Speaker for April 19 MSSF Meeting

Dennis Desjardins, Ph.D.

"Why I Am a Mycologist"

I studied with Dr. Harry Thiers at San Francisco State University from 1981-1985 (B.S.-1983, M.A.-1985), then studied with Dr. Ron Petersen at the University of Tennessee from 1985-1989 (Ph.D.-1989). I taught at Oberlin College for one year before coming back to SFSU after Harry Thiers retired. I am currently Professor of Biology and Director of the H.D. Thiers Herbarium in the Dept. of Biology at San Francisco State University where I have been for the past 15 years.

I have been a member of the Mycological Society of San Francisco for nearly 25 years and its

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Mycena News

The Mycological Society of San Francisco April, 2005, vol 56:04

MycoDigest: Of Flies and Fungi

Else Vellinga

I had never thought that I would be thrilled by minifungi growing in fly guts. I have still to see one but these Trichomycetes are fascinating creatures!

Trichomycetes really do not look like any other fungus, and are only found growing in or on arthropods (insects, crabs, millipedes and sow bugs to name a few). They occur in masses that look like miniature velvet mats, whence the name Trichomycetes, which literally means hair fungi.

All the usual questions and problems arise with this group of fungi. How do we recognize species, what are the bigger groupings, and are these groups monophyletic (an ensemble of everything derived from one common ancestor - you can guess the answer, especially because these things do not abound in characters to tell them apart); what kind of life cycle do they go through; what role do they play for their hosts, do they specialize in some particular part of the animal; and how do they get around from one place to another?

The discovery of these organisms was made by Leidy in the mid 19th century. He declared "that plants may grow in the interior of the healthy animal as a normal condition", mistaking what he had found within the guts of millipedes and beetles for a colourless alga.

In the 20th century researchers in France and in the USA put Trichomycetes on the mycological map as a class belonging to the Zygomycota; bread mold and the beautiful *Pilobolus* are other members of the Zygomyccota that may be more familiar. At first four different orders were recognized within the Trichomycetes but two of these orders have now been shown to be out of place, in fact one of them is at the base of the animal-fungus split in the big tree of life. Of the two orders that remain in the Trichomycetes, Harpellales is the better known, and we focus on it for the rest of our fly-and-fungus story. Its members actually live within the aquatic larvae of black flies, stone flies and may flies. The fungi are completely adapted to life within the larvae and are very hard to grow outside their hosts.

To take an example, black fly larvae are found in flowing water as little tubes attached to the streambed; they have two brushes on top for filter-feeding. These larvae are small, and the fungi living within the guts are *very* small, the individuals not reaching one tenth of a millimeter in length. How they are attached to the gut, the branching patterns of the hyphae, and the shape and size of the spores are crucial characters to distinguish the species. There isn't much to go on so it won't be a great surprise if classifications change when molecular methods are applied to the group.

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

Speaker for March 19

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Scientific Advisor for the past 14 years. My publication record totals over 75 papers on mushroom taxonomy in refereed-scientific journals, and over $1.6 million from the National Science Foundation to support my research. I currently have 9 graduate students, 4 at SFSU, and 5 in Asia where I supervise their doctoral research at Chiang Mai University, Ramkhamhaeng University and King Monkut's Institute of Technology in Thailand, and at the University of Malaya in Kuala Lumpur. I have published over 140 new species and 3 new genera. I received the Alexopoulos Award for scholarly work and the Weston Award for teaching excellence from the Mycological Society of America. Currently, I spend most of my research time in Southeast Asia.

Things I will explore in my talk:
1) reasons why I am a mycologist and why you should be too
2) new species and new genera - like a coralloid jelly fungus; a sponge-like bolete without a stipe; mushrooms that fruit under water and under ice
3) interesting adaptations in mushrooms that allow them to survive and thrive in specific habitats
4) 6 new species of bioluminescent mushrooms all collected from the same habitat in the Atlantic Forest area of Brazil; why are mushrooms bioluminescent?
5) the exciting work my 9 graduate students are doing in the US and Asia
6) why all of you should join me to explore the wonders of the spring fungi of the Sierra Nevada this June 5-10.

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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.)

The Foragers' Report April 2005

Patrick Hamilton

Last column told of a not-so-great coastal blacks season-and I think it is yet not. But inland, ah, that can make for a different report.

About two weekends ago (March 5) a few close friends and I were drawn a map of a certain area in Jackson State Forest by a commercial picker buddy. (No, not for any sum, may you purchase one of these maps. Psst!—write me privately). The place we were told to go look was over 10 miles inland—certainly not "coastal blacks."

About 15 miles down the highway, then a left turn by the little structure with the cute roof, down the dirt road another two miles to the locked gate and then about a mile and a half hike to the ridge on our left and then through nasty piles of brush and other logging leftovers, past the malevolent Pampas grass (I hate it), up through the huckleberry, and—yes! Blacks. There were plenty where he said there would be and, on our own (who needs a special map anyway), we located another very productive area nearby.

A common misconception about commercially picked areas is that why bother to go when they pick them all. Nobody does. And, there are enough for everybody. In fact there are almost too many now (March 18) coming to market.

You've all heard of the pigs of Perigord, those truffle finding pets, but maybe never seen them in action? We'll I have witnessed a similarly talented animal right here in our woods. A very good friend of mine has this dog, a chocolate Labrador (perfect name—after a food item) that can find black chanterelles. Yep. Finds them. Yea! Eats them. Oh. . . .

First time I saw Hunter (another great name) do that I figured it to be a typical Labrador, a.k.a. canine eating machine, activity—anything slow enough to get into his mouth was fair game. But no, he was game specific and actually sought out the primary fungus that we were looking for, and nothing else. He disdained winters and candy caps and also ignored stuff that we cared not about either, like Russulas, and Lactarii.

Just about when we'd stoop to pick a bouquet of blacks he would swoop (kind of like a Norm Andresen move on your morels—and just as quick) and pop them into his mouth (never saw Norm do that). Good thing was that, if you saw him do it, you could order him to drop them (try that on Norm).

We had been looking hard for some coastal blacks in northern Sonoma County recently and found decent amounts in our usual patches on Saturday but on Sunday the pickins were slim. I had to leave but my friends stayed on and gleaned over some lesser producing (read, better known by others) spots for more mushrooms. The story I got was that upon returning from the foray and showing each other their rather empty baskets Hunter tossed them his. Yeah, his. They were being kept in his basket—only one he had. His bread basket. He'd eaten them this time.

"A substantial pile was displayed on the corner of the deck. More than all of us combined had found." Or something like that I was told. Hunter had succeeded big time and now just needed some proper training to allow his unique talent to become better directed. No reports of recovery methods on his mushrooms, if any. And, apparently, Hunter suffered no ill effects, other than the obvious. There is information here for someone.

Have you been noticing the lovely little yellow violets growing in profusion in dry areas near your black chanterelle patches? They are either Yellow Wood violets or Redwood Violets. Black Chanterelles, yellow violets and a chocolate Lab.

Nice time. Get out in the woods. (Apologies to Norm.)

Recipe? I have written 146 recipes for mushroom dishes and stored them in my MasterCook II program and if anyone needs one for a certain mushroom or for whatever reason feel free to email me and you will be served. Let's do the always yummy. . . .

Coquilles St. Jacques with Black Chanterelles

Serving Size: 8 Preparation Time: 1 Hour

1/4 cup bread crumbs, fresh from baguette
1/4 cup (1/2 oz) Parmigiano-Reggiano, finely grated
1 1/4 cup dry white wine
1 cup water
1/2 onion, small, sliced
1/2 bay leaf
1/2 tsp sea salt
1/4 tsp black pepper
1 lb sea scallops, tough muscle removed — cut into 3/4" pieces
1/2 lb black chanterelles — sliced thin
6 Tbsp unsalted butter
1/2 cup heavy cream
1 egg yolk, large
1 Tbsp all-purpose flour
8 cups Kosher salt
1 1/2 Tbsp Italian parsley — minced

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MycoDigest

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In addition to regular spores which bud off asexually Trichomycetes can form zygospores, sexually produced spores which, under the microscope, look like two-dimensional cap-and-stem mushrooms. What conditions lead to the formation of zygospores is still not known, and asexual spores are much more common.

The spores swim around with whip-like appendages to find their hosts. Spores get into the fly larva, germinate and a new fungal individual is formed. The fungal spores - both regular spores and zygospores - emerge to infest the larvae anew. The lining of the insect gut is actually not separate from the outside skin of the animal, and when these larvae molt the gut lining is shed as well. So the fungi have to reinfect their hosts over and over again, at least in those species which molt several times during their larval part of life; in other words a constant coming and going of fungi. Rarely, and in some species combinations, the female adults have the fungus as a parasite. In that case, the fungi form cysts in the ovaries of the female, so instead of eggs, clusters of spores are laid, which reinfect the larvae. This is a beautiful way of dispersal for the fungi, as those adult females fly upstream of the place where they were hatched themselves, to deposit their eggs. But when and why the fungus parasitizes the adults is one of the question marks of the life cycle.

The fungi are not just anywhere in the guts of the larvae, but are concentrated in the hind gut, and that may have to do with the conditions there. The spores only attach to the gut lining and germinate under a certain pH, and that is not available just anywhere inside the gut.

Everywhere where people have looked for the host insects, these fungi have also been found, including remote islands like the Crozet Islands in the southern part of the Indian Ocean, and the Galapagos Islands where blackflies, and apparently also their fungi, have been introduced. Even the pitcher plant mosquito larvae, occurring in isolated pitcher plants in the Carolinas for instance, have Trichomycetes. You have to wonder how the fungi got into these little pools of water. I have not found a publication devoted to the Californian species, but as there are black flies in California, there must be Trichomycetes as well.

The fungi feed from food the insects eat and, as Leidy already discovered, apparently cause their hosts no other harm. Indeed, in recent experiments with one particular host-fungus combination, starved and fungus-free larvae did much worse than starved larvae which were infected with Trichomycetes. Both starved groups did worse than others with full bellies and fungi. This means that the relationship between the insects and the fungi is not always commensal (no effect on either of the parties), but under some conditions (in this experiment, a lack of food) can become a mutualism (beneficial for both parties), and under other different, still unknown circumstances, can be parasitic (detrimental to one party, and beneficial to the other). We tend to think of these relationships as fixed and mutually exclusive, but nature is always in flux, and different conditions may produce different effects. This is also true for mycorrhizal fungi and their plant hosts. Fungi which are instrumental in the survival of a seedling during summer drought may not be essential when water or food are plentiful. The relationship depends on circumstance.

In fact, insects have many more organisms defining their circumstance than just those Trichomycetes. Every individual animal is a walking (or flying) assemblage of bacteria and fungi, some good, some bad, some neutral, but all being a part of a bigger whole. Wondering how the hair fungi found their particular niche in this interaction web, and how they have become so specialized still gives me a thrill.

Further reading:

Lichtwardt, R.W., 1986. *The Trichomycetes: fungal associates of arthropods*. New York: Springer-Verlag. 343 pp.
http://www.nhm.ku.edu/~fungi/ [accessed March 17, 2005]

Mushroom Haiku

David Campbell

Exuberant yes
Fulfilled with mushrooms
I am
How bad can it be?

San Jose Family Camp Morel Foray 2005

Foray Chair Norm Andresen announces that this year the San Jose Family Camp Foray will start with dinner on Friday, May 6 and last through lunch on Sunday, May 7. The San Jose Family Camp is a wonderful place to spend a spring weekend, get acquainted with spring mushrooms and have all meals prepared for you. Not only will you find morels, but in past years we have also found false morels, spring boletes, coral fungi among others and even snow plants. The program for the weekend includes leader guided trips on Saturday and photo slide shows on both Friday and Saturday evening. Mark Lockaby, Norm Andresen, Tina and Thomas Keller will be leading the foray groups.

San Jose Family Camp is located off of State Highway 120 about 10 miles west of the Oak Flat entrance to Yosemite National Park. Lodging will be in tent cabins having wooden floors and electric lights. Bathrooms with hot water and showers are located nearby. Meals prepared by camp staff are served in the dining hall located adjacent to the Tuolumne River and include BBQ chicken on Friday night and prime rib on Saturday evening.

The wonderful thing about this foray is that it takes place in the Sierra Mountain near Yosemite National Park. A good place to shed your winter gloom. You will not only see spring mushrooms, but also snow fed streams (snow at higher elevations), vegetation turning green and dogwoods in bloom. You can visit Yosemite National Park with waterfalls in their full glory (but remember national parks are off limits to mushroom hunting).

Registration for the foray will include the programs, the leader-guided trips, two night lodging and six meals and is a bargain for members at $98 and $60 for their children. For nonmembers, the fee is $120. Register early to reserve your spot. Registration will close April 30. Register by sending a check made out to MSSF to coordinator Tom Sasaki, 1506 Lyon Street, San Francisco, CA 94115. For more information, contact Tom at 415-776-0791 or sasakitom@aol.com.

Foragers' Report

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Set oven to 350 degrees

1. Toast crumbs until pale golden 6-8 mins, toss with cheese.

2. Simmer wine, water, onion, bay leaf, salt, and pepper in 2-3 qt pan, uncovered, 5 mins, add scallops and simmer, uncovered, stirring occasionally, until just cooked—2 to 3 mins. Transfer scallops to a platter with slotted spoon to cool, returning any onions to pan, reduce to 1 cup. Strain into bowl.

3. Cook mushrooms in 2 Tbsp of butter for 5 minutes. Season.

4. Whisk cream and yolk. Melt 2 Tbsp of butter in pan and add flour and cook roux 2 mins. Break roux with reduced liquid, heat and simmer 1 min. Remove from heat and season.

5. Heat broiler. Stir scallops and mushrooms into sauce, divide among scallop shells (if using them, nestle shells in Kosher salt in pan) or ramekins and sprinkle with crumb mix. Dot with butter and broil 4" from heat until golden. Garnish with parsley.

Try a Muscadet or dry Chenin blanc or Sancerre with this. If you like to drink California wines (that is so-o unfashionable in some circles) try a Geyser Peak Sauvignon Blanc or any white from Navarro.

That's all for now, folks!

Thank You Volunteers!

A page has been posted in the members only section of our website honoring the MSSF members who have actively participated in operating and supporting our Society during the past year. The alphabetic

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MSSF Calendar, April, 2005

Tuesday, April 19: MSSF General Meeting. Randall Museum, doors open at 7:00 pm. Dennis Desjardins will talk about his love for mycology.

Tuesday, April 19: NAMA's Mushroom Photo Slide Program at 6:45 pm in the Randall Museum auditorium (preceding the General Meeting). Continuing the discussion of the Friesian classification of mushrooms in March, the April show will feature "The Gilled Fungi: The Friesian Genera." This program will demonstrate which genera of each spore color occur in each stature type and will explain how to tell them apart.

Friday-Sunday, May 6-8, San Jose Family Camp Morel Foray. For a fun and carefree weekend, join our annual foray hunting for morels and spring boletes. See article in news section. Members cost for the weekend is $98, $60 for children and $120 for nonmembers. For reservations send checks to coordinator Tom Sasaki, 1506 Lyon St., San Francisco, CA 94115.

Note: Deadline for the May 2005 issue of Mycena News is April 22. Please send your articles, calendar items and other information to: mycenanews@mssf.org