Speaker for April MSSF Meeting

Paul Stamets

Recent Advancements with Medicinal Mushrooms

Visionary Paul Stamets will speak to the MSSF this month on "Recent Advancements with Medicinal Mushrooms." Paul has just been published in "Herbalgram 54," the official journal of the American Botanical Society, a juried, peer-reviewed journal. His article, "Novel Antimicrobials from Mushrooms," will form the subject of his talk.

Stamets founded Fungi Perfecti, which educates those contemplating cultivation of gourmet and medicinal mushrooms as a business, and promotes the concept of mycological landscaping, which involves the cultivation of exotic mushrooms in gardens, lawns, woodlands, and other natural settings.

Stamets has often been a keynote speaker to packed audiences at our annual fungus fair.

Paul Stamets has been a dedicated mycologist for over twenty years. Over this time, he has discovered and co-authored four new species of mushrooms, and pioneered countless techniques in the field of edible and medicinal mushroom cultivation. He received the 1998 "Bioneers Award" from The Collective Heritage Institute, and the 1999 "Founder of a New Northwest Award" from the Pacific Rim Association of Resource Conservation and Development Councils.

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Mycena News

Mycological Society of San Francisco *April, 2002, vol 53:4*

The End is Near – Again

By David Rust

There is no "good" news about Sudden Oak Death, but the papers have been full of stories about it lately.

One recent barrage was unleashed on the discovery that *Phytophthora ramorum* "may" be killing redwoods. On January 8, 2002, screaming headlines in several San Francisco Bay Area newspapers proclaimed the potential new victim, and the San Francisco Chronicle ran a page one story: "Tree-killer spores found in redwoods – Sudden oak death found in redwoods." An arborist in Marin County had leaked a story to the newspapers, and even with a lack of real science and conclusive evidence, the papers chose to run the story anyway. Words like "frightening" and "ruinous" called up the spectre of a California landscape bereft of both its oaks and redwoods.

* * *

I've spent a lot of time in tanoak woodlands this winter. It's sad to think that these majestic trees may soon disappear – and with them the mycorhizzal relationships that produce many species of interesting and edible mushrooms. Tanbark oak is most susceptible to *P. ramorum*, with 95-99% mortality.

When I walk through tanbark oak woodlands, I now carefully inspect the trees for signs of disease. Any leaf spots or dead branches catch my eye. I look closely for bleeding cankers, sawdust "frass" from a secondary infestation of bark beetles, or the fungal domes of *Hypoxylon*. I know it is unlikely, but what if I have brought the disease here on my boots?

* * *

After the redwoods' demise was publicized, the California Oak Mortality Task Force ran a rebuttal on its email distribution list of over 1,000 non-profit, state and federal representatives. Here is the message:

> *Redwood is not a confirmed host of Sudden Oak Death at this time.*
>
> *On January 8, 2002, several newspapers, television stations, and radio stations picked up a story that* Phytophthora ramorum *(the cause of Sudden Oak Death) may be killing redwoods. The story was given to the media by Ken Bovero, a Marin County Arborist. He took reporters to two sites in Marin County where dying redwoods are adjacent to areas with symptomatic toyon, tanoak, coast live oak, and rhododendron.*
>
> *The symptoms found on the redwood stump and surrounding redwood trees do not follow the recognized SOD pattern of mortality. In addition, while the private laboratory Mr. Bovero used was able to identify the presence of a* Phytophthora *on the redwood samples provided, the specific species of* Phytophthora *was not determined.*
>
> *In response to the story, Matteo Garbelotto, UC-Berkeley researcher, and David Rizzo, UC-Davis researcher, reported that they have identified* Phytophthora ramorum *DNA on redwood sprouts (not killing trees) in Pfeiffer Big Sur State Park in Monterey County and on the UC Berkeley campus.*
>
> *The California Department of Food and Agriculture (CDFA) and the Rizzo Laboratory are sampling the trees and doing the scientific studies necessary to determine whether the pathogen that causes Sudden Oak Death is affecting redwoods. The original report of dead redwoods is based on a lot of circumstantial evidence. Laboratory confirmation is necessary before redwood can be considered*

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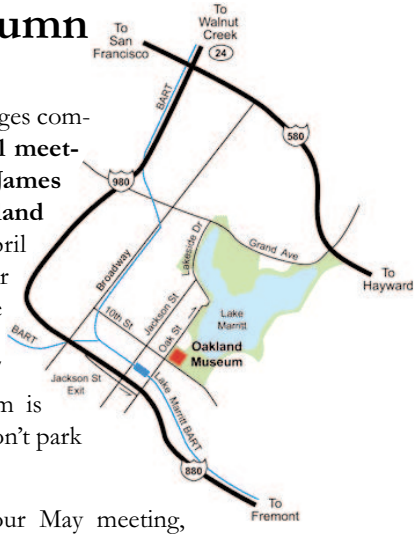
President's Column

By David Rust



We have some important changes coming up in April. **The general meeting is going to be in the James Moore Theater at the Oakland Museum** on Tuesday, April 16th. Paul Stamets is our speaker. Directions to the meeting can be found at: http://www.museumca.org/visit/map.html. The museum is easily accessible by BART – don't park in the underground garage.

There is also a change in our May meeting, which will be held on the second Tuesday, May 14th. The speaker will be Elio Schaechter.

The member logon and password are going to change now that we have updated the email discussion group list. The new password will apply to both the current Mycena News and the member area of the MSSF website. *logon*: mycena *password*: pura

Once again, I encourage you to join the email discussion group. We use this list for timely announcements about classes, forays, and meetings. Instructions to join are on the member area of the website.

Society Officers

President: David Rust	(510) 430-9353
Vice Pres: Mark Lockaby	(510) 412-9964
Secretary: Jeanne Campbell	(415) 457-7662
Treasurer: Sherry Carvajal	(415) 695-0466

Select Committees

Forays: Tom Sasaki	(415) 776-0791
Book Sales: Norm Andresen	(510) 278-8998
Membership: David Bartolotta	(415) 621-3166

Paul Stamets

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He has written five books on mushroom cultivation, use and identification; his books "Growing Gourmet and Medicinal Mushrooms" and "The Mushroom Cultivator" (coauthor) have long been hailed as the definitive texts of mushroom cultivation. Other works by Paul Stamets include "Psilocybe Mushrooms and Their Allies" (out of print), "Psilocybin Mushrooms of the World", "MycoMedicinals®: an Informational Booklet on Medicinal Mushrooms," and many articles and scholarly papers.

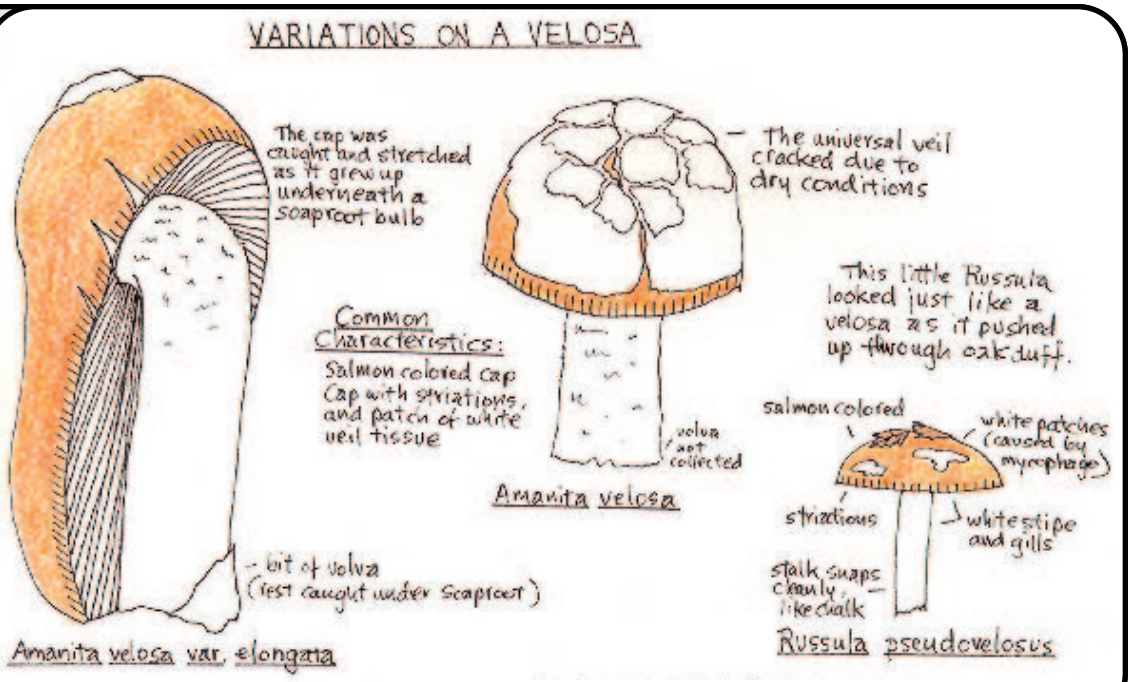
Paul sees the ancient Old Growth forests of the Pacific Northwest as a resource of incalculable value, especially in terms of its fungal genome. A dedicated hiker and explorer, his passion is to preserve, protect, and clone as many ancestral strains of mushrooms as possible from pristine woodlands. Much of the financial resources generated from sales of goods from Fungi Perfecti are returned to sponsor such research.

Membership and Subscription Information

To Join the MSSF and receive this newsletter, send a $25 check, payable to MSSF ($20 for seniors 65 and over and full time students), to MSSF Membership, 2750 Market St., Suite 103, San Francisco, CA 94114-1987, Attn: David Bartolotta. Please include contact information: home and/or work phone numbers and email address. New and renewal memberships will be current through December of 2002. To change your mailing address, please notify David. MSSF members may also join or renew membership in the North American Mycological Association at a reduced rate by including with their MSSF check a separate check for $32 payable to NAMA. Send it to David at the same address. For further information, email David at david@bartolotta.com or call at (415) 621-3166.

For the most current Calendar information, call the MSSF hotline at 415-759-0495 or check the MSSF web site at: www.mssf.org

Artist's Corner



Drawings and creative Latin by Debbie Viess 02/2002

The End is Near

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an official host by CDFA.

The next day, the SF Chronicle ran a follow-up story that sounded very much like a retraction: "All involved urge calm on tree-killing spores – results of tests on redwoods not in yet."

Since the reported threat to redwoods, funding has been dramatically increased for *Phytophthora* study. The Gordon and Betty Moore Foundation has awarded a $1 million grant to researchers Dave Rizzo and Matteo Garbelottto. A farm bill, passed by the U.S. Senate on February 14, includes a provision offered by Senator Barbara Boxer authorizing $70 million over the next five years for research related to Sudden Oak Death Syndrome. The bill will now go to a joint House and Senate conference. Agriculture Secretary Ann Venneman approved a $3.5 million proposal from the USDA to fund research, monitoring and education.

* * *

On January 16, 2002, Bay Area newspapers carried a new threat: "Oak disease spreads throughout East Bay", the papers said, again on page one, citing three locations where the cool-climate disease was not supposed to reach. This is where I live. Although there is little or no tanoak here, the long-term effects could be devastating. Each new development in this unfolding story brings a threat of park closures. In an area already off-limits to mushroom collection, a quarantine could be devastating.

* * *

The U.S. Department of Agriculture issued federal quarantine regulations for *Phytophthora ramorum* on February 14, 2002. This interim rule takes place immediately. Although it may be modified through a series of public hearings, this is the first action by the federal government to regulate movement of materials out of the state of California, although similar quarantines by Canada and the state of Oregon have been in effect for almost one year. California state regulations remain in effect for the 10 counties in the Bay Area.

USDA officials, perhaps worried about the wide-ranging economic effects of this pathogen, e.g., a possible threat to the redwood timber industry, have stepped in to halt its spread with any tools at their disposal. Unfortunately, P. ramorum is dispersed by aerial sporangia, and quarantine is futile.

The new federal regulations do not address collection of mushrooms. Regulated materials include 15 host plant species as well as the bark chips, forest stock, and mulch of these species. It would be prudent to expect that all forest products, including fungi, will come under increased scrutiny as more attention is given to limiting the spread of this disease.

* * *

In Mushrooms Demystified, David Arora lists thirty fungi associated with tanbark oak (*Lithicarpus densiflorus*). Among the treasures one might find in the leaf litter under a tanoak are *Agaricus silvicola, Boletus aereus, Cantherellus subalbidus, Ramaria*, and *Craterellus cornucopioides*.

* * *

A company called "Bioscape, Inc." is capitalizing on the fears of homeowners with oaks on their property. Bioscape is holding seminars to educate them about Sudden Oak Death (calling it "tree decline complex") and its causes. From the web site:

Dear Friends,

We hope you can join us for the upcoming Peninsula Environmental Forum next Tuesday, January 29. Please circulate this message to others who may be interested.

What: "What is really killing our forest trees?"

Who: Ralph J. Zingaro, a graduate of Cornell University Agriculture, Licensed CA Pest Control Advisor and principal with Bioscape, Inc., will talk about his research into the causes of sudden oak death syndrome.

When: January 29, 2002 (Tuesday) 7-9pm

Where: Located at the PCC, 3921 East Bayshore Road, Palo Alto, CA 94303.

The blame is placed on acid rain and air pollution. Also from the web site:

Our lab tests, taken at our 500-acre research site for the past 2 years, indicate extremely acidic soils and elevated toxic aluminum levels in soils and trees. What this means to trees is sudden root death . . . Remember, neither a beetle or a fungus alone is killing your trees, rather, it is good old fashioned air pollution. Air pollution strips nutrients from trees and makes them more susceptible to fungi and insect attacks.

* * *

On March 1, 2002, the Contra Costa Times reported on DNA evidence of Sudden Oak Death in Placer County near Foresthill. This information was retrieved through a Public Records Act request from Mike Taugher of the Contra Costa Times to the California Department of Food and Agriculture (CDFA). The information had not been formally announced because findings are preliminary and culturing of the pathogen has not been successful (a necessary step in classifying an area as regulated for Sudden Oak Death). Many media outlets reported on the story.

The Rizzo (UC-Davis) and Garbelotto (UC-Berkeley) labs are collecting samples of big leaf maple and other symptomatic hosts in the area and are in the process of confirming pathogen presence. While the disease is not officially in the foothills of the Sierra Nevada, the DNA results are the first evidence of *Phytophthora ramorum* having crossed the Central Valley.

A similar version of this article will appear in the spring issue of Mushroom the Journal of Wild Mushrooming.

Will Still Work for Mushrooms

Phil Frank, local mushroom hunter and professional cartoonist, encourages us to send him any mushroom cartoon ideas (and any extra dried morels lying around) to: 500 Turney Street, Sausalito, 94965, or email him at baba@sfchronicle.com

Mushroom Fruiting: Why and When, OR Bankers Hours at the Old Oak Tree – Part I

By Steven Pencall

Like many mushroom hunters, especially those who have worn out a few baskets, I have devoted considerable thought to why some mushrooms, particularly chanterelles, fruit in some seasons and not in others. Larry Stickney and Stephen Bowen's article in the March Mycena News finally prompted me to put down in writing some speculations on this: a subject that I consider one of the great enigmas of fungal biology.

Like most novices, when I began hunting twenty years ago, I took it for granted that there was a simple linear relationship between rainfall and mushroom fruiting. It rained and mushrooms fruited, or as is often the case in Southern California, where I do most of my hunting, it didn't rain and mushrooms didn't fruit. For about ten years I took it for granted that rainfall was a guarantee of mushroom fruiting and was content to fill my basket in the good years and pine for a full basket in the bad years. That all changed in 1991.

The Mushroom Season That Never Happened

The fall and most of the winter in the 1990-91 season were very dry throughout the state of California. At the Los Angeles Civic Center no rain fell in October, only 0.19 inches in November, none in December and only 1.17 inches in January. A terrible drought was imminent when it began to rain heavily in late February of 1991. The rains continued throughout March, so much that most regions of California received half to two thirds of the normal season total in the month of March, a month that normal brings 20% or less of the average season precipitation to most parts of the state. The "March Miracle" as it came to be known, did not completely end the drought, but it certainly averted a major statewide water crisis.

The whole winter had been so dry that there were virtually no mushrooms to be found during December, January or February. After several weeks of rain, I was in a state of near euphoria anticipating the coming mushroom bounty. When a break in the weather came I raced to all the usual mushroom spots. I found a few saprophytes: *Agaricus, Clitocybes*, blewitts and a few others. I found no mycorrhizal mushrooms associated with coast live oak – quite literally – none. Disappointed, I returned home and waited a couple more weeks during which time it rained some more. I tried again with much the same results.

I was disappointed and somewhat bewildered. Had all that rain really been for naught, mycologically speaking? Clearly, the lateness of the rains was to blame, but why? I could see the effect, but what was the mechanism that had caused it? I couldn't answer that question and just reveled in the next two seasons, which were abnormally wet, with abundant mushroom fruitings.

Dancing at Arm's Length

Fast forward about three years. My wife Patricia Hannon and I enjoy gardening and a copy of the Sunset Western Garden Book sees frequent use in our home. Many of you know that this classic has brief but useful descriptions of almost all plants commonly grown in western gardens. While reading the description of coast live oak (*Quercus agrifolia*) I read the following passage, "Has greedy roots and drops almost all its old leaves in early spring just when gardening time is most valuable." I had never realized this. A quintessential "Eureka!" moment soon followed.

"Live" oaks are not true evergreens like conifers, where a needle may stay on the tree for 3 to 5 years or more. They are much like their deciduous cousins, except there is no dormant period. The need to produce an entire new canopy of leaves (and also a large amount of pollen) in a short time means that the tree must summon all available reserves of carbohydrates for this essential task. However, ectomycorrizal fungi such as chanterelles and so many of our other familiar woodland mushrooms must also obtain the carbohydrates they need from their symbiotic oak partner. Although they are not exactly in competition, the oak and the mycorrhizal fungus depend on the same resource. This co-dependence leads to a wary partnership, rather like dancing at arm's length.

The timing of rainfall is crucial to setting the ground rules for the dance. In a "typical" year fall rains activate the mycelium of ectomycorrhizal fungi that form sheaths encasing oak roots. The mycelium sends a hormonal signal to the oak to release carbohydrates and the oak complies. The fungi quickly convert the carbohydrates they receive into a form of sugar, trehalose, that trees cannot metabolize. The sequestration of trehalose ensures that the tree will not subsequently re-absorb the carbohydrates from the fungi. The mycelium then uses the carbohydrate reserves to form primordia that will develop into mushrooms with later rains. I call the period when the fungus is obtaining and sequestering carbohydrate stores from its symbiotic partner the "induction period." Familiarize yourself with this concept as I will be referring to it often.

In some years – about four of the last twenty – rains have fallen so late that the bulk of the mycorrhizal fungi, most conspicuously chanterelles, did not fruit at all. Evidently the induction period has a finite length and rains falling after it has ended will not result in sequestration of carbohydrates from the tree or induction of fruiting. Fungi and their seekers must content themselves with the old refrain of Brooklyn Dodger fans: "Wait till next year!"

Banker's Hours

Why then does the induction period have a finite length? The induction period is limited by the oak's need to hoard its own carbohydrate reserves for the all-important spring leaf crop. Rather like the old days of "banker's hours" the tree opens its carbohydrate withdrawal "window" for a relatively short time in the fall and early winter. Delayed rains mean that the fungus arrives at the window too late to make a withdrawal and loses out.

What triggers the initiation of the induction period? The exact amount and timing of rain required to trigger induction of fruiting has probably been debated since humans first began hunting mushrooms. However, soil temperature, humidity, and other environmental parameters also have an important although more ambiguous role. There are so many other factors involved that it would probably be beyond the capacity of a supercomputer to calculate it precisely, although statistical techniques could probably be used to isolate those factors of greatest importance.

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The Foragers' Report

By Patrick Hamilton
MYCOCHEF@aol.com

The title of this column (note the plural possessive of forager) is what it is because they who foray forth and forage in our forests are "reporting" their findings to your compiler of such info. At least that is what a lot of you used to do.

When I took over writing this column in 2000 we all were experiencing the new mssfgroups discussion on the Internet. That is right about when you all stopped actually telling me stuff away from the eyes and ears of those who daily were looking at the postings about the findings of fellow society members.

So where does this column now fit in? If all that used to be available only in this monthly written form, the "Mycena News," is now accessible almost immediately on the Net, do we change this column in the future to report different things? (Yes, I have been trying to do that and still have crumbs from last column's doughnut.)

When Bob Gorman was the author of this he had a loose cadre of members who would inform him of what was fruiting here and there and he wrote beautifully of it. I loved looking forward to learning about others' findings, especially when I had not yet developed my own patches nor yet had I learned much about weather, terrain, habitats et al.

Then David Campbell took us on his fanciful literary trips to some of his and Jeanne's mushroom spots, some here and some way out there. And he also told us what his informers told him so that it could be reported here."Fungal Follies" by Mike Boom was written by an excellent professional writer and was full of important (and funny) stuff. Especially when he would complain about not finding enough of this or that or of others finding more of this or of that. I used to imagine his lower lip – the pouting one – with his size 14 boot prints on it. But at least he had things to report, because folks reported to him.

I think that many of us thought it was kind of cool to see one's name being cited as contributing to Bob's or David's or Mike's columns. That has apparently lost its appeal with so many people contributing on mssfgroups list. It is no longer a hook to get you to send information to this column's reporter.

So, where should this column go in the future? There is history to this so we can't mess with it too much but perhaps make it more contemporary? Any suggestions would be welcome (as would any not yet seen on the Internet contributions regarding foraging from readers).

We did get some looks at *Amanita velosa* recently and with those came the mandatory warnings to any collectors not absolutely sure of their identifications. These mushrooms flirt consistently with me as favorites for several reasons: How well they go sautéed in any of those delicious butters now available in your gourmet store's cheese cases and nothing else except gray sea salt and a bit of freshly ground black pepper; their scarcity and short season; their signal that soon morel season will be here for those who go; and, finally, they are very pretty and delicate – like so many of us. Golden chanterelles are fruiting but certainly not like we'd like. A note – David Campbell and I found a bunch one day, years ago, along with *A. velosa* and *M. rachodes*, morels (!) and a mad cow encounter, in late March (the Spring after the Inverness fire) near Hwy. 1 in Marin so maybe other pickers still can.

Black chanterelles, now fashionably called by some "trumpets," did finally sprout pretty well along the north coast in the usual areas. I am going again today (March 9) to Salt Point and do expect to get enough to keep the hunt interesting. We have been finding them in the steep ravines where you prop up your butt on a downhill tan oak to pick uphill, on the little ledges formed just above.

(An update on the hunt mentioned in the above paragraph – Kathy Faircloth and I did find some, each our limit, by taking the high road above the State Park, parking where we could, and just sort of popping in and out of the tan oak forests, never going more than 300 yards downhill. Tough going but rewarding. This is the last time we will go this year because the season there is definitely almost over. "Rubber Lips" were beginning to show their ugly selves and a few even had that burnt rubber smell. We left those.) Blacks will probably come up down in the Peninsula and around Santa Cruz later, maybe even deep into April.

The long awaited "Best Places to Pick Morels" that I was going to tell you about was swooped in last month's issue by Norm Andresen – much like he will swoop in front of any picker mentally lame enough (and soon physically) to get in his way when those little jewels are around. They are all his, he once told me during evening cocktails. So the next day I asked him if that unnoticed big one just behind his boot was too or that one he'd missed over there. . . .

We were up on the north coast Sunday past when Kathy and I decided to check out the Trough fire. It was a very long, scenic, drive east from Scotia on winding and snowy Hwy.. 36 and then down the lava and Blue oak sheep and cattle country west of Hwy.. 5 via small well paved roads into Stonyford. Just west of town (and I am being generous in scope; there are no gas stations anywhere in this area) a road goes into the fire. I mean right up into the fire area – directly – as if there was a forest fire and then afterwards someone built a curving Lord of The Rings style road to it and through it.

Green grass, blackened willows, Indian Warrior and burnt manzanita already sprouting new growth at their bases, scorched Digger (Gray) pines and up higher it looked like some other conifers forming some canopy are what we saw. No sign yet of cup fungi (a good indicator of morels in this type of habitat) but it was very moist and did appear that with warm weather and more rains in the next few weeks there might be morels there. Could be.

Rose Flaherty, Utaka Wada, Norm Andresen, David Campbell, Kathy, myself and I forget who else picked at the Sugarfoot fire several miles north and west of here in the early 90's and did find some morels and had a heck of a good time just being.

I say to the adventurous and early seekers to go check out the Trough fire in mid April but do it by driving to Clear Lake, go east on Hwy.. 20 to the Bear Valley turnoff and then drive north towards Stonyford and experience here one of the West's most spectacular explosions of wildflowers. This is a known wildflower heaven and this time it might lead to morels.

Mycena News is the newsletter of the Mycological Society of San Francisco and is published monthly from September through May. Send or email newsletter submissions by the 12th of each month to Lorrie Gallagher, 129 Tucker Avenue, San Francisco, CA 94134, phone: (415) 467-1868, email: lorriegallagher@ hotmail.com

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Culinary Corner

By Al Carvajal

In the month of March, the culinary group had another terrific dinner. The theme of the dinner was food of Latin America. Modern Latin America is an amalgam of European, American-Indian and African cultures that used an incredible variety of products from temperate Europe, tropical America and the heart of Africa as the prime materials to create a rich and varied food.

As usual, we had quite a spread of wonderful appetizers. Some of the ones that I wrote down, before I consumed one too many glass of Carol Hellums' wonderful Fiesta punch were: Asparagus with aioli (Sue Witt), Fiesta abalone with shitake (Carol Reed and Curt Haney), Lomi-Lomi salmon with shemeji Salsa (Dave Bell), Chile con queso Texan style (Bill Hellums, hey, Texas used to be part of Mexico), Baked mushrooms stuffed with salmon and six kind of cheeses (David Bell), Famous cheese (George Repinec), Guacamole and chips (Zoe Caldwell), Salad of black Lentils and black trumpets (David Bartolotta) and a Baked brie cheese stuffed with black trumpets (Dulcie Heiman). There was also a wonderful dish of pickled mushrooms with antipasto mix made by someone whose name I could not decipher from my own handwriting. I'll tell you, that was a very good punch!

The main attractions of the dinner were a couple of typical plates from the city of San Cristobal in Mexico's State of Chiapas. The dishes were prepared by George and Jane Collier, a couple of cultural anthropologists who traveled extensively through Chiapas in the course of their research. Both are also marvelous cooks.

After 400 years, San Cristobal still seems like a colonial center. Narrow cobbled streets wind past ancient porticoed buildings with tall barred windows and tiled roofs. The old Spanish church plazas remain the centers of activity. The Indian majority is the only notable natural resource, providing goods for market and drawing a substantial tourist business. Indian barrios make up much of San Cristobal's population, and hundreds more trek into town each morning packed into trucks and old buses for the daily market. But the city belongs to the Spanish-speaking minority, who own the businesses and reap the profits. These are the descendants of the Spanish conquistadors and colonists who came to the area hundreds of years ago. The dishes are prepared by these descendants to celebrate special occasions, such as Christmas, weddings and baptisms. The preparation requires the use of lots of wonderful products from Europe, products that were hard to obtain in San Cristobal in years past, but the sort of food that an expatriate immersed in an alien culture would have been homesick to taste. The current generation no longer has any attachments or memories of Spain but the tradition lingers.

We started the dinner with a wonderful salad of cabbage and lettuce prepared by Toby Garrone. We followed with George Collier's Sopa de pan and roasted pork loins. Sopa de pan is a casserole prepared by baking layers of bread, tomatoes, onions, green beans, nuts, raisins, platanos and boiled eggs. The pork loins were butterflied, rubbed with garlic, salt and pepper, stuffed with prunes, onions and nuts, rolled, layered with bacon and roasted in the oven. They were topped by a wonderful Salsa de cepas y vino tinto by David Campbell. The sauce was made by cooking porcinis, yellow chanterelles, and hedge hogs in a red wine reduction. The combination was delicious! If that was not enough, we had Fred Kron's Black beans with Cotija cheese and David Bell's Spicy carrots to go along. The spicy carrots are a combination of grated carrots, golden raisins, saffron threads, coriander seeds, cumin and chopped fresh cilantro leaves. The black beans were cooked with ham hocks, covered with the cheese and baked until the cheese melted.

For dessert, we had Monique Carment's Guava in a syrup made of guava juice and served with queso fresco casero, a version of farmer's cheese, and Remo Arancio's wonderful coffee. The chilled fruit and cheese combined to provide a very light and enjoyable mix.

It has been a long time since I have had a dinner so interesting and unique. Everything was delicious and cooked to perfection.

For the next monthly dinner we will be celebrating Easter with a Greek Easter Celebration, featuring roasted lamb. Come and join us.

On another subject, I'm interested in updating a list of places where one can buy wild mushrooms. The original list was put together a couple of years ago by Debbie Viess. Perhaps now is a good time for an update. If you know of any place that has good fresh wild mushrooms in your area and it is not on Debbie's list, please e-mail me at alvaro.carvajal@att.net, or call me at (415) 695-0466. I'm really interested in updating the list with regards to markets in San Francisco and the Peninsula. Here is Debbie's list:

East Bay:

Andronico's: Almost always has some wild mushrooms on hand at reasonable prices. Make sure to check for freshness.

Berkeley Bowl: They have a good selection of wild mushrooms throughout much of the year.

Made to Order: They are located near the Monterey Market and sell white truffle oil for $16.55 for a 250 ml bottle and black truffle oil for $16.50 for a 100 ml bottle.

Monterey Market: They carry the largest variety of wild mushrooms that I have seen in the Bay Area. They are usually quite fresh. This is definitely the best place to purchase wild mushrooms. This is also the only source of dried candy cap mushrooms that I'm aware of.

Market Hall in Rockridge: The pasta shop carries white and black truffles in season. They also have a good selection of truffle oils.

Vino on College Avenue: They have the least expensive dried morels and porcini that I've come across.

Oakland Chinatown: We have bought big bags of porcini at Good Luck Market, at prices lower than Costco. There's also a store on the corner of 7th & Broadway that has a good selection of "upscale" mushrooms, but I don't know the name.

Marin:

I would suggest **Molly Stone's** and **Andronicos** for wild and exotic mushrooms. The **Farmers Market** at the Civic Center on Thursday and Sunday has a wonderful assortment of high quality wild and exotic mushrooms (if you get there early) sold by a Korean woman. There's another woman there who sells your more basic edibles like portobello.

Exotics are sold in most chain markets in Marin today and even some of the more widely acceptable wild mushrooms, such as chanterelles, can be found at these stores. As already pointed out, quality and freshness – even at Molly Stone's and Andronicos – is not always A+.

Don't forget the very limited – but also very cheap – selection of wild mushrooms at Costco. You can buy a half pound of dried porcini there for $20 if I recall correctly.

Cultivation Corner

By Ken Litchfield, © 2001

We have made some very productive progress in the garden and the lab over the last month. With the help of Enrique Sanchez and Debbie Collins we have transplanted many of the plants, logs, and cultures to be returned to the museum after the remodeling. We have also reworked a lot of the lab, like finally getting the very heavy ultraviolet sterile transfer unit up on a tabletop where it can be used, putting together shelving units for storage, mounting bookcases for storing spawn cultures, and generally getting the lab ready for the big workday we had on Sunday, March 10th.

The workday started out at the tail end of a passing rain front but, with dispersing clouds, it turned into one of those fine San Francisco summer days that you enjoy in March and April and September and October. We started from ten to noon working on the communal part of the community garden workday helping to excavate a recently exposed sunken brickwork garden patio. It had been buried for decades under debris and overgrowth in the historic garden next to the community gardens. It was almost like revealing ancient Roman mosaics. By the time we had finished with the communal part of the workday more members were showing up and we started in on the mushroom garden.

We mulched fresh bedding chips over the herb, vegetable, and fruit tree garden beds then spread Garden Giant mycelialed chips over them to inoculate them. We moved the pond to a sunnier spot and in the remaining pit we dumped a bunch of bags of Enrique's elm wood chips. Later we mixed in four jars of *Pholiota squarrosa* spawn, the garlic scented, orange shagged mushroom we cultured at the lab. Some plugged logs that were removed from another site to border the herb garden have just popped oysters. Lots of turkey tails are flowering all around the gardens.

The most work and effort was devoted to the giant pine log that the park gave us when they removed it from the Victorian garden restoration. Last fall Jerod Aldrich had chain sawed it into sections but hadn't been able to cut it all the way through due to crimping. We had just managed to roll the huge sucker over so it could be cut from the bottom with bow saws by hand when he showed up with his chain saw and he finished the job on the whole thing. We retained the basal nine feet of the two-foot thick trunk in one section and upended it into a three-foot hole. The garden soil is so deep and open it took only five to ten minutes to dig that hole. After a lot of levering and bouncing and grunting and groaning it was so surprisingly easy to drop it into place that I thought nobody would mind a suggestion to adjust its position to two feet over that-a-way. Not. We now have a nice wood chipped communal gathering and teaching area between the ornamental edible garden and the tree grotto centered with a six-foot pine log pillar primed for impudicus worship. We'll probably plug it with some of the *Gymnopilus spectabilis* spawn we have cultured in the lab. The original stump that is still in the garden we'll try to plug with cauliflower mushroom. Some of us stayed at the garden to help get the rest of the tree trunk and other logs in the garden area cut and moved to the communal area as benches and seats for sitting and plugging.

Everybody else headed over to the lab with Terri and Norm where they finished out more of the work of lab setup. The last of the big shelving units was assembled and stacked with computer and other equipment, lab tables and cabinets were put together and arranged and work areas organized and established. They started cleaning test tubes and bottles and other miscellaneous duties to get the lab ready for production work. Norm Andresen has custom welded a 55 gallon drum turboboiler for pasteurizing large quantities of straw, wood chips, and other substrate for mycelial ramping up, or some hella fierce stir fry. When he ignites the propane burner it looks like a fondue warmer on steroids but when he switches on the turbofan it looks like we're firing an anchored liftoff at the Jet Propulsion Lab. "Pyrito" brings a washtub of water to a roiling boil in two minutes flat. He has also rigged up a piping system to put several propane tanks in tandem. I hear tell a rumor that Al Carvajal may have a competitive engineering interest in Norm's latest pyrotechnic marvel.

I would like to sincerely thank Enrique Sanchez, Terri Beausejour, Norm Andresen, Glen Mounkes, Milo de Angelis, Meidor Hu, Chris Melville, Harlen Mallis, Herb Levine, Mahon McGrath, Carrie Craddock, Jerod Aldrich, and others for a wonderful, fun, and productive day at the Presidio.

We are not scheduling any formal cultivation events for April since most weekends are going to be devoted to what looks to be shaping up into a productive morelling season. However, if you haven't already signed up by email for some of our other activities, or haven't filled out an information questionnaire, or haven't otherwise shared your email address with me to get on the emailing list for announcements to upcoming cultivation events, please do so. This is the most direct way to announce to the most people about our planned or spur of the moment activities.

Members should also avail themselves of mssf@yahoogroups.com, the MSSF online discussion group. If you register there before summer then you can read or take part in up to the minute discussions about where to foray for what mushrooms, ask ID questions, get event announcements, and generally discuss all things fungal. I say summer because we have no Mycena News issues during June through August, which is supposedly mushroom slack time with no rainy season. However, don't forget that there are fog drippers and garden mushrooms and corn-fed huitlacoche and fungal action in other regions during our dry summers. And the e-group is the off-season communication channel where you can hear about what you need to know through the rhizomorph.

We'll shoot for summer to have a number of cultivation activities that you might not normally have time to participate in during the regular season. Most of them will probably be working with the aforementioned programs we are building with the Presidio. However, we have a continuing desire to establish local mushroom demonstration gardens with schools, botanical gardens, or other institutions in the Bay Area so members and their friends can participate in their local communities. You might wish to spearhead one of these endeavors with us for your local community.

Next month we'll discuss details about the SLUG mushroom cultivation seminar and the SF Garden Show. Also, we'll discuss how you can participate in the mushroom cultivation projects during the summer at the Presidio garden, lab, and field composting lot.

And lastly, we are seeking a number of propane tanks to feed Norm's "Pyrito", twenty pounds to 75 or 100 or more in size. These are often used by roofers or for recreational vehicles. If they are empty it's OK, we can fill them. If you can loan or donate any of these, please contact Norm or myself.

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Mycophile or Mycofodder?

By David Campbell

Relentlessly we mycophiles frequent forest and field foraying for macrofungi, the mushrooms, and a formidable pack of hunters and pickers we are. But then, back on the home front, many of us face a turning of the spore, so to speak, wherein we are the ones being "foraged" or otherwise bombarded by the lurking presence of highly adaptive filamentous microfungi – molds, that is.

Our inadvertent co-habitation with these upstart colonies of the fungi imperfecti has proven capable of significantly threatening our pursuit of health and well being, as evidenced by the recent proliferation of disastrous mold infestation stories making the news. Molds as food contaminants have long been studied and are rather well understood. The study of serious health concerns that have arisen from living with mold activity in our homes and worksites, however, is far from finalized.

Molds are not necessarily nefarious or insidious, in fact, many are productively employed by humankind. *Penicillium roqueforti* and *P. camemberti* are responsible for the culinary qualities of the cheeses bearing their names. *Rhizopus oligosporus* is key to the production of tempe from soy beans. *Fusarium graminearum* comprises the bulk of the British fabricated food product called "Quorn", originally conceived to save the world from famine. *Botrytis cinerea* is the noble rot that defines the great late harvest wines of Sauternes. *Lagenidium giganteum, Verticillium lecanii*, and *Phytopthera palmivora* are a few of the molds used in varying capacities for pest control. *Penicillium chrysogenum, Acremonium chrysogenum*, and *Tolypocladium niveum* are essential resources for modern medicines.

The medicinal or therapeutic value of molds is not always readily apparent. For instance, the rye mold, *Claviceps purpurea*, produces the toxic alkaloid ergotamine. In the Middle Ages, its constrictive effect on blood vessels caused massive epidemics amongst those eating contaminated bread, with victims losing life and limb to gangrenous infection. Nowadays, after a little research, the vasoconstrictive activity of ergotamine is therapeutically applied to migraine headaches, for control of the motor activity of the uterus, and in treatment of Parkinson's disease and senile dementia. *C. purpurea* also generates lysurgic acid, from which the renowned psychoactive agent LSD-25 evolved. That may account for some of the gnarly visions ergot victims purportedly reported.

Molds are ubiquitous, floating with airflows, hitching rides with passersby. Their detectable presence within living spaces is a given. Meaningful testing for environmental mold infestation compares genus- and, if possible, species-specific indoor spore volumes against a standard derived from concurrent outdoor concentrations.

Different people have varying degrees of vulnerability or sensitivity to mold conditions. As is the case with many diseases, persons most susceptible to adverse health effects from mold are infants and children, the elderly, immune compromised patients, pregnant women, and individuals with existing respiratory conditions, such as asthma.

Positively identifying specific molds within a home in relation to specific maladies of its occupants tends to be very difficult, for much of the data currently available is primarily circumstantial and/or anecdotal in nature. A major research snafu is that many molds perform differently in a petri dish than they do in their native substrate. The production of mycotoxins is frequently motivated only by competitive response to a complex population of other microbial flora in the naturally existing habitat. Also, mycotoxin, allergen, or microbial volatile organic compound (mVOC), production from various species tends to be intermittent or cyclic, influenced by various factors not completely understood. Therefore, a given mold species that has been blithely generating health hazards in one's basement may not happen to produce them in isolated culture down at the lab – or, for that matter, may not even manifest evidence in the basement at the time of testing.

There are four categories of health impact from molds. They may occur individually or in combination.

Allergy: A broad spectrum of potential indoor allergens besides mold may be present, such as pet dander, house dust mites, dried rodent urine, latex, or plant pollen. Allergic reactions to mold range from mild transitory symptoms to severe chronic conditions, and typically involve the skin and/or respiratory system. Many fungi can be allergenic, producing various antigenic proteins and polysaccharides capable of causing allergic reactions in sensitive individuals. Occupational allergies from molds are not uncommon among sawmill and wood pulp workers, farmers handling moldy hay, cheese factory workers, grain and tobacco leaf handlers, refuse collectors, and persons working around mold contaminated ventilation ducts and humidifiers. Closer to home, we all probably know someone who sneezes almost instantly upon entering a room infested with "mildew".

Infection: Human fungal infections, such as those caused by *Coccidioides, Histoplasma*, and *Blastomyces* are typically contracted through animal or wind-born exposure and are, therefore, relatively unlikely to cause diseases within buildings. Human infection from indoor molds occurs primarily only to immune-compromised populations. *Aspergillus fumigatus* is frequently implicated in such cases.

Membrane and sensory irritation: The mVOC's, which result from primary or secondary metabolic processes of the molds, are the primary cause of irritation. Aldehydes, alcohols, and acidic molecules produced can irritate the mucous membranes of the eyes and respiratory system. These microbial volatiles may sometimes affect our "common chemical sense" – the response to pungency primarily related to the trigeminal nerve – which can initiate involuntary avoidance reactions, such as breath holding, dizziness, attention deficit, and crawling or burning skin sensations. Also, the substrate on which mold grows can produce specific related toxic volatiles. For instance, one mold growing on wallpaper with arsenic-containing pigments produced the highly toxic gas, arsine.

Toxicity: Mycotoxicoses results from inhalation, ingestion, or other association with mycotoxins. Professional testing is required to determine the presence and severity of any aerosolised mycotoxin that may be present in a given habitable space. The conidia or spores, with which the mycotoxins are primarily associated, are cast off in blooms that vary with the molds' diurnal, seasonal and life cycles. Although many toxigens are produced by many different molds, occurrences of *Aspergillus, Penicillium, Stachybotrys*, *Fusarium*,

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Cladosporium or *Myrothecium* genera are of mentionable concern for potentially severe to lethal mycotoxicity conditions.

Aspergillus flavus produces aflatoxin B., known to be the most potent carcinogenic substance of biological origin. *A. ochraceus* produces kidney damaging ochratoxins. The same *Penicillium chrysogenum* used to produce penicillin antibiotic medication is a common household allergen. *P. citrinum, P.expansum, P. viridicatum, P. cyclopian, P. viridicatum*, and *P. expansum* produce a variety of powerful mycotoxins. The increasingly notorious *Stachybotrys chartarum* (atra) (aka "the black mold") has a high moisture and very low nitrogen growth requirement, and especially favors wet gypsum board, ceiling tiles, and cellulose insulation as a substrate. Its spores are rather sticky and not given to being aerosolised, so the slightest detectable amount in the environment is cause for great concern and immediate response. *S. chartarum* produces at least five dermotoxic and cytotoxic trichothecenes, potent inhibitors of DNA and RNA production and protein synthesis. Exposed groups tend to suffer immune suppression, lower respiratory problems, cognitive impairment, skin, eye, and constitutional symptoms, chronic fatigue, and allergy. *S. chartarum* is suspected of inducing acute pulmonary bleeding, sometimes lethal, in infants. *Myrothecium* species parallel *Stachybotrys* in severe health-threatening mycotoxin production. *Cladosporium* species, significant allergen culprits, also produce the immunosuppressive epicladosporic acid. Various *Fusarium* species produce neurotoxic, hepatoxic, nephrotoxic, and carcinogenic aerosols.

Whether the hyphae or spores of a mycotoxic mold are viable or dead often has no effect on toxicity, as most mycotoxins are chemically stable. Simply killing a noxious mold is not a sufficient remedy for the health threat it poses. You may have heard tales of people burning their house down with all belongings inside to rid themselves of their fungal curse.

An ounce of prevention is worth a gallon of cure. Uncontrolled moisture is always at the root of mold conditions within structures. Molds need three things to operate: water, food, water, proper temperature and water. Building lumber used in construction is usually "green" when installed, and typically impregnated with various macrofungi and microfungi just waiting for fresh moisture to activate their metabolic processes. Fungal organisms are capable of transporting moisture, once accessed, for amazing distances to develop their colonies. Flooding, subarea moisture intrusion, roof, wall or plumbing leaks, perpetual condensation on interior surfaces, untended drip pans for refrigerator, air conditioner or humidifier units, and poorly ventilated areas are all likely initiators of mold growth. Timely, routine property maintenance and proper repair and remediation of water-damaged or mold-infected areas are critical to preventing mold contamination.

As a healthy rule of thumb, if you can see or smell mold presence, you should take steps to eliminate the moisture source and to clean up and remove the mold. Hard surfaces such as glass, metal, or plastic are cleanable. Absorbent materials such as ceiling tiles, sheetrock, wood, carpets, clothing, and teddy bears should be discarded if mold contaminated. However, do-it-to-yourselfers, beware! Depending on the extent of mold presence detected, it may be advisable to retain a professional mold abatement company.

Some indoor air quality professionals have rated mold infestation into four categories, addressed as follows. Level one is for an affected area of less than ten square feet. It prescribes that clean-up personnel should be trained in proper mold abatement techniques, educated in the health hazards involved, wear hand, eye and respiratory protection, remove by-standers from the contaminated area, use dust suppression methods, bag all contaminated materials, and leave the area clean and dry. Level two is ten to thirty square feet of contaminated area. It adds sequestering of the room with plastic, and use of a HEPA vacuum. Level three is thirty to one hundred square feet. At this level of severity, one should consult with a mold expert prior to commencement of cleaning operations and use hazardous materials trained workers only. Level four is an infested area greater than one hundred square feet. At this level, a mold expert must perform the cleaning, full body protection must be worn, and complete isolation of the contaminated and adjacent areas by means of plastic, negative pressure and air locks must be installed. The air quality must be professionally monitored after completion of the cleaning for a prescribed amount of time before allowing re-occupation of the area.

For more information, direct inquiries concerning health and mold issues to the Center for Disease Control (CDC), or the Environmental Protection Agency (EPA).

Mushroom Fruiting:

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The best we can do is resort to "rules of thumb" that work (sort of) for a given mushroom in a given habitat. MY rule of thumb, which works reasonably well in Southern California, is the accumulation of at least 1 inch of rain in any 14 day period. To explain further, because we often don't get a 1 inch accumulation from a single storm, I have adopted the 14 day accumulation. I use this amount to determine both the initiation of the induction period AND as a rule to know when to go looking once the season has begun. If the total as measured at the Los Angeles Civic Center does not total one inch in any given 14 day period, then I continually reset the calendar until there is a 14 day period blessed with at least one inch of rain. If it is the first such period in a given season then I allow 15-20 days after the 1 inch threshold has been attained for mushrooms to develop before I start hunting. As most of us know, mushrooms begin to fruit with more regularity after the rainy season is underway, so I reduce the wait to 7-10 days following subsequent accumulations of one inch or more.

Next Month: Setting the clock and more lessons from the historical record.

Correction

The Mycena News regrettably did not give full credit to Steve Bowen as the co-author, with Larry Stickney, of their fine article "What happened to the Chanterelles this year" which appeared in the March Mycena News. Our sincerest apologies!

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The Mycological Society of San Francisco

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MSSF Calendar, April 2002

Tuesday, April 2, Culinary Group's Monthly Dinner: At the Slavonic Cultural Center, located at 60 Onondaga Avenue in San Francisco. For reservations, please contact Zoe Caldwell at (510) 569-1554 or e-mail Karin Roos at karo@sprintmail.com

Tuesday, April 16, MSSF General Meeting: DIFFERENT LOCATION! The general meeting will be held in the James Moore Theater at the Oakland Museum. Paul Stamets will be the speaker, and his topic will be "Recent Advances in Medicinal Mushrooms". Directions to the museum can be found at: http://www.museumca.org/visit/map.html. The museum is easily accessible by BART. Please use the 10th Street entrance to the museum. Doors open at 7, lecture starts at 8 pm

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Saturday-Sunday, April 20-21, Calaveras Morel Foray: Car Camping at Calaveras Big Trees State Park for forays to last year's burn areas. Make your own camping reservation with the Park. No need to make foray reservations. Just meet leaders at 9:00 am at location in note to be posted on camp bulletin board at park entrance. For all other information, call David and Jeanne Campbell (415-457-7662) and Norm Andresen and Terri Beausejour (510-278-8998)

Saturday-Sunday, April 27-28, Evergreen Morel Foray: Foray to areas around Evergreen Road and Highway 120. This area has always been a surprise. Call Mark Lockaby (510-412-9964) and Tina and Thomas Keller (408-879-0939) for information on camping spot and meeting time.

Friday-Sunday, May 3-5, San Jose Camp Foray: Experience our Annual San Jose Camp Foray starting with two nights in tent cabins with electric lights and meals served from Friday night to Sunday lunch. Cost for MSSF members is $90 and for nonmembers, $100. To reserve a space, register early. Make your check out to MSSF and send to Foray Coordinator: Tom Sasaki, 1506 Lyon Street, San Francisco, CA 94115 (Telephone: 415-776-0791). Further information will be sent to you after you register.

Tuesday, May 14, MSSF General Meeting: The May general meeting will be held on the second Tuesday of May, instead of the traditional third Tuesday. Our speaker will be Elio Schaechter, author of "In the Company of Mushrooms." The meeting will be held at the Randall Museum, doors open at 7, lecture starts at 8 pm.

Date Change

Wednesday and Thursday, May 22-23, Chinook Restaurant: David Campbell reports that Chef/owner Sunita Dutt will once again mastermind a mushroom menu just for us mycophagists, this one a morel indulgence. Call restaurant for details and reservations. Chinook Restaurant, 1130 4th St., San Rafael (415) 457-0566

Thursday, May 28, Ross Valley Brewing Company: David Campbell also reports that "the Chef Sven Ravel mans the pans, whipping out his version of morel heaven". Call restaurant for details and reservations Ross Valley Brewing Company, 765 Center Boulevard Fairfax (415) 485-1005