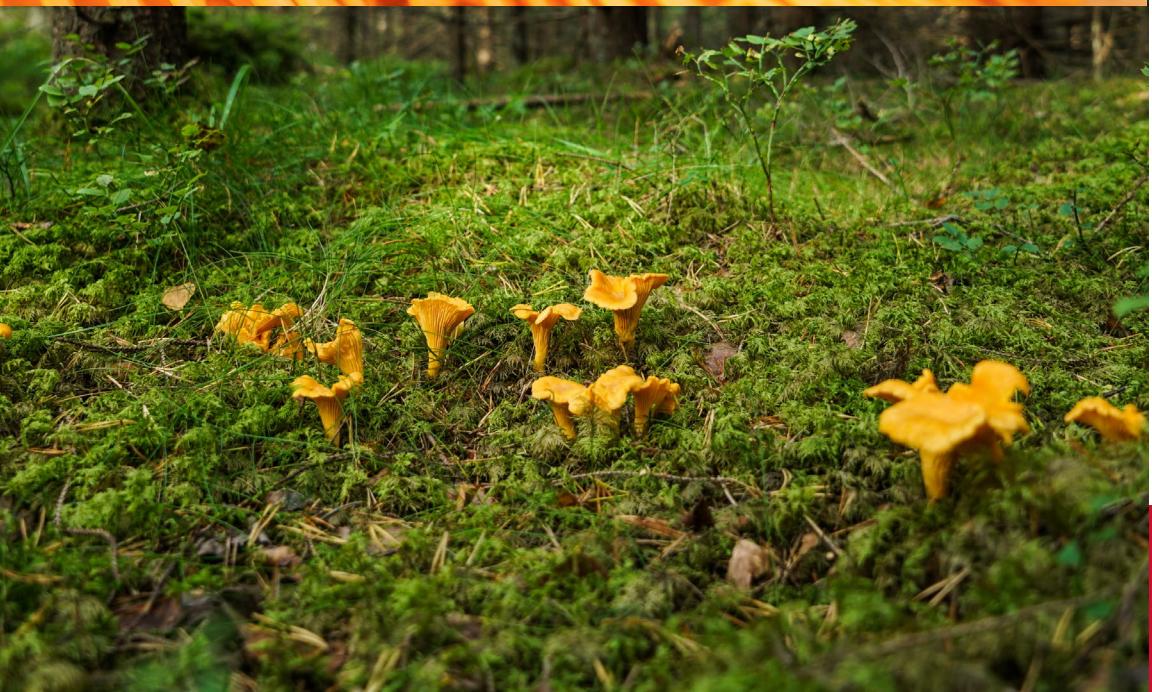
Omphalotus illudens- GI upset
Jack-o-lantern mushroom





Chanterelles

- Singly appear
- Pseudogills
- Out of soil
(apparent)



Jack-o-lantern

- appear in clusters
- True gills
- Out of wood



A successful wild-harvested mushroom program

- Has a well-defined list of legal-to-sell species
- Requires regular recertification to keep up with food codes
- Works with stakeholders and state regulators to bridge communication gap with certificate holders
- Requires record-keeping and education about safe wild-harvested mushroom consumption

IOWA STATE UNIVERSITY

Extension and Outreach



MCAFDO 2025

IL Wild Mushroom ID, Harvest and Sale Certification Program Proposal

Story, Status, & Lessons Learned



Chicken of the Woods N Frillman 2025



Nick Frillman

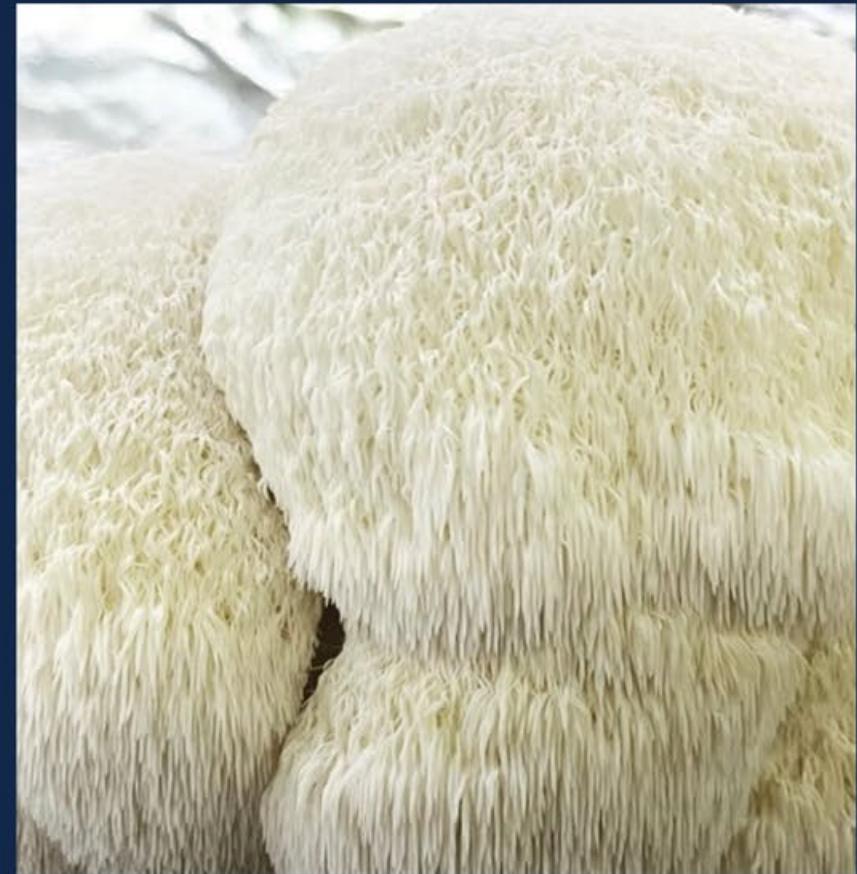
Local Food Systems/Small Farms Educator
Mushroom Production Specialist

I Illinois Extension
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

PC: N Frillman mushroom classes

About me

- Crop production MS 2019 - UIUC
- Culinary mushroom biz - '22, '23
- Made IL Ext. mushroom website
- Teach mushroom production classes
- Resource developments in process



Cultivated lion's mane mushroom
N Frillman 2023



Illinois Extension

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Foraging, eating wild mushrooms since 2019



Cultivation classes went well...

Can IL Extension teach people to ID, harvest and sell wild mushrooms safely?

Risky, yes, but...

- Already happening, semi-unregulated
- Facebook Marketplace, co-op grocery stores, etc
- Bring into the open
- Seems risky to pretend this doesn't exist

Objective: expanding education (and enhancing safety)



Bucket-grown oyster N
Frillman 2023

What are other states doing?

Missouri Mycological Society

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Morel Certification Class

For morel mushrooms to legally be sold to the public in Missouri they must first be inspected by a certified identifier who has successfully completed an approved identification course, per food safety regulations established by the Missouri Department of Health and Senior Services (see link below). This includes morels sold at farmers markets, grocery stores, and restaurants.

The course offered by the Missouri Mycological Society is currently the only approved class available in the state that can certify you to sell, or identify for sale, morels in Missouri. Restaurants or stores that wish to sell morels must either obtain them from a certified morel mushroom identifier, or have a certified identifier inspect any morels that are served or sold to the public. A chef who is a certified identifier can get morels from someone who is not!

Certification is valid for three years, after which identifiers must take the class again and get recertified. The cost for the class is \$75. The class will be held via Zoom on Saturday, February 17th from 1:00 PM until 4:00 PM, presented by Mike Snyder, MOMS board member and head of the research committee.

We will go over identifying characteristics of true morels (*Morchella* species). The class is as in-depth as time and format allow and is designed to provide students with the tools and knowledge to identify morels safely and confidently. The 20-question multiple choice/true-false test is given at the end of the class and must be passed to get certification.

Those who successfully complete the course will be awarded a certificate of completion and a wallet-sized card indicating they are certified to identify morel mushrooms for sale in the state of Missouri.

What are other states doing?



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Home > Mushroom Certification Courses

All Activity

2024 Morel & Wild Mushroom Courses

Morels and Food Safety - January 20, 2024 - 1pm - 5pm - [REGISTER](#)

Wild Mushrooms - January 27, 2024 - 9am - 5pm - [REGISTER](#)

This will be our tenth year offering wild mushroom courses. These courses provide a way for individuals, chefs, restaurant owners, and others to get the training necessary to correctly identify the most common species of edible mushrooms in the State of Indiana. Prior to this course residents of Indiana did not have a way to comply with the state law requiring all mushrooms being sold commercially to be "individually inspected by a mushroom identification expert." We have worked with the Indiana State Department of Health (ISDH) and Purdue Extension in order to get the ability to offer certifications that will be accepted by the State of Indiana. For a typical course, only about half of the participants have an interest in selling mushrooms. The other half take the course purely for educational purposes.

During the pandemic, we moved to online trainings. The format worked fairly well for the material we needed to cover. We will be holding our morel and wild mushroom trainings online this year.

All aspects of the course will remain the same for the online format. The wild mushroom course will take place from 9am to 5pm. The Saturday morning of the course, you will receive a link and passcode to the Zoom meeting to the email you register with. We will begin with introductions, spend an hour on food safety, spend 1-2 hours on morels, and conclude with a test. The test will be emailed out to participants after the course is complete. By finishing and returning the test, you will have completed the requirements for the course, and we will issue the requisite recommendation to become a morel mushroom identification expert for Indiana. (The summer wild mushroom course online, the exam will be required to be taken at a local testing center.)

Digital copies of course materials will be emailed once you register for the course.

Before Saturday, please go to the link below to join a test meeting, to ensure your camera and microphone are properly configured: <https://support.zoom.us/hc/en-us/articles/115002262083-Joining-a-test-meeting>

At the conclusion of the course, participants will be given a letter providing one of the two references that are needed to be certified to sell wild mushrooms in Indiana. (See FAQ below for additional details on the second reference.) In order to register with ISDH, you will need two references and food safety training to finalize the application. The ISDH Wild Mushroom Expert application is [available online here](#). The morel mushroom course we offer in the spring includes a food safety component that meets these requirements. ServSafe training is another option. It is possible to take the wild mushroom course now and to take the food safety training at a later date.

What are other states doing?



Home Membership **Class Sign-Up** Events Newsletters Board Myco Links Contact

Wisconsin Wild Mushroom Identification Class ... please read on to find out more

Up-coming course dates:

Time: for all course dates, the **class starts at 9:30 AM** and runs until around 3:30 PM, with testing starting then until all students finish, typically by ~4:15 PM.

Testing accommodations: There is no time limit on the test. If we had to leave the venue before you were ready, we would work to accommodate a way for you to finish up anyway. We also would love to hear from you if we could find a way to make testing more accessible to you. Please reach out in advance to [wisconsinwildfungi \(at\) gmail \(dot\) com](mailto:wisconsinwildfungi(at)gmail(dot)com).

Venue location: are sent to you after you sign up by email, if a venue is finalized for your testing date/location. If it is not yet finalized, the email will note that and give a date by which you should hear from your teaching assistant (TA) with the specifics.

December 2nd - Waukesha, WI - class already occurred

January 13th - Madison, WI - class already occurred

January 27th - Eau Claire, WI - class already occurred

February 3rd - Green Bay, WI - class already occurred

Inclusion on this list does not mean WMS endorses any particular medical benefit claim made about a species. Please follow up in the scientific literature to investigate and support any claim. Some fungi included on this list may cause allergic reactions or minor gastrointestinal upset as any other food may on a person-by-person basis. They are all widely considered reliably safe for human consumption.

Who is required to gain this certification, and by when? How will it be enforced, and by who?

It is our understanding from our conversations with the WI DATCP that this certification is required:

Starting in January 2024 for any person selling fresh, unprocessed, non-imported, wild foraged fungi to grocery stores, restaurants, or any agent purchasing on behalf of grocery stores or restaurants. The law will be enforced by health inspectors, who will check for appropriately filled out Wisconsin Statement of Sale for Wild Mushrooms forms as filled out by you and held by the purchasers of your wild foraged fungi for 90 days.

Imported wild foraged fungi from another state are not covered under this regulation, and do not require this certification or Statement of Sale process. However, these imports may be subject to some other form of regulation. Please follow up yourself with state regulators if you are unsure.

Wild-harvested Mushrooms Certification

Every year in the spring, Iowa State University Extension and Outreach offers classes for anyone interested in being certified to sell wild-harvested mushrooms within Iowa.

Use the link embedded below to navigate to the page for registration. Dates for the in-person portion of each workshop in 2024 are March 23, April 6, and April 20 and will be held in Ames, IA. You can find more specific details by [reading the information on the registration page](#). Please read the information on the registration page carefully, as workshop format is changing this year.

[Wild Mushroom certification](#) (includes all mushrooms listed below, \$60)

[Dates for Wild-Harvested Mushroom Certification Workshops below:](#)

Saturday, March 23 from 1:00-3:00 p.m. (online portion is Wednesday, March 20 from 6-7 p.m., link to access will be sent after registration)

Saturday, April 6 from 1:00-3:00 p.m. (online portion is Wednesday, April 3 from 6-7 p.m., link to access will be sent after registration)

Saturday, April 20 from 1:00-3:00 p.m. (online portion is Thursday, April 18 from 6-7 p.m., link to access will be sent after registration)

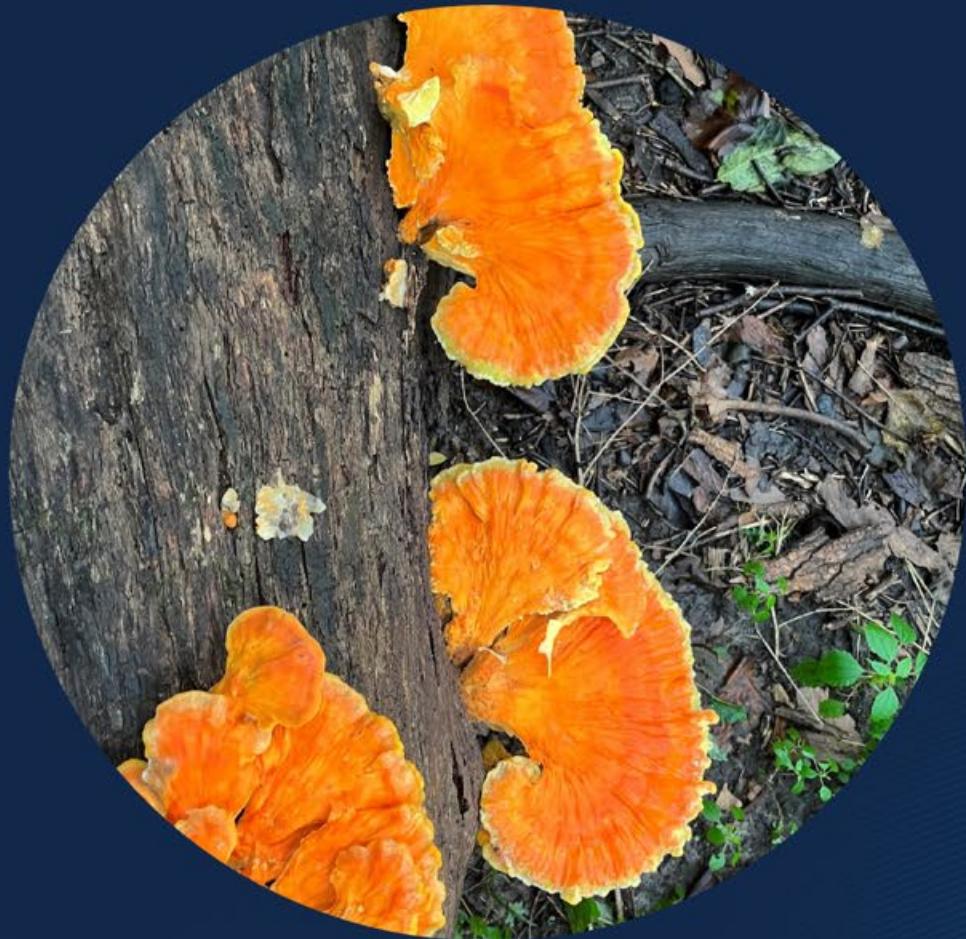
For questions about the training, email pidc@iastate.edu

To legally sell eight different wild-harvested mushrooms in Iowa, sellers must complete a certification workshop that covers identifying and distinguishing them from look-alikes.

Can Illinois have a program too?

A Wild Mushroom Identification, Training, and Certification Program

- **Allowing Harvest and Sale of Wild Edible Mushroom Species in Illinois...**
- Modeled on trainings by surrounding state Extension, Mycology Associations, and state DNR
- Only at FMs, only 3-5 species Yr 1
- Expanding in POS, species Yr 2+



Chicken of the Woods N Frillman 2023

Indiana's Hoosier Mushroom Society ID, Cert and Harvest Program – 8+ Years Old

Full list of species covered with lookalikes:

Oysters – *Pleurotus ostreatus* & *Pleurotus pulmonarius*

Lookalikes - *Pleurotus dryinus*; *Lentinus levis*; *Hypsizygus ulmarius*; *Phyllotopsis nidulans*; *Pleurocybella porrigens*; *Crepidotus* spp.; *Hohenbuehelia* spp.; *Lentinellus* spp.; *Panus* spp.

Chicken of the Woods – *Laetiporus sulphureus* & *L. cincinnatus* (with caution)

Lookalikes - *Hapalopilus rutilans*; *Hapalopilus croceus*; *Trametes (Pyconoporus) cinnabarinus*; *Pseudoinonotus dryadeus*; Dryad's Saddle - *Cerioporus (Polyporus) squamosus*

Hen of the Woods – Maitake – *Grifola frondosa*

Lookalikes - *Meripilus sumstinei*; *Bondarzewia berkeleyi*

Umbrella Polypore - *Polyporus umbellatus*

Chanterelles – *Cantharellus lateritius*, *Cantharellus cibarius* group (No others)

Lookalikes - *Omphalotus illudens*; *Hygrophoropsis aurantiaca*

Cauliflower Mushrooms - *Sparassis crispa*, *Sparassis spathulata*

Lookalikes - *Sebacina (Tremelodendron) pallida*; *Hydnopolyphorus* sp.; *Podoscypha aculeata*

Lion's Mane – *Hericium erinaceus*, *Hericium coralloides*, *Hericium americanus*

Lookalikes - Coral fungi; *Artomyces pyxidatus*

Black Trumpets – *Craterellus* spp.

Lookalikes - *Urnula craterium*

Puffballs – *Calvatia gigantea*, *Lycoperdon pyriforme*, etc.

Lookalikes - *Scleroderma* spp.; Amanita eggs; Stinkhorn egg

Deadly Poisonous species: *Amanita bisporigera* group; *Galerina marginata*

Missouri Mycological Society recently started their program

This course is intended to provide a way for people to sell wild edible mushrooms legally,* but it is also an excellent opportunity for those wanting to learn about some of the most common edible fungi in Missouri, how to tell them apart from their lookalikes, and some basics about fungi in general. You do not have to take the certification test to attend the course!

The 50-question multiple choice/true-false test is given at the end of the presentation, with an 80% minimum score required to pass. Registrants will receive an outline of the material before the class to help prepare them for the course and test.

The course will cover the following species and many of their lookalikes:

- **Chicken of the Woods** – *Laetiporus sulphureus* & *cincinnatus*
- **Hen of the Woods** – Maitake – *Grifola frondosa*
- **Lion's Mane, Comb Tooth** - *Hericium erinaceus*, *H. coralloides*, *H. americanum*
- **Puffballs** – *Calvatia*, *Lycoperdon* spp.
- **Cauliflower Mushroom** – *Sparassis spathulata*
- **Chanterelles** – *Cantharellus lateritius* group, *cibarius* group, *C. cinnabarinus* group
- **Black Trumpets** – *Craterellus*
- **Aborted Entoloma** – Shrimp of the Woods – *Entoloma abortivum*
- **Oysters** – *Pleurotus ostreatus* & *P. pulmonarius*

Those who successfully complete the course will be mailed a certificate of completion and a wallet-sized card indicating they are certified to identify these specific wild mushrooms for sale in the state of Missouri.

This class is only for certification for the wild mushrooms listed above. A separate class for certification to identify and sell morels is scheduled for February 17, 2024.

MOMS is a non-profit organization dedicated to expanding our understanding and appreciation of fungi, and fees collected go towards research and education efforts across the state.

<https://health.mo.gov/safety/foodsafety/pdf/missourifoodcode.pdf>

Species covered by training in Wisconsin

Wisconsin Wild Mushroom Currently Approved Species List

- Morels - all WI species in genus *Morchella*
- Chanterelles - all WI species in genus *Cantharellus*
- Trumpets - all WI species in genus *Craterellus*
- King Boletes / Porcini - all WI species in *Boletus edulis* clade
- Oyster mushrooms - all WI species in genus *Pleurotus*
- Hedgehog mushrooms - all WI species in genus *Hydnus*
- Lobster mushrooms - *Hypomyces lactifluorum* on its host
- Lion's Mane, Bear's Head, and Comb Tooth - all WI species in genus *Hericium*
- Matsutake - in Wisconsin our species is *Tricholoma magnivelare*
- Maitake / Hen of the Woods - *Grifola frondosa*
- Chicken of the Woods - *Laetiporus cincinnatus* and *Laetiporus sulphureus* **except:** *Laetiporus huronensis*
- "Salisbury Steak of the Woods" / Resinous polypore - *Ischnoderma resinosum*
- Pheasantback / Dryad's saddle - *Cerioporus squamosus*
- Giant Puffball - *Calvatia gigantea*
- Ganoderma Species considered Reishi in WI - *Ganoderma tsugae* (primarily considered reishi), plus *Ganoderma applanatum*, *Ganoderma sessile*
- Chaga - *Inonotus obliquus*
- Turkey Tail - *Trametes versicolor*

IF WI can pull off this many species, 3-5 in IL seems comparatively easy

Common themes from neighbor state programs

- 物种容易识别，~常见，
- 有毒的近似物种在训练中受到严厉打击
- 所有4个州项目包括7种相同的物种
- 2个项目 **要求销售和接收记录** 90天 - **增强可追溯性**
- 所有项目与卫生部门、教育工作者、扩展、州立法机构合作，如果必要



chicken fat mushrooms N Frillman 2025

Common themes - continued

- All programs have in-person field-based and/or lab-based learning
- ☒ Remote components - 100% cameras-and-mics on attendance to advance to exam
- ☒ All states have certification exams that are difficult to pass w/out proper training
- ☒ Retraining & re-cert eventually required
- (IA - 3 yrs)



Wild Dryad's Saddle Allerton Park N Frillman
2023

2023 - 2025 stakeholder meetings and listening sessions

IL Departments of: Ag, Natural Resources
IL Environmental Health Association
NILPHC, SIPHC, mushroom producers...

IDOA, IEHA receptive to idea

They prefer Extension over a for-profit or private non-profit - research-based, trusted



Wild (escaped) golden oyster mushroom N
frillman 2025



Golden and summer oyster mushrooms N
Frillman 2025

Then what happened?

Developed rough draft program outline and disclaimer form based on IA Extension training

Pitched idea to Dean/Director of IL Ext. and Extension legal dept

Heads of both programs announced retirement

Proposed a market analysis to confirm potential participant interest in the interim

“Does IL Extension have to be the one to do this? Why us?”

Comprehensive Qualtrics survey released early 2025

Market analysis results

332 responses

68 counties all across the state - $\frac{2}{3}$!

4 out-of-state border counties repped - KY

Cook, Mercer, Rock Island, Jackson, Champaign,
Sangamon Co - most responses

61% - would-be foragers

31% - would-be consumers

27% - landowners (private property only prog)

\$25,000 potential gross income in Y1

100+ individuals shared email addresses to enroll



foraged unbrushed chanterelles N Frillman
2025

Benefits of an Illinois Wild Mushroom Program



Chanterelles in Central IL - N Frillman 2023

- Economics
 - More mushroom sales = tax revenue
 - Mushroom farmers will make more \$
 - Foraging leases?
- Food access
 - Mushrooms are highly nutritious
 - A renewable resource
 - Widely available throughout year
- Education
 - Cultivate awareness, appreciation of surrounding woodlands, natural areas for youth and adults
- Culinary and agrotourism
 - Beneficiaries: restaurant owners, farmland owners

Now what ?

New Dean/Director hired September 2025

Extension Legal: not yet...

Meanwhile:

Continue developing program draft

Re-pitch to leadership spring 2026?

Figure out program accessibility (large state)

- traveling wild mushroom roadshow?

First cohort (3 classes, 30 a class?) - 2026?



foraged oyster mushroom N Frillman 2022

Facts & personal thoughts from 3 years



People are foraging and selling under the table

Poisonous mushroom ed would enhance safety

Another party will bring this to your state sooner or later (Mushroom Mountain, SC)

Wild mushrooms are wildly popular - if a little scary

Lessons learned from 3 years



cultivated shiitake mushrooms N Frillman 2023

Complex projects desired by the public can be slowly but surely advanced

- seek buy-in from organization gatekeepers
- take time to learn hesitations
- if leaders supportive, membership will support
- gauge public support (objectively)
- notify, inform, seek feedback, iterate

Find excellent variant of thing that doesn't exist in your state in another state - partner with contact person!

Don't reinvent the wheel - borrow and adapt

Cooperative Extension is a trusted organization;
Time to leverage that trust!

Questions?



Winter oyster mushroom Funks Grove IL N Frillman 2023

Nick Frillman

Local Food Systems & Small Farms Educator
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anonymous demographic
survey



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