# FUNGIFAMA

NEWSLETTER FOR SVIMS.CA

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## THANK YOU

A big *thank you* goes out to previous editors, **Euan Thomson and Thomas Witte**, who gave graciously of their time to the world of Fungifama.

## Safety first, folks!

**We would like to remind readers the risk of poisoning when eating unfamiliar fungi. Some mushrooms are acutely toxic and can cause death. Always cross-reference. Gather intel &/or ask professional mycologists.**

## Past Events

SVIMS has had a successful 2018 so far with the Annual Survivors Banquet that was held on January 2. Much fun was had by all and the culinary prowess was impressive, particularly those dishes that highlighted the mushroom. Upcoming online and/or published recipes are in the works!

The Chinese Mushroom Dinner was also a success with many people attending and enjoying more culinary delights from The Golden City's chef. None of us had access to photos of the evenings, but will be hunting people down in the future… beware.

*Photo & Artwork by Mary Sundstrom of Grand Haven, Michigan, USA.*

## Letter from the editors

Welcome back! Fungifama has been resuscitated! The world of fungi is vast, mysterious, complex, spiritual and incredibly rewarding. Those that fall in love with mycology are also incredibly unique and cover a multitude of subject matter. Scientists, crafters, foragers, cultivators, culinary enthusiasts, artists, phytologists, medical scientists and experimenters can all find common ground.

We have a new group of editors who will strive to capture the diverse interests of the fungi enthusiasts. Most of us are quite green, and have struggled finding information for certain topics; thus Fungifama has a list of columns that we will be building on with each issue. Our focus (since January) has been on spring time… use what we've gathered for next spring (morels)! Upcoming newsletters will be focused on more current seasonal topics.

We are also looking for submissions, so if you feel inspired please share your voice with us. Help fill our newsletter with intriguing articles. Thank you to those and have volunteered to help write columns &/or articles!

Feel free to contact us with questions, comments and/or requests for topics, guest speakers, Ask Aunt Amanita at: fungifama.svims@gmail.com. Annual fee to become a part of SVIMS is only 25$ per individual. 35$ for an entire family!

Photo by Terrie Finston, Mount Work, Victoria. December 3rd, 2016.

## LIBRARY

We have a vast array of books, videos, manuals, magazines, texts etc! For our library list, it is available online at www.svims.ca. To borrow, please contact Thor (email available on the library webpage). Please return books after a month's use!

## Upcoming guest speakers

**July, August = no SVIMS meetings**

**September 6**
- Shannon Berch.

**October 4**
- Daniel Winkler.
- We may have Henry Beker, Hebeloma expert, around the week before!

**November 1**
- Dennis Benjamin

**December 6**
- AGM + speaker TBA.

**All meetings will begin promptly at 7pm, and ending no later than 9pm. They will be held on the first Thursday of the month, at: Pacific Forestry Centre, 506 West Burnside Rd, Saanich, BC V8Z4N9. For up-to-date information, please visit www.svims.ca**

## An Ode...

Gary LincoffMr. Lincoff, who led mushroom hunts as far afield as India and Siberia, examined the day's haul after the 2011 Bronx foray.

Credit
Alan Zale for The New York Times

## Eulogy for Gary Lincoff

On behalf of the Connecticut-Westchester Mycological Association (COMA) I offer my sincere condolences to Irene and Noah, to Gary's family, and to the countless friends of Gary Lincoff in the mycological community and beyond. Gary touched us all in a profound and indelible way. He taught us the science of fungi, and he helped us to know the beauty of the natural world in marvelous, intimate detail.

The physicist Richard Feynman once recommended to his students, "Study hard what interests you the most in the most undisciplined, irreverent, and original manner possible." I think we know that Gary Lincoff did just that. He forged his own path in mycology, botany, and nature study. In doing so he helped to create a living, lively community.

Gary's involvement with COMA began in 1975, the same year COMA was founded. He gave countless lectures; he came to every foray; and his last lecture was just last Saturday at COMA's Mushroom University, which one might say was really "Gary Lincoff University" – a winter tutorial on mushroom genera and species that we've sponsored for several years.

Gary gave an annual lecture for COMA every spring. I always enjoyed introducing him, for it gave us a chance to cut up and have fun right before his talk. I once introduced him by reciting the title of every talk he ever did for COMA. This exercise literally took well over five minutes – and he was slightly exasperated and amused by this, but I wanted everyone to know that here is a scholar whose dedication is absolutely unstoppable, going back almost half a century! And that was just for COMA! He did this for the New York Mycological Society, for the Telluride Mushroom Festival, and for how many others?

The Audubon Society Field Guide to North American

Mushrooms was our bible. I have three copies. The first is utterly ruined from a thunderstorm on a foray in the woods, but I will treasure it always for Gary's inscription: "To Sue and Dave and Lila and Katie – Roses are much more interesting than mushrooms. I want photos of all of you! You deserve medals for showing such good humor at the driest foray in a quarter century! That we found so many mushrooms anyway is magic – which is what mushrooms are all about!!! – Gary, COMA foray, 30 September 1995." And at that foray I will never forget the special attention he gave to my daughters, teaching them how to identify Gomphus, and Leccinum, and other fascinating mushrooms.

Gary was the Socrates of Mycology – that is not a misplaced exaggeration. He really did employ the Socratic Method, just as he incorporated history, biography, epistemology, and literary perspectives into his educational process. He was a true educator. "Education" means "drawing one out." He drew us out and taught us time and again – in the words of Henry David Thoreau – that "nature works from reverence," and that "The man of most science is the man most alive, and whose life is the greatest event."

Not so long ago Gary took to posting quotations from Thoreau on his Facebook page. In his book, A Week on the Concord and Merrimack Rivers, Thoreau said this: "What, after all, does the practicalness of life amount to? The things immediate to be done are very trivial. I could postpone them all to hear this locust sing. The most glorious fact in my experience is not anything that I have done or may hope to do, but a transient thought, or vision, or dream, which I have had. I would give all the wealth of the world, and all the deeds of all the heroes, for one true vision."

Gary Lincoff provided us with that one true vision. When so much of our world is garishly fraudulent, Gary Lincoff was authentic. His magnanimous friendship was authentic. He was loved by countless thousands of people, and he changed the world for us. We will miss him.

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# President's Picnic

**JUNE 16/1018.**

An annual June event, where SVIMS members and their significant others, family members and/or friends come together to enjoy good food and joyous company. It was a great turnout and plenty of laughs were had. Come join us next year!!

# ASK AUNT AMANITA

*By Anja Hess*

***Dear Aunt Amanita,***

I really want to go mushroom picking around Victoria, but when I tried looking for tips online, there was so much conflicting information as if nobody knows what they're talking about. To top it all off, every time I ask someone where to look for a patch, they laugh at me! Please help.
--Clueless, Victoria, BC

***What Aunt Amanita says:***

**Dear Clueless,**

You are eager to learn about foraging for fungi, but I do not recommend pursuing this hobby by yourself, especially if you are planning to eat what you find. Don't bother with the internet since fungus identification varies based on region and some articles are written by poltergeists trying to detract you from their secret spots. In order to avoid a life-changing digestive event or getting lost and even worse, your untimely demise, learning from well-seasoned local mycolofans is the first step. The South Vancouver Island Mycological Society (SVIMS) holds monthly meetings where you can meet such people and sign up for a group foray, which is a great hands-on way to build new friendships and learn about what is growing near you. SVIMS meetings offer fascinating presentations by expert guest speakers, a specimen identification table, a fine library, and many bad jokes about licking toadstools. Just be warned: many of us mycolofans started out as mushroom soup enthusiasts and are now dealing with a full-blown obsession. We welcome you to join us at our next meeting, but for Bolete's sake stop asking for the coordinates of picking patches!
— Aunt Amanita, Victoria BC

## *Do's and Don't...*

There are many different opinions floating about in our minds and on this planet. We will try our best to follow some common "myths" and debunk them.

**Why are some fungus names capitalized and others, not?!**

All forms of life are organized into a list … this list is a system of Latin-inspired scientific names. It is binomial. Comprising of two names. The first is the genus (capitalized), the second is the species (never capitalized). Example: Homo sapiens = humans. When naming something, especially in literature, they are generally italicized as well.

**Why should we *not* use a closed-in bag for foraging, instead a basket?**

Very simply (after pondering, a bit of discussion and reading through a few different opinions), a basket has holes in it, where the spores of that particular mushroom(s) you're foraging for can and will slip through… You may be helping with the spreading of those spores while you're hiking/walking around; whereas, if you were to have them in a closed off component, the spores are unable to be released.

## Some of the Tools and Gear:

- Knife - for defence as well as to extract fungi
- Whistle - to communicate with your pals, or to help Search & Rescue find you...
- Wax paper – allows the mushrooms to breath so you can ID them later
- Magnifying glass - for ID'ing smaller visual keys
- Paper bags = non-mushy mushrooms
- Bright coloured weather appropriate clothing - especially in fall, when others will be hunting!
- Comfortable, sturdy and moisture proof footwear
- Rain gear
- Bear spray - for the cougars, bears, wolves and humans
- Water and non-perishable snacks
- Personal locator beacons –

You can find these at MEC, London Drugs, Amazon and many other retailers. **A PLB is an invaluable tool when you travel beyond the boundaries of cell service and will send emergency responders your GPS location.**

## Newbies Guide to Foraging

It is safe to say that one of the most important things to remember is to have a "check in time" with someone whom is NOT coming along on a foray with you. This means they need to know what area you will be going to, what route you'll be taking (loosely) and when you want to be back by… latest. In our next issue we will be addressing what kind of Personal Locator Beacons, GPS apps/devices, survival and first aid kits should be on your person.

# Front Page Fungi

There has been a lot of talk recently of how the usage of psychedelics is helping those with mental health issues. (More, than the "normal crazy"…). Our own University of Victoria has been doing some research.

### Magic mushroom users eager to talk 300 responses in one day after U Vic researcher put out call for details

By Deborah Wilson, CBC News Posted: Feb 13, 2018 6:00 PM

For University of Victoria masters student Lindsay Shaw, finding subjects to interview for her research project has been easy. Shaw wants to know how and why people use magic mushrooms — the hallucinogenic fungi that grows wild in fields and lawns of coastal British Columbia but is illegal to possess.

The second-year masters student at UVic's Canadian Institute for Substance Use Research has found no shortage of people who want to talk about their experiences with psilocybe semilanceata. When she put out a request for volunteers to answer a survey about their use of magic mushrooms, her email inbox filled with more than 300 responses in just over a day. People strike up conversation in the grocery store when they learn the subject of her research and she has been contacted by people from around the world who are eager to share their stories. Shaw became curious about the topic after reading surveys of university-age recreational substance users that said 93 per cent had taken magic mushrooms at least once. As well, 27 per cent said they used them in the previous month. "When I was reading these results they seemed relatively high," Shaw told On the Island host Gregor Craigie.

### Few other studies

But despite its apparent popularity, she found specific research on recreational magic mushroom use was scarce.

"There have been reports of people using them in therapeutic and medicinal ways, perhaps micro-dosing … to treat anxiety or headaches," she said. Others might use them for party drugs or in an outdoor setting.

"But we actually don't know what the users are using these recreational substances for," Shaw said.

## NETHERLANDS MAGIC MUSHROOMS

Magic mushrooms in a grow room at the Procare farm in Hazerswoude, central Netherlands. (Peter Dejon/Associated Press). Transformative experiences recounted Shaw expects to have results of her survey within a few months, but she has been struck by the overwhelming positive and sometimes transformative experiences with magic mushrooms that people have described to her.

"I think it was presenting a unique opportunity for a lot of people," Shaw said of her study. "I think it says something to me about the prevalence and also there aren't venues for people to talk about their magic mushroom use."

http://www.cbc.ca/news/canada/british-columbia/magic-mushroom-substance-users-study-uvic-1.4533962

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## A book review: *How to Change Your Mind*

A brilliant and brave investigation by Michael Pollan, author of five New York Times best sellers, into the medical and scientific revolution taking place around psychedelic drugs--and the spellbinding story of his own life-changing psychedelic experiences.
When Michael Pollan set out to research how LSD and psilocybin (the active ingredient in magic mushrooms) are being used to provide relief to people suffering from difficult-to-treat conditions such as depression, addiction and anxiety, he did not intend to write what is undoubtedly his most personal book. But upon discovering how these remarkable substances are improving the lives not only of the mentally ill but also of healthy people coming to grips with the challenges of everyday life, he decided to explore the landscape of the mind in the first person as well as the third. Thus began a singular adventure into the experience of various altered states of consciousness, along with a dive deep into both the latest brain science and the thriving underground community of psychedelic therapists. Pollan sifts the historical record to separate the truth about these mysterious drugs from the myths that have surrounded them since the Sixties, when a handful of psychedelic evangelists catalyzed a powerful backlash against what was then a promising field of research.
A unique and elegant blend of science, memoir, travel writing, history, and medicine, “How to Change Your Mind” is a triumph of participatory journalism. By turns dazzling and edifying, it is the gripping account of a journey to an exciting and unexpected new frontier in our understanding of the mind, the self, and our place in the world. The true subject of Pollan's "mental travelogue" is not just psychedelic drugs, but the eternal puzzle of human consciousness and how, in a world that offers us both struggle and beauty, we can do our best to be fully present and find meaning in our lives.

E-book is $16.99 CAD. Watch an interview with Mr. Pollan & Stephen Colbert:
https://m.facebook.com/story.php?story_fbid=1402797519864995&id=545775132233909

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# Iran’s Fungal Fatalities

“The (following) article is mycophobic. Information is lacking. The reminder to have solid ID skills is very real. Updated information on he species suspected to be responsible for this (numerous poisonings) is Amanita I Rosa or similar to the Destroying Angel (that we have).”
**- - Mr. Jason Gowan, a local mid-island myco-enthusiast, aspiring mycologist and mushroom picker.**

“More than 800 people have been poisoned after eating toxic wild mushrooms in around 10 provinces in the west of Iran. At least 11 people have died from the effects of the fungi and hundreds more have been hospitalised. There is no effective treatment for this kind of poisoning, Iran's Tasnim News Agency reports. At least two people have received liver transplants. The mushrooms concerned look similar to edible ones. People have been urged not to buy loose mushrooms and only purchase those packed and sealed in shops. According to BBC Persian, mushrooms can sometimes be seen for sale in the street in Iran, and local folk wisdom about which ones are safe to eat can be unreliable. The deadly fungi grow wild in mountainous regions of Iran's west after spring showers, according to Tasnim. Seven of the dead came from the Kermanshah area. Reports suggest that unprecedented rainfall over the past month has led to more mushrooms growing than usual.”

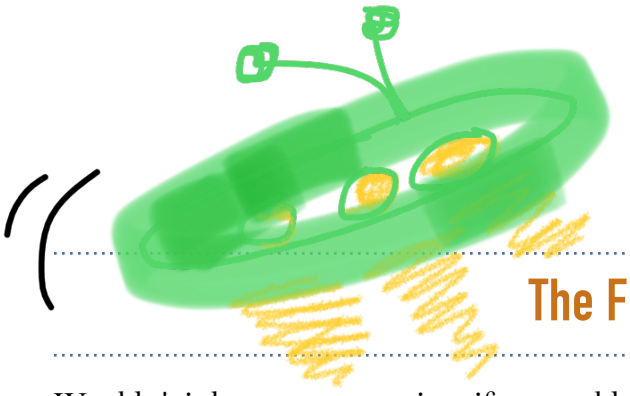
— BBC reporter. http://www.bbc.com/news/world-middle-east-44194078#

Still madly mycophobic... Tehran Times has issued an update on May 26th/2018:

“The poisonous mushrooms targeted their first victims in western province of Kermanshah with 7 people died of the poisoning and 389 people were admitted to the hospitals, Khaledi said, adding that most of those affected were from western parts of the country.

So far provinces of Lorestan, Kordestan, West Azarbaijan, Zanjan, Ilam, Kohgiluyeh and Boyer Ahmad, Qazvin, Chaharmahal and Bakhtiari, Fars, Markazi and Hamedan reported mushroom poisoning cases, he added.
Some 1,151 became ill eating the mushrooms and admitted to the hospitals and unfortunately 96 are still hospitalized and some are now on organ transplant waiting list to receive a liver or kidney, Khabaronline quoted Khaledi as saying.
Health ministry has banned buying loose mushrooms to avoid further complications. Citizens are also warned against picking wild mushrooms which may even resemble the edible ones.
Oliya Sami, an official with Hamedan province emergency medical services has linked the recent events with recent heavy rainfalls and considerable growth of wild mushrooms particularly in western parts of the country, YJC reported on Saturday.
“Right now it is better to avoid purchasing and consuming mushrooms and in case one started experiencing symptoms such as nausea and diarrhea after eating mushrooms they should refer to a hospital in no time,” Sami explained.
Amanita virosa, the recent serial killer
The Food and Drug Administration has announced that Amanita virosa, commonly referred to as the destroying angel, is the deadly poisonous fungus which has been killing people off for the past days.
The destroying angel is found infrequently in the lowlands but is more plentiful in mountainous areas.
Destroying angels contain a complex group of poisonous substances called amatoxins which initially cause gastrointestinal disorders with symptoms such as diarrhea, nausea and stomach pains occurring within five to twelve hours. Cruelly, the symptoms usually fade away for several hours or even a day or two, tricking the victim into thinking that they are recovering. When in due course the symptoms return with a vengeance, it may well be too late: kidney and liver damage is already underway. Without treatment, coma and eventual death are almost inevitable.
Often, people hospitalized late into a poisoning episode can be saved only by major surgery and a liver transplant, and even then recovery is a precarious, painful and protracted process.
— MQ/MG. http://www.tehrantimes.com/news/423947/Mushroom-poisoning-kills-18-in-Iran

Whom to contact in case of possible poisonings and more information **concerning your pets:**
Mushroom Poisonings in Dogs and Cats - North American Mycological Association
http://www.namyco.org/mushroom_poisonings_in_dogs_an.php



## The Future is HERE!

Wouldn't it be most convenient if we could dig a finger into the earth and have a computer chip tell us what type of species of fungi are there? Sadly we're not there yet; however, a graduate student of CU Boulder, Jen Lou, has invented a glove that tests moisture content of the soil, which in turn allows us to determine what type fungi could be there. She has also invented a walking stick that collects soil samples and a vest that vibrates in certain areas to "guide" mushroomed to secret fungal spots. Alas, the vest connects to an online mapping system and many of our PNW/ Vancouver Island areas are in the deep dark forest without cellular reception. Not to mention, most of our GPS coordinates will remain elusive, prized and coveted. (Unless you get invited to Mr. Kevin T.'s backyard...I hear there are Morels growing along his sidewalk...)

https://www.colorado.edu/today/2018/05/09/wearable-technology-brings-high-tech-mushroom-hunting

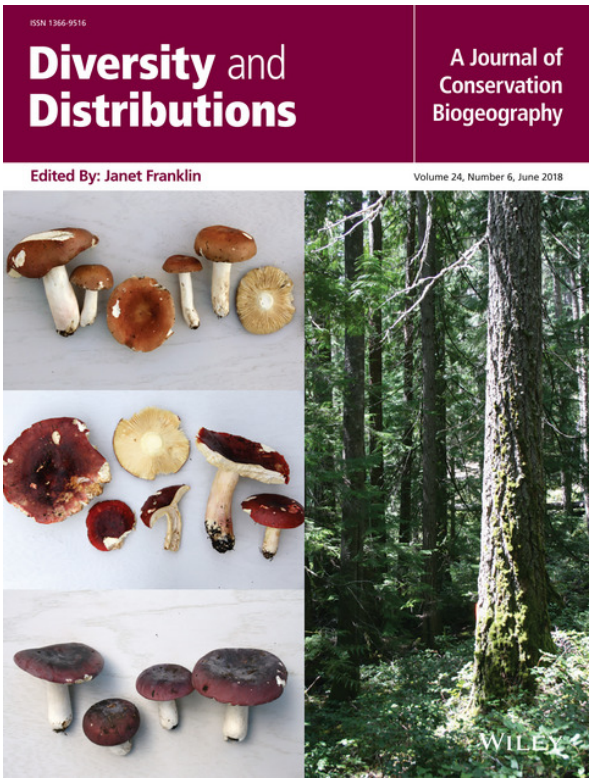
## MUSICA!

The world of fungi is so vast and covers such a variety of hobbies and scientific studies, that I thought for SURE there was perhaps an instrument made out of a fungus. No dice. I'm sure many people have produced some amazing tunes and lyrics whilst on a "trip"... however, there has yet to be an actual invention of a musical instrument. If you choose to be ambitious and create a musical tune, poem or instrument, please share with us!

There is a type of music called FUNGI! **Fungi** is the name given to the local musical form of the British Virgin Islands. It is also the native music of the U.S. Virgin Islands, where it is known as ***quelbe***. Fungi music is an expression of Virgin Islands culture as it shows the islands' African and European influences in a unique sound. The name fungi comes from a local dish of the same name. It is a cornmeal-based food which is made with different ingredients including okra, onions, and green peppers, and is sometimes served plain. This "cook-up" which is a savoury fusion of different flavours creates something new. Similarly, Fungi music is a blend of many different instruments and styles. A fungi band is based on the fusion of a wide range of instruments, many of which are homemade. The beat of the double bass is usually the base for a colourful mix of sounds and instruments.

Click the link for some vibes that will get you doing a jig or two!

https://m.youtube.com/watch?v=6Y0IuTCKZC8




# HIT THE BOOKS!

The June 2018 edition of the journal 'Diversity and Distributions' contains an article titled "Species–area curve and distance–decay relationships indicate habitat thresholds of ectomycorrhizal fungi in an old-growth *Pseudotsuga menziesii* landscape", by SVIMS members Marty Kranabetter, Shannon Berch, Andy MacKinnon and Oluna Ceska, as well as Dave Dunn and Peter Ott.

As most SVIMS members will know, mycorrhizal fungi are those fungi that form associations with plant foots ('mycorrhiza' means 'fungus-root'). Ectomycorrhizal fungi (EMF) are those mycorrhizal fungi that form these associations in a particular fashion – the fungus wraps itself around the plant root, but doesn't penetrate the root cells. EMF are important locally, because they're the main fungi associated with the roots of most of our coniferous trees, and the fruiting bodies of many of these EMF are our common large local mushrooms. If you collect, e.g., chanterelles, pine mushrooms, boletes, or hedgehog mushrooms, you're collecting the fruiting bodies of EMF.

The "old-growth *Pseudotsuga menziesii* landscape" in the title is unlogged (old-growth) stands in the Victoria watershed, dominated by Douglas-fir (*Pseudotsuga menziesii*) and western hemlock. The authors sampled 11 stands, each 0.15 hectare in size, each about average for moisture and nutrients. They were particularly interested in what EMF grew in these forests, and in how that species diversity was distributed. For example, if you sampled two stands, would the same fungi be present in each stand, or would the fungal species be very different between them? This is an important question for conservation of these fungal species. To protect EMF species diversity, you might be better off protecting several larger patches of old-growth forest, or many smaller patches, depending on how the species diversity is distributed among stands.

Marty and the others sampled all 11 plots in the spring and autumn of three years, from 2013-2015. They surveyed the stands for 'sporocarps' (mushrooms and other fruiting bodies), and also collected Douglas-fir root samples for DNA identification of fungi, and to examine and identify the fungi under a microscope.

They found an impressive 238 species of EMF, including numerous species of the well-known EMF genera *Cortinarius*, *Piloderma*, *Russula* and *Tricholoma*. Based on what they found (238 species) in the small area they sampled, these results suggest that there might be 350-360 EMF species in the entire sample area – that is, if you sampled everywhere. This means that EMF species diversity is an important component of overall species species diversity. For example, there are certainly more EMF species in the watershed, than vascular plant species. The results also suggest that retaining a modest amount

of old-growth forest on the managed forest landbase should suffice for protecting EMF species diversity. And since many of the *Ramaria*, *Inocybe* and *Russula* species, for example, are likely to occur only in the dry, warm coastal Douglas-fir/western hemlock forests of the Pacific Northwest, conservation of old-growth Douglas-fir forests is an even more important global responsibility.

Congratulations to our SVIMS scientists!

# Cultivating Edible Mushrooms at Home

*By Arieta Epp*

## Introduction

Edible wild mushroom foragers make trips to their favourite collecting secret spots at different times of the year, depending on which mushrooms are popping up at a given season. At this time in BC, mushroom foragers are quietly anticipating the early Spring producers such as morels, oyster mushroom, king and red cracked boletes, to name a few.

Majority of wild mushroom foragers enjoy the outdoor adventures to the woods, hunting for their favourite edibles, while others may not find the outdoor adventures convenient or achievable. The approach to cultivating some of the edible mushrooms has recently led to mushroom connoisseurs resorting to different methods of cultivation for individuals or small-scale/low-tech growers.

## Objective

The objective of this article is to explore the different methods of cultivation for edible mushrooms that are now available to the public. Because morels are one of our early Spring producers in BC, this writer has set out to explore the different methods of cultivating morels in terms of costs, time, yield, labour, and lessons learned.

## Background

It appears, from literature search, that morels are not the easiest of culinary mushrooms to cultivate. The first successful cultivation of Morchella esculenta spores, in a laboratory, under controlled conditions, was done by Ronald Ower, (1982) at the San Francisco State University. In 1986 two scientists (Mills and Malachowski) from MSU refined Ower's findings in lab experiments. In an interview with the New York Times, " Mycologists, or scientists who specialize in fungi, have long known how to establish the morel mycelium, Mr. Mills said. What has eluded them was how to induce the mycelium to "bloom" and grow the ascocarp" (Holusha, 1986). This led to a first patented process which was later followed by a second one invented by Stuart C. Miller in 2002. Miller became the first to discover the mycorrhizal and symbiotic relationship of the fungus with trees by inoculating elm tree seedlings as reported by morelfarms.com.

Mushroom growing kits are available for purchase on numerous websites. Prices vary depending on the types of mushroom and the methods of propagation: spores, spawn, mycelia, plugs, and/or inoculations of substrates.

The following methods have been adapted from an unnamed author on www.mushroom-appreciation.com.

**Starter Kit and Spawn Method:** This is the most common means of cultivating morel mushrooms. The purchased kit consists of morel mycelium and the substrate on which it was grown such as grain, sawdust, or woodchips. You will need a prepared bed in which to spread your spawn. It is best to follow the instructions that come with the kit. Paul Stamets' experimented with this method in 2011 and 2012 and he was able to harvest morels within 8 months, in both cases (YouTube, 2011, 2012).

**Spore Slurry Method:** This method is slightly more work. As a forager, you may want to save your collection of morels for their spores. Morels are suspended in a solution of water, sugar, salt for one to two days, and no longer than this. The spores collected is then used to either spread over a prepared site or other known habitats. This is the cheapest way to cultivate morels but may be a little more labour intensive.

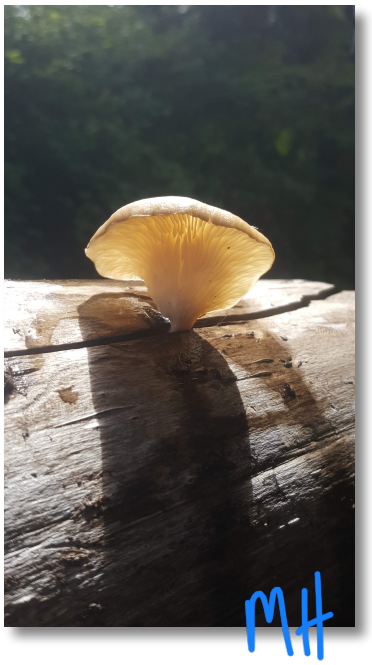
**Inoculating Tree Method:** As early studies and research have now shown that morels have a mycorrhizal and symbiotic relations with certain trees, the approach here is to inoculate thee roots of these young trees (elm, ash) with morel mycelia, and wait for any results to develop.

**Indoor Growing Method:** The first indoor cultivation of morels was successfully done by Ron Ower et al, in a lab, in 1982. The results from these studies led to some large-scale cultivation of morels. According to mushroom-appreciation.com., Peter Dilley would be the authority on this cultivation method. Dilley takes you through a 25-step process with this approach at www.gorsky.com

## Summary

Growing your own wild mushrooms for culinary or medicinal purposes can be gratifying and rewarding. The method of cultivation will depend on how much time, labour, place to grow your mushrooms, and the money you're willing to invest on your project. It appears that morels are one of the most challenging wild mushrooms to cultivate; it could take anywhere from eight months to two years before you get results. Patience and the willingness to learn from mistakes can result in many years of producing and harvesting edible mushrooms.

On a personal note, I love to garden and continue to experiment with different types of plants and cultivation methods. I am looking into growing edible mushrooms in my backyard and have secured a contract with a local mushroom grower to assist me with getting started. I would like to obtain morel spores/spawn to experiment with, besides other edibles that may be easier to cultivate (Oysters, Shiitake, Lions Mane, Garden Giants, Reishi).



# KNOW YOUR TREES: *Malus pumila*

*By Anja Hess*

Springtime brings the promise of romance. And for some of us this twitterpation is with the alluring *Morchella esculenta*, better known as the morel. Trees can tell us a lot about which fungi may be growing nearby; read on to learn about one special tree friend of the delicious morel. If you came to last month's mushroom dinner at Golden City Restaurant, you may have heard about recent sightings of our brain-like treasure in a certain mature orchard of the *Malus pumila*, also known as the apple.

Apple trees are abundant on Vancouver Island and although they are cultivated for the fruit, you may find them in abandoned orchards or in any relatively open and sunny location where a wild animal may have accidentally participated in some guerilla gardening by excreting viable seed. Easily recognizable by its fruit in late summer and autumn, in the springtime the apple tree is in its most visually spectacular and fragrant state with shows of five-petal blossoms ranging in colour from white to pink and about the size of a nickel or quarter, depending on the cultivar. Look for these blossoms on trees that can tower to twenty feet tall with alternate branches spreading to make a bulbous canopy over a semi-broad trunk that is covered in greyish, scaly to somewhat smooth bark. Apple trees share a classical shape with many other fruit trees that will be bursting with blossoms now too, but never fear because the illusive morel could be lurking near those too.

# Edible vs Non-edible

The season is over for these fungi, but “knowledge is power”. Next issue will have fungi that should be available to find!

## *Morchella*

### EDIBLE

There are two major groupings of edible Morels, here in the pacific northwest: “black” Morchella elata and “yellow” Morchella esculenta. I will lump identifying information for the two together, where I can.

**Pileus/cap**
Ridges & pits like a honeycomb
Conical, bell-like, cylindrical shape
Projects up, above stipe
Attached to stipe at the BASE/bottom of cap
Brownish, yellowish, tan, grey and whitish varying tones.

**Stipe/stalk**
Hollow all the way through to top of pileus
Whitish, creamy color (varies)

**No lamellae/gills, no veil, no volva.**

**Spore print**
Will resemble honey-combed structure
Ocher-buff tones


Gyromitra

**Where and what trees?**
On ground, solitary or scattered.
Begin fruiting April/May, into the summer going in to higher elevations.
Coniferous and hardwood (a combination) forests
**Black**:
Mostly following a fire.
Around hardwoods, landscaping and disturbed areas.
**Yellow**:
Around plantings/landscaping, orchards and burn sites.

**Cool facts**
The Morchella is an ascomycetes.
They love to grow in alkaline soil… ie: look for areas of lime deposits both natural and not.
DO NOT EAT RAW! Always cook (any) mushroom for a minimum of 5 minutes, in order to decrease any toxic components that may be present, as well as to break down the chitin (molecular building block for the structure of fungi).

**Nicknames**
merkels
Molly moochers
dry land fish

# *Amanita aprica*

**TOXIC. *For photos, and incredibly specific information, please visit www.amanitaceae.org***

**Lamellae/gills**
white/whitish
Free

**Pileus/cap**
Top can have various shades of yellow, yellow-orange, apricot-like.
Smooth, rounded to convex early on, then convex to flatish when aged.
Layer of volva on pileus is frost-like, not like larger warts (Amanita muscaria).

**Stipe/stalk**
white/whitish
Bulb at base
Bruise light tan.
Firm when young, may become partially or fully hollow with age.
Tissue of volva remains at base of stipe throughout its life
Fragile, skirt-like ring on the stipe from the volva may disappear with age. Think "frost-like".

**Spores**
Spore print is white
(8.0-) 9.5 - 13.0 (-21) × (5.0-) 6.5 - 8.5 (-12.5) µm
Ellipsoid to elongate. Inamyloid. Clamps are infrequent.

**Where and what trees?**
Mycorrhizal with douglas fir (primary relationship) and pines.
Occasionally urban
Pacific northwest, in woods mostly.
In exposed, sunny areas like in openings in the forest's canopy.
Solitary or gregariously.
600-1850 meter elevation.

**Nicknames**
sunshine Amanita
Jan's yellow friend

**Cool facts**
Formerly was within the taxon called gemmata, until (officially) in 2005 Tulloss, R.E., Lindgren, J.E. found it to be its own species. "Amanita" is a name after a mountain in Turkey.

**Toxicity = Ibotenic acid:**
Sought after for psychoactive properties and therefore, effects. However, accidental poisonings occur often. Side effects are those like that of being inebriated (in a bad way…). Causes "Pantherine Syndrome" due to being mistakenly linked with the Amanita pantherina and gemmata (which are also toxic in different ways). "Mushrooms Demystified" and all other texts will have a back section with a lot of information on toxicity.

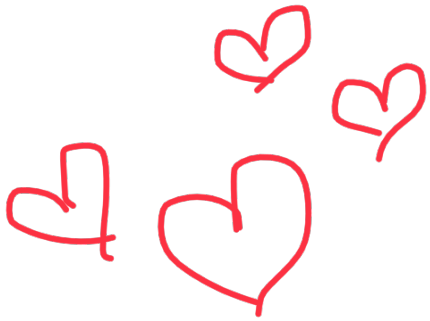
# Cooking with Fungi

## Mushroom Pasta

*By Meghan Maloney*

I wanted this recipe to have a serious mushroom flavour. It's all about the mushrooms. I use chanterelles for this recipe, but you can certainly use your own favourites or whatever is in season.

**Ingredients**
1 lb. linguine or other pasta of your choice
4-6 cups of chopped mushrooms of your choice
2- 3 sprigs of fresh thyme
6 tbsp. of butter
2 tbsp. olive oil
1/2 cup freshly grated parmesan cheese
To serve
Parsley, finely chopped
Parmesan cheese, grated



**Instructions**
- Bring a large pot of water to a boil and add a couple of generous tablespoons of mushroom stock. My preferred brand is Better than Bouillon.
- Cook pasta per packet instructions minus 2 minutes. Reserve 1 ½ to 2 cups of pasta cooking liquid, and then drain pasta.
- While your pasta is cooking, soak your dry mushrooms in water to rehydrate. Reserve the water from the rehydrated mushrooms. If using fresh mushrooms, slice or chop to your desired thickness.
- Melt 4 tbsp. of butter and the olive oil in a large skillet over medium heat.
- Turn heat up to high. Add mushrooms and thyme leaves and cook until water has evaporated, and the mushrooms start to turn golden – between 7 – 10 minutes.
- Add remaining 2 tbsp. butter. Stir until melted.
- Turn heat down to medium high. Add pasta, about 3/4 cup of reserved pasta water, and ¼ cup of the reserved liquid from your rehydrated mushrooms and parmesan. Toss gently or until water reduces and thickens into a saucy glaze that coats the pasta. If the pasta dries out, add more pasta water.
- Season to taste with salt and pepper. Caution: Season gradually as the parmesan provides salt.
- Remove from stove and serve immediately, garnished with fresh parsley and parmesan cheese.

http://onlinelibrary.wiley.com/doi/10.1111/j.1469-8137.2009.02775.x/full

# "Water sources and controls on water-loss rates of epigeous ectomycorrhizal fungal sporocarps during summer drought"

Erik A. Lilleskov Thomas D. Bruns Todd E. Dawson Francisco J. Camacho

First published: 27 March 2009

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## Introduction

Summer drought in forested ecosystems presents numerous challenges to trees and their mycorrhizal symbionts. Low soil water potential, which reduces water availability, and high air temperatures and low humidity, which together drive high evaporative demand from tissues, can lead to severe water stress. Mycorrhizal fungi may have a role in supplying water to hosts under these conditions (Smith & Read, 1997) and alternatively can be recipients of water from their hosts via hydraulic lift or redistribution of water (Querejeta *et al*., 2003; Egerton-Warburton *et al*., 2007; Warren *et al*., 2008)

One window into the water relations of ectomycorrhizal fungi is via their sporocarps. Sporocarps are directly integrated with both tree roots and soil via the fungal mycelium, receiving water from these sources through the creation of water potential gradients. As in plants these gradients are at least in part established by diurnal variation in evaporative demand at the surface of the sporocarp. Unlike plants, sporocarps do not possess structures analogous to stomata, so regulation of water loss must be via other mechanisms such as seasonality, macromorphology and microhabitat.

Sporulation is a key event in the life history of fungi, and how fungi solve the problem of sporulation in water-limited conditions affects fungal reproduction, population structure and forest food webs. In mesic ecosystems most macrofungi produce epigeous (above-ground) sporocarps, which facilitate advection of spores out of the boundary layer, resulting in long-distance dispersal. However, this habit exposes sporocarps to high near-surface air temperatures, low humidity and winds, leading to potentially rapid water loss and desiccation. In summer, in drought-prone ecosystems such as the forests of the Sierra Nevada Mountains of California, USA, fungi have evolved a range of strategies that minimize the loss of water by sporocarps. Many fungal lineages appear to have independently evolved gastroid (closed) or hypogeous (below-ground) sporocarps, presumably in part to avoid the extreme water stress of the epigeous habit (Hibbett *et al*., 1997; O'Donnell *et al*., 1997). Some other fungi sporulate in the springtime, when water availability is rather high. However, C availability is likely low at this time, as host growth sinks are also quite active and therefore provide a competing sink for the products of photosynthesis.

A few Sierran fungi fruit epigeously during the late summer drought, but how they manage to do this is unclear. Of particular interest is *Boletus edulis*, an economically important edible fungus (Hall *et al*., 1998) that can produce large quantities of sporocarp biomass under summer drought conditions. We observed *B. edulis* fruiting heavily along hillslopes adjacent to floodplains in the Sierra and hypothesized that *B. edulis* sporocarps access groundwater in these habitats. This access could occur via capillary water transport to surface soils, via hyphal water uptake from deeper soil or roots and vertical transport, or via hydraulic lift of groundwater by the host plant and subsequent transfer to fungi (Querejeta *et al*., 2003). Hydraulic lift involves a diurnal cycle in which the direction of water potential gradients reverses between day and night, with gradients from soil into roots during the day, and from roots into soil at night after transpiration declines (Dawson, 1993; Caldwell *et al*., 1998 for a review). Host plants conducting hydraulic lift can release groundwater to their fungal symbionts either directly into hyphae connected to their roots or indirectly via the soil (Querejeta *et al*., 2003). Thus mycorrhizal fungi associated with hosts performing hydraulic lift can receive water from their host tree, and transfer this water to mycelium and sporocarps.

It is likely that epigeous fungi differ in the relative amounts of water they use for sporocarp production. Fungal surface to volume relationships could have a large impact on water loss. In the Sierra Nevada Mountains, *B. edulis* produces sporocarps with a very rounded cap and expanded stipe morphology with a high potential for water storage and low water loss (Fig. 1a). By contrast, other taxa that fruit above ground less frequently under these conditions, such as *Amanita muscaria* (Fig. 1b) and *Tricholoma* spp., produce sporocarps with much higher surface to volume ratios. We hypothesized that surface to volume ratios would be good predictors of water-loss rates from sporocarps.

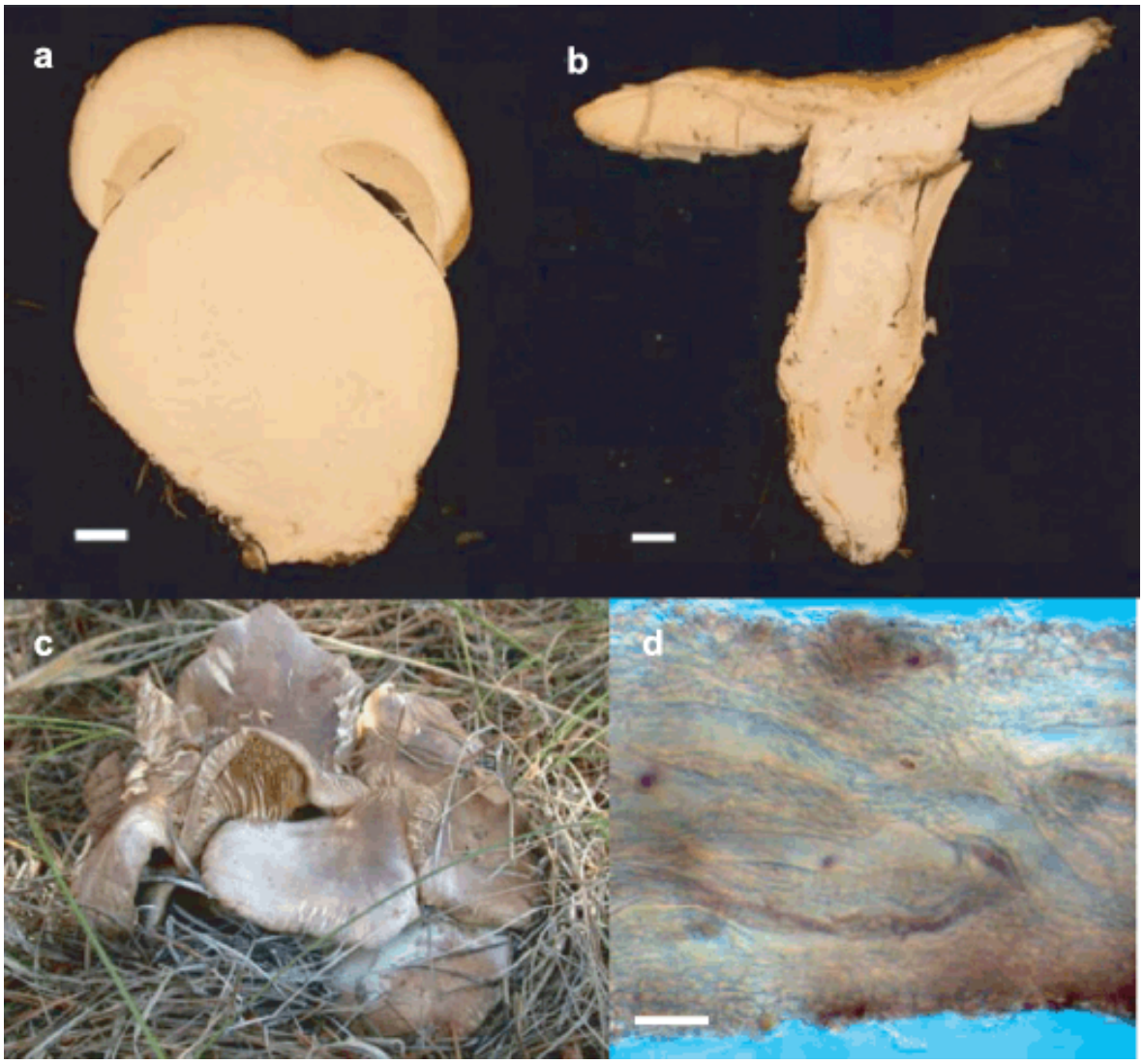


Figure 1
Open in figure viewerPowerPoint
Sporocarps and rhizomorphs of fungi investigated in the present study. (a) *Boletus edulis*, cross section of sporocarp (bar, 1 cm); (b) *Amanita muscaria*, cross-section of sporocarps (bar, 1 cm); (c) *Tricholoma* sp. exhibiting caespitose sporocarp morphology that effectively reduces sporocarp surface area; (d) *B. edulis* rhizomorph (bar, 25 μm).
Caption
To test our hypothesis about access to groundwater, we used natural abundance stable isotope methods that take advantage of the divergent oxygen stable isotope composition of groundwater and precipitation-derived surface water (Ehleringer & Dawson, 1992; Dawson *et al*., 2002). To test our hypotheses about water loss and sporocarp morphology we characterized sporocarp water loss using a transient porometer designed to measure sporocarp water loss *in situ*, and by measuring evaporative mass loss under *in situ* field conditions; we then characterized sporocarp morphology and related water loss to sporocarp morphology.
***(More can be read from the original article...)***

# Save the Date!

Thank you to Juliet Pendray, whom has a list of events (both fungal and bioblitz) for this year. http://forums.botanicalgarden.ubc.ca/forums/fungi-events.321/?order=title&direction=asc


- June 8-10 - Whistler Bioblitz
- June 23 - Fraser Valley Mushroom Cultivation
- June 28. - Dawson City Bioblitz
- July 15-20. - Corvallis Symbiosis Congress
- August 3-5. - Dawson City Fungi and Lichen weekend
- August 13-31. - Bamfield Mycology course
- Sept. 20-22. - Bamfield Fungus Festival
- Sept. 20-23. - Sicamous mushroom Festival
- Oct. 5-7. - Tofino Mushroom Workhop
- Oct. 11-14. - Salem, Oregon = annual NAMA foray
- Oct. 12-14. - Sunshine Coast Mushroom Festival
- Oct. 12-13. - Whistler “Fungus Amongus” Festival
- Oct. 14. - Errington Mushroom Festival
- Oct. 19-21 - SVIMS Annual Mushroom Major Foray @ Cowichan Lake
- Oct. 21. - Vancouver Mushroom Show
- Oct. 28 - SVIMS Annual Mushroom Show
- Nov tba. - Richmond Mushroom show
- Nov 2-3. - Mitchosin Mycoblitz
- Nov 3. - Galiano Mushroom Festival
- Nov 3-4. - Victoria/Colwood Mushroom workshop (class & foray)

## (More) INTERNATIONAL EVENTS

- Mr. Daniel Winkler goes abroad and has an upcoming foray in Columbia April 2019. www.mushroaming.com
- IMC 11 = Fungal Biology Congress JULY 16-21. San Juan, Puerto Rico. http://www.ima-mycology.org/
- 11th Annual Girdwood Fair SEPT 7-9. (Steve Trudell and Noah Siegel will be speaking, as well as a few local presenters and foray leaders.). Alaska. http://www.fungusfair.com/
- International Alba White Truffle Fair & Festival, Italy. Oct 6 - Nov 25/2018.
    - https://www.fieradeltartufo.org/en/2018-edition/

# *What the future holds...*

- We will address raking and “over-picking”.
- Introducing new fungi to your diet do’s and don’ts.
- Italian cuisine.
- Food, Fungi and Folklore.
- Dyeing with Mushrooms! Straight from the most experienced local source: Ann Harmer from the Sunshine Coast.
- Medicinal qualities of fungi.
- An Index for the newsletter....
- News and Event updates.
- Pets & mushrooms.
- Any question(s)/requests to Aunt Amanita, columns, investigations etc.

# References

*The following are books and websites we’ve used to gather information for this newsletter. We apologize if we forgot anything!*

**Species–area curve and distance–decay relationships indicate habitat thresholds of ectomycorrhizal fungi in an old-growth Pseudotsuga menziesii landscape**

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- 5. Pacific Forestry Centre, Natural Resources Canada, Victoria, BC, Canada
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www.amanitaceae.org Dr. Cornelius Bas has dedicated many years to studying and researching Amanitas. Much information can be found here.

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