SPORE PRINTS

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NEW TECHNIQUE TO MEASURE PSILOCYBIN POTENCY OF MUSHROOMS

Katherine Egan Bennett
https://www.uta.edu/, Mar. 18, 2024

Since the 1970s, the federal government has listed the active ingredients in mushrooms—psilocybin and psilocin—as illegal and having no accepted medical use.

However, in recent years, medical professionals have found that these substances are safe and effective for treating stubborn conditions such as treatment-resistant depression and post-traumatic stress disorder. Some jurisdictions now allow for the medical use of mushrooms, while others are considering permitting or at least decriminalizing their recreational use.

Clinicians now find themselves needing to carefully measure the doses of mushrooms to ensure patients receive the proper amount during treatment. To solve this problem, University of Texas-Arlington researchers have created a method to determine the clinical potency of psilocybin and psilocin in the hallucinogenic mushroom species *Psilocybe cubensis*.

Psilocybe cubensis.

"These legislative changes are expected to facilitate further research and potential clinical applications," said Kevin Schug, the Shimadzu Distinguished Professor of Analytical Chemistry in the Department of Chemistry and Biochemistry.

Using liquid chromatography with tandem mass spectrometry, Schug and colleagues were able to extract and measure the strength of the mushrooms, according to findings published in the February issue of *Analytica Chimica Acta*. Co-authors included colleagues at Scottsdale Research Institute in Phoenix; Shimadzu Scientific Instruments in Maryland; and Millipore-Sigma in Round Rock, Texas. The results were then compared with two separate labs to ensure accuracy.

"As medical professionals identify more safe and effective treatments using mushrooms, it will be important to ensure product safety, identify regulatory benchmarks, and determine appropriate dosing," Schug said. "Established and reliable analytical methods like the one we describe will be essential to these efforts to use mushrooms in clinical settings."

RARE FUNGUS TO BE MOVED FROM SCOTLAND TO ENGLAND IN HOPES TO SAVE SPECIES

https://www.theguardian.com/, Mar. 25, 2024

Fingers of a critically endangered fungus will this week be removed from its last sites in Scotland and fixed to trees in three woodlands in England to save it from extinction.

The willow gloves fungus (*Hypocreopsis lichenoide*), which resembles the fingers of washing-up gloves and grows on dead trees, is found only in two woodlands, and the vast majority is living on just one fallen tree.

Chris Knowles

Willow glove fungus [*Hymenochaete tabacina*]. *The vast majority of this fungus is living on just one fallen tree in the Scottish Borders.*

Mycologists will carefully remove sections of dead wood, as well as some fruiting bodies of the fungus in the Scottish Borders, and hurry them to Cumbria in a single day, where they will be tied to trees in three receptor sites.

The pioneering translocation is uniquely complicated because willow gloves is a parasite that lives off the tiny aerial filaments of another fungus, willow glue [*Hymenochaete tabacina*], which mostly resides inside decaying willow wood.

Matt Wainhouse, fungi and lichen senior specialist for Natural England, said: "We have a responsibility to all species in this country to ensure they have a future and fungi are no different. This is a species that is hanging on by a thread.

"This is a really exciting chance for us to start learning about how we can bring this species back and … out of its threatened status."

The three receptor sites are all protected sites of special scientific interest, and Cumbria was where the fungus was last recorded before its extinction in England about 50 years ago. The woods, including Finglandrigg Wood national nature reserve, have been chosen because they have plentiful supplies of decaying wet willow wood and its willow glue host.

Moving willow gloves to more sites—without endangering the remaining population at its Scottish strongholds—will greatly increase the resilience of a species that could easily be wiped out at a single location by a tree disease or the accidental removal of deadwood.

It is not yet known how to maximize the chances of the translocated willow gloves fungus successfully latching on to the hyphae of the willow glue, but the Natural England project, funded by the government's species recovery program, will test different methods.

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CALENDAR

Apr. 9	Membership meeting, 7:30 pm, CUH
Apr. 23	*Spore Prints* deadline
Apr. 27	Field trip (see psms.org members' page)
May 4	Field trip (see psms.org members' page)
May 10–12	Field trip (see psms.org members' page)
May 24–27	Field trip (PSMS volunteers only)

BOARD NEWS

Carolina Kohler

Our virtual meeting room was full of new faces this past Monday, when President Colin Meyer welcomed the newly elected trustees and alternates, albeit as spectators for now, at our board meeting March 18. This gave us all a chance to get to know each other a little better, and was a great opportunity for the new members to see what a board meeting looks like. We are eager to see them again next month, when they rejoin us in their full capacity as trustees!

First on our agenda was the customary approval of the minutes and the treasurer's report presented by Brenda Fong, after which the board moved on to discuss the final stages of our lease renewal at the CUH. PSMS will be leasing a larger room just a few steps away from our current office, with an abundance of much-needed storage space. The move is only a few weeks away and will be a fantastic opportunity to go through the wealth of PSMS materials currently stored in our office space and reorganize them to make them more accessible.

This was followed by a thoughtful conversation regarding the Burke Museum, the Stuntz Foundation, and the potential role PSMS could be playing in supporting a mushroom-specific position to manage the Burke Herbarium's mycology collection. The urgency of this type of action was made clear by the recent sobering news of the imminent closure of the Duke Herbarium, and PSMS board members feel this should be an important part of our future discussions. This issue has a lot of moving parts, and we look forward to hearing more from the parties involved.

On a more celebratory note, PSMS's 60th anniversary is quickly approaching, and Joe Zapotosky gave the board a quick preview of the special program that we will be enjoying at the May membership meeting. This will include, among other things, a presentation by the Stuntz Foundation. Mark the date on your calendars!

Closing the meeting, Pei Pei Sung updated the board regarding five new scholarship applications that were recently received, and Randy Richardson announced he will be looking for collaborators to aid him with the "Harvesting Rules Update" project. Let him know if you are interested!

April is here, and that means our spring field trip season is around the corner. See you all on the trails!

MEMBERSHIP MEETING

Scott Maxwell

Dr. Cazares.

The membership meeting on April 9, 2024, will be a "hybrid" meeting, both in-person at the Center for Urban Horticulture and virtual on Zoom. We will start letting people into the CUH meeting hall at about 7:00 pm and into the Zoom meeting at about 7:20 pm. The meeting will begin at approximately 7:30 pm. This month we will be focusing on one of the more beautiful members of our spring fungi, *Ramaria*. If you have wondered about the details of this Basidiomycete which looks in some ways like a marine coral, this is the lecture to attend. Efren Cazares, a *Ramaria* expert, will be sharing with us virtually on Zoom and provide you the opportunity to ask some questions about these interesting fungi. Prior to the lecture, we will also be conducting some PSMS business and making announcements that will be important to the membership. This will include transitioning from myself to our new Vice President, Joe Zapotosky. Please attend, be informed, and prepare for the upcoming Spring season.

Dr. Cazares' presentation is entitled "The Genus *Ramaria* of the Pacific Northwestern United States." He will talk about *Ramaria*'s history, taxonomy, morphology, and ecology. To aid you in identifying the various species of *Ramaria*, he will provide key characteristics to distinguish one from the other.

Efren Cazares-Gonzalez is a mycologist who specializes in mycorrhizal fungi. He obtained his PhD in the Dept. of Botany and Plant Pathology at Oregon State University in 1992. He was a Professor at [the] Technological Institute at the University of Tamaulipas in Ciudad Madero, Ciudad Madero, Tamaulipas, Mexico, from 1993 to 1995. He was also an Assistant Research Professor at Oregon State University from 1995 to 2007. He founded MycoRoots, a consulting company dedicated to increasing the knowledge about and the benefits of mycorrhizal fungi and their ecology. He provides fungi assessment and management services to individuals and companies including private land owners, mycorrhizal fungi inoculant producers, plant nurseries, farmers, other environmental consultants, plant restoration companies, landscape architects, and golf course management, to name a few. He is a taxonomy expert on coral fungi and truffles for the US Forest Service and US Department of Agriculture. As a teacher, researcher and author, Efren has been published in peer-reviewed journals and lectured in international forums.

2024 GOLDEN MUSHROOM AWARD

Scott & Marian Maxwell

The Golden Mushroom Award is given for a lifetime of service to PSMS. In addition having their names is inscribed on the PSMS Golden Mushroom plaque and receiving a lifetime membership to PSMS, winners receive a new, gold-colored "golden mushroom" PSMS badge.

Jamie Notman with the PSMS Golden Mushroom plaque.

This year's award goes to Jamie Notman. Jamie and joined PSMS in 2000. Being a chef, he found that his skills were sought after to help out with mycophagy at the annual mushroom show. It wasn't long before he became the Mycophagy Committee chair, a position he held for over 10 years. In addition he chaired the PSMS spring event Mushroom Maynia for several years.

The mycophagy at the show requires extensive planning and effort in addition to physical labor transporting all that is necessary for the cooking. He had to find a work around for refrigerating foods since many of our locations didn't have or didn't allow use of the facilities refrigerator. He also had to find work arounds for dish washing capabilities while maintaining a standard acceptable to the health dept. Jamie did an amazing job of providing tasty morsels to the public coming to our show and to Mushroom Maynia. He chaired the Survivors Banquet several times and served on the PSMS board from 2006 to 2010.

On behalf of PSMS and the PSMS board, thank you for your years of volunteering, Jamie!

Willow Gloves Fungus, *cont. from page 1*

These include removing whole twigs containing willow gloves and willow glue, according to Chris Knowles, the mycologist who is leading the operation.

The other main techniques to be tested are taking whole specimens of willow gloves and fixing them to new deadwood locations with plant-grafting tape and also moving the fingertip fragments of old fruiting bodies of willow gloves.

Knowles said: "A lot of people ask, why put all this effort, time and money into rescuing it? It seems to be the right thing to do to conserve and protect it, just as we would if it was a mole or a pine marten.

"It's a stunning, almost unique-looking fungus with an incredibly niche lifestyle. It is so interesting, exciting and not fully understood yet that it would be a terrible thing to lose."

According to Wainhouse, it has traditionally been difficult to persuade conservationists—let alone the general public—to care about endangered fungi, particularly species that live off dead wood because they are seen as "diseases" or threats to tree species. But he said those attitudes were changing.

The translocation and the relative success of different techniques will be monitored by volunteers from Cumbria Fungi Group for at least five years.

MICHIGAN TECH STUDENT USING NATIVE FUNGI TO WEAKEN INVASIVE TREES

Cyndi Perkins

https://www.mtu.edu, Mar. 20, 2024

Abe Stone can expertly identify mushrooms. The longtime forager's affinity for fungi has guided him down a research path that holds promise for suppressing one of the most recent and obstinate invasive species in the forest.

On a metal counter in Michigan Tech's forest microbiology lab, a dozen clear glass flasks agitate on a shaker. Each is about one-eighth full of small, saffron-yellow gelatinous balls—solid globs of the fungus *Chondrostereum purpureum* growing in a malt-extract solution. Abe Stone, propagator of the mycelium, stands nearby, regarding the fresh batch of fungi balls with a satisfied smile.

"Exactly what I wanted to see," he says.

Chondrostereum purpureum—lab nickname "SuperPurp," a word twist that fans of the animated TV series "Adventure Time" may appreciate—is a weak forest pathogen commonly known as silverleaf disease. Stone developed his unique propagation technique after digging into online research literature in search of a more efficient way than his former means that resulted in cafeteria-style metal pans of gloppy mush.

"Abe has interesting lab techniques for growing different types of culture," remembers Tara Bal, assistant professor of forest health and one of Stone's faculty advisors in the College of Forest Resources and Environmental Science (CFRES). "One day he came very excitedly to show me the fungus growing in a new method he found in the literature, which creates these cute little balls of hyphae."

Cultivating SuperPurp as Stone does makes it easier to process into a sprayable liquid. Stone uses an immersion blender to whir the solution to the proper viscosity, then pours the broth into a garden-variety sprayer used for application in outdoor test areas.

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RESUPINATE FUNGUS OF THE MONTH:
A new relative of Piloderma fallax

©Brian S. Luther

Piloderma fallax is a common resupinate found worldwide in temperate forested regions. Even mycophiles who aren't interested in or aren't looking for resupinate fungi notice this species once in a while because of the strikingly brilliant yellow color of the mycelium. As with almost all resupinates, it's usually found on the underside of woody debris which it decays. You'd normally find it by looking under sticks, rotting wood, and other forest litter. But, this species also often extends onto the surface of the surrounding forest duff and becomes outwardly visible.

I thought I'd found *P. fallax*, so I was surprised when I examined it carefully microscopically and found some features that didn't fit that species or others in the genus *Piloderma* in the literature. I've provisionally named this new species *Piloderma cypressensis*.

In the following paragraphs, I describe this new species, compare and contrast it with *P. fallax*, and provide a key to North American *Piloderma*. I also touch on similar bright yellow resupinate fungi.

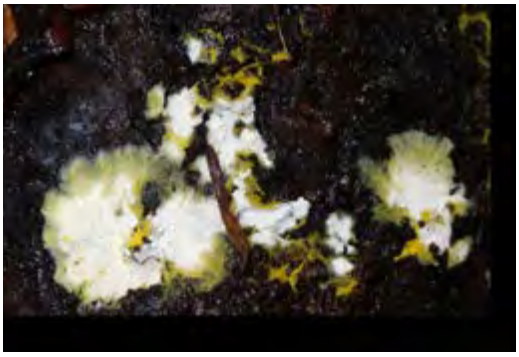
Species Description

Piloderma cypressensis B.S. Luther nom. prov.

Collections studied: BSL coll. # 2011-48-17; BSL coll. #2014-1112-10; BSL coll. #2016-121-15.
Cypress Island, Skagit Co., WA

Basidiocarp

Resupinate, very soft and cottony at first, becoming submembraneous, loosely attached to the substrate on woody debris or forest duff, up to 1 mm thick; margin mostly distinctly rhizomorphic, but abrupt and undefined in places; hymenophore smooth to slightly roughened, starting out creamy-yellow (Straw Yellow), but maturing to creamy-white or bright white; rhizomorphs, rhizomorphic margins, and mycelium are all brilliant yellow (Lemon Chrome to Lemon Yellow) to bright sulphur yellow (Picric Yellow), thus overall giving a distinct contrasting bi-colored appearance to the mature fungus (see photos). Colors in parentheses are from Ridgway (1912).

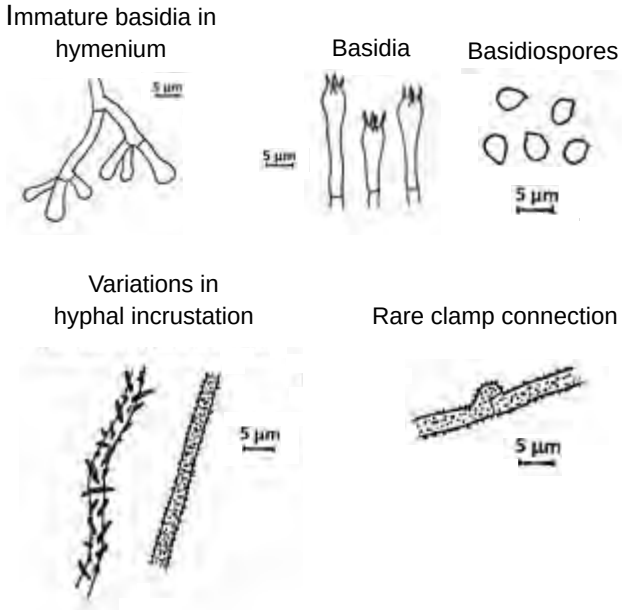


Piloderma cypressensis nom. prov. BSL coll. #2016-121-15.

Piloderma cypressensis nom. prov. BSL coll. #2016-121-15. Sterile mycelium and rhizomorphs on forest duff.

Microstructures

Hyphal system monomitic; hyphae 2–3.5 µm wide, thin to slightly thick walled, hyaline but pale yellowish in mass; hymenial and adjacent subhymenial hyphae either not incrusted or slightly incrusted with various shaped crystals; subicular or basal hyphae with rare clamp connections as well as abundant acicular (needle-like) or dense granular crystals throughout; rhizomorphic hyphae parallel, densely arranged, coarsely granular incrusted overall and yellow-brown in Melzer's reagent. Cystidia none. Basidia 12–20 × 4–5 µm, clavate and distinctly apically subcapitate, without a basal clamp connection, four sterigmate, the sterigmata up to 4.5 µm long. Basidiospores 2.5–3.5 × 2.5–3 µm, subglobose, hyaline to pale yellowish, but more highly colored in mass, slightly thick walled, smooth, inamyloid (neither amyloid or dextrinoid), and with one large central guttule.



Habit & Habitat

All of the collections I studied here were found on woody debris and forest duff in a mixed conifer forest, with Douglas Fir (*Pseudotsuga menziesii*), Western Hemlock (*Tsuga heterophylla*), Grand Fir (*Abies grandis*), and Western Red Cedar (*Thuja plicata*) at or near sea level. Other species of *Piloderma* can also be found growing on hardwood debris (Lindsey & Gilbertson, 1978; Ginns & Lefebvre, 1993). Only a few species of resupinate fungi are known to be mycorrhizal, and *P. fallax* is one of them (Eriksson, et al. 1981; Kropp & Trappe, 1982).

Classification hierarchy for the genus *Piloderma*

Kingdom Fungi
Division Basidiomycota
Class Agaricomycetes
Order Atheliales
Family Atheliaceae
Genus *Piloderma*

Discussion

The collections of *Piloderma* described here are very similar overall to *Piloderma fallax*, but differ notably in having subcapitate or capitulate basidia and possessing infrequent clamp connections in the subicular or basal hyphae. As a result I've given

my collections the provisional name *Piloderma cypressensis*. A DNA sequence comparing the two would be required to confirm this as a new species.

The basidiocarps on *P. fallax* and my collections described here vary slightly in color when immature, but both have a distinctive bi-colored appearance when mature, with the fertile hymenium white or bright cream colored and having contrasting brilliant yellow margins, rhizomorphs, and mycelium. These two fungi are known to grow and spread not just over woody forest debris, as mentioned earlier, but also partially over rocks, ground covers or anything else in the way. Also, being mycorrhizal, their source of nutrition is not just dead organic matter.

It's common for me to find extensive areas covered with mycelia of both *P. fallax* and *P. cypressens*is nom. prov. that, being immature, are all sterile and uniformly brilliant in color. It's curious that we're able to collect sterile mycelium from these two fungi and still confirm that they're species of *Piloderma* because of a unique feature—the pronounced and heavy granular incrustation on the rhizomorphic hyphae, allowing us to identify them from patches of sterile mycelium, without having fertile tissue. Because there is other yellow mycelium out there not belonging to these fungi, it's a way of determining them without having fertile, spore bearing samples.

Eriksson, et al. (1981) say that the basidiospores of the genus *Piloderma* are "often somewhat dextrinoid." However, the specimens I've examined do not react with Melzer's reagent in any way that I would consider dextrinoid. Even in clear mounting medium such as KOH, NH4OH, or water, the spores in mass are colored pale yellowish or reddish-brown. Other authors such as Lindsey & Gilbertson (1978), Breitenbach & Kranzlin (1986), Hansen & Knudsen (1997) and Bernicchia & Gorjón (2010) state that the spores are inamyloid and not dextrinoid.

Lindsey & Gilbertson (1978) provide a description and line drawings of *Piloderma fallax*, but under the name *Athelia bicolor*. Eriksson, et al. (1981) have an excellent description, line drawings, and SEM (scanning electron microscope) photos of this species but under *P. croceum*. Breitenbach & Kranzlin (1986) have a good description, line drawings and a color photo of this species, also under *P. croceum*. Hansen & Knudsen (1997) provide a key to three species of *Piloderma* as well as a basic description of *P. fallax*. Bernicchia & Gorjón (2010) provide a key to seven species of *Piloderma*, but have descriptions and line drawings for just three of them, including *P. fallax*, as well as giving an excellent color photo of it.

Other brightly colored resupinate fungi that could be confused with these two species include *Phlebiella vega*, which is distinguished in the field by being mostly uniformly bright yellow overall (not bi-colored) and microscopically by having clamped hyphae, larger spores that are ornamented with spines and a hymenium that stains reddish in KOH. Some species of *Membranomyces* are also bright yellow, but are uniform in color, not bi-colored, not rhizomorphic, have very large basidia along with much larger, thick-walled spores. *Rhizochaete sulphurinus* is another bright yellow resupinate, but also is not bi-colored and microscopically has clamped hyphae, ellipsoid spores, and pronounced metuloids (thick-walled, crystal incrusted cystidia). I describe another bright yellow orange resupinate polypore in an earlier article I wrote (Luther, 2020). We have many other resupinate fungi with bright yellow, yellow-orange, or orange colors, but confirming their identity requires microscopic study.

Ginns & Lefebvre (1993) list five species of *Piloderma* and two varieties for North America. Because I've not seen a key to the N. American species in the literature, I'm providing one here. So far, only *P. fallax*, *P. byssinum*, and my collections of *Piloderma cypressensis* nom. prov. have been recorded from Washington State, although *P. olivaceum* is known from nearby British Columbia, Canada.

Key to the North American species of Piloderma

1. Basidiocarp and hymenium bright whitish with brilliant yellow mycelium and rhizomorphs, distinctly bi-colored 2

1. Basidiocarp variable in color, but not white **and** with the mycelium and rhizomorphs a contrasting bright yellow color 3

2. Infrequent clamp connections found in the subicular hyphae and the basidia are more prominently enlarged apically (subcapitate) compared to *Piloderma fallax* ..... *P. cypressensis* nom. prov.

2. Without clamp connections on any hyphae and basidia more narrowly clavate overall, not noticeably subcapitate ..... *P. fallax*

3. Basidiocarp and hymenium distinctly olive-brown (Deep Olive-Buff to Dark Olive-Buff) when mature; rhizomorphs a duller ochraceous yellow or brownish-yellow, otherwise like *P. fallax* .....*P. olivaceum*

3. Basidiocarp creamy to whitish, with or without rhizomorphs..... 4

4. Basidiocarp with fine white rhizomorphs.....*P. byssinum**

4. Basidiocarp without rhizomorphs.....5

5. Hymenium smooth in appearance; basidia 20–25 µm long; basidiospores 4.5–6 × 3–4 µm..... *P. lanatum*

5. Hymenium granular in appearance; basidia 11–15 µm long; basidiospores 3–4 × 2-3 µm..... *P. reticulatum*

**P. byssinum* has two varieties: var. *byssinum* & var. *minimum*.

Acknowledgments

The collections of *P. cypressensis* nom. prov. described here were all found during my continued research on the resupinate fungi of Cypress Island in Skagit County, Washington. This research was originally approved by the Washington State Department of Natural Resources, which owns the vast majority of Cypress Island. I wish to thank my daughter Arnica, who has always taken time off of her job in the past to assist me doing this work on Cypress Island.

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cont. on page 6

Resupinate Fungus of the Month, *cont. from page 5*

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Native Fungus vs Invastive Trees, *cont. from page 3*

Abe Stone admires SuperPurp.

"It's literally mushroom soup," he says.

Stone, an undergraduate majoring in ecology and evolutionary biology, is living proof that you don't have to wait until you graduate to tackle the complex problems facing the world.

SuperPurp is Stone's not-so-secret weapon to beat back the widespread Midwest invasion of two species of invasive buckthorn trees: *Rhamnus cathartica* and *Frangula alnu*s. The trees are gaining a foothold across the upper Midwest and altering the character of forests. Stone inoculates them with the fungus, weakening the aggressive invaders to give native species a chance to rebound.

The overarching goal is to create a practical and accessible herbicide alternative that zaps buckthorn without causing harm to surrounding plants. "Our fungus only goes after woody tree species, and if we can establish that this is viable alternative for those looking to only affect invasive buckthorn, then we've done exactly what we hoped for," says Stone, who also works closely with Sigrid Resh, CFRES research assistant professor and coordinator of the Keweenaw Invasive Species Management Area (KISMA).

"My research is focused on alternatives to chemical management of invasive plant species, such as biocontrol with insects, goats—and yes, fungi—as well as proving the efficacy of manual control on invasive knotweed species," says Resh.

Stone says the native fungus used in his research is a natural infector of trees throughout the northern hemisphere, from Norway

Abe Stone in the field.

to Siberia to the boreal forests of Canada. "It is present on many hardwood trees, but is mostly associated with birch, cherry, alder, and aspen trees," Stone explains. "Typically, it causes an infection that slowly affects the tree, causing a silvering color on the leaves and eventual death of some branches and often the entire tree. It is very much a part of the forest ecosystem and has been around for thousands of years. In its natural state, it infects only trees with significant wounds and wouldn't wipe out an entire forest. It is merely one of the many actors causing our forests to develop into various types of ecosystems."

Once you see invasive buckthorn, you can't stop seeing it. Stubborn and pervasive, it appears as woody shrubs or small trees, rapidly claiming the understory of the landscape, from residential yards to recreational forests.

"Buckthorn is a challenging organism. Humans introduced it to the region and it does exceptionally well here," Stone says. "This has come at the cost of many native ecosystems, especially in areas south of us in Wisconsin, Minnesota, and southern Michigan. With climate change, we expect to see this species flourish even more strongly in our forests."

IN CLEVELAND, MUSHROOMS DIGEST ENTIRE HOUSES: HOW FUNGI CAN BE USED TO CLEAN UP POLLUTION

Nick Hilden

https://www.bbc.com/, Mar. 15, 2024

[truncated] The city of Cleveland faces an epidemic of abandoned houses. Crumbling homes number in the thousands. These ramshackle structures are riddled with toxins like lead and dilapidated to the point of no return. And if tearing down and safely disposing of the waste of one such home sounds daunting, imagine thousands of them.

Among the numerous issues that arise, one essential question involves waste: What do you do with the waste material from so many teardown structures, when so much of it is toxic?

"All of the material from demolition—the studs, the floors, cellulosic mass [the primary structural component of plants], and even things like ceiling tiles and asphalt material like roof shingles, can be mixed into substrate that then becomes good for growing fungus," says Chris Maurer, founder of Cleveland-based architect firm Redhouse Studio. Through his firm, Maurer has been advocating for the use of substrate to address Cleveland's housing crisis, which is also a health crisis for the city's inhabitants.

Substrate is any material that mycelium—the thready, vegetative part of fungi—uses for nourishment. In other words, fungi can eat the noxious waste from the abandoned homes. Heavy metals

and other toxins are extracted and captured in the mushrooms that grow, while the substrate leftovers, including the mycelium, are compacted and heated to create clean bricks for new construction. The resulting "mycoblocks" have a consistency akin to hardwood and, depending on the specifics of the manufacturing process, have been shown to be significantly stronger than concrete.

This is Redhouse's Biocycler program, which is one of many diverse efforts around the world aiming to eliminate pollution, combat climate change, and mitigate its already-looming effects via one of nature's oldest biotechnologies: fungi.

"Effectively what we're doing is diverting tonnage from landfill," says Joanne Rodriguez, founder and chief executive of a similar organization called Mycocycle, which works to recycle construction waste for corporate clients. "… 11 percent of the world's carbon comes from materials in the built environment. By 2027, just from Mycocyle's waste diversion, Rodriguez anticipates carbon reductions "of close to 160,000 metric tons."

Getty Images

Abandoned house in Cleveland.

A MUSHROOM-CENTRIC RESTAURANT JUST OPENED IN NEW YORK CITY

VegOut Team

https://vegoutmag.com/, Mar. 18, 2024

In the heart of New York City's East Village, a culinary revolution is underway as Overthrow Hospitality unveils its latest restaurant—Third Kingdom. Spearheaded by acclaimed Chef Juan Pajarito and hospitality visionary Ravi DeRossi, this innovative dining concept promises to redefine plant-based cuisine with a focus on mushrooms.

Third Kingdom builds upon the success of Overthrow Hospitality's previous mushroom-themed concept, & Beer, which captivated diners with its inventive dishes. Now, with Third Kingdom, patrons can expect an expanded menu showcasing a diverse array of edible fungi, including Chanterelle, Oyster, Lion's Mane, Shiitake, Hedgehog, Black Pearl, and more.

Chef Pajarito's culinary prowess shines through in signature dishes like the Lion's Mane dumpling with daikon sauce and micro cilantro, and the Black Pearl dyster dole dnchilada with epazote sour cream. Each plate is meticulously crafted to highlight the unique flavors and textures of mushrooms, promising a dining experience like no other.

Complementing the mushroom-centric menu is an extensive wine list curated by Overthrow Hospitality partner Drew Brady, renowned for his award-winning selections. From bold reds to crisp whites, each wine is carefully chosen to enhance the flavors of Chef Pajarito's creations. Additionally, guests can explore a rotating beer selection, adding another layer of culinary delight.

Third Kingdom

Mushroom themed restaurant dishes.

Step into Third Kingdom and be transported to a realm where dark burgundy walls, black banquette seating, and handmade Spalted Maple wood tables set the stage for a truly immersive dining experience. Adorned with whimsical mushroom art, the milieu creates a memorable atmosphere.

Third Kingdom invites diners to embark on a gastronomic journey unlike any other. Whether you're a dedicated vegan or simply curious about plant-based cuisine, this new restaurant promises an unforgettable dining experience. Make your reservation today and prepare to indulge in the world of mushrooms.

Third Kingdom is located at 21 East 7th Street, New York, NY 10003. For more information, visit ThirdKingdomNYC.com.

MUSHROOM CAKE

No, your eyes are not deceiving you, nor are the images generated by AI—those are *real*, edible cakes, and you can even customize the cake flavors within! The cakes feature some of the most "controversial" vegetables, and you'll either love them or hate them.

We think this new vegetable-inspired series definitely takes the cake. Want one of these vegetable cakes to make the perfect April Fool's prank? Place your orders with Baker's Brew online now, as they'll only be available for a limited time!

Prices start from $108 and you can pick from options like asparagus, taugeh (beansprouts), green peas, carrots, or mushrooms. Cake flavors are also customizable, with options like Earl Grey Lavender, Yuzu, Yubari Melon, Mixed Berries, and more. All the vegetables are also par cooked (not raw) before being placed on the cakes.

Baker's Brew

Baker's Brew mushroom cake featuring real mushrooms.

NEW FUNGUS DISCOVERY COULD STOP DEADLY YEAST INFECTIONS

Zachy Hennessey

https://www.israel21c.org/, Mar. 26, 2024

Researchers at the Weizmann Institute of Science have discovered a novel species of yeast that may have the power to displace its deadly peer *Candida albicans*, a strain of yeast which causes candidiasis, a fungal infection responsible for around 200,000 deaths per year.

Dubbed "*Kazachstania weizmannii*" in homage to Chaim Weizmann, Israel's first president and the Weizmann institute's founder, the new yeast species exhibits close ties to yeasts involved in sourdough production, and peacefully coexists in mice intestines, even under immunosuppressed conditions.

The research, spearheaded by Prof. Steffen Jung and his team at the Weizmann Institute, originated from an unexpected observation during yeast infection studies. *Candida albicans*, a microscopic yeast commonly residing in the body's inner cavities, typically poses no threat (besides the occasional thrush infection), but under specific conditions it can breach the intestinal barrier, causing invasive candidiasis.

During their studies, the researchers observed that some laboratory mice seemed resistant to *C. albicans* colonization, harboring instead a previously unidentified yeast species.

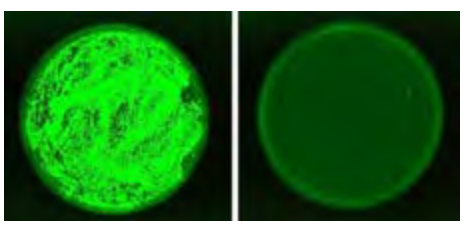
"Knowing that *C. albicans* can cause life-threatening disease, we decided to investigate this further," Jung said. "And indeed, this line of research paid off—we found that the novel yeast could robustly prevent colonization with *C. albicans*."

Indeed, *K. weizmannii* demonstrated a competitive edge over *C. albicans* within the gut, diminishing its presence and notably delaying invasive candidiasis onset in immunosuppressed mice.

What's more, it seems that mice may not be the only benefactors from the new yeast. Preliminary human gut sample analyses revealed *K. weizmannii* and similar species, hinting at a potential competition mechanism against *Candida* species in human intestines, though further investigations are warranted to confirm these findings.

"By virtue of its ability to successfully compete with *C. albicans* in the mouse gut, *K. weizmannii* reduced the presence of *C. albicans* and mitigated candidiasis development in immunosuppressed animals," Jung said. "This competition between *Kazachstania* and *Candida* species might possibly have therapeutic value for the management of human diseases caused by *C. albicans*."

The discovery of *K. weizmannii*'s prowess against invasive candidiasis marks a significant stride in combating this lethal infection, offering hope for enhanced treatment strategies in vulnerable patient populations.



Kidney tissue from immunosuppressed mice with invasive candidiasis. The Candida (fluorescent green) normally flourishes (left), but its growth is delayed in mice exposed to the new yeast (right).

MUSHROOMS' POTENTIAL MAGIC IN QUELLING ALCOHOL ABUSE THE FOCUS OF CANADIAN RESEARCHERS

Bill Kaufmann

https://www.msn.com/, Mar. 20, 2024

Could banishing the destructive thirst for alcohol stem partially from magic mushrooms?

University of Calgary (UC) researchers have begun recruiting 128 patients to embark on the largest single-site trial of its kind in Canada to find out.

They're trying to determine if sending patients on a psychedelic psilocybin trip will enhance the effect of psychotherapy sessions for those with alcohol use disorder.

"What's new is taking a scientific approach to demonstrate it has an impact," said Dr. David Hodgins, a professor of clinical psychology at the UC's faculty of arts.

"There are a lot of beliefs about what the possibilities are—it would be really nice to see the science there."

In the clinical trials, patients would undergo about an hour of psychotherapy, which would be followed by a psilocybin dosing session lasting five to six hours, said Dr. Leah Mayo, principal investigator and Parker Psychedelic Research chair at the Cumming School of Medicine.

"It's what you'd think of a psychedelic trip—the visual, the profound insights," said Mayo, adding that patients would receive another psychotherapy session afterward.

"It going to be done in a very controlled environment with a trained therapist."

Sing a song of springtime,
Shiver your last shiver.
Four and twenty cottonwoods
Are growing by the river.
When their leaf buds open
Morels will soon spring up.
Won't they make a dainty dish
To tempt you when you sup?

—Don Goetz, Oregon Myco. Soc.

April 1st field trip (Dick Sieger).