



Ohio Mushroom Society

# The Mushroom Log

**Fall Foray 2019 at  
Dawes Arboretum  
Oct. 5-6, 2019**

**By Debra Shankland**

We are excited to have secured **Dawes Arboretum** for our annual Fall Foray this year. Located just north of I-70 and right between Columbus and Zanesville, this beautiful, educational facility boasts nearly 2000 acres.

We are very fortunate to have author and internationally-recognized field mycologist **Walt Sturgeon** as this foray's mycologist and presenter. His illustrated program titled, "Mushrooms, Just for the Smell of It" can help you learn how to use your sniffer to sort one species from another!

Mushroom fragrances can be fascinating, and helpful for field identification as well.

Our beneficial partnership with the Dawes Arboretum is a long one. Depending on its endowment, grants, and now membership fees for its plant science work and programming, the Dawes staff is working with us to ensure this foray is free to OMS members, like all of our forays. In addition to Dawes, we've secured permission for a very small group to survey for mushrooms at a very special property at **Flint Ridge**.

Be sure to register for this **October 5 – 6** foray in advance! Please contact Debra Shankland, foray organizer, to register your name and the number in your party. **Advance registration is required**

**for free admission to the Arboretum.** Call 440-263-2334 or email [dks@clevelandmetroparks.com](mailto:dks@clevelandmetroparks.com) **by October 3.** *Only current OMS members will be allowed to register.*

Not a member yet? No problem! Simply fill out the [OMS Membership Application](#) and mail it along with your membership dues to:  
*Ohio Mushroom Society  
c/o Jerry Pepera  
8915 Knotty Pine Ln.  
Chardon, OH 44024*

Annual family membership dues are just \$15/year for an electronic version of our newsletter, or \$20 for those wanting a hard copy of the newsletter.

The Dawes Arboretum is located at 7770 Jacksontown Rd in Newark. Access their web site at [www.dawesarb.org](http://www.dawesarb.org)

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### FORAY SCHEDULE OF EVENTS

#### Saturday, October 5

8:15 a.m. Registration and coffee in the Zand Education Center

8:45 a.m. Welcome and orientation

9 - 11 a.m. Morning forays

11 - 12:30 Sort and identify collected specimens

12:30 p.m. Dinner reservations to be called in (sign up during Registration)

12:30 - 1:15 Potluck lunch (*please see "What to Bring" below*)

1:15 - 2 "Mushrooms, Just for the Smell of It" presentation by Walt Sturgeon

2 - 3:30 Afternoon forays

4:30 - 5:30 Table talk concerning noteworthy collected specimens

6 p.m. Dinner at Elliot's Wood Fired Kitchen & Tap at 16 W. Main St. in Newark (*go to [elliotspizzaretaurantnewark.com](http://elliotspizzaretaurantnewark.com) to see the menu*)

#### Sunday, October 6

9:15 - 10:30 a.m. Coffee & light breakfast in the Zand Education Center and review collections

10:30 - 12 noon

Final foray

1 p.m. Show-and-Tell Mushroom Pop-Up

Program; open to Dawes visitors

### WHAT TO BRING

- Refillable water bottle
- Reusable coffee/tea mug
- Food/drink to share at the potluck; *please make sure it's ready to serve*--there is a sink, but no refrigerator or other kitchen facilities.
- Utensils and knives needed to serve your potluck item; cooler and/or crock pot if needed. Think about foil and/or storage containers for your leftovers, too.
- Cash for a donation (Forays are free, but your generosity buys coffee, paper products, nametags, goodwill for our hosting institutions, speaker expenses, and more. *Thank you!*)
- Basket (paper bag can do in a pinch)
- Sharp knife
- Mushroom field guide(s)
- Notepad and pencil/pen
- Magnifier
- Camera
- Hat, rain gear, change of shoes/boots
- Compass
- Whistle

### OVERNIGHT ACCOMMODATIONS

**Camping** - a number of private campgrounds are around Buckeye Lake, 10 - 15 minutes southwest of Dawes:

Mill Dam Acres  
Buckeye

Lake/Columbus East KOA  
The Camping Spot

**Hotels/Motels** - many options just 10 minutes away to the northwest near Heath, Ohio:

Hampton Inn

Heath/Newark - *mention Dawes Arboretum for a special room rate*

Super 8 by

Wyndham Heath/Newark  
America's Best Value Inn

Comfort Inn

**Unique and affordable** places to stay may be found on **airbnb**. Begin your search in Jacksonville, Fleatown, Heath or Newark.

### Finding a Clue to Life's Arrival

by Carl Zimmer

*New York Times* May 28, 2019

Microscopic fossils from the Arctic hint that fungi

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reached land long before plants.

Scientists reported last Wednesday that they had discovered the oldest known fossils of fungi a finding that may reshape our understanding of how life first arrived on land from the oceans

Fungi are the invisible giants of the natural world, even if most people are dimly aware of them as toadstools along a hiking trail, or as mushrooms sprinkled on a pizza.

Scientists have identified about 120,000 species of fungi so far but estimate there are as many as 3.3 million species in all. By comparison, all living mammals comprise fewer than 6,400 species.

The success of fungi results largely from their way of feeding Rather than absorbing sunlight like plants or devouring other organisms like animals, fungi spew out enzymes that break down surrounding cells or even rock, which the fungi slurp up.

Fungi use this strategy in a variety of ways. Some attack our bodies, creating serious risks to health Other types thrive on the

skins of frogs and salamanders, threatening hundreds of species with extinction. Plants are victims too; some fungi pose a huge threat to the world's crops.

But many other fungi are partners to animals and plants. Cow grow fungi in their stomachs to help break down the tough grass they eat. Most plants intertwine their roots with networks of underground fungal threads that supply nutrients.

And when plants and animals die, fungi use their powerful enzymes to quickly break down dead tissue, liberating nutrients for the living to enjoy. The world would become a stinking charnel house if fungi disappeared.

The ecological importance of fungi has left scientists to wonder about their evolutionary history. But the spores and tendrils grow don't form fossils, making the story hard to uncover.

In the early 1900's, researchers found a cache of fungal fossils that were 407 million years old. The fungi had turned to stone in mineral-rich hot springs, preserved in microscopic detail.

Some of them seemed to have teamed up with plants that also left fossils in the rocks. Others appeared to have specialized in breaking down dead plant matter.

Until now, those fossils have been the oldest clear evidence of fungi. Many scientists considered them a snapshot of the early conquest of land. Fungi and plants came ashore together as ecological partners, it seemed. Together, they transformed barren lands into a soil-carpeted habitat.

Recently, though, some researchers have grown dissatisfied with this scenario.

By comparing the DNA of different species, scientists have drawn an evolutionary tree of fungi. If the Scottish fossils were among the earliest members of the fungal kingdom, you'd expect that living fungi would share a common ancestor not much before 407 million years.

But that's not what DNA trees tell us. The genes of living fungi indicate that their common ancestor lived over a billion years ago.

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Could there be a 600-million year gap in the fossil record? In recent years, scientists have searched for fungi in rocks older than those in Scotland, and they've found a few microscopic fossils that looked as if they might fungi. But they were too ambiguous to convince many experts.

The new fossils came to light during an expedition to the fringes of the Canadian Arctic. In 2014 Robert Rainbird, a research scientist at the Geological Survey of Canada, noticed black flecks on a piece of shale.

He knew that sometimes flecks like these turn out to be microscopic fossils. "I thought, 'I should grab some of this stuff, because it looks juicy,'" He said.

Dr. Rainbird sent the material to Emmanuelle Javaux, a paleontologist at the University of Liege in Belgium. She asked Corontin Loron, a graduate student, to analyze them.

Mr. Loron put the rocks in an acid bath to strip out the minerals. He ended up with a black paste of organic matter, which he smeared onto slides.

When he looked at them under a microscope, he saw hundreds of tiny fossils.

The fossils were single-celled organisms. They were much bigger than bacteria, but Mr. Loron couldn't determine exactly what they were. Dr. Rainbird's analysis of the rocks showed that these organisms had fossilized a billion years ago in an estuary, where a river flowed into a sea.

On an Expedition in 2017, Dr. Rainbird and Mr. Loron and colleagues discovered some peculiar fossils in the rocks. They were composed of spore-like spheres, often joined to long filaments that sprouted T-shaped branches—the kind of shapes found today in fungi.

Mr. Loron used electron microscopes to survey the structures and found that the spheres and filaments had double walls, a hallmark of fungi. To see what molecules were contained in the fossils, Mr. Loron and his colleagues fired infrared beams at them and measured the light they released.

Three fossils produced a pattern that matches that of a protein called chitin. All fungi make chitin to build their tough walls. The researchers concluded they had found an ancient fungus, which they named *Ourasphaira giraldae*.

"This is the first evidence that fungi are a billion years old, even though we've thought they were for long time," said Mary Berbee, a mycologist at the University of British Columbia, who was not involved in the new research.

But Dr. Berbee and other experts said they would have more confidence in the findings with more data, especially about the fossils' chemistry.

"I don't have doubt that they're fossils and that alone is fascinating" said George Cody, an organic geochemist at the Carnegie Institute in Washington. But the infrared results could have been produced by molecules other than chitin, he added.

If the Arctic fossils are indeed fungi, it's a mystery how the tendril-sprouting organisms made a living. Today fungi that sprout

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tendrils grow to huge sizes by feeding on plant matter. A billion-year-old fungus would have had no land plants to feed on. The oldest known plant fossils are no more than 470 million years ago.

The fungi had to be eating something. One possibility: bacteria.

Researchers have found signs that crusts of bacteria were growing on land 3.2 billion years ago.

It's also possible that these ancient fungi lived on the bottom of the estuary, perhaps feasting on underwater mats of algae. Land plants evolved from green algae and so perhaps the estuary habitat was where fungi and the ancestors of plants first formed partnerships.

### **VACCINES MAY HELP BATS FIGHT WHITE NOSE SYNDROME** By Helen Thompson

<https://www.sciencenews.org/>, May 17, 2019

Oral vaccines could give wild bats a better chance at surviving white nose syndrome, the fungal disease that has ravaged bat colonies in North

America. In lab tests conducted on captured little brown bats, vaccination led to fewer infected bats developing lesions and more of the bats surviving, researchers report May 1 in *Scientific Reports*.

White nose syndrome, caused by the fungus *Pseudogymnoascus destructans*, has killed around 7 million bats in the United States since 2006. In some regions, the disease cut some bat colonies by 75 percent. The white fuzz grows across bats' skin when the animals hibernate, eventually making them wake up, fly around, and waste energy needed to survive winter.

"It's just devastating to some bat populations," says veterinarian Elizabeth Falendysz at the U.S. Geological Survey National Wildlife Health Center in Madison, Wisc.

Falendysz and colleagues made two vaccines against the fungus by implanting raccoon poxviruses with DNA instructions for making one of two fungal proteins, in order to trick the bats' immune system into recognizing and fighting the fungus. (Vaccines that helped in rabies eradication efforts and in fighting plague in prairie

dogs rely on the same mechanism.)

Wild little brown bats (*Myotis lucifugus*) were vaccinated before being exposed to the fungus. Of 10 bats given a combination of both vaccines, only one developed lesions within the experiment's 100-day hibernation period. Because little brown bats don't do well in captivity, the team struggled with dwindling sample sizes, so it was hard to compare these numbers to other individual treatments. But 14 of the other 23 bats, or 61 percent, that didn't get this vaccine combo developed lesions.

In a second trial aimed at confirming the results, researchers vaccinated bats both orally and by injection. After 126 days, about 88 percent of bats that received oral versions of both vaccines survived the effects of the fungus, compared with 30 percent of unvaccinated bats (and 80 percent of bats vaccinated by injection). Bats that survived the experiments lost an average of about 34 percent of their body weight, while bats that died had lost about 55 percent.

Researchers suspect that slowing the fungus growth or reducing the intensity of

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infections may have helped vaccinated bats sleep more peacefully and maintain more of their weight and energy.

The team has since combined DNA for both proteins into a single vaccine and hopes to add more proteins for an even stronger jolt to the immune system. "Mortality rates are extremely high for some species that get white nose syndrome, so even modest gains in immunity and survival could make a big difference," says Winifred Frick, a biologist at the University of California Santa Cruz.

Researchers have also looked at using antifungal compounds from plants and bacteria to control the fungus, but haven't deployed them in the field over concerns about possibly harming cave ecosystems.

Falendysz says the team hopes to develop a vaccine spray, which bats could lick from their fur as they groom themselves and spread as they nuzzle other bats—a strategy that's worked with a rabies vaccine in lab tests on big brown bats. Reaching a large enough number of some wild bat species will require creativity, Frick says,

Reprinted from the June 2019 issue of Spore Prints, the Bulletin of Puget Sound Mycological Society

### Chaga Reconsidered

Thanks to Martha Bishop who sent information on Oxalates in Chaga. (Oxalates are small negatively charged carbon molecules)

Two recent articles have concerned possible health risks from consuming Chaga (*Ionotus obliquus*) a conk which parasitizes birch trees. Enthusiasts who regularly drink tea from ground Chaga or a tincture often report health benefits. Recently, two articles have appeared, Susan Goldhor: Chaga Revisited: Mushroom, the Journal Issue 116, Vof. 32(3): 25-31. And Oxalates in Chaga—a Potential Health Threat by Michael Beug, Chair NAMA Toxicology Committee.

"In short, from both Susan Goldhor's article and everything I can discern, while there are many interesting anecdotes about + effects of using Chaga, and there are intriguing in vitro and animal studies, we have too little evidence to say whether taking Chaga is healthy for humans."

The issue revolves around the oxalates in the Chaga. In some combinations these can pass into the blood stream, complex with calcium ions and form insoluble calcium oxalate crystals which can become kidney stones and be hard to excrete. Larger metallic cations (iron) will combine with oxalates to form insoluble

### Editorial Musings

Many thanks to Bob Antibus for the article on Bioluminesce. Bob teaches (taught?) Biology at Bluffton College in Bluffton, Ohio.

Deb Shankland sent me a link about the rapid spread of *Amanita phalloides*. If you are interested see their link at

<https://www.theatlantic.com/science/archive/2019/02/deadly-mushroom-arrives-canada/581602/>

### RARE, ISRAELI-CULTIVATED DESERT TRUFFLES MAY SOON BE AVAILABLE

Klara Strube <http://nocamels.com/>, April 21, 2019

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Israel's culinary landscape has often been praised for offering a multicultural flavor palette and adventurous food combinations. Over the past several years, Israeli researchers have been cultivating a rare desert treat to add more widely to the local cuisine.

In the dry lands of the Negev, researchers at the Ramat HaNegev Desert Agriculture Center have cultivated a unique desert truffle known as *Terfezia leonis*, a prized delicacy across the Middle East and North Africa.

But in Israel supplies are unstable and costs unpredictable, making the rare fungus a hard-to-come-by ingredient. The Jewish Telegraphic Society reported last year that market prices for the truffles reached \$120 per pound, "slightly less than the cost of silver and four times that of uranium."

"Today, the fungus you find in the market is there because of the Bedouins," explains Professor Yaron Sitrit, who is head of the research project that aims to commercialize the cultivation of desert truffles in Israel's south. "The Bedouins know the host plant, can track the mushroom down, and sell it in the market. But it's collected in the wild, and the yield is heavily influenced by the rains. This year, for example, the rain patterns were very bad, so you can find almost no fungi in the markets, and the prices are very high. People can buy

the fungus today, but they are dependent on rain, God, and the Bedouins who will collect and sell it to them."

This is about to change. In a long-term research endeavor, the researchers managed to decode the intricate relationship between the fungus and its host plant *Helianthemum sessiliflorum*, commonly known as the Desert Trap, in a successful experiment first unveiled last year in Israeli news daily *Ynet*. The experiment was a joint cooperation between the Ramat HaNegev Desert Agriculture Center and Sitrit.

Both the fungus and the host plant require little water and no fertilizer, making it potentially a very cost-effective agricultural crop. The plant grows in the dry dunes of the Mediterranean desert lands but, despite all adjustments, is unable to absorb phosphor by itself.

"The fungus does that much better," explains Sitrit. "It transfers the phosphor it absorbs to the plant and in return gets sugars and other nutrients from it that can only be produced through the plant's photosynthesis, nutrients the fungus needs to be able to grow underground."

The challenge was to not only keep the conditions stable enough for both the plant and the truffles to grow, but also keep their intricate, necessary symbiosis in the experimental field.

In the beginning, about 30 kg (66 lb) of truffles were farmed per hectare (2.4

acres)—not enough to make the endeavor profitable. "So we came up with more ideas, and over the last three years, we jumped from 30–130 kg (286 lb) to 140–150 kg (330 lb) per hectare, so we are getting closer and closer to commercialization," says Sitrit.

According to his calculations, approximately 300 kg (727 lb) per hectare would be needed to make truffle-farming marketable in Israel, a goal that seems attainable.

But the professor's dreams are bigger than just making the delicacy available for Israeli foodies all year round. For him, the truffles also present an excellent opportunity to give Israel a new touristic feature.

Much as families can go cherry-picking or harvest strawberries on a sunny Saturday, truffle-hunting could become the next attraction. The truffles grow especially well in areas near Egypt's Sinai region, which are usually not very popular travel destinations. "But in the villages here, there is room for tourists. They can come with their families, take them to the fields, go truffle hunting—that's nice for kids and adults."

From May, 2019 Spore Prints

This latter article will definitely test any mushroom enthusiast's dedication to his/her hobby by inducing them to go to Israel for truffles!

# Calendar of Events

### Miniforays: (RSVP required)

Check our website (<https://ohiomushroomsociety.wordpress.com>) for more detailed information, last-minute additions or changes to this published schedule. Please plan to join us. All mini-forays are subject to cancellation. Call first to confirm.

Please bring a whistle and compass and an **RSVP to the host is mandatory so they have cancellation flexibility.**

Mini-forays are subject to change. Leaders will be checking the woods to assess their progress, so you should contact them at least a week prior to the announced mini-foray for any updates.

**Sunday, July 14, 1 p.m.**  
Central Ohio near Granville or Hocking Hills. Contact Shirley McClelland at (740) 215-5883 to register.

**Sunday, July 14, 2 p.m.**  
Scenic Vista public hunting area near Lisbon. Mushroom display and walk. Contact Walt Sturgeon at [mycowalt@comcast.net](mailto:mycowalt@comcast.net) to register.

**Sunday, July 28, 11 a.m. – 2 p.m.** Pickerington near Columbus. Contact Debra Shankland at [dks@clevelandmetroparks.com](mailto:dks@clevelandmetroparks.com)



to register.

**Saturday, Sept 7** at Caesar Creek State Park. Register at [mycowalt@comcast.net](mailto:mycowalt@comcast.net)

**Saturday, Sept 21**, afternoon time tbd. Near Wakeman. Register with Pete Richards at 440-774-3412.

**OMS 2019 Summer Foray** See pp. 1 & 2 of the May-June Log.

**OMS 2019 Fall Foray** at Dawes Arboretum near Newark on Oct 5 - 6. Details this Log pp. 1 & 2.

**Dick Grimm Memorial Banquet** Save Saturday, November 2, 6 p.m. for this great event located in Lancaster. More details will be in the next Log!

### Other Regional Forays

**July 19 - 21** Davis West Virginia  
<https://www.westvirginiamushroomclub.net/single-post/2018/10/11/2019WV-Mushroom-Foray-News>

**Aug 1 - 4** NEMF in Lockhaven PA  
<https://wpamushroomclub.org/events/nemf-foray/>

**Sept 26 - 29 Wildacres Regional Foray**, Wildacres Retreat, located just off the Blue Ridge Parkway near Little Switzerland, NC

**Saturday, Oct 12, 10 a.m. - 3 p.m. Krohn Conservatory Mushroom Fest**, Cincinnati, OH.

David Miller  
17402 Dorchester Drive  
Cleveland OH 44119  
[dmiller@oberlin.edu](mailto:dmiller@oberlin.edu)

**Articles for the next Log due Sept 1, 2019**

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Name:(printed) \_\_\_\_\_ Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Telephone: \_\_\_\_\_

Fax: \_\_\_\_\_ Email Address: \_\_\_\_\_

Enclosed please find check or money order (check one):

\_\_\_\_ \$15.00 annual family membership (newsletter via email and website only)

\_\_\_\_ \$20.00 annual family membership (newsletter via paper, email, and website)

\_\_\_\_ \$150.00 life family membership (newsletter via paper, email, and website)

My interests are: Mushroom Eating/Cookery \_\_\_\_\_ Photography \_\_\_\_\_ Nature Study \_\_\_\_\_ Mushroom  
ID \_\_\_\_\_ Cultivation \_\_\_\_\_ Other (specify) \_\_\_\_\_

Would you like to be an OMS volunteer? In what way? \_\_\_\_\_

How did you hear about our group? \_\_\_\_\_

May OMS provide your name to other mushroom related businesses? Yes \_\_\_\_\_ No \_\_\_\_\_

### **LIABILITY RELEASE AND PROMISE NOT TO SUE:**

I understand that participating in the activities of a mushroom club involves a moderate amount of risk. This includes all of the risks of being away from home, risks associated with moving about in fields and woods, risks of encountering inclement weather, risks involved in eating wild mushrooms, risks of losing personal property by theft or misplacement, and all other expected and unexpected risks, including illness or injury. While a member of the Ohio Mushroom Society; or as a non-member attending any event hosted by the Ohio Mushroom Society, I agree to assume total responsibility for my own safety and well-being; and that of any minor children under my care, and for the protection of my and their personal property. I release the Ohio Mushroom Society, its board members, club members, contractors, and any and all entities such as parks or preserves, or any private property owner who may host an Ohio Mushroom Society event, and all other persons assisting in the planning and presentation of any Ohio Mushroom Society event, from liability for any sickness, injury, or loss I or any minor children under my care may suffer during any event or as a result of attending or participating. I further promise not to file a lawsuit or make a claim against any of the persons or entities set forth above, even if they negligently cause me or my minor children injury or loss. I agree to hold the Ohio Mushroom Society harmless from any liability they may incur as a result of any damages to any property I may cause. This release and promise is part of the consideration I give in order to be a member of the Ohio Mushroom Society, or to attend any event which they host or attend, whether a member or a non-member. I understand this affects my legal rights. I intend it to apply not only to me but to anyone who may have the right to make a claim on my behalf.

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Return form and check or money order to: Ohio Mushroom Society, c/o Jerry Pepera, 8915 Knotty Pine Lane, Chardon, OH 44024

## 2019 Ohio Mushroom Society Volunteers

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Contributions of articles and ideas for columns are always welcome. Articles may be edited for length and content.

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