SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 615 October 2025

ANNUAL WILD MUSHROOM SHOW Derek Hevel

Here's a reminder that our 62nd Annual Wild Mushroom Show is on Saturday October 25 (noon–6 pm) and Sunday October 26 (10 am–5 pm) in the student union bldg. at Shoreline Community College, 16101 Greenwood Avenue North, in Shoreline. The show is a fund-raiser, a classroom, an eatery, a boutique, a garden, a laboratory, and a crafts project!

Lots of different activities will recharge your interest in mushrooms. There will be lectures on a variety of mushroom topics, mushroom cooking/tasting, photos of mushrooms, commercial vendors, arts and crafts, and a cultivation table where you can make your own oyster-mushroom growing kits. Check out the fluorescent mushrooms in the spooky glowing haunted house this year. All these activities help us introduce the public to the incredible diversity of mushrooms and other fungi.

To get more information about the show, go to the show page at psms.org and download the show PDF, which includes all the info you need to attend. We will post the PDF about two weeks before the show. Highlights of the PDF will be directions to SCC, parking info, admissions fees, lecture times, activities, and a feedback form.

Volunteering

A huge THANK YOU to all the wonderful people who have already signed up to volunteer to help with the show! You still have an opportunity to sign up to help. **Register on the psms.org member's page under "Event Registration" or email volunteers@psms.com for help registering**. Volunteer shift options are organized by committee first, then activity, and then by day and time. We cannot have a Wild Mushroom Show without your help, so please volunteer generously!

Collecting for the Show

The primary feature of the show is our wild mushroom display, which includes hundreds of mushroom species in as many shapes, sizes, scents, and colors as you can imagine. In order to create our display, we need everyone to get into the woods and bring back prime specimens of as many mushroom species as possible. If you hadn't noticed yet, fall mushrooms are starting to pop. Beginning the week of October 20, please collect and bring in every mushroom you can find. Here are some guidelines for doing that.

Where to Collect: Find mushrooms on your own or join an organized collecting group on Friday, October 24, (details on how to join a group will come out soon). Either way, if you collect mushrooms, forest duff, or moss for the show, *you can get into the show for free, so please register on the website in the "Collecting" categories at the bottom of the list of committees.* We strongly encourage members to forage far and wide to collect wherever mushrooms are around. In early October, experts have suggested collecting in the foothills of Mount Rainier, the Olympic Peninsula, and the Washington Coast, but it is impossible to predict when and where they will start fruiting. Also, don't forget those urban mushrooms! Look in lawns, gardens, and landscaping. And please remember to pay special attention to fluorescent mushroom species for the glowing haunted house; species include *Hypholoma fasciculare*, *Phaeolus schweinitzii*, *Cortinarius clandestinus*, and some *Gymnopilus* species. We're counting on YOU to make the display happen!

How to Collect: Before you go, stock up on plastic containers, foil, and wax paper bags to hold your specimens. Bring a garden trowel to dig if necessary to remove the entire mushroom intact, including underground structures. Then gently wrap each collection individually and put them in bigger cardboard boxes. Care for them all the way to the show because they must stay fresh and intact through Sunday. Store smaller specimens separately in their own container with moss or duff, and mist (but not soak) them to keep them fresh and colorful. For geotropic mushrooms (those that quickly reorient their gills toward the ground), including Amanitas, stand them upright in empty milk cartons so their stalks don't bend. Also, don't forget the little ones and the most common mushrooms, since everyone assumes someone else will bring them in. Better to have too many than none at all. Delicate inky caps should be collected on Friday or Saturday morning since they dissolve to ink so quickly. For the naturalistic displays, please also bring organic matter like duff, grass, leaves, bark, and moss. Include a few leaves from the nearest trees or grass for the grass-inhabiting varieties, both for ID and for the display.

Record Collection Details: Put all your finds from one location in one container and add a paper label with your name, phone number, and location. A slip of paper is enough! We ask for your name and phone number on the chance that a researcher may request further info, but the written location alone is invaluable. You can skip this step for edible species.

Drop Off Your Mushrooms: Show receiving is on Friday evening, October 24, after 4 pm and Saturday morning outside the student union at Shoreline Community College (enter the campus at the main southeast entrance and look for the PSMS signs). The receiving area will be clearly identified once you enter the campus.

Spore Prints

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CALENDAR

Oct. 4	Field trip (see PSMS website)
Oct. 6	Mushroom ID clinic, 4–7 pm, CUH
Oct. 11	Field trip (see PSMS website)
Oct. 13	Mushroom ID clinic, 4–7 pm, CUH
Oct. 14	Membership meeting, 7:30 pm, CUH (in-person only)
Oct. 17	Ben Woo Foray
Oct. 18	Field trip (see PSMS website)
Oct. 20	Board meeting, 7:30 pm, CUH board room Mushroom ID clinic, 4–7 pm, CUH
Oct. 21	*Spore Prints* deadline
Oct. 24	Setup for Wild Mushroom Show, CUH
Oct. 25–26	PSMS Annual Wild Mushroom Show, Shoreline Community College
Oct. 27	Mushroom ID clinic, 4–7 pm, CUH
Nov. 2	Field trip (see PSMS website)
Nov. 3	Mushroom ID clinic, 4–7 pm, CUH

BOARD NEWS — Valerie Costa

At the September meeting, the board discussed whether to resume or expand forays for outside groups. The central question was how to balance our public education mission with volunteer capacity, safety/liability, and fairness to PSMS members whose primary benefit is access to classes and field trips. There was broad agreement that if we engage with nonmember groups, it must be done on our terms, with clear standards that protect volunteers, maintain safety, and apply consistently.

The board unanimously approved the possibility of taking outside groups on forays, contingent on creating formal guidelines. The forthcoming draft should define when and why we partner with external organizations (including values alignment), how we schedule to respect limited volunteer bandwidth, what safety requirements apply, when certified identifiers are required, what liability/waiver standards we will accept, and how to handle donations or cost recovery without monetizing forays. The Policies & Procedures Committee may lead the drafting, with consultation from Identification and Safety. The draft will return to the board for review and a vote.

The Ben Woo Foray is on track but has not sold out yet. For the Wild Mushroom Show, outreach is underway and everyone was encouraged to hang posters and postcards. Mycophagy leads for the show are now confirmed, and we're on track for another great show!

MEMBERSHIP MEETING — Joseph Zapotosky

Discover the Fungi of the North:
Lecture & Book Launch for *Mushrooms of Alaska*

Join us for a special evening celebrating the release of *Mushrooms of Alaska*, the first comprehensive field guide dedicated to Alaska's astonishing fungal diversity. This groundbreaking book is authored by renowned mycologists Noah Siegel, Steve Trudell, and Kate Mohatt.

Date & Time:	Tuesday, October 14, 7:30 pm
Location:	Center for Urban Horticulture University of Washington
Admission:	Free & Open to the Public

Noah Siegel.

The event will feature a captivating lecture by Noah Siegel, who will share stunning photography, fascinating natural history, and insights gained from years of fieldwork across Alaska. Co-author Steve Trudell will also be in attendance to answer questions and sign books. (Co-author Kate Mohatt will be joining in spirit from Alaska!)

Mushrooms of Alaska is a must-have guide for mushroom enthusiasts, foragers, naturalists, and anyone curious about the hidden world of fungi in the Far North. Whether you're an experienced mycophile or just beginning to notice the mushrooms around you, this lecture will deepen your appreciation for these essential and mysterious organisms.

Noah is one of North America's foremost field mycologists. He has spent over three decades seeking, photographing, identifying, and furthering his knowledge about all aspects of macrofungi. He travels and lectures extensively across America, following the mushrooms from coast to coast.

Noah was the recipient of the 2022 North American Mycological Association's Award for Contributions to Amateur Mycology. His primary research interest is on the taxonomy and systematics of fungi.

He authored, along with Christian Schwarz, *Mushrooms of the Redwood Coast—a Comprehensive Guide to the Fungi of Coastal Northern California* and *Mushrooms of Cascadia*—a *Comprehensive Guide to Fungi of the Pacific Northwest*, as well as *A Field Guide to the Rare Fungi of California's National Forest*s.

Books will be available for purchase and signing after the lecture.

Don't miss this unique opportunity be among the first persons to have the opportunity to purchase this exciting new book and meet the authors. Please come join us to learn from the experts and celebrate the extraordinary fungal life of Alaska.

Note: **This event is in person only.** There is NO Zoom option. PSMS members who are unable to attend will have the opportunity to watch a recorded version of the lecture after the event for a period of 30 days. Details to follow.

HELP US CHOOSE A STATE MUSHROOM!

Conservation and Ecology Committee

Washington State has yet to adopt an official mushroom even though it has official symbols such as a state tree, bird, fish, gem, flower, and even a state dinosaur. Eight states have already chosen a state mushroom, including California, Oregon, Idaho, and Colorado. Though rich with fungal biodiversity, our state is behind.

The first step to an egalitarian process of choosing a state symbol often involves sending a survey to interested people to find the most popular choices. The next step includes narrowing down those choices to one species. Once the populace speaks, state representatives seek support, draft a bill, and eventually vote on it. The survey below is the first step.

Help us by filling out the short survey and suggest the worthiest mushroom. You can also share the link with other mushroomers. We will share results in a future *Spore Prints.*

Scan the QR code with your phone app or copy and paste the link to access the survey.

httpsnyurl.com/yc5nwc24

ELEMENTARY STUDENTS HOSPITALIZED AFTER EATING MAGIC-MUSHROOM CHOCOLATE GIRL TOOK FROM MOM'S FRIDGE, CHARGES SAY

WCCO Staff

https://www.cbsnews.com/, Sept. 16, 2025

A Wright County, Minnesota, woman is facing charges after police say two elementary school students overdosed on hallucinogenic mushrooms.

Court documents say a 6-year-old and another young girl were taken to the hospital last week. School staff says the girls started acting strangely after snack time. They later found a wrapper for a chocolate bar containing the mushrooms. One of the girls told police she took the chocolate from her mom's fridge.

During a search of the mother's apartment, charges say investigators found drug paraphernalia throughout the residence, including three glass pipes that field-tested positive for methamphetamine. The girl's mother, 39, was charged with one count each of fifth-degree drug possession, storing meth paraphernalia in the presence of a child, and child endangerment, according to a complaint filed Friday.

Court documents show the woman was recently placed on probation and ordered not to use or possess controlled substances.

BOZEMAN, MONTANA, SCIENTISTS PATENT NOVEL PROCESS FOR GROWING TRUFFLES IN A LAB

Isabel Hicks

https://www.bozemandailychronicle.com/, Sept. 23, 2025

With its distinctive earthy, chocolaty taste, the truffle fungus is as rare as it is valuable.

The elusive mushroom is one of the most treasured culinary delicacies in the world, on par with caviar and bluefin tuna in terms of its high-end reputation and price tag. Historically, people have used pigs and dogs to sniff out the valuable fungi, which only grow in specific geographic regions at the base of select trees.

But now, an expedited process for growing the treasured truffle is being homed here in Bozeman. A local mycologist and a retired Montana State University professor received a patent in August for a novel process of growing truffles in a lab.

The invention is significant for the wallets of truffle consumers, reducing the process of growing truffles from around 10 years to a matter of months and drastically increasing their affordability.

Gary Strobel, an MSU professor emeritus of plant pathology, partnered with Bozeman-based Black Boar Truffle Company to do the work that led to the patent.

"To our knowledge, no one in the world has used this method to grow these valuable fungi," said Strobel, who is 87.

Wild truffles are mostly found in southern Europe and the U.S. Pacific Northwest, attached symbiotically to the roots of trees, mainly oaks and hazelnuts. Cultivating truffles is possible but difficult, Strobel said, and involves inoculating a grove of trees

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LEUCOAGARICUS AMERICANUS AND A COMPARISON WITH THE GENUS *CHLOROPHYLLUM*

Brian S. Luther

Brian S. Luther

Leucoagaricus americanus in our ornamental beds here at Eagle Creek.

I recently spread composted steer manure on many of our ornamental beds to improve the soil and for mulch. Not long after doing so, I got a big flush of *Leucoagaricus americanus* in places it has never previously fruited in or around. In fact, I'd never seen it anywhere on our property before. It's well known that this species likes wood chips and mulch, so it's not surprising to find it fruiting in this situation. It's often found in eastern North America, but is infrequently or rarely seen on the west coast. It's common name is the American Parasol and it used to be in the genus *Lepiota*.

We have many species of *Leucoagaricus* here in Washington, but *L. americanus* is the only one that can be easily confused with the common species of *Chlorophyllum*. It's edible, so a careful comparison should be made when considering it for food. This species has a peculiar microscopic feature (cheilocystidia with a distinct narrow mucronate apical appendage) that separates it from all *Chlorophyllum* species, which I confirmed in this collection.

Brian S. Luther

Leucoagaricus americanus. Notice the gradually enlarged swollen stem base (*narrower above and below*) *and the yellow staining.*

The obvious outward differences are that *L. americanus* has a distinctive spindle-shaped enlarged stem (gradually becoming swollen, but narrower above and below the swelling), compared to *Chlorophyllum* species where the bulb is enlarged only at the very base of the stem. Also, *L. americanus* stains yellow at first where cut, bruised, or handled (then becoming darker) vs. *Chlorophyllum* species which stain reddish or orangish at first, not yellow. In addition, *L. americanus* often has a solid stem, whereas the species of *Chlorophyllum* have distinctly hollow stems at all stages. Because *L. americanus*, in particular, is so similar to some species of *Chlorophyllum*, I'm including a key to the species of *Chlorophyllum* to help you compare them and identify the differences between these look-alikes.

Quick Key to the Five Species of Chlorophyllum in Washington State

1. Fruitbody distinctly conical in shape at maturity and gastroid (puffball-like); cap not opening up like a regular mushroom and outer surface smooth or covered with creamy-whitish scales; not forming normal lamellae (gills) at maturity; stem without a distinct partial veil (ring) at maturity ..... *C. agaricoides*

1. Fruiting bodies not conical in shape, nor gastroid; with a normal cap, gills, stem, and ring; cap surface when mature with distinct darker scales or with a mat of radiating fibrils, but not smooth or with creamy-whitish scales 2

2. Gills distinctly green at maturity; spore print green; always growing in grass, sometimes in large fairy rings ..... *C. molybdites*

2. Mature gills varying from creamy to grayish or pale brownish at maturity, but not green; spore print creamy whitish; habitat normally forest duff, leaf litter, or compost, rarely in grassy areas 3

3. Cap surface at maturity with prominent brownish to blackish scales, distinctly separated on a much paler and contrasting creamy-whitish background; stem approximately the same length as cap diameter 4

3. Cap surface covered with a thick uniform layer of soft olivaceous-brown hairs that are radially arranged forming a complete mat, without large darker scales or contrasting colors; mature stem normally longer than the cap diameter ..... *C. olivieri*

4. Swollen and enlarged stem base prominently and abruptly squared-off (truncated), not gradually enlarged ..... *C. brunneum*

4. Stem base bulbous, but not with an abrupt squared-off bulb ..... *C. rhacodes*

Chlorophyllum agaricoides used to be in the genus *Endoptychum*, but DNA studies have proven it's a *Chlorophyllum*. When cut in half lengthwise, you can see that the gills are chambered, contorted, and undeveloped and don't look normal, so it's gastroid, or puffball-like. It's known to be edible when young, but I've never tried it, so I can't offer an opinion. This species is rare in Washington State and is only found and brought in once in a while.

Chlorophyllum molybdites is very common in the central and southern U.S. and in warmer climates around the world and is clearly poisonous to everyone if eaten. It's rare in Washington State; however, it's been gradually migrating in. Many years ago we never saw it here. However, it's been found in a couple of locations (Walla Walla and Everett areas) and may be more widespread than we realize. Only the very mature specimens of this species have green gills or give a green spore print, otherwise they could be confused with the others. Thus extreme caution is advised in being sure to separate this species from the others, if you're considering eating any.

Over the years the other three species in *Chlorophyllum* have been eaten by some, but none are recommended because a certain percentage of people simply don't tolerate them and can get mild to severe gastrointestinal upset after consuming them. Some people are able to eat them with no problems, but others not. You basically don't know if they'll agree with you without trying them, so it's best to totally avoid them. However, they are tasty if you can tolerate them. As PSMS ID Chair I never encourage folks to eat these species, but let them decide on their own. *Chlorophyllum rhacodes* and *C. brunneum* are nearly identical in stature and outward appearance, but differ as noted in the key.

All of these mushrooms (except *C. agaricoides*) are quite striking and often grow in large groupings. Except for the first two species in the key, they're frequently found and brought in for

ID in fall. *Chlorophyllum rhacodes* is also seen in many older books spelled *C. rachodes* and the three similar species (*C. rhacodes*, *C. brunneum*, and *C. olivieri*) have all gone by the common name of Shaggy Parasol.

As shown in this article, *Leucoagaricus americanus* strongly resembles three of the species of *Chlorophyllum*. So, I hope you've found this comparison helpful. In the past I've had members bring me *L. americanus* asking which species of Shaggy Parasol it was, only for me to correct them and tell them about the differences.

More complete and detailed descriptions of these species can be found in some popular mushroom field guides or online.

Growing Truffles in a Lab, *cont. from page 3*

with truffle spores that can take a decade to burgeon into the spherical fruits.

The complexity of the truffle fungus is why it's so difficult to grow in a lab, Strobel said.

"Because they are only found in soil, each truffle has its own microbiome of organisms associated with it, including various other soil fungi and bacteria," Strobel said. "That means isolating the pure truffle organisms is difficult because they exist in that rich microbiome."

But that challenge was one Strobel was determined to tackle. Starting at MSU in 1963, his extensive career took him around the world searching for novel fungi with medical uses for humans. He is one of the world's pioneers of endophyte biology, or the study of endophytes, which are microorganisms that live within plants without causing apparent disease.

Strobel wondered if one endophytic fungus he discovered more than 15 years ago, which is now used in antibacterial cleansers, might have another application for food science.

That fungus, named *Muscodor crispans*, or B-23 for short, was found by Strobel in a wild pineapple in the Bolivian Amazon rainforest. He discovered upon transporting the specimen that the fungus emitted a toxic, smelly gas that killed the other microorganisms in the same container. Indeed, B-23 demonstrated significant antibacterial and antimicrobial properties. It also happened to be a distant relative of the truffle fungus.

Breakthrough

Some years later, when Black Boar Truffles owner Kelly Gaisford approached Strobel, a family friend, for help with isolating the truffle fungi. He had an idea: perhaps exposing truffle tissue to the B-23 fungus would kill every organism inhibiting it from growing in a lab and leave only the pure truffle culture.

It worked.

The breakthrough first happened in 2022 after the now-retired Strobel conducted experiments in unused lab space at MSU and in the Black Boar Truffles facility. His work resulted in a product that can be ground up and sold as truffle powder, an ingredient that adds a rich truffle flavor to other foods.

"We spent so long—years—trying to find someone to isolate the truffle strain, and it was starting to feel impossible," said Gaisford, who approached a fungal strain bank in the Netherlands and previously worked with another scientist who developed a truffle culture that ultimately died in storage.

Isabel Hicks/for the *Chronicle*

Black Boar Truffles owner Kelly Gaisford and retired MSU professor Gary Strobel.

Strobel and Gaisford have spent the past few years refining the process for her business, with her sights set on expansion. In 2023, she secured an additional facility for Black Boar Truffles. The 7,200 square-foot space is on the outskirts of Four Corners, in the same complex as Aurore French Bakery.

So far, the scientists have isolated strains from seven different truffle species. The most popular products are the black winter truffle and the white alba truffle powders, which sell for around $480 and $600 a pound (that might sound like a lot, but one pound of a wild-harvested white truffle can cost over $3,000).

The company plans to produce around 5,000 lbs of truffle powder in 2026, to be sold to large global food brands. Many of the resulting products are sold at Whole Foods, Gaisford said, and have been used in everything from hot sauces to buffalo wings to goat cheese for Amaltheia, a local dairy in Belgrade.

Strobel is still involved in product development alongside production manager Aaron Sanchez. Much of his work these days involves identifying which substrates to grow the truffle strains on and which influence the flavor and can create unique end products.

Typically grown on grain, Strobel is experimenting with using substrates such as garlic, fruit, and even mustard seed to create new products.

The Growing Process

The facility features a collection of rooms for a different part of the growing process, which the scientists explained step-by-step.

To start the process, Strobel breaks open a freshly harvested truffle. He then places truffle tissues on a Petri dish around a small cup with one drop of the B-23 solution. From there, the tissues are left for several weeks while the gases emitted from the B-23 cup kill the other microorganisms naturally found within truffles.

The result is a pure truffle culture, free from any contaminants.

Spores from the pure culture are then placed in plastic, air-tight "grow bags" filled with substrate, which is the organic material that fungi break down as their mycelium, or roots, colonize their environment. The grow bags are kept in a dark, temperature-controlled room where they sit for about six weeks as the truffle cultures mature.

From there, the truffle fungi are harvested and dried in a low-temperature oven. Then the dried fungi are ground into a fine powder

cont. on page 6

Growing Truffles in a Lab, *cont. from page 5*

in a room with 20-foot high ceilings to mitigate the resulting dust. Strobel said sometimes people criticize the powder as not being from "real" truffles, but he said genetically the products are identical and the main difference is eating dead cultures versus alive ones, without any exposure to other bacteria or organisms.

From start to finish, the process takes around two months. The resulting product is akin to cocoa powder in large plastic bags. Each of the 10-lb bags can be worth around $6,000, Gaisford said.

The process of isolating the truffle fungus with B-23 is now patented, but the scientists are still working to copyright every part of that process. It's an exciting time to do this work, Gaisford said, as more chefs, brands, and consumers become intrigued by the allure of truffles…previously available only to society's elites. She often attends ingredient shows across the country to expose people to the product.

"We found a way to make these wonderful truffles widely available to everyone and that's what we will continue to do," Strobel said.

HE CROSSED 26 MILES IN A KAYAK MADE FROM MUSHROOMS

Lisa Kwon

https://www.theguardian.com, Sept. 7, 2025

On a clear, still morning in early August, Sam Shoemaker launched his kayak into the waters off Catalina Island and began paddling. His goal: to traverse the open ocean to San Pedro, just south of Los Angeles, some 26.4 miles away.

Jordan Freeman/Courtesy of Sam Shoemaker

Sam Shoemaker in a kayak made entirely from mushrooms in the waters off Catalina Island, California.

But upon a closer look, Shoemaker's kayak was no ordinary kayak. Brownish yellow and bumpy in texture, it had been made—or rather, grown—entirely from mushrooms. His journey, if successful, would mark the world's longest open-water journey in a kayak built from this unique material.

With his phone, GoPro camera, walkie talkie, and a compass affixed to his life vest, Shoemaker left shortly before 6 am in order to avoid the worst of the swells in the forecast. But three hours in and powering through his ninth mile, the coastline still out of sight, Shoemaker began feeling seasick.

Suddenly, he heard the sound of a large animal breaching the waters. To his left, a fin whale flashed its glistening tail, then trailed slowly behind him. As the 50-ft creature followed him for three more miles, Shoemaker found the strength to finish out the maiden voyage.

"It was just like a psychedelic experience," he says of the crossing, which took him 12 hours.

As he stumbled onto shore with his mushroom kayak still intact, the artist and mycologist embraced his friends and family. All of them hoped this voyage would usher in a new wave of curiosity about the unconventional fungus material, which Shoemaker and others argue is a more environmentally-friendly option than the plastics that are used extensively in boats and other aquatic recreation.

From Gallery Walls to Open Sea

Shoemaker began his career as an artist creating sculptures with propagated mushrooms. Upon returning to Los Angeles after graduating from Yale with an MFA in 2020, he began exhibiting artwork that captured the unique behavior of mushrooms as they grew out of hand-built ceramic vessels and blown glass.

Eventually, his interests grew beyond the gallery walls. Shoemaker now belongs to a small community of scientists and artists exploring the potentiality of fungal innovation as an alternative material that could be used in everything from kayaks and buoys to surfboards.

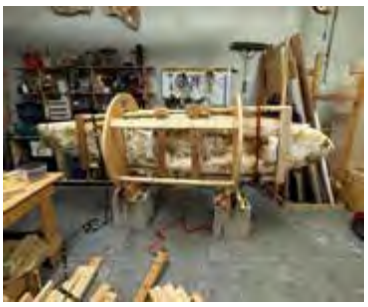
Their focus is on mycelium—the network of threads that support the growth of fungi, i.e., mushrooms. Though it tends to do the brunt of its work underground or in a substrate, it is a pivotal connective tissue in the animal kingdom. Mycelium-based materials in an aquatic context are known as AquaFung, a term coined by Shoemaker's mentor Phil Ross, an artist and the co-founder of a biotechnology company called MycoWorks that engineers mycelium-based materials including a mushroom "leather" that can be used in furniture, handbags, and biomedical equipment. After cofounding MycoWorks, Ross cofounded Open Fung, a nonprofit advancing the future of fungi-based technologies, materials, and the arts.

Ross argues that AquaFung has many of the appealing properties as plastic—such as being lightweight and buoyant—but without the harmful footprint. "People hate Styrofoam plastics in the water washing onto shore," says Ross. "[AquaFung] is biodegradable. It acts a lot like the material that everyone seems to hate."

Growing the Kayak

Shoemaker began working on his first mycelium boat in 2024 with harvested wild *Ganoderma polychromum* mycelium outside his Los Angeles studio. He modified a used fishing kayak to serve as his fiberglass mold, then grew the mycelium network inside the mold, which held over 300 lbs of inoculated hemp substrate to support the cultivation. After propagating the mycelium for almost four weeks, Shoemaker meticulously dried the resulting kayak composite structure using fans over the course of several months.

After incubation, the dried mycelium exhibits a strong, hydrophobic material. To the touch, it feels rough and durable, like cork. And it



Jordan Freeman/Courtesy of Sam Shoemaker

Mushroom kayak in the making.

doesn't keep the same consistency in color and texture throughout—a testament to the mushroom's wildness.

Confident in his prototype, Shoemaker began searching for appropriate support.

Shoemaker met Patrick Reed, the lead curator of the Pasadena-based arts organization Fulcrum Arts, in December 2023 through mutual friends. After a studio visit, Reed was blown away by everything that the artist had to show him, fondly remembering their conversation to be "incredibly exciting and stimulating." It aligned with Fulcrum Arts' mission to support artists pursuing social change at the intersection of art and science, and the pair entered into an official collaboration in early 2024.

Shoemaker completed his second mushroom boat in June; grown from the same wild *Ganoderma polychromum* mycelium, the kayak was propagated on over 520 lbs of a hemp hard substrate packed inside a new fiberglass mold. Shoemaker allowed the boat to grow over six weeks, then took another three months to dry it. At 107 lbs, the new kayak is three feet shorter, but 50 percent larger by volume for more buoyancy and stability. It also featured a keel to improve tracking and rigidity.

The community of AquaFung enthusiasts, spanning mycologists, artists, fisherman, farmers, and hobbyists alike, is vigorous but nascent. The completion of Shoemaker's boat marks the second ever water-tested mushroom boat to be made after Katy Ayers, who holds the Guinness World Record for growing, then testing, what was then the world's longest fungal mycelium boat on a Nebraska lake in 2019.

"A lot of people really didn't think it was possible," says Ayers, who grew her boat after being inspired by a documentary called Super Fungi. "I had reached out to companies who actually make the biomaterials, and their spokespeople weren't confident in it working, but I was confident and naive enough to give it a shot and figure out what the shortcomings were."

HOW WILDLIFE IS RETURNING TO RESTORED HEATHLAND

Jon Cuthill

https://www.bbc.com/, Sept. 15, 2025

A new study of recently restored heathland has found species are returning faster than expected. The specialist habitat will take decades to establish fully, but the project has identified more than 70 different species already thriving.

Forestry England has restored 170 hectares of heathland in the New Forest since 2019 with a further 190 hectares planned over the next 5 years. The work follows a devastating year of heath fires across the South which has seen hundreds of hectares lost.

The survey examined three separate restoration sites in the New Forest over a two-year period. Amongst the wildlife recorded were 22 nationally uncommon or threatened species of birds, reptiles, bats, insects, and fungi.

The tiny Nail Fungus, *Poronia punctata*, which grows only on the dung of ponies that have lived on a high-fiber, low-nutrition diet, was among the species found. The New Forest is one of the few places in Great Britain where it grows, and lowland heath is the perfect habitat.

BBC

Tiny nail fungus, Poronia punctata.

"We've probably got the most lowland heathland across all of Europe in the New Forest" says Leanne Sargeant, a senior ecologist with Forestry England. "So it's really important that we protect it and we restore as much area as we can." "Conifer supports some species but they're very few. But the lowland heathlands supports a vast array of species."

The importance of these areas of biodiversity is one of the key reasons for the New Forest's designation as a Site of Special Scientific Interest (SSSI).

In 1905 less than 5 percent of the UK's land area was covered by woodland. The Forestry Commission was established in 1919 to create a strategic timber reserve following the First World War after supplies ran short. It led to vast swathes of conifer plantations being established, including in the New Forest.

Although timber production was boosted, the single-species sites saw a fall in biodiversity, something the restoration program hopes to address.

Today it is estimated woodland covers 13 percent of the UK's total land area (3.24 million hectares).

The independent survey of the recently restored heathland has been carried out by Wild New Forest and the New Forest Biodiversity Forum. Director of Wild New Forest, Professor Russell Wynn said: "Within 1 to 2 years we've got an assemblage here now that is pretty characteristic of lowland heathland."

"It's going to take years for it to really restore back to absolutely top quality heathland but it's on it's way and it's going really quick," says Wynn. "And that was a real pleasant surprise just how fast it's starting to recover."

The restoration work by Forestry England has also seen artificial drains filled in and former plantations opened up for grazing by ponies and cattle.

Remaining enclosures are being thinned and native trees planted to boost biodiversity.

"Restoring heathland takes many years so it is incredibly encouraging to see over 70 different species already returning" said Sargeant. "It just shows how nature can thrive again given a little bit of help."

ENGINEERS GROW EDIBLE PLASTIC FROM WORTHLESS WASTE USING BLACK YEAST-LIKE FUNGUS

Georgina Jedikovska

https://interestingengineering.com/, Sept. 22, 2025

A new German startup has recently come up with a groundbreaking way to turn industrial waste into high-value, sustainable materials by using a yeast-like black fungus [species unspecified].

cont. on page 8

Edible Plastic from Waste, *cont. from page 7*

The Jena-based company was founded as a spin-off from the Leibniz Institute for Natural Product Research and Infection Biology (Leibniz-HKI). It was prompted by the Circular Biomanufacturing Challenge organized by the Federal Agency for Breakthrough Innovations, SPRIND.

Their process could potentially decarbonize the chemical industry, which is widely regarded as one of the most polluting sectors around the world. The industry is responsible for about 5 percent of global CO_2 emissions.

"SPRIND has given us momentum—in content, finance, and strategy," Lara Regestein, Biophelion's future CEO, revealed.

A Fungus with Industrial Potential

The innovative process harnesses the extraordinary metabolic flexibility of a black yeast-like fungus to convert industrial waste into valuable materials. Black yeast-like fungi are unique because many inhabit strange, extreme, poor, or toxic environments.

The fungus is reportedly capable of breaking down carbon-rich waste streams produced in large volumes during bioethanol production, sugar processing, and paper manufacturing.

Instead of allowing the embedded carbon to escape into the atmosphere as CO_2, the microorganism transforms it into useful compounds, thus closing the carbon loop and turning pollution into production.

According to Biophelion, the black yeast produces three crucial compounds from waste materials. These include a bio-based polyester for future packaging and the edible polymer pullulan already used in food, as well as a novel surfactant still under investigation.

Unlike traditional chemical processes, which often require high energy input and generate harmful byproducts, the startup's biotechnological approach is designed to be clean, efficient, and circular.

"Biophelion is specifically developing applications that are not yet conceivable today—we are breaking new ground with pullulan and our surfactant molecule in particular," Till Tiso, one of the startup's founders and future CTO, stated.

Rethinking Plastic

Instead of focusing on just existing applications, the startup is currently exploring new uses for its materials. At the moment, they are investigating if they could use pullulan as a 3D printing material.

As such, it would potentially replace petroleum-based plastics in fast-growing additive manufacturing sectors. In the long term, the team imagines producing 3D-printed bioreactors for the circular bioeconomy from pullulan. This would allow the fungus to produce the final product and its own production environment.

Surfactants, on the other hand, are mass-produced and widely used in detergents and dishwashing liquids. They frequently end up in wastewater and pollute the environment. This is why biologically produced and therefore easily degradable alternatives are an important contribution to reducing the ecological footprint.

The startup is based at the BioInstruments Center on the Beutenberg Campus in Jena, steps away from Leibniz-HKI. The proximity to the institute will enable close scientific collaboration as the company scales its operations and continues optimizing the fungus-based processes.

ALIEN LIFE OR DEADLY FUNGUS? TIKTOK'S "PANAMA METEORITE" CLIPS SPARK GLOBAL CONCERN OVER VIRUS THREAT **Crisnel Longino**

https://www.ibtimes.co.uk/, Sept. 16, 2025

[abridged] A short silver "rock" found in a Panamanian crater has set the Internet on fire. TikTok clips show the object oozing greenish-yellow slime before sprouting black tentacles, sparking wild speculation over whether it is alien life, a lethal fungus, or just a clever hoax.

TikTok/@kinpanama

Alien life or fungus?

Scientists insist the most likely culprit is a common stinkhorn fungus. Social media users, however, fear the samples could be hiding something far more sinister. Clips of the phenomenon have racked up millions of views and sparked panicked commentary online, with some viewers even speculating the growth could carry a novel virus.

Skeptics on Reddit and X have offered alternative readings: some argue the object is an ordinary tuber or root painted silver; others suggest staged lighting…or even AI-assisted editing. As red flags, observers pointed to inconsistencies in the uploader's footage—abrupt camera cuts, odd editing, and the absence of third-party verification.

STUNTZ MYCOLOGY FUND GRANTS

Oliver Filialuna

The Stuntz Mycology Fund is looking to provide financial support for mycological research and education in the Pacific Northwest (PNW) this fall. If you have a project with a geographical focus on the PNW and/or need funding for equipment and supplies for research, travel fees, materials for teaching, or fungarium fees, please consider applying.

Required materials include a proposed budget, one or two reference letters, and a cover letter explaining your work.

Deadlines: October 1st and March 1st
Average grant size: $1000–$6000

If you missed the deadline October 1st for our larger grant, please note that we accept requests of less than $1000 at any time.

For more information, please visit our website at https://stuntzfund.org/grants/ or contact us at Grants@stuntzfund.org