

SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Number 573 June 2021



BURN MORELS: MYSTERY AND SCIENCE

Kristen and Trent Blizzard

The Mycophile, North Amer. Myco. Assn., May-June 2021



Each year like clockwork, North America lights up with a frenzied mania for the spring morel (*Morchella* spp.). Yet, the morel experience is markedly different in the West vs. the East. Eastern morels progress northward with foragers focusing on certain types of hardwood trees during the short few weeks of fruiting at any given latitude.

Western morels move from deciduous trees in riparian areas to conifer trees on mountain slopes as spring turns into summer. Foragers can pick for months by simply heading uphill. Most importantly though, the West has burn morels or fire morels, which grow in the scar of a recent wildfire. In normal conditions these mushrooms grow with a great abundance that is rarely seen outside of a burn.

What are They?

Morel hunters in the East and Midwest often have a totally different understanding of “burn morels.” For these hunters they are simply morels that are found somewhere in a burn disturbance. Common sense, right? Not so fast...

When we discuss burn morels we don’t mean a morel that is found where it burned. Instead we are specifically referring to a unique species of morel that typically displays three characteristics:

1. They only grow in conifer forests.
2. With a few exceptions, in North America they only grow in the Western U.S.
3. They only grow after a fire (not after clear cuts or logging activity).

Fire morels live in the ground in a mycorrhizal relationship with conifer trees and their roots. Although they are always there, they only fruit after a significant fire event! These mushrooms might lie in hiding for 50 years or more, just waiting for a fire to come through and activate them. The actual cause of their activation is still a scientific mystery but certainly fun to theorize about. Fire changes the soil chemistry which is likely to be a factor. Perhaps the phenomenon is an elegant survival response to the death of the tree host? This *Morchella* species does not fruit after clear cutting, so more than just the death of the host is required.

Fortunately for us, these mushrooms follow an entirely predictable mantra, becoming attainable prey and a rewarding study.

Burn Morel Species

Widely considered “black morels,” burn morels present a range of colors from black to grey, tan, greenish, pinkish, or yellowish. Taxonomically speaking, there have been a lot of revisions over the last 10 years with DNA testing filling in the blanks of these morphologically similar species. We are not mycologists or geneticists, but here is what we have learned: There are at least four clearly defined burn morel species and a fifth strong candidate.

The most iconic of the burn morels is *Morchella tomentosa*. It has several highly recognizable features: dense double wall construction with small hairs (velvet) on the stem which are especially noticeable when young. Tomentosas have a striking color scheme, can grow large, and are usually the last to fruit. They might be called grays, blacks, black foot, or fuzzy foot by foragers in the field. These meaty mushrooms are a prize for any chef!

The next three are *Morchella sextelata*, *Morchella eximia*, and *Morchella exuberans*. *Morchella sextelata* and *M. eximia* are difficult to distinguish without a lab. Foragers may commonly call them conicas, pinks, and/or pickles. *Morchella brunnea* is probably the fifth species of burn morel, but the evidence is not conclusive.

Duration

We are often asked if burn morels grow in subsequent years after a fire or only in year 1. This is an interesting study. You will find varying reports. The general theory is that they grow most predominantly in year 1, and with ideal weather conditions will continue to fruit in years 2 and 3 at reduced numbers. This is consistent with our personal experience. While you may find morels out further than



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Spore Prints

is published monthly, September through June by the
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MEMBERSHIP MEETING

Marion Richards

Tuesday, June 8, 2021, via Zoom

Our speaker for June is Jess Starwood, a forager, plant-based chef, and herbalist with a Masters of Science degree in Herbal Medicine (American College of Healthcare Sciences). Recognized as one of the most creative chefs in Ventura County by *Edible Ojai & Ventura County* magazine, Jess teaches wild food and herbalism classes in the greater Los Angeles area, hosts monthly wild food tasting events featuring her latest culinary creations, and has worked with several Michelin starred restaurants in Los Angeles to bring nutritious, wild foods to the table. In addition to sharing her love for unique and unusual foods, she strives to help students cultivate an intimate, sustainable, and connected relationship with the land. Her first book, *Mushroom Wanderland: A Forager's Guide to Finding, Identifying, and Using 25 Wild Fungi*, will be available August 2021 from Countryman Press. Join us for what is sure to be an interesting and entertaining evening.



Jess Starwood



WONDERING ABOUT IN-PERSON PSMS EVENTS?

PSMS Board

We are eagerly planning for in-person PSMS events this fall, including the Ben Woo Foray and the fall field trips! To ensure the safest possible environment for all participants, these will be open only to those who are fully vaccinated, i.e., those who are at least two weeks past the final recommended dose for whichever COVID vaccine(s) they received. We are crossing our fingers that we will be able to safely get together this fall.

Best wishes for a safe and satisfying spring foraging season!

CALENDAR

June 8 Membership meeting, 7:00 pm, via Zoom
June 14 Board meeting, 7:30 pm, via Zoom
Aug. 24 *Spore Prints* deadline
Sept. 14 Membership meeting, 7:30 pm (via Zoom?)
Sept. 20 Board meeting, 7:30 pm (via Zoom?)
Oct. 15–17 Ben Woo Memorial Foray, Camp Berachah, aka Black Diamond Camp

BOARD NEWS

Su Fenton

This is my first report as PSMS board secretary. You might not realize what big shoes I am attempting to fill as Luise Asif has been doing an amazing, seamless job for many years. But I will do my best.

Sadly, I need to report that Marion Richards has decided to resign her position as Vice President of the board. She has done an excellent job, and we appreciate that she had to negotiate running all the membership meetings by Zoom from the onset of her tenure. Thankfully, Scott Maxwell has agreed to fill in the position for the remainder of the term.

The board wants to thank Jeremy Collison for putting together another amazing Mushroom Maynia which was shown on May 2. It was made all the more challenging by being virtual. It was packed with great presentations and information and had good attendance including many children.

Owing to the lack of in-person PSMS events this year, a motion was approved to extend the membership period to new and renewing members who paid their dues after January 2021 until June 30, 2022. Happily, the board is excited to prepare and anticipate the return of in-person events in the near future. The Ben Woo Foray is being planned by Luise Asif, James Nowak, and Marian Maxwell, and Brian Luther is busy planning the fall field trips. Can't Wait!

SHIITAKE DIAPERS: TORONTO TEENS WIN \$30,000 IN NORTH AMERICAN STEM COMPETITION

Janice Golding

<https://toronto.ctvnews.ca/>, May 7, 2021

TORONTO - The average baby goes through thousands of diapers before it is toilet trained. That translates to tens of billions of diapers in North American landfills every year.

“My neighbor had a young baby and I saw how many diapers she was using,” Alexandra Miller told CTV News Toronto.

That’s why the North York teen pitched the idea of creating an “eco-friendly” diaper to her classmates when they entered ExploraVision, a STEM competition in which thousands of North American teens participate in every year.

At the time, Harriet Lerman, Miller’s classmate, says her mother was reading a book about mushrooms.

“And I knew that mushrooms were super good at carbon capturing, so I brought it up with my group members.”

“And then we found out how absorbent the roots were and then we decided to implement that and mix the two together,” said Alexandria Yau.

And thus, the concept for “Shiitake Diapers” was born. The girls proposed growing highly absorbent mycelium—the root system of mushrooms—by harnessing harmful carbon dioxide. The mycelium would then be used as the basis of a biodegradable diaper.

“Mushroom diapers—shiitake diapers, taking CO₂ out of the environment, using that to grow mycelium, and then to make a diaper that would reduce land waste, that is truly amazing, it’s so creative,” said their science teacher, Cindy Law.

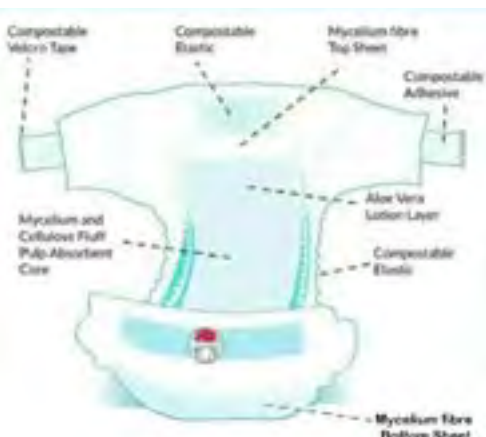
It took a month of hard work for the grade 10 girls at William Lyon MacKenzie Collegiate Institute to develop the diaper.

“Like seven-hour Zoom calls after class just to get our ideas organized or researched,” says Yau.

But the hard work came with a big payoff. The 15-year-old students won first prize in the ExploraVision contest that came with a \$10,000 payout, for each of the teens.

“\$10,000, I mean, that’s like a lot of money,” says Yau. “And I think I can really invest in my future.”

The award has extra meaning for these youngsters, given studies indicate women make up less than 30 percent of the workforce in fields involving science, technology, engineering, and math.



Prototype diaper.

AMANITA MUSCARIA: A Legal Psychoactive Mushroom With Potential Therapeutic Effects

Natan Ponieman

Benzinga.com, Apr 2021

extracted from *The Spore Print*, L.A. Myco. Soc., May 2021

Amanita muscaria is an understudied species of psychoactive mushroom that’s as commonplace as it is misunderstood. The iconic red-capped, white-dotted toadstool represents the archetypal idea of a mushroom in most people’s minds, yet few are aware of its therapeutic potential as a psychoactive fungus.



Amanita muscaria.

“We know it’s often associated with stress reduction, with pain reduction, with longevity. There’s lots of anecdotal evidence of its value particularly in the native peoples living in the northern parts of Asia,” says Professor David Nutt, a world-leading neuropsychopharmacologist with extensive experience researching psychoactive substances.

As public, scientific, and financial interest in psychoactive mushrooms gains momentum, *Amanita muscaria* is catching the eye of investors in the psychedelics sector.

As opposed to psilocybin mushrooms—the centerpiece of the psychedelic mushroom movement, *Amanita muscaria* offers one special differentiator: It’s not a controlled substance in most countries, including the U.S.

Its psychedelic properties, however, appear to be of a very different nature.

Is *Amanita muscaria* a Psychedelic?

When most people speak of “magic” mushrooms, they usually refer to those of the *Psilocybe* genus. These species produce psilocybin, a very powerful psychedelic compound with a similar chemical structure to LSD, mescaline, and DMT, all of which interact with a specific serotonin receptor in the human brain.

Amanita muscaria mushrooms fall into a different category from that of “classic psychedelics” since muscimol, its main active component, interacts with GABA_A receptors.

“It doesn’t have the same psychedelic actions as psilocybin mushrooms. But that doesn’t mean it doesn’t have value,” says Professor Nutt, who began researching muscimol and its incidence in GABA receptors over four decades ago.

“We know muscimol is a unique molecule if we want to look at the therapeutic value of the GABA system,” he says.

Professor Nutt’s initial research on muscimol and the GABA receptors came to a standstill in the early days because science didn’t yet have a full understanding of how the GABA system worked. However, developments during the past few decades may have opened new opportunities for understanding how this compound affects the human brain.

“We’re not entirely clear whether the psychedelic effects [of *A. muscaria*] are due to the muscimol,” says Nutt.

According to the scientist, those may be due to other components present in the mushroom. It is possible that muscimol can become a therapeutic agent without psychedelic effects

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THE PSMS BEN WOO MEMORIAL FORAY IS BACK!

Friday, October 15, thru Sunday, October 17

You must be a PSMS Member
\$195/person

Registration opens the middle of June
Space is limited to only 100 foragers

For the safety of all foragers

*Proof of vaccination is required at time of registration
and temperature will be taken at check in.*

Puget Sound Mycological Society is very excited to be able to host the fifth annual Ben Woo Memorial foray as we celebrate and continue the work of mycologist Ben Woo. This year's foray theme is "Citizen Science," how we all can expand our understanding of and contribute to the study of mycology. This is a great opportunity to get together with friends, meet new people, and explore the incredible world of fungi.

The foray will be held at Camp Berachah Ministries, also called Black Diamond, at Mt. Rainier. The campus is surrounded by magnificent old growth forest with mushrooms growing literally just outside your door! Within a short driving distance there is access to acres of prime mushroom habitat.

The package includes accommodations, meals, engaging evening presentations, and guided mushroom forays. There will also be hands-on workshops; prior registration is required.

Accommodations are dormitory style with separate rooms for women and separate rooms for men. There are typically 3 adults per room. If you have a special request to share a room with another person(s) please include their name(s) in the notes section. Though we can't guarantee that your specific requests can be accommodated, we should be able to group same gender couples or friends wanting to share a room. Bathroom facilities are segregated into separate women's and men's facilities.

There are RV and camping spaces available, but no RV hook-up services. You are welcome to camp or bring your RV, There is no reduction in registration fee. Please make a note in the comment's section if you plan on camping or if you are bringing your RV.

A few rustic A-frame cabins are available and I do mean rustic! They're great for rugged outdoor types who want to room together. These cabins have 6 bunk beds, a light bulb, an electric outlet and a heater that might work. The bathrooms are a short walk away. There is no extra charge for cabin rental.

If children will be attending, they must also be vaccinated. Please make a note in the comments section. Children must be PSMS members and must be registered. Children and adults pay the same price. Sorry no unexpected visitors and no pets, except service animals.

The event will wrap up Sunday morning with a walk around the collection table. Our team of expert identifiers, Marian Maxwell, Steve Trudell (pending), and Noah Seigel will discuss details and answer questions about specimens gathered during the foray.

Bring your own bedding, sheets, blankets, pillows, sleeping bag, towels, and other personal items to make yourself comfortable. There are no nearby services, so bring what you need with you. Don't forget a flashlight, rain gear, and mushroom gathering gear.

Meals are served in the main lodge. There will be dinner served Friday night, Saturday breakfast, lunch and dinner. A sack lunch will be provided for those going off site all Saturday on their own forays. If you want a sack lunch to take with you Saturday, we will take a count during breakfast. Sunday breakfast will be served before checkout at 11:00 am. There is refrigeration, and kitchens are available for those with special dietary needs or for those that just want to cook their own meals.

Check in begins at 3:00 pm on Friday, October 15, and checkout is at 11:00 am Sunday morning, October 17. You must be out of your room by 11:00 am, but you may linger on the property to forage for the remainder of Sunday.

Presentations

This year lectures will be by Steve Trudell (pending), mycologist and co-author of *Pacific Northwest Mushrooms*; Alana McGee, truffle expert and owner of The Truffle Dog Company; Marian Maxwell, former PSMS president, on the amazing "Role of Fungi in the Ecosystem"; and Noah Seigel, co-author with Christian Schwarz of *Mushrooms of the Redwood Coast*, a comprehensive guide for the northern California coast.

Workshops

We are excited to offer several informative hands-on workshops. *Advanced registration is required* for all workshops *except the Cortinarius*. Workshops take place on Saturday; below is a list of this year's workshops. When signing up for afternoon workshops keep in mind that *they all happen concurrently so sign up for only one* afternoon workshop, unless you have your avatar with you! A free *Cortinarius* workshop is scheduled after breakfast. The cultivation workshop is scheduled before lunch, so all can take part in this workshop even if they are signed up for an afternoon workshop.

***Cortinarius* Workshop**

No registration required
Saturday, October 16
After Breakfast



Shannon Adams will offer a free 1-hour workshop after breakfast to discuss the genus *Cortinarius*. This is a walk-about through the camp while discussing the features of this complex mushroom group. Gather for this tour after breakfast on Saturday in the main lodge.

***Cultivation* Workshop**

Saturday, October 16
11:00 am to 12:00 pm
Cost \$6.00
No limit on attendance



Milton Tam, Ph.D., PSMS cultivation chair, will lead the mushroom cultivation workshop. This workshop will include a Power Point presentation to provide supportive information, then participants will make their own oyster mushroom "patches" to take home. Milton will be there to guide you through his unique nonsterile process. So much fun and so easy!

***Cooking* Workshop**

Saturday, October 16
1:00 to 5:00 pm
Cost \$45
Limit 20



Master chef Chad Hyatt, author of *The Mushroom Hunters Kitchen*, will expand your awareness of culinary mushrooms and share unusual and flavorful recipes from his book. You will have the opportunity to work directly with Chef Hyatt creating unique preparations to add to your quiver of recipes. Open to all levels of cooking experience. Roll up those sleeves and be prepared to cook up a storm.



Microscopy Workshop

Saturday, October 16

1:00 to 5:00 pm

Cost \$35

Limit 10

Shannon Adams, an expert in microscopy, will reveal the fascinating world of mushrooms as seen through the lens of a microscope. So useful for identification and for viewing fascinating fungal structure. This is a rare opportunity to work with PSMS's brand new, state-of-the-art microscopes. Shannon strives to make workshops inclusive and exciting to people from all backgrounds. No prior experience necessary.

Mushroom Dye Workshop

Saturday, October 16

1:00 to 5:00 pm

Cost \$35

Limit 20



Marion Richards will guide you through the fascinating process of dyeing fabric using mushrooms. Each participant will receive one silk scarf to dye during the class as well as a sample card that will be created from woolen yarn samples dyed during the demonstration. Additional scarves are available for purchase for \$10. Experience another incredible aspect of mushrooms in this "to dye for" workshop.

Note: Maps of nearby foraging sites will be provided Saturday morning after breakfast for those who want to explore the forests on their own. James Nowak will be available to answer your questions.

Since *Spore Prints* is not published in July and August, further information will be sent via broadcast emails.

Please feel free to contact us with any questions.

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*Looking forward for a joyous return to being together
for the fungi hunt!*

SOIL FUNGI AND THEIR POTENTIAL USE AS A FORENSIC TOOL

Sweta

<https://legaldesire.com/>, May 11, 2021

There are various fields of forensic science that are used to solve criminal cases based on the nature of the crime like forensic toxicology in cases of drug abuse, forensic biology and serology in cases where blood, semen, saliva, etc., are found at the scene

of the crime, forensic documentation in cases of forgeries and counterfeiting, ballistics in cases where firearms are involved, etc.

With the advancement in science and knowledge of new biological aspects, the forensic field also uses these new advanced technologies in solving crimes. Forensic taphonomy is one such new field in forensics which studies the effect of environment and the surrounding conditions that affect the process of decomposition and estimate the cause and time since death. Forensic mycology studies the fungi associated with the dead decaying cadavers and employs them in estimating cause and time since death. This field is quite new in forensics but holds humongous potential as a tool because it is based on botany, archeology, soil microbiology, and entomology. In Argentina, Brazil, the USA, and Japan, forensic mycology has been employed as a tool, but the limited number of studies in this field poses a problem for its acceptance. Hence more and more studies need to be done for the advancement of forensic mycology and the evidential value of fungi can be appreciated.

Any crime involving murder will lead to anomalous graves where decaying corpses are found. In these type of unidentified bodies, or where the cause of death is unknown, i.e., if it's a homicide, suicide, or accidental, it becomes the duty of law enforcing authorities to investigate and discover the cause and time since death. Fungi found near or under the dead decaying cadaver can be analyzed for the same. Fungi will not only tell the post mortem interval, but they will also establish the presence of psychoactive substances and toxins and link the trace evidence with people and places.

COW DUNG THERAPY CAN'T BEAT COVID, MAY ACTUALLY TRIGGER BLACK FUNGUS, WARN DOCTORS IN INDIA

<https://www.news18.com/>, May 12, 2021

Ever since the coronavirus pandemic broke out in March of last year, people have been particular about immunity.

From home remedies to supplements, Indian people have been getting their hands on every feasible option to boost the immune system. However, there has also been spike in popularity of cow dung and cow urine as a "cure" for coronavirus.

Eminent doctor and member of Ahmedabad Medical Association, Dr. Vasant Patel says that videos of taking baths in cow dung and cow urine to promote the immune system are circulating on social media are misleading. On the contrary, people are inviting an infectious disease called mucormycosis, or Black Fungus, says Patel.

Ahmedabad has been witnessing 10 to 12 new cases of Black Fungus daily, and the administration is now setting up a separate facility to treat these patients. Over the past few weeks, Black Fungus has been reported from several states like Maharashtra, Odisha, Delhi, Gujarat, etc. It has been seen particularly in people who have recently recovered from coronavirus [and people with diabetes]. One reason for this infection is the weakened immunity caused by steroids taken during Covid-19 infection.

"Using face masks, hand sanitizers, and maintaining social distancing is the only way to prevent Covid-19," he says, appealing people not fall for such dangerous quacks.

Fire Morels, cont. from page 1

3 years on the burn scar timeline, only DNA sequencing can tell us definitively whether or not they are a true burn morel species at that point.

Another interesting theory, relevant in dry climates such as Colorado, is that a burn that did not fruit in year 1 owing to inadequate weather conditions will fruit aggressively in year 2. We have yet to discover the answer to this, to be determined....

The Hunt

Once you realize burn morels almost always follow the rules, then finding them becomes about learning their habits. We already mentioned that you begin in burn scars in the Western U.S. and that you are looking for mixed conifer forests. But there is a bit more to know.

A signature of these mushrooms is that you can hunt them for months if the weather is ideal. As the season matures, they move up in elevation.

In order to experience success, you must have at least average precipitation for the location. A wildfire scar with no rain will yield almost nothing. Steady rain patterns will usually cause wide-spread fruiting. If conditions are good, one hillside may fruit 2 or 3 times, as each species takes its turn, over several weeks.

In the right kind of burned forest, in the right area of the country, with good moisture, you are almost always guaranteed to find burn morels. A LOT of burn morels in fact. If the habitat is favorable, these mushrooms can be prolific. Forget about counting mushrooms, it is not uncommon to fill a five gallon bucket in a few hours.

Elevation is an important factor. Burn morels start low and move up as the season progresses. It's important to have an idea of where to begin. Don't hesitate to scour morel and mushroom hunting Facebook groups in the area (years back as well). People will often share the timing and elevation information of their finds.

A general understanding of aspects is imperative for mountain hunting. South facing slopes are dryer and warmer. In the early season, this might be where you start. However, if you are facing a general lack of rain, North facing slopes stay cooler and hold moisture longer.

In severely dry environments, microclimates are key. These environments trap moisture, such as underneath shade-producing logs or inside root holes and other depressions. Often morels will grow near a forest seep or other water source when it's very dry.

Pre-Trip Research & Mapping

Often burn hunting requires a fairly significant drive, so it pays to do a little research before you go. A successful hunt asks you to first consider these factors:

Access - Some fires are located in remote areas with no road access. How will you approach? Is there a clear path into the fire?

Tree Type - Make sure to research the tree type in the forest burned. If you don't have conifers, you likely won't find morels. Mixed conifer forests containing spruce and fir trees are often best. However, pending location, burn morels can also be found with other types of conifers such as Ponderosa Pine or Douglas fir.

Land Type - Do you know where the fire perimeters are located? Do you have a reliable map? Are you on private land, in a reservation, a National Park, Wilderness, or state land? We target National Forest lands which always offer rules for hunting and often require a permit. Fire data can be hard to find; make sure you have reliable resources.

Elevation - Burn morels grow in elevation rings; once you find the elevation they are at right now, you can reliably bank on it within 100–200 ft.

Aspect - We often start on North facing slopes and then look for East or West facing gullies. When conditions are good, aspect won't matter.

Fire Size - If you have a long way to travel, often a larger burn is an ideal destination. It offers the best chance for you to check a variety of elevations and aspects.

Safety

Hunting in a wildfire scar can be dangerous. It is important to take the utmost care when trekking through a burn. You may encounter a few treacherous scenarios:

1. Tree roots burn well into the ground leaving hidden and some-times cavernous holes. It is possible to easily lose your footing and tweak an ankle or knee.
2. Wind is not a friend. If it's windy, come back another time. Dead trees blow over, easily.
3. Heavy rain on a steep slope is also quite dangerous. The top 2–3 inches in a burn is often ash, and when wet, it's nearly impossible to gain footing on a slope. In these conditions it can be very, very slippery! Also take heed of flash flood warnings.
4. Make sure your party has some kind of GPS device as well as walkie talkies. Like any foray, it is easy to lose your way in a burn, where you often wander for miles.

Permits & Closures

Burns are often closed as a safety precaution or for logging operations. Always check the status before you hop in the car. The Forest Service does a good job keeping this information up-to-date. You will also need to check with your local ranger station before you go. Most National Forests require a mushroom hunting permit. In certain areas of the country, such as Oregon and California, this is taken very seriously.



Commercial Hunters

If you are in the right spot, you will likely encounter commercial mushroom hunters. You may even see a mushroom buyer set up in a nearby town. Do not despair. Often, these folks are friendly—they are out there entirely focused on doing a job. They pick incredibly fast and go after the low hanging fruit, often leaving mushrooms behind. There is usually plenty of forest and enough mushrooms for everyone.

Sustainability

Respect for the forest is always a must, please leave no trace. Because burn morels only fruit in wildfire scars, the discussion about sustainability is nuanced. These mushrooms come out in the millions, and just as quickly, they go. Research indicates that limits set for recreational harvesting to date appear appropriate and sustainable. As with many mushrooms, the health of the forest is paramount for species sustainability.

An Unforgettable Journey

If you are planning a trip, note that you will need to be flexible and mobile. It may be difficult to make concrete plans, Mother Nature is the boss. We often plan only where to begin, flagging 3 or 4 potential fire destinations. We tow our camp trailer, park in the forest for 3 days, and then find an RV park intermittently to clean up and power our dehydrators. Then back to the forest and the cycle continues.

We hit the road each year, traveling from Colorado to Oregon in late May and June to hunt the burns. Burn morels are the destination and we follow the rain around the west, chasing mushrooms and sometimes getting schooled. It is one of the most rewarding experiences of our foraging year. Keep an open mind and embrace your sense of adventure! If you've done your research, you will find burn morels.

Enjoy the hunt, perhaps we'll see you out there!

*Kristen and Trent Blizzard have been hunting burn morels for years. They offer curated morel burn maps for 11 Western states and more resources at modern-forager.com. They are also the authors of *Wild Mushrooms: A Cookbook and Foraging Guide*.*



Amanita Muscaria, cont. from page 3

How Toxic is *Amanita muscaria*?

“In the *Amanita* genus, there are a number of different *Amanita* mushrooms and some of them are very, very poisonous. As a result of that, historically, this has been labeled as a poisonous mushroom,” says Stevens.

In larger doses, muscimol is believed to have inebriating qualities. However, the compound itself is not readily present in raw *Amanita muscaria* mushrooms. That's part of the reason Stevens believes *Amanita muscaria* [muscimol] was never labeled as a scheduled drug.

The initial form of muscimol is ibotenic acid, which is converted to muscimol after the process of decarboxylation. While usually not deadly in moderate amounts, raw *Amanita muscaria* mushrooms can still cause very unpleasant effects.

“When you pick it, you need to process it. You'll get quite sick if you don't convert the ibotenic acid,” says Stevens.

The company is currently in the initial stages of understanding how muscimol can be used therapeutically. It recently announced the results of a toxicology exam, finding that the mushroom's alleged toxicity is not backed by scientific evidence.

Clinical Developments with *A. muscaria* and Muscimol

As a potential FDA approved drug, muscimol is still far from the finish line.

“I've always been fascinated by *Amanita*. I put it in my lectures, but there's very little research on it,” says Professor David Nutt.

“We welcome all researchers willing to explore the potential therapeutic value of *Amanita* and its derivative compounds for FDA-approved drug development programs,” says Dr. J. Andrew Jones, chairman of the scientific advisory board of biosynthetic psychoactive compounds developer PsyBio.

Jones explains that historic clinical experiments demonstrated that muscimol has a variety of effects including anxiolytic, analgesic, antispastic, and as a muscle relaxant, but none of these progressed through the clinical trial process. “There are smaller studies currently being run in academic research laboratories, and as the knowledge base around muscimol grows, there may be further attempts at clinical development,” says Jones.

The more researchers can learn about the complex pharmacology of nature-derived psychoactive compounds, he adds, the faster these molecules can be advanced as potential treatments for a host of mental health illnesses.



BLACK FUNGUS: 111 PATIENTS UNDERGOING TREATMENT FOR MUCORMYCOSIS INFECTION IN MUMBAI, INDIA

<https://zeenews.india.com/>, May 12, 2021

MUMBAI - The Brihanmumbai Municipal Corporation (BMC) on Wednesday informed that as many as 111 patients, all COVID-19 survivors, are undergoing treatment for mucormycosis infection in Mumbai hospitals. Also known as the “Black Fungus,” mucormycosis can turn fatal if not treated on time.

According to additional municipal commissioner Suresh Kakani, at least 38 patients are being treated from the infection at the civic-run BY Nair Hospital, 34 at KEM Hospital, 32 at Sion Hospital, and seven at Cooper Hospital.

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Further, Kakani said that the mucormycosis infection is not “contagious” and doctors at COVID-19 hospitals are trained to handle it.

Meanwhile, state health minister Rajesh Tope on Tuesday said there could be over 2,000 mucormycosis patients in Maharashtra and with more and more COVID-19 cases coming up, their number is likely to increase.

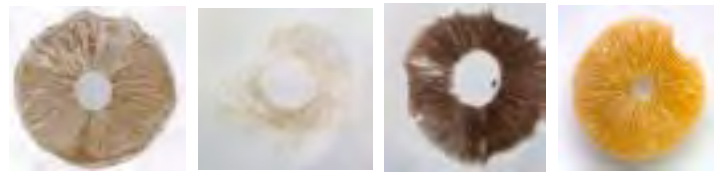
The state government has decided to select hospitals attached to medical colleges for treatment of mucormycosis patients as it demands a multidisciplinary approach, Tope said.

As per doctors, this fungal infection is mostly found among COVID-19 patients suffering from diabetes. Its symptoms include headache, fever, pain under the eyes, nasal or sinus congestion, and partial loss of vision. Though, the good news is if diagnosed at an early stage, it can be cured completely.

Ed Note: The foregoing article is a just sample of the many, many from India recently about cases of Black Fungus, aka mucormycosis, in patients who have had COVID-19. The stories range from individual histories to case numbers reported by various provinces to reports of cities setting up whole hospitals to deal solely with this problem. It's almost as if there is a post-pandemic epidemic of mucormycosis.

To obtain a spore print from a fresh gilled mushroom, cut off the stalk if there is one. Put the mushroom cap, gills down, on white paper. (Pale yellow and pale pink spore prints can be mistaken for white if made on black paper.) If the mushroom is dry, put a few drops of water on the top of the cap. Cover with a drinking glass to retain moisture. Wait at least an hour, perhaps overnight. Hold the paper to a bright light and look for a pattern of the gills. Don't mistake a pigment stain for a spore print. Failure to obtain a spore print isn't uncommon.

In the field, I sometimes put a mushroom cap on a piece of paper, wrap it in waxed paper, put it in my collecting basket gills down, and hope to have a spore print when I get home. Sometimes one mushroom will overlap another and leave a spore print on the lower mushroom. Updrafts may leave a spore deposit on the top of shelving polypores.



***This will be the last newsletter until September.
Have a great summer!***

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