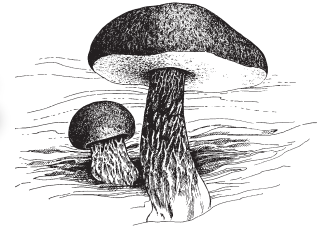


Mycena News



The Mycological Society of San Francisco March 2010, vol. 61:03

March 16th MSSF
Meeting Speaker



Nicole Hynson
*Mycorrhizal Fungi:
Form and Function*

The mycorrhizal symbiosis between plants and fungi is one of the most ubiquitous and widespread examples of cooperation between unrelated organisms and fungi. This talk will give an overview of the common types of mycorrhizal fungi and their role in ecosystem function.

Nicole is a graduate student in Mycology at UC Berkeley under the advisement of Professor Tom Bruns. She first became interested in fungi as an undergraduate student at the Evergreen State College under the mentorship of Professor Michael Beug. While living in Washington she was involved with both the Pacific Northwest Key Council and Puget Sound Mycological Society. Since beginning her work on her Ph.D., she remains involved with education and outreach by teaching mycology and mushroom identification to undergraduates at UC Berkeley and volunteering for San Francisco Mycological Society's annual Fungus Fair.

MycoDigest: Deconstructing the Decomposing

Jennifer Kerekes

Saprotrophic, or decomposing, fungi play very important ecological roles in decomposition and nutrient recycling. Saprotrophic fungi are responsible for recycling the majority of carbon from dead organic matter and have the unique ability to break down and release nutrients that are then readily available for other organisms. The process of decomposition has been viewed by some as being just as important as the process of photosynthesis (Heal et al., 1997).

There are two main types of fungal wood rot: brown and white rot. What is the difference? The "rot" types are characterized by the morphological appearance of the wood they leave behind rather than the role they play in decomposition. White-rot fungi specialize in lignin degradation that leaves behind cellulose and a distinctive white color in wood. This ability to degrade lignin among microbes is unique. White-rot fungi are typically found on hardwoods and softwoods.

Examples of white wood-rot fungi are found in the Euagarics, Polyporoid, and Hymenochaetoid clades. Common genera that often encountered in the woods containing white-rot fungi are *Pleurotus*, *Phanerochaete*, *Ganoderma*, *Phlebia*, and *Phellinus*.

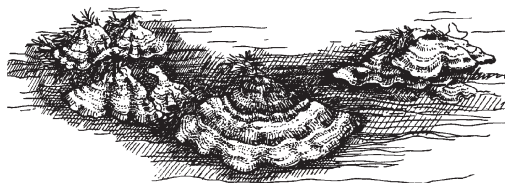


White-rot fungus *Pleurotus ostreatus*. Photo by Fred Stevens, courtesy of <http://www.mykoweb.com>.

Brown-rot fungi specialize in cellulose degradation, which leaves behind a lignin-rich substrate; the decayed wood has a brown color and often looks cracked

into cubical pieces. They are typically found on softwoods such as conifers. Brown-rot fungi are found in the Euagarics, Boletales, and Polyporoid clades. Common genera containing brown-rot fungi are *Paxillus*, *Laetiporus*, *Phaeolus*, and *Fomitopsis*. A unique type of brown rot called "coniothoraceae-rot" is found among saprotrophic Boletales and primarily decays conifer wood (Binder and Hibbett, 2006). Through ancestral-state reconstruction, Binder and Hibbett hypothesized that the ancestor of the Boletales was a resupinate or polyporoid saprotrophic brown-rot fungus. Interestingly, brown- and white-rot fungi, like mycorrhizal fungi, are not monophyletic; or, in other words, they are not each other's closest relatives.

Fungi are able to decompose lignin and cellulose by releasing extracellular enzymes that degrade these polymers. White-rot fungi in particular produce

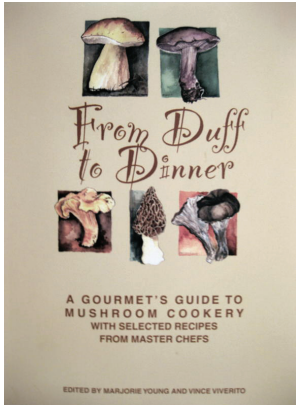


Polyporus (Trametes) versicolor

Continued on page 3

MycoDigest is dedicated to the scientific review of mycological information.

What's Bookin'?



From Duff to Dinner is a gourmet's guide to mushroom cookery. This book is about cooking with mushrooms, both domestic and wild. Many of the recipes in this book are quite unusual and should provide some exceptional gourmet experiences. This book is not intended to be used for identifying mushrooms. It is a collection of recipes donated by the members of the Fungus Federation of Santa Cruz and numerous notable chefs. When you see a small chef's hat perched above the title of a recipe in this book it indicates that the recipe was provided by one of the following chefs:

Joseph M. Cirone · Jozseph Schultz · Carolyn Allen
Tony Baker · Clyde G. Griesbach, III · Ellen Mooser
Michelle Dey · Julio J Ramirez · Maria Perucca-Ramirez

This versatile cookbook contains sections on:

Appetizers · Soups and Salads · Main Courses · Side Dishes · Baked Goods · Deserts

From Duff to Dinner, ISBN 1-890880-02-7 by Marjorie R. Young and Vince Viverito, 1998, Seasonal Feasts, Los Gatos, CA. Soft back, 119 pages, 5 X 9 inches, Price: \$9.95

This book will be available for sale and for check-out from the MSSF library. ~ Curt Haney

CULINARY CORNER

The Culinary Group's February dinner, "A Warm Winter Menu for a Cold Month" was enjoyed by an enthusiastic group of fungiphile friends and newcomers. Our menu featured many artisan appetizers, most made of wild mushrooms, as well as winter vegetables prepared by MSSF volunteers who cook very well. Our centerpiece for the dinner was pork butt roast with black chanterelles and apricots. We also enjoyed a rich banana cake and coffee. Our March menu will feature lamb cooked tagine style as well as salad, vegetables, couscous and an elegant Greek dessert called galactobourico (I hope I spelled that right!).

Chanterelles are still showing up for us. Wet, but definitely delicious. I found a soggy group and, on the suggestion from Mary Hazelwood on the MSSF Yahoo groups, dried them in my washing machine's spin cycle. First, I cleaned them then put them, jelly roll style, in a towel, pinned the ends and put them in a mesh laundry bag, zipped it up and put them in for the spin cycle. After the 8 minute cycle I removed the bag and, voila, dry mushrooms.

George Collier, an inspired cook, created our February entree and gave his permission to print it here. Like all of our Culinary Group cooks, George volunteered his time, energy and talent for our pleasure. We so appreciate his contributions and those of our other fine cooks.

Pork Butt roasts for MSSF Culinary Group – for 50

25 lb boneless pork butt (from Taylor Sausage) = 7 rolled roasts

5 lb bacon

1 gallon orange juice – and one empty gallon jug

1 large bag of black chanterelles (previously dry sautéed)

Apricots, dried, 2 28oz bags from Smart and Final, put into gallon jug with orange juice

Pepper, ground rosemary

Chez Panisse brine, double recipe, brined over ice slabs in cooler

Brine the pork, rolled and tied, for 1 day in Chez Panisse recipe brine. Towel-dry, untie and retie the roasts lined with bacon under the string. Sprinkled with pepper and ground rosemary.

Roast slowly: start for 20 minutes at 450°, then reduce to 300°, turn after 45 minutes and continue at 300° for one hour or until an internal temperature of 150°. Allow to sit in the warm oven for a couple of hours, turning it on at 200° for brief periods to keep it warm.

Soak the apricots for 24 hours in orange juice, and put them and the blacks in right around the roasts at the initial 450° stage. I found that the blacks and apricots were getting too blasted, so I removed them from the pans and just kept them aside until the very end of the cooking, when I added them back into a single pan of their own.

FYI, I began with 25 lbs of pork and 3 packages of bacon, anticipating a head count of 60. Well, we were fewer, but the meat surely disappeared! It didn't hurt to have a ton of blacks.

Keep enjoying our magic year of finding good edibles - Pat



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Past issues of *Mycena News* can be read on-line at www.mssf.org.

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MycoDigest continued

several types of enzymes, including lignin peroxidases, manganese peroxidases, and laccases. These enzymes allow the fungus to break down and utilize the organic substrates as an energy and nutrient source (Osono, 2007). Lignin is a large, complex, aromatic polymer made up of phenylpropane-based monomers linked via a variety of bonds which bind cell-wall components together (Osono, 2007). Lignin provides strength and support to plant cells and bonds cellulose fibers. Lignin can make up 20-35% of wood, while cellulose can make up 40-50% and hemicellulose can make up 25-40% (Pointing et al., 2003).



Top: white rot on aspen; bottom: brown rot on pine.
Photos courtesy of Prof. Tom Volk.

A third type of wood rot is soft rot. Soft-rot fungi are typically ascomycetes and degrade cellulose and hemicellulose. Wood inflicted with soft-rot fungi often appears soft in consistency in wet environments and brown and crumbly in dry environments. Soft-rot fungi are typically found on hardwoods and are often most active in moist environments. Some ascomycetes, primarily xylariaceous fungi (Pointing et al., 2003), are capable of degrading lignin, although they are less capable than the white-rot fungi; this was recently explored in a study by Shary and colleagues (2007).

In comparison to wood-decay fungi, there has been less of a focus on litter decomposers, which are also capable of producing extracellular enzymes such as laccases and manganese

peroxidases. However, litter decomposers vary in their ability to decompose lignin in leaf litter. Basidiomycete genera such as *Clitocybe*, *Collybia*, *Marasmius* and *Mycena* have been studied for their bleaching activity and enzyme production (Osono, 2007). Bleaching of leaf surfaces and humus indicates ligninolytic activity of fungi, as lignin content has been found to be lower in both bleached leaf surfaces and humus compared with unbleached surfaces.

Recent and current research is looking at the diversity and evolution of laccase and peroxidase-encoding genes across a diversity of species and habitats. As you know, fungi play an important role in wood and leaf litter decomposition. Hopefully you will continue to appreciate the ecological roles of these saprotrophic fungi, including those pesky LBMs and persistent inedible polypores present along your next walk through the woods!

Further reading:

Prof. Tom Volk's website:

http://botit.botany.wisc.edu/toms_fungi

Prof. David Hibbet's website:

<http://www.clarku.edu/faculty/dhibbett/index.html>

Ecology of Saprotrophic Basidiomycetes, edited by L. Boddy, J. Frankland, and P. Van West, Academic Press, Amsterdam (2008).

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Heal, O.W., Anderson, J.M., Swift, M.J., 1997. Plant litter quality and decomposition: an historical overview. In: Cadisch, G., Giller, K.E. (eds.), *Driven by Nature*, CAB International, Wallingford, UK.

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Pointing, S.B., Parungao, M. M., Hyde, K.D. 2003. Production of wood-decay enzymes, mass loss and lignin solubilization in wood by tropical Xylariaceae. *Mycological Research*. 107 (2): 231-235.

Shary, S., Ralph, S.A. and Hammel, K.E., 2007. New Insights into the Ligninolytic Capability of a Wood Decay Ascomycete. *Applied and Environmental Microbiology*. Oct. 2007: 6691-6694.



Jennifer Kerekes is a Ph.D. candidate studying the ecology and diversity of saprotrophic fungal communities with Prof. Tom Bruns at the University of California, Berkeley.

For more information on her research, and her publications, see:

<http://plantbio.berkeley.edu/~bruns/people/jk2>

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MSSF Calendar March 2010

Monday, March 1st, 7 pm - Culinary Group Dinner

SF County Fair Building (aka. Hall of Flowers), Golden Gate Park, 9th and Lincoln. Our dinner this month will feature lamb. Reservations are required and must be made no later than Friday, February 26th.

The dinners are open to MSSF members and their guests. Contact Pat George at (510) 204-9130 or plgeorge33@yahoo.com to make your reservation. We limit the the number of diners to 60. Please remember to bring your own tableware and beverage and an appetizer to share. Our next dinner will be Monday, April 12th, as the first Monday of April is the day after Easter.

Tuesday, March 16th, 7 pm - MSSF General Meeting

Randall Museum, 199 Museum Way, San Francisco. 7 pm, mushroom identification and refreshments provided by the Hospitality Committee. 8 pm, Nicole Hynson presents *Mycorrhizal Fungi: Form and Function*.

The submission deadline for the April 2010 issue of *Mycena News* is Friday, March 19th. Please send your articles, calendar items, and other information to: mycenanews@mssf.org

ANNOUNCEMENTS

GUIDED FORAYS - CA AND ELSEWHERE

MushRoaming Tours in Tibet

Daniel Winkler is organizing two MushRoaming Eco-tours in Tibet in 2010:

- *Cordyceps* & morel expedition (E. Tibet) May 24th to June 6th
- Fungal & Floral Foray in Tibet, July 14th to 27th

More details at: www.MushRoaming.com.

