
Mycena News



The Mycological Society of San Francisco March, 2012, vol. 63:07

Daniel Winkler: Flavorful, Foul and Far Fungi

In the March 20th general meeting Daniel will share his stunning images and entertaining and educational stories from his journeys to far flung places. The hunting grounds range from dark mountain forests and vast alpine meadows, to village markets, restaurants and home kitchens. You will encounter many famous and familiar mushrooms in exotic places you never expected. The fancy flavorful mushrooms will be accompanied by fascinatingly odd fungal fellows, some of them stinky, slimy and incredibly beautiful, others eerily strange and more precious than gold.

Daniel's mushroom photos are from places as diverse as Tibet, Bhutan, China, Peru, Ecuador, Austria, Switzerland, Germany, Canada and the US [Hawaii, Alaska, and also Colorado, California, Oregon and his resident state, Washington].

[Daniel Winkler](#) is the author of "A Field Guide to Edible Mushrooms of the Pacific Northwest". He grew up collecting and eating wild mushrooms in the Alps and has been foraging for 15 years in the Pacific North West and working as mushroom educator and guide. He has been researching Tibet's ethnomycology for over 10 years. [He organizes and leads several mushroom focused eco-tours to Tibet and South America annually.](#)

Mycodigest: How long do fungal spores live?

By Nhu Nguyen



Spores of *Rhizopogon salebrosus*, one of the species discussed in the article.

Photo by Nhu Nguyen

"How long do fungal spores live?" seems like a pretty obvious question, but in reality, we don't really know. The good news is that mycologists are starting to take an interest in this question and running long-term experiments to answer one of the most basic questions in mycology.

For many years, the few examples that exist that clue us in to how long fungi can live come from observations of pathogenic fungi. The resting sporangia (structures that contain spores) of the potato wart disease fungus *Synchytrium endobioticum* (Thaxter 1890), the resting sporangia of the soil fungus *Allomyces macrogynus* (J. W. Taylor per. communication), and spores of the onion smut fungus *Urocystis cepulae* (Putnam & Sindermann 1994) are thought to last >25 years in the soil. However, the evidence in all three cases is anecdotal without specific experiments to back them up.

As to saprobic and mycorrhizal basidiomycetes, there have only been a few studies that tell us about the spore longevity of these fungi. Unfortunately, all of these studies end within one year. So based on this, we know that at least a few mushroom forming species have spores that could last up to one year. But

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PRESIDENT'S POST

March is upon us. While we suffered through February with substandard rainfall fungal activity outside the immediate Bay Area kept pace according to reports by MSSF members. Hedgehogs in record numbers from counties to the north were reported with at least one person telling the story that they had to walk away from some. Yellowfeet were also somewhat abundant and scattered reports of chanterelles were also heard during the month.

Our culinary group started the month with another grand feast as you will find reported in this month's Mycena News. Our general meeting on February 21st featured Brit Bunyard, Founder and Editor in Chief of Fungi magazine. Fungi boasts the largest circulation of any mycological publication in North America and Brit's talk was among the best of the year. His subject "Aflatoxins to Zombies" touched on a wide range of mycological topics, species, and lore and was accompanied by world-class photographic imagery some of which was contributed by our own MSSF members. If you were not able to attend and have not seen Brit speak I encourage you to make sure to see him present in the future at an MSSF meeting or other mycological event.

As we come into spring there are a few things to be aware of in the realm of fungi and MSSF. First, we are moving towards the fruiting of our spring Ascomycetes, so pray for rain and get ready for morels! As usual MSSF will run a spring foray (or two) to the Yosemite area in May. Stay tuned to the Web site or to next month's newsletter for details; we expect to have the trip arranged by April so everyone can get it on their calendar.

Remember that Dennis Desjardin will lead his annual spring class at the Sierra Nevada Field campus in early June. This class is geared to all levels of mycological expertise and is highly recommended for members seeking to jump-start their knowledge of mycology. More information can be found at http://www.sfsu.edu/~sierra/Course_Fungi.html

Before I close I want to thank all of you who have been donating old MSSF T-shirts for the quilts we plan to create from them in the fall. I also want to remind you that MSSF is always looking for volunteers. At present we have two council positions open, one for librarian and one for editor of the Mycena News. Please contact me if you'd like more information or are ready to get involved in helping us to operate the club.

I look forward to seeing many in March for Al's zarzuela de mariscos at the culinary dinner, Daniel Winkler speaking at the general meeting, or out on the trail. Stay tuned to the calendar for spring events that are being planned.

Thanks for your support,

-Lou
president@mssf.org

CULINARY CORNER

The February culinary dinner was a marvelous trip to Hungary! Unfortunately, I don't speak magyar so I'm unable to rave about the meal in its native tongue.

Brilliant Team Larsen/Eichorn (more uber volunteers) and their contributions:

Borscht - Norm Andresen (outstanding, incredibly delicious - who knew he could cook? OK...after we all got over the shock...I remembered, he made an incredible sulphur shelf mushroom dish with tarragon and cream on one of the Sierra forays cons ago!

Chicken Paprik - Sandy Waks, Stephanie Wright, Zoe Caldwell (yes, David...the sour cream was the perfect finish!)

Noodles from Phoenix Pasta, Berkeley - cooked by David Eichorn & Jeanette Larsen (we all enjoyed the leftovers!)

Braised Cabbages, onions & apples: David Eichorn (scrumptiously spicy compliment)

Salad: Dave & Peggy Manuel (I loved the simplicity of this dressing)

Chocolate/Walnut torte: Jeanette Larsen (Jeanette you rocked this!)

I also have to give kudos to those who shared appetizers - best turn out to date! Thank you for sharing. Now...let's put some of that talent into helping prepare the last few meals of this season. Please volunteer to assist the team captains!

En Marzo, vamos a España con Alvaro Carvajal as Team Captain. The menu will be:

Sangria
Gazpacho
Olive Bread from Tartine Bakery (be still my beating heart!)
Lettuce wedges with dressing and chopped eggs
Zarzuela de Mariscos (seafood stew)
Saffron Rice
Bread pudding with Candy Cap & Rum Sauce

This stew is originally for the Catalan coast of northeast Spain. It derives its name from Zarzuela - "operetta," or "variety show," and perfectly describes the sing-song versatility of this dish. Alvaro tells us the greater the variety of seafood you add to this dish, the better its flavor is - can't wait.

We meet at 7 p.m. at the San Francisco County Fair Building (a.k.a. Hall of Flowers), Golden Gate Park, 9th and Lincoln, SF. The dinners are open to current members of MSSF and the Culinary Group, and their guests. Reservations are required and must be made no later than Wednesday, February 29. You may contact Bill and Carol Hellums at 415-347-7444 for information or assistance, but we ask that you make your own reservation online if possible. We keep our reservation numbers at a maximum of 60, so reserve early. Be sure to bring all your own tableware and table covering, as the venue does not provide linens, dishes, utensils, glassware, etc. Also bring your favorite dinner beverage and an appetizer to share. The dinner will be \$16 per person, \$15 for seniors and students.

-Lisa Bacon

WANTED! VINTAGE MSSF T-SHIRTS

Attention all MSSF members! Wanted! Your old MSSF t-shirts and other mushroom related t-shirts. If you attended the most recent MSSF fungus fair at the Lawrence Hall of Science you may have noticed the mushroom t-shirt quilt displayed behind Curt Haney's, "Just Mushroom Stuff" vendor booth. The plan is to collect as many old MSSF t-shirts as possible and have a mushroom t-shirt quilt made to raffle off at next year's fungus fair as a fund raiser. If we receive enough donations, we will have two quilts made, one for the raffle, and one to display in the future at MSSF fungus fairs as a work of art. Please look through your dressers and closets for old MSSF t-shirts, or any other t-shirt with mushrooms on them to donate to the cause. T-shirts in any condition will be accepted; stains and holes are ok and will not affect the quality of the quilts. Get your t-shirts to Curt Haney at a general meeting, mail them to him, or drop them off at the address below. If you have a large number to donate, arrangements can be made to pick them up from you. All donated t-shirts are needed not later than 1 May 2012 in order to have time to make the quilts and start selling raffle tickets at the first general meeting in September 2012. Thank you all for your generosity!

Curt Haney, 150 Sadowa St. San Francisco, CA 94112 (415)333-8820

MSSF ANNUAL HOLIDAY DINNER 2012

Plans have not yet been made for next year's holiday dinner, but the council has suggested that we alternate the location between North, South, East, and West of San Francisco each year. The East and West were utilized over the past two years, anyone in the North or South ready to step forward to organize next year's holiday dinner? If not, an organizer from the East or West is welcome to step forward as well. Anyone who is interested in organizing the holiday dinner and a location for it next year, please contact Lou Prestia, (President@mssf.org) or any of the society's council members. Thank you all and I look forward to seeing everyone at the 2012 holiday dinner.

~ Curt Haney

Contribute to the Mycological Society of San Francisco

Since 1950 the Mycological Society of San Francisco has been an innovative, cultural, and educational icon in San Francisco, the greater bay area, and beyond. Would you like to see this great educational organization thrive for many years to come? You may have assets to donate that can help ensure the long term future of this great organization. Remember, MSSF is a 501(C) (3) non-profit organization, so all contributions in support of this great organization are tax deductible as allowed by law. Please remember the Society in your living will or trust.

Send contributions or inquiries to:

Henry Shaw: MSSF Treasurer c/o MSSF
Randall Museum, 199 Museum Way
San Francisco, CA 94114



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To subscribe, renew, or make address changes, please contact Alvaro Carvajal: alvaro.carvajal@sbcglobal.net or (415) 695-0466.

Past issues of *Mycena News* can be read online at www.mssf.org.

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what about long term survival? Can we continue observing these spores for their viability year after year? Of course we can!

In 2004, Tom Bruns at UC Berkeley took on the challenge of trying to figure out how long spores of ectomycorrhizal fungi could live in the soil (Bruns et al. 2009). He picked four Rhizopogon species (*R. occidentalis*, *R. salebrosus*, *R. vulgaris*, and *R. olivaceotinctus*), extracted the spores, and sprayed them onto soil that has no Rhizopogon spores. The soil/spore mixtures were packed in terracotta pots, covered with terracotta saucers, tied, and buried in a tree-less area at Point Reyes National Seashore. The reason for this was so that he could emulate the natural conditions that the spores would face in nature. These pots of soil would remain buried for 99 years. Each year for the first 4 years, we unearthed a pot of soil from each species, the soil/spore mixture within was mixed with sterile soil, and pine seedlings were planted in them. We grew the seedlings for six months and then examined the roots for colonization of Rhizopogon. We initially hypothesized that the spores would die off over time but the experimental evidence was contrary. We found that the spores actually became more alive over time! But what does becoming more alive mean?

What it means is that most of these spores start out being dormant, and they wake up over time. Analogous to a seed, a dormant spore cannot germinate and can only grow and partner with a seedling root after it had awoken from dormancy. Thus, a consequence of this dormancy means that the spores lay in the soil for years, waiting for the moment when by chance a pine seed would drop onto the soil and germinate. It is only then that the spore will germinate and form mycorrhizae with the seedling. This idea is along the same lines of thought as a “seedbank”, where a seed lays dormant in the soil and waits for the proper conditions before it germinates. We call the waiting of spores in the soil for proper a condition to germinate a “sporebank”.

What about other species of ectomycorrhizal fungi? Do they behave the same way as Rhizopogon and produce a sporebank? To answer this question, Tom collected forest soil (which we thought contained spores of many species), put them into terracotta pots, and buried them. After 6 years, we dug up these pots, planted seedlings in the soil and identified the species that have colonized the roots. As expected, spores of Rhizopogon species, particularly *R. vulgaris* and *R. salebrosus* could survive up to 6 years. The surprise came from the fact that *Suillus brevipes* could also survive up to 6 years in the soil. Even though *Suillus* is closely related to Rhizopogon, their fruiting structure (mushroom in *Suillus* vs. truffle in Rhizopogon) and the way they disperse their spores (wind in *Suillus* vs. rodents in Rhizopogon) are different. We only expected the rodent dispersed species to be resistant through time, but the results of this experiment proved otherwise.

So, all of these results together tells us that spores of suilloid ec-

tomycorrhizal species can form a sporebank and remain alive in that sporebank for at least 6 years. Of course this is only the first 6 years of the experiment. We still have 93 years to go! Tom considered sticking around until the experiment is done.

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About the Author:

Nhu Nguyen is a PhD candidate at UC Berkeley studying under Tom Bruns. He enjoys collecting and eating mushrooms (the edible ones of course), describing new fungal species, and photography of plant and fungi. His research interest is in symbiotic interactions between fungi and other organisms. For more of his work, see his web page at <http://www.flickr.com/photos/xeranthem/>

Edible and medicinal mushrooms in China: A brief introduction

By: Mo-Mei Chen

Many Americans view mushrooms as a rather novel addition to their kitchen but in China they have been critical culinary and medical products for millenia. In 1999 Chen Shi Yu published the "Collection of Mushroom Prescriptions," a 2,000 year history of Chinese medicine. He cited 297 fungal species and 3,840 prescriptions that utilized medicinal fungi.

Today 930 mushroom species are known to be edible in China of which 20-30 are produced commercially. In Huang Shan National Park near suburban Shanghai, 230,000 farmers work year round to cultivate about 10 species such as Shiitake (*Lentinula edodes*), Ping Gu (*Pleurotus ostretus*), Enokii (*Flammulina velutipes*), King Oyster (*Pleurotus eryngii*), Maitake (*Grifola frondosa*), Straw mushroom (*Volvariella volvacea*), Button mushroom (*Agaricus bisporus*), Wood Ear (*Auricularia auricular*), Cha shu gu (*Agrocybe aegerita*), and White Wood Ear (*Tremella fuciformis*). But the large and widespread agricultural production of mushrooms in China is a relatively recent phenomenon.

During the 1950-1960's many agricultural institutions such as the Shanghai Academy of Agriculture and the Hua Zhong Agricultural University sponsored innovative work. While at Hua Zhong, Professor Yang Xin Mei worked on the *Tremella fuciformis* liquid inoculation spawn. And, starting in the 1950's, Professor Yang Life began a small revolution in mycological agronomy. He trained a generation of students to focus on cultivation and wrote keystone texts culminating in "The Science of Chinese Edible Mushroom Cultivation" in 1986.

In the 1960's agronomists in suburban Shanghai discovered how to grow the button mushroom (*Agaricus bisporus*) in large quantities. This innovation proved extremely important because it made button mushrooms into a culinary staple in Chinese markets and became a valuable agricultural export.

During the 1970's Chinese farmers developed the cultivation process for growing Shiitake (*Lentinula edodes*) and Wood Ear (*Auricularia auricular*) in sawdust substrate in plastic bags. Previously farmers had to grow these mushrooms in rotting logs which severely limited production as lumber was expensive and rare. Once the sawdust substrate in plastic bag method was discovered farmers in Fu

Jian Province began to use machinery to reduce the amount of manual labor which precipitated a price decline and their use as a common staple in Chinese markets and restaurants. Since then the agricultural production of mushrooms in China has exploded. From 1980 to present 40 million tons of mushrooms are produced annually in China which represents 60% of the total world production. Shiitakes are grown most widely while many more wild species are being studied for their potential domestication.

The great demand for mushrooms within China and the relative ease of cultivation has meant a wide variety of cultivation enterprises ranging from backyard gardeners to large-scale corporations. Mushroom cultivation in China is a very specific intercropping system. Mushrooms are grown side by side with other crops in order to balance the needs of each product. For example: Wood ear is grown with garlic and spinach while corn is grown with oyster mushrooms. Crops gain nutrients from soil, whereas mushrooms are saprophytic from substrates, they do not add nutrition to the surrounding crops but Chinese farmers fully utilize the land by sharing space, water, and humidity with other crops. The surrounding crops also help mushrooms avoid direct sunlight. This intercropping results in a 10-30% increase in production

About the Author:

Mo-Mei Chen teaches and does research at Department of Plant Pathology and University Herbarium at University of California/Berkeley. She graduated from the Department of Plant Protection, Beijing Agricultural University and was a professor and director at Forest Pathology Laboratory, Chinese Academy of Forestry, Beijing, China.

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MSSF Calendar March 2012

March 5th: March Culinary Dinner

March 13th: MSSF Council Meeting

March 20th: General Meeting

April 2nd: April Culinary Dinner

April 10th: MSSF Council Meeting

April 17th: General Meeting

Check the MSSF online calendar at:
<http://www.mssf.org/calendar/index.php>
for full details, latest updates and schedule changes.

Volunteers Needed

Mycena News Editor

The MSSF is looking for an editor to collect, edit, and lay out the pieces that make up the 10 issues across the year. Ideally you'll have some background in editing and layout but anyone with aptitude can be trained. Email mycenanews@mssf.org

Librarian

Help organize and distribute the MSSF's printed resources. Email president@mssf.org

Archivist

The society still needs to scan its archives in order to share them online. Email: president@mssf.org

The submission deadline for the April, 2012 issue of Mycena News is March 19th. Please send your articles, calendar items, and other information to: mycenanews@mssf.org