SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 558 January 2020

2019 HOLIDAY EXTRAVAGANZA

Milton Tam

There was a capacity crowd of 120+ PSMS members at the gala Holiday Extravaganza this year. Good food, good company, and good cheer were the order of the evening. Once again our members came through with an amazing assortment of appetizers, casseroles, salads, baked goods, and desserts. With such a selection, who could have possibly gone home hungry? This year's potluck dinner ran smoothly under a new system: attendees were asked to place the potluck items they brought on one of five separate buffet tables matching the napkin patterns on the tables they were sitting at. At the signal, everyone got up and filled their plates from "their own" buffet table for the first round, and then for seconds could "graze" at any other table. No waiting for your food!

The surprise of the evening was the debut of the 2019 edition of the PSMS cookbook, which is destined to become a classic. The book was the result of countless hours put in by Derek Hevel recruiting, adapting, developing, and testing recipes. He photographed, wrote text, and was the driving force behind publishing this book. Thanks, Derek, for this amazing contribution, which is $25 a copy for PSMS members.

There were also ample door prizes and a silent auction to benefit the Ben Woo Scholarship Fund. This year there was only a single entry in the edible art contest, that naturally took first prize (Come on people, next year unleash your inner Mycoangelos and make something for the contest!). After dinner Paul Hill ran the projector for five of us who shared our photos of mushroom exploits and/or travels this year.

Special thanks again to your hard-working Board of Trustees who set up and festively decorated the room with evergreen boughs, holly, pine cones, and ornaments and tidied up at the end of the event.

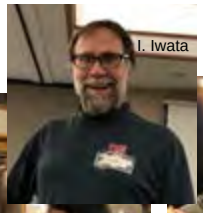
T. Quintana


T. Quintana


I. Iwata


I. Iwata

2019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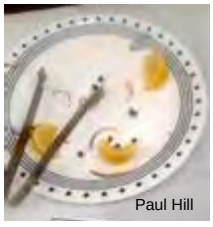
Paul Hill

Holiday Extravaganza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CALENDAR

Jan. 14	Membership meeting, 7:30 pm, CUH
Jan. 17	Nomination deadline
Jan. 20	Board meeting, 7:30 pm, CUH board room
Jan. 21	*Spore Prints* deadline

BOARD NEWS

Luise Asif

A very Happy New Year to all! Kudos to Derek Hevel and his team for creating the beautiful PSMS cookbook. Congratulations on doing such a fantastic job. The board is gearing up for another eventful year. The very popular Ben Woo Foray has been scheduled for October 9–11, 2020, and registration will open in June. The Annual Fall Show is planned October 17 & 18, 2020, and will again be at North Seattle College. Danny Miller has done some exciting DNA sequencing using specimens gathered by the Bridle Trails group. The study will continue this spring once we get the nod from Daniel Winkler and Danny. Elections for Board Trustees, Vice President, and Treasurer will be in February, and nominations are open through January 17. Know someone who is interested? Please take a moment to email suggestions. Thank you.

MEMBERSHIP MEETING

Tuesday, January 14, 2020, at 7:30 pm at the Center for Urban Horticulture, 3501 NE 41st Street, Seattle

The new *Puget Sound Mycological Society Cookbook* is now available! The first general meeting of 2020 will be a cookbook release party, including information about the edible mushrooms used, the new and revised recipes contributed by members, the people who made it happen, and the effort and time it took to create and print. Derek Hevel, a PSMS board member and the editor of the cookbook, will present a short summary of all that you would want to know about it, and one or two of the prepared recipes will be available for tasting by those who attend.

More about the cookbook: Picking up where we left off 50 years ago with the first two editions, the book includes almost 200 recipes and is organized by species so you can quickly find a recipe that is suitable for the mushrooms you have found. From simple sautés, to sauces and spreads, to soups and salads, to hearty baked main dishes, the cookbook covers a wide range of delectable dishes for all Pacific Northwest foraging seasons. You will learn about finding, identifying, and cooking edible mushrooms and about many of the food-based PSMS events. The book is filled with color photographs of all our favorite edible mushrooms and many of the prepared dishes.

We think the cookbook is an essential item for mycophagists and also makes for a great gift for your mushroom-loving family and friends. The book will be available for purchase at the meeting for $25 for members or $28 for nonmembers.

Would people with last names beginning with the letters M–Z please bring a plate of refreshments to serve after the meeting.

WHY ARE MUSHROOMERS SO SECRETIVE?

Wren Hudgins

A few years ago I wrote an article extolling the virtues of sharing our favorite mushroom-finding spots with beginners. It seemed like the moral high road. Sharing our spots would be kind, educational, and generous and build up our bank account of good karma. What's not to like here? However, no one I showed the article to liked it, and it was never published.

I was a little miffed for a while, but then I started observing my own behavior (as opposed to my words). When behavior and words collide, truth lies with behavior. I was feeling self righteous about sharing, but in reality I was only sharing mediocre spots, not true gems.

Why Couldn't I Share?

Upon reflection, I came up with three reasons. One is that a mushroom patch has an unknown lifespan. Undisturbed, a good mushroom spot can last for years. It's a bonanza akin to having a key to the back door of the grocery store and an unlimited expense account. I once had a chanterelle patch that produced for 15 to 20 years, until finally there were enough changes in the forest that mycorrhizal relationships were lost. Other patches die unnatural

deaths at random moments. Years ago, one of my spots came to a premature death when the area was clear cut. Another spot was "discovered," and I watched the crowds come, more and more every year. I winced at every cut stem I came across; my harvest diminishing accordingly.

Another reason is that a good patch takes a lot of work, and time, to find. I have come to believe in the "Two Percent Rule" which states that mushroomers will find the targeted edibles in only two percent of perfect habitat. Thus, while it's possible to stumble right away onto the productive two percent of a forest, the odds greatly favor a lot of walking before then. The reality is that, for most of us, finding a good productive patch is the result of 50 miles of walking off trail over three fall seasons, a considerable effort.

Finally, once a good patch is found, we revisit it often because it's the most efficient use of our time. We count on and look forward to visiting an old friend. The unknown says that the next new patch discovered might take even longer to find.

I concluded that a productive patch is quite valuable because of the substantial effort invested to find it, the exquisite payoff of it potentially lasting for years, and its unknown lifespan. In addition, we don't have that many of them, so scarcity becomes a variable. It's hard to share a thing with a potentially high payoff that requires a lot of effort and unfortunately has an unknown life span.

So What Is Good Sharing Etiquette?

I do have some regular hunting friends with whom I share everything, and I suspect many of us do. It's a relaxing experience to hunt with such people because there is no need to be wary of someone indirectly searching for clues to "your" spots. However this brings up the issue of sharing etiquette. If someone does share a spot with you, what is your responsibility?

I would argue that your primary responsibility is not to share it with anyone else unless authorized by the finder. The finder then "owns" the spot and can make the rules. The finder may say to you, "Please don't come here unless we are together" or "You can come on your own but tell me when you plan to do that because maybe I was planning to come the next day." A generous finder may say, "Help yourself anytime." Spot location is a magnificent gift. Our responsibility is to take good care of that gift while also respecting the giver. If I find the spot, then it's up to me to decide how much to share and with whom.

Conclusion

So where did I end up with my original noble notion of sharing? Well I think I understand the secrecy a little more now. I understand the fragility after seeing one of my spots get crowded and another clear cut. I'm happy to share general knowledge, to go out with new people to discover new spots together. I'm also happy to give away a lot of my bounty. That part at least, feels pretty good. In the end, however, I still have secrets.


Paul Hampson

Locals are usually happy to share their favorite local mushroom sites.

BAMBOO-DWELLING MEDICINAL FUNGUS HONORED

https://www.theguardian.com/, Dec. 17, 2019

A medicinal fungus known in China for more than 400 years has been found to be a genus as well as a species previously unknown to science. It has now been formally named *Rubroshiraia bambusae*. It was one of 102 plants and eight fungi that were officially named by experts at the Royal Botanic Gardens, Kew in 2019. (Roughly 2,000 new species are named worldwide every year.)

The new genus is native to Yunnan in southwest China where it grows on a species of bamboo, forming pink ball-like fruiting bodies. The fungus is used as traditional medicine in the area to treat arthritis and infantile convulsions. However, scientific interest has increased because of the discovery of compounds in the fungus known as hypocrellins.

The Royal Botanic Gardens, Kew included *R. bambusae* in its list of its top 10 species discovered by Kew and its collaborators around the world in 2019.


Cici Dong-Qin Dai/RBG Kew

Rubroshiraia bambusae.

HOW ENZYMES PRODUCED BY WHITE ROT FUNGI REIGN SUPREME IN WORLDWIDE CARBON RECYCLING

https://scitechdaily.com/, Dec.7, 2019

The recycling of most of the carbon in nature depends on the breakdown of two polymers in woody matter, notably cellulose and lignin. In a paper just published in the journal *Biochemistry*, Richard Wolfenden, Ph.D., and colleague Charles Lewis, Ph.D., both in the University of North Carolina Department of Biochemistry and Biophysics, show the extent to which enzymes from woodland fungi accelerate the breakdown of lignin, a complex polymer held together entirely by ether linkages.

After a tree falls in the forest and the chain saw has done its work, clusters of white-rot fungi appear near the cut surfaces. "Etherases" from these lowly fungi use the antioxidant glutathione to clip ether linkages in 23 ms. Lewis and Wolfenden show that without these enzymes, the half-life for the needed hydrolysis of the ether linkages in lignin in water would be about 100 billion years, exceeding the age of the universe by a long shot.

So it turns out that these familiar organisms catalyze what is generally considered to be the rate-determining step in the global carbon cycle, using enzymes that are found to achieve the largest rate enhancement known for any of the thousands of enzymes that exist.

Without these little enzymes—without carbon recycling—we'd be in a world of hurt.

White rot fungi,
Duke Forest, North Carolina.

A NEWLY FOUND ATACAMA DESERT SOIL COMMUNITY INCLUDING FUNGI SURVIVES ON SIPS OF FOG

Jack J. Lee

https://www.sciencenews.org/, Dec. 10, 2019

Perhaps the hardiest assemblage of lichens and other fungi and algae yet found has been hiding in plain sight in northern Chile's Atacama Desert.

This newly discovered "grit-crust," as ecologists have named it, coats tiny stones and draws moisture from daily pulses of coastal fog that roll across the world's driest nonpolar desert. These communities are optimized to photosynthesize using less than half of the water that other known desert biological soil crusts use, researchers report December 16 in *Geobiology*.

P. Jung

Atacama grit-crust. Grit-crust differs from other known biological soil crusts by forming on pebbles rather than directly on soil, and is optimized to use less than half as much water during photosynthesis as other desert biocrusts.

The "super cool" find suggests that soil communities can eke out a living in the planet's harshest settings, says Jayne Belnap, a U.S. Geological Survey ecologist based in Moab, Utah, who was not involved in the study.

Biological soil crusts, or biocrusts, are conglomerations of algae, cyanobacteria, lichens, fungi, or mosses that cover an estimated 12 percent of the land on Earth. They are commonly found in deserts, where they blanket the soil and prevent erosion. They also shape ecosystems by drawing atmospheric carbon and nitrogen into the ground and producing oxygen via photosynthesis.

Only a few millimeters of rain dampen the Atacama on average each year. But some areas experience daily cycles of fog and dew. In one such "fog oasis," about 2.5 km from the Pacific Coast in Pan de Azúcar National Park north of Santiago, researchers spotted odd markings.

"We got there with our cars and saw these blackish and whitish patterns in the landscape," says botanist Patrick Jung of Hochschule Kaiserslautern - University of Applied Sciences in Germany.

Previous surveys have identified other biocrusts in the Atacama. But the new crust samples weren't like those—analyses revealed lichens, fungi, algae, and cyanobacteria enveloping tiny, 6-mm pebbles and keeping the pebbles stuck together atop the soil, like a rock-based peanut brittle. Unlike other biocrusts, which form on soil surfaces, grit-crust is "something different that we've not seen before," says Matthew Bowker, an ecologist at Northern Arizona University in Flagstaff not involved in the study.

In lab experiments, the team measured the rate at which the crust collectives consumed carbon dioxide with varying amounts of moisture. Photosynthetic activity peaked when a sample had just 0.25 mm of water—equivalent to 250 mL of water for one square meter of grit-crust—which is within the range expected for deposits from daily fog banks near the coast. By comparison, biocrusts in the Sonoran Desert in Mexico and the U.S. Southwest are most photosynthetically active when saturated with between 0.5 and 1 mm of water.

Detailed microscopy of the rocks showed fungi associated with the grit-crust tunneling in from the surface. These fungi's tubular growth structures, or hyphae, swell and shrink with the flow of fog, creating cracks that eventually break up the stones. This "biological weathering" is the only known process to create new soil in the Atacama Desert, the team says.

P. Jung

Samples of individual grit-crust pebbles. Lichens and other algae and fungi combine to cover tiny pebbles and clump them together, forming a crust that blankets the soil.

Such grit-crusts may have transformed the harsh surface of ancient Earth before photosynthesizing plants arose by breaking down stones and contributing to nutrient cycling. While scientists have documented both fungi and plants burrowing into rock, as well as lichens surviving in fog deserts, grit-crust represents "a novel composite of those processes," Belnap says.

Similar crusts probably grow in Earth's other fog deserts, Jung says. The researchers plan to search for communities in the coastal Namib Desert in southern Africa, where others have spotted the telltale black-and-white patterns.

BLUE MUSHROOM DYE USED TO DEVELOP NEW FLUORESCENT TOOL FOR CELL BIOLOGISTS

Vicky Just

https://phys.org/, Dec. 17, 2019

A new fluorescent tool for detecting reactive oxygen species based on a chemical found in mushrooms has been developed by scientists at the University of Bath.

Reactive oxygen species (ROS), such as free radicals and peroxides, are produced in cells under oxidative stress. Whilst present in healthy cells in small amounts, excessive ROS in cells are damaging and can lead to cancer and neurodegenerative diseases such as Alzheimer's Disease.

The scientists at Bath, collaborating with researchers in South Korea, have developed a new probe that biologists studying these diseases can use to see changes in cells under the microscope, helping them to understand the fundamental biological processes involving ROS.

They've created a family of new molecules—dubbed AzuFluor—based on azulene, a bright blue chemical found in the mushroom *Lactarius indigo*. It fluoresces when it comes into contact with a ROS in a one-way reaction, detecting tiny amounts of these reactive oxygen species.

Dan Molter

Lactarius indigo. Blue, blue, blue.

Whilst most fluorescent probes absorb a single photon, AzuFluor absorbs two photons, meaning that two lower energy photons can be used to produce the same level of fluorescence. Using shorter wavelengths of light in the infrared range means that the light can penetrate tissues more deeply without harming the cells. This technology has been shown to work in rat tissue; the researchers hope that in the future it could be used as a probe in the human body.

Dr. Simon Lewis, Senior Lecturer in the Centre for Sustainable & Circular Technologies (CSCT) at the University of Bath, said: "AzuFluor is a much smaller molecule and simpler to make than other two-photon fluorophores. Its small size makes it easy to diffuse and transport into cells.

"We aim to make a family of these fluorophores that can be used in a range of cell imaging applications."

Professor Tony James, also from the CSCT at Bath, said: "This research has wide-ranging potential applications in cell biology and the pharmaceutical industry and is a great example of a fantastic international collaboration between chemists at Bath and Professor Hwan Myung Kim and his group at Ajou University in South Korea."

RESEARCHERS FIND NEW EVIDENCE THAT A FUNGUS CAN BE HARD TO FIND

https://phys.org/, Dec. 9, 2019

A team of experts has discovered that a common fungus that infects humans cannot only predict an imminent attack from the immune system, but will even change its appearance to hide from it.

New research from the University of Aberdeen has found that *Candida albicans*, the fungus that can cause thrush, has evolved the ability to predict an attack by the immune system and so alters its surface markings to avoid detection.

wikipedia

Candida albicans.

Although harmless to most healthy individuals, *Candida albicans* can be deadly to patients with weakened immune systems and can lead to serious fungal diseases such as candidiasis which affects around 1,000 patients in the U.K. per year and can prove fatal in up to half of cases.

This study, published in *Nature Communications*, is the first to show in detail how this fungus evades the immune response and could lead to new more effective ways to target fungal infections.

The Medical Research Council (MRC) funded research was conducted at University of Aberdeen's Fungal Group in the MRC Centre for Medical Mycology.

Dr. Delma Childers, research team member and Lecturer in Medical Sciences at University of Aberdeen, said: "*Candida albicans* is not a concern in day-to-day life. However, it can be a serious problem for very vulnerable patient groups, so it's important to understand how this fungus exploits conditions inside us to survive. Then we can look for new ways of combating this infection.

"We found that *Candida albicans* can 'camouflage' its cell surface from immune cells after sensing many different signals present in its environment. These findings suggest that this fungus can anticipate imminent immune attack and react quickly to avoid detection."

Professor Alistair Brown, who recently relocated to the MRC Centre for Medical Mycology, University of Exeter, said: "What we found is important. We discovered that *Candida* is a moving target for our immune defenses, changing its surface and camouflaging itself to hide from these defenses.

"This discovery is important because it presents the opportunity, in the future, to develop drugs that denude *Candida* of its camouflage and allow our immune defenses to clear the infection."

How many products are made from fungi? A team of researchers from Utrecht University and the Westerdijk Institute set up a library of more than 10,000 fungi products in the hope of discovering new biologically active compounds.

LIVING FUNGI IS THE MEDIUM FOR STUDENTS' TRADITIONAL CHINESE LANDSCAPE ART

Ed: Li Yan

http://www.ecns.cn/, Dec. 17, 2019

Five university students studying biology in East China's Anhui Province spent months learning how to use living fungi as a medium for their works of art that depict traditional Chinese landscapes.

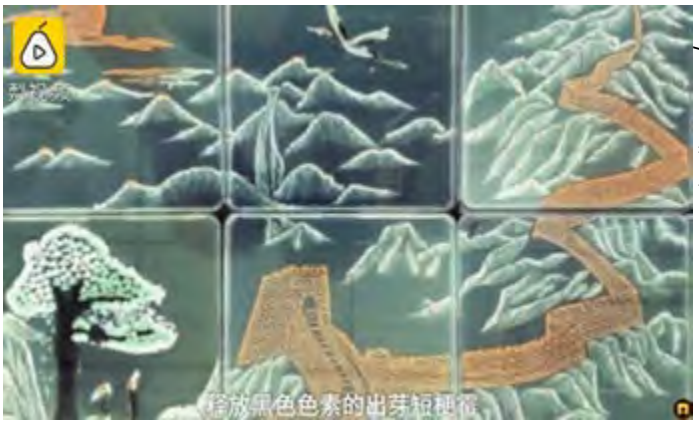
According to a video posted by Pear Video, the works of art are made on a board with a growing medium for fungi of different colors that are used to depict cranes, pine trees, mountains, and the Great Wall.

The students used brushes to "paint" fungi spores on the board and then waited for them to grow.

The students said they made "countless" failed attempts to make a fungi "painting." They had trouble making the fungi grow in the shape they wanted or produce the right colors.

One of the students, Chen Bosong, told the media that it takes about nine months to cultivate the fungi, and some fungi take longer to grow than others and have different growing seasons.

"What a romantic combination of science and art!" wrote an Internet user on Sina Weibo, hailing the "artsy" experiments as beneficial to the students' studies.



http://www.ecns.cn/

Landscape made with living fungi.

MAGIC MUSHROOM TREATMENT FOR DEPRESSION ONE STEP CLOSER AFTER PSILOCYBIN PASSES SAFETY TEST

Kashmira Gander

Newsweek, Dec.12, 2019

Scientists hope the active ingredient in magic mushrooms is a step closer to being used as a treatment for depression, after it passed a clinical safety trial.

In what was the largest controlled study of psilocybin, researchers at King's College London in the U.K. tested the drug on 89 volunteers aged around 35. They found psilocybin caused no serious problems, including to participants' cognition and emotional functions.

The team at the Institute of Psychiatry, Psychology and Neuroscience gave the participants either 10 or 25 mg of psilocybin, or a placebo drug to the control group. The drugs were randomly assigned, and the subjects didn't know which they would receive. The subjects were healthy, and didn't have any past history of mental illness, including major depression, schizophrenia, psychosis, or bipolar disorder, according to the researchers.

The participants received one-to-one support and supervision during the sessions, which lasted around six hours. They were allowed to go home once the "acute" effects of the drugs had worn off according to the researchers. After taking the psychedelic substance, the volunteers were encouraged to relax and engage in introspection.

As the experiment unfolded, the investigators made notes of the participants' vital signs, and checked whether they appeared to have an increased risk of suicide.

The volunteers were assessed before and after taking psilocybin, and visited a therapist to discuss their experiences.

Researchers documented 511 of what are known as adverse events, including hallucinations, changes to mood, feelings of euphoria, tiredness, and shifts in how they perceived time. The vast majority of these happened on the day the volunteers took the hallucinogenic drug.

The team concluded psilocybin was "well-tolerated," led to no serious adverse events, and caused no withdrawal symptoms in the participants.

The results were presented at the annual meeting of the American College of Neuropsychopharmacology.

The synthetic psilocybin used in the study was provided by mental health care company Compass Pathways, which calls its formulation COMP360. The firm is currently also running a phase two randomized control trial of psilocybin for treatment-resistant depression, taking place across Europe and North America, according to its website.

Lead investigator of the safety trial Dr. James Rucker, consultant psychiatrist and senior clinical lecturer in psychopharmacology at King's College London's Institute of Psychiatry, Psychology and Neuroscience, said in a statement: "This is the largest controlled study of psilocybin to date. The results of the study are clinically reassuring and support further development of psilocybin as a treatment for patients with mental health problems that haven't improved with conventional therapy, such as treatment-resistant depression."

Dr. Ekaterina Malievskaia, co-founder of Compass Pathways, said in a statement: "This study is part of our overall clinical development program in treatment-resistant depression; we wanted to look at the safety and tolerability profile of our psilocybin, and to look at the feasibility of a model where up to six one to one sessions are held at the same time.

"We are focused on getting psilocybin therapy safely to as many patients who would benefit from it as possible," she said. "We are grateful to the many pioneering research institutions whose work over the years has helped to demonstrate the potential of psilocybin in medicine."

The research comes amid what is known as the psychedelic renaissance, as researchers around the world investigate the potential benefits of using psychedelic drugs in controlled medical settings to treat mental disorders like depression, anxiety, and PTSD. The drugs under the spotlight include LSD and magic mushrooms, as well as MDMA, ayahuasca, and peyote ibogaine. Scientists are also investigating the use of ketamine, which is an anesthetic rather than a hallucinogenic. Experts stress the drugs should not be used outside of clinical settings and without the supervision of a medical professional.

WHY MAGIC MUSHROOMS GO BLUE

https://www.chemistryworld.com/, Dec. 10, 2019

Why do magic mushrooms turn blue when they are cut? Chemists have now unravelled this decade-old mystery, in the process revealing that the dark blue pigments at the center of the mystery are similar to indigo, the dye used to produce blue jeans.

Magic mushrooms, or Psilocybes, are fungi producing the psychotropic compounds psilocybin and psilocin. They are one of several species that instantly develop a blue coloration when they are cut or bruised. In Boletales mushrooms, oxidized gyrocyanin or pulvinic acid are the source of the blue color. But that isn't the case in *Psilocybe* mushrooms.

Dirk Hoffmeister from the Leibniz Institute for Natural Product Research and Infection Biology in Germany and his team had been working with *Psilocybe cubensis* for several years. Growing the mushrooms in their lab, they had seen the mysterious blueing reaction countless times. "We were just curious and tried to solve a phenomenon that's been known for decades," Hoffmeister says.

But when they tried to extract and purify the blue compound, they failed. "It puzzled and challenged us," says Hoffmeister. "This is where previous researchers—very talented people—had to give up, and that's where we went one step further with unconventional analytical methods."

The researchers dug deep into the analytical toolbox with liquid chromatography–mass spectrometry, Maldi mass spectrometry, and infrared spectroscopy, as well as time-resolved nuclear magnetic resonance spectroscopy to observe the compounds as they form.

Blueing reaction of Psilocybe cubensis: intact mushroom (left) and scalpel-injured mushroom (right).

The pigment, as it turns out, is not just a single compound but a complex mixture of linked psilocybin oxidation products. Most of them are quinoid psilocyl oligomers—compounds not unlike indigo, a deep blue pigment used to dye jeans. "[The blue compounds and indigo] share structural similarities in the indole core, and in both the basis for the color is a quinoid," says the study's lead author Claudius Lenz.

All of the six mushroom pigments the team identified are products of a cascade reaction starting with psilocybin. A phosphatase enzyme takes off its phosphate group, converting it into psilocin. An oxidizing laccase then creates psilocyl radicals, which combine to form C-5 coupled subunits and then further polymerise via C-7. "I think they did a beautiful job of showing the cascade reaction," says Jaclyn Winter, who studies natural product biosynthesis in bacteria and fungi at the University of Utah, U.S.

What exactly the blue pigments do, however, remains a mystery. "Our hypothesis—and we don't have any evidence for this yet—is that it might serve a protective role, like an on-demand repellent against predators," says Hoffmeister. The compounds might produce reactive oxygen species, which are toxic to any insect nibbling on the mushrooms. "I think we're going to see a lot of follow-up studies on the true ecological role of these molecules," Winter says.

Hoffmeister hopes that his study not only inspires others to study fungi from a chemistry perspective but also changes people's mind about psilocybin. "Psilocybin is looked at as this illegal, recreational drug, but it has a fantastic potential as a medication for therapy resistant depression," he says.

Winter agrees. "There's quite a few groups who are studying psilocybin, and especially because it's been legalized in the U.S. in various states, and because it's in clinical trials," she says. "I think [this study] is going to have a huge impact in the field."

Death of a Tree

The saw screamed through the timber,
Inside my head the tree groaned
—it is not heard.
How many hours they toiled
To move those heavy boughs
—just to be burnt.
Those limbs, a roost for owl and sparrow hawk,
Now lie defenseless on the ground
—their use is gone.
And soon the fungi will appear on fallen branch,
The woodlouse chews a way through rotting wood
—and life goes on.

PAUL STAMETS BECOMES FUNGI PHENOM WITH ACCLAIMED DOCUMENTARY AND STAR TREK CHARACTER

Molly Gilmore

https://www.theolympian.com/, Dec. 6, 2019

Olympia mushroom guru Paul Stamets, long a major figure in the world of mushroom research, is now a pop-culture celebrity, too.

Stamets, a scientist and head of the business Fungi Perfecti selling mushroom remedies, cultures, and supplies, is the central expert featured in the current documentary "Fantastic Fungi" and the inspiration for science officer Paul Stamets on CBS's "Star Trek: Discovery."

"Fungi's" Olympia premiere on Thursday, Dec. 12, included a Q&A with Stamets, who has spoken at only a few of the screenings nationwide. That screening sold out, but both the Olympia Film Society and the Grand Cinema in Tacoma hope to bring back the film.

"This show sold out in about two weeks, which is unusually quick for us," said OFS spokesman Jonah Barrett. "We get so many calls every day from people asking for tickets, and it's so sad to turn them away."

Directed by time-lapse photography master Louie Schwartzberg, "Fungi" celebrates the healing power of mushrooms and mycelium, vast underground networks that spawn them and connect plants and trees, to heal both humans and the earth.

Yes, psychedelic mushrooms are part of the story—and an interesting one given that research on psilocybin's power to alleviate depression and anxiety is so promising that Johns Hopkins University recently opened a center for research into it and other psychedelics.

The film, which opened in October, has received international acclaim.

It was one of just nine films to get a perfect score on the film-review aggregate site rottentomatoes.com in 2019, according to a recent article in London's *Daily Mail*.

" 'Fantastic Fungi' is a must see for anyone interested in life, death, and the pursuit of the planet's well-being," David Carpenter wrote in *Forbes*.

Stamets, who graduated from The Evergreen State College in 1979, is a leader in that pursuit.

Though his only graduate degree is an honorary doctorate from the National University of Natural Medicine in Portland, he holds numerous patents, with the most recent ones relating to the enormous power of fungi extracts to fight viruses that have killed huge numbers of honeybees and contributed to colony collapse disorder.

"My bee research is a paradigm-shifting breakthrough," he told *The Olympian*.

"Nature can repair itself with a little help from mycologists," he wrote in an opinion piece in *The New York Times* in December 2018.

"Mycology is an underfunded, understudied field with astonishing potential to save lives: ours and the bees.' "

That's just one example of the potential Stamets and others see in the mushrooms that *Los Angeles Times* critic Robert Abele labeled "capped crusaders" and in the mycelium beneath.

It might sound science-fictional—especially when you think of the fungi as superheroes—but the interconnected organisms Stamets studies are quite down to earth.

On "Discovery," meanwhile, his science-fictional namesake studies alien fungi. Stamets said he talked with writers on the series about mycelium, which is a key technology on the show.

"Science fiction often precedes, conceptualizes, and can predict science facts," Stamets noted.

ONE-SKILLET MUSHROOM CORNBREAD DRESSING

Andy Baraghani

https://www.bonappetit.com/

Ingredients

¼ cup (or more) extra-virgin olive oil
12 oz. mixed mushrooms (such a maitake, shiitake, and/or oyster), torn into 1–2 in. pieces
2 medium red onions, sliced into 1 in. wedges
4 garlic cloves, thinly sliced
2 TBs finely chopped rosemary, sage, and/or thyme
1 TBs honey
1 bunch of Tuscan kale (about 6 oz.), center ribs and stems removed, leaves torn
2 tsp Diamond Crystal or 1 tsp Morton kosher salt, plus more
2 cups yellow cornmeal (not polenta)
1 tsp baking soda
1 large egg, lightly beaten
2 cups low-fat buttermilk
½ cup (1 stick) unsalted butter, melted plus 1 TBs for greasing

Preparation

Preheat oven to 450°F. Heat oil in a large ovenproof skillet, preferably cast iron, over medium-high. Add mushrooms and cook, undisturbed, until golden brown and crisp underneath, 3–5 minutes. Toss and continue to cook, tossing occasionally, until mushrooms are deeply browned all over, 4–6 minutes longer. Transfer to a medium bowl, leaving any leftover oil in skillet.

Return skillet to medium-high heat. Add onions and cook, stirring occasionally and adding 1–2 Tbsp oil if pan looks dry, until lightly charred all over and softened, 8–10 minutes. Add garlic and cook, stirring often, until softened but not browned, about 5 minutes. Stir in herbs and drizzle honey over, then add kale and cook, stirring occasionally, until kale has wilted and is tender, 6–8 minutes.

Return mushrooms to skillet, season with salt, and toss to combine. Transfer mushroom mixture back to medium bowl. Wipe out skillet and place in oven to preheat.

Combine cornmeal, baking soda, and 2 tsp Diamond Crystal or 1 tsp Morton salt in a large bowl. Whisk egg, buttermilk, and ½ cup melted butter in another medium bowl. Add egg mixture to dry ingredients and stir to combine. Fold in three-quarters of mushroom mixture.

Carefully remove preheated skillet from oven and pour in remaining 1 TBs butter, swirling skillet to distribute. Scrape batter into skillet. Top with remaining one-quarter of mushroom mixture. Bake stuffing until golden brown, 25–30 minutes. Serve in skillet or break into craggy pieces and transfer to a platter. *Serves 8.*

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