Mushrooms as Medicines?

Peter Werner

Mushrooms have long been used in traditional medicines in many parts of the world and are particularly well-represented in pharmacopeias of Asian traditional medicines. Until recently, the importance of mushrooms and their extracts were dismissed out of hand by medical researchers, who saw few medicinal compounds of interest in basidiomycetes and no empirical basis for the claimed efficacy of mushrooms used in traditional herbal medicine. This began to change some 30 years ago as Japanese researchers began to examine the the use of mushroom extracts, especially those of polypores, in the treatment of cancer.

Research has focused on a group of fungal cell wall polysaccharides known as $\beta$-$(1-3)/(1-6)$-glucans. Well known examples include lentinin from *Lentinula edodes* (shiitake) and grifolan from *Grifola frondosa* (maitake), but compounds of this type are found almost universally among fungi. While it was previously believed that long-chain polysaccharides like this would be physiologically inert because the digestive system would simply break them down into simple sugars, recent studies have found that these compounds are highly active, even (in fact, especially) those in which the component molecules are quite large.

Many of these compounds have been found to be strongly immunopotentiating, that is, they stimulate the production and activity of immune cells such as T-cells, macrophages, natural killer cells, and the like. The reasons for this are unclear, but several types of $\beta$-glucan receptors are found in immune-type cells. It is thought that these receptors aid the immune system in recognizing invasion by something that is ‘not self’, and hence help marshal an immune response. Stimulation of $\beta$-glucan receptors may be particularly useful in the treatment of cancer, as cancer cells are simply mutations of the body’s normal cells and aren’t always recognized as ‘not self’ by the immune system.

So much for theory – how do these mushroom extracts work in practice? Immunopotentiating $\beta$-glucans have shown significant anti-tumor activity in vitro and some mushroom extracts have been demonstrated to significantly lower the rate of mutagen-induced cancer in mice when compared to an untreated control. However, as with many such promising anticancer compounds, success in actual clinical trials was limited. The use of lentinin or crude extracts of shiitake in combination with more traditional chemotherapy has been extensively studied in Japan. Several studies demonstrated increased length of survival in patients with certain types of cancer (though these studies were not always well-controlled), however, with many other types of cancer it was completely ineffective.
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.)

Fungus Fair Speakers

Continued from page 1

3:30
Debbie Viess
*Edible and Poisonous Mushrooms of the Bay Area*

Sunday, December 5th
James Moore Theatre

12:30
Tom Bruns
*Ectomycorrhizal Fungi: The Hidden Side of Forest Ecology*

2:00
Gary Lincoff
*Mondo Fungi*

3:30
Taylor Lockwood
*Fantastic Fungi of the World*

Sunday, December 5th
Lecture Hall

12:30
Mo-Mei Chen
*Edible and Medicinal Mushrooms in China*

2:00
Debbie Viess
*Edible and Poisonous Mushrooms of the Bay Area*

3:30
Earth and Fire
*An Introduction to Psychoactive Mushrooms*

Society Officers

President: Mark Lockaby (510) 412-9964
Vice Pres: David Campbell (415) 457-7662
Secretary: Mark Thomsen (510) 540-1288
Treasurer: Shawn Johnson (925) 377-7727

Select Committees

Forays: Tom Sasaki (415) 776-0791
Book Sales: Norm Andresen (510) 278-8998

To Celebrate the Holiday Season the Mycological Society of San Francisco invites you to the Annual Holiday Dinner

Cost: $30/member; $35/non-members
Location: December 13, 2004, 7 p.m., Snow Building, Oakland Zoo

**Reservations are required.** Please mail check, payable to MSSF, together with the names of those in your party to: Shawn Johnson / Holiday Dinner, 74 Sanders Ranch Road, Moraga, CA 94556

Dinner produced by the Culinary Group of the MSSF.
The Foragers’ Report
December 2004

Patrick Hamilton

Old wives’ tales, and those of young husbands/partners too, should once and for all be on their way out—at least for me. I’m not again going to believe that love is forever nor, and more importantly, will boletes fruit 10 days after the first ½ inch of rain. “The check is in the mail,” I finally am letting go of. Along with “I love you” et al.

So, what did happen after that deluge of late October? Anybody find any boletes a week and a half later? (For those not paying attention the answer is “no.”)

And what is up with Oakland having porcini before the coast?

All of this falls into the ever getting bigger category called, “Stuff we thought that we knew about fungi, but did not, again.”

Ah, mushroom knowledge. In science classes in the 1950’s and 60’s “mycology” was taught as thoroughly as how cell phones work. We did not learn much and still don’t, I am thinking. Or maybe we are, but don’t know it.

Year after year folks make notes on the fruitings of the where and whats. Some write the date/place on containers holding dried bounty and look to see if this year the same place produced the same on past similar dates. It seems to depend on things largely unknown—like soil temperature and moisture, full moon or not, astrological signs of particular pickers.

The admonition for this upcoming spring is don’t depend on “when the black oak leaves are the size of mouse ears the morels will be fruiting.” Used to believe it, not now.

But this season upon us is grand—no matter what the reason. From early November we have been blessed, again, with forests full of fungi, magically brightening our souls and allowing us our seasonal raison d’etre.

Chanterelles (C. cibarius) were almost flying out of the ground from northwest Washington State to southern Oregon for the past several months and still continue to fruit in huge amounts around Coos Bay and points south. Our local chanterelle (C. formosus) has begun to appear in West Marin, the East Bay, Salt Point State Park (SPSP) and other spots too. Check under live oaks (and, it seems, wherever poison grows).

Thinking of SPSP—even in the middle of any of the past few weeks most of the pull-outs along Highway 1 were full of pickers’ vehicles. D’ya think that each of the folks were mindful of the 5 pound limit? Doesn’t take many porcini to do that. Anybody hear of any citations written or anyone stopped and questioned?

Oh boy, I just (Thursday a.m., the 18th of November) read the Internet postings by Anna Moore and Ellisa Rubin-Mahon about the very thing mentioned in the paragraph above. For those readers who do not subscribe to our discussion group at Yahoo learn this here—don’t get caught in Salt Point State Park with mushrooms in your vehicle, no matter where picked, if they weigh more than 5 pounds per person. Conks, dyeing fungi, mushrooms for a fungus fair specimen tables—they all are “limited.”


A couple of members were able to check out a fruiting pattern of boletes on a hillside in Mendocino county recently. On one Friday morning they picked a small, flat, area on a hillside clean, even checking for unpopped buttons. Returning to the exact spot on Sunday they found large edulis sticking out of the grass with the sponge already yellowing—just two days later. The area was exposed to the west and south so all that sunshine could have affected the speed at which the fungus fruited, and surely accelerated how they began to already age.

Matsutakes will soon be showing in Mendocino county and black chanterelles can come up along the north coast as early as Thanksgiving. What a mushroom paradise we live in. Pt. Reyes candy caps will show in mid to late December and blewits will be right behind them.

Okay, it’s not all perfect for us; where was the Sierra fall bolete season? Right about when we usually expected them we got that deep snow at 6,000 feet and no one I know ever saw any edulis up there this year. Guess we’ll just have to focus on our more local locales and pick ‘til we can’t pick no more.

Chef buddy (and Fungus Fair demo guy with your reporter last year) Todd Humphries made a special mushroom tasting menu for his Martini House restaurant in St. Helena. I wanted to post the dish descriptions for you to use your “minds’ mouths” to savor. . . .
A recent literature review by Andrea Borchers and others from UC Davis School of Medicine suggests several ways in which research on mushroom extracts might be improved. Different compounds have been studied in many different tumor types, making comparison of their efficacy difficult. It would be more useful if these compounds were all tested on a few tumor types and if the more effective compounds were then screened against a wide range of tumor types.

Also, it needs to be more clear what is actually being administered. In many studies and reviews, crude mushroom extracts and purified compounds were treated as equivalent, though this may not be the case. Mushrooms contain a host of compounds that act on the immune system in different ways. The synergistic or inhibitory action of these compounds in combination is a real possibility. Crude extracts and purified compounds should both be tested against the same tumor models to establish which is more effective. Additionally, in vitro studies of *Agaricus brasiliensis* have shown that mushroom strain type, fruiting body age, and extraction from fruiting bodies vs extraction from mycelium significantly affected the immune-regulating effect of these extracts.

What about regular consumption of certain mushrooms or mushroom extracts as a dietary supplement to prevent cancer? A number of mushrooms are increasingly being used as “nutriceuticals”, notably *Lentinula edodes*, *Ganoderma lucidum* and *G. orontense*, and *Agaricus brasiliensis* (sold as *Agaricus blazei*, though the latter name properly refers to a species found in the eastern US and not the cultivated species that originated in Brazil). There are some intriguing studies hinting that there might be something to this, notably a study demonstrating that a group of enoki farmers showed significantly lower cancer rates than the general population of the same area, and a study from Korea (an area with a high rate of gastric cancer) showing an inverse correlation between gastric cancer rate and mushroom consumption. However, these studies did not control for factors such as sex, socioeconomic status, family history, etc and were too general to demonstrate a cause-and-effect relationship.

There are, of course, many other useful compounds that one can get from mushrooms. Mushrooms live in a constant battle with bacteria and other fungi and have developed a host of antibiotics to defend themselves from attack from other organisms. Modern antibiotic treatment was first ushered in with the discovery of penicillin from the imperfect fungus *Penicillium*. However, basidiomycetes represent a great untapped reservoir of such compounds – when a group of researchers screened extracts of 204 species of basidiomycetes collected in Spain, 109 were found to have antimicrobial activity. Considering that many strains of pathogenic bacteria are becoming increasingly resistant to our present arsenal of antibiotics, the importance of developing novel antibiotics is clear.

After a hiatus of several decades, research into the therapeutic effects of hallucinogenic compounds is once again active. This includes research into uses of psilocybin, a promising use of which is the treatment of obsessive-compulsive disorder (OCD). There have been a number of anecdotal reports of individuals with severe OCD (such as handwashing 200+ times per day) being relieved of obsessive thoughts during the psilocybin experience. More importantly, this effect has been lasting, with reports of individuals going for two years after the experience without OCD symptoms before relapsing. Controlled study of OCD treatment with psilocybin is now being carried out at University of Arizona. Another active study of the therapeutic use of psilocybin includes a study at UCLA investigating whether psilocybin can provide relief of death anxiety in terminal cancer patients. There is also quite a bit of anecdotal information that psilocybin use has a therapeutic effect for chronic sufferers of cluster headaches (an extremely severe recurring type of headache said to be more painful than migraine headaches). Psilocybin is said to break the cycle of headache recurrence, with effects lasting anywhere from two weeks to a year. At present, however, there is no active study looking at this effect.

Understanding of the medicinal properties of mushrooms is another area where amateur mycologists can make some contribution. Is the cancer rate among people who regularly consume wild mushrooms higher or lower than the rest of the population? Such an epidemiological study would be well worth carrying out. Do we observe that certain mushrooms are consistently avoided by certain other organisms or are slower to decay than others? There may be more to that than meets the eye.

Further reading:


Fungus Fair Forays: Friday, December 3

S.F. Watershed Collecting Foray. 10 am. Reservation required. Limited to 35 persons. Meet at the Pulgas Temple, on Cañada Road one mile north of Edgewood Drive, which ramps from Route 280. Please bring waxed paper bags and a basket or other device for sampling specimens. Rain or shine, be prepared with durable shoes or boots. Call Bill Freedman early at 650-344-7774 or loufreed@aol.com.

Huddart County Park (Woodside) Collecting Foray. 10 am. Meet Leader Wade Leschyn at Ranger entrance kiosk. Limited to 25 persons by reservation. Rain or shine. Wear durable shoes. Please bring waxed paper bags and basket. Call 650-591-6616 or wade@belmateo.net.

Roy’s Redwoods and Point Reyes Foray. 9 am. Meet leader Peter Werner at Roy’s Redwoods, in San Geronimo Valley, on Nicasio Valley Rd, just beyond the intersection with Sir Francis Drake Blvd. Pack a lunch and something to drink, the biggest basket you have (we’ll be collecting a lot of species), waxpaper and wax bags, and some extra boxes Call 415-289-0168 or e-mail pgwerner@sfsu.edu.

Memorial County Park Collecting Foray. 10 am. Meet Leader Fred Stevens at Ranger’s Station. Limited to 25 persons by reservation. Rain or shine. Wear durable shoes. Please bring waxed paper bags and basket. Call 650-994-1374 or fstev@sonic.net.

Santa Cruz Foray. 9 am. Meet leaders Thomas and Tina Keller at the campus. From 17, Highway 1 north towards Half Moon Bay. Turn right on Bay Street. 1 mile then left on High Street. Continue 3.8 miles and look for the silver VW Passat Wagon. Call 409-879-0939 or e-mail tinakeller@covad.net.

Joaquin Miller Park. 10 am. Leader: Robert Mackler. Call 510-799-6756 or e-mail rdmackler@aol.com.


Other Forays:

Saturday, December 18: Yuba Watershed Institute’s Foray. 15 miles north of Nevada City 10 am. Dr. Else Vellinga will be having a slide show the evening of Dec. 17. Contact Daniel at (530)288-3304 or danmadrone@yahoo.com.

Saturday, January 8: Mills Canyon Foray. Fred Stevens will lead his popular fact-filled study foray down into Mills Canyon, Burlingame. 10:00 am. By reservation only, limited to 25 guests. For reservations and directions, call Bill Freedman at 650-344-7774 or loufreed@aol.com

Sunday, January 23: San Francisco Watershed Foray. Park at the western end of Edgewood road which ramps off Route 280 just past Hillsborough. 10:00 am. By reservation only, limited to 25 guests. For reservations, call Bill Freedman at 650-344-7774 or loufreed@aol.com

MSSF Scholarship

The Mycological Society of San Francisco offers scholarships to full time graduate students majoring in mycology attending colleges and universities in northern California. These scholarships vary in amount from $500 to $1,500 and are given in the name of Esther Colton Whited and Dr. Harry Thiers. All research proposals are welcomed, but special consideration will be given to taxonomic studies of the higher fungi of the Pacific States.

Requirements include two letters of recommendation, one from a professional mycologist, a brief statement describing the research project, and agreement to present the results at a general meeting of the MSSF. Send inquiries/materials to Robert Mackler, 157 Mesa Ct., Hercules CA, 94547. Deadline for applications is December 10, 2004.

MycoDigest

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Wasser SP. 2002. Medicinal mushrooms as a source of antitumor and immunomodulating polysaccharides. Applied Microbiology and Biotechnology 60:258-274.
Calling All California Mushroomers!

ACCF Update: Don't miss this banner year for California mushrooms! There will be specimens galore for all of you science types, and then there will surely be plenty of our favorite winter edibles for those stocking their larders. We have obtained special foray access to normally restricted areas of Jackson State Forest, and have a dynamic speaker for Saturday night, Dr. Terry Henkel from Humboldt State University, who will be speaking to us on "Mycology and Ethnomycology of the New World Tropics".

The first annual All California Club Foray (ACCF) will take place the weekend of February 4-6, 2005, at the Albion Field Station in Mendocino County. This will be a great opportunity to get to know your fellow mushroomers from all over our great state.

No matter what your interests or abilities, this foray will have something for you. There will be guided field trips to prime, local mushroom habitats, NAMA educational videos, mushroom ID and fabulous food, catered by the inimitable Debbie Dawson.

Lodging is in comfortable, heated cabins, with full bathroom/shower facilities close-by. Cost is only $100/person, and includes lodging, activities and all meals from Friday dinner thru Sunday lunch. This year's event is being hosted by the MSSF. To reserve your space, send a check, made out to Debbie Viess, to: Debbie Viess, 328 Marlow Dr. Oakland, CA 94605. Please include your e-mail address and mention ACCF. For more information, contact Debbie at amanitarita@yahoo.com or David Rust at incredulis@yahoo.com, or you can reach both by phone at 510.430.9353. All enrollment restrictions by Club have been lifted, so it's first come, first served. See you there!

Autumn Tasting of Mushrooms

Sautéed Cauliflower Mushroom “*Sparassis Crispa*”
Mushroom Tea and Truffle Oil

Warm Salad of Butter Poached Chanterelles “*Cantharellus Cibarius*”
Artichokes and Hollandaise Sauce

Steamed Matsutake “*Armillaria Ponderosa*”
Fried Leeks, Mirin, Sake, and Ginger

Roasted Porcini “*Boletus Edulis*”
Shaved Parmesan, Fried Parsley and Porcini Vinaigrette

Crème Brûlé infused with Candy Caps “*Lactarius Fragilis*”
Chocolate Rocher

That's all for now, folks.

Calendar

Friday-Sunday, December 31-January 2: The Wild About Mushrooms Company “Risqué Foray”
Frogwood Retreat Center near Booneville in Mendocino County. Mushroom hunting, dining, New Year's revelry. Food and lodging provided. Contact Charmoon Richardson (707-887-1888 or charmoon@sonic.net) for details and/or reservations.

Monday, January 10, 2005: Culinary Group's Monthly Dinner:
Meeting and dinner at the Library of the Hall of Flowers in Golden Gate Park in San Francisco. For reservations or information, please contact Phil Brown at (510) 526-4325 or at towltek2000@msn.com Future culinary group dinners (all Mondays): February 7, March 7, April 4, May 2, June 6, 2005.

Saturday, January 15-Monday, January 17, 2005: SOMA Camp
Featured speaker Dr. Tom Volk, with special guests Gary Lincoff, Paul Stamets and Jim Trappe. For more information visit www.somamushrooms.org or call 707-887-1888.

Friday-Sunday, Feb.4-6, 2005. All California Club Foray, at Albion Field Station in Mendocino Co. See inside for details.
You Can Now Renew Your Membership by Credit Card

If you have not renewed your membership for 2005 (or beyond), you can now do so by credit card. MSSF accepts MasterCard, Visa, Discovery and American Express cards. You can also still renew by the older methods of sending a check made out to “MSSF Membership,” to MSSF Membership, c/o The Randall Museum, 199 Museum Way, San Francisco, CA 94114 or bringing it with you to the Oakland Fungus Fair on the weekend of December 4-5, to turn in at the Membership Table.

Multiple year membership rates approved by MSSF Council for renewals beginning Jan. 1, 2005:

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Membership rates are:

**Regular** members receive the yearly Roster of members and the Mycena News by mail.

**Senior** members must be over 65 and enjoy all the privileges of regular membership.

**Student** membership is for full-time students who receive both the membership Roster and the Mycena News by mail.

**Electronic** members must download the yearly Roster of members and the Mycena News for themselves from the MSSF website.

Members in all categories are eligible to sign up for inclusion in the information sharing Yahoo group. Consult the MSSF website www.mssf.org for information.

Many of you have already renewed for 2005 (and beyond), so be sure to check the mailing label on your Mycena News to find out if your membership expires in December of 2004.

E-Members and Yahoo Group Participants

Remember: If you have not renewed your membership for 2005 and/or your current email address is not in the MSSF membership database, you will lose access to MSSF services on February 1, 2005. If you are in doubt about your status, email the membership chair, Polly Shaw, at polly@ef.org for information.
MSSF Calendar, December, 2004

Saturday and Sunday, December 4 & 5: Fungus Fair: Oakland Museum 10-5 Saturday, Noon-5 Sunday. Speakers, cooking and dyeing demos, mushroom oriented vendors, kid art projects, mushroom soup sales, and fungal displays galore. For more information or to be part of the planning committee contact Ken Litchfield at klitchfield@randallmuseum.org, 415-863-7618 or Dan Long at danlong@astound.net, 925-945-6477.

Saturday, December 12: Mushrooms in Your Garden. Grow mushrooms organically in your garden as easily as you grow plants! This is a hands-on class, so wear clothes that can get dirty and bring a snack and water. Presidio Community Garden, 1 to 4 p.m. $15 per person; pre-registration required, call 415-561-7752. Co-sponsored by the Mycological Society of San Francisco.

Monday, December 13: MSSF Annual Holiday Dinner: 7:00 PM. at the Snow Building at the Oakland Zoo, located at 9777 Golf Links Road, Oakland. For information, please contact Alvaro at (415) 695-0466 or at alvaro.carvajal@sbcglobal.net. For reservations, please mail a check, payable to the MSSF, for $30 per person to Shawn Johnson, 74 Sanders Ranch Road, Moraga, CA 94556.

Saturday, December 18 and Saturday, January 15: Muir Woods Foray. MSSF member Robert Mackler will offer a beginners’ class and foray. The session will begin at 10am with a slide show/lecture “Mushrooms 101” and then walk the trails of Muir Woods until 2pm. This program is for adults only. Reservations must be made by contacting Muir Woods at 415-388-2596. The program is free but there is an admission fee to the park.

Note: Deadline for the January 2005 issue of Mycena News is December 18. Please send your articles, calendar items and other information to: mycenanews@mssf.org

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