

**Speaker for
November 15
MSSF Meeting**



Dr. Rytas Vilgalys

**Past and Future Evolution
of Mushrooms:
The Science Behind Endemic
vs. Invasive Species in Fungi**

Our speaker for the November general meeting is one of the up-and-coming stars in the world of mycology: Dr. Rytas Vilgalys, Professor of Biology at Duke University in North Carolina.

Dr. Vilgalys took his first mushroom course with Marge Morris in Great Neck, NY. He later earned his master's and Ph.D. degrees at Virginia Tech University,

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Mycena News

The Mycological Society of San Francisco November, 2005, vol 56:11

MycoDigest: Common Mycorrhizal Networks: an Important Ecological Phenomenon

Peter Kennedy

As ectomycorrhizal hyphae extend out from one plant's roots they often encounter the root systems of different plants. If those plants also associate with ectomycorrhizal fungi, the hyphae will often grow around the root and create a new mycorrhizal structure. In this way, two plants can be linked into what is called a "common mycorrhizal network". The networks can link individuals of the same species as well as create networks between individuals of different species. These networks were first observed in laboratory studies that used glass boxes, which allowed researchers to visually follow hyphae from one plant to another. The presence of networks in the field was assumed to occur, but until recently there was little specific evidence. The main reason for this is that hyphae are both small and fragile and any disturbance of the soil often breaks hyphal connections. So researchers were unable to dig into the soil to see the networks without destroying them in the process.

With the advent of molecular techniques, studying mycorrhizal networks became much more tractable. By taking small soil cores that contained roots of different species, scientists could extract fungal DNA from the roots and determine if they were the same species. If the same fungal species was present on the roots of different tree species, it provided strong evidence that the plant species were connected by a common mycorrhizal network. Although this method did not conclusively demonstrate a direct hyphal linkage between the plants, most fungal individuals extend over areas much larger than the diameter of a small soil core, so it was most likely that plant species were connected by hyphae of the same fungal individual. Many studies have used this method and almost all of them have found that common mycorrhizal networks are quite widespread. For example, a study at Pt. Reyes showed that Bishop Pine (*Pinus muricata*) and Douglas fir (*Pseudotsuga menziesii*) were connected by mycorrhizal networks and another on Mt. Tamalpais showed that Douglas fir and tanoak (*Lithocarpus densiflora*) were connected belowground. In the latter study, the researchers found that although common mycorrhizal networks were common, the fungal species connecting the two trees was different at different locations in the forest.

While demonstrating that common mycorrhizal networks were widespread was an important first step, big questions still remained about the ecological function

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MycoDigest is a section of the Mycena News dedicated to the scientific review of recent Mycological Information.

2005 MSSF Holiday Dinner

Monday, December 12th, 7:00 pm

Snow Building, Oakland Zoo, Knowland Park, Oakland

Our annual joyous MSSF holiday dinner is coming up! Produced by the MSSF Culinary Group with Michael Giacomini, chef extraordinaire, this splendid event is not to be missed. Open to all MSSF members with reservations, the dinner centers around Fillet of Beef with Porcini Sauce. Proudly accompanying will be Butternut Squash Soup with Candy Cap Mushrooms, Truffled Mashed Potatoes, Peas, Carrots and Chanterelles with Carmelized Shallots, Garden Salad and a Dessert not yet announced. Of course, there will be a plethora of sumptuous appetizers prepared by Culinary Group members and others who love to cook and share. We encourage MSSF members to bring appetizers to share at this feast, especially ones with mushrooms. A vegetarian entree will be available. Please indicate if you prefer vegetarian fare.

Please note: diners should remember to bring their own dishes, bowls, glasses, utensils and wine or other beverage.

Reservations are required! The cost of the dinner is \$32.00 for MSSF members, \$37.00 for non-members. To make a reservation, send checks or money orders made payable to MSSF to our treasurer, Hilary Somers/MSSF Holiday Dinner, 4148 Briarwood Way, Palo Alto, Ca. 94306. Be sure to include the names of your party and if they are MSSF members with your check or money order. Please make your reservations no later than December 8th.

Directions to the Snow Building, 9777 Golf Links Road, Oakland, 94605: Take 580 to the Golf Links Road/98th Avenue exit. Go under the freeway to Golf Links Road. The nearby entrance to the Zoo, on the right, takes you to the Snow Building. Go through the gate and up the hill. The Snow Building is on your right at the top. There is plenty of parking. You may also access directions from Mapquest.

Speaker for November 15 Continued from page 1

studying under Orson K. Miller, Jr. The title of his thesis was, "Evolutionary genetics and systematics of fungi in the *Collybia dryophila* group". He received the Mycological Society of America Alexopolous Prize in 1995, and was named an MSA Fellow in 2002.

At Duke University, the Vilgalys Lab employs a variety of molecular-based approaches to study evolution in fungi. The lab's research areas include molecular systematics; and population genetics and speciation.

In 2003, Dr. Vilgalys and colleagues from the University of Minnesota, Oregon State University, and Clark University, began collaborating on a project funded by the National Science Foundation, "Assembling the Fungal Tree of Life," which aims to reconstruct the earliest events in the evolution of animals and fungi. The project uses molecular systematic methods in addition to traditional identification based on morphology. The Tree of Life project aims to significantly increase our understanding of the evolution of fungi, with implications ranging from understanding how ecosystems function to discovering new drugs. One of the project's goals is to help scientists discover new species of fungi.

Another study, which began in 2000, also funded by the National Science Foundation, is the Duke Forest Microbial Observatory (DFMO). The DFMO studies fungal communities that form the core group of saprophytic and mycorrhizal fungi in temperate forests. As a pilot project, plots representing a range of forest types are surveyed in order to establish a baseline data set of basidiomycete diversity from the forest, to document long-term forest/ecosystem health and stability.

The microbial observatory concept integrates state-of-the-art technologies such as high-throughput sequencing, micro-arrays, and bioinformatics to study how microbial communities respond to environmental change.

For more information about Dr. Vilgalys' current work at Duke, visit his lab website: <http://www.biology.duke.edu/fungi/mycolab/default.htm>.

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The Foragers' Report

November 2005

Patrick Hamilton

You're too young to have much to remember, and I'm too old to remember much," the gracious and gracefully aging mushroom hunter was advising over a glass of youthful Pinot to a couple of new members of the society's forays sitting and eagerly listening around the camp's fire. "Each year I struggle to cram newly learned mushroom names into my cramped brain and also try to remember ones from past years that I thought I'd known.

"Where does all that memory go," the old guy rhetorically mused to the group, "and (being a wise forayer of some experience), before I forget, can I have another bit of that wine?"

An inquisitive but rather young yet obviously hard-lived camper inquired of the wise one, "Is there something to those little conical shaped piles of gray dust that I sometimes find on my pillow?"

"I'm glad you notice the little things in life like I do. They tend to go away, and for ever too. You'll do well on our forays," the elderly sipper said. "I do believe that in every one of those small heaps by our ears some of our life's remembrances are being let go of, shoved out the door, so to speak, to make room for new stuff.

"I do wish I could retain more of what should be important, now, and not have my brain filled with past events that it thinks are important but I think are not. Does that make sense to you all, at all?"

"Got any more wine?" He did remember to say.

Hey—your columnist knows what that wine drinker means. Just the other day, while driving from one mushroom patch to another (I forget which was where), the person on the other end of my cell phone asked what is another way to get a hold of me. I recited my business phone number, then my personal phone number, then my fax number, then again my cell phone number, then my email address, then my PO Box number, and finally my street address. Where in our craniums is there space for the new stuff?

About thirty-five years ago a college essay was written trying to explain how humans' biological evolution was not able to keep up with that of technology. Advances were coming at such a rate that we would not be able to cope very

well and problems new to society were sure to arise. That was way before personal computers, cell phones, digital cameras, and the now always asked, difficult to answer, question "paper or plastic?" (And the correct response to that is. . . what?)

We have too much to know so surely we place sliding scale of "retrievable value" on everything we brain jam and significant, memorable-enough, items get to see daylight again in "thought balloons"—like in comic strips. Others are long gone down the ear chutes. At least that explains it to me.

You know how actors give awards to themselves? Broadway and the music industry do too. ESPN even has the Espies. We can do better. Twice as good. The SPSP's which would be awarded to the "best" mushroom hunter at Salt Point State Park. He or she who identifies (or finds or gives away, whatever) the most species in a season, for example, would be good. Why not? It could be a statuette of Ranger Woodie writing a citation. Maybe.

Mushrooms continue to be found in our wonderful Sierra from Plumas NF to Kings' Canyon NP and assuredly beyond. Boletes, edible and not, Russulas to dine on, and chanterelles of different persuasions have been picked this week of October 21.

On the international scene we have local restaurants being stocked with truffles from Burgundy and hedgehogs from northern Europe.

In spite of a supposed ban on picking permits in Oregon somehow, someday, golden chanterelles are coming south. By the time you read this perhaps it will have rained; but based on past weather patterns probably only a little and not enough to pop awaiting porcini pups. (This has been mostly true except back in late October 2001 there was a mighty fruiting of boletes along our coast. . .)

It is the recipe time of this column and what to do, what to do? I'm thinking a couple of things you probably never did, beginning with:

Filet Mignon, Fontina, and Porcini

Serving Size: 6 Preparation Time: 0:30

6 1/2 lb filets
 3 tbs extra virgin olive oil
 6 slices porcini, fresh (from the cap or stem)
 1/4 lb butter, unsalted
 1/3 cup dry white wine
 8 oz Fontina, Italian, sliced into 1/4" pieces
 Gray seal salt and fresh ground black pepper

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of these networks. There has been lots of speculation in the scientific literature, particularly because many laboratory studies had shown that both carbon from the tree and nutrients taken from the soil by fungi could pass between plant individuals linked by a common mycorrhizal network. This research suggested that plants could potentially facilitate the growth of other plants (both of the same and different species), which could play a very important role in seedling establishment, forest succession, and other plant-plant interactions. Demonstrating this in the field though was a challenge, since one would need to set up an experiment where plants were grown with and without access to common mycorrhizal networks. One way to do this would be to dig trenches around some plants (which severs any hyphal connections) and leave other plants untrenched. The problem with this method, however, is that in addition to severing the common mycorrhizal network in trenched plots, the roots of other plants are also eliminated. So changes in growth of plants in those plots could be due to the absence of the common mycorrhizal network or lack of root competition from other plants. Because of this difficulty, understanding the ecological significance of these networks in the field remained relatively unresolved until very recently.

A field study by Kazuhide Nara has shed important new light on this subject. He used a novel approach of first establishing common mycorrhizal networks in glass boxes in the laboratory and then transplanting the boxes into the field. He also took advantage of working in a study area where there was no native mycorrhizal inoculum. He worked in a volcanic desert on Mt. Fuji, where there has been very little plant recolonization following a 1707 eruption. By having no inoculum, the networks he established in the lab were able to remain the only connections between seedlings in the field. He connected very young and older willow (*Salix reini*) seedlings with eleven different ectomycorrhizal species independently. This allowed him to examine whether common mycorrhizal networks formed by different fungal species had different effects on the plants. He also had non-mycorrhizal control boxes, which contained the same seedlings but no common mycorrhizal networks.

To analyze the importance of the networks for seedling establishment, Nara focused primarily on the growth and nutrient status of the younger seedlings. In the boxes where there was no common mycorrhizal network, the young seedlings showed very poor growth and this appeared to be driven by competition with the older willow seedlings in the same box. In comparison, the growth and nutrient acquisition of the youngest seedlings connected to older seedlings by common mycorrhizal networks was significantly greater. So it appeared that competition was reduced by the mycorrhizal network.

Interestingly though, growth of connected seedlings varied considerably depending on which fungus was used to create the common mycorrhizal network. Seedlings connected by *Hebeloma leucosarx* and *Russula sororia* did the best, while seedlings connected by *Laccaria amethystina* did the worst. In fact, seedlings connected by *Laccaria amethystina* did not grow any better than the seedlings that had no mycorrhizal fungi. This variation is very important ecologically because we know that the distribution of most fungi is quite patchy. Depending on where a seed lands, the mycorrhizal network that is formed may consist of different species, which may or may not provide benefits to the seedlings during their establishment.

Nara's work represents a major breakthrough in our understanding of how common mycorrhizal networks affect seedling establishment in field conditions. While the variation in the effects of different fungi was quite interesting, we know from many studies that plants are often colonized by multiple ectomycorrhizal species at the same time. Future studies that look at the effects of multiple networks on seedling establishment will help deepen our understanding of this phenomenon. However, due to the inherent difficulties in studying mycorrhizal networks, Nara's work gives us an excellent place from which to start.

Relevant Literature

Kennedy, P.G., Izzo, A.I., and T.D. Bruns. 2003. There is high potential for the formation of common mycorrhizal networks between understory and canopy trees in a mixed evergreen forest. *Journal of Ecology* 91: 1071-1080.

Horton, T.R. and T.D. Bruns. 1998. Multiple-host fungi are the most frequent and abundant ectomycorrhizal types in a mixed stand of Douglas fir (*Pseudotsuga menziesii*) and Bishop Pine (*Pinus muricata*). *New Phytologist* 139: 331-339.

Nara, K. 2005. Ectomycorrhizal networks and seedling establishment during early primary succession. *New Phytologist*. In press.

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Fungus Fair Volunteering 2005

It looks like we'll have some pleasant surprises at this year's fair. We'll have all our usual aspects of mushroom displays and demos, chefs and speakers, with purveyors and proselytizers of all things fungi, each with expansions and improvement.

Because the museum will be open till 8pm on Saturday and 6pm on Sunday during the fair this year for a special baseball exhibit, we will take some advantage of that for an extra hour for the fair. So our hours will be 10-6 on Saturday and 12-5 on Sunday.

To exhibit the artistic talent of our members, if you have framed, ready to hang graphics of mushrooms we have gallery space at the fair.

For any labels, or signs for displays, or labels for graphics, or for any changes from last year's already created printed materials that need typesetting for display at the museum during the fair, please have them in to us by Monday, November 11th.

If you need to deliver materials for exhibits at the fair this can be done anytime during the day on Friday December 2nd. We will have many volunteers at the museum from around 10 in the morning until the late evening. You can also deliver stuff to the museum anytime during regular museum hours from Tuesday November 29th through Thursday, December 1st. All fair stuff can be stored after delivery in the exhibit hall bays upon delivery. It is best to contact us the week before about any logistical considerations or appointments that may be needed. Details of delivery contacts and logistics will be available from the password section of the "mssf.org" website.

Please look for updates and details of fair activities on the "mssf.org" website and for volunteer details and updates check the membership password section as we get closer to the fair.

Ken Litchfield – klitchfield@randallmuseum.org
Dan Long – danlong@comcast.net
David Campbell – davidcampbell@mssf.org

2005 FUNGUS FAIR

December 3rd & 4th

We need your help

Small tasks for all levels of experience

Friday set-up, December 2nd 3-6:30 pm or 7:30-11 pm

Volunteers especially needed

Saturday 10-6 & Sunday 12-5

Dinner will be provided Friday from 6:30-7:30 pm., as well as snacks and lunch on Saturday and Sunday. Shift obligation for free admission is three hours.

Contact Dan Long at danlong@astound.net

Friday Forays: contact Norm Andresen at n.andresen@comcast.net

MSSF Discussion Group on Yahoo Groups

The MSSF email discussion group facilitated through Yahoo Groups is a great way to keep in contact with other members and is one of the primary ways in which members keep up on news about the Society. The list features often-intriguing discussion of fungal-related topics, tips about current fungal activity, and up-to-the-minute news about MSSF functions.

The list is available in both individual-message and digest formats. Additionally, you can also subscribe to the group in "Special Notices" mode. That means that if you wish to receive only official announcements from the society and not email traffic from other members, you can subscribe using this method. (Subscribers to the list in regular and digest formats also, of course, receive official announcements in addition to posts from other members.)

To sign up, go to:

<http://groups.yahoo.com/group/mssf/>

Follow the link that says "Join This Group". (You will need to sign up for a free Yahoo Groups membership if you do not have one already.)

Wilder Mushrooms: By the Skins of Our Tooth Fungus

Bob Sommer

The wine columnist for *Sunset Magazine* was in lyric form describing Oregon varietals. The Chardonnay was vivid and gorgeous; the Pinot Gris had a lovely rich pear flavor; one Pinot Noir resembled chocolate-covered cherries and another had a fascinating wild mushroom flavor. While I could interpret the cherries and pears metaphorically, as a mycophile I had problems with the last phrase. Is wild mushroom flavor the deep smokiness of the morel, the airy hint of apricot in the chanterelle, the sweetness of a candy cap, or the acrid and peppery lactarius? I experience a similar uncertainty when I see a dish containing “wild mushrooms” on a menu. It will be an appetizer or entree (often the token veggie course), but rarely a side dish. I know too much to accept “wild mushroom” as a sufficient description and will ask the waiter for a species ID. The typical response is puzzlement and the inference that I am a smart-ass looking for an opportunity to demonstrate my superior knowledge. After all, the waiter did not prepare the dish or write the menu. Most of the time, I receive no satisfactory answer.

Probably the wine columnist is referring to the damp earthy quality of some freshly picked fungi, and her conception does not include leaves stuck to the cap, bugs hastily exiting the gills, and dirt caked at the base, which are some of the characteristics I associate with fresh-cut forest fungi. It is mostly the term “wild” that puts me off. Is this wild as in crazy, befuddled, and confused; in hippie argot, “Hey, Man, dig the crazy flavor.” If so, how can we explain the insipid taste of so many forest mushrooms, such as the watery suillus or the disrespected and kicked-over *R. brevipes*? Perhaps the connotation is of savage, untamed, or undomesticated, as in living in the wild? This usage isn’t appropriate for dishes containing cultivated species such as shitakes, oyster, or enoki-dake. I hope the meaning is not one of danger (skin-of-the-tooth fungus), which makes wildness attractive to thrill-seekers. Perhaps the intended meaning is one of exclusion, in which a wild mushroom is anything but *A. bisporus*, reminiscent of the Victorian application of “toadstool” to every mushroom except the cultivated button. Although some day an adventuresome chef might list “toadstools” as an accompaniment to frogs legs, as something for the poor legless frog to sit on, I don’t believe that euphemism (the sprinkling of verbal incense over a rank word) is the explanation. When it refers to a mushroom dish, “wild” is not a pleasant substitute for a tarnished term; rather it is intended to suggest positive qualities that invite the customer to order the dish.

In my opinion this wine critic is using wildness to

suggest surprise, excitement, and novelty, something different from the ordinary gustatory experience. For the uninitiated, novelty for its own sake may be sufficient, as in *vive la différence*. Apple Computer based a major ad campaign on the ungrammatical slogan “Think different.” The thinking person wonders “Different in what respects?” The chef replies that it is a different variety, a Macintosh rather than a Red Delicious. But will this sell apples? Ask Steve, as marketing is one of his jobs. While you do, we will return to the question of whether wildness in a mushroom translates into improved flavor. This is a nice project for a high school science fair. Do wild varieties have superior flavor to their domesticated counterparts in a double-blind taste test? One would have to carefully match species and variety and use similar cooking procedures. Even if it could be shown that the flavor of a field or forest fungus was superior to its cultivated counterpart (the diamond-in-the-rough hypothesis), it would still not explain current usage of “wild mushroom” on restaurant menus. For this general phrase to have meaning, it would need to be shown that *any* field or forest fungus is superior in flavor to *all* cultivated varieties. This conclusion is patently false. The majority of field and forest mushrooms are unexciting to the palette, while most domestic varieties have been selected and bred for their excellent flavor. Despite its hegemony, the cultivated *A. bisporus* has a complex and delicate flavor, although often diminished through careless overcooking.

Another connotation of wild is “unknown.” This usage receives some support when one queries waiters or chefs about the specific ingredients of a “wild mushroom ragout.” I have seen vendors selling mushrooms at farmers markets in Europe and North America who could not supply either a common or technical name, only the claim that they had eaten the mushroom themselves without ill effect. Such ignorance does little to enhance one’s confidence in the product. Would anyone order the Catch of the Day without further elaboration? The appearance of this generic phrase on a menu is an invitation to the customer to inquire as to species and cooking procedure or this information is part of the server’s introduction. The problem with “wild mushroom sauce” is that the server doesn’t know its ingredients and these are not recognizable in the tasting. The restaurant dish is likely to contain a mixture of overcooked pieces in a heavy wine and flour base. There is a certain challenge trying to make an ID under these difficult conditions. By its chewy texture this may be a morsel of an over-the-hill chanterelle while the watery fragment, lacking a discernible flavor, may be a suillus, and the slimy bit seems distantly related to a shaggy mane. Most pieces observed floating in the sauce will remain mystery mushrooms. If restaurants continue to offer wild mushroom dishes, I predict that an enterprising chef will soon feature wilder mushrooms, and then in an orgiastic gastronomic high, someone will move to the wildest mushrooms, which could only be ‘shrooms served on silver service with hemp tablecloth and napkins.

Mendocino Woodlands Camp

Norm Andresen

Time is upon us to think of the pleasures of the moist forests, sheltered glade, the smell of pine, and the excitement of the hunt. What is around that tree ahead, what's pushing up those needles, a bolete, a chanterelle? Or a mole. The perfect symmetry of the shrimp *Russula*, that purple ball on a violet shaft erupting from the forest floor, vibrant scarlet, yellow and tan corals hiding in the huckleberry, the satisfaction of that fungal beauty that only you see after others have past by. Where are these to be had, Salt Point? Three hours up, 5lbs only and ranger Woody. I think not.

Jackson State Forest, Mendocino, the land with some rain already is the place to be. Drive up Friday, collect all day, come to the woodlands camp for Bill Hellums' (The Little Texan) Texas chili, set up in a private cabin, all wood with a natural stone fire place, wake up in a redwood forest overlooking a beaver pond. Have breakfast courtesy of the culinary group with their inventive flare, pack a lunch, and head out into the forest with one of our foray groups or trust to luck/skill and find that legendary place with your companions. If the forest is not for you Ken Litchfield is giving a mushroom cultivation demonstration, an art presentation is scheduled and there is shopping in Mendocino Village.

Saturday night, a chef will prepare our dinner, to the high standard that we have come to expect at this event. You will be able to use some kitchen equipment to try some of the edible mushrooms that you find. We will help with identification, lay out our own fungal display, drink with our friends, new and old, tell the story of the hunt, today's or long past, sit before the fire, wake up to the wind in the trees, have another great breakfast, and head out to adventure.

\$100 for two nights, food, friends and information. An excellent place for the beginner to kick off the season. Come join us Nov. 11-12-13.

Send a check to:
Norman Andresen
16096 Selborne Dr
San Leandro CA 94578

Myco-Blitz Forays at Pt. Reyes National Seashore

Saturday, December 10, 2005, 9:00 a.m.

Saturday, January 28, 2006, 9:00 a.m.

Well yes, we do plan to collect mushrooms in the National Park. And, we have their blessing to do so. Over the years, the ecology of Pt. Reyes has been extensively studied. The Park now wants to expand their knowledge of the flora and fauna there to include fungi.

Dr. Tom Bruns, Professor, Department of Plant and Microbial Biology at UC Berkeley, has initiated this new collaboration to document the fungi there. At Pt. Reyes National Seashore field sites, members of the Bruns Lab have spent many years investigating species changes associated with season, soil depth, host, root disturbance, detritus enrichment, wild-fire, and prescribed burning.

The first foray is **Saturday, December 10, 2005**. We plan to assemble in the early morning, split into groups and collect fungi in four different parkland habitats. The mushrooms will be photographed, identified, catalogued and vouchered for future study. Look for additional details in the December Mycena News.

A second foray is planned for **Saturday, January 28, 2006**. Following the January foray, there will be a public display of fungi (i.e., a mini-Fungus Fair) at the National Seashore on **Sunday, January 29th**.

The goals for the forays are to generate as complete a list as possible for the macrofungi at Pt. Reyes, to photograph and archive specimens, and to incorporate this information into the Pt. Reyes National Seashore website. These goals will be achieved by a set of forays that span several seasons, sample all of the major plant community types, and include both professional and amateur mycologists.

These forays are a collaboration of the Mycological Society of San Francisco, the Department of Plant and Microbial Biology at UC Berkeley under the leadership of Dr. Tom Bruns, and the Pt. Reyes National Seashore. The Sonoma County Mycological Association and members of the Fungus Federation of Santa Cruz are also participating.

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Nice Killer Fungus

Darvin DeShazer

New research into molds indicates that they can be the next useful and powerful insecticides. Can you imagine newspaper headlines or the evening news report that claims a fungus saved millions of people? Research from entomology has uncovered a benign fungus (not harmful to humans) that kills the number one disease vector of people, the Anopheles mosquito. This pesky mosquito transmits Plasmodium between mammals and it's one of the major killers of human beings by causing malaria. About 400 million cases of malaria occur worldwide and roughly 2 million are fatal each year. Most of these fatalities are among young children. On a global scale, this is a MAJOR problem.

Researchers in England, the Netherlands and Tanzania have been honing in on fungal spores that can kill the mosquito. They have discovered six species of *Hyphomycetes*, aka molds, that can kill by simple exposure. It seems that the spores are picked up by the insect and then the hyphae grow into their bodies and within a couple of weeks, kill the bug. This two week time period is important because this pathogenic Protist (Plasmodium), in the phylum *Sporozoa*, requires about two weeks to mature in the stomach and salivary glands of the mosquito before transfer to the second mammal. Humans get the disease when they are the second host the mosquito bits. If the mosquito dies before two weeks it can't transmit the disease.

Successful experiments that kill the mosquitoes have included an oily fungal slurry in a pot or hanging pieces of cloth that are covered with spores of *Metarhizium anasopliae*. *Metarhizium* is an olive green mold from insect larvae that occasionally grows on soil. The mosquitoes land on the cloth, pick up some spores and the subsequent fungal growth not only can kill them outright, but also reduces the ability of the surviving mosquitoes to transmit the malaria causing organism. In other experiments researchers tried a fungus that has been used against locusts, *Beauveria bassiana* and observed a 90% kill rate. In some countries, both of these fungi are already approved for agricultural use as pesticides.

Many scientists believe that if global warming progresses, malaria will spread from the neotropics to the southern United States and the disease could be our problem in the very near future.

Further Reading:



1. Harder, Ben. 2005. Sicking Fungi on Malaria. *Science News*

168 (7): 106-107.

2. Crisan, Eli V. 1971. Mechanism responsible for release of toxin by *Metarhizium* spores in mosquito larvae. *Journal of Invertebrate Pathology* 17(2): 260-264.

3. Blanford S, Chan BH, Jenkins N, Sim D, Turner RJ, Read AF, Thomas MB. 2005. Fungal pathogen reduces potential for malaria transmission. *Science* 308(5728): 1531-1533.

4. Scholte EJ, Ng'habi K, Kihonda J, Takken W, Paaijmans K, Abdulla S, Killeen GF, Knols BG. 2005. An entomopathogenic fungus for control of adult African malaria mosquitoes. *Science* 308(5728): 1641-1642.

MycoBlitz Forays

Continued from page 7

These forays will be fun, and may lead to more projects at other parks. Dr. Bruns has invited several mycologists from the West Coast to help with identification. Please join us. Learn about fungi, the unique habitats of Pt. Reyes, and have a blast. The more folks who participate, the more fungi we can add to the list.

Where:

Meet at the Bear Valley Visitor Center. Point Reyes National Seashore NP is located approximately 35 miles north of San Francisco on Highway 1. You can also reach the park via Sir Francis Drake Boulevard. When you reach Olema at Highway 1, turn right. Go one block north and turn left; following signs to the visitor center.

When (first foray):

Saturday, December 10, 2005 9:00 a.m.

What:

Bring mushroom collecting baskets, wax bags, digging tools or a pocket knife, water, lunch, and an extra layer of clothing for warmth. Be prepared to spend two or three hours in the field, with some additional time to help document the fungi.

Who:

Members of the Bay Area mycological societies, as well as professional and amateur mycologists from all over the Bay Area and beyond. Contact David Rust (incredulis@yahoo.com, 510-430-9353), Peter Werner (pgwerner@sfsu.edu), Ron Pastorino (ronpast@aol.com, 415-924-4818), or Darvin DeShazer (muscaria@pacbell.net) for more information.

For more information about the Point Reyes National Seashore, visit the website: <http://www.nps.gov/pore/>. For directions and a map: <http://www.pointreyes.org/>.

Mushroom Cultivation and Art at the Mendocino Foray

Ken Litchfield

At the Mendocino foray we're planning to have some cultivation equipment so we can do some sterile transfer capture of wild Mendocino mushrooms on to agar and grain jars. You can take home a special fungal pet blob to play in your home garden, worm bin, or ramping-up bag of cellulosic stuffing. We'll be doing our pressure cooking and spreading ideas for home mushroom cultivation all during the day while folks are out foraging. We'll be lassoing onto agar and practicing a few other things in the evening also when folks have returned with their foray bounty.

In addition, we'll be having some artistic opportunities with mushrooms. We'll have art paper and supplies for spore printing art and mushroom drawing. Making spore print art with mushroom spores and woodland foraged curios is fun and surprising and can be eerily beautiful, sort of like really slow airbrushing. There are lots of tricks of the trade for mushroom drawing from botanical and fungal illustration that any beginner or advanced artist can utilize to make their artwork scientifically accurate and aesthetically beautiful. We'll be exploring some of those same techniques that were used on the 2000 Fungus Fair poster and T-shirt. If you would like to bring paper or cloth or whatever material surface upon which to drift spores, that would make for further creative possibilities. A few extra cans of Krylon clear acrylic spray won't hurt. If you would like to delve into any of this more deeply for things you could bring or otherwise prepare for the artistic enhancement of your creations, don't hesitate to contact me before the foray.

About four years ago we had a Sunday cultivation seminar at the MSSF Presidio mushroom garden. About twenty MSSF folks with a cultivation bent showed up. Among a number of other things we worked on was the installation of a nine-foot tall, two-foot diameter *heavy* Monterrey pine log fresh cut from remodeling in another part of the garden. After a lot of huffing and sweating through a few Easter Island engineering techniques we erected it into a three foot deep hole so we had a nice vertical pillar in the middle of our garden's gathering area. At a later seminar after we had grown out a few mushrooms on agar and ramped them up on grain jars we drilled several two inch diameter cores deep into the log pillar and stuffed in a grain jar full of *Gymnopilus spectabilis*, the Big Gym. It was one of the first mushrooms we captured from a Presidio stump overlooking the Pacific.

Last October I noticed that out of one of the core holes was sprouting a little Big Gym. So it seemed like it "took" after all, but maybe just at the inoculation site. On October 16th half way up the trunk of the log, there were two big eruptions of young tight Big Gyms. It *really* took.

The Big Gym is mainly known for being a humongous orangey-colored mushroom, more brownish on top, that I like to call the IHOP mushroom because in full bloom from above it looks like a stack of huge pancakes. It is very acridly bitter tasting, not edible, not that you would want to eat it except that it has a reputation for being hallucinogenic because the Japanese version is called the Laughing Mushroom, *waraitake*, due its psilocybin content and ability to induce Buddhist monks who "accidentally" eat it to go laughing and dancing in the streets. We have had our local version analyzed at a criminology lab of Mark Lockaby's acquaintance and they found no traces of controlled substances in the samples we sent them. Had they, you can reckon there'd be some local lore on how to ingest them minus the acrid principles. Big Gym is well known to be good to dye with and maybe die, too, at least with a lot of gagging and grimacing on the way down.



Foragers' Report

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1. Brush the steaks with a little of the oil. Grill over moderate heat (either BBQ or indoors). Cook about 12 minutes total. Remove from heat, S & P, and let stand 5 minutes while you:
2. Sauté the porcini "steaks" in the remaining oil, S & P, and set aside.
3. Melt the butter in a pan, add the wine and cheese and cook, stirring, until the cheese is all melted and very hot.
4. Serve the steaks on warm plates. Put a porcini "steak" atop each filet and then top with the sauce. Garnish with parsley or tarragon. Adjust the seasonings.

Note: If using dried porcini sauté the re-hydrated mushrooms and add them, chopped, to the cheese sauce (a little sautéed garlic would be nice too).

Suggested wine: A big Dry Creek Zinfandel (that's redundant).

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Calendar

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November 25-27, Friday-Sunday (Thanksgiving Weekend): David Arora's annual Mendocino Mushroom Foray. Three days of mushroom hunts, ID, cooking demos, and lectures by Arora and special guests. \$160 per person, includes lodging in heated cabins and most meals. All experience levels welcome. For more info or to register, contact Debbie Viess at: amanitarita@yahoo.com, or 510.430.9353 (days or eves 7-9 pm) or 328 Marlow Dr., Oakland, CA, 94605.

Friday, December 2, 10AM; Fungus Fair foray at Memorial Park, near La Honda, CA. Meet just past entrance kiosk. Bring lunch and collecting gear. For information, email Fred Stevens, (fstev@sonic.net) or Mike Wood (mgwood@mykoweb.com).

Friday, December 2, Fungus Fair forays. There will be numerous forays today (Salt Point, Joaquin Miller, Big Basin, Point Reyes, Crystal Spring Reservoir, and on and on.) For the latest list, foray leader and contact information, check the Yahoo group site or the MSSF.org members only area.

Friday, December 2, Two helpers with strong backs are needed to haul books to the book sale table from and to my truck just before the Fungus Fair starts....and just after it ends. I have a hand-truck, but could use another as well. The commitment would be for 1/2 hour each time. If you are willing to help, please contact me by November 17th at: lmarsh2@chw.edu. Tel: 650-367-5880 (work, Mon-Thu) or cell tel: 650-483-1156.

Saturday-Sunday, December 3-4. Annual Fungus Fair. Oakland Museum. Speaker presentations, mushroom displays, specimen tables food, books, and art gallery. Open from 10-6 Saturday and 10-5 Sunday.

Tuesday and Wednesday, Dec 6-7, Mushroom Dinner at Lalimes Restaurant in Berkeley. For the 10th, year Lalimes will have a prix fixe mushroom dinner the week right after the fair. The MSSF will have a display set up and will be there answering questions. For menu and reservation information contact www.lalimes.com or call 510-527-9838

Saturday, December 10, 2005, 9:00 a.m. Point Reyes Foray. Led by Tom Bruns with David Rust, Peter Werner, Darwin Deshazer and Ron Pastorino. See inside this issue for more details.

Monday, December 12th, 7:00 pm. Annual Holiday Dinner Snow Building, Oakland Zoo. Produced by the MSSF Culinary Group with Michael Giacomini. Open to all MSSF members with reservations. \$32.00 for MSSF members, \$37.00 for non-members. To make a reservation, send checks or money orders made payable to MSSF to our treasurer, Hilary

Somers/MSSF Holiday Dinner, 4148 Briarwood Way, Palo Alto, Ca. 94306.

Friday-Monday, January 14-16. SOMA Winter Mushroom Camp. Special guests this year include Paul Stamets, well known author and fungal pioneer; Leon Shernoff, editor of *Mushroom, the Journal* and Dr. Michael Kuo from MushroomExpert.com. \$195 until Nov. 15, \$225 after. Registration closes on Wed. January 4. Includes lodging, meals, and all classes & activities. Sunday only fee: \$110, includes all the day's activities & presentations, and main dinner feast. Info: 707-829-2063 or camp@somamushrooms.org.

Foragers' Report

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And for dessert:

Candied Snow Mushrooms with Liqueur d'Oranges

Serving Size: 6 Preparation Time: 30 minutes

Note: You can buy these dried fungi in a good Oriental market.

3 oz snow mushrooms (tremella fuciformis)
 3/4 cup light corn syrup
 3/4 cup water
 3/8 cup orange juice (fresh not necessary here)
 1-1/4 lemons, peeled, sliced thin
 1-1/2 oranges, peeled, sliced 1/8" thick
 2 tbs Triple Sec
 1-1/2 pint vanilla ice cream

1. Soak the mushrooms in hot water to cover for 5-10 minutes. Drain and rinse.

2. Bring the corn syrup, sugar, water and orange juice to a boil. Lower heat and add the drained snow mushrooms and lemon slices. Immerse for several minutes. Drain in a colander. Allow to cool.

3. Drizzle the triple sec over orange slices with the mushrooms and serve on ice cream.

Suggested Wine: Navarro Late Harvest Gewurztraminer

That's all for now folks!

Congratulations! Today is your day!
 You're off to Great Places. You're off and away!
 You've renewed your membership early. You have
 password and books.
 You're ready to look in swails, groves, and rock nooks.

On you will go though the weather be foul.
 Past the floppers and too-picked's and the hakken-kraks'
 howls.
 On you will go to your "spot" by the creek,
 Though your arms may get sore and your sneakers may
 leak.

You won't lag behind because you'll have been to our
 meets.
 You'll pass the whole gang and soon take the lead.
 Wherever you ID, you'll be best of the best.
 Wherever you go, you'll outpick all the rest.

Except when you *don't*. Because sometimes you *won't*.
 You'll forage in prickles and mosquitoes and poison oak.
 And you won't find a single chanterelle, suillus, or Elfin—
 you won't.

Then somehow you'll find them, just a day before the Fair.
 Russulae, polypores, and tremellae for the ID table or to
 share!
 You and new foraging friends will be the winningest
 winners of all.
 Your halo will shine at the MSSF campsites, dinners, and
 meeting hall.

Oh! The Places You'll Go!*

** But only if you renew for 2006 and remember to tell us what contact
 info changed...*

2005 memberships expire in December. You need to renew
 before then to receive 2006 publications and to continue your
 access to the MSSF website. (Check the mailing label on your
Mycena News to find out when your membership expires.)
 Please complete the enclosed application and a check made out
 to "MSSF Membership," and speed it to "MSSF c/o the
 Randall Museum," 199 Museum Way, San Francisco, CA
 94114. You can also renew online by using the PayPal option
 on the MSSF website. If you do, please send Polly Shaw your
 full contact information in the application (at
 sfwaterbug@yahoo.com or 415-665-3293).

The regular, adult/family membership fee is \$25.00. Seniors
 over 65 and full-time students pay \$20.00. E-members pay \$15
 to download the *Mycena News* and other publications from the
 website. The MSSF treats membership information as private,
 but it does VERY occasionally release its membership list for
 mailings by mycological businesses. If you do not want your
 name included, let us know on the application.

MYCOLOGICAL SOCIETY OF SAN FRANCISCO - Membership and Membership Renewal Application

New Members please fill out as much information as you can. Members who are renewing need to fill out only the blanks for which information has changed within the last year. Please check the current *Roster* to see if any of your address, phone, and email need updating!

Name 1: _____ Home Phone: _____
 Name 2: _____ Business Phone: _____
 Street/Apt#/PO: _____ Cell Phone: _____
 City: _____ Email 1: _____
 State: _____ Email 2: _____
 Zip Code: _____
 Interests: _____

New Membership? _____ Renewal? _____
 Membership type: _____ Adult/Family (\$25) _____ Senior/Students (\$20) _____ Electronic (\$15)

If sending a check, please make it out to "MSSF membership" and mail it, with this form to: MSSF Membership, c/o The Randall Junior Museum,
 199 Museum Way, San Francisco, CA 94114

If paying by Credit Card, please provide the following information:
 Circle Type of Credit Card: MasterCard, Visa, Discovery, or American Express

Mycological Society of San Francisco
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MSSF Calendar, November, 2005

November 5-6, Saturday-Sunday: Salt Point State Park Foray. Meet at 10 am November 5 at Gerstle Cove Campground, in Salt Point State Park. Attendees responsible for their own campsites and adherence to park regulations. Potluck cookout Saturday night featuring what you bring and mushrooms you will find. Mushroom ID will be an important part of this Event. No pre-registration required. SPSP web site has maps and regulations. Contact Norm Andresen at n.andresen@comcast.net for more details.

Monday, November 7: Culinary Group monthly dinner. Reservations required. 7 pm at the Hall of Flowers, Golden Gate Park, San Francisco. To make a reservation, call Pat George at (510) 204-9130 or e-mail plgeorge33@yahoo.com no later than Friday, November, 4th. We limit the number of participants to 60. Note: There will be no regular Culinary Group meeting in December due to the Holiday Dinner on December 12th. We will resume our normal calendar with dinners on the first Monday night of the month in January.

Friday-Sunday, November 11-13. Mendo Camp Foray. Good foraging, good food, cultivation seminar, art display and Norm Andresen. What else do you need? \$100 per person. Contact Norm at n.andresen@comcast.net or (510)278-8998 for more information or see the preview inside this issue.

Tuesday, November 15: MSSF General Meeting. Randall Museum. Mushroom identification at 7 pm. Dr. Rytas Vilgalys will discuss the science behind endemic vs. invasive species in fungi at 8 pm.

Tuesday, November 15: NAMA Photo Slide Show for Beginners at 6:45 p.m. in the main auditorium of the Randall Jr. Museum before the main program. The program will feature The Best Edible Non-gilled Mushrooms and Poisonous Look-Alikes and include Boletes, Polypores, Hydnums and Chanterelles. The program is geared toward the beginning mushroomer but all are welcome.

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**Note: Deadline for the December 2005 issue of Mycena News is November 21.
Please send your articles, calendar items and other information to:
mycenanews@mssf.org**